

**18th World Congress**  
**World Society of Cardio-Thoracic Surgeons**  
*Kos Island - Greece • April 30 - May 3, 2008*

# CONTENTS



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18th World Congress - World Society of Cardio-Thoracic Surgeons  
Kos Island - Greece  
April 30 - May 3, 2008

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## National Organizing Committee

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## Program Committee

**Chairmen: C. Anagnostopoulos, Greece • B. Gersak, Slovenia • J. Bonatti, Austria**

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A. Fikri, Malaysia	A. Michalis, Greece	L. Papadimitriou, Greece	A. Tsiorna, Greece
S. Gabbay, United States	A. Michalopoulos, Greece	A. Pitsis, Greece	M. Vettath, India

## Honorary Committee

**Chairmen: J. Wada, Japan • G. Tolis, Greece • F. Robicsek, United States**

O. Adame, Mexico	B. Cho, Korea	I. Jelic, Croatia	H. Osada, Japan
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G. Buckberg, United States	P. Goldstraw, United Kingdom	C. Mavroudis, United States	V. Sirvydis, Lithuania
E. Buffolo, Brazil	M. Guida, Venezuela	C. Mestres, Spain	P. Spanos, Greece
C.E. Cabrol, France	R. Hetzer, Germany	K. Moghissi, United Kingdom	F. Spencer, United States
A. Carpentier, France	A. Iatrides, United States	S. Mouloupoulos, Greece	S. Stamatiopoulos, Greece
K. Cherian, India	S. Jamieson, United States	T. Mussivand, Canada	R. Stanbridge, United Kingdom

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I. Stinios	T. Sulling, Estonia	P. Toutouzas, Greece	D. Wheatley, United Kingdom
N. Stolf, Brazil	F. Tarr, Hungary	N. Trehan, India	R. Wolf, United States
V. Subramanian, United States	J. Tatoulis, Australia	A. Tschirkov, Bulgaria	M. Yakub, Malaysia
H. Suma, Japan	G. Thanopoulos, Greece	F. Unger, Austria	X.D. Zhu, China

## Invited Faculty

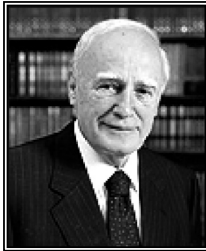
D. Adams, United States	R. Jakovic, Serbia	B. Meyns, Belgium	K. Spencer, United States
B. Akpinar, Turkey	W.R.E. Jamieson, Canada	L. Mongero, United States	S. Srivastava, United States
O. Alfieri, Italy	F. Jatene, Brazil	C. Muneretto, Italy	G. Stellin, Italy
R. Ascione, United Kingdom	O. Jegaden, France	S. Mylona, Greece	P. Suwalski, Poland
B. Biocina, Croatia	A. Kalangos, Switzerland	E. Mylonakis, United States	D. Taggart, United Kingdom
D. Branscheid, Germany	H. Karagoz, Turkey	P. Nataf, France	L. Thanos, Greece
J. Brink, South Africa	T. Kazui, Japan	K. Nelson, United States	D. Tilson, United States
D. Burkhoff, United States	K. Khargi, Netherlands	P. Noirhomme, Brussels	A. Toker, Turkey
G. Dangas, United States	P. Kilner, United Kingdom	P. Pairolero, United States	G. Tolis Jr., United States
D. De Canniere, Belgium	J. Kobayashi, Japan	H. Paterson, Australia	F. Venuta, Italy
M. Di Mauro, Italy	P. Kolh, Belgium	D. Petrov, Bulgaria	P. Vogt, Switzerland
N. Dickgreber, Germany	R. Kormos, United States	L. Poa, United States	W. Walker, United Kingdom
T. Dickinson, United States	G. Ladas, United Kingdom	F. Rea, Italy	B. Walpoth, Switzerland
M. Ercegovac, Serbia	S. Levitsky, United States	A. Redington, United Kingdom	O. Weber, United States
V. Falk, Germany	D. Likosky, United States	H. Reichenspurner, Germany	Q. Yan, China
R. Favalloro, Argentina	R. Lima, Brazil	M. Rigby, United Kingdom	M. Yuksel, Turkey
M. Gatzoulis, United Kingdom	J. Long, United States	S. Sano, Japan	L. Zellos, United States
M. Glauber, Italy	F. Melfi, Italy	G. Sarris, Greece	E. Zias, United States
V. Hraska, Germany	L. Menicanti, Italy	A. Simon, Germany	
S. Itescu, United States	F. Merkle, Germany	O. Soran, United States	

## International Scientific Committee

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H. Boudoulas, Greece	E. Kabil, Bosnia-Herzegovina	A. Refatllari, Albania	P. Van Schil, Belgium
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C. Dettler, Germany	D. Kremastinos, Greece	I. Sharouf, Syria	T. Ziabakhsh, Iran
W.H. Eid, UAE	N. Lakic, Slovenia	H. Sie, Netherlands	P. Zilla, South Africa
R. El Oakley, Saudi Arabia	M. Laskar, France	T. Sinjari, Albania	
S. Elia, Italy	D. Lee, Korea	L. Spassov, Bulgaria	
M. Elsharawy, Saudi Arabia	A. Manolis, Greece	R. Starling, United States	

## ADDRESS BY THE PRESIDENT OF THE HELLENIC REPUBLIC TO THE 18TH WORLD CONFERENCE OF CARDIO-THORACIC SURGEONS



I' am addressing the opening of the 18th World Conference of World Society of Cardio-Thoracic Surgeons wishing every success to your works with Hippocrates oath guiding you unfailingly and faithfully all along your arduous and praise-worthy mission.

Your mission is strenuous and demanding. Your contribution to human beings and the society in general requires support by all of us, mainly by the State to support your scientific study and research.

The Health sector is the first token displaying our Society degree and quality of progress. For this reason, the State has the obligation to provide all the necessary means which would underpin an integrated Health policy, pursuant to the latest scientific data and the principles of morality and human life protection.

I am convinced that your Conference shall pave new ways in your scientific field highly contributing to broadening the knowledge around the most precious good, health. I also believe that the exchange of knowledge and experience shall add to your 'arsenal' assisting your every day struggle for better health.

**Karolos Papoulias**  
President of the Hellenic Republic

## WELCOME ADDRESS BY THE MINISTER OF HEALTH AND SOCIAL SOLIDARITY



Greece from the ancient years was a pioneer in Medicine having experienced the tremendous contribution of Asclepios, Hippocrates and through the centuries of Papanikolaou, with the worldwide known pap test. In the recent years the evolution in medicine was achieved by the introduction of technology both in diagnosis and treatment. The contribution of new therapeutic treatments particularly in the field of Cardio-Thoracic Surgery, has been proved to be unparalleled.

Taking in account the worldwide and rapid increase in the prevalence of cardiovascular diseases, we understand the importance of initiations promoting the exchange of thoughts and experience between teams and groups active in the field of Cardio-Thoracic Surgery, from several countries. The World Society of Cardio-Thoracic Surgeons has contributed in several ways, especially through the World Congress that organizes every year, in spreading knowledge, informing public and exploring the latest and most noteworthy developments in Cardio-Thoracic Surgery today. The Hellenic Ministry of Health and Social Solidarity supported, strongly and from the first time, the bid for the organization of the 18th WSCTS World Congress, in Kos and endorsed this initiation that fits well with our goal to promote the quality of research in Greece by encouraging international research networks and cooperation.

It is an honor for Greece to have this opportunity to organize the 18th WSCTS World Congress and I would like to welcome you all in Kos, homeland of Hippocrates, the father of medicine. This beautiful and historical island constitutes a meeting point of old and contemporary, as well as a luminous point to remind us of the continuous efforts of mankind to progress medical science through the historical paradigm of Hippocrates who did not only established the scientific basis of current medicine, but also founded the moral principles of medicine, based on the humanistic ideals that reached their philosophical perfection in the 5th Century B.C. Realising the unifying capacity of medicine, not just contained in the scientific field, the Hellenic Ministry of Health and Social Solidarity organised, last June, also in Kos, the Founding Global Hellenic Medical Forum. I would like to express my satisfaction because, in this very island of Kos, our initiatives are successfully continued, enhancing the academic and social bonds between the hellenic medical society and the eminent scientists who exercise cardio-thoracic surgery abroad.

I believe that exchange of knowledge in Cardio-Thoracic Surgery from people coming from different countries, not only will bring on the surface new ideas, techniques and treatments but will also re-enforce the existing knowledge, clarify and secure the available methods, giving the chance to younger and more senior doctors to enrich their armamentarium against cardiovascular diseases.

Wishing success to the scientific activities of the 18th WSCTS World Congress I address to all of you a very warm welcome to Greece, the country of Hippocrates and Asclepios, the country of goddess of health "Hygeia".

**Dimitris L. Avramopoulos**  
Minister of Health and Social Solidarity

## GREETINGS BY THE MINISTER OF TOURISM MR. ARIS SPILIOPOULOS ON THE 18TH WSCTS WORLD CONGRESS



Ladies and Gentleman,

Dear Friends,

First of all I would like to thank you for your invitation to be among you today, in this great initiative that you organized. Such initiatives are very important for our effort to promote the development of our country.

Unfortunately, my presence among you today is not possible. However, I would like to express my wishes for the fulfillment of the goals and the purposes of your great effort.

Tourism represents a national priority for our country, because it attributes a tangible and countable result to Greek economy. It's neither abstract, nor mutable. Its development is perceptible through the rhythms of our economy, outlining an important aspect of our country's general profile.

Tourism is an industry where diverse branches of business, social and professional organizations are active. It is a field that combines a multitude of views, diverse approaches and manifold trends. It is an industry that brings together civilizations, mentalities and cultures.

Our vision of Greek tourism is twofold: the first fold necessitates vigorous growth, dynamic investments, creation and maintenance of employment opportunities, robust revenues and affluence for all, the staunch support of the local societies, the vigilant protection of our cultural heritage and the uninterrupted continuity of our traditions. The second fold decrees that those who visit Greece live through an experience which more than meets their expectations, feel justified in having selected Greece as their destination, and depart so replenished by experiences as to wish to return in company, all the while acting as the most effective ambassadors of our country to their homelands.

This is exactly the model of tourism growth that we envisage. It is a model well worth working for with all our strength.

In our effort to promote Greek Tourism, initiatives like that of the World Society of Cardio-Thoracic Surgeons (WSCTS) can greatly contribute to the development and promotion of a tourism model that upgrades the services offered on all sides, that predicts the demands of contemporary age for on-line and digital information, that restricts bureaucracy and promotes investment, always with an environmental conscience.

The contribution to all these three priorities renders the key to winning future challenges that demand the enrichment and the diversification of the Greek tourism product with many forms of tourism and through out the year.

The growth strategy we aim to follow on the matter of tourism will be strongly influenced by environmental concerns. The growth model we aim to adopt will not abuse our "home", a home we are making for ourselves and future generations. Such initiatives are the frontguard of Greek Tourism. The future of Greek Tourism is based on such initiatives.

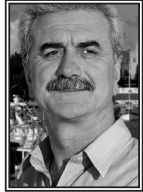
Greece is a country with unique comparative advantages. Its huge cultural wealth and its natural beauties make it one of the most attractive countries in the world, ideal for the development of tourism activities. This is why Greek tourism, as a major resource for the country, has established a great dynamic course, creating expectations and responsibilities.

Today Greece has been established as a power of balance and security in Southeastern Europe, as a modern and attractive destination for all visitors. Our goal is to showcase Greece as a world power in the realm of tourism, while maintain its identity the make our country special. By expressing those simple thoughts I would like to wish full success to the working groups of the conference and to the goals set up by the organizers of this great effort.

Sincerely Yours,

**Aris Spiliopoulos**  
Minister of Tourism

## WELCOME NOTE BY THE PREFECT OF DODECANESE



It is a great honor for Dodecanese region and particularly for the island of Kos, Hippocrates's native land, to host a part of the distinguished and active scientific potential of our country and of the entire world in the context of the 18th WSCTS World Conference.

It is a great honor to host those people who behind the closed doors of the operating theaters are fighting hard on a daily basis with time, often scarce chances and crucial decisions in order to save a human life.

We firmly believe that the works of this Conference shall highlight one step further in the toil-some effort invested on a daily basis to answer to questions and challenges emerging in the world scientific community, always placing emphasis on Man.

We strongly believe that the island of Kos will rise to the occasion of this significant scientific meeting, whose conclusions shall become point of reference in the world medical community.

Yours sincerely,

**Yiannis Machairides**  
The Prefect of Dodecanese

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## WELCOME NOTE BY THE MAYOR OF KOS



It is a great pleasure and honor for me to welcome all participants in the "18th World Congress of Cardio-Thoracic Surgeons» in our historic island Kos, the birthplace or Hippocrates.

The connection between medicine, science and ethic is undoubtedly the supreme challenge through times and is Hippocrates himself that proves it, being the first that composed "The Medical Ethic Code", with the "Hippocratic Oath". Its noble principles transcend time and place, and today is more diachronic, than ever.

Therefore, we consider the results of the congress very valuable and wish every success to its work.

Parallel to the congress, and your very important meetings, I am confident that you will also enjoy the beauty of a historical city, the cultural attractions, the pleasant climate, the traditional cuisine, but most of all; you will experience the famous hospitality of the people of Kos.

I wish you all a successful congress and enjoyable stay.

With my warm wishes,

**Mr. George Kirtsis**  
Mayor of Kos





## WSCTS Officials

### ► Steering Committee Members

**Honorary Chancellor & Founder:** J. Wada (Tokyo)

**Chancellor:** S. Jamieson (San Diego)

**Vice Chancellors:** F. Unger (Salzburg) 2002-2007, W. R. E. Jamieson (Vancouver) 2003-2008

**Honorary Founding Members:** C. E. Cabrol (Paris), D. A. Cooley (Houston, TX), C. J. Hahn † (Arzier, Valais), N. E. Shumway † (Stanford, CA)

**President:** M. Matsumoto (Chuo-shi, Yamanashi) 2007-2008

**Immediate Past President:** T. Mussivand (Ottawa) 2006-2007

**Incoming Chairman:** S. Prapas (Athens)

**Secretary General:** W. R. Ade (Tokyo) 2005-2010, M. M. Madani (San Diego) 2007-2012

**Historian:** F. Robicsek (Charlotte NC) 2006-2011

**Honorary Editor:** A. Gunning (Oxford)

**Executive Councillors:** F. J. Benetti (Buenos Aires) 2005-2008, W. Dembitsky (San Diego CA) 2006-2009, R. R. Favaloro (Buenos Aires) 2006-2009, O. H. Frazier (Houston TX) 2005-2008, H. Osada (Kawasaki, Kanagawa Pref.) 2005-2008

### ► Regional Representatives

#### **Africa/Europe:**

M. C. Aghaji (Enugu) 2005-2008, H. M. Elsayed (Cairo) 2005-2008, R. Deac (Tirgu Mures) 2005-2008, M. P. Gawdzinski (Warsaw) 2005-2008, G. K. Nachev (Sofia) 2005-2008, M. I. Perelman (Moscow) 2005-2008, S. N. Prapas (Athens) 2005-2008

#### **America:**

R. C. J. Chiu (Montreal, Quebec) 2005-2008, N. Gonz  les (Ciudad de La Habana) 2005-2008, S. F. Khuri (West Roxbury, MA) 2005-2008, O. R. Rodrigues (Sao Paulo) 2005-2008, H. Spencer (Kingston) 2005-2008

#### **Asia/Australia/Oceania:**

B. F. Akasheh (Amman) 2005-2008, A. Bagirov (Baku) 2005-2008, M. M. Al-Omeri (Baghdad) 2005-2008, S. S. Kabbani (Damascus) 2005-2008

### ► Honorary Members

1988: Chawalit Ongcharit (Bangkok)

1991: Donald Ross (London, Eng.)

1994: Hans Georg Borst (M  nchen)

1996: Hermes C. Grillo † (Boston, MA)

2000: Sir Magdi Habib Yacoub (Harefield, Middlesex, Eng.)

2002: Alf Gunning (Oxford, Eng.)

2002: Francis Robicsek (Charlotte, NC)

### ► Past Presidents

1991: Juro Wada (Tokyo)

1991-1992: Chawalit Ongcharit (Bangkok)

1992-1993: Ahmet Y. Bozer (Ankara)

1993-1994: Felix Unger (Salzburg)

1994-1995: Joseph B. Borman (Jerusalem)

1995-1996: Esteban I. Fern  ndez Noda (Hato Rey, PR)

1996-1997: Kozo Suma (Tokyo)

1997-1998: Reiner K  rfer (Bad Oeynhausen)

1998-1999: John C. Baldwin (Hanover, New Hampshire)

1999-2000: Jos   M. M. H. Roquette (Lisbon)

2000-2001: W. R. Eric Jamieson (Vancouver)

2001-2002: N.A.G. Stolf (Sao Paulo)

2002-2003: L.K. von Segesser (Lausanne)

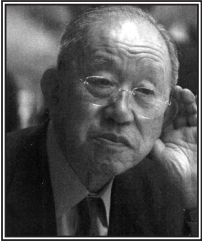
2003-2004: S. W. Jamieson (San Diego, Ca.)

2004-2005: X.-D. Zhu (Beijing)

2005-2006: V. Sirvydis (Vilnius)

2006-2007: T. Mussivand (Ottawa)

## WELCOME NOTE BY THE WSCTS HONORARY CHANCELLOR AND FOUNDER

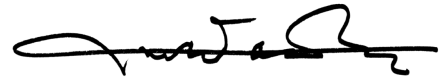


Dear Colleagues,

It is most encouraging to see the verve and efficiency with which Dr. Prapas has started the organization of the XVIIIth World Congress. After the Kyoto Congress that Dr. Matsumoto with the support of Drs. Hetzer and Osada made a success this meeting on Hippocrates' island of Kos promises not only professional value but also a superb cultural event.

I am also most pleased to inform you that Dr. Roberto R. Favaloro will host the XIXth World Congress. These will be a wonderful opportunity to honour the late René G. Favaloro whose noble personality was belauded in the Journal of Cardiovascular Surgery in the year 2000.

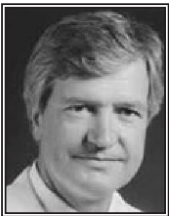
During a visit in Athens and Delphi on the occasion of a panel discussion by the Seven Wise Men of the World in Cardiovascular Surgery, I could convince myself of the excellency of Greek hospitality. Join us at Kos, you will not regret it.

A stylized, handwritten signature in black ink.

**J. Wada, M.D., Ph.D., F.A.C.S., F.C.T.S.**  
Honorary Chancellor of the W.S.C.T.S.

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## WELCOME NOTE BY THE WSCTS CHANCELLOR



Dear Colleagues,

It gives me great pleasure to add my welcome to the 18th World Congress.

Dr. Prapas and his colleagues have organized an outstanding meeting in a spectacular location. The conference will bring together current knowledge and future promise in all fields of cardiothoracic surgery and related disciplines.

The meeting is timely. The techniques and applications of cardiothoracic surgery are changing, as is our understanding of how best to progress in merging our expertise with allied fields so as to produce optimal results for our patients.

We all have a lot to learn from each other, and the World Society of Cardiothoracic Surgery remains the only international society. The Society thus provides a forum where ideas and progress can be presented from all parts of the world, without geographical bias.

The Society was started 18 years ago by the important pioneers in the field, and meetings rotate between Europe, North America, Asia and South America. Plans are underway to hold the 2009 meeting in Buenos Aires, the 2010 meeting in India, and the 2011 meeting in Berlin.

Thank you for your support of the 18th annual meeting on the spectacular island of Kos. Please join us all in making this an unforgettable conference, and establishing the World Society as an important forum for the exchange of ideas.

With my warm wishes,

A stylized, handwritten signature in black ink.

**Stuart Jamieson**  
Distinguished Professor of Surgery  
Head of Cardiothoracic Surgery  
University of California San Diego  
Director, California Heart and Lung Institute

## WELCOME NOTE BY THE CONGRESS CHAIRMAN



Dear Colleagues and Friends,

On behalf of the Organizing Committee, it gives me great pleasure to welcome you to the 18th WSCTS World Congress, on the island of Kos in Greece.

The WSCTS 2008 appeal has been remarkable due to your personal recommendations, giving us the opportunity to welcome distinctive guests from all over the world and raising our expectations for a top quality scientific program that will stimulate open discussion among the world's leading experts.

Our aim for the WSCTS 2008 scientific program was to have a broad appeal to everyone who participates in the cardiothoracic healthcare delivery team, by introducing multidisciplinary sessions on Cardiology, Anesthesiology, Nursing, Perfusion and Respiration. I am glad to inform you that the Greek cardiothoracic healthcare community, along with the local authorities, have been very supportive throughout the planning of the WSCTS 2008, sharing with us the same aspiration to organize a congress that will have a distinctive atmosphere steaming from bridging the past with the future.

WSCTS 2008 participants will have the opportunity to experience the very origins of our profession, while reflecting on its future prospects. We will welcome you under the Plane Tree of Hippocrates, setting the ambience for the other social events to follow, among them the re-enactment of the ancient oath of Hippocrates in its historical setting.

"Philoxenia" the Greek word for hospitality has always been among our core values.

We look forward welcoming you on the Island of Kos to revive the Hippocratic Oath, while exploring the future of our profession.

Sincerely Yours,

A stylized handwritten signature in black ink, consisting of a large 'S' followed by a horizontal line and a small dot.

**Sotirios N. Prapas**  
Chairman of the 18th WSCTS World Congress

# WSCTS 2008 Scientific Program

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## MV Repair 1 (100)

### Type: Plenary Session

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Hippocrates (Main Hall)

**Chair:** A. Carpentier, France  
**Co-chair:** A. Yakub, Malaysia G. Nachev, Bulgaria

Anatomy, physiology of the mitral valve  
*P. Kolh, Belgium*

Timing of surgery for mitral valve repair  
*C. Mestres, Spain*

Lessons learned from cadaver studies in functional mitral regurgitation (FMR)  
*F.B. Jatene, Brazil*

Rings used in mitral valve repair  
*M. Di Mauro, Italy*

Surgery for FMR and non FMR  
*A. Calafiore, Italy*

Port access approach for mitral valve repair  
*B. Gersak, Slovenia*

Management of infective endocarditis - The team approach  
*E. Mylonakis, United States*

## Parallel: Cardiac 1 (105)

### Type: Abstracts - Oral Presentation

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Panacea

**Chair:** C. Detter, Germany  
**Co-chair:** N. Bonaros, Austria E. Papadakis, Greece

**OP-450** IMMEDIATE AND LONG-TERM FOLLOW-UP AFTER ENDOVASCULAR TREATMENT OF THE TRUE DESCENDING AORTIC ANEURYSMS  
*Kim, Hyung*

**OP-451** VIDEO-THORACOSCOPIC PERICARDIAL WINDOW IN THE TREATMENT OF PERICARDIAL EFFUSIONS  
*Gaia, Diego*

**OP-452** LONG TERM RESULTS OF PROSPECTIVE RANDOMIZED STUDY OFF PUMP VS ON PUMP CORONARY REVASCULARIZATION  
*Benetti, Federico*

**OP-453** PREDICTORS FOR THE SUCCESS OF ON TABLE EXTUBATION AFTER ENDOSCOPIC HEART SURGERY  
*Sostaric, Maja*

**OP-454** ROBOTIC ATRIAL SEPTAL DEFECT REPAIR - PRELIMINARY EXPERIENCE WITH DA VINCI S SYSTEM IN CHINA  
*Gao, Changqing*

**OP-455** THE USE OF THE TRANSAORTIC EDGE TO EDGE MITRAL VALVE REPAIR IN PATIENTS WITH CONCOMITANT AORTOTOMY  
*Kelpis, Timotheos*

**OP-456** BIOPROSTHETIC VALVE MODIFICATION FOR FULL

RETENTION OF THE NATIVE MITRAL VALVE  
*Hugh, Paterson*

**OP-457** PULMONARY NITRITE EVALUATION WITH THE AID OF EXHALED BREATH CONDENSATE IN THE PER-OPERATORY AND LATE POST-OPERATORY (24 HOURS) TIMES OF ON-PUMP CARDIAC SURGERY  
*Evora, Paulo Roberto B.*

**OP-458** INFLAMMATORY MARKERS PREDICTS FUTURE CARDIOVASCULAR AND NEUROLOGICAL EVENTS IN PATIENTS UNDERGOING CAROTID STENTING  
*Versaci, Francesco*

**OP-459** THE EFFECT OF ANEUMASTAT ON AORTIC ANEURYSM FORMATION IN A RABBIT EXPERIMENTAL MODEL  
*Tilson, David*

## Parallel: Devices 1 (110)

### Type: Abstracts - Oral Presentation

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Aegle 1

**Chair:** T. Mussivand, Canada  
**Co-chair:** K. Bolos, Greece Y. Jung-Min, Taiwan

**OP-460** EARLY EXPERIENCE WITH IMPLANTABLE MECHANICAL CIRCULATORY SUPPORT DEVICES (MCSD) IN SEVERELY AND MORBIDLY OBESE PATIENTS  
*Louis, Louis*

**OP-461** USE OF HAEMOFILTRATION DURING CARDIOPULMONARY BYPASS HAS NO EFFECT ON THE INCIDENCE OF ATRIAL FIBRILLATION AFTER CORONARY BYPASS GRAFTING SURGERY  
*Musleh, Ghassan*

**OP-462** IMPROVEMENT IN OUTCOME FOR CHILDREN WITH SEVERE HEART FAILURE UNDERGOING MECHANICAL SUPPORT  
*Griselli, Massimo*

**OP-463** LVAD IMPLANTATION AS DESTINATION THERAPY IN NON-HEART-TRANSPLANT PATIENTS - A SINGLE CENTER EXPERIENCE  
*Paraforos, Alexandros*

**OP-464** MECHANICAL CIRCULATORY SUPPORT. IMPROVED RESULTS WITH OPTIMISED PATIENT SELECTION IN A NON TRANSPLANT CENTRE  
*Visouli, Aikaterini*

**OP-465** PREDICTION OF CARDIAC RECOVERY DURING MECHANICAL UNLOADING IN PATIENTS WITH DILATED CARDIOMYOPATHY  
*Dandel, Michael*

**OP-466** A METANALYSIS ON THE USE OF EXTRACORPOREAL MEMBRANE OXYGENATION FOR CARDIAC ARREST IN ADULTS  
*Cardarelli, Marcelo*

**OP-467** OUR EXPERIENCE WITH THORATEC MECHANICAL HEART SUPPORT  
*Pirk, Jan*

**OP-468** THE SWEDISH EXPERIENCE WITH THE IMPELLA RECOVERY® AXIAL-FLOW SYSTEM IN ACUTE HEART FAILURE  
*Granfeldt, Hans*

**OP-469** SIGNIFICANTLY BETTER HEALTH STATUS FOLLOWING THIRD

GENERATION LEFT VENTRICLE ASSIST DEVICE THERAPY  
*Fiane, Arnt E.*

**OP-470** VENTRICULAR ASSIST DEVICE IMPLANTATION IN A NON-TRANSPLANT CENTER - A SINGLE CENTER EXPERIENCE  
*Oertel, Frank*

**OP-471** A NEW INTRAVASCULAR LEFT VENTRICULAR ASSIST DEVICE: THE IMPELLA RECOVER LP 5.0.  
*Jegaden, Olivier*

#### Parallel: Coronaries 1 (115)

##### Type: Abstracts - Oral Presentation

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Aegle 2

**Chair:** G. Bougioukas, Greece  
**Co-chair:** D. Mikroulis, Greece A. Cherniavsky, Russia

**"Demokritos" University of Thrace, Invited Lecture:** CABG in the Era of Des  
*D. Mikroulis, Greece*

**OP-472** CORONARY ARTERY BYPASS SURGERY IN OLD AGE GROUP: IS AGE ITSELF A MATTER?  
*Da, Mudassir Iqbal*

**OP-473** CORONARY VASCULAR RESISTANCE - AN EASY MEASUREMENT GIVES EARLY WARNING FOR GRAFT FAILURE  
*Dernevik, Leif*

**OP-474** USE OF THE CARDICA PAS-PORT AORTIC CONNECTOR SYSTEM: EARLY RESULTS IN CORONARY ARTERY BYPASS SURGERY  
*Bassano, Carlo*

**OP-475** REPEAT SURGERY FOR CORONARY ARTERY BYPASS GRAFTING - THE ROLE OF THE LEFT THORACOTOMY APPROACH  
*Harris, David*

**OP-476** COMPARISON OF VASODILATORS ON RADIAL ARTERY VASOSPASM: ILOPROST VERSUS DILTIAZEM  
*Ustunsoy, Hasim*

**OP-477** LONG-TERM CLINICAL IMPACT OF REMOVAL OF THE RADIAL ARTERY AS CORONARY ARTERY BYPASS GRAFT ON HAND, FOREARM PERFUSION AND FUNCTION  
*Saeed, Giovanni*

**OP-478** NEW TECHNOLOGIES IN CORONARY SURGERY: MINIMAL EXTRACORPORAL CIRCULATION AND OFF-PUMP COMPARED TO CONVENTIONAL CARDIOPULMONARY BYPASS  
*Hausmann, Harald*

**OP-479** PREDICTORS OF ADVERSE NEUROLOGICAL OUTCOME FOLLOWING CARDIAC SURGERY  
*Chang, Guohao*

**OP-480** COMPLICATIONS AND CLINICALLY PROVEN OCCLUSIONS IN 3281 CONSECUTIVE INTERRUPTED CORONARY ANASTOMOSES PERFORMED OFF-PUMP IN 815 PATIENTS  
*McManus, Robert*

**OP-481** ATRIAL PACING IS SUPERIOR TO ATRIO-VENTRICULAR SEQUENTIAL PACING POST CORONARY ARTERY BYPASS GRAFTING  
*Doddakula, Kishore Kumar*

#### Parallel: Congenital 1 (120)

##### Type: Abstracts - Oral Presentation

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Acceso

**Chair:** S. Albanese, Italy  
**Co-chair:** A. Kourtesis, Greece A. Bertini, Brazil

**OP-482** ONSET OF PULMONARY STENOSIS AFTER ARTERIAL SWITCH OPERATION FOR NEONATAL TRANSPOSITION OF GREAT ARTERIES WITH INTACT VENTRICULAR SEPTUM  
*Delmo Walter, Eva Maria*

**OP-483** CONTINUOUS SELECTIVE CEREBRAL PERFUSION FOR REPAIR OF INTERRUPTED AORTIC ARCH  
*Chen, Qiang*

**OP-484** REINTERVENTION AFTER ARTERIAL SWITCH OPERATION FOR THE TAUSSIG-BING ANOMALY  
*Sinzobahamvya, Nicodime*

**OP-485** IMPROVED SURVIVAL FOR THE MODIFIED NORWOOD PROCEDURE IN CHILDREN WITH DIMINUTIVE ASCENDING AORTA  
*Nento, Daniel*

**OP-486** RIGHT VENTRICULAR REMODELING SURGERY IN CONGENITAL HEART DISEASE USING VALVED PORCINE PROSTHESIS  
*Maluf, Miguel*

**OP-487** LATE PULMONARY VALVE REOPERATIONS AFTER CORRECTION OF TETRALOGY OF FALLOT  
*Tirilomis, Theodor*

**OP-488** EVALUATION OF A RIGHT VENTRICULAR OUTFLOW SURGICAL RECONSTRUCTION BY PLACEMENT OF A STENTLESS BIOPROSTHESIS  
*Soule, Mauricio*

**OP-489** SURGICAL MANAGEMENT OF PENTALOGY OF CANTRELL - A 10 YEAR EXPERIENCE  
*Knott-Craig, Christopher J.*

**OP-490** EARLY AND INTERMEDIATE TERM RESULTS OF MODIFIED CARPENTIER'S REPAIR FOR EBSTEIN'S ANOMALY  
*Kapadia, Nandkishore*

**OP-491** THE INFLUENCE OF RIGHT VENTRICULAR DYSSYNCHRONY ON EARLY OUTCOME FOLLOWING TETRALOGY OF FALLOT REPAIR  
*Peng, Edward WK*

**OP-492** RESULT OF BOVINE JUGULAR VEIN (CONTEGRA®) USED FOR RIGHT VENTRICULAR OUTFLOW TRACT RECONSTRUCTION  
*Najm, Hani*

**OP-493** IS THE PRESENCE OF INTERRUPTED IVC A RISK FACTOR IN BILATERAL CAVOPULMONARY ANASTOMOSIS?  
*Sersar, Sameh*

**Parallel: Cardio-Thoracic 1 (125)**

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Chiron

**Chair:** D. Boulafendis, Greece  
**Co-chair:** M. Elsharawy, Saudi Arabia A. Panos, Switzerland

**OP-494** REOPERATIVE AORTIC ARCH PROCEDURES: A COMPARISON WITH CONTEMPORANEOUS PRIMARY OPERATIONS  
*Etz, Christian D.*

**OP-495** AORTIC ROOT REPLACEMENT WITH XENOGRAFT STENTLESS VALVED BIOCONDUIT: HAEMODINAMIC BENEFITS AND CLINICAL OUTCOMES  
*Calderon, Eyal*

**OP-496** NEW PERFUSION CONCEPT FOR THE SURGERY OF TYPE A AORTIC DISSECTION  
*Ates, M. Sanser*

**OP-497** ARE Ca<sup>2+</sup>-SENSITIZERS SUPERIOR TO CATECHOLAMINES DURING MYOCARDIAL STUNNING?  
*Korbmacher, Bernhard*

**OP-498** THE INITIATION OF A LUNG TRANSPLANT PROGRAMME - CHALLENGE IN 21 CENTURY  
*Bartosik, Waldemar*

**OP-499** THE EFFECTS OF DONOR-RECIPIENT ETHNIC MISMATCH ON EARLY AND LATE RESULTS OF HEART TRANSPLANTATION  
*Lavee, Jacob*

**OP-500** NEUROLOGICAL COMPLICATIONS AFTER LUNG TRANSPLANTATION  
*Keplinger, Maya*

**OP-501** HEART TRANSPLANTATION AFTER FAILED SURGICAL VENTRICULAR RESTORATION. IS IT AN HIGHER RISK PROCEDURE?  
*Triggiani, Michele*

**OP-502** ROUTINE USE OF ANTEGRADE CEREBRAL PERFUSION WITHOUT DEEP HYPOTHERMIA FOR OPERATIONS ON THE AORTIC ROOT  
*Davies, Ryan*

**OP-503** DISTAL AORTIC REINTERVENTIONS AFTER PREVIOUS ROOT SURGERY IN MARFAN PATIENTS  
*Girdauskas, Evaldas*

**OP-504** IS THE COMBINED SURGICAL AND ENDOVASCULAR THORACIC AORTA REPAIR EFFECTIVE?  
*Gorlitzer, Michael*

**OP-505** SURGICAL MANAGEMENT OF COMPLICATIONS DUE TO TAKAYASU ARTERITIS. A 30 YEARS EXPERIENCE  
*Vasquez Jimenez, Cuauhtemoc*

**Parallel: Mini Presentations 1 (130)**

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Homer

**Chair:** B. Meyns, Belgium  
**Co-chair:** K. Anastasiadis, Greece M. Sezen, Turkey

**Aristotle University of Thessaloniki, Invited Lecture:** Is the application of Mini-Extracorporeal Circulation Systems an evolution in open heart surgery?

*K. Anastasiadis, Greece*

**OP-506** LEFT VENTRICULAR ASSIST DEVICE INDUCES HIGH LEVELS OF SCD30 WITH NO EFFECT ON GRAFT REJECTION RISK  
*Ypsilantis, Efthymios*

**OP-507** BENEFITS OF THE PRE-EMPTIVE INTRA-AORTIC BALLOON PUMP (IABP)  
*Nzewi, O.C*

**OP-508** TEMPORARY CARDIAC SUPPORT WITH A MINI-CIRCUIT SYSTEM CONSISTING OF A CENTRIFUGAL PUMP AND A MEMBRANE VENTILATOR  
*Meyer, Anna L.*

**OP-509** ACCEPTABLE LOW MORTALITY AFTER MITRAL VALVE OPERATIONS IN MULTI-MORBID PATIENTS WITH SEVERELY DEPRESSED LV-FUNCTION  
*Parker, Jack*

**OP-510** OFF PUMP SURGICAL REVASCULARIZATION IN ISCHEMIC HEART FAILURE  
*Puri, Deepak*

**OP-511** DEVELOPMENT AND TESTING OF A NOVEL DEVICE FOR LEFT ATRIAL APPENDAGE OCCLUSION  
*Saltman, Adam*

**OP-512** ATRIAL FIBRILLATION SURGERY IN EUROPE: A NEED FOR STANDARDISATION AND DOCUMENTATION  
*Wisser, Wilfried*

**OP-513** PRELIMINARY RESULTS OF QUIXIL UTILIZATION IN CARDIAC SURGERY  
*Totaro, Pasquale*

**OP-514** SUCCESSFUL OUTCOME IN PATIENTS WHO HAVE UNDERGONE VALVE REPLACEMENT/REPAIR AFTER PREVIOUS CORONARY ARTERY BYPASS GRAFTING  
*Datta, Subir*

**OP-515** TRICUSPID VALVE REPAIR WITH COSGROVE RING IN AGED PATIENTS RECEIVING COMPLEX PROCEDURES IS ASSOCIATED TO A SIGNIFICANT FUNCTIONAL CLASS IMPROVEMENT  
*Spina, Amedeo*

**OP-516** RESULTS OF SURGERY IN DIFFERENT TYPES OF ISCHEMIC MITRAL VALVE REGURGITATION  
*Shumavets, Vadim*

**OP-517** MITRAL VALVE REGURGITATION CORRECTION WITH SYNTHETIC TAPE  
*Schneider, Yuri*

**OP-518** MITRAL INSUFFICIENCY CAUSED BY SYSTEMIC LUPUS ERYTHEMATOSIS REQUIRING VALVE REPLACEMENT IN THE SOUTHERN

REGION OF SAUDI ARABIAN POPULATION-A CASE REPORT  
*Birudugadda, Rajubabu*

**OP-519** PREDICTIVE FACTORS TO REOPERATION AND LATE MORTALITY IN PATIENTS WITH RHEUMATIC MITRAL VALVE DISEASE WHO UNDERWENT REPAIR  
*Petrucci, Orlando*

**OP-520** MITRAL VALVE SURGERY AFTER PERCUTANEOUS BALLON VALVULOPLASTY. A TWENTY-YEAR EXPERIENCE  
*P. Negueruela, Carolina*

### Parallel: Chest Wall Reconstruction (135)

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 14:30 - 16:30  
Room: Melabus

**Chair: J.M. Wihlm, Germany**  
**Co-chair: M. Yuksel, Turkey**

**OP-521** PRIMARY CHEST WALL NEOPLASMS, AN EXPERIENCE OF 84 PATIENTS  
*Bilal, Amer*

**OP-522** RECONSTRUCTION OF THE CHEST WALL IN EXTENDED RESECTIONS: A 25 YEARS FOLLOW UP  
*Ribeiro Rodrigues, Olavo*

**OP-523** EARLY AND SHORT-TERM RESULTS OF CHEST WALL RESECTION AND RECONSTRUCTION  
*Gabal, Ayman*

**OP-524** RECONSTRUCTION OF CHEST WALL AFTER STERNECTOMY WITH A TOMOGRAPHY-PERSONAL MADE POLYETHYLENE STERNAL PROSTHESIS - REPORT OF TWO CASES. WHY NOT TO DO IT EVER?  
*Costa, Altair*

**OP-525** MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM IN ADULT PATIENTS: THE NUSS PROCEDURE. MULTICENTER FRENCH STUDY OF 64 CASES  
*Wihlm, Jean-Marie*

**OP-526** LONG -TERM RESULTS AFTER THE MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM. A PRELIMINARY REPORT  
*Adamczak, Jaroslaw*

**OP-527** EARLY RESULTS FOLLOWING THE NUSS PROCEDURE FOR PECTUS DEFORMITY - A TWO INSTITUTION EXPERIENCE  
*Yuksel, Mustafa*

**OP-528** SYMPTOMATIC PECTUS EXCAVATUM IN THE ELDERLY, INDICATION AND SURGICAL TREATMENT: PRESENTATION OF TWO CASES  
*Belgers, Eric*

**OP-529** TECHNICAL MODIFICATION OF THE NUSS OPERATION FOR THE CORRECTION OF PECTUS EXCAVATUM  
*Jatene, Fabio*

**OP-530** QUALITY OF LIFE OF PATIENTS WHO HAVE UNDERGONE THE NUSS PROCEDURE: PRELIMINARY FINDINGS  
*Bostanci, Korkut*

**OP-531** SURGICAL CORRECTION OF PECTUS EXCAVATUM AND ASSOCIATED HYPOMASTIA  
*Wihlm, Jean-Marie*

### MV Repair 2 (140)

**Type: Plenary Session**

Date: Wednesday, April 30, 2008  
Time: 17:00 - 19:00  
Room: Hippocrates (Main Hall)

**Chair: S. Gabbay, United States**  
**Co-chair: I. Fessatidis, Greece G. Tinica, Romania**

Surgery of congenital malformations of the mitral valve  
*A. Kalangos, Switzerland*

The role of the edge-to-edge technique (in the treatment of mitral regurgitation). Surgical and percutaneous approach  
*O. Alfieri, Italy*

Mitral valve repair on a beating heart  
*N. Trehan, India*

Minimally invasive mitral valve repair  
*D. De Canniere, Belgium*

Video: 'Mitrofast': Artificial coaptation surface in mitral valve repair  
*B. Biocina, Croatia*

Video: Artificial chords for mitral valve repair  
*M. Aronis, Greece*

Video: Ventricular repair: Is it standard procedure for ischemic LV aneurysm  
*Z. Mitrev, FYROM*

### Parallel: Coronaries 2 (145)

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 17:00 - 19:00  
Room: Panacea

**Chair: U. Oppel, United Kingdom**  
**Co-chair: A. Fikri, Malaysia A. Bisbos, Greece**

**OP-532** LONG-TERM SUPERIORITY OF TWO OR MORE ARTERIAL GRAFTS IN PATIENTS WITH MULTIVESSEL CORONARY ARTERY BYPASS GRAFTING  
*Chamogeorgakis, Themistocles*

**OP-533** MANAGEMENT OF PATENT INTERNAL MAMMARY ARTERY GRAFTS DURING REOPERATIVE VALVULAR SURGERY: A COMPARISON OF TWO APPROACHES  
*Cheema, Faisal*

**OP-534** FACTORS DETERMINING THE DURATION OF INTUBATION AFTER CORONARY ARTERY GRAFT SURGERY  
*Salehi, Mehrdad*

**OP-535** LOW HEMATOCRIT DURING CARDIOPULMONARY BYPASS IS NOT ASSOCIATED WITH ADVERSE OUTCOME AFTER CORONARY BYPASS SURGERY  
*Senay, Sahin*

**OP-536** EARLY AND MIDTERM RESULTS OF CORONARY ARTERY BYPASS USING PAS-PORT SYSTEM  
*Okada, Masahiro*

**OP-537** IS SINGLE CROSS CLAMP TECHNIQUE REDUCING RISK OF STROKE IN CORONARY ARTERY SURGERY  
*Olszowka, Piotr*



**OP-538** FEMALE RISK USING OPCAB, n-CIRCUIT CORONARY REVAS-  
CULARIZATION

*Linardakis, Ioannis*

**OP-539** RESULTS OF USING DRUG ELUTING STENTS IN THE TREAT-  
MENT OF THE PATIENTS WITH DIFFERENT TYPES OF ISCHEMIC HEART  
DISEASE

*Alekyan, Bagrat*

**OP-540** QUALITY OF LIFE AFTER CORONARY BYPASS GRAFTING VER-  
SUS PERCUTANEOUS CORONARY INTERVENTION

*Loponen, Pertti*

**OP-541** IS THERE A LONG-TERM SURVIVAL BENEFIT IN CORONARY  
ARTERY BYPASS GRAFTING BECAUSE OF BLOOD CARDIOPLEGIA OR  
MICROSCOPE USE IN A 16-YEAR FOLLOW-UP STUDY?

*Swistel, Daniel*

### Parallel: Arrhythmia 1 (150)

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008

Time: 17:00 - 19:00

Room: Aegle 1

**Chair: T. Meinertz, Germany**

**Co-chair: C. Sanina, Moldavia A. Kondili, Albania**

**OP-542** ATRIAL FIBRILLATION TREATMENT CONCOMITANT WITH  
ELECTIVE CARDIAC SURGERY. FIVE YEARS EXPERIENCE

*Koukoulis, Giovana*

**OP-543** SURGICAL ABLATION OF ATRIAL FIBRILLATION WITH HIGH  
INTENSITY FOCUSED ULTRASOUND: OPERATIVE TECHNIQUE AND  
MID-TERM RESULTS IN 55 PATIENTS

*Noebauer, Christian*

**OP-544** THAIS' EXPERIENCE OF MODIFIED MAZE PROCEDURE IN  
ATRIAL FIBRILLATION ASSOCIATED WITH MITRAL VALVE DISEASE

*Kasemsarn, Choosak*

**OP-545** EPICARDIAL VERSUS ENDOCRDIAL RADIOFREQUENCY AB-  
LATION - DWO DIFFERENT METHODS OF ATRIAL FIBRILLATION TREAT-  
MENT, TWO DIFFERENT GROUPS OF PATIENTS, ONE YEAR EXPE-  
RIENCE

*Sielicki, Piotr*

**OP-546** QUANTIFICATION OF SINUS NODE'S BLOOD CAPILLARY  
DENSITY IN PATIENTS WITH CHRONIC ATRIAL FIBRILLATION

*Hurl, Aquilino*

**OP-547** RESULTS OF THE TREATMENT OF ATRIAL FIBRILLATION WITH  
MICROWAVE ABLATION USING RIGHT MINI-THORACOTOMY AP-  
PROACH

*Aidietis, Audrius*

**OP-548** ARE THERE ANY PREDICTORS FOR THE SUCCESS RATE OF  
CONCOMITANT ATRIAL ABLATION IN PATIENTS WITH ATRIAL FIBRIL-  
LATION UNDERGOING CARDIAC SURGERY?

*Wagner, Florian*

**OP-549** VIDEO-ASSISTED PULMONARY VEIN ISOLATION FOR LONE  
ATRIAL FIBRILLATION USING BIPOLAR RADIOFREQUENCY

*Suwalski, Piotr*

**OP-550** IRRIGATED RADIOFREQUENCY MODIFIED MAZE PROCE-  
DURE IN PATIENTS WITH PERMANENT ATRIAL FIBRILLATION UNDE-  
RGOING CARDIAC SURGERY FOR RHEUMATIC HEART DISEASE

*Babazadeh, Kamran*

**OP-551** INCISIONAL ATRIAL TACHYCARDIAS IN CHILDREN, POSSI-  
BILITIES OF CATHETER ABLATION

*Murzina, Olga*

**OP-552** CRYOABLATION FOR ATRIAL FIBRILLATION CURE: 1 YEAR  
EXPERIENCE

*Duran, Dario*

**OP-553** INCIDENCE OF PREOPERATIVE ATRIAL FIBRILLATION IN CAR-  
DIAC SURGERY PATIENTS AND IMPACT OF CONCOMITANT RHYTHM  
SURGERY ON OUTCOME

*Tzanavaros, Ioannis*

### Parallel: Cardiac Other 1 (155)

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008

Time: 17:00 - 19:00

Room: Aegle 2

**Chair: S. Kabbani, Syria**

**Co-chair: P. Zilla, South Africa T. Ziabakhsh, Iran**

**OP-554** LEFT ATRIAL MYXOMA ASSOCIATED WITH ATRIAL SEPTAL  
DEFECT IN A PATIENT WITH ACUTE MYOCARDIAL INFARCTUS; AN  
UNCOMMON ASSOCIATION WITH AN UNUSUAL PRESENTATION

*Hatemi, Ali Can*

**OP-555** PULMONARY ARTERY CATHETER ENTRAPMENT BY INADVER-  
TENT SUTURING DURING CARDIAC SURGERY: SURGICAL REMOVAL  
AND A WORD OF CAUTION

*Gabir, Walid*

**OP-556** THE TEACHING OF ADULT CARDIAC SURGERY: A CONTE-  
MPORARY RESIDENT EXPERIENCE

*Bowdish, Michael*

**OP-557** CARDIAC SURGERY IN OCTOGENARIANS. HOW FAR CAN  
WE GO?

*Lazopoulos, George*

**OP-558** A SYSTEMATIC COMPARATIVE STUDY OF CLINICAL OUT-  
COME OF OPEN HEART SURGERY IN ADULT JEHOVAH'S WITNESS  
PATIENTS

*Kumar, Sanjay*

**OP-559** ACUTE PULMONARY EMBOLECTOMY: THE SURGICAL  
OPTION

*Dimitrakakis, Georgios*

**OP-560** COMPARATIVE EVALUTION OF E-LEARNING IN HEART SUR-  
GERY

*Friedl, Reinhard*

**OP-561** RISK FACTORS OF RED CELL TRANSFUSION IN ISOLATE OFF  
PUMP CORONARY ARTERY BYPASS

*Chung, Euy suk*

**OP-562** RESULTS AND OUTCOMES OF TARGETED EARLY EXTUBA-  
TION AND FAST TRACK RECOVERY POST CARDIAC SURGERY

*Salhiyyah, Kareem*

**OP-563** SURGICAL TREATMENT OF CARDIAC MYXOMAS - 27 YEARS  
OF SINGLE CENTER EXPERIENCE IN 150 PATIENTS

*Gaweda, Boguslaw*

**OP-564** POSTOPERATIVE TEMPORARY NEUROLOGICAL DYSFUN-  
CTION AND INFLAMMATORY ACTIVITY FOLLOWING CARDIAC  
SURGERY

*Mendonca-Filho, Hugo Tannus*

**OP-565** UROCORTIN II ACUTELY CAUSES CRFR2-DEPENDENT NO PRODUCTION IN PORCINE AORTIC ENDOTHELIAL CELLS  
*Caïmmi, Philippe*

**Parallel: Coronaries 3 (160)**

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 17:00 - 19:00  
Room: Acesso

**Chair:** H. Osada, Japan  
**Co-chair:** A.J. Rodrigues, Brazil P. Kalogris, Greece

**OP-566** CLINICAL CHARACTERISTICS OF IRANIAN PATIENTS WITH PREMATURE CORONARY ARTERY DISEASE  
*Taghipour, Hamidreza*

**OP-567** INFLUENCE OF PREOPERATIVE INTRAAORTIC BALLOON PUMP ON THE OUTCOME OF CORONARY BYPASS PATIENTS WITH PREEXISTENT LOW-OUTPUT-SYNDROME  
*Reiss, Nils*

**OP-568** SAFETY AND EFFICACY OF FIBRIN SEALANT IN CORONARY ARTERY SURGERY  
*Papaspapros, Sotiris*

**OP-569** EFFECT OF DIABETES MELLITUS ON OUTCOME IN CORONARY SURGERY - SINGLE CENTRE EXPERIENCE  
*Olszowka, Piotr*

**OP-570** SIMULTANEOUS CARDIAC AND CAROTID DISEASES: TWO PROBLEMS, ONE SOLUTION  
*Capuano, Fabio*

**OP-571** A NEW HIGH RISK PATIENT IN CARDIAC SURGERY-CABG AFTER PREVIOUS STENT ANGIOPLASTY  
*Oertel, Frank*

**OP-572** SYSTEMATIC BEATING HEART CORONARY ARTERY BYPASS GRAFT SURGERY IN 2078 CONSECUTIVE PATIENTS  
*Marino, Luigi*

**OP-573** EXPERIENCE AND EARLY RESULTS OF ENDARTERECTOMY WITH EXTENDED SAPHENOUS VEIN PATCHING WITH LIMA IMPLANTATION IN CABG SURGERY FOR DIFFUSELY DISEASED LAD CORONARY ARTERY  
*Menaissy, Yasser*

**OP-574** INTRAOPERATIVE GRAFT FLOW: LUXURY OR NECESSITY?  
*Korbmacher, Bernhard*

**OP-575** CARDIAC SURGERY IN OCTOGENARIANS - OUTCOME AND LONGTERM RESULTS FROM AUSTRALIAN DATABASE REGISTRY  
*Dinh, Diem*

**OP-576** TOTAL ARTERIAL REVASCULARISATION WITH RADIAL ARTERY T-GRAFTS IN SIGNIFICANT LEFT MAIN STEM STENOSIS  
*Klima, Uwe*

**OP-577** HORMONAL VARIATION DURING OFF-PUMP AND ON-PUMP MYOCARDIAL REVASCULARIZATION: B-TYPE NATRIURETIC PEPTIDE (BNP) EVALUATION  
*Ismeno, Gennaro*

**Parallel: Multidisciplinary 1 (165)**

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 17:00 - 19:00  
Room: Chiron

**Chair:** A. Michalopoulos, Greece  
**Co-chair:** P. Wouters, Belgium B. Medalion, Israel

**"Euro-Asian Bridge", Invited Lecture:** Diabetes Management in Cardiothoracic Surgery  
*P. Mylonaki-Koutkia, Greece*

**OP-578** UTILIZATION "ROLLER PUMP" AS A VENTRICULAR ASSIST DEVICE IN CRITICAL CONDITIONS, WHEN NO VAD IS AVAILABLE  
*Ahmadi, Zargham Hossein*

**OP-579** IMPACT OF THE INTENSIVIST-LEAD TEAM ON POSTOPERATIVE OUTCOMES IN A SPECIALIZED CARDIAC SURGERY INTENSIVE CARE UNIT  
*Kogan, Alexander*

**OP-580** THE PREDICTORS OF SURVIVAL AFTER GASTRO-INTESTINAL COMPLICATIONS IN CONTEMPORARY OFF-PUMP AND ON-PUMP CORONARY ARTERY BYPASS GRAFTING: THE HAREFIELD EXPERIENCE  
*Farid, Shakil*

**OP-581** INTRAVASCULAR CATHETER COLONIZATION AND RELATED BLOODSTREAM INFECTION IN THE HEART SURGERY INTENSIVE CARE UNIT  
*Hashemzadeh, Khosrow*

**OP-582** INSIGHT OF THE 2000 BERNSTEIN-PARSONNET VERSUS EUROSCORE AT THE HEART INSTITUTE OF SAO PAULO-BRAZIL  
*Velca, Omar Asdrubal*

**OP-583** VASSOPRESSINE INFUSION IN CARDIAC SURGERY PATIENTS: EFFECTS IN HAEMODYNAMICS, DIURESIS AND BLEEDING  
*Sintou, Eleni*

**OP-584** COGNITIVE IMPAIRMENT BEFORE AND AFTER CORONARY ARTERY BYPASS GRAFTING - HIGHER THAN EXPECTED?  
*Krannich, Jens-Holger*

**OP-585** USE OF TRANEXAMIC ACID IN OFF-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY TO REDUCE BLEEDING AND BLOOD REQUIREMENTS  
*Jalaeian Taghaddomi, Reza*

**OP-586** CAROTID ENDARTERECTOMY FOR AMELIORATING THE SYMPTOMS OF TRANSIENT ISCHEMIC ATTACK  
*Ouyang, Chenxi*

**OP-587** FORWARD WITH WEANING: AN INITIAL CASE STUDY OF THE FOCUSED OXFORD RESPIRATORY WEANING AND RATIONAL DECISION PLAN  
*Quayle, David*

**Parallel: Mini Presentations 2 (170)**

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 17:00 - 19:00  
Room: Homer

**Chair:** P. Nataf, France  
**Co-chair:** S. Siminelakis, Greece K. Perreas, Greece

**University of Ioannina, Invited Lecture:** Intraoperative management of very high risk coronary patients for improved outcomes  
*S. Siminelakis, Greece*

**OP-588** TRICUSPID PAHOLOGY IN THE CONTEXT OF VALVULAR SURGERY

*Moriones, Ignacio*

**OP-589** CORONARY ENDARTERECTOMY- PREDICTORS OF POST OPERATIVE MORTALITY

*Vaidyanathan, Karthik*

**OP-590** CORONARY ENDARTERECTOMY HAS NO DETRIMENTAL EFFECT ON OUTCOMES AND SURVIVAL FOLLOWING BYPASS SURGERY

*Pai, Remananda Krishnanan*

**OP-591** BLEEDING FOLLOWING CORONARY ARTERY SURGERY IN NORMOTHERMIC VERSUS HYPOTHERMIC CARDIOPULMONARY BYPASS

*Ghyasy, Mohammad Saeid*

**OP-592** SKELETONIZED INTERNAL MAMMARY ARTERY IN CABG; THE CURRENT VIEWPOINTS

*Sarzaeem, Mahmood Reza*

**OP-593** SURGICAL EXPERIENCES IN MYOCARDIAL BRIDGING AND INTRAMYOCARDIAL LEFT ANTERIOR DESCENDING ARTERY

*Erturk, Murat*

**OP-594** INTRAOPERATIVE IN SITU RADIAL ARTERY CONDUIT FLOW ASSESSMENT

*Yousafzai, Sajjad*

**OP-595** CHARACTERISTICS OF PATIENTS PRONE TO ATRIAL FIBRILLATION AFTER CORONARY BYPASS SURGERY

*Kalishnik, Jurij Matija*

**OP-596** DIABETES MELLITUS SHOULD NOT BE A LIMIT FOR HARVESTING BOTH INTERNAL THORACIC ARTERIES FOR CORONARY ARTERY BY-PASS GRAFTING

*Martins, Stevan*

**OP-597** CORONARY OSTIAL RECONSTRUCTION: SURGERY OR STENTING?

*Raanani, Ehud*

**OP-598** CORONARY ARTERY BYPASS USING ONLY COMPUTED TOMOGRAPHY AS A PRE-OPERATIVE ANGIOGRAM

*Gaia, Diego*

**OP-599** TOTAL ARTERIAL MYOCARDIAL REVASCULARIZATION: ITS IMPORTANCE AS IT APPEARS IN REDO CORONARY ARTERY BYPASS CRAFTING

*Chlorogiannis, Ioannis*

**OP-600** THE CLINICAL PROFILE OF PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTS: DO RECENT TRENDS DIFFER BETWEEN DEVELOPED AND DEVELOPING COUNTRIES? THE SRI LANKAN EXPERIENCE

*Harischandra, Tolusha*

**OP-601** IS IT NECESSARY TO STOP CLOPIDOGREL FIVE DAYS BEFORE ELECTIVE CORONARY ARTERY BYPASS GRAFTING?

*Vaidyanathan, Karthik*

**Parallel: Tracheal Surgery (175)**

**Type: Abstracts - Oral Presentation**

Date: Wednesday, April 30, 2008  
Time: 17:00 - 19:00  
Room: Melabus

**Chair:** D. Branscheid, Germany  
**Co-chair:** K. Iliadis, Greece I. Cordos, Romania

**OP-602** RECONSTRUCTIVE LARYNGOTRACHEAL SURGERY

*Bagirov, Mamed*

**OP-603** BENIGN TRACHEAL STENOSIS-OUR EXPERIENCE

*Stanic, Vojkan*

**OP-604** CARINAL OPERATIONS

*Gezer, Suat*

**OP-605** BRONCHIAL AND CARINAL RESECTION AND RECONSTRUCTION WITHOUT LOSS OF PULMONARY PARENCHYMA

*Beqiri, Safet*

**OP-606** TRACHEAL RESECTIONS: ANALYZES OF COMPLICATIONS AND INTERVENTIONS

*Kaya, Serkan*

**OP-607** OUTCOME OF ENDOSCOPIC TREATMENT OF ADULT POSTINTUBATION TRACHEAL STENOSIS

*Nouraei, Reza*

**OP-608** MANAGEMENT OF ADULT CONGENITAL AND ACQUIRED TRACHEOESOPHAGEAL FISTULA "CASE SERIES"

*Davari, Hamid Reza*

**OP-609** LASER IN AIRWAY PALLIATION: A SINGLE CENTRE EXPERIENCE

*Rathinam, Sridhar*

**OP-610** PALLIATION OF MALIGNANT CENTRAL AIRWAY OBSTRUCTION: A REVIEW OF EXPERIENCE FROM UNIVERSITY HOSPITAL OF SOUTH MANCHESTER

*Soon, Sing yang*

**OP-611** TRACHEOESOPHAGEAL FISTULAS OF MALIGNANT ORIGIN: TREATMENT WITH EXPANDABLE WALLSTENTS

*Nikolouzos, Stefanos*

**OP-612** LARYNGOTRACHEOBRONCHIAL INJURY

*Davari, Hamid reza*

**OP-613** TRACHEAL REPLACEMENT WITH AORTIC ALLOGRAFT

*de Delva, Pierre*

**OP-614** RETAINED FOREIGN BODIES FROM PENETRATING CERVICO-THORACIC INJURIES

*Delima, Mariam Grace*

**20:00 WSCTS 2008, Welcome Reception**

Cocktail offered under the Plane Tree  
of Hippocrates, Kos Old Town

## International Hippocratic Foundation of Kos (180)

**Type:** Special Lecture

Date: Thursday, May 01, 2008

Time: 08:30 - 09:00

Room: Hippocrates (Main Hall)

**Chairs:** F. Robicsek, United States C. Lolos, Greece

**Lecture by the President of International Hippocratic Foundation of Kos**

S. Geroulanos, Greece

**Video Presentation: The Hippocratic Oratorium**

Kindly offered by "The Society of Hippocratic Oath Friends"

09:30 - 13:30 Re-enactment of the Hippocratic Oath in the Sanctuary of Asclepion

### Satellite Symposium

#### Innovative Solutions for Atrioventricular Valve Repairs

Date: Thursday, May 01, 2008

Time: 13:00 - 14:30

Room: Aegle 1

**Sponsored by:** BIORING

New Technology: Atrioventricular Valve Repairs with Biodegradable Rings

A. Kalangos, Switzerland

Mitral and Tricuspid valve repair in Children: new surgical strategies

C. Brizard, Australia

Lecture title: to be announced

M. Azhari Yakub, Malaysia

### Coronaries 1 (185)

**Type:** Plenary Session

Date: Thursday, May 01, 2008

Time: 15:30 - 17:30

Room: Hippocrates (Main Hall)

**Chair:** T. Salerno, United States

**Co-chair:** P. Spanos, Greece H. Bedi, India

Percutaneous, surgical or medical treatment of chronic coronary disease

K. Spencer, United States

Technical aspect of OPCAB

P. Sergeant, Belgium

The Lima's stitch in OPCAB surgery

R. Lima, Brazil

Current state of off-pump coronary surgery (OPCAB)

S. Prapas, Greece

The use of bilateral IMA's

P. Nataf, France

Alternative arterial grafts

H. Suma, Japan

Which conduit for which coronary artery?

J. Tatoulis, Australia

### Parallel: Arrhythmia 2 (190)

**Type:** Abstracts - Oral Presentation

Date: Thursday, May 01, 2008

Time: 15:30 - 17:30

Room: Panacea

**Chair:** G. Theodorakis, Greece

**Co-chair:** M. Guden, Turkey A. Goda, Albania

**OP-615** SINUS RHYTHM AFTER ABLATION: CARDIAC AUTONOMIC MODULATION UNDEPENDENT ON TYPE OF ATRIAL FIBRILLATION  
Kalisnik, Jurij Matija

**OP-616** COMPARATIVE STUDY OF MONOPOLAR VERSUS BIPOLAR DEVICES FOR THE RADIOFREQUENCY ABLATION OF ATRIAL FIBRILLATION DURING MITRAL VALVE SURGERY: MIDTERM RESULTS  
Roussel, Jean Christian

**OP-617** IS CONCOMITANT ABLATION OF PAROXYSMAL ATRIAL FIBRILLATION JUSTIFIED?  
Tzanavaros, Ioannis

**OP-618** SURGICAL RADIOFREQUENCY MAZE III ABLATION FOR TREATMENT OF ATRIAL FIBRILLATION DURING OPEN HEART SURGERY IN SHAHID MADANI  
Parvizi, Rezayat

**OP-619** A NOVEL DEVICE TO DETECT ATRIAL FIBRILLATION IN FOLLOW-UP AFTER SUCCESSFUL MAZE PROCEDURE  
Sternik, Leonid

**OP-620** ARRHYTHMIAS, REPOLARIZATION AND CARDIAC AUTONOMICS IN BEATING AND ARRESTED HEART REVASCULARIZATION  
Kalisnik, Jurij Matija

**OP-621** DOSE RADIOFREQUENCY MODIFIED MAZE NEED LEARNING CURVE IN PATIENTS WITH ATRIAL FIBRILLATION UNDERGOING A CONCOMITANT CARDIAC SURGERY?  
Hassantash, Seyed Ahmad

**OP-622** LEFT ATRIAL ABLATION FOR ATRIAL FIBRILLATION: A 10-YEARS SINGLE CENTRE EXPERIENCE  
Barbone, Alessandro

**OP-623** MULTI-DEVICE COMPARISON TRIAL OF FIVE DIFFERENT ENERGY SOURCES IN A CLINICALLY RELEVANT MODEL: STUDY ON LESION WIDTH, DEPTH, VOLUME AND THE EFFECT OF EPICARDIAL FAT  
Saltman, Adam

**OP-624** THE IMPACT OF PREOPERATIVE ATRIAL FIBRILLATION IN PATIENTS UNDERGOING MITRAL VALVE SURGERY  
Santa Ritta, Raphael

### Parallel: Valves 1 (195)

**Type:** Abstracts - Oral Presentation

Date: Thursday, May 01, 2008

Time: 15:30 - 17:30

Room: Aegle 1

**Chair:** G. Chajikostas, Greece

**Co-chair:** A.R. Khorasani, Iran H.S. Saw, Singapore

**"Euro-Asian Bridge", Invited Lecture:** AVR in Suprannular Position  
A.R. Khorasani, Iran

**OP-625** SORIN FREEDOM® AND FREEDOM SOLO® - EARLY CLINICAL EXPERIENCE WITH A PERICARDIAL STENTLESS AORTIC VALVE PROSTHESIS  
*Pfeiffer, Steffen*

**OP-626** PROGNOSTIC VALUE OF B-TYPE NATRIURETIC PEPTIDE AFTER CARDIAC SURGERY: A NEW FOLLOW-UP TOOL  
*Hatemi, Ali Can*

**OP-627** THE ROSS PROCEDURE FOR THE TREATMENT OF AORTIC VALVE DISEASE IN ADULT PATIENTS: MID AND LONG TERM RESULTS AT A SINGLE REFERRAL SURGICAL CENTER  
*Favaloro, Roberto*

**OP-628** POSSIBLY INDICATIONS FOR THE MITROFAST-DEVICE IN MITRAL VALVE REPAIR  
*Oertel, Frank*

**OP-629** HOW TO HANDLE THE BORDERLINE EFFECTIVE ORIFICE AREA INDEX IN AORTIC VALVE REPLACEMENT  
*Kawase, Isamu*

**OP-630** MIDTERM OUTCOMES OF AORTIC ROOT REPLACEMENT: A COMPARISON BETWEEN MECHANICAL AND BIOLOGICAL VALVE CONDUITS  
*Kanji, Hussein*

**OP-631** AORTIC VALVE REPLACEMENT USING THE FREEDOM SOLO VALVE. SUPERIOR EARLY HEMODYNAMIC RESULTS  
*Sakellaridis, Timothy*

**OP-632** AORTIC ROOT RECONSTRUCTION WITH CRYOPRESERVED AORTIC HOMOGRAFTS. A SINGLE INSTITUTION'S EXPERIENCE (5 YEARS)  
*Dimitrakakis, Georgios*

**OP-633** RELEVANCE OF CLOSED MITRAL VALVOTOMY FOR MITRAL STENOSIS IN TWENTY FIRST CENTURY IN DEVELOPING COUNTRIES  
*Murthy, B. Suryanarayana*

**OP-634** EFFECT OF PATIENT-PROSTHESIS MISMATCH ON LONG-TERM SURVIVAL: ASSESSMENT TO 15 YEARS WITH AORTIC VALVE REPLACEMENT  
*Jamieson, W R Eric*

#### Parallel: Multidisciplinary 2 (200)

**Type: Abstracts - Oral Presentation**

Date: Thursday, May 01, 2008  
Time: 15:30 - 17:30  
Room: Aegle 2

**Chair: J.W. Wong, Singapore**  
**Co-chair: R. El Oakley, Saudi Arabia P. Stratigi, Greece**

**"Euro-Asian Bridge", Invited Lecture:** Cardiovascular Bioengineering; from Bench to Bedside  
*R. El Oakley, Saudi Arabia*

**OP-635** THE EFFECTS OF BODY MASS INDEX ON OUTCOMES AND BLEEDING INDICES FOLLOWING ADULT CARDIAC SURGERY  
*Ramaiah, Chand*

**OP-636** CORRELATION PREOPERATIVE MAXIMAL MOUTH PRESSURE AND PULMONARY MORBIDITY AFTER CARDIAC SURGERY  
*Deblier, Ivo*

**OP-637** QUALITY OF LIFE ASSESSMENT AFTER MITRAL VALVULAR SURGERY IN OCTOGENARIANS  
*Gabbieri, Davide*

**OP-638** TIMING OF CARDIAC CATHETERIZATION AND ACUTE RENAL FAILURE AFTER CARDIAC SURGERY  
*Medalion, Benjamin*

**OP-639** WHAT IS THE INCIDENCE OF MRSA INFECTION FOLLOWING CARDIAC SURGERY AMONG KNOWN MRSA CARRIERS?  
*Healy, David*

**OP-640** APROTININ REEXPOSURE: RISK OF ANAPHYLACTIC REACTION STARTS IMMEDIATELY AFTER FIRST EXPOSURE  
*Scheule, Albertus*

**OP-641** THE NEED FOR INTRA AORTIC BALLOON PUMP (IABP) IS ASSOCIATED WITH HIGHER ADVERSE OUTCOME IN PATIENTS REQUIRING VALVE SURGERY  
*Parissis, Harry*

**OP-642** PLASMA NITRATE/NITRITE IS NOT A BIOMARKER TO PREDICT VASOPLEGIC SYNDROME IN PATIENTS UNDER CARDIO-PULMONARY BYPASS SURGERY  
*Evora, Paulo Roberto B.*

**OP-643** APPLICATION OF THE SEQUENTIAL ORGAN FAILURE ASSESSMENT SCORE IN PREDICTION OF MORBIDITY AND MORTALITY AFTER CARDIAC TRANSPLANTATION IN COMPARISON WITH BIOLOGICAL MARKERS  
*Qedra, Naser*

**OP-644** PREDICTIVE ACCURACY OF EUROSCORE: IS END-DIASTOLIC PRESSURE A MISSING VARIABLE?  
*Theologou, Thomas*

#### Parallel: Cardiac Other 2 (205)

**Type: Abstracts - Oral Presentation**

Date: Thursday, May 01, 2008  
Time: 15:30 - 17:30  
Room: Acesso

**Chair: T. Katsumata, Japan**  
**Co-chair: E. Zias, United States, G. Ribeiro, Brazil**

**"Euro-Asian Bridge" Invited Lecture:** Ventricular Reshaping: When and How  
*E. Zias, United States*

**OP-645** SURGICAL TREATMENT OF ATRIAL MYXOMA: 14 YEARS EXPERIENCE  
*Hung Dung, Van*

**OP-646** ISCHEMIA AND REPERFUSION INDUCE PHOSPHORYLATION OF CYTOCHROME C OXIDASE AND ALTERNATE OXYGEN TURN OVER  
*Vogt, Sebastian*

**OP-647** DELAYED STERNAL CLOSURE IN PATIENTS UNDERGOING CARDIAC SURGERY  
*Sarzaeem, Mahmood Reza*

**OP-648** EXCIMER LASER FOR SAFE REMOVAL OF INFECTED OR DYSFUNCTIONAL PACEMAKER OR ICD LEADS: A SERIES OF 137 CONSECUTIVE PATIENTS  
*Treede, Hendrik*

**OP-649** NON-DIALYSIS-DEPENDENT MILD RENAL DYSFUNCTION IN CABG  
*Taniguchi, Fabio*

**OP-650** ATRIAL MYXOMAS: A SINGLE UNITS EXPERIENCE IN THE MODERN ERA  
*Vaughan, Paul*

**OP-651** PREOPERATIVE STATIN USE DECREASES THE RISK OF SEPSIS IN PATIENTS UNDERGOING CARDIAC SURGERY

*Kalavrouziotis, Dimitri*

**OP-652** LEVOSIMENDAN ACUTELY INDUCES AN INCREASE OF NO PRODUCTION IN PORCINE CORONARY ENDOTHELIAL CELLS

*Caimmi, Philippe*

**OP-653** CASUISTIC IN CARDIAC SURGERY

*Uzdaviny, Giedrius*

**OP-654** INFLUENCE OF DIFFERENT ANTICALCIFICATION TREATMENT ON VALVE TISSUE

*Raugele, Saulius*

**OP-655** SUBMITRAL MEMBRANOUS CURTAIN: A POTENTIAL ANATOMICAL BASIS FOR CONGENITAL SUBMITRAL ANEURYSM

*Nayak, Vijaya*

**OP-656** MANAGEMENT OF OPEN CHEST AND DELAYED STERNAL CLOSURE WITH THE VACUUM ASSISTED CLOSURE SYSTEM

*Wisser, Wilfried*

### Parallel: Congenital 2 (210)

**Type: Abstracts - Oral Presentation**

Date: Thursday, May 01, 2008

Time: 15:30 - 17:30

Room: Chiron

**Chair: G. Sarris, Greece**

**Co-chair: T. Sinjari, Albania H. Kazi Abul, Bangladesh**

**OP-657** RUPTURE OF SINUS OF VALSALVA, EARLY AND LATE RESULTS, OUR EXPERIENCE

*Kapadia, Nandkishore*

**OP-658** CLOSURE OF ATRIAL SEPTAL DEFECTS VIA LIMITED ANTERO-LATERAL THORACOTOMY AS A MINIMALLY INVASIVE APPROACH IN FEMALE PATIENTS

*Rayidi, Maruthi Vara Prasad*

**OP-659** THE EFFECTS OF SURGICALLY INDUCED RIGHT BUNDLE BRANCH BLOCK AFTER VENTRICULAR SEPTAL DEFECT CLOSURE

*Lins Pedersen, Thais A*

**OP-660** IMPROVED OUTCOME OF NORWOOD PROCEDURE FOR UNIVENTRICULAR CONGENITAL HEART ANOMALIES

*Najm, Hani*

**OP-661** SEARCHING THE OPTIMAL TIMING TO RE-OPERATE FALLOT'S TETRALOGY WITH PULMONARY INSUFFICIENCY

*Murzi, Bruno*

**OP-662** LIVER FUNCTION OF DESFLURANE VERSUS SEVOFLURANE ANESTHESIA IN ACYANOTIC CHILDREN FOR OPEN HEART SURGERY

*Bahar, OC*

**OP-663** DEALING WITH DR JEKYLL AND MR HYDE - PERFORMING PEDIATRIC CARDIOVASCULAR SURGERY IN A DEVELOPING COUNTRY

*Dalva, Moise*

**OP-664** PERSISTENT DUCTUS ARTERISUS IN ADULTS - ARE DEVELOPING COUNTRIES PREPARED TO HANDLE CHALLENGES

*Adeoye, Peter*

**OP-665** LECOMPTE PROCEDURE FOR CORRECTION OF THE TRANSPOSITION OF THE GREAT ARTERIES ASSOCIATED WITH VENTRICULAR SEPTAL DEFECT AND LEFT VENTRICLE OUTFLOW TRACT OBSTRUCTION

*Maluf, Miguel*

**OP-666** OPEN CARDIAC SURGERY IN NEONATES AND INFANTS LESS THAN 3 KG BODY WEIGHT

*Najm, Hani*

### Session: Parallel: Mini Presentations 3 (215)

**Type: Abstracts - Oral Presentation**

Date: Thursday, May 01, 2008

Time: 15:30 - 17:30

Room: Homer

**Chair: C. Anagnostopoulos, Greece**

**Co-chair: E. Raanani, Israel R. Sharma, India**

**"Euro-Asian Birdge", Invited Lecture:** Procedural options in the "Hybrid" operating room

*E. Raanani, Israel*

**OP-667** OFF PUMP VERSUS ON PUMP CORONARY ARTERY BYPASS GRAFTING: SEVEN YEARS SINGLE INSTITUTION EXPERIENCE

*Ahmed, Elazeer*

**OP-668** IS IT FEASIBLE TO AVOID STROKE IN OFF-PUMP CORONARY ARTERY BYPASS GRAFTING?

*Reber, Delawer*

**OP-669** SELECTIVE RETROGRADE VENOUS REVASCLARIZATION OF THE MYOCARDIUM. AN EXPERIMENTAL PIG MODEL

*Muller, Christian H.*

**OP-670** CAROTID ENDARTERECTOMY / CORONARY ARTERY BYPASS GRAFTING: ARE THERE ANY MERITS?

*Sismanidis, Socrates*

**OP-671** RELATIONSHIP OF ATRIAL FIBRILLATION AND STROKE AFTER CORONARY ARTERY BYPASS GRAFT SURGERY

*Radmehr, Hassan*

**OP-672** CLOSURE OF TRICUSPID VALVE FATIGUE FAILURE-A SERENDIPITOUS OBSERVATION TO AID DESIGN OF MITRAL VALVE

*Guhathakurta, Soma*

**OP-673** SHORT TERM RESULTS AFTER PULMONARY VALVE REPLACEMENT USING THE MATRIX P PLUS HEART VALVE

*Kroll, Johannes*

**OP-674** OFF-PUMP FONTAN OPERATION IN COMPLEX SINGLE VENTRICLE

*Goksel, Onur*

**OP-675** EARLY REPAIR OF HEMITRUNCUS- SURGICAL MANAGEMENT WITH THE BEATING HEART TECHNIQUE

*Mitropoulos, Fotios*

**OP-676** REOPERATIONS IN CONGENITAL HEART SURGERY

*Sarioglu, Tayyar*

**OP-677** TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION: OUTCOME OF SURGICAL CORRECTION AND LONG TERM FOLLOW UP

*Menaissy, Yasser*

**OP-678** TRANSESOPHAGEAL ECHOCARDIOGRAPHY- A PRICELESS TOOL IN PROVIDING SURGICAL EXCELENCE

*Birk, Einat*

**OP-679** THE RIGHT VENTRICULAR OUTFLOW TRACT AFTER REPAIR OF TETRALOGY OF FALLOT - 44 YEARS OF INSTITUTIONAL EXPERIENCES WITH REOPERATIONS USING HOMOGRAFTS

*Wollenek, Gregor*

**OP-680** SURGERY FOR AORTIC COARCTATION IN THE ADULT: 25

#### YEARS EXPERIENCE

*Gamboa Cerda, Angel Mario*

#### OP-681 EARLY AND LATE RESULTS OF TOTAL CORRECTION OF TETRALOGY OF FALLOT

*Hashemzadeh, Khosrow*

### Myasthenia Gravis, Pros & Cons (220)

**Type:** Plenary Session:

Date: Thursday, May 01, 2008

Time: 15:30 - 16:30

Room: Iasso

**Chair:** S. Elia, Italy

**Co-chair:** N. Anastasiou, Greece, J.M. Wihlm, France

Open surgery

*P. Kormas, Greece*

VATS

*F. Rea, Italy*

### Complications in Cardio-Thoracic Surgery (221)

**Type:** Plenary Session:

Date: Thursday, May 01, 2008

Time: 16:30 - 17:30

Room: Iasso

**Chair:** G. Ladas, United Kingdom

**Co-chair:** A. Simon, Germany

Unstable sternum and sterno-mediastinitis

*F. Robicsek, United States*

Lung herniation

*K. Athanassiadi, Greece*

### Parallel: Esophageal Surgery (225)

**Type:** Abstracts - Oral Presentation

Date: Thursday, May 01, 2008

Time: 15:30 - 17:30

Room: Melabus

**Chair:** K. Jeyasingham, United Kingdom

**Co-chair:** A. Duranceau, Canada K. Potaris, Greece

**OP-682** SYSTEMATIC REVIEW: CHEMOPREVENTION OF ESOPHAGEAL ADENOCARCINOMA WITH ASPIRIN OR NON STEROIDAL ANTI-INFLAMMATORY AGENTS

*Yiannakopoulou, Eugenia*

**OP-683** SERIAL ESOPHAGEAL DILATATION IS A BETTER OPTION THAN ESOPHAGEAL RESECTION FOR BENIGN STRICTURES

*Hossain, Azhar*

**OP-684** FACTORS AFFECTING PERIOPERATIVE MORTALITY OF OESOPHAGECTOMY FOR OESOPHAGEAL CANCER

*Boran, Mertay*

**OP-685** RECURRENCE PATTERN AFTER SELECTIVE THREE-FIELD LYMPH NODE DISSECTION FOR THORACIC ESOPHAGEAL SQUAMOUS CARCINOMA

*Fang, Wentao*

**OP-686** A SURGEON'S CASE VOLUME OF OESOPHAGECTOMY FOR CANCER DOES NOT INFLUENCE OPERATIVE MORTALITY

*Jeganathan, Reubendra*

**OP-687** ACCURACY OF CT IN PREOPERATIVE ASSESSMENT OF CARCINOMA ESOPHAGUS IN THE ABSENCE OF EUS AND PET/ CT

*Bilal, Amer*

**OP-688** EVOLVING CONCEPTS IN THE MANAGEMENT OF ESOPHAGEAL PERFORATIONS: A TWENTY-SEVEN YEAR EXPERIENCE

*Bhatia, Pankaj*

**OP-689** EARLY COMPLICATIONS AFTER RESECTION AND RECONSTRUCTION OF THE ESOPHAGUS

*Cordos, Ioan*

**OP-690** ROLE OF NEOADJUVANT PREOPERATIVE CHEMOTHERAPY IN SQUAMOUS CELL CARCINOMA OF ESOPHAGUS: A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL: EXPERIENCE FROM KASHMIR-A CANCER BELT

*Lone, G N*

**OP-691** 3 YEARS FOLLOW UP STUDY OF TWO HUNDRED CASES OF TRANSTHORACIC OESOPHAGECTOMY

*Bilal, Amer*

**OP-692** TREATMENT OF ESOPHAGEAL PERFORATIONS. ANALYSIS OF 41 CASES

*Onat, Serdar*

**OP-693** PHARYNGO-ESOPHAGEAL DIVERTICULA: DIAGNOSIS AND TREATMENT

*Athanassiadi, Kalliopi*

**OP-694** DELAYED DIAGNOSIS OF PERFORATIONS OF THE THORACIC ESOPHAGUS: RESULTS OF A MULTIMODAL APPROACH

*Leoncini, Giacomo*

### Poster Session 1 (230)

**Type:** Abstracts - Poster Presentation

Date: Thursday, May 01, 2008

Time: 17:30 - 18:00

Room: Congress Exhibition (Ground Level)

**P-001** ANTICOAGULATION DRUGS - IS IT POSSIBLE FOR PREGNANT WOMAN WITH MECHANICAL HEART VALVE PROSTHESIS?

*Vildziuniene, Sigute*

**P-002** ANTICOAGULATION IN PREGNANT WOMEN WITH PROSTHETIC HEART VALVE - PROSPECTIVE STUDY

*Kashfi, Fahimeh*

**P-003** ASSESSMENT OF REGISTERED AND STUDENT NURSES' KNOWLEDGE ABOUT WARFARIN'S INTERACTIONS WITH DRUGS AND FOODS

*Goz, Mustafa*

**P-004** PREVALENCE OF PROTHROMBOTIC GENE POLYMORPHISMS IN CARDIAC SURGERY PATIENTS

*Kammerer, Ina*

**P-005** PROSTHETIC MITRAL VALVE THROMBOSIS IN TWO PATIENTS WITH INADEQUATE ADHERENCE TO ANTICOAGULANT THERAPY

*Ponton, Alejandro*

**P-006** ADMINISTRATION OF RECOMBINANT ACTIVATED FACTOR VIIa (NOVO SEVEN) AS "ULTIMA RATIO" FOR MANAGEMENT OF SEVERE UNCONTROLLABLE INTRAOPERATIVE BLEEDING IN A PATIENT UNDERWENT SURGICAL REPAIR OF ACUTE TYPE A AORTIC DISSE-



CTION UNDER DEEP HYPOTHERMIC CIRCULATORY ARREST  
*Saeed, Giovanni*

**P-007** IMMEDIATE RESULTS OF SURGICAL CORRECTION OF AORTIC STENOSIS WITH LOW LEFT VENTRIVULAR EJECTION FRACTION (LVEF < 35%)  
*Bockeria, Leo*

**P-008** ENDOVASCULAR REPAIR OF POST-SURGICAL PSEUDOANEURYSM OF SUPRARENAL ABDOMINAL AORTA IN BEHCET'S DISEASE  
*Alidoosti, Mohammad*

**P-009** AORTIC STENTGRAFTS. NOT EVERYTHING ACCORDING RULES  
*Kosinskas, Eugenijus*

**P-010** HYBRID ENDOVASCULAR APPROACH FOR DISTAL AORTIC ARCH - PROXIMAL DESCENDING AORTA ANEURYSMS: PRELIMINARY RESULTS  
*Tselikos, Dimitrios*

**P-011** PEARLS AND PERILS OF PALMAZ STENTING IN THORACIC AORTIC ANEURYSMS  
*Piluiko, Vitaly V.*

**P-012** INITIAL EXPERIENCE IN ENDOVASCULAR TREATMENT OF THORACIC AORTIC DISEASES  
*Ponton, Alejandro*

**P-013** ONE STAGE OFF PUMP SURGICAL AND ENDOVASCULAR REPAIR OF AN AORTIC ARCH ANEURYSM AND CORONARY OCCLUSION  
*Piluiko, Vitaly V.*

**P-014** POSTOPERATIVE ATRIAL FIBRILLATION TREATMENT WITH INTERNAL CARDIOVERSION IN PATIENTS SUBMITTED TO CARDIAC SURGERY  
*Argiriou, Michalis*

**P-015** THE IMPACT OF ATRIAL FIBRILLATION ON CARDIAC SURGERY: A 10-YEAR REVIEW OF AN ASIAN SURGICAL DATABASE  
*Soon, Jia-Lin*

**P-016** CRT (CARDIAD RESYNCRONISATION THERAPY) OUR EXPERINCE WITH ST JUDE MYODEX LEAD  
*Actis Dato, Guglielmo*

**P-017** OPTIMAL ATRIAL LEAD POSITION FOR PERMANENT PACING AFTER MITRAL VALVE SURGERY COMBINED WITH MODIFIED MAZE PROCEDURE  
*Aidietis, Audrius*

**P-018** EFFECTS OF TEMPORARY ATRIAL PACING ON THE PREVENTION POSTOPERATIVE ATRIAL FIBRILLATION  
*Avila, Vicente*

**P-019** INTRAOPERATIVE TRANSESOPHAGEAL ECHOCARDIOGRAPHIC EVALUATION OF RIGHT VENTRICULAR GEOMETRY AND FUNCTION IN PATIENTS UNDERGOING LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION  
*Stepanenko, Alexander*

**P-020** HIGH URGENCY TRANSPLANTATION AS AN ALTERNATIVE FOR ASSIST DEVICES IN ACUTE HEART FAILURE PATIENTS  
*Sack, Falk-Udo*

**P-021** THE USE OF pVAD AS A BRIDGE TO OFF-PUMP SURGICAL REVASCULARIZATION  
*Pogljajen, Gregor*

**P-022** IABP SIZING: THE LENGTH OF THE AORTA FROM THE LEFT SUBCLAVIAN ARTERY (LSA) TO THE CELIAC AXIS (CA) CAN BE PREDICTED  
*Parissis, Harry*

**P-023** HEARTMATE II AND QUALITY OF LIFE: ALARMS AND ADVISORIES IN THE OUT CLINIC SETTING  
*Rodermans, Ben*

**P-024** COMPARISON OF CARDIOMYOCYTE CULTURE FROM DIFFERENT SPECIES FOR AUTOLOGOUS TRANSPLANTATION  
*Kim, Won Gon*

**P-025** CALCIFICATION RESISTANCE WITH PROCYANIDINS TREATED DECELLULARIZED PORCINE AORTIC VALVE IN VIVO  
*Liu, Yang*

**P-026** REPAIR OF TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE - VIENNA EXPERIENCES  
*Wollenek, Gregor*

**P-027** TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION: EARLY AND MIDTERM RESULTS OF A LOW VOLUME PAEDIATRIC CARDIAC CENTER IN THE CURRENT ERA  
*Kalavrouziotis, Georgios*

**P-028** OVERVIEW OF POSSIBILITIES OF CAVA PULMONARY CONNECTIONS  
*Liekiene, Daina*

**P-029** AUTOPERICARDIAL VALVED CONDUITS AS AN ALTERNATIVE FOR RIGHT VENTRICULAR OUTFLOW TRACT REPLACEMENT IN CHILDREN  
*Bockeria, Leo*

**P-030** ACUTE RIGHT HEART FAILURE DUE TO AN AORTOVENTRICULAR FISTULA SECONDARY TO TETRALOGY OF FALLOT OPERATION (CASE REPORT)  
*Orhan, Atilla*

**P-031** COMPLETE ARTERIAL CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION (EF≤40%)  
*Erdil, Nevzat*

**P-032** AMPLATZER ATRIAL SEPTAL OCCLUDER: WHEN NOT TO USE IT  
*Martinez-Sanz, Rafael*

**P-033** A CASE OF PATENT DUCTUS ARTERIOSUS CLOSING WITH THE AMPLATZER DUCT OCCLUDER USING AN ALTERNATIVE TECHNIQUE  
*Evrengul, Harun*

**P-034** TELEMETRICALLY ADJUSTABLE PULMONARY ARTERY BANDING: FIRST APPLICATION IN GREECE  
*Kalavrouziotis, Georgios*

**P-035** HYBRID PALLIATION IN THE CRITICALLY ILL NEONATE WITH HYPOPLASTIC LEFT HEART SYNDROME AND INTACT ATRIAL SEPTUM  
*Yoshizumi, Ko*

**P-036** PULMONARY ARTERY BANDING FOR HEMI-TRUNCUS ARTERIOSUS: A CASE REPORT  
*Nikolaidis, Nicolas*

**P-037** UNIQUE CASE OF DOUBLE AORTIC ARCH IN INFANT: DIAGNOSTIC IMAGING AND SURGERY VIDEO  
*Atamanyuk, Iryna*

**P-038** ATRIAL SEPTAL DEFECT SURGERY THROUGH LIMITED RIGHT POSTEROLATERAL THORACOTOMY IN CHILDREN  
*Tarutis, Virgilijus*

**P-039** LONG-TERM RESULTS OF RASTELLI OPERATION USING VALVED CONDUITS  
*Park, Young-Hwan*

**P-040** ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY ASSOCIATED WITH ACCESSORY PATHWAY- COMBINED SURGICAL AND INTERVENTIONAL TREATMENT  
*Mitropoulos, Fotios*



**P-041** PATENT DUCTUS ARTERIOSUS CLOSURE IN PREMATURE INFANTS LESS THAN 1000 GRAM BY SUBAXILLARY MINI-THORACOTOMY  
*Baek, Wan Ki*

**P-042** HYBRID PROCEDURES IN PAEDIATRIC CARDIAC SURGERY  
*Tsibinos, Michael*

**P-043** SECUNDUM TYPE ATRIAL SEPTAL DEFECT IN ADULT PATIENTS: OPERATIVE RESULTS AND MID-TERM FOLLOW-UP  
*Ergunes, Kazim*

**P-044** OPERATIVE TECHNIQUE FOR THE TREATMENT OF SUBVALVULAR AORTIC STENOSIS CAUSED BY DIVERTICULUM OF THE MITRAL ANTERIOR LEAFLET  
*Cikirikcioglu, Mustafa*

**P-045** ATRIAL SEPTAL DEFECT CORRECTION IN PATIENTS OVER 40 YEARS OLD  
*Bockeria, Leo*

**P-046** RISK FACTORS FOR EARLY DEGENERATION OF ALLOGRAFTS IN PULMONARY CIRCULATION  
*Deigheidy, Ehab*

**P-047** TRILEAFLET EQUINE PERICARDIAL EXTRACARDIAC CONDUIT IN PULMONARY POSITION: MEDIUM-TERM FOLLOW-UP WITH EXCELLENT HEMODYNAMICS AND FREEDOM FROM CALCIFICATION  
*Deigheidy, Ehab*

**P-048** GIANT ANEURYSMAL DILATION OF A NATIVE PERICARDIAL PATCH USED FOR RECONSTRUCTION OF THE RIGHT VENTRICULAR OUTFLOW TRACT  
*Gurbuz, Ali*

**P-049** HYPOPLASTIC LEFT HEART SYNDROME ASSOCIATED WITH CONGENITAL DIAPHRAGMATIC HERNIA AND INTERRUPTED AORTIC ARCH  
*Dalva, Moise*

**P-050** CHANGES OF THE AORTIC VALVE SIZE AND FUNCTION AFTER THE ROSS AND ARTERIAL SWITCH OPERATIONS  
*Sudikiene, Rita*

**P-051** THE EARLY PRIMARY REPAIR OF TRUNCUS ARTERIOSUS COMMUNIS WITH REDUCED TO BICUSPID PULMONARY HOMOGRAFT - LATE AND MIDTERM RESULTS  
*Kopala, Marek*

**P-052** CORONARY PATTERN IN ANATOMICALLY CORRECTED MALPOSED GREAT ARTERIES AND THEIR SURGICAL IMPLICATIONS  
*Chiu, Ing-Sh*

**P-053** LONG TERM RESULTS OF TRILEAFLET EQUINE PERICARDIAL EXTRACARDIAC CONDUIT USED FOR THE CORRECTION OF ANOMALIES HAVING PULMONIC VENTRICALE-PULMONARY ARTERIAL DISCONTINUITY  
*Zelenekin, Mikhail*

**P-054** SUPRAVALVULAR AORTIC STENOSIS WITH ASCENDING AORTIC HYPOPLASIA AND PULMONARY STENOSIS: A NEW MODIFICATION OF BROM'S 3-PATCH TECHNIQUE (TWO CASES)  
*Akbulut, Birkan*

**P-055** MAGNESIUM SUPPLEMENTATION DURING PEDIATRIC CARDIOPULMONARY BYPASS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL  
*Manrique, Ana Maria*

**P-056** SYSTEMIC-TO-PULMONARY ARTERY SHUNTS IN CYANOTIC CONGENITAL HEART DISEASES  
*Hashemzadeh, Khosrow*

**P-057** EXPERIENCE OF SURGICAL TREATMENT OF CONGENITAL HEART DISEASES COMPLICATED WITH INFECTIVE ENDOCARDITIS  
*Prikhodko, Vladimir*

**P-058** DID THESE PATIENTS BENEFIT FROM ABSENT PULMONARY VALVE?  
*Liu, Jichun*

**P-059** DEXTROPOSITION OF AORTA IN TETRALOGY OF FALLOT  
*Kestelli, Mert*

**P-060** ECTOPIA CORDIS: A REPORT OF TWO CASES  
*Aleta, Karlos*

**P-061** AORTIC IMPLANTATION OF THE ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY-TREATMENT OF CHOICE IN INFANCY  
*Krishnan, Prasad*

**P-062** BRAIN NATRIURETIC PEPTIDE AS PROGNOSTIC FACTOR OF DEVELOPMENT AND PROGRESSION OF CONGESTIVE HEART FAILURE  
*Bockeria, Leo*

**P-063** MECHANICAL CIRCULATORY SUPPORT SYSTEMS AND HEART TRANSPLANT  
*Miniauskas, Saulius*

**P-064** THE TREATMENT TO PATIENTS WITH END STAGE HEART FAILURE  
*Zuoziene, Gitana*

**P-065** DO PATIENTS WITH CHRONIC HEART FAILURE IN NYHA II BENEFIT FROM CARDIAC RESYNCHRONISATION THERAPY?  
*Maneikiene, Vyte Valerija*

**P-066** EARLY AND LONG TERM OUTCOMES OF PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION FOLLOWING DOR PROCEDURE  
*Kalinauskas, Gintaras*

**P-067** AN EXPERIMENTAL STUDY OF TRANSPLANTATION OF SKELETAL MYOBLASTS TRANSFECTED BY VEGF GENE COMBINED WITH LEFT VENTRICULAR REPAIR SURGERY ON ISCHEMIC CONGESTIVE HEART FAILURE  
*Cui, Yong*

**P-068** CHANGEMENT OF GENERAL CONDITION BEFORE AND AFTER OPERATION IN CHRONIC CONSTRICTIVE TUBERCULOUS PERICARDITIS  
*Gurbuz, Ali*

**P-069** VENTRICULAR RESTORATION SURGERY: LONG-TERM RESULTS AND IMPACT OF ISCHEMIC MITRAL VALVE REGURGITATION  
*Butkuvienė, Irena*

**P-070** OUTCOME OF CORONARY ARTERY BYPASS SURGERY IN DIABETIC AND NONDIABETIC PATIENTS: A COMPARATIVE STUDY  
*Ahmadi, Hossein*

**P-071** BIOMARKERS OF T-CELL FUNCTION FOR POST-OPERATIVE RISK STRATIFICATION AFTER CARDIOPULMONARY BYPASS SURGERY  
*Ferrari-Kuehne, Katharina*

**P-072** NEUROTROPHINS IN VASCULAR WALL AND PERIVASCULAR ADIPOSE TISSUE OF HUMAN CORONARY AND INTERNAL THORACIC ARTERIES  
*Panayotov, Plamen*

**P-073** CORONARY ARTERY BYPASS SURGERY VERSUS PERCUTANEOUS CORONARY INTERVENTIONS: CURRENT STATE OF THE ART  
*Psarros, Themistokles*

**P-074** TOTAL ARTERIAL REVASCLARIZATION IN HIGH RISK PATIENTS  
*Peter, Sanjeeth*

**P-075** THE ANESTHESIA MANAGEMENT IN A CORONARY BYPASS SURGERY PATIENT WITH SICKLE-CELL ANEMIA  
*Karahan, Nagihan*

**P-076** A SINGLE DOSE OF APROTININ PREVENTS PLATELETS HYPO-REACTIVITY FOLLOWING CORONARY ARTERY BYPASS SURGERY  
*Morawski, Włodzimierz*

**P-077** LONG TERM OUTCOMES AFTER SURGERY MANAGEMENT IN PATIENTS WITH SEVERE VENTRICULAR DYSFUNCTION  
*Ivaskeviciene, Loreta*

**P-078** THE TREATMENT OF OSTIAL CORONARY ARTERIOPATHY SECONDARY TO THORACIC IRRADIATION WITH OFF-PUMP CORONARY BYPASS GRAFTING: A CASE REPORT AND REVIEW OF LITERATURE  
*Zhu, Ya Bin*

**P-079** CARDIOPROTECTIVE EFFECTS OF INSULIN, GLUCOSE, AND NORMOGLYCEMIA AFTER CORONARY ARTERY BYPASS GRAFTING SURGERY  
*Leung Wai Sang, Stephane*

**P-080** 30-YEAR PATENCY OF A SAPHENOUS VEIN GRAFT IN A CASE OF CORONARY BYPASS SURGERY  
*Ozcan, Ali V.*

**P-081** LOW INCIDENCE OF COMPLICATIONS IN COMPLETE ARTERIAL MYOCARDIAL REVASCULARIZATION  
*Diena, Marco*

**P-082** UTILITY OF B-TYPE NATRIURETIC PEPTIDE IN PREDICTING POSTOPERATIVE ATRIAL FIBRILLATION AFTER CORONARY ARTERY BYPASS GRAFTING  
*Turk, Tamer*

**P-083** GHRELIN LEVELS AND EFFECTS ON THE PATIENTS UNDERGOING CORONARY ARTERY BYPASS SURGERY  
*Guvener, Murat*

**P-084** PREOPERATIVE IDENTIFICATION OF PATIENTS WITH HIGH RISK FOR POST CABG STERNUM INSTABILITY  
*Kuehnelt, Ralf-Uwe*

**P-085** PREOPERATIVE ENDOTHELIAL FUNCTION PREDICTS CARDIOVASCULAR MORBIDITY AFTER CORONARY ARTERY BYPASS GRAFTING  
*Balciunas, Mindaugas*

**P-086** THE BEATING HEART REVASCULARIZATION OF CORONARY ARTERIES THOSE PRESENT AT THE POSTERIOR CARDIAC WALL AND THE COMPARISON OF THE ANGIOGRAPHIC FINDINGS OF THE BEATING HEART PROCEDURE WITH THE CONVENTIONAL CORONARY ARTERY BYPASS PROCEDURE  
*Ozelni, Ahmet*

**P-087** EMERGENCY REINSTITUTION OF CARDIOPULMONARY BYPASS DURING CORONARY ARTERY BYPASS GRAFTING SURGERY: RISK FACTORS AND OUTCOMES  
*Samalavicius, Robertas*

**P-088** SURGICAL TREATMENT OF RADIAL ARTERY SPASM  
*Valaika, Arunas*

**P-089** EFFECT OF PREOPERATIVE INTRA-AORTIC BALLOON PUMP SUPPORT FOR HIGH RISK OFF PUMP CORONARY ARTERY BYPASS OPERATIONS  
*Barbetakis, Nikolaos*

**P-090** ROLE OF PROSTAGLANDINS ON VASOPRESSIN-INDUCED CONTRACTION OF HUMAN GASTROEPIC ARTERY AND SAPHENOUS VEIN  
*Juez, Marina*

**P-091** LATE RESULTS OF MINIMALLY INVASIVE OPERATIONS OF MYOCARDIAL REVASCULARIZATION  
*Giedraitis, Saulius*

**P-092** RING-FREE MITRAL VALVE REPAIR WITH CONCOMITANT CORONARY ARTERY BYPASS GRAFTING  
*Gateliene, Egle*

**P-093** FIBRIN GLUE AS EXTERNAL SUPPORT ENHANCED ADVENTITIAL GENE TRANSFECTION  
*Liu, Jichun*

**P-094** EARLY POSTOPERATIVE COMPARISON OF RENAL FUNCTIONS IN ONPUMP AND OFFPUMP CORONARY ARTERY BYPASS GRAFTS  
*Pradeep, Panicker*

**P-095** VINEBERG'S PROCEDURE WITH DISTAL MAMMARY ANASTOMOSIS: A NEW PROPOSE FOR EXTENSIVE CORONARY DISEASE  
*Dallan, Luis Alberto*

**P-096** ANOMALOUS CORONARY ARTERY IN ADULT  
*Rossini Iglezias, Jose Carlos*

**P-097** CORONARY ENDARTERECTOMY WITH OFF-PUMP CORONARY ARTERY BYPASS SURGERY  
*Schneider, Yuri*

**P-098** INFLUENCE OF CORONARY BYPASS GRAFT COMPLIANCE ON BYPASS FLOW AND PULSATILITY INDEX  
*Jelenc, Matija*

**P-099** TEN YEAR OUTCOME OF SKELETONIZED BITA GRAFTING FOR LEFT MAIN DISEASE  
*Pevni, Dmitry*

**P-100** CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH PULMONARY HYPERTENSION  
*Nevzat, Erdil*

**P-101** POSTOPERATIVE DELIRIUM AS A PROGNOSTIC FACTOR FOR THE LONG-TERM OUTCOME OF ON-PUMP CORONARY OPERATED PATIENTS  
*Tagarakis, Georgios*

**P-102** LIPOPROTEIN LIPASE GENE POLYMORPHISMS AND COGNITIVE DECLINE AFTER CORONARY SURGERY: IS THERE A CONNECTION?  
*Tagarakis, Georgios*

**P-103** TWO INTERNAL THORACIC ARTERIES IN DIABETIC PATIENTS SUBMITTED TO OPCAB  
*Milani, Rodrigo*

**P-104** RELIABILITY OF SJM AORTIC CONNECTOR AS A TOOL FOR PROXIMAL VEIN GRAFT ANASTOMOSIS DURING CABG  
*Iliev, Rumen*

**P-105** ITALIAN CABG MODEL AND EUROSCORE SYSTEM: THEIR USE IN THE EVALUATION OF CARDIAC SURGERY PERFORMANCE  
*Rosato, Stefano*

**P-106** QUALITY OF CARE ASSESSMENT IN CARDIAC SURGERY: THE USE OF HIERARCHICAL MODELS  
*D'Errigo, Paola*

**P-107** "ISLETS" TECHNIQUE" FOR COMPLICATED ENDARTERECTOMY OF THE LEFT ANTERIOR DESCENDING CORONARY ARTERY  
*Nezic, Dusko*

**P-108** EVALUATION OF CARDIOVASCULAR RISK FACTORS AFTER CABG: EVIDENCE FOR AN AGGRESSIVE STRATEGY  
*Barandon, Laurent*

**P-109** OPCAB SURGERY IN VERY HIGH RISK PATIENT: WHY WE DO IT?  
*Barandon, Laurent*

**P-110** PROTECTIVE ROLE OF INTRACORONARY SHUNT IN OFF-PUMP

## CORONARY BYPASS OPERATIONS

*Tok, Mustafa*

### Coronaries 2 (235)

**Type:** Plenary Session

Date: Thursday, May 01, 2008

Time: 18:00 - 20:00

Room: Hippocrates (Main Hall)

**Chair:** V. Subramanian, United States

**Co-chair:** V. Guilielmos, Greece T. Kofidis, Singapore

Composite grafts in coronary surgery

*J. Kobayashi, Japan*

The Use of Bilateral Internal Mammary Artery T-grafts: Late angiographic results

*H. Paterson, Australia*

Aortic no-touch techniques have a favorable effect on neurological outcomes after CABG

*H. Karagoz, Turkey*

Beating heart totally endoscopic CABG: Where do we stand today

*S. Srivastava, United States*

Complete off pump myocardial revascularization via left thoracotomy as a routine

*M. Guida, Venezuela*

Late results of OPCAB surgery

*M. Di Mauro, Italy*

Approach to diabetic patient with multivessel disease: Stent vs Surgery vs Freedom Trial Enrolment

*G. Dangas, United States*

Tissue engineered coronary bypass grafts: dream or reality?

*B. Walpoth, Switzerland*

### Parallel: Valves 2 (240)

**Type:** Abstracts - Oral Presentation

Date: Thursday, May 01, 2008

Time: 18:00 - 20:00

Room: Panacea

**Chair:** D. Nikas, Greece

**Co-chair:** J. Wong, Singapore N. Lakic, Slovenia

**OP-695** CARDIAC RESYNCHRONIZATION THERAPY EARLY AFTER CARDIAC SURGERY FOR ISCHEMIC HEART FAILURE. THE IMPORTANCE OF A LEFTVENTRICULAR EPICARDIAL LEAD  
*Weber, Alberto*

**OP-696** EARLY EXPERIENCE WITH ALTERNATIVE PULMONARY CONDUIT FOR ROSS PROCEDURE IN ADULTS  
*Shatakhyan, Mesrop*

**OP-697** MITRAL VALVE REPAIR IN ACUTE ENDOCARDITIS AFTER RESECTION OF THE INFECTED POSTERIOR LEAFLET USING THE MITROFAST™ VALVULOPLASTY DEVICE  
*Oertel, Frank*

**OP-698** EARLY OUTCOME AFTER AORTIC VALVE REPLACEMENT IN OCTOGENARIANS  
*Djordjevic, Miladin*

**OP-699** AORTIC VALVE REPLACEMENT WITH AORTIC OR PULMONARY HOMOGRAFT: 15 YEARS FOLLOW-UP IN 280 PATIENTS  
*Gamba, Amanda*

**OP-700** BEATING HEART AORTIC VALVE REPLACEMENT AFTER PREVIOUS ALL ARTERIAL CORONARY ARTERY BYPASS GRAFTING  
*Thalmann, Markus*

**OP-701** STENTLESS VERSUS STENTED PROSTHESIS FOR PRIMARY AORTIC VALVE REPLACEMENT: MIDTERM RESULTS OF MORBIDITY, MORTALITY AND QUALITY OF LIFE  
*Loberman, Dan*

**OP-702** AORTIC VALVE REPLACEMENT IN PATIENTS AGE 70 YEARS AND OLDER: EARLY AND LATE RESULTS  
*Jamieson, W R Eric*

**OP-703** IMPROVED PROSTHESIS DESIGN TO ENHANCE PATIENT-PROSTHESIS INTERACTION AND POSTOPERATIVE HEMODYNAMIC PERFORMANCE FOLLOWING STENTED AORTIC BIOPROSTHESIS IMPLANTATION  
*Totaro, Pasquale*

**OP-704** NEW TECHNIQUE IN SURGICAL MANAGEMENT OF RIGHT SIDED ACUTE INFECTIVE ENDOCARDITIS  
*Sayed, Osama*

**OP-705** TREATMENT OF AORTIC VALVE ENDOCARDITIS WITH THE ROSS OPERATION: MIDTERM RESULTS  
*Shatakhyan, Mesrop*

### Parallel: Valves 3 (245)

**Type:** Abstracts - Oral Presentation

Date: Thursday, May 01, 2008

Time: 18:00 - 20:00

Room: Aegle 1

**Chair:** M. Toumpouras, Greece

**Co-chair:** P.H. Noirhomme, Belgium I. Scopin, Russia

**"Euro-Asian Bridge" Invited Lecture:** Aortic Valve repair  
*P.H. Noirhomme, Belgium*

**OP-706** MITRAL WEB: A NEW CONCEPT FOR MITRAL VALVE REPAIR - IMPROVED ENGINEERING DESIGN AND IN VITRO STUDIES  
*Erek, Ersin*

**OP-707** IMPACT OF COMPLETE AND UN-COMPLETE PROSTHETIC MITRAL RINGS ON MITRO-AORTIC FUNCTION: AN MRI STUDY  
*Caimmi, Philippe*

**OP-708** MID-TERM RESULTS OF TRICUSPID VALVE ANNULOPLASTY WITH RINGS "MEDENG" IN COMPARISON SUTURE TECHNIQUE  
*Karaskov, Alexandr*

**OP-709** ARTIFICIAL CHORDAE IMPLANTATION IN REPAIR OF RHEUMATIC MITRAL VALVE DISEASE  
*Dillon, Jeffrey Jeswant*

**OP-710** DOES PREOPERATIVE ATRIAL FIBRILLATION INCREASE THE OPERATIVE RISK IN PATIENTS UNDERGOING AORTIC VALVE REPLACEMENT?  
*Ennker, Juergen*

**OP-711** MASSIVE THROMBOSES OF LEFT ATRIUM IN SURGERY OF ISOLATED MITRAL VALVE DISEASE  
*Popov, Volodymyr*

**OP-712** IN PATIENTS WITH GRADE 2+ ISCHAEMIC MITRAL REGURGI-

TATION, THE ADDITION OF MITRAL VALVE REPAIR TO CABG DOES NOT ADVERSELY AFFECT HOSPITAL OUTCOME  
*Abunasra, Haitham*

**OP-713** MULTIPLE VALVULAR HEART DISEASE: COMPARATIVE STUDY BETWEEN PATIENTS WITH TRIPLE VALVULAR CHANGE AND HIGH RISK UNIQUE VALVULAR CHANGE.  
*Chuquiure-Valenzuela, Eduardo*

**OP-714** MITRAL VALVE REPAIR WITH QUADRANGULAR RESECTION WITH THE DOUBLE TEFLON NO RING TECHNIQUE: 12 YEAR RESULTS  
*Pomerantzeff, Pablo*

**OP-715** COMBINED TREATMENT OF ATRIAL FIBRILLATION AND ATRIOMEGALIA DURING MITRAL VALVE SURGERY  
*Bogachev-Prokophiev, Alexandr*

### Parallel: Cardiac Other 3 (250)

#### Type: Abstracts - Oral Presentation

Date: Thursday, May 01, 2008  
Time: 18:00 - 20:00  
Room: Aegle 2

Chair: C. Gradinac, Serbia  
Co-chair: G. Tedy, Lebanon I. Khadragui, Egypt

**"Euro-Asian Bridge" Invited Lecture:** Should clopidogrel be stopped prior to urgent cardiac surgery?  
*G. Tedy, Lebanon*

**OP-716** INTRANASAL MUPIROCIN IN NASAL CARRIERS OF STAPHYLOCOCCUS AUREUS TO PREVENT SURGICAL SITE INFECTIONS  
*Nocchi, Andrea*

**OP-717** FACTORS INFLUENCING VASCULAR COMPLICATIONS IN INTRA-AORTIC BALLOON PUMP  
*Pour Abbasi, Mohammad Sadegh*

**OP-718** LEFT VENTRICULAR MYECTOMY FOR HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY - LOCAL EXPERIENCE IN PAKISTAN  
*Mazhar Ur, Rehman*

**OP-719** THE TARDIEU'S SIGN IN CARDIAC SURGERY, LOCAL AND SYSTEMIC PERSPECTIVE  
*Nobre, Francisco*

**OP-720** IS THERE A SEX DIFFERENCE IN CAROTID DISEASE IN PATIENTS UNDERGOING CORONARY REVASCULARIZATION?  
*Sismanidis, Socrates*

**OP-721** VALIDATION OF EUROPEAN SYSTEM FOR CARDIAC OPERATIVE RISK EVALUATION IN SAUDI ARABIA  
*Bodlak, Petr*

**OP-722** RESULTS OF THE SHELHIGH STENTLESS BIOPROSTHESIS IN PATIENTS WITH ACTIVE INFECTIVE ENDOCARDITIS: 7-YEAR SINGLE CENTRE EXPERIENCE IN 255 PATIENTS  
*Musci, Michele*

**OP-723** VACUUM-ASSISTED CLOSURE AND BILATERAL PECTORALIS MUSCLE FLAP FOR DIFFERENT STAGES OF MEDIASTINITIS  
*Eyileten, Zeynep*

**OP-724** ACUTE CORONARY SYNDROMES: RISK FACTORS AND RESULTS OF PATIENTS OPERATED FOR REVASCULARIZATION  
*Siminelakis, Stavros*

**OP-725** CORONARY ARTERY REVASCULARISATION IN ACUTE ST-

ELEVATIONS MYOCARDIAL INFARCTION  
*Bodlak, Petr*

### Parallel: Stem Cells - Bioengineering (255)

#### Type: Abstracts - Oral Presentation

Date: Thursday, May 01, 2008  
Time: 18:00 - 20:00  
Room: Acceso

Chair: T. Eschenhage, Germany  
Co-chair: A. Plata, Peru E. Chandrinou, Greece

**OP-726** PARACRINE ACTION OF MESENCHYMAL STEM CELLS IMPROVES MYOCARDIAL PROTECTION AND FUNCTION ONE MONTH AFTER ACUTE ISCHEMIC INJURY IN PIGS  
*Perrault, Louis*

**OP-727** INDIGENOUSLY PROCESSED BOVINE PERICARDIUM FOR CARDIOVASCULAR USE  
*Guhathakurta, Soma*

**OP-728** ASSESSMENT OF MYOCARDIAL CELL THERAPY EFFICACY WITH LONGITUDINAL STRAIN ECHOCARDIOGRAPHY ANALYSIS  
*Nasseri, Boris*

**OP-729** CCR3- AND CXCR4-MEDIATED INTERACTIONS REGULATE MIGRATION OF CD34+ HUMAN BONE MARROW PROGENITORS TO ISCHEMIC MYOCARDIUM AND SUBSEQUENT TISSUE REPAIR  
*Bonaros, Nikolaos*

**OP-730** AUTOLOGOUS BONE MARROW CELL THERAPY FOR HEART FAILURE: MIDTERM FOLLOW-UP  
*Benetti, Federico*

**OP-731** STEM CELL THERAPY IN A COATED SCAFFOLD MUSCLE PATCH FOR CARDIAC REGENERATION: WHICH CELL TYPE SHOULD WE USE?  
*Barandon, Laurent*

**OP-732** BONE MARROW STEM CELLS FOR TREATMENT OF CHRONIC MYOCARDIAL INFARCTION WITH LOW EJECTION FRACTION  
*Rivas-Plata, Alfonso*

**OP-733** ISCHEMIC HUMAN ATRIAL TISSUE CONTAINS HIGHER NUMBERS OF CARDIAC RESIDENT STEM CELLS  
*Emmert, Maximilian*

**OP-734** CELL THERAPY IN CHRONIC CORONARY ARTERY DISEASE: BACK TO THE FUTURE  
*Actis Dato, Guglielmo*

**OP-735** BONE MARROW STEM CELLS AND MEDICAL LASER REVASCULARIZATION AS AN ALTERNATIVE TREATMENT IN PATIENTS WITH END-STAGE CORONARY ARTERY DISEASE  
*Rudzinski, P.*

**OP-736** RESULTS OF ENDOCARDIAL STEM CELLS IMPLANTATION BY NOGA SYSTEM IN ISCHEMIC HEART FAILURE PATIENTS  
*Pokushalov, Evgeniy*

**OP-737** REDUCTION OF INFLAMMATORY RESPONSE AFTER MI: USE A BONE MARROW CELL MIGRATION MODEL AS A TOOL TO RELEASE FRZA IN THE SCAR  
*Barandon, Laurent*

### Parallel: Video 1 (260)

#### Type: Abstracts - Video Presentation

Date: Thursday, May 01, 2008  
Time: 18:00 - 20:00  
Room: Chiron

Chair: V. Kotsis, Greece  
Co-chair: Z. Mitrev, FYROM G. Lazopoulos, Greece

**"Euro-Asian Bridge" Invited Lecture:** New surgical technique for stentless aortic valve replacement  
*Z. Mitrev, FYROM*

**VD-1300** OPERATIVE TECHNIQUE OF ULTRASONIC CARDIAC ABLATION FOR ATRIAL FIBRILLATION DURING CONCOMITANT CARDIAC SURGERY  
*Jegaden, Olivier*

**VD-1301** IMPLANTATION TECHNIQUE OF THE CARDIOWEST TOTAL ARTIFICIAL HEART FOR ENDSTAGE CARDIAC FAILURE  
*Wahlers, Thorsten*

**VD-1302** THE SANO-NORWOOD OPERATION FOR HYPOPLASTIC LEFT HEART SYNDROME - USEFUL SURGICAL TECHNIQUES TO MINIMIZE OPERATIVE MORTALITY  
*Knott-Craig, Chris*

**VD-1303** REPAIR OF TRUNCUS ARTERIOSUS WITHOUT THE USE OF CONDUITS  
*Leman, Hamdan*

**VD-1304** CONGENITAL MITRAL INSUFFICIENCY REPAIR WITH THE WORLD'S SMALLEST ANNULOPLASTY RING: VIDEO PRESENTATION  
*Myers, Patrick O.*

**VD-1305** OFF-PUMP ANTERIOR REPAIR OF AORTIC COARCTATION AND HYPOPLASTIC AORTIC ARCH  
*Abbruzzese, Pietro*

**VD-1306** HOW TO DO IT: TRICUSPID VALVE REPAIR WITH A BIODEGRADABLE ANNULOPLASTY RING FOR EBSTEIN'S ANOMALY  
*Cikirikcioglu, Mustafa*

**VD-1307** SUCCESSFUL TREATMENT OF A PATIENT WITH EISENMENGER SYNDROME BY A SURGICAL-INTERVENTIONAL PROCEDURE: THE WHOLE IS MORE THAN THE SOME OF ITS PARTS  
*Anguseva, Tanja*

**VD-1308** DESCENDING BRANCH OF LATERAL FEMORAL CIRCUMFLEX ARTERY IN CORONARY ARTERY BYPASS GRAFTING: TECHNICAL ASPECTS AND INITIAL RESULTS  
*Gaiotto, Fabio Antonio*

**VD-1309** EFFECTS OF PRIOR PERCUTANEOUS REVASCULARIZATION ON LATE OUTCOMES OF CABG IN DIABETIC AND TRIPLE-VESSEL DISEASE PATIENTS  
*Habib, Robert H.*

### Parallel: Mini Presentation 4 (265)

#### Type: Abstracts - Oral Presentation

Date: Thursday, May 01, 2008  
Time: 18:00 - 20:00  
Room: Homer

Chair: M. Rigby, United Kingdom  
Co-chair: N. Tsilimingas, Greece F. Mitropoulos, Greece

**University of Thessaly, Invited Lecture:** Pediatric Transplantation: Bridge to Life  
*N. Tsilimingas, Greece*

**OP-738** THE RESULTS OF THE SURGICAL CORRECTION TAUSSIG-BING ANOMALY IN NEWBORNS AND INFANTS  
*Kim, Alexey*

**OP-739** DELAYED STERNAL CLOSURE IN PAEDIATRIC OPEN HEART SURGERY  
*Loh, Yee Jim*

**OP-740** FLAP VALVE VSD CLOSURE IN PATIENTS WITH SEVERE PULMONARY HYPERTENSION  
*Venkataraman, Ravishankar*

**OP-741** 10 YEARS EXPERIENCE ACCORDING SUBCLAVIAN FLAP AORTOPLASTY FOR COARCTATION OF AORTA  
*Gholampour Dehaki, Maziar*

**OP-742** DO PATIENTS IN ADULTHOOD BENEFIT FROM SURGICAL CLOSURE OF ATRIAL SEPTAL DEFECT? ABOUT 89 CASES  
*Tribak, Mohammed*

**OP-743** PARTIAL ON- PUMP ATRIAL SEPTECTOMY: A LESS INVASIVE, MORE EFFECTIVE MODIFIED TECHNIQUE  
*Baghaei, Ramin*

**OP-744** EXTENDING THE LIMITS OF THE PRIMARY ARTERIAL SWITCH OPERATION FOR TGA  
*Krishnan, Prasad*

**OP-745** VAC SYSTEM AS TREATMENT OF STERNAL INFECTIONS AFTER CARDIAC SURGERY: OUR EXPERIENCE IN 126 CASES  
*Eusebio, Alessandro*

**OP-746** ENDOVASCULAR REPAIR OF TRAUMATIC AORTIC RUPTURE  
*Iannelli, Gabriele*

**OP-747** PERCUTANEOUS CANNULATION OF THE FEMORAL VESSELS FOR CARDIOPULMONARY BYPASS IN MINIMALLY INVASIVE MITRAL VALVE REPAIR  
*Mazzitelli, Domenico*

**OP-748** CONVENTIONAL VS ENDOSCOPIC SAPHENOUS HARVESTING: PROPENSITY SCORE ANALYSIS  
*Lamascese, Nicola*

**OP-749** CLINICAL OUTCOME IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING USING MINIATURIZED EXTRACORPOREAL CIRCULATION  
*Reber, Delawer*

**OP-750** SURGICAL CORRECTION OF MIDVENTRICULAR OBSTRUCTION ASSOCIATED WITH THE SUBAORTIC OBSTRUCTION IN HOCM PATIENTS  
*Borisov, Konstantin*

**OP-751** STERNOTOMY VERSUS CLAMSHELL INCISION FOR SINGLE SEQUENTIAL LUNG TRANSPLANTATION  
*Parissis, Harry*



**OP-752** BRAIN DEATH INDUCES EARLY CORONARY BUT NOT PULMONARY ARTERY ENDOTHELIAL DYSFUNCTION

*Perrault, Louis*

**Advances in Thoracic Surgery (270)**

**Type:** Plenary Session

Date: Thursday, May 01, 2008

Time: 18:00 - 20:00

Room: Iasso

**Chair:** A. Duranceau, Canada

**Co-chair:** I. Bellenis, Greece N. Dickgreber, Germany

Photodynamic therapy and the thoracic surgeon

*K. Moghissi, United Kingdom*

Endobronchial therapy for emphysema

*F. Venuta, Italy*

Radiofrequency ablation for cancer

*S. Mylona, Greece*

Endoscopic management of airway obstruction

*K. Iliadis, Greece*

**Parallel: Minimally Invasive Procedures (275)**

**Type:** Abstracts - Oral Presentation

Date: Thursday, May 01, 2008

Time: 18:00 - 20:00

Room: Melabus

**Chair:** F. Melfi, Italy

**Co-chair:** R. Stanbridge, United States A. Hatzimichalis, Greece

**Invited Lecture:** Vats Excisions - How I do it

*R. Stanbridge, United Kingdom*

**OP-753** THE ROLE OF THORACOSCOPY IN THE MANAGEMENT OF ORGANIZING EMPYEMA "PRESENT AN EXPERIENCE"

*Kadkhodaie, Hamid*

**OP-754** ROBOTIC VERSUS HUMAN VIDEO-ASSISTED THORACIC SYMPATHECTOMY CAMERA CONTROL: SAFETY AND EFFICIENCY EVALUATION

*Biscegli Jatene, Fabio*

**OP-755** VIDEO-ASSISTED THORACIC SURGERY LOBECTOMY FOR BENIGN LUNG DISEASE

*Choi, Yong Soo*

**OP-756** CURRENT SCENARIO IN MULTIFOCAL THORACIC AND ABDOMINO-THORACIC HYDATID DISEASE: A SURGICAL CHALLENGE AND RELEVANCE OF MINIMALLY INVASIVE SINGLE STAGE APPROACH TO THE MANAGEMENT

*Lone, G N*

**OP-757** SINGLE ACCESS TROCARLESS VIDEO-ASSISTED THORACOSCOPIC SURGERY FOR PARAPNEUMONIC THORACIC EMPYEMA IN INFANTS

*Huybrechts, Hilde*

**OP-758** A SINGLE-STAGED COMPLETE RESECTION OF A DUMBBELL NEUROGENIC TUMOR VIA POSTERIOR APPROACH WITHOUT THORACOTOMY

*Morita, Katsuhiko*

**OP-759** SINGLE SUPINE POSITION AND DOUBLE-PORT TECHNIQUE OF ENDOSCOPIC THORACIC SYMPATHECTOMY: A SERIES OF 11 HYPERHIDROSIS CASES

*Abdullah, Fikri*

**OP-760** THE ROLE OF THORACOSCOPY IN THE MANGEMENT OF HYDATID CYST OF LUNG PRESENT AN EXPERIENCE

*Kadkhodaie, Hamid*

**OP-761** CO2-VIDEO-ASSISTED THORACIC SURGERY (CO2-VATS) LOBECTOMY: A COMPLETELY CLOSED CHEST TECHNIQUE

*Bottoni, Dave*

**OP-762** THYMECTOMY FOR MYASTHENIA GRAVIS: VIDEO-ASSISTED THORACIC SURGERY IS NOT INFERIOR TO STERNOTOMY

*Sihoe, Alan*

**OP-763** VIDEO-ASSISTED THORACOSCOPIC SURGERY FOR MYASTHENIA GRAVIS

*Sakiyalak, Pranya*

**OP-764** VIDEO - ASSISTED CERVICAL MEDIASTINOSCOPY (VACM): OUR 7 YEARS EXPERIENCE

*Karfis, Elias*

**OP-765** THE APPLICATION OF VIDEO-ASSISTED THORACIC SURGERY IN THE DIAGNOSIS AND TREATMENT OF SOLITARY OR MULTIPLE PULMONARY NODULES

*Luh, Shi-Ping*

**OP-766** VIDEO ASSISTED THORACOSCOPIC EXTRACTION OF SHARP INTRA-THORACIC FOREIGN BODIES

*Nanjaiah, Prakash*

**OP-767** THORACOSCOPIC SPLANCHNICECTOMY WITH PATIENTS WITH EXTREME ABDOMEN PAIN

*Yordanov, Deyan*

**OP-768** VATS APICAL BULLECTOMY AND TALC POWDRAGE IN THE TREATMENT OF SPONTANEOUS PNEUMOTHORACES: EFFECT ON PULMONARY FUNCTION AND 1-YEAR RESULTS

*Dubois, Luc*

**OP-769** THE FEASIBILITY OF MEDICAL THORACOSCOPY IN THE TREATMENT OF SUBACUTE EMPYEMA

*Kim, Dohyung*

**Meet the Experts - Mitral valve repair: How to do it**

Date: Friday, May 02, 2008

Time: 07:00 - 08:30

Room: Hippocrates (Main Hall)

**Chairs:** G. Sanoudos, Greece G. Stavropoulos, Greece  
A. Katinioti Greece

Mitral valve repair with artificial chords

*A. Calafiore, Italy*

Late results of mitral valve repair in peadiatric age

*A. Kalangos, Switzerland*

Long term Results of Mitral Valve Repair

*O. Alfieri, Italy*

## Valves 1 (280)

### Type: Plenary Session

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Hippocrates (Main Hall)

**Chair:** G. Christakis, Canada  
**Co-chair:** U. Klima, Singapore G. Kostopoulos, Greece

Pre-Operative imaging and cannulation strategies to reduce the incidence of CVA during Valvular surgery

*G. Tolis, Jr., United States*

Beating valvular surgery

*T. Salerno, United States*

Robotics in cardiac valve surgery: Where do we stand

*O. Jegaden, France*

The small aortic annulus

*W.R.E. Jamieson, Canada*

Aortic root replacement

*R. Favaloro, Argentina*

Transcatheter AVR

*K. Spargias, Greece*

Transapical AVR

*V. Falk, Germany*

## Congenital 1 (285)

### Type: Plenary Session

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Panacea

**Chair:** M. Rigby, United Kingdom  
**Co-chair:** H. Tarmizi, Indonesia

Congenital heart disease: Past, present and future

*M. Gatzoulis, United Kingdom*

The challenges of pediatric cardiac surgery in the 21st century

*G. Sarris, Greece*

New horizons for patients with hypoplastic left heart syndrome

*S. Sano, Japan*

Surgery for transposition of the great arteries

*F. Mitropoulos, Greece*

Arrhythmia surgery for congenital heart disease

*C. Mavroudis, United States*

Experience in low weight and premature neonates with congenital diseases

*Q. Yan, China*

Interrupted aortic arch: Surgical considerations

*L.V. Zannini, Italy*

## Parallel: Cardiac 2 (290)

### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Aegle 1

**Chair:** R. Benetis, Lithuania  
**Co-chair:** Z. Sultic, Croatia T. Fischlein, Germany

**OP-770** RETROGRADE CARDIOPLEGIA IN CORONARY ARTERY DISEASE: BLESS OR CURSE? A COMPUTER MODEL APPROACH

*Kouerinis, Ilias*

**OP-771** A NOVEL METHOD FOR A SIMPLIFIED MITRAL VALVE REPAIR

*Kotidis, Konstantinos*

**OP-772** PREVALENCE OF CAD RISK FACTORS AND THEIR RELATIONSHIP WITH NUMBER OF INVOLVED CORONARY ARTERIES IN CABG

*Darehzereshki, Ali*

**OP-773** SIMULTANEOUS HYBRID REVASCLARIZATION BY CAROTID STENTING AND CORONARY ARTERY BYPASS GRAFTING: THE SHARP TRIAL

*Del Giudice, Costantino*

**OP-774** WHERE ARE WE GOING WITH CONVENTIONAL CORONARY ARTERY BYPASS SURGERY

*Najm, Hani*

**OP-775** A REGENERATIVE CARDIAC SCAFFOLD FOR USE IN VENTRICULAR REMODELING

*Saltman, Adam*

**OP-776** MINIMAL EXTRACORPOREAL CIRCULATION V.S. OF PUMP SURGERY

*Moriones, Ignacio*

**OP-777** THE IMPACT OF MAJOR POSTOPERATIVE COMPLICATIONS ON IN-HOSPITAL MORTALITY FOLLOWING CORONARY ARTERY BYPASS GRAFTING - ARE THEY UNEXPECTED OR PREVENTABLE?

*Angouras, Dimitrios*

**OP-778** OFF PUMP REVASCLARISATION IN ACUTE MYOCARDIAL INFARCTION AND CORRELATION WITH TROPONIN- I LEVELS

*Puri, Deepak*

## Parallel: Coronaries 4 (295)

### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Aegle 2

**Chair:** I. Chlorogiannis, Greece  
**Co-chair:** M. Vettath, India I. Berishvili, Russia

**"Euro-Asian Bridge" Invited Lecture:** Developing OPCAB surgery in a developing country- pros and cons

*M. Vettath, India*

**OP-779** THE INFLUENCING FACTORS OF ACUTE HEART FAILURE AND IABP INSERTION IN CABG PATIENTS WITH EF > 50%

*Ahmadi, Hossein*

**OP-780** MINIMALLY INVASIVE HARVESTED RADIAL ARTERY FOR CORONARY ARTERY BYPASS OUR REVUE OF 185 PATIENTS

*Schraverus, Peter*

**OP-781** RISK FACTORS OF CEREBROVASCULAR ACCIDENTS AFTER ON PUMP ISOLATED CORONARY ARTERY SURGERY  
*Yassin, Ibrahim*

**OP-782** OFF PUMP CORONARY ARTERY BYPASS GRAFTING SURGERY (OPCAB) IN ACUTE CORONARY SYNDROME (ACS)  
*Edayath Thazhakuni, Ismail*

**OP-783** DOES OFF-PUMP CORONARY ARTERY BYPASS GRAFTING REDUCE THE INCIDENCE OF POSTOPERATIVE ATRIAL FIBRILLATION?  
*Hovakimyan, Arman*

**OP-784** ARRHYTHMIAS AND AUTONOMIC HEART REGULATION AFTER OFF-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY  
*Knez, Jure*

**OP-785** MODIFIED T-GRAFT IS THE SAFE OPTION IN ARTERIAL REVASCLARISATION IN SELECTED PATIENTS  
*Kaszczyński, Tomasz*

**OP-786** EVALUATION OF TOPICAL HEMOSTATIC EFFICACY AND SAFETY OF MICROPOROUS POLYSACCHARIDE HEMOSPHERES COMPARED WITH CONVENTIONAL AGENTS IN PATIENTS UNDERGOING CARDIAC SURGERY  
*McCusker, Kevin*

**OP-787** THE COMPARATIVE CHARACTERISTICS OF INVASIVE TREATMENT IN MULTIVESSEL DISEASE OF CORONARY ARTERIES  
*Khalikulov, Khusan*

**OP-788** POSTOPERATIVE TROPONIN I IS AN INDEPENDENT PREDICTOR OF IN-HOSPITAL DEATH AFTER CABG  
*Hashemzadeh, Khosrow*

#### Parallel: Multidisciplinary 3 (300)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Access

**Chair:** B. Gersak, Slovenia  
**Co-chair:** T. Anguseva, FYROM T. Vrachliotis, Greece

**OP-789** SELF-MANAGED ANTICOAGULATION AFTER MECHANICAL HEART VALVE REPLACEMENT IMPROVES HEALTH RELATED QUALITY OF LIFE  
*Krannich, Jens-Holger*

**OP-790** LOW-DOSE ANTICOAGULATION WITH INR SELFMANAGEMENT: FINAL REPORT FROM THE EARLY SELF-MANAGEMENT ANTICOAGULATION TRIAL  
*Koertke, Heinrich*

**OP-791** BETAINE A TRIMETHYLGLYCINE IN PATIENTS WITH SEVERE PULMONARY ARTERIAL HYPERTENSION  
*Iqbal, Omer*

**OP-792** IS IT POSSIBLE TO QUANTIFY MYOCARDIAL PERFUSION DURING NON-FLOW LIMITING STENOSES BY FLUORESCENT CARDIAC IMAGING?  
*Wipper, Sabine*

**OP-793** COMPARISON OF GRAFT WAVEFORM IN CABG BETWEEN ON-IABP AND OFF-IABP  
*Hatada, Atsutoshi*

**OP-794** ANOMALOUS LEFT CORONARY ARTERY FROM PULMONARY ARTERY (ALCAPA): THE ROLE OF 64-MULTISLICE COMPUTED

TOMOGRAPHY  
*Rayatzadeh, Hussein*

**OP-795** EFFICACY OF PREOPERATIVE SCREENING WITH COMPTUED TOMOGRAPHIC ANGIOGRAPHY BEFORE CORONARY ARTERY BYPASS SURGERY  
*Choi, Jin Ho*

**OP-796** QUANTITATIVE CT-ANGIOGRAPHIC EVALUATION OF AORTO-CORONARY BYPASS GRAFTS USING SYNGO VESSEL VIEW SOFTWARE APPLICATION - INITIAL CLINICAL EXPERIENCE  
*Miszaros, Katharina*

**OP-797** INITIAL EXPERIENCE OF REAL-TIME 3D TRANSESOPHAGEAL ECHO PRIOR TO MITRAL VALVE REPAIR  
*Ninios, Vlas*

**OP-798** AN ECHOCARDIOGRAPHIC STUDY OF HEART IN A GROUP OF ADULT ELITE ATHLETES  
*Sheikhvatan, Mehrdad*

**OP-799** NON-INVASIVE DETECTION OF MYOCARDIAL FIBROSIS IN PATIENTS AFTER SURGERY FOR CONGENITAL HEART DISEASE  
*Kondrachuk, Oleksandr*

#### Acute decompensated heart failure: The same old story calls for a different approach - An Interactive Workshop (305)

**Type:** Plenary Session - Nursing Track

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Chiron

**Chair:** M. Chatzopoulou, Greece

**Speakers:** N. Giakis, Greece E. Kletsios, Greece E. Stamatopoulou, Greece E. Tsafou, Greece

#### Parallel: Mini Presentations 5 (310)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Homer

**Chair:** O. Oto, Turkey  
**Co-chair:** I. Linardakis, Greece S. Moutafis, Greece

**"Euro-Asian Bridge" Invited Lecture:** Routine application of minimally invasive technique to AVR operations  
*O. Oto, Turkey*

**OP-800** AMPLATZER OCCLUSION OF PARAVALVULAR LEAK OF MECHANICAL PROSTHESIS FOLLOWING A REOPERATION FOR MITRAL MECHANICAL PROSTHESIS DEHISCENCE  
*Nikolic, Aleksandar*

**OP-801** FIFTH YEAR RESULTS OF MAURITIUS - INDIAN OCEAN ISLANDS HUMANITARIAN MEDICINE PROJECT  
*Cikirikcioglu, Mustafa*

**OP-802** ACUTE DESCENDING NECROTISING MEDIASTITIS, BILATERAL EMPYEMA OF PLEURAE, PURULENT PERICARDITIS WITH HEART'S TAMPONADE AND RETROPERITONEAL INFECTION IN A COURSE OF PERITONSILLAR ABSCESS  
*Gawdzinski, Marek*



**OP-803** NEW INSIGHTS INTO THE FORM AND FUNCTION OF THE SUBAORTIC CURTAIN  
*Nayak, Vijaya*

**OP-804** PROCALCITONIN (PCT) VERSUS C-REACTIVE PROTEIN (CRP) AS SYSTEMIC INFLAMMATORY RESPONSE MARKER AFTER CARDIO-PULMONARY BYPASS (CPB)  
*Chlapoutakis, Serafeim*

**OP-805** REOPERATION IN THE INTENSIVE CARE UNIT FOLLOWING CARDIAC SURGERY: 10 YEAR REVIEW  
*Dandekar, Uday*

**OP-806** CAROTID STENOSIS IN CORONARY PATIENTS WITH PERIPHERAL VASCULAR DISEASE: APPROACH FOR BETTER OUTCOME  
*Kotsanti, Angeliki*

**OP-807** PRIMARY CARDIAC TUMOURS: A 13 YEARS EXPERIENCE OF SURGICAL TREATMENT  
*Khan, Abdul*

**OP-808** MASSIVE PERICARDIAL EFFUSION IN THE PHILIPPINE GENERAL HOSPITAL: CLINICAL PROFILE OF PATIENTS OVER FIVE YEARS  
*Aleta, Karlos*

**OP-809** ERDHEIM-CHESTER'S DISEASE OF THE HEART: A MEDICAL RARITY  
*Palotas, Andras*

**OP-810** STRENGTH OF WIRED STERNOTOMY CLOSURES: EFFECT OF NUMBER OF WIRE TWISTS  
*Waqar, Salman*

**OP-811** PULMONARY-THORACIC RATIO - A NOVEL MEASUREMENT FOR EVALUATING INFANTS WITH PENTALOGY OF CANTRELL  
*Knott-Craig, Christopher J*

**OP-812** STROKE AFTER CORONARY ARTERY SURGERY WITH AND WITHOUT CARDIOPULMONARY BYPASS  
*Hovakimyan, Arman*

**OP-813** PREVENTION OF STERNAL DEHISCENCE USING THERMO-REACTIVE CLIPS (FLEXIGRIP®) IN HIGH-RISK PATIENTS  
*Romero-Ferrer, Bernardo*

**OP-814** CORONARY ARTERY BYPASS GRAFTING IN DIALYSIS PATIENTS  
*Pfeiffer, Steffen*

## Challenges in Thoracic Surgery (315)

**Type:** Plenary Session

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Iasso

**Chair:** P. Goldstraw, United Kingdom

**Co-chair:** G. Ladas, United Kingdom P. Van Schil, Belgium

Pedicle Myo-cutaneous flaps in the management of Chest Wall Tumours - How I do it?  
*G. Ladas, United Kingdom*

Pancoast's Tumor  
*F. Rea, Italy*

Sentinel lymph-node mapping in early Non Small Cell Lung Carcinoma (NSCLC)  
*F. Melfi, Italy*

Pulmonal Metastasectomies  
*D. Branscheid, Germany*

Surgical management of Extrapulmonary Thoracic Metastases  
*S. Elia, Italy*

Management of the pleural effusion  
*I. Bellenis, Greece*

## Parallel: Minimally Invasive Surgery 1 (320)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Syndicate 1

**Chair:** J. Sugamura, Japan

**Co-chair:** F. Tarr, Hungary L. Spassov, Bulgaria

**OP-815** HYBRID PROCEDURES FOR COMPLEX THORACIC AORTIC DISEASE  
*Kuntze, Thomas*

**OP-816** HYBRID TREATMENT OF TYPE-B AORTIC DISSECTION INVOLVING THE ARCH  
*Iannelli, Gabriele*

**OP-817** A HYBRID ENDOVASCULAR APPROACH TO ASCENDING AORTIC PSEUDOANEURYSM  
*Tullis, Gene*

**OP-818** MANUBRIUM SPARIN STERNOTOMY IN PATIENTS WITH TRACHEOSTOMY UNDERGOING CARDIAC SURGERY PROCEDURES  
*Coronella, Germano*

**OP-819** THE USE OF VIDEOPERICARDIOSCOPY IN INDETERMINATE PERICARDIAL EFFUSIONS  
*Biscegli Jatene, Fabio*

**OP-820** ROUTINE USE OF BILATERAL INTERNAL MAMMARY ARTERIES: RELEVANCE TO STERNAL WOUND COMPLICATIONS  
*Chlorogiannis, Yiannis*

**OP-821** XIPHOID APPROACH LONG TERM RESULTS  
*Benetti, Federico*

**OP-822** MINIMALLY INVASIVE DOUBLE VALVE SURGERY USING THREE DIFFERENT APPROACHES  
*Aybek, Tayfun*

**OP-823** MINIMAL ACCESS MITRAL VALVE SURGERY  
*Ahmed, Elnazeer*

**OP-824** THE DIRECT FLOW VALVE - A NEW REPOSITIONABLE AND RETRIEVABLE BOVINE PERICARDIAL VALVE FOR PERCUTANEOUS AORTIC VALVE REPLACEMENT  
*Treede, Hendrik*

**OP-825** HYBRID CORONARY REVASCULARIZATION USING ROBOTIC TECHNOLOGY - AN APPEALING CONCEPT FOR MINIMALLY INVASIVE TREATMENT OF MULTIVESSEL DISEASE  
*Bonaros, Nikolaos*

**OP-826** ROBOTIC ASSISTED OFF PUMP CORONARY ARTERY BYPASS SURGERY. THE FIRST 100 DA VINCI PROCEDURES IN THE UK  
*Khoshbin, Espeed*

**OP-827** ENDOVASCULAR TREATMENT OF COARCTATION OF THE AORTA IN ADOLESCENTS AND ADULTS WITH COVERED STENTS: EXPERIENCE WITH A NEW APPROACH  
*Saadi, Eduardo*

**Parallel: Surgical techniques in Lung Cancer (325)**

**Type: Abstracts - Oral Presentation**

Date: Friday, May 02, 2008  
Time: 08:30 - 10:30  
Room: Melabus

**Chair: S. Bequiri, Germany**  
**Co-chair: M. Konstantinou, Greece**

**OP-828** IS PRIOR STERNOTOMY FOR CARDIAC SURGERY AFFECTING THE SAFETY AND EFFICACY OF MEDIASTINOSCOPY AND MEDIASTINOTOMY?

*Anastasiou, Nikolaos*

**OP-829** EARLY RESULTS OF BIOLOGIC LUNG VOLUME REDUCTION (BLVR) USING A FIBRIN-BASED HYDROGEL FOR ADVANCED EMPHYSEMA

*Refaely, Yael*

**OP-830** SLEEVE RESECTIONS

*Gezer, Suat*

**OP-831** PULMONARY ARTERIAL RECONSTRUCTIONS IN SURGERY FOR LUNG CANCER

*Toker, Alper*

**OP-832** VERTICAL THORACOTOMY - EXPERIENCE WITH 369 OPERATED PATIENTS

*Costa, Altair*

**OP-833** ANTERO AXILLARY MUSCLE SPARING MINI THORACOTOMY OFFERS GOOD ACCESS AND MINIMAL MORBIDITY

*Karunaratne, Waruna Lakmal*

**OP-834** AWAKE ANAESTHESIA FOR MAJOR THORACIC SURGICAL PROCEDURES: AN OBSERVATIONAL STUDY

*Al-Abdullatif, Mohammad*

**OP-835** SAFETY OF INDIVIDUAL AND SIMULTANEOUS STAPLING HILUM STRUCTURES CLOSURE IN PULMONARY LOBECTOMY

*Losso, Luis Carlos*

**OP-836** A NOVEL AND SAFE TECHNIQUE FOR PREVENTION OF DRAIN MALPOSITION IN TUBE THORACOSTOMY

*Kocer, Bulent*

**OP-837** USE OF TRANSSTERNAL TRANSPERICARDIAL APPROACH FOR BRONCHIAL STUMP FISTULA AFTER PNEUMONECTOMY

*Cordos, Ioan*

**OP-838** 5-YEAR REVIEW OF THE USE OF POCKET SIZED HEIMLICH VALVE IN POST BULLECTOMY PATIENTS: INITIAL EXPERIENCE WITH PNEUMOSTAT TM

*Abdul Rahman, Mohd Ramzisham*

**OP-839** POSTOPERATIVE RESIDUAL PLEURAL SPACES WITHOUT AIRLEAK

*Misthos, Panagiotis*

**OP-840** SURGICAL TREATMENT OF SUPERIOR SULCUS (PANCOAST) TUMORS; RESULTS AND PROGNOSTIC FACTORS

*Demir, Adalet*

**OP-841** FAST-TRACK REHABILITATION FOR LUNG CANCER LOBECTOMY: A FIVE YEARS EXPERIENCE

*das Neves Pereira, Joyo Carlos*

**OP-842** THE ROLE OF MUSCLE FLAP IN PREVENTING BRONCHUS STUMP INSUFFICIENCY AFTER PNEUMONECTOMY FOR MALIGNANT

PLEURAL MESOTHELIOMA IN HIGH RISK PATIENTS

*Beshay, Morris*

**OP-843** MEDIAN STERNOTOMY FOR SYNCHRONOUS BILATERAL LUNG CANCERS

*Zervos, Michael*

**OP-844** FAILED DECORTICATION AETIOLOGY, TREATMENT OPTIONS AND OUTCOME

*Bilal, Amer*

**OP-845** LONG-TERM RESULTS OF LUNG DECORTICATION IN PATIENTS WITH RESTRICTIVE PLEURISY AND TRAPPED LUNG SECONDARY TO CORONARY ARTERY BY PASS GRAFTING

*Celik, Sezai*

**OP-846** COLD COAGULATION OF BLEBS IN SPONTANEOUS PNEUMOTHORAX: A NEW ALTERNATIVE TECHNIQUE TO ENDOSTAPLER RESECTION

*Ambrogio, Marcello Carlo*

**OP-847** COMPARATIVE STUDY OF NEW DRAINAGE DEVICE (DRAINAGE BAG) AND CHEST BOTTLE FOR PLEURAL CAVITY DRAINAGE

*Kadkhodaie, Hamid*

**OP-848** SMALL-BORE CATHETER USING FOR THE TREATMENT OF IATROGENIC PNEUMOTHORAX

*Findikcioglu, Alper*

**OP-849** ANALYSIS OF 369 PATIENTS WITH ONLY ONE PLEURAL DRAIN (28 FR) ON THE THORACIC SURGERY POSTOPERATIVE

*Costa, Altair*

**Poster Session 2 (330)**

**Type: Abstracts - Poster Presentation**

Date: Friday, May 02, 2008  
Time: 10:30 - 11:00  
Room: Congress Exhibition (Ground Level)

**P-111** COMPOSITE BILATERAL INTERNAL THORACIC GRAFTING: IS THE FLOW ENOUGH FOR LEFT CORONARY ARTERY?

*Canas, Alfonso*

**P-112** ENDARTERECTOMY FOR DIFFUSE CORONARY ARTERY DISEASE - IS IT WORTHWHILE?

*Nezic, Dusko*

**P-113** LEFT ANTERIOR DESCENDING CORONARY ARTERY REVASCULARIZATION USING CORONARY-CORONARY ARTERIAL CONDUIT

*Nezic, Dusko*

**P-114** COMPARING HEPARIN-COATED AND NON-COATED OXYGENATORS ON RENAL FUNCTIONS IN CORONARY ARTERY BYPASS SURGERY

*Erdil, Nevzat*

**P-115** GIGANTIC SAPHENOUS VEIN GRAFT ANEURYSM LATE AFTER BENTALL OPERATION

*Daliakopoulos, Stavros I.*

**P-116** ACUTE ISCHEMIC HEPATITIS FOLLOWING CARDIAC SURGERY

*Qaradaghi, Lawand*

**P-117** ASSESSMENT OF METABOLIC IMBALANCE OF POSTISCHEMIC MYOCARDIUM AFTER CABG PROCEDURE USING INTERMITTENT WARM BLOOD CARDIOPLEGIA (IWBC)

*Borowski, Andreas*

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*Kamangari, Arash*

**P-119** ASSISTED MYOCARDIAL REVASCULARIZATION WITHOUT CARDIOPULMONARY BYPASS

*Caleron, Moises*

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*Susak, Stamenko*

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*Ozker, Emre*

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*Bakhshandeh, Ali Reza*

**P-123** DOES COMBINED ANTEGRADE - RETROGRADE CARDIOPLEGIA HAVE ANY SUPERIORITY OVER ANTEGRADE CARDIOPLEGIA?

*Tatari, Hassan*

**P-124** RECONSTRUCTION OF THE BRACHIAL-ULNAR ARTERY CONTINUITY AFTER IATROGENIC INJURY DURING THE HARVESTING OF THE RADIAL ARTERY AS CORONARY ARTERY BYPASS GRAFT FOR MYOCARDIAL REVASCULARIZATION

*Saeed, Giovanni*

**P-125** ROLE OF REAL-TIME THREE-DIMENSIONAL ECHOCARDIOGRAPHY IN DIAGNOSTICS OF ATRIOVENTRICULAR CANAL DEFECT

*Nartsisova, Galina*

**P-126** ABERRANT RIGHT SUBCLAVIAN ARTERY: AN UNUSUAL TREATMENT FOR A RARE ANOMALY

*Benassi, Filippo*

**P-127** TEE MONITORING FOR EMPTY BEATING HEART AORTIC VALVE REPLACEMENT WITH PATENT CORONARY BYPASS GRAFTS

*Szudi, Laszlo*

**P-128** VENTRICULAR CLEAVAGE: A NOVEL FINDING. THE ROLE OF CMR IN SUCCESSFUL DIAGNOSIS AND SURGICAL REPAIR

*Wanamaker, Kelly M.*

**P-129** SEEING IS BELIEVING: MR IMAGING OF PARTIAL ANOMALOUS PULMONARY VENOUS RETURN BEFORE AND AFTER SURGICAL CORRECTION

*Cikirikcioglu, Mustafa*

**P-130** ENDOSCOPIC VESSEL HARVESTING (EVH): THE LEARNING EXPERIENCE OF A TEACHING HOSPITAL

*Panagiotakopoulos, Victor*

**P-131** PERCUTANEOUS CARDIOPLEGIA DELIVERY USING THE MINIPORT IN MINIMALLY INVASIVE MITRAL VALVE SURGERY

*Chiu, Kuan-Ming*

**P-132** ENDOSCOPIC HARVEST OF SAPHENOUS VEIN-A LESSON LEARNED FROM 1348 CASES

*Chiu, Kuan-Ming*

**P-133** OPEN HEART SURGERY IN PATIENTS AGED OVER 75: OUTCOMES FOLLOWING THE MINIMALLY INVASIVE APPROACH

*Karimov, Jamshid H.*

**P-134** MINIMALLY INVASIVE PORT ACCESS VERSUS CONVENTIONAL MITRAL VALVE SURGERY- EXPERIENCE AND EVOLUTION OF A PRACTICE

*Jutley, R S*

**P-135** A TOUCH OF GLUE TO REPLACE SUTURE KNOTS, STITCHES AND STAPLES: PRELIMINARY STUDIES

*Kolesov, Evgenii*

**P-136** FEASIBILITY OF ASSISTED VENOUS DRAINAGE USING A TINY CENTRIFUGAL BLOOD PUMP (TINY PUMP) FOR TRANSFUSION-FREE CARDIOPULMONARY BYPASS IN NEONATAL PIGLETS

*Ugaki, Shinya*

**P-137** VENTRICULE ASSISTANCE IN CARDIAC FAILURE

*Sparr, Brigitte*

**P-138** OUR EXPERIENCE WITH A NEW RIGID PLATE FIXATION OF THE STERNUM IN HIGH RISK PATIENTS UNDERGOING HEART SURGERY

*Feijoo-Osorio, Juan*

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*Sarvanakis, Konstantinos*

**P-140** NEW ULTRA-HIGH SENSITIVE CCD CAMERA FOR CAPTURING OF COLOR AND NEAR-INFRARED IMAGES DURING ICG ANGIOGRAPHY IN CABG

*Handa, Takemi*

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*Pogljajen, Gregor*

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*Cochurkova, Elena*

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*Ereminiene, Egle*

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*Benyoussef, Hicham*

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*Jakuska, Povilas*

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*Martinez-Sanz, Rafael*

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*Jakuska, Povilas*

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*Fouad, Ahmed*

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*Demertzis, Stefanos*

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*Saeed, Giovanni*

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*Yetkin, Ufuk*

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*Wauthy, Pierre*

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*Korbmacher, Bernhard*

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*Junjiro, Kobayashi*

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*Gryaznov, Dmitry*

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*Zheleznev, Sergey*

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*Kondruweit, Markus*

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*Yavuz, Senol*

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*Juscinski, Jacek*

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*Jensen, Henrik*

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*Tsomkopoulos, Sotirios*

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*Ozbek, Cengiz*

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*Saeed, Giovanni*

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*Barili, Fabio*

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*Kazaz, Hakki*

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*Jelenc, Matija*

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*Al-Sarraf, Nael*

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*Saeed, Giovanni*

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*Kazaz, Hakki*

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*Gullu, Ahmet Umit*

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*Samuel Avila, Walkiria*

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*Inaba, Hirotaka*

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*Lee, Dong-Hyup*

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*Ilhan, Gokhan*

**P-182** THE AFFECT OF PYROLITIC CARBON COATED MECHANICAL VALVES TO D-DIMER

*Ilhan, Gokhan*

**P-183** REST AND STRESS ECHOCARDIOGRAPHIC EVALUATION OF PATIENTS WITH AVR FOR ESTIMATION OF MISMATCH BETWEEN EFFECTIVE ORIFICE AREA AND BODY SURFACE AREA

*Kamangari, Arash*

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*Kamangari, Arash*

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*AL-Masri, Ayman*

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*Lee, Dong-Hyup*

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*Mistiaen, Wilhelm*

**P-190** OPTIMAL MULTIPLANAR MECHANICAL AORTIC VALVE

*Kestelli, Mert*

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*Mirzaaghayan, Mohammad Reza*

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*Ponton, Alejandro*

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*Bakkali, Aberrahmane*

**P-194** CARDIAC TUMORS ABOUT 31 CASES AND LITERATURE REVIEW

*Belkhadir, Aziz*

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*Chlapoutakis, Serafeim*

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*Shah, Dhiren*

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**P-198** REPAIR OF LEFT VENTRICULAR ANEURYSM AND LARGE PSEUDOANEURYSM USING PERICARDIAL PATCH AND BIO-GLUE™

*Henn, Lucas*

**P-199** MURINA FISH IMAGE OF A GIANT RIGHT ATRIAL THROMBUS: ASSOCIATION WITH PERSISTENT LEFT SUPERIOR VENA CAVA

*Orhan, Atilla*

**P-200** ENDOMYOCARDIAL FIBROSIS: PATHOLOGICAL FINDINGS IN SURGICAL SPECIMENS AND CLINICOPATHOLOGICAL CORRELATION

*D'Andretta Iglezias, Silvia*

**P-201** RESULTS OF OPEN HEART SURGERY IN PATIENTS WITH SICKLE CELL TRAIT OR DISEASE

*Canver, Charles*

**P-202** LEUKOCYTE DEPLETING FILTERS IN HEART TRANSPLANTATION: A PROSPECTIVE, RANDOMISED CLINICAL TRIAL

*Dvorak, Lubos*

**P-203** RIGHT-SIDED BOCHDALEK HERNIA IN AN ADULT: REPORT OF A CASE

*Onat, Serdar*

**P-204** OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY: STILL GOOD RESULTS WITH OLD FASHIONED SURGERY

*Martins, Stevan*

**P-205** COMPARISON OF OLIGON CENTRAL VENOUS CATHETERS WITH STANDARD IN CARDIAC SURGERY ICU PATIENTS

*Douka, Evangelia*

**P-206** DISASTER MEDICINE: IS IT A CHALLENGE FOR CARDIOTHORACIC SURGEONS?

*Dimitrakakis, Georgios*

**P-207** SURGICAL RESECTION OF VENTRICULAR FIBROMA IN AN ADULT

*Roubelakis, Apostolos*

**P-208** COMPARISON BETWEEN ASSESSMENT OF PULMONARY ARTERY PRESSURE WITH ECHOCARDIOGRAPHY AND CATHETERIZATION IN PEDIATRIC PULMONARY HYPERTENSION

*Tabib, Avis*

**P-209** ENDOVASCULAR REPAIR OF TYPE III ENDOLEAK. EXPERIENCE IN THREE CASES

*P. Negueruela, Carolina*

**P-210** EARLY RESULTS OF LEFT VENTRICULAR ANEURYSMECTOMY IN PATIENTS WITH EJECTION FRACTION OF 30% OR LESS

*Dvaz-Vazquez, Diana M.*

**P-211** SUTURELESS REPAIR OF ACUTE LEFT VENTRICULAR WALL RUPTURE WITHOUT CARDIOPULMONARY BYPASS

*Nikolaidis, Nicolas*

**P-212** NT BRAIN NATRIURETIC RELATED PEPTIDE AS A PROGNOSTIC BIOCHEMICAL PARAMETER IN CARDIAC SURGERY

*Asimomytis, Dimitris*

**P-213** HEART TUMORS - 37 YEARS OF EXPERIENCE IN 121 PATIENTS

*Kondruweit, Markus*

**P-214** PRIMARY CARDIAC RHABDOMYOSARCOMA OF THE RIGHT ATRIUM: CASE REPORT

*Onur, Sokullu*

**P-215** MODIFIED SUTURE OF INFECTED WOUND AFTER HEART SURGERY

*Pronckus, Vytautas Antanas*

**P-216** STATINS FOR AORTIC VALVE STENOSIS: WHERE DO WE HEADED

*Psarros, Themistokles*

**P-217** APICOAORTIC CONDUIT: AN ALTERNATIVE TO AORTIC VALVE REPLACEMENT IN SEVERE AORTIC STENOSIS WITH PORCELAIN AORTA

*Casais, Rocio*

**P-218** EARLY RESULTS OF COMBINED AORTIC VALVE REPLACEMENT AND CORONARY ARTERIES BYPASS GRAFTING USING DIFFERENT METHODS OF MYOCARDIAL PROTECTION

*Tchuev, Denis*

**P-219** INFORMATION NEEDS OF CABG PATIENTS CONCERNING THEIR MEDICATION AND DISEASE

*Feyrer, Richard*

**P-220** CARDIAC TUMOR REPRODUCING CONGENITAL CARDIOPATHY

*Rossini Iglezias, Jose Carlos*

## Valves 2 (335)

**Type: Plenary Session**

Date: Friday, May 02, 2008  
Time: 11:00 - 11:30  
Room: Hippocrates (Main Hall)

**Chair: G. Christakis, Canada**  
**Co-chair: U. Klima, Singapore G. Kostopoulos, Greece**

Addressing regional differences in the management of valvular heart disease

*H.S. Saw, Singapore*

How to do it: Video 1 - Transcatheter AVR  
*The Catania University Group*

Video 2 - AVR via right small thoracotomy  
*M. Glauber, Italy*

## Surgery for AF (340)

**Type: Plenary Session**

Date: Friday, May 02, 2008  
Time: 11:30 - 13:00  
Room: Hippocrates (Main Hall)

**Chair: C. Muneretto, Italy**  
**Co-chair: H.T. Sie, Netherlands M. Argyriou, Greece**

Surgical treatment of atrial fibrillation: Where do we stand  
*R. Wolf, United States*

Surgery for lone atrial fibrillation  
*L. Poa, United States*

Surgery for atrial fibrillation and valvular heart disease  
*P. Suwalski, Poland*

Less invasive methods for the surgical treatment of atrial fibrillation.  
Which lesion pattern for the individual patient  
*B. Akpınar, Turkey*

How to start an arrhythmia program in your practice  
*K. Khargi, Netherlands*

## Session Plenary: Congenital 2 (345)

**Type: Plenary Session**

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Panacea

**Chair: C. Mavroudis, United States**  
**Co-chair: C.N. Lee, Singapore**

Preservation of right ventricular function after repair of TOF  
*G. Sarris, Greece*

RV and LV function early and late after repair of TOF  
*A. Redington, United Kingdom*

Sudden cardiac death after repair of TOF  
*M. Gatzoulis, United Kingdom*

Pulmonary valve replacement after repair of TOF - Indications, techniques, results  
*D. Shore, United Kingdom*

Results of the arterial switch operation for D-TGA. Is there a learning curve?  
*H. Nazm, UAE*

Surgery for PA - VSD - MAPCA's  
*V. Hraska, Germany*

MRI in evaluation of late RV function after repair of TOF  
*P. Kilner, United Kingdom*

## Parallel: Cardiac 3 (350)

**Type: Abstracts - Oral Presentation**

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Aegle 1

**Chair: R. Deac, Romania**  
**Co-chair: G. Uzdaviny, Lithuania V. Lozos, Greece**

**OP-850** THE EFFECT OF REMOTE EARLY ISCHEMIC PRECONDITIONING ON SPINAL CORD INJURY AFTER DESCENDING THORACIC AORTIC OCCLUSION  
*Toumpoulis, Ioannis*

**OP-851** THE EFFECT OF SIMVASTATIN ON ANEURYSM FORMATION IN A RABBIT EXPERIMENTAL MODEL  
*Tilson, David*

**OP-852** IS THE EUROSCORE MODEL ACCURATE ENOUGH TO PREDICT MORTALITY AFTER CARDIAC SURGERY?  
*Medalion, Benjamin*

**OP-853** OESOPHAGOGASTRECTOMY FOR CARCINOMA VIA A LEFT THORACOPHRENOTOMY  
*Anastasiou, Nikolaos*

**OP-854** EARLY AND LATE RESULTS OF CONCOMITANT LUNG CANCER RESECTION AND OFF-PUMP CABG  
*Dyszkiewicz, Wojciech*

**OP-855** INTRACRANIAL ANEURYSMS IN PATIENTS WITH THORACIC AORTIC ANEURYSMS  
*Feldman, Marina*

**OP-856** IMPACT OF CORONARY ARTERY DISEASE IN AORTIC VALVE SURGERY  
*Oliveira, Josi de Lima Jr.*

**OP-857** MECHANICAL VALVE PERFORMANCE OVER 15 YEARS AS ASSESSED BY MICROSIMULATION: OPPORTUNITIES FOR IMPROVEMENT WITH THE ON-X MECHANICAL PROSTHESIS  
*Jamieson, W R Eric*

**OP-858** PREOPERATIVE PRO-BNP: PROGNOSTIC FACTOR IN CARDIAC SURGERY  
*Simon, Caterina*

**OP-859** FEASIBILITY OF MITRAL VALVE REPAIR FOR DEGENERATIVE INSUFFICIENCY INVOLVING BOTH LEAFLETS  
*Diena, Marco*



## Parallel: Coronaries 5 (355)

### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Aegle 2

Chair: I. Panteliadis, Greece  
Co-chair: R. Mohr, Israel W.H. Eid, UAE

**"Euro-Asian Bridge" Invited Lecture:** Relation between native coronary stenosis and graft failure in patients undergoing bilateral ITA grafting with composite T grafts  
*R. Mohr, Israel*

**OP-860** TIMING AND DURATION OF HYPOTENSIVE EPISODES DURING CARDIAC SURGERY  
*Likosky, Donald*

**OP-861** EARLY AND MID-TERM RESULTS OF MYOCARDIAL REVASCULARISATION USING BILATERAL INTERNAL THORACIC ARTERIES. SINGLE UNIT'S 13 YEAR EXPERIENCE  
*Kalogris, Panayiotis*

**OP-862** EFFECT OF TRAINING ON LONG TERM OUTCOME IN CORONARY ARTERY BYPASS GRAFTING  
*Olszowka, Piotr*

**OP-863** "TAILOR-MADE" REOPERATIVE OFF-PUMP CORONARY SURGERY  
*Porta, Fabiano*

**OP-864** THE ARTERIAL BYPASS: A GRAFT FOR ALL REASONS  
*Kieser, Teresa M.*

**OP-865** INFLUENCE OF SIMVASTATIN ON INFLAMMATORY AND METABOLIC RESPONSE TO CORONARY ARTERY BYPASS GRAFTING  
*Zeleschowski, Pawel*

**OP-866** AUTOTRANSFUSION AFTER URGENT CORONARY ARTERY BYPASS SURGERY. SAFETY AND EFFICIACY OF POST OPERATIVE CELL SALVAGE. A RANDOMISED CONTROLLED TRIAL  
*Bose, Amal*

**OP-867** RANDOMIZED CLINICAL AND ANGIOGRAPHIC EVALUATION OF DIFFERENT BILATERAL ITA REVASCULARIZATION  
*Pierre Yves, Etienne*

**OP-868** "NO-TOUCH" SAPHENOUS VEIN GRAFT HARVESTING WITH HARMONIC SCALPEL: MID-TERM RESULTS  
*Semagin, Andrey*

## Session: Parallel: Multidisciplinary 4 (360)

### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Acceso

Chair: C. Kotoulas, Greece  
Co-chair: M. Cikirikcioglu, Turkey A. Kondili, Greece

**"Euro-Asian Bridge" Invited Lecture:** Ventricular Reshaping: When and How  
*E. Zias, United States*

**OP-870** EPICARDIAL 3D ECHOCARDIOGRAPHY DURING MITRAL VALVE REPAIR: COMPARISON WITH TRANSESOPHAGEAL ECHO  
*Ninios, Vlasia*

**OP-871** IMPACT OF CARDIOPULMONARY BYPASS ON FIBRINOLYSIS IN CORONARY SURGERY  
*Snircova, Jana*

**OP-872** MYOCARDIAL REVASCULARIZATION IN DIABETIC PATIENTS, BETTER THE SURGICAL OR THE PERCUTANEOUS TECHNIQUE?  
*Contini, Giovanni Andrea*

**OP-873** IMPACT OF CLOPIDOGREL USE ON MORBIDITY, MORTALITY AND ON MAJOR BLEEDING IN PATIENTS UNDERGOING URGENT CORONARY ARTERY BYPASS SURGERY  
*Nesher, Nachum*

**OP-874** ALZHEIMER'S DISEASE-LIKE BIOMARKER CHANGES AFTER CORONARY ARTERY BYPASS GRAFTING  
*Palotas, Andras*

**OP-875** IS THERE ANY EVIDENCE FOR USING THE PREOPERATIVE INTRA-AORTIC BALLOON PUMP IN CORONARY ARTERY SURGERY: AN UPDATED META-ANALYSIS WITH MORTALITY OUTCOMES  
*Theologou, Thomas*

**OP-876** REDO SURGERY IN END-STAGE ISCHEMIC HEART DISEASE 15 YEARS AFTER MULTIPLE CORONARY ENDARTERECTOMY (CASE REPORT)  
*Jonjev, Zivojin*

**OP-877** IS CAROTID SCREENING OBLIGATORY IN YOUNG PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING?  
*Sismanidis, Socrates*

**OP-878** FAST TRACK CARDIAC ANESTHESIA FOR CORONARY ARTERY BYPASS GRAFTING: EFFECTS ON HEMODYNAMICS AND EXTUBATION TIME  
*Eid, Hossameldin*

**OP-879** PREDICTORS OF POST-OPERATIVE ACUTE RENAL FAILURE REQUIRING RENAL DIALYSIS AFTER CARDIAC SURGERY  
*Datta, Subir*

**OP-880** RADICAL EXCISIONAL THERAPY FOR A HUGE RECURRENT MYXOMA THROUGH COMPLETE TRANSECTION OF AORTIC ROOT  
*Ghaffari Nejad, Mohammad Hassan*

**OP-881** MULTIDISCIPLINARY APPROACH FOR REDUCED INCIDENCE OF STROKE AFTER CORONARY ARTERY BYPASS  
*Siminelakis, Stavros*

## Round Table Discussion (University Hospital of Ioannina) (365)

### Type: Plenary Session - Nursing Track

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Chiron

Components of Bioethics in the clinical practice  
*D. Tziallas, Greece*

Secondary prevention in cardio - surgery patients  
*M. Fatourou, Greece*

Basic indexes of nursing concerning troubleshooting in Cardio - surgery patient in a tertiary centre  
*A. Karapanou, Greece A. Magou, Greece*

Rehabilitation of Cardio - surgery patient  
*D. Kaskanis, Greece*

### Parallel: Mini Presentations 6 (370)

**Type: Abstracts - Oral Presentation**

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Homer

**Chair: N. Kouchoukos, United States**  
**Co-chair: I. Kokotsakis, Greece**

**Evangelismos General Hospital, Invited Lecture:** The frozen elephant trunk technique for complex thoracic aortic pathologies  
*I. Kokotsakis, Greece*

**OP-882** URGENT CAROTID SURGERY FOR MULTIPLE TRANSIENT ISCHEMIC ATTACKS  
*Alsac, Jean-Marc*

**OP-883** RELATIONSHIP BETWEEN BMI AND POST-OPERATIVE STROKE IN PATIENTS UNDERGOING ISOLATED CABG  
*Filardo, Giovanni*

**OP-884** DOES ARCH REPLACEMENT IMPROVE OUTCOMES AFTER ACUTE TYPE A AORTIC DISSECTION?  
*Alessandro, Piccardo*

**OP-885** TYPE A AORTIC DISSECTION: LONG TERM OUTCOMES IN AN ACADEMIA HOSPITAL IN ARGENTINA  
*Daniel, Bracco*

**OP-886** AORTIC ROOT SURGERY: TEN YEAR EXPERIENCE AT THE FAVALORO FOUNDATION  
*Favaloro, Roberto*

**OP-887** EMERGENCY ENDOVASCULAR REPAIR OF ACUTE THORACIC AORTIC PATHOLOGY  
*Paraskevas, Nikolaos*

**OP-888** NOVEL METHOD FOR BIO GLUE USE IN SURGERY FOR ACUTE AORTIC DISSECTION  
*Mitrev, Zan*

**OP-889** USE OF CEREBRAL OXIMETRY TO FACILITATE ADULT AORTIC ARCH SURGERY AT MODERATE HYPOTHERMIA  
*Singh, Sumeet*

**OP-890** AORTIC VALVE REPLACEMENT IN PATIENTS OLDER THAN 60 YEARS  
*Arikbuka, Mehmet*

**OP-891** THE USE OF SURGICAL SPONGES TO TREAT SEVERE BLEEDING IN PATIENTS OPERATED ON FOR ACUTE AORTIC DISSECTION  
*Rudzinski, Pawel*

**OP-892** ENDOVASCULAR REPAIR OF DESCENDING THORACIC AORTIC DISEASE  
*Matsagas, Miltiadis*

**OP-893** HYBRID TREATMENT OF THORACOABDOMINAL AORTIC ANEURYSMS WITH THE USE OF A NEW PROSTHESIS  
*Esposito, Giampiero*

**OP-894** IN SINUS AORTIC VALVE REPLACEMENT  
*Rajaii-Khorasani, Ahmad*

**OP-895** TEACHING VALVE-SPARING AORTIC ROOT REPLACEMENTS - SUCCESSFUL OUTCOMES WITHIN A TRAINING PROGRAM  
*Davies, Ryan*

**OP-896** AORTIC VALVE REIMPLANTATION: RESULTS IN 82 CONSECUTIVE PATIENTS WITH MID-TERM FOLLOW-UP  
*Coscioni, Enrico*

### Thoracic Track "Surgical Techniques" (375)

**Type: Plenary Session**

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Iasso

**Chair: D. Branscheid, Germany**  
**Co-chair: Th. Dosios, Greece R. Jakovic, Serbia**

Open thoracotomy  
*K. Potaris, Greece*

VATS  
*W.S. Walker, United Kingdom*

Robotics  
*F. Melfi, Italy*

Segmentectomy in surgical treatment of lung cancer  
*M. Ercegovic, Serbia*

Lobectomy  
*R.A. Schmid, Switzerland*

Bronchoplastic procedure  
*P. Van Schil, Belgium*

### Parallel: Cardiac Other 4 (380)

**Type: Abstracts - Oral Presentation**

Date: Friday, May 02, 2008  
Time: 11:00 - 13:00  
Room: Syndicate 1

**Chair: T. Munzel, Germany**  
**Co-chair: D. Unic, Croatia A. Hevas, Greece**

**OP-897** GENISTEIN INCREASES CORONARY BLOOD FLOW THROUGH B2-ADRENERGIC MEDIATED NO RELEASE AND ESTROGENIC RECEPTORS  
*Caimmi, Philippe*

**OP-898** THE NEW HTK-N46 CARDIOPLEGIC SOLUTION PROVIDES SUPERIOR POSTISCHEMIC HEMODYNAMIC RECOVERY IN THE FAILING RAT HEART  
*Hasun, Matthias*

**OP-899** BONE WAX INFLUENCES STERNAL WOUND INFECTION RATE? RESULTS OF A PROSPECTIVE AUDIT  
*Bhimagunta, Prabhakar Rao*

**OP-900** COMPARISON OF LOGISTIC EUROSORE AND CARE SCORE IN HEART SURGERY: A TERTIARY CENTRE EXPERIENCE  
*Sintou, Eleni*

**OP-901** THE EFFECT OF MATRIX METALLOPROTEINASE INHIBITOR IN VENTRICULAR REMODELING AFTER MYOCARDIAL INFARCTION  
*Han, Sung Sae*

**OP-902** HEART TUMORS: PRESENTING SYMPTOMS, DIAGNOSIS AND SURGICAL TREATMENT. 11 YEARS CLINICAL EXPERIENCE OF ONE SINGLE CENTRE  
*Saeed, Giovanni*

**OP-903** PREVENTION OF RETROSTERNAL PERICARDIAL ADHESIONS AFTER PRIMARY CARDIAC OPERATIONS BY MITOMYCIN C (EXPERIMENTAL STUDY)  
*Gormus, Niyazi*



**OP-904** QUALITY MANAGEMENT IN CARDIAC SURGERY IMPROVES OUTCOMES

*Stamou, Sotiris*

**OP-905** ESTIMATION OF GLOMERULAR FILTRATION RATE IN CARDIAC SURGERY: COCKCROFT-GAULT FORMULA VS MDRD

*Simon, Caterina*

**OP-906** EVALUATION OF A BIOABSORABLE OXIDIZED REGENERATED CELLULOSE IN A RABBIT MODEL FOR THE REDUCTION OF PERICARDIAL ADHESIONS

*Bicer, Murat*

**OP-907** METASTATIC TUMORS OF THE HEART

*Chlapoutakis, Serafeim*

### Parallel: Oncology in Lung Cancer 1 (385)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008

Time: 11:00 - 13:00

Room: Melabus

**Chair:** F. Rea, Italy

**Co-chair:** N. Dickgreber, Germany J. Dahabreh, Greece

**OP-909** DETECTION OF CIRCULATING TUMOUR CELLS DURING PULMONARY RESECTION FOR NON-SMALL CELL LUNG CARCINOMA

*Humphrey, Robert*

**OP-910** DELAYS IN THE MANAGEMENT OF NON-SMALL CELL LUNG CANCER IN A PUBLICLY FUNDED HEALTH CARE SYSTEM

*Behzadi, Abdollah*

**OP-911** BRONCHOPULMONARY TYPICAL CARCINOID TUMOR: INCIDENCE OF LYMPH NODE MICRO METASTASES

*das Neves Pereira, Jojo Carlos*

**OP-912** PRECISE PREDICTION OF LUNG CANCER PATIENTS SURVIVAL WITHOUT LYMPH NODE METASTASIS AFTER COMPLETE LOBECTOMIES AND PNEUMONECTOMIES

*Kshivets, Oleg*

**OP-913** THE ANALYSIS OF THERAPEUTIC MODALITIES FOR pIIIB(T4) NON-SMALL CELL LUNG CANCER: SURGICAL OR NON-SURGICAL TREATMENT?

*Turna, Akif*

**OP-914** SHORT-TERM AND LONG-TERM RESULTS OF LUNG CANCER SURGERY IN THE OCTOGENARIANS

*Zuin, Andrea*

**OP-915** TUMOR REGRESSION GRADE AND PROGNOSIS IN MULTIMODALITY-TREATED NON-SMALL CELL LUNG CANCER

*Marra, Alessandro*

**OP-916** EFFECT OF SUBAORTIC-PARAAORTIC LYMPH NODE INVOLVEMENT IN RESECTED LUNG CANCER OF LEFT UPPER LOBE

*Volkan Kara, Hasan*

**OP-917** CAUSE SPECIFIC ANALYSIS OF RISK FACTORS FOR COMPLETELY RESECTED PATHOLOGIC STAGE IA NON-SMALL CELL LUNG CANCER: CANCER RELATED AND NON-CANCER RELATED

*Park, Seong Yong*

**OP-918** THE ACCURACY AND COST OF POSITRON EMISSION TOMOGRAPHY IN MEDIASTINAL STAGING OF NON-SMALL CELL LUNG CANCER

*Melek, Huseyin*

**OP-919** POSITRON EMISSION TOMOGRAPHY FOR NODAL STAGING OF LUNG CANCER IN A TUBERCULOSIS-ENDEMIC REGION

*Sit, Alva*

**OP-920** RISK OF RECURRENCE IN SURGICALLY RESECTED STAGE I ADENOCARCINOMA OF THE LUNG

*Cho, Sukki*

**OP-921** IMMUNOHISTOCHEMICAL FACTORS PREDICTING RECURRENCE AFTER RESECTION OF STAGE I NON-SMALL CELL LUNG CANCER

*Kim, Hyeong Ryul*

**OP-922** EFFECT OF NEOADJUVANT THERAPY FOR MICROSCOPIC N2 NON-SMALL CELL LUNG CANCER DETECTED BY MEDIASTINOSCOPY

*Choi, Yong Soo*

**OP-923** RESULTS OF <sup>99m</sup>Tc DEPREOTIDE SCINTIGRAPHY IN SOLITARY PULMONARY NODULE

*Hanafi, Moataz*

**OP-924** PROGNOSTIC SIGNIFICANCE OF MAIN BRONCHIAL INVASION WITH LUNG CANCER LOCALIZED IN RIGHT UPPER LOBE

*Aydogmus, Umit*

**OP-925** ACCURACY OF THE PET ACCORDING TO MEDIASTINAL LYMPH NODE STATIONS IN MEDIASTINAL STAGING OF LUNG CANCER

*Gunluoglu, Mehmet Zeki*

**OP-926** THE EFFECT OF NEOADJUVANT CHEMOTHERAPY ON STAGE IA TO IIIA NON-SMALL CELL LUNG CANCER: A CASE CONTROL STUDY

*Turna, Akif*

**OP-927** PLEURODESIS WITH SILVER NITRATE 1%, DOES A BETTER AGENT EXIST? ANALYZE OF 36 PATIENTS

*Costa, Altair*

**OP-928** ROLE OF CHEMOTHERAPY IN COMBINED TREATMENT OF NON-SMALL CELL LUNG CANCER

*Jackevicius, Algirdas*

### Satellite Symposium

**The Development of Transcatheter Heart Valve Technology and future perspectives**

Date: Friday, May 02, 2008

Time: 13:00 - 14:30

Room: Aegle 1

**Sponsored by:** EDWARDS LIFESCIENCIES

Speakers: To be announced

### Heart Failure 'From Surgical Reconstruction to Cell Therapy' (390)

**Type:** Plenary Session

Date: Friday, May 02, 2008

Time: 14:30 - 16:30

Room: Hippocrates (Main Hall)

**Chair:** F. Unger, Austria

**Co-chair:** K. Arom, Thailand G. Reyes, Spain

The structural basis of myocardial function

*P. Kilner, United Kingdom*

Left ventricular reconstruction in ischemic dilated cardiomyopathy  
*L. Menicanti, Italy*

Left ventricular reconstruction for idiopathic dilated cardiomyopathy  
*H. Suma, Japan*

Myocardial restoration by stem cells and tissue engineering  
*T. Kofidis, Singapore*

Septal reshaping of LV  
*A. Calafiore, Italy*

Autologous stem cells for myocardial repair  
*R. Ascione, United Kingdom*

Safety and Efficacy of Intramyocardial Angiogenic Cell Precursors Injection for Cardiomyopathy  
*K. Arom, Thailand*

### Congenital 3 (395)

#### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 14:30 - 16:30  
Room: Panacea

Chair: **J. Stinios, Greece**  
Co-chair: **L.V. Zannini, Italy**

**OP-930** TEN-YEAR EXPERIENCE IN THE USE OF AORTIC HOMOGRAFT CONDUITS TO CONSTRUCT AN EXTRACARDIAC TOTAL CAVO-PULMONARY CONNECTION  
*Hennein, Hani*

**OP-931** THE APPLICABILITY OF THE "RISK ADJUSTMENT FOR CONGENITAL HEART SURGERY (RACHS-1)" SCORING SYSTEM FOR STRATIFICATION OF PROBABILITY OF MORTALITY FOLLOWING CONGENITAL HEART SURGERY  
*Alsoufi, Bahaaldin*

**OP-932** TRANSPOSITION OF THE GREAT ARTERIES WITH INTACT VENTRICULAR SEPTUM. ARTERIAL SWITCH OPERATION IN PATIENTS 21 DAYS OF AGE OR OLDER  
*Serraf, Alain*

**OP-933** MAKING A SIMPLE AUTOLOGUS MONOCUSP PERICARDIAL TRANS ANULAR PATCH FOR RIGHT VENTRICULAR OUTFLOW TRACT RECONSTRUCTION IN TETRALOGY OF FALLOT  
*Kazi Abul, Hasan*

**OP-934** SELF-EXPANDABLE PULMONARY VALVE IMPLANT TROUGHT ENDOVASCULAR APPROACH  
*Bertini, Ayrton*

**OP-935** ANATOMICAL REPAIR -PANACEA FOR CONGENITALLY CORRECTED TRANSPOSITION OF THE GREAT ARTERIES?  
*Sharma, Rajesh*

**OP-936** SERUM CYSTATIN C: A SENSITIVE MARKER OF EARLY RENAL INJURY AFTER PAEDIATRIC CARDIAC SURGERY  
*Vassalos, Antony*

### Parallel: Coronaries 6 (400)

#### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 14:30 - 16:30  
Room: Aegle 1

Chair: **G. Makos, Greece**  
Co-chair: **J. Cuenca, Spain P. Panayiotov, Bulgaria**

**OP-937** COMPARISON BETWEEN ARTERIAL REVASCULARISATION AND DRUG ELUTING STENTS IN MULTIVESSEL DIABETIC PATIENTS  
*Mohr, Rephael*

**OP-938** EXPANDING EXPERIENCE OF THE MINI-EXTRACORPOREAL CIRCULATION SYSTEM (MECC) VS. OFF-PUMP CABG  
*Mazzei, Valerio*

**OP-939** LATE OUTCOMES OF ALL-ARTERIAL REVASCULARIZATION IN MULTIVESSEL CORONARY DISEASE  
*Zacharias, Anoar*

**OP-940** THE USE OF n-CIRCUIT IN ACUTE CORONARY SYNDROMES  
*Protogeros, D.A.*

**OP-941** THE IMPACT OF MALIGNANT VENTRICULAR ARRHYTHMIAS ON EARLY AND LONG-TERM SURVIVAL FOLLOWING CORONARY ARTERY BYPASS GRAFTING  
*Chamogeorgakis, Themistocles*

**OP-942** IMPACT OF PREOPERATIVE STATIN THERAPY ON ADVERSE POSTOPERATIVE OUTCOMES IN PATIENTS UNDERGOING CARDIAC SURGERY: A META-ANALYSIS OF OVER 30.000 PATIENTS  
*Liakopoulos, Oliver J.*

**OP-943** COST COMPARISON OF RADIAL ARTERY HARVESTING TECHNIQUES: VESSEL CLIPPING, HARMONIC SCALPEL AND THERMAL WELDING  
*Eales, Rodney*

**OP-944** ROLE OF OFF-PUMP CORONARY SURGERY IN OCTOGENARIANS  
*Contini, Marco*

**OP-945** IS CARDIAC REOPERATION AN INDEPENDENT PREDICTOR FOR HOSPITAL OR LONG-TERM MORTALITY?  
*Angouras, Dimitrios*

### Parallel: Valves 4 (405)

#### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 14:30 - 16:30  
Room: Aegle 2

Chair: **M. Khouri, Greece**  
Co-chair: **B. Akasheh, Jordan R. Akchurin, Russia**

**OP-946** TRICUSPID VALVE SURGERY IN THE ELDERLY: IS IT DIFFERENT?  
*Sheick-Yousif, Basheer*

**OP-947** EVOLUTION OF NON-SEVERE MITRAL REGURGITATION AFTER AORTIC VALVE REPLACEMENT FOR AORTIC STENOSIS  
*Alvarez, Marta*

**OP-948** MID-TERM CLINICAL AND HEMODYNAMIC PERFORMANCE

# OF STENTLESS AORTIC BIOPROSTHESIS

*Unic, Daniel*

**OP-949** CONGENITAL BICUSPID AND QUADRICUSPID SEMILUNAR VALVES: ASSESSMENT OF 3.861 DONOR HEARTS IN THE EUROPEAN HOMOGRAFT BANK (EHB)

*Jashari, Ramadan*

**OP-950** ABSORBABLE ANNULOPLASTY RING IN THE TRICUSPID POSITION: INITIAL CLINICAL EXPERIENCE

*Myers, Patrick O.*

**OP-951** CLINICAL OUTCOME OF AORTIC VALVE REPLACEMENT IN PATIENTS WITH LOW BODY MASS INDEX

*Okamura, Yoshitaka*

**OP-952** OUR EXPERIENCE WITH EDWARD MIRA BILEAFLET MECHANICAL VALVE

*Prasad, Jagdish*

**OP-953** RECIDIVATE TRICUSPID AND MITRAL INSUFFICIENCY AFTER SURGERY FOR ISCHAEMIC MITRAL REGURGITATION

*Fabri, Miklos*

**OP-954** THE SOURCE OF ELEVATED BLOOD LACTATE DURING MITRAL VALVE SURGERY

*Venturini, Andrea*

**OP-955** PATIENT PROSTHESIS MISMATCH AFTER AORTIC VALVE REPLACEMENT IN RHEUMATIC PATIENTS

*Keshk, Samir*

**OP-956** THE IMPACT OF PARAVALVULAR ABSCESS IN THE MANAGEMENT AND OUTCOME OF INFECTIVE ENDOCARDITIS. A SINGLE CENTER EXPERIENCE

*Spiliopoulos, Kyriakos*

**OP-957** LONG TERM RESULT OF PREDOMINANT RHEUMATIC MITRAL VALVE REPAIR AT NATIONAL HEART INSTITUTE, MALAYSIA

*Dillon, Jeffrey Jeswant*

## Parallel: Congenital 4 (410)

### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008

Time: 14:30 - 16:30

Room: Acceso

**Chair:** E. Saadi, Brazil

**Co-chair:** H. Hennein, United States A. Vassalos, United Kingdom

**OP-958** ICU OUTCOME OF DOWN SYNDROME CHILDREN UNDERGOING SURGICAL REPAIR OF CONGENITAL HEART DISEASES

*Najm, Hani*

**OP-959** USE OF STENTS FOR THE TREATMENT OF CERTAIN CONGENITAL HEART DEFECTS

*Alekyan, Bagrat*

**OP-960** NEONATAL BRAIN PROTECTION USING INNOMINATE ARTERY CANNULATION FOR CONTINUOUS BRAIN PERFUSION IN COMPLEX ARCH REPAIRS

*Amir, Gabriel*

**OP-961** BEATING HEART REPLACEMENT OF THE PULMONARY VALVE USING OVERSIZED BIOPROSTHETIC VALVE IN OPERATED PATIENTS WITH TETRALOGY OF FALLOT

*Mitropoulos, Fotios*

**OP-962** SURGICAL APPROACH FOR DIFFERENT TYPES OF SUBAORTIC STENOSIS

*Yalcinbas, Yusuf K.*

**OP-963** OUR EXPERIENCE IN CORONARY ARTERY SURGERY IN PEDIATRIC POPULATION

*Salihoglu, Ece*

**OP-964** ROUTINE LEAFLET AUGMENTATION OF LEFT ATRIOVENTRICULAR VALVE IN THE REPAIR OF ATRIOVENTRICULAR SEPTAL DEFECT

*Najm, Hani*

**OP-965** ENDOVASCULAR CLOSURE OF SEPTAL HEART DEFECTS AND PATENT DUCTUS ARTERIOSUS WITH MECHANICAL AMPLATZER OCCLUDERS.

*Alekyan, Bagrat*

**OP-966** SINGLE CENTER TRANSCATHETER PATENT FORAMEN OVALE CLOSURE EXPERIENCE USING THE STARFLEX DEVICE IN 75 CONSECUTIVE PATIENTS

*Missault, Luc*

**OP-967** TRANS ESOPHAGEAL ECHOCARDIOGRAPHY A PRICELESS TOOL IN ACHIEVING SURGICAL EXCELLENCE

*Birk, Einat*

**OP-968** THE PEDIPUMP: A NEW PEDIATRIC VENTRICULAR ASSIST DEVICE

*Nento, Daniel*

## Parallel: Video 2 (415)

### Type: Abstracts - Video Presentation

Date: Friday, May 02, 2008

Time: 14:30 - 16:30

Room: Chiron

**Chair:** G. Tolis Jr., United States

**Co-chair:** B.R. Shabb, Lebanon G. Astras, Greece

**VD-1310** WORLD'S FIRST CASE REPORT OF A UNIQUE THERAPEUTIC STRATEGY IN POST MYOCARDIAL INFARCTION SEPTAL RUPTURE

*Pannu, Harshbir*

**VD-1311** THORACOSCOPIC IMPLANTATION OF EPICARDIAL ELECTRODE FOR RESYNCHRONIZATION THERAPY INTO THE MYOCARDIUM OF THE LEFT VENTRICLE

*Kalysov, Kurbanbek*

**VD-1312** MINIMAL ACCESS AORTIC SINGLE SUTURE LINE PERICARDIAL STENTLESS VALVE IMPLANTATION

*Schroeyers, Pascal*

**VD-1313** TOTAL AORTIC VALVE REPLACEMENT WITH AUTOLOGOUS PERICARDIUM: AN EASY AND REPRODUCIBLE SURGERY USING A NEW DEVICE

*Maazouzi, Wajih*

**VD-1314** SAFE STERNAL RE-ENTRY IN REDO CARDIAC SURGERY. USING THE daVINCI SYSTEM

*Jara, Fernando*

**VD-1315** SURGICAL MANAGEMENT OF ESOPHAGO - AIRWAY FISTULA IN THE ADULT

*Temes, Roy Thomas*

**VD-1316** THE TECHNIQUE OF MONOBLOC AORTO-MITRAL HOMOGRAFT IMPLANTATION FOR RECURRENT DESTRUCTIVE ENDOCARDITIS

*Buklas, Dimitrios*

**VD-1317** A NOVEL NEW DESIGN FOR POSTERIOR MITRAL LEAFLET RESECTION BUTTERFLY RESECTION AND ROTATION PLASTY  
*Asai, Tohru*

**VD-1318** SURGICAL TREATMENT OF ISCHEMIC MITRAL VALVE INSUFFICIENCY  
*Mitrev, Zan*

**VD-1319** Off-PUMP LEFT VENTRICULAR ANEURYSMORRHAPHY: EXO-ANEURYSMORRHAPHY  
*Rajaii-Khorasani, Ahmad*

#### Parallel: Mini Presentations 7 (420)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008

Time: 14:30 - 16:30

Room: Homer

**Chair:** N. Trehan, India

**Co-chair:** D. Dougenis, Greece D. Angouras, Greece

**University of Patras, Invited Lecture:** Hybrid approach of aortic arch aneurysms  
*D. Dougenis, Greece*

**OP-970** VALVE SPARING SURGERY OF THE AORTIC ROOT  
*Gasiavelis, Nikolaos*

**OP-971** OUR EXPERIENCE OF VISCERAL ORGANS' PROTECTION BY PERFUSION OF COLD CRYSTALLOID SOLUTION DURING THORACOABDOMINAL AORTAS' REPAIR  
*Belov, Yury*

**OP-972** BENTALL SURGERY USING A BIOLOGICAL VALVE  
*Chivez Alarcón, Hermes*

**OP-973** SURGERY FOR ACUTE TYPE A AORTIC DISSECTION  
*Belostotsky, Vladimir*

**OP-974** ANEURYSMS AFTER COARCTATION OF THE AORTA REPAIR  
*Leonid, Sytar*

**OP-975** SAFETY OF UNILATERAL ANTEGRADE CEREBRAL PERFUSION at 22 DEGREES °C SYSTEMIC HYPOTHERMIA  
*Sanioglu, Soner*

**OP-976** HEART INJURIES: A SCANDINAVIA PERSPECTIVE  
*Rashid, Moheb*

**OP-977** THE ROLE OF VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS) ON THE MANAGEMENT OF PATIENTS SUSPECTED TO HAVE A DIAPHRAGMATIC INJURY AFTER A PENETRATING THORACIC TRAUMA: A SYSTEMATIC REVIEW OF THE LITERATURE  
*de Oliveira Carvalho, Paulo Eduardo*

**OP-978** PROXIMAL AORTIC ARCH SURGERY WITH INTERRUPTED BLOOD FLOW IN MILD HYPOTHERMIA  
*Chevez, Hermes*

**OP-979** ABDOMINAL PATHOLOGY IN THE CHEST AN EXPERIENCE OF 50 CASES  
*Bilal, Amer*

**OP-980** INCIDENCE AND PATTERNS OF PERMANENT PACING FOLLOWING BICAVAL AND BIATRIAL ORTHOTOPIC HEART TRANSPLANTATION  
*Tetteh, Hassan*

**OP-981** THE PRESERVATION OF DONOR'S HEART AND LUNG AND

THE POSTOPERATIVE IMMUNOTHERAPY FOR THE HEART-LUNG TRANSPLANTED PATIENTS - THE CLINIC EXPERIENCES OF DISCRIMINATION FOR GRAFT REJECTION WITH TWO CASES  
*Yin, Shengli*

**OP-982** TOTAL INFLOW OCLUSION OF THE RIGHT DONOR HEART IMPROVES THE OUTCOME OF HETEROTOPIC HEART TRANSPLANTATION  
*Burgos, Claudio*

**OP-983** TRANSLARYNGEAL TRACHEOTOMY (TLT). AN ALTERNATIVE IN EARLY TRACHEOTOMY AFTER CARDIAC OPERATION  
*Vrettos, Theofanis*

#### Pulmonary Infections: The Role of the Thoracic Surgeon (425)

**Type:** Plenary Session

Date: Friday, May 02, 2008

Time: 14:30 - 16:30

Room: Iasso

**Chair:** M. Yksel, Turkey

**Co-chair:** M. Ercegovic, Serbia J. Dahabreh, Greece

Pleural tuberculosis  
*R. Jakovic, Serbia*

Bronchiectasis  
*A. Toker, Turkey*

Pleural empyema  
*D. Petrov, Bulgaria*

Hydatid cyst  
*J. Dahabreh, Greece*

#### Parallel: Coronaries 7 (430)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008

Time: 14:30 - 16:30

Room: Syndicate 1

**Chair:** N. Motomura, Japan

**Co-chair:** D. Protogeros, Greece R. Cabral, Brazil

**OP-984** WHO WILL BE THE CANDIDATE FOR SURGICAL CORONARY REVASCULARIZATION IN THE NEAR FUTURE?  
*Kotoulas, Christophoros*

**OP-985** RESPIRATORY FAILURE AFTER CORONARY ARTERY BYPASS SURGERY: INTRAOPERATIVE AND POSTOPERATIVE RISK FACTORS  
*Radmehr, Hassan*

**OP-986** USE OF THE CARDICA PAS-PORT AORTIC CONNECTOR SYSTEM: EARLY RESULTS IN CORONARY ARTERY BYPASS SURGERY  
*Bassano, Carlo*

**OP-987** PREDICTORS OF PROLONGED (>48 HRS) MECHANICAL VENTILATION AFTER OPCAB AORTA NON-TOUCH (n-CIRCUIT TECHNIQUE)  
*Panagiotopoulos, Ioannis*

**OP-988** ACCELERATED IDIOVENTRICULAR RHYTHM FOLLOWING CORONARY BYPASS SURGERY: A CONFUSING ARRHYTHMIA  
*Hatemi, Ali Can*

**OP-989** THE SYSTEMIC INFLAMMATORY RESPONSE IN CABG: WHAT IS THE ROLE OF THE VERY LOW EJECTION FRACTION (EF  $\leq$  30%)?  
*Karfis, Elias*

**OP-990** PREOPERATIVE MYELOPEROXIDASE SERUM LEVELS AS A PROGNOSTIC FACTOR OF SHORT TERM OUTCOME IN OFF-PUMP CORONARY ARTERY REVASCULARIZATION  
*Knezevic, Ivan*

**OP-991** IMPACT OF METABOLIC SYNDROME IN POSTOPERATIVE OUTCOME FOLLOWING ISOLATED CORONARY ARTERY BYPASS GRAFT  
*Totaro, Pasquale*

**OP-992** ULTRASONOGRAPHIC AND 64-MSCT ANALYSIS OF SINGLE LIMA VERSUS ARTERIAL Y GRAFTS 12 YEARS AFTER SURGERY  
*Hartman, Joost*

**OP-993** UNPROTECTED BEATING HEART SURGERY FOR COMPLETE MYOCARDIAL REVASCULARISATION  
*Schroeyers, Pascal*

**OP-994** TOTAL ARTERIAL REVASCULARIZATION IN PATIENTS WITH END STAGE RENAL DISEASE AWAITING RENAL TRANSPLANT  
*Peter, Sanjeeth*

**OP-995** HEARTSTING DEVICE IN OFF-PUMP CORONARY ARTERY BYPASS OPERATIONS: MINIMIZING AORTIC MANIPULATION MINIMIZES RISKS OF PERIOPERATIVE NEUROLOGICAL EVENTS  
*Sakopoulos, Andreas*

#### Parallel: Mini Presentations 8 (435)

##### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 14:30 - 16:30  
Room: Melabus

Chair: I. Bellenis, Greece  
Co-chair: G. Drossos, Greece N. Anastasiou, Greece

**"G. Papanikolaou" General Peripheral Hospital of Thessaloniki, Invited Lecture:** Aortic arch surgery in normothermia  
*G. Drossos, Greece*

**OP-996** PULMONARY THROMBOENDARTERECTOMY: THERAPY OF CHOICE IN CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION  
*Favaloro, Roberto*

**OP-997** OFF-PUMP OR ON-PUMP, IS THE QUESTION  
*Rajaii-Khorasani, Ahmad*

**OP-998** MITRAL VALVE REPAIR FOR MITRAL REGURGITATION - IN THE CURRENT ERA  
*Krishnan, Prasad*

**OP-999** SIMULTANEOUS OPERATIONS FOR OPEN HEART SURGERY AND LUNG RESECTIONS  
*Okay, Tamer*

**OP-1000** IMPLANT OF LEFT VENTRICULAR ASSIST DEVICES: TEN YEARS EXPERIENCE IN A SINGLE CENTER  
*Forni, Alberto*

**OP-1001** LUNG PERFUSION: A REVOLUTIONARY CONCEPT IN HEART SURGERY WITH CARDIOPULMONARY BYPASS  
*Gabriel, Edmo Atique*

**OP-1002** SURGICAL TREATMENT OF ONCOLOGY PATIENTS WITH

CONCURRENT CARDIOVASCULAR DISEASE  
*Gerasimov, Sergey*

**OP-1003** SIMULTANEOUSLY PERFORMED OPEN HEART SURGERY AND CORRECTION OF PECTUS DEFORMITY  
*Tamer, Okay*

**OP-1004** EXTRA-CORPOREAL MEMBRANE OXYGENATION IN ADULTS UNFIT FOR TRANSFER TO A SPECIALISED CENTRE IS WORTHWHILE  
*Buchan, Keith*

**OP-1005** ULTRASTRUCTURAL INVESTIGATION OF INTERNAL THORACIC ARTERY AND AORTIC WALL PATHOLOGY BY TRANSMISSION ELECTRON MICROSCOPE IN CORONARY ARTERY BYPASS GRAFTING PATIENTS  
*Dogan, Omer Faruk*

#### Poster Session 3 (440)

##### Type: Abstracts - Poster Presentation

Date: Friday, May 02, 2008  
Time: 16:30 - 17:00  
Room: Congress Exhibition (Ground Level)

**P-221** SECONDARY PREVENTION AFTER BYPASS HEART SURGERY IN GREECE: HOW PLEASED CAN WE BE?  
*Stylianakis, Georgios*

**P-222** THIRD RECURRENCE OF CARDIAC MYXOMA, LEFT VENTRICULAR AND LEFT ATRIA IN A YOUNG PATIENT. A CASE REPORT  
*Iliescu, Vlad Anton*

**P-223** ROUTINE IMMEDIATE EXTUBATION OF PATIENTS UNDERGOING OPCAB SURGERY IN THE COMMUNITY HOSPITAL SETTING  
*Martella, Arthur*

**P-224** BIOCHEMICAL MONITORING OF METABOLIC CHANGES IN SKELETAL MUSCLE DURING CARDIAC OPERATIONS WITH AND WITHOUT CARDIOPULMONARY BYPASS. A MICRODIALYSIS STUDY  
*Mandak, Jiri*

**P-225** POST OPERATIVE BLEEDING AND BLOOD TRANSFUSION IN CARDIAC SURGERY  
*Tetty, Mark*

**P-226** THE FUTURE OF CARDIAC SURGERY  
*Lee, Chuen-Neng*

**P-227** NON-BACTERIAL PYOPERICARDIUM LEADING TO LETHAL SEPSIS IN A PATIENT WITH SEVERE HUMORAL IMMUNODEFICIENCY  
*Mizaros, Katharina*

**P-228** RENAL PROTECTION IN CARDIAC SURGERY PATIENTS WITH RENAL DYSFUNCTION  
*Ali, Idri*

**P-229** A SIMPLE AND SAFE TECHNIQUE TO MANAGE THE INTERNAL MAMMARY ARTERY IN REDO CARDIAC SURGERY  
*Ali, Idri*

**P-230** CHRONIC TOTAL OCCLUSION OF LEFT MAIN CORONARY ARTERY, A CASE SERIES  
*Kamangari, Arash*

**P-231** EVALUATION OF RISK FACTOR FOR CORONARY DISEASE IN YOUNG PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING  
*Kamangari, Arash*

**P-232** METASTATIC ADENOCARCINOMA OF RIGHT ATRIUM  
*Baharali, Anil*

**P-233** MAINTAINING ANNULO-PAPILLARY MUSCLE CONTINUITY IN MITRAL VALVE SURGERY: ANATOMIC STUDY IN NORMAL AND DISEASED HUMAN HEARTS  
*Holloway, Edward*

**P-234** HOW TO DO IT: THORASCOPIC EXCISION OF BRONCHOGENIC CYST IN THE PARA VERTEBRALSULCUS  
*Al-Damouk, Mays*

**P-235** COST BENEFIT ANALYSIS COMPARING MEDIWRAP HEAT RETENTION BLANKET AND FORCED AIR WARMING BLANKETS IN THORACIC SURGICAL PATIENTS  
*Rathinam, Sridhar*

**P-236** TEMPORAL OCCLUSION FISTULUS OF THE BRONCH BY ACUTE PURULENT DESTRUCTION OF LUNGS  
*Kolkin, Yan*

**P-237** VIDEOTHORACOSCOPIC MANAGEMENT OF CATAMENIAL PNEUMOTHORAX DUE TO POROUS DIAPHRAGM SYNDROME  
*Iliadis, Kosmas*

**P-238** VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) FOR DRAINAGE AND DECORTICATION OF LATE ORGANISED EMPYEMA  
*Chen, Jianye*

**P-239** HOMOLATERAL THORACIC MUSCLE FLAPS FOR THE MYOPLASTY OF THE RESIDUAL CAVERNA IN THE TREATMENT OF THE PULMONARY ASPERGILLOMA  
*Tunea, Calin*

**P-240** ENDOBRONCHIAL HAMARTOMA IN A CASE WITH NEUROFIBROMATOSIS  
*Poyrazoglu, Hakan*

**P-241** PERI-OPERATIVE DATA ON THE PLATINUM-CHINA ANNIVERSARY OF THE NUSS PROCEDURE: SURVEY OF DATA FROM THE INITIAL 20 YEARS OF MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM  
*Protapapas, Aristotle*

**P-242** EMPYEMA THORACIS DUE TO MALPRACTICE  
*Athanassiadi, Kalliopi*

**P-243** GENE EXPRESSION PROFILING OF THORACOSCOPIC RESECTED LUNG TISSUE IN PRIMARY SPONTANEOUS PNEUMOTHORAX  
*Fang, Hsin-Yuan*

**P-244** CLINICAL AND DIAGNOSIS AND THERAPEUTIC ISSUES IN COMPLICATED HYDATID CYSTS OF THE LUNG  
*Safarpour, Feizolah*

**P-245** RESULTS OF CHEST WALL RESECTION AND RECONSTRUCTION WITH AND WITHOUT PROSTHESIS  
*Aghajanzadeh, Manuchehr*

**P-246** ESOPHAGEAL SURGICAL EMERGENCIES  
*Prokakis, Christos*

**P-247** A PHASE I STUDY OF DOCETAXEL WITH CONCURRENT RADIOTHERAPY IN PATIENTS WITH ESOPHAGEAL CANCER  
*Hokamura, Nobukazu*

**P-248** DEFINITIVE CHEMORADIATION VS SURGERY IN ESOPHAGEAL CANCER  
*Hokamura, Nobukazu*

**P-249** NON SURGICAL STRATEGIES FOR ACUTE MESENTERIC ISCHEMIA  
*Rim, Rousei*

**P-250** TRANSTHORACIC VERSUS TRANSHIATAL ESOPHAGECTOMY  
*Bagheri, Reza*

**P-251** THE ANALYSIS OF ECG CHANGES OCCURING AFTER LUNG RESECTIONS DUE TO LUNG CANCER  
*Ulukol, Zeynep Nilgun*

**P-252** DOES OSTENE™ IMPROVE BONE HEALING COMPARED WITH BONE WAX AFTER STERNOTOMY?  
*Vestergaard, Rikke*

**P-253** AN UNUSUAL ETIOLOGY FOR PNEUMOMEDIASTINUM AND CERVICAL EMPHYSEMA  
*Tunea, Calin*

**P-254** VIDEO ASSISTED THORACOSCOPIC TALC PLEURODESIS FOR PERSISTENT SYMPTOMATIC PLEURAL EFFUSION FOLLOWING CORONARY BYPASS SURGERY  
*Barbetakis, Nikolaos*

**P-255** ENDOSCOPIC REPAIR OF IATROGENIC ESOPHAGEAL PERFORATION  
*Tsagkaropoulos, Sokratis*

**P-256** STUDY OF PREVALENCE, COMPLICATIONS, IN-HOSPITAL MORTALITY AND SURVIVAL OF TRANS-HIATAL ESOPHAGECTOMY IN 197 ESOPHAGEAL CARCINOMA PATIENTS  
*Kohsari, M R*

**P-257** LONG-TERM OUTCOME AFTER PULMONARY SURGERY FOR NON-SMALL CELL LUNG CANCER WITH LIVER CIRRHOSIS  
*Iwata, Takashi*

**P-258** CONSERVATIVE MANAGEMENT OF PROLONGED AIR LEAK DUE TO SECONDARY SPONTANEOUS PNEUMOTHORAX  
*Findikcioglu, Alper*

**P-259** TRANSSTERNAL MAXIMAL THYMECTOMY IN MYASTHENIA GRAVIS: THE IMPORTANCE OF EXTENSIVE CERVICAL DISSECTION  
*Park, Seong Yong*

**P-260** RESULTS OF THYMECTOMY FOR MYASTHENIA GRAVIS WITH AND WITHOUT THYMOMA  
*Hemmati, Hossein*

**P-261** PLEURAL NEUROFIBROMA: THE FIRST TWO CASES OF A RARE PLEURAL TUMOUR  
*Rathinam, Sridhar*

**P-262** DIAGNOSIS AND TREATMENT OF BALT LYMPHOMA  
*Boran, Mertay*

**P-263** ROLE OF 'T' AND 'N' ON THE TIME OF DIE IN THE PATIENTS WHO DIED AFTER RADICAL LUNG OPERATIONS  
*Sarper, Alpay*

**P-264** A CLINICAL STUDY OF MEDIASTINAL NEOPLASMS-40 CASES ANALYSIS-  
*Ryoo, Ji Yoon*

**P-265** CORRELATION BETWEEN PET/CT AND HISTOPATHOLOGICAL OESOPHAGEAL TUMOUR LENGTHS  
*Jeganathan, Reubendra*

**P-266** NEUROENDOCRINE NEOPLASMS OF THE LUNG  
*Rallis, Georgios*

**P-267** LUNG CANCER AS A SECOND PRIMARY CANCER  
*Lukavetsky, Nazar*

**P-268** THE OVEREXPRESSION OF VEGF AND P53 IN CYTOLOGIC SPECIMENS OF LUNG CANCER PATIENTS  
*Valeri, Rosalia-Maria*

**P-269** THE SAC OF BRONCHOSCOPY IS REALLY A WASTE OR A NEW METHOD FOR DIAGNOSIS? Dr.ANTZEL JACOB'S NEW METHOD  
*Kleontas, Athanasios*



**P-270** USE OF Y-STENT IN THE MANAGEMENT OF INOPERABLE TRACHEAL STENOSES AND TRACHEOESOPHAGEAL FISTULAS  
*Iliadis, Kosmas*

**P-271** ADENOEID CYSTIC CARCINOMA OF TRACHEA  
*Bagheri, Reza*

**P-272** A RARE CASE OF A PATIENT WITH THREE DIFFERENT SYNCHRONOUS LUNG TUMORS WHO WERE TREATED SUCCESSFULLY BY SURGERY  
*Tagarakis, Georgios*

**P-273** EFFECTIVENESS OF TUMOR MARKERS (CEA, NSE, CYFRA21-1) IN COMPLETELY RESECTED NON-SMALL CELL LUNG CANCER  
*Haam, Seokjin*

**P-274** VIDEO-THORACOSCOPIC PERICARDIAL WINDOW VERSUS SUBXIPHOID PERICARDIOCENTESIS FOR THE MANAGEMENT OF RECURRENT MALIGNANT PERICARDIAL EFFUSIONS  
*Barbetakis, Nikolaos*

**P-275** A PULMONARY ADENOCARCINOMA DEVELOPED IN TUBERCULOSIS CAVITY  
*Gezer, Suat*

**P-276** SPUTUM CYTOLOGIC EXAMINATION AS A FOLLOW-UP CONTROL METHOD FOR OPERATIVELY TREATED LUNG CANCER PATIENTS  
*Tagarakis, Georgios*

**P-277** COMBINED SURGERY AND RADIOTHERAPY IN THE MANAGEMENT OF THYMIC TUMORS  
*Prokakis, Christos*

**P-278** THE ROLE OF MEDIASTINAL LYMPHADENECTOMY IN THE TREATMENT OF RESECTABLE LUNG CANCER  
*Misthos, Panagiotis*

**P-279** LUNG SIGNET-RING-CELL-ADENOCARCINOMA  
*das Neves Pereira, Joyo Carlos*

**P-280** LUNG CANCER STAGE IIIA ANALYSIS: MODE OF LYMPHATIC SPREAD AND PROGNOSIS CLASSIFICATION  
*Misthos, Panagiotis*

**P-281** CORRELATION BETWEEN CT MORPHOLOGY AND HISTOLOGY FOR THE DIAGNOSIS OF MEDIASTINAL LYMPH NODE INVOLVEMENT IN NSCLC - A PROSPECTIVE STUDY  
*Fieguth, Hans-Gerd*

**P-282** <sup>99m</sup>Tc-DEPREOTIDE AND HYBRID SPECT/CT IMAGING FOR LYMPH NODE STAGING IN OPERATED PATIENTS WITH NSCLC  
*Dougenis, Dimitrios*

**P-283** PRIMARY YOLK SAC TUMOR IN THE THORACIC WALL  
*Onat, Serdar*

**P-284** ADJUVANT CHEMOTHERAPY WITH UFT(URACIL-TEGAFUR) IN COMPLETELY RESECTED STAGE I NON-SMALL CELL LUNG CANCER(NSCLC): EARLY CLINICAL RESULTS  
*Park, Chang Ryul*

**P-285** PNEUMONECTOMY IN NON-SMALL CELL LUNG CANCER - DOES IT WORTH?  
*Rzyman, Witold*

**P-286** CLINICAL IMPLICATION AND PROGNOSTIC SIGNIFICANCE OF STANDARDIZED UPTAKE VALUE OF PRIMARY NON-SMALL CELL LUNG CANCER ON POSITRON EMISSION TOMOGRAPHY: ANALYSIS OF 176 CASES  
*Al-Sarraf, Nael*

**P-287** A CASE OF STERNAL MALIGNANT FIBROUS HISTIOCYTOMA WHO WAS APPLIED SURGICAL RESECTION AFTER NEOADJUVANT

CHEMOTHERAPY  
*Gulbahar, Gultekin*

**P-288** THE EXPRESSION OF ANTI-APOPTOTIC PROTEIN, SURVIVIN, IN NON-SMALL CELL LUNG CANCER  
*Hoshi, Fumihiko*

**P-289** GIANT PULMONARY MASS WITHOUT ANY CONSTITUTIONAL SYMPTOMS: CASTLEMAN'S DISEASE  
*Karlis, Elias*

**P-290** SOLITARY METASTATIC ADENOCARCINOMA OF THE STERNUM TREATED BY TOTAL STERNECTOMY AND CHEST WALL RECONSTRUCTION USING A CORE-TEX PATCH AND MYOCUTANEOUS FLAP  
*Daliakopoulos, Stavros I.*

**P-291** T1LE MYELOMA PRESENTED AS AN ASYMPTOMATIC ANTERIOR MEDIASTINAL TUMOR- A CASE REPORT  
*Tseng, Kevin*

**P-292** MARY LYMPHOEPITHELIOMA-LIKE CARCINOMA OF THE LUNG PRESENTED WITH CERVICAL AND MEDIASTINAL LYMPHADENOPATHY IN AN ELDERLY PATIENT: A CASE REPORT  
*Tseng, Kevin*

**P-293** ATTEMPT OF POST BRONCHOSCOPIC LARYNGEAL EDEMA-THE ROLE OF ADRENALINE NEBULIZATION  
*Habib, Ahmed*

**P-294** MINI-THORACOTOMY FOR DIAPHRAGMATIC PPLICATION BY TRANS-DIAPHRAGMATIC VIDEOTHORACOSCOPIC ASSISTANCE  
*Griffo, Salvatore*

**P-295** TBC DIAGNOSIS - STILL SERIOUS SURGICAL PROBLEM  
*Vernerova, Alice*

**P-296** XIPHOID PERICARDIECTOMY FOR DIAGNOSIS AND TREATMENT OF PERICARDIAL EFFUSIONS  
*Theakos, Nikolaos*

**P-297** NTANEIOUS CUTANEOUS FISTULA OF PULMONARY HYDATID CYST: A RARE CASE  
*Onat, Serdar*

**P-298** ROSTERNAL GOITER; WHEN IS TRANSTHORACIC APPROACH INDICATED?  
*Kilic, Dalokay*

**P-299** AGEMENT OF DESCENDING MEDIASTINAL INFECTION OF THE UNUSUAL ETIOLOGIES  
*Kilic, Dalokay*

**P-300** WHEN IS SURGICAL TRACHEOSTOMY INDICATED? COMPARISON OF SURGICAL "U SHAPED" AND PERCUTANEOUS TRACHEOSTOMY  
*Kilic, Dalokay*

**P-301** TRACHEAL LEIOMYOMA A RARE CASE REPORT  
*Kenan Can, Ceylan*

**P-302** THORACOSCOPIC RESECTION OF ANTERIOR MEDIASTINAL TUMORS: EXPLORE A NEW METHOD OF STERNUM LIFTING  
*Komori, Eisaku*

**P-303** CENTRAL-LOCATED PULMONARY SCLEROSING HEMANGIOMA MIMICKING LUNG CANCER ON FDG-PET SCAN  
*Hsu, Po-Kuei*

**P-304** SOLITARY NODULAR PULMONARY AMYLOIDOSIS IN A PATIENT WITH SJOGREN'S SYNDROME  
*Hsu, Po-Kuei*

**P-305** THE CASE AND EMERGENT TREATMENT OF EPIDURAL



PNEUMATOSIS AND PNEUMOMEDIASTINUM DUE TO TRACHEAL INJURY

*Gezer, Suat*

**P-306** SURGICAL TREATMENT OF BENIGN TRACHEAL STENOSIS

*Prokakis, Christos*

**P-307** MDCT ANGIOGRAPHY: EVALUATION OF THORACIC OUTLET SYNDROME

*Kalogeropoulou, Christina*

**P-308** MEDIASTINAL HYDATID CYSTS TWO CASES

*Usluer, Ozan*

**P-309** LEFT-UPPER-LOBE-PULMONARY-SEQUESTRATION

*das Neves Pereira, Joyo Carlos*

**P-310** ANTERIOR MEDIASTINUM HEMANGIOMA: THE RISK OF PERFORMING NEEDLE BIOPSY

*das Neves Pereira, Joyo Carlos*

**P-311** INTRATHORACIC ABERRANT THYROID AS A RARE CAUSE OF MEDIASTINAL MASS

*Barbetakis, Nikolaos*

**P-312** INCISIONAL INTERCOSTAL SPLEEN HERNIA AFTER OPEN WINDOW THORACOSTOMY (COSTA-CASTELLANI HERNIA) - AN UNIQUE CASE REPORT

*Costa, Altair*

**P-313** CONTRACTILITY OF THE MYOCARDIUM BEFORE AND AFTER CARDIAC SURGERY

*Sarvanakis, Konstantinos*

**P-314** SURGICAL TREATMENT OF SYMPTOMATIC KINKED INTERNAL CAROTID ARTERY

*Tetik, Omer*

**P-315** RARE GIANT MEDIASTINAL THYMOLIPOMA: A CASE REPORT

*Lin, Xu*

**P-316** TOPOGRAPHIC RELATIONSHIP BETWEEN THE SYMPATHETIC TRUNK AND INTERCOSTAL VEIN IN THE 3RD AND 4TH INTERCOSTAL SPACE UNDER THORACOSCOPY

*Kim, Dohyung*

**P-317** GIANT PNEUMOMEDIASTINUM ON MYASTHENIA GRAVIS CRISIS - CASE REPORT

*Villanueva, Filiberto*

**P-318** ONE YEAR PAEDIATRIC THORACIC SURGERY AUDIT AT LADY READING HOSPITAL PESHAWAR

*Bilal, Amer*

**P-319** LEVOBUPIVACAINE 0,375% AND FENTANYL IN THORACIC SURGERY

*Bruno, Katia*

**P-320** DIFFICULT AIRWAYS IN THORACIC SURGERY. A CASE REPORT

*Di Lorenzo, Carlo*

**P-321** LONG TERM EVALUATION OF LASER-TREATED SILICONE (LTC) MEMBRANE AS A PERICARDIAL SUBSTITUTE: AN EXPERIMENTAL STUDY

*Kamangari, Arash*

**P-322** ANGIOGRAPHIC FINDINGS IN 401 VERY PREMATURE CAD PATIENTS (AGE<40)

*Kamangari, Arash*

**P-323** STEAL PHENOMENA FROM MAMMARY SIDE BRANCHES, REAL OR IMAGINARY?

*Kamangari, Arash*

**P-324** EFFECTS OF ORAL PENTOXYPHYLLINE IN CARDIOPULMONARY BYPASS SURGERIES

*Kamangari, Arash*

**P-325** GASTRIC MESH EROSION FOLLOWING LAPAROSCOPIC REPAIR OF PARAESOPHAGEAL HERNIA

*Peiluiko, Vitale*

**P-326** ESOPHAGEAL PYOMYOSITIS

*Frank, Lin*

**P-327** THE ROLE OF VIDEO ASSISTED THORACIC SURGERY IN THE EVALUATION OF PATIENTS WITH UNDIAGNOSED EXUDATIVE PLEURAL EFFUSION

*Bagheri, Reza*

**P-328** TRACHEAL DIVERTICULUM: A RARE CAUSE OF DYSPHAGIA

*Han, Serdar*

**P-329** PRIMARY THORACIC HEMANGIOSARCOMA: BREAST MASS IN A FILIPINO MALE

*Aleta, Karlos*

**P-330** AORTIC DISSECTION TYPE I IN A WEIGHTLIFTER WITH HYPERTENSION

*Ahmadi, Hossein*

### Plenary: Congenital 3 (445)

#### Type: Plenary Session

Date: Friday, May 02, 2008

Time: 17:00 - 19:00

Room: Panacea

Chair: **D. Shore, United Kingdom**

Co-chair: **B. Maruszewski, Poland H. Nazm, UAE**

Coarctation of the aorta. A "simple" diagnosis with some very complex issues

*C. Paphitis, Greece*

Surgery for PA/IVS

*G. Stellin, Italy*

Non-surgical intervention for aortic coarctation and recoarctation

*M. Rigby, United Kingdom*

Percutaneous closure of VSD

*G. Thanopoulos, Greece*

Surgical treatment of Ebstein's anomaly

*A. Kalangos, Switzerland*

Self-expanding metal stents in the management of infants and children with vascular airway compression and ventilator dependency

*G. Ladas, United Kingdom*

Hybrid cardiac surgery

*P. Azariades, Greece*

### Parallel: Coronaries 8 (450)

#### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 17:00 - 19:00  
Room: Aegle 1

Chair: M. Lascar, France  
Co-chair: E. Kabil, Bosnia-Herzegovina D. Vihos, Greece

**OP-1006** POSTOPERATIVE MORTALITY AND MORBIDITY OF OCTA-GENERIAN UNDERGOING CORONARY ARTERY BYPASS SURGERY  
*Radmehr, Hassan*

**OP-1007** CORONARY ARTERY SURGERY WITH MINI C.E.C. VS OFF PUMP TECHNIQUE  
*Padro, Josep M.*

**OP-1008** LONG TERM FOLLOW-UP FOR PATIENTS WITH TOTAL ARTERIAL GRAFT REVASCULARIZATION OF MYOCARDIUM  
*Abdouni, Ahmad Ali*

**OP-1009** INCIDENCE OF REACTIVE THROMBOCYTOSIS AFTER CABG OPERATIONS  
*Sargin, Murat*

**OP-1010** n-CIRCUIT IN OPCAB SURGERY: EARLY OUTCOME AND MID-TERM RESULTS  
*Kotsis, V.N.*

**OP-1011** PREOPERATIVE THROMBOLYSIS IMPROVES LONG-TERM SURVIVAL AFTER CORONARY ARTERY BYPASS GRAFTING: ARE MEN DIFFERENT FROM WOMEN?  
*Rokkas, Chris*

**OP-1012** COMPARISON WITH ENDOSCOPIC AND OPEN SAPHENOUS VEIN HARVESTING IN CORONARY ARTERY BYPASS GRAFTING  
*Zhang, Yong*

**OP-1013** DOES LASER TYPE IMPACT MYOCARDIAL FUNCTION FOLLOWING TRANSMYOCARDIAL LASER REVASCULARIZATION?  
*Horvath, Keith*

**OP-1014** RELATIONSHIP OF BLOOD TRANSFUSION AND INCREASED RISK OF ATRIAL FIBRILLATION AFTER CORONARY BYPASS GRAFT SURGERY  
*Radmehr, Hassan*

**OP-1015** PAPAVERINE AND NITROGLYCERIN WORK ON BLOOD FLOW AND ENDOTHELIUM OF LIMA  
*Zhang, Yong*

### Heart Failure: Mechanical Circulatory Support 2008 (455)

#### Type: Plenary Session

Date: Friday, May 02, 2008  
Time: 17:00 - 19:00  
Room: Aegle 2

Chair: S. Schueler, United Kingdom  
Co-chair: O. Oto, Turkey A. Mpakas, Greece

Intraoperative protection of the myocardium - 2008  
*S. Levitsky, United States*

New devices and perspectives in mechanical assist therapy  
*R. Hetzer, Germany*

Elective bridging to recovery after repair: The surgical approach to ventricular reverse remodeling  
*A. Pitsis, Greece*

Left ventricular reverse remodeling during LVAD support  
*D. Burkhoff, United States*

Partial mechanical support for chronic heart failure  
*B. Meyns, Belgium*

Outpatient programs and financials for success with LVAD program  
*K. Nelson, United States*

From heart transplantation to destination treatment: are we there yet?  
*J. Long, United States*

### Parallel: Valves 5 (460)

#### Type: Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 17:00 - 19:00  
Room: Acceso

Chair: F. Panagopoulos, Greece  
Co-chair: R. Cabral, Brazil H. Kim, Brazil

**OP-1016** KYMOGRAM - A NEW TOOL FOR THE ASSESSMENT OF HEART VALVE PERFORMANCE  
*Kondruweit, Markus*

**OP-1017** THE EFFECT OF TRAINING IN TRICUSPID VALVE REPAIR SURGERY ON EARLY AND LATE OPERATIVE OUTCOME  
*Abunasra, Haitham*

**OP-1018** SHORT AND LONG-TERM OUTCOMES OF AORTIC VALVE SURGERY IN PATIENTS WITH IMPAIRED LEFT VENTRICULAR FUNCTION  
*Cheema, Faisal H.*

**OP-1019** IN HOSPITAL AND LONG TERM PROGNOSIS OF MISMATCH IN PATIENTS WITH FIRST AORTIC VALVE SURGICAL REPLACEMENT  
*Chuquiure-Valenzuela, Eduardo*

**OP-1020** PARTICULATE EMBOLI CAPTURE BY INTRA-AORTIC FILTER DEVICE DURING AORTIC VALVE REPLACEMENT  
*Leite Filho, Osanan*

**OP-1021** A COMPARISON BETWEEN CUSTODIOL AND ST THOMAS COLD BLOOD CARDIOPLEGIA DURING MITRAL VALVE SURGERY  
*Venturini, Andrea*

**OP-1022** STENTLESS HEART VALVE FLOW PROFILE  
*Funder, Jonas Amstrup*

**OP-1023** SEGMENTAL ANULOPLASTY OF THE POSTERIOR MITRAL VALVE - A FEASIBLE SURGICAL PROCEDURE  
*Denk, Katja*

**OP-1024** PROCESSING OF BOVINE PERICARDIUM FOR APPLICATION IN CARDIAC VALVE PROSTHESES  
*Leirner, Adolfo A*

**OP-1025** INR SELF MANAGEMENT DECREASES COMPLICATION RATES AFTER MECHANICAL VALVE IMPLANTATION  
*Dalladaku, Fatmir*

**OP-1026 MYOCARDIAL PROTECTION FOR ISOLATED MITRAL VALVE REPLACEMENT**

*Popov, Volodymyr*

**OP-1027 RECOVERY OF SYSTOLIC AND DIASTOLIC LEFT VENTRICULAR FUNCTION AFTER AORTIC VALVE REPLACEMENT FOR SEVERE AORTIC STENOSIS: WOMEN VERSUS MEN**

*Tatu-Chitoiu, Alexandrina*

**Parallel: Cardiothoracic 2 (465)**

**Type: Abstracts - Oral Presentation**

Date: Friday, May 02, 2008  
Time: 17:00 - 19:00  
Room: Chiron

**Chair: D. Iliopoulos, Greece**  
**Co-chair: A. Refatlary, Albania C. Alexiou, United Kingdom**

**OP-1028 WRAPPING OPERATION IN SURGERY OF ASCENDING AORTA'S ANEURYSM**

*Popov, Volodymyr*

**OP-1029 ACUTE TYPE-A DISSECTION AND CHRONIC DILATATION: TENASCIN-C AS A KEY FACTOR IN DESTABILIZATION OF THE AORTIC WALL**

*Trescher, Karola*

**OP-1030 EXTENDING INDICATIONS FOR REIMPLANTATION VALVE-SPARING AORTIC ROOT REPLACEMENT TO OLDER PATIENTS: OUR EXPERIENCE**

*Settepani, Fabrizio*

**OP-1031 UNILATERAL ANTEGRADE SELECTIVE CEREBRAL PERFUSION IN AORTIC SURGERY - EFFECT OF BODY TEMPERATURE**

*Lee, Jae Hoon*

**OP-1032 NOVEL TECHNIQUE FOR AORTIC ARCH SURGERY UNDER MILD HYPOTHERMIA**

*Panos, Aristotelis*

**OP-1033 RETROGRADE TYPE-A DISSECTION ASSOCIATED WITH STENT-GRAFT IMPLANATION IN THE THORACIC AORTA- INCIDENCE, MECHANISMS AND MANAGEMENT**

*Zipfel, Burkhardt*

**OP-1034 SURVIVAL AND REOPERATION RISK FOLLOWING BICUSPID AORTIC VALVE SPARING ROOT REPLACEMENT**

*Suri, Rakesh*

**OP-1035 STENT-GRAFTING OF THE DESCENDING THORACIC AORTA: THE IMPORTANCE OF OPERATOR EXPERIENCE ON OUTCOME**

*Dagenais, Francois*

**OP-1036 EARLY AND MID-TERM RESULTS OF ARCH SURGERY USING THE AXILLARY CANNULATION AND THE ARCH FIRST TECHNIQUE**

*Francois, Dagenais*

**OP-1037 SINGLE SHOT ATG INDUCTION FOLLOWED BY POSTOPERATIVE CNI HOLIDAY: A RENAL SPARING AND SAFE STRATEGY AFTER HEART TRANSPLANTATION!**

*Wagner, Florian*

**OP-1038 EFFICACY AND SAFETY OF APROTININ IN HEART TRANSPLANTATION: COMPARISON BETWEEN LOW DOSE VS HIGH DOSE**

*Favaloro, Roberto*

**OP-1039 INTRA-THORACIC ORGAN TRANSPLANTATION FROM DONORS WITH MENINGITIS: A SINGLE CENTRE 20 YEAR EXPERIENCE**

*Shaikhrezai, Kasra*

**Parallel: Mini Presentations 9 (470)**

**Type: Abstracts - Oral Presentation**

Date: Friday, May 02, 2008  
Time: 17:00 - 19:00  
Room: Homer

**Chair: H. Shennib, Canada**  
**Co-chair: C. Rokkas, Greece N. Sfiras, Greece**

**OP-1040 THORACIC AND CARDIOVASCULAR TRAUMA SURGERY IN A THIRD WORLD TERTIARY HOSPITAL - CHALLENGES AND IMPROVISATIONS**

*Delima, Mariam Grace*

**OP-1041 ATRIAL FIBRILLATION TRENDS IN CARDIAC SURGERY AN INSIGHT INTO THREE DIFFERENT TECHNIQUES CONVENTIONAL CABG, OFF PUMP CABG AND MINIEXTRACORPOREAL CIRCULATION CABG**

*Singh, Hardip Singh*

**OP-1042 SHOULD QUALITY OF LIFE MATTER WHEN DECIDING ON OPEN HEART SURGERY**

*Krause, Tyrone*

**OP-1043 SURGICAL REPAIR OF POST INFARCTION VENTRICULAR SEPTAL DEFECT: A SINGLE CENTRE EXPERIENCE**

*Okiwelu, Ngozichukwuka*

**OP-1044 VENA CAVAL SYNDROMES IN BEHHET DISEASE DIAGNOSTIC AND THERAPEUTIC MODALITIES**

*Akcali, Yigit*

**OP-1045 BRIDGE TO CANDIDACY FOR TRANSPLANTATION IN DESTINATION THERAPY PATIENTS**

*Sai Sudhakar, Chittoor*

**OP-1046 HEARTMATE II AND QUALITY OF LIFE: ELECTROSTATIC DISCHARGE AND PRECAUTIONS AT WORK**

*Rodermans, Ben*

**OP-1047 AORTIC ROOT SURGERY WITH THE MODIFIED BENTALL PROCEDURE. 13 YEAR SINGLE UNIT'S EXPERIENCE WITH 235 CONSECUTIVE CASES**

*Perreas, Konstantinos*

**OP-1048 TYPE A AORTIC DISSECTION: THE SALERNO PROVINCE EXPERIENCE**

*Panza, Antonio*

**OP-1049 IMPALEMENT INJURIES OF THE CHEST: UNUSUAL MECHANISMS AND PRINCIPLES OF MANAGEMENT**

*Edwin, Frank*

**OP-1050 WHEN TO TRANSPLANT HEART FAILURE PATIENTS WITH HEART ALONE (OHT) OR WITH COMBINED HEART AND KIDNEY (HKT)? - AN ANALYSIS OF THE UNOS DATA BASE**

*Hardy, Mark*

**OP-1052 HOSPITAL AND LONG-TERM OUTCOME OF TRACHEOSTOMY IN INTENSIVE CARE UNIT AFTER CARDIOVASCULAR SURGERY**

*Song, Suk-Won*

**OP-1053 SHORT-TERM PATHOPHYSIOLOGICAL CHANGES IN CONTROL OF BREATHING, AIRWAY RESISTANCE AND DIFFUSION CAPACITY AFTER OFF-PUMP CORONARY ARTERY BYPASS GRAFTING**

*Platis, I.*

**OP-1054 PAIN LOCATION, DISTRIBUTION, AND INTENSITY AFTER CARDIAC SURGERY**

*Kianfar, Amir Abbas*

## Management of Mesothelioma (475)

**Type:** Plenary Session

Date: Friday, May 02, 2008  
Time: 17:00 - 18:00  
Room: Iasso

**Chair:** P. Van Schil, Belgium  
**Co-chair:** R.A. Schmid, Switzerland N. Anastasiou, Greece

Current practice in North America  
*L. Zellos, United States*

Mesothelioma: Worldwide practice  
*A. Lioulis, Greece*

The pulmonologist's point of view  
*N. Dickgreber, Germany*

## Esophageal Surgery (476)

**Type:** Plenary Session

Date: Friday, May 02, 2008  
Time: 18:00 - 19:00  
Room: Iasso

**Chair:** A. Duranceau, Canada  
**Co-chair:** K. Moghissi, United Kingdom

Esophageal surgery  
*A. Little, United States*

Minimally Invasive Surgery of Esophagus  
*R. Mehran, United States*

### Parallel: Valves 6 (480)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 17:00 - 19:00  
Room: Syndicate 1

**Chair:** C. Charitos, Greece  
**Co-chair:** A. Tschirkov, Bulgaria A. Abdel Salam, Egypt

**"Euro-Asian Bridge" Invited Lecture:** Major Advancement in Surgical treatment of severe heart valve endocarditis - 23 years follow up  
*A. Tschirkov, Bulgaria*

**OP-1055** CHANGES IN MYOCARDIAL AMINO ACIDS DURING MITRAL VALVE SURGERY USING TWO CARDIOPLEGIC TECHNIQUES  
*Venturini, Andrea*

**OP-1056** IMMEDIATE AND LATE EFFECT OF MITRAL VALVE REPAIR ON BNP (B-TYPE NATRIURETIC PEPTIDE) VALUES  
*Ismeno, Gennaro*

**OP-1057** MEASURED POSTERIOR ANNULOPLASTY FOR REPAIR OF NON-ISCHEMIC MITRAL REGURGITATION. A SINGLE UNIT FOLLOW-UP  
*Jyrala, Aarne*

**OP-1058** MIDTERM OUTCOMES OF TRICUSPID VALVE REPAIR FOR ORGANIC VERSUS FUNCTIONAL LESIONS  
*Benyoussef, Hicham*

**OP-1059** BEATING HEART MITRAL VALVE REPLACEMENT VIA SUPERIOR SEPTAL APPROACH USING ANTEGRADE NORMOTHERMIC OXYGENATED BLOOD PERFUSION: AN EMERGING CONCEPT IN MYOCARDIAL PROTECTION  
*Radhakrishnan, Pradeep Kumar*

**OP-1060** 1000 PERICARDIAL VALVES IN AORTIC POSITION: RISK FACTORS FOR EARLY MORTALITY  
*Mistiaen, Wilhelm*

**OP-1061** MID-TERM OUTCOME OF MANOUGUIAN PROCEDURE IN PATIENTS WITH SMALL AORTIC ROOT  
*Gholampour, Maziar*

**OP-1062** BRAIN'S PROTECTION IN SURGICAL TREATMENT OF MITRAL VALVE DISEASES WITH NEUROLOGICAL DEFICITS  
*Popov, Volodymyr*

**OP-1063** ISCHEMIC MITRAL VALVE REGURGITATION: MORPHO-FUNCTIONAL AND MYOCARDIAL VITALITY EVALUATION WITH CARDIAC MRI  
*D'Ancona, Giuseppe*

**OP-1064** ISCHEMIC MITRAL REGURGITATION AND THE EFFECTS OF LEFT VENTRICULAR REMODELING ON SURGICAL OUTCOME  
*Panagiotis, Hountis*

### Parallel: Coronaries 9 (485)

**Type:** Abstracts - Oral Presentation

Date: Friday, May 02, 2008  
Time: 17:00 - 19:00  
Room: Melabus

**Chair:** L. Bockeria, Russia  
**Co-chair:** I. Panagiotopoulos, Greece A. Ciubotaru, Moldova

**OP-1065** EFFECTS OF OBESITY IN DIABETIC PATIENTS WHO UNDERGOING CORONARY ARTERY BYPASS GRAFT SURGERY  
*Salehi, Mehrdad*

**OP-1066** RANDOMISED TRIAL COMPARING SURVIVAL FOLLOWING BILATERAL INTERNAL MAMMARY ARTERY GRAFTING VERSUS SINGLE INTERNAL MAMMARY ARTERY GRAFTING: THE ARTERIAL REVASCULARISATION TRIAL  
*Taggart, David*

**OP-1067** COMPARING THE EFFECTS OF FREQUENTLY USED BETA BLOCKERS (NEBÉVOLOL, METOPROLOL) ON THE VASCULAR NITRIC OXIDE LEVELS OF THE CORONARY BYPASS SURGERY PATIENTS  
*Celkan, Mehmet Adnan*

**OP-1068** SHORT PERIOD OF ISCHEMIC PRECONDITIONING REDUCES INOTROPIC SUPPORT REQUIREMENT AFTER ON-PUMP CABG  
*Jebeli, Mohammad*

**OP-1069** A SINGLE CENTER COMPARISON OF CORONARY ARTERY BYPASS GRAFTING VERSUS PERCUTANEOUS DRUG-ELUTING STENTING FOR UNPROTECTED LEFT MAIN DISEASE  
*Laudito, Antonio*

**OP-1070** NEUROLOGICAL COMPLICATIONS FOLLOWING OFF PUMP REVASCULARIZATION: IS ROUTINE PRE-OPERATIVE CAROTID DOPPLER WORTHWHILE?  
*Khurana, Deepak*

**OP-1071** ANGIOGRAPHIC EVALUATION OF ARTERIAL COMPOSITE GRAFTS WITH SKELETONIZED BILATERAL MAMMARY ARTERIES  
*Sarzaeem, Mahmood Reza*

**OP-1072** EFFECTS OF USAGE MILRINONE AND PAPAVERINE SOLUTIONS IN STORING RADIAL ARTERY CONDUITS ON CLINICAL RESULTS IN PATIENTS WITH CORONARY ARTERY DISEASE

*Rudziński, Pawe*

**OP-1073** SOCIAL DEPRIVATION, NOSOCOMIAL INFECTIONS AND CORONARY ARTERY BYPASS GRAFTING

*Kumar, Sunjay*

**OP-1074** OFF-PUMP CORONARY ARTERY BYPASS GRAFTING: SINGLE-CENTER 10 YEARS EXPERIENCE

*Klokocovnik, Tomislav*

**OP-1075** SURGICAL TREATMENT OF DIFFUSE CORONARY ARTERY DISEASE WITH PLAQUE BRIDGING BY PASS GRAFTING. RESULTS OF SIX YEARS EXPERIENCE IN A SINGLE CENTER STUDY

*Tzanavaros, Ioannis*

**21:00 WSCTS 2008 - GALA DINNER**

*Hippocrates Hall, 1st Level Kos International Convention Center (KICC)*

**Multidisciplinary Session (490)**

**Sponsored by the Hellenic Cardiological Society**

**Type: Plenary Session**

Date: Saturday, May 03, 2008

Time: 08:30 - 10:30

Room: Hippocrates (Main Hall)

**Chair: K.M. Cherian, India**

**Co-chair: D. Mazer, Canada A. Kiousi, Greece**

Transesophageal echocardiogram: an alternative tool for intraoperative LV function assessment

*P. Wouters, Netherlands*

Cardiac surgery with epidural anesthesia in awake patients: An effective treatment option for high risk subset population

*C. Muneretto, Italy*

Transplantation - The HF Surgery in Greece

*P. Sfirakis, Greece*

Stem cell therapy: Future expectations

*S. Itescu, United States*

TMR and autologous stem cells: Combined approach in treating ischemic heart disease as a sole therapy

*G. Reyes, Spain*

Ischemic mitral valve regurgitation repair: When and How to do it

*D. Adams, United States*

Safety of aortic surgery in the recent era

*T. Kazui, Japan*

**Parallel: Devices, Stem Cells & Bioengineering (495)**

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008

Time: 08:30 - 10:30

Room: Panacea

**Chair: N. Stolf, Brazil**

**Co-chair: K. Narine, Belgium B. Todurov, Ukraine**

**OP-1076** THE EXTRACORPOREAL LIFE SUPPORT FOR ADULTS WITH IRREVERSIBLE CARDIOGENIC SHOCK: THE FLORENCE INITIAL EXPERIENCE

*Bonacchi, Massimo*

**OP-1077** LONG-TERM BIVENTRICULAR MECHANICAL SUPPORT IN A LOW ORGAN DONATION SETTING

*Leontiadis, Evangelos*

**OP-1078** EXTRACORPOREAL MEMBRANE OXYGENATION IN ADULT PATIENTS WITH PERI-CARDIOTOMY CARDIOPULMONARY FAILURE

*Huang, Shoo-Chay*

**OP-1079** MYOCARDIAL REVASCULARIZATION ALONE AND COMBINED WITH VENTRICULAR RECONSTRUCTION FOR ISCHEMIC HEART FAILURE

*Marchenko, Andrey*

**OP-1080** STEM CELL THERAPY IN END-STAGE HEART DISEASE

*Cherian, Sanjay M.*

**OP-1081** FETAL STEM CELLS THERAPY FOR HEART FAILURE IN PATIENT WITH IDIOPATHIC CARDIOMYOPATHY MIDTERM FOLLOW-UP

*Benetti, Federico*

**OP-1082** IN VIVO FORCE MEASUREMENT ON MITRAL VALVE TRACTION SUTURE: INSIGHTS TO LEFT VENTRICULAR FORCE BALANCE

*Jensen, Morten*

**OP-1083** THE FIRST MECHANICAL PROSTHETIC HEART VALVE DESIGNED FOR FREE ANTICOAGULATION

*Amerio, Osvaldo*

**OP-1084** MITRAL VALVE RELOCATION FOR ISCHEMIC MITRAL REGURGITATION: THE FIRST-IN-MAN SURGICAL EXPERIENCE

*Orlov, Boris*

**OP-1085** MODULATION OF VASCULAR CELL MOBILITY FOR TISSUE ENGINEERING OF CARDIOVASCULAR IMPLANTS

*Fittkau, Matthias*

**Parallel: Coronaries 10 (500)**

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008

Time: 08:30 - 10:30

Room: Aegle 1

**Chair: Y. Hosoda, Japan**

**Co-chair: N. Radovanovic, Serbia O.V. Adame, Mexico**

**"Euro-Asian Bridge", Invited Lecture:** Enterectomy in CABG

*N. Radovanovic, Serbia*

**OP-1086** EFFECTS OF CORONARY ARTERY BYPASS GRAFTING ON REGIONAL LEFT VENTRICLE WALL MOTION

*Awan, Muhammad Asad Bilal*

**OP-1087** FIRST DESCRIPTION OF NON-LINEAR HEART DYNAMICS AFTER BEATING HEART REVASCLARIZATION  
*Ksela, Jus*

**OP-1088** PERIOPERATIVE STRESS RESPONSE AND POSTOPERATIVE INFLAMMATORY COMPLICATIONS AFTER OFF-PUMP CORONARY ARTERY BYPASS SURGERY  
*Song, Suk-Won*

**OP-1089** CARDIAC SURGERY IN PATIENTS WITH DRUG ELUTING IN STENT RESTENOSIS- 'A NIGHTMARE'  
*Singh, Jaswinder*

**OP-1090** OFF-PUMP VERSUS ON-PUMP MYOCARDIAL REVASCLARIZATION IN LOW-RISK PATIENTS WITH MULTIVESSEL DISEASE  
*Shipulin, Vladimir*

**OP-1091** THE NO TOUCH HARVESTING TECHNIQUE FOR SAPHE-NOUS VEIN GRAFTS  
*Dreifaldt, Mats*

**OP-1092** ARE FEMALE PATIENTS OVER 70 YEARS A HIGH RISK IN CORONARY ARTERY BYPASS SURGERY?  
*Nitsch, Brigitte*

**OP-1093** PREEXISTING ATHEROSCLEROSIS OF RADIAL ARTERY AND INTERNAL THORACIC ARTERY USED AS CONDUITS FOR CABG  
*Eghtesadi-Araghi, Payam*

**OP-1094** ON-TABLE [OR] EXTUBATION FOLLOWING OFF-PUMP CO-RONARY ARTERY BYPASS  
*Dasmahapatra, Himansu K*

**OP-1095** EARLY RESULTS OF CORONARY ARTERY BYPASS SURGERY IN DIALYSIS PATIENTS  
*Kaoutzanis, Gabriel*

#### Parallel: Valves 7 (505)

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008  
Time: 08:30 - 10:30  
Room: Aegle 2

**Chair: V. Iliescu, Romania**  
**Co-chair: A. Banerjee, India S. Osama, Egypt**

**"Euro-Asian Bridge", Invited Lecture:** Noncoronary open-heart surgery on a perfused, beating heart, with or without aortic cross-clamp  
*A. Banerjee, India*

**OP-1096** MINIMALLY INVASIVE VERSUS CONVENTIONAL MITRAL VALVE RECONSTRUCTION  
*Mazzizelli, Domenico*

**OP-1097** SURGICAL TREATMENT OF ENDOCARDITIS  
*Nocchi, Andrea*

**OP-1098** UNDERSIZING IN MITRAL REPLACEMENT FOR CHRONIC MITRAL REGURGITATION ACCORDING TO INTERTRIGONAL SIZE  
*Martinez-Sanz, Rafael*

**OP-1099** 18 YEARS EXPERIENCE WITH MITRAL VALVE REPAIR  
*Baev, Boian*

**OP-1100** THE FREEDOM SOLO SORIN® STENTLESS AORTIC VALVE. A PROMISING EVOLUTIONARY IMPLANT  
*Papastavrou, Leonidas*

**OP-1101** RECONSTRUCTION OF LEFT PART OF THE HEART FOR ISOLATED MITRAL VALVE DISEASES  
*Popov, Volodymyr*

**OP-1102** AORTIC VALVE REPLACEMENT WITH "FREEDOM SOLO" PROSTHESIS: SHORT AND MID-TERM CLINICAL AND HEMODYNAMIC RESULTS  
*Natsvtishvili, Nino*

**OP-1103** LONG-TERM RESULTS OF THE MULTICENTRE INVESTIGATIONS PROS-THETIC HEART VALVE "CARDIAMED"  
*Nazarov, Vladimir*

**OP-1104** COEXISTENT, COVERT MITRAL DISEASE IN HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY: TRAP FOR THE UNWARY DURING TRANSAOTRIC SEPTAL MYECTOMY  
*Sheick-Yousif, Basheer*

**OP-1105** THE FREEDOM SOLO AORTIC VALVE BIOPROSTHESIS CAUSES SEVERE POSTOPERATIVE THROMBOCYTOPENIA  
*Yerebakan, Can*

#### Parallel: Congenital 5 (510)

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008  
Time: 08:30 - 10:30  
Room: Acceso

**Chair: A. Carotti, Italy**  
**Co-chair: A. Serraf, France A. Bahaaldin, Saudi Arabia**

**OP-1106** ARTERIAL SWITCH FOR D-TGA, FIRST FIVE YEARS EXPERIENCE AT KACC  
*Najm, Hani*

**OP-1107** FATE OF PULMONARY ARTERIES AFTER ARTERIAL SWITCH OPERATION FOR TRANSPOSITION OF GREAT ARTERIES WITH VENTRICULAR SEPTAL DEFECT  
*Delmo Walter, Eva Maria*

**OP-1108** FREEDOM FROM REINTERVENTION AND LONG-TERM SURVIVAL IN PATIENTS WITH CONGENITAL AORTIC STENOSIS AFTER OPERATIVE COMMISSUROTOMY VERSUS BALLOON VALVULOPLASTY  
*Nasseri, Boris*

**OP-1109** RECONSTRUCTION OF PULMONARY VALVE WITH CONTEGRA™ CONDUIT DURING RIGHT VENTRICULAR OUTFLOW TRACT REPAIR: EXCELLENT SHORT TERM OUTCOME  
*Tsibinos, Michael*

**OP-1110** APPLICATION OF NK SOLUTION FOR MYOCARDIAL PROTECTION IN INFANTS  
*Ryabtsev, Dmitriy*

**OP-1111** ATRIOVENTRICULAR SEPTAL DEFECT REPAIR WITH TWO PATCH TECHNIQUE AND MITRAL CLEFT CLOSURE  
*Elsayed, Moustafa*

**OP-1112** EARLY AND MID-TERM RESULTS OF EBSTEIN ANOMALY REPAIR  
*Radmehr, Hassan*

**OP-1113** REOPERATION FOR AN OCCLUDED LIMA-LAD BYPASS GRAFT FOLLOWING ARTERIAL SWITCH OPERATION IN A FIVE YEAR OLD BOY  
*Hatemi, Ali Can*

**OP-1114** CHANGES IN HISTOLOGY OF NEONATAL KIDNEYS AFTER CARDIOPULMONARY BYPASS  
*Tirilomis, Theodor*

**OP-1115** MINISUBMAMMARY APPROACH FOR ATRIAL SEPTAL DEFECT CLOSURE ON FIBRILLATING PERFUSED HEART  
*Kapadia, Nandkishore*



**OP-1116** OFF-PUMP FONTAN IN COMPLEX SINGLE VENTRICLE  
*Goksel, Onur*

**OP-1117** CLEFT CLOSURE AND UNDERSIZING ANNULOPLASTY IMPROVE MITRAL REPAIR IN ATRIOVENTRICULAR CANAL DEFECTS  
*Padala, Muralidhar*

### Cardio-Surgery and Nursing (515)

**Type:** Plenary Session

Date: Saturday, May 03, 2008  
Time: 08:30 - 10:30  
Room: Chiron

**Chair:** L. Vastardis, Greece

Emotions of patients and their relatives undergoing Cardiac Surgery  
*M. Tsimbou Maria, Greece*

Nursing Workload as a prognostic factor of the hospitalization length  
*K. Yiakoumidakis, Greece*

Needs and Methods of hemofiltration among the cardio - surgery population  
*S. Theologou, Greece*

**OP-1241** A PILOT-TESTING POINT-OF-CARE COMPUTER SYSTEM: A NEW CHALLENGE FOR BRAZILIANS NURSES  
*Evora, Yolanda Dora M*

**OP-1242** TELEHOME MONITORING IN THORACOSCOPICALLY-ASSISTED ABLATION OF LONE ATRIAL FIBRILLATION PATIENTS  
*Struthers, Christine*

**OP-1243** TRANSITIONING FROM HOSPITAL TO HOME: USING TECHNOLOGY TO KEEP CARDIAC SURGERY PATIENTS SAFE  
*Kearns, Sharon Ann*

**OP-1244** THE SIGNIFICANCE OF THE ISCHEMIC STENOSIS OF THE SUPERIOR MESENTERIC ARTERY (SMA), DURING CARDIOPULMONARY BYPASS (CPR)  
*Vichos, Dimitrios*

### Parallel: Congestive Heart Failure Surgery 1 (516)

**Type:** Abstracts - Oral Presentation

Date: Saturday, May 03, 2008  
Time: 08:30 - 10:30  
Room: Homer

**Chair:** B. Akpınar, Turkey  
**Co-chair:** A. Pitsis, Greece P. Dedeilias, Greece

**OP-1118** MITRAL VALVE REPAIR IN SEVERE HEART FAILURE PATIENTS: IS THERE A CUT OFF?  
*Wagner, Florian*

**OP-1119** VOLUMETRIC AND FUNCTIONAL CHANGES OF RIGHT VENTRICLE AS A PREDICTOR OF OUTCOME IN POST SURGICAL VENTRICULAR RESTORATION IN DILATED CARDIOMYOPATHY - STUDY OF 40 CASES  
*Shah, Dhiren*

**OP-1120** IMPACT OF GEOFORM RING ANNULOPLASTY FOR ISCHEMIC MITRAL REGURGITATION ON LEFT VENTRICULAR PARAMETERS AND PATIENT OUTCOME  
*Anil, Jain*

**OP-1121** SURGICAL VENTRICULAR RESTORATION IN PATIENTS WITH ISCHEMIC CONGESTIVE HEART FAILURE - 5 YEAR RESULTS  
*Baev, Boian*

**OP-1122** DOES THE APPLICATION OF ELECTRICAL MICROCURRENT HEAL HEART FAILURE? FIRST PRE-CLINICAL RESULTS  
*Mueller, Johannes*

**OP-1123** MANAGEMENT OF HIGH RISK ISCHEMIC PATIENTS REQUIRING THREE OR MORE CONCOMITANT OPEN HEART PROCEDURES  
*Petkov, Dimitar*

**OP-1124** IMPROVED RESULTS OF SURGERY FOR ISCHEMIC HEART FAILURE USING A NEW TECHNIQUE OF VENTRICULAR RESTORATION. PRELIMINARY RESULTS  
*Stefanelli, Guglielmo*

**OP-1125** LEFT VENTRICLE ANEURISM PLASTY USING DUPLICATION METHOD  
*Schneider, Yuri*

**OP-1126** SURGICAL VENTRICULAR RESTORATION: THE EARLY EXPERIENCE IN SAUDI ARABIA: AN UPDATE  
*Abukhudair, Walid*

**OP-1127** SHORT TERM FOLLOW-UP OF GEOFORM MITRAL VALVE REPAIR IN PATIENTS WITH SEVERE LV DYSFUNCTION  
*Veeragandham, Ramesh*

**OP-1128** OUTCOME IN PATIENTS UNDERGOING COMBINED SURGICAL VENTRICULAR RESTORATION (SVR) AND GEOFORM RING MITRAL ANNULOPLASTY FOR DILATED CARDIOMYOPATHY  
*Gupta, Vishal*

**OP-1129** COMBINED TREATMENT OF ISCHEMIC HEART FAILURE: CARDIAC RESYNCHRONIZATION THERAPY AND SURGERY  
*Pokushalov, Evgeniy*

### Cardiothoracic Trauma (520)

**Type:** Plenary Session

Date: Saturday, May 03, 2008  
Time: 08:30 - 10:30  
Room: Iasso

**Chair:** M. Gerazounis, Greece  
**Co-chair:** A. Little, United States F. Robicsek, United States

Esophageal injury  
*A. Duranceau, Canada*

Tracheobronchial injury  
*D. Branscheid, Germany*

Cardiac injury  
*C. Papakonstantinou*

### Parallel: Mini Presentations 10 (521)

**Type:** Abstracts - Oral Presentation

Date: Saturday, May 03, 2008  
Time: 08:30 - 10:30  
Room: Syndicate 1

**Chair:** F. Panagopoulos, Greece  
**Co-chair:** G. Nachev, Bulgaria P. Vavilov, Russia

**"Euro-Asian Bridge" Invited Lecture:** Acute aortic dissection  
*G. Nachev, Bulgaria*



**OP-1130** APPLICATION OF EUROSCORE IN CORONARY ARTERY BYPASS SURGERY FOR PATIENTS 60 YEARS AND OLDER

*Hovakimyan, Arman*

**OP-1131** IS HBA1C AN INDEPENDENT RISK FACTOR FOR PREDICTING OUTCOME AFTER CORONARY ARTERY BYPASS GRAFTING?

*Ziabakhsh Tabary, Shervin*

**OP-1132** A RETROSPECTIVE EVALUATION OF MINIMAL EXTRACORPOREAL CIRCULATION (JOSTRA MECC SYSTEM) VERSUS STANDARD CARDIOPULMONARY BYPASS

*Punta, Giuseppe*

**OP-1133** TOPICAL APPLICATION OF AUTOLOGOUS BLOOD PRODUCTS DURING SURGICAL CLOSURE FOLLOWING A CORONARY ARTERY BYPASS GRAFT

*Khalafi, Reza*

**OP-1134** SUCCESSFUL USE OF VAC THERAPY FOR THE TREATMENT OF STERNAL AND LEG WOUND INFECTION AFTER CARDIAC

*Datta, Subir*

**OP-1135** EARLY RESULTS WITH THE USE OF BIODEGRADABLE RING FOR TRICUSPID VALVE ANNULOPLASTY

*Mitropoulos, Fotios*

**OP-1136** INTRA-OPERATIVE TEMPERATURE CONTROL USING THE THERMOGUARD SYSTEM DURING OFF-PUMP CORONARY ARTERY BYPASS SURGERY

*Allen, Gary*

**OP-1137** SUPPRESSING VEIN GRAFT INTIMAL HYPERPLASIA THROUGH EXTERNAL NITINOL MESHES: SIZE-MATCH MATTERS

*Zilla, Peter*

**OP-1138** VAC® THERAPY AND PLATE FIXATION SYSTEM FOR COMPLICATED STERNAL WOUND INFECTION: A NEW STERNAL-SPARING TECHNIQUE

*Lopez Almodovar, Luis Fernando*

**OP-1139** PERCEPTIONS OF EMERGING PERCUTANEOUS TECHNOLOGY: A SURVEY OF CANADIAN TRAINEES AND PRACTICING CARDIAC SURGEONS

*Tang, Gilbert*

**OP-1140** TOTALLY ROBOTIC INTERNAL MAMMARY ARTERY HAVEST AND BEATING HEART CORONARY ARTERY BYPASS

*Gao, Changqing*

**OP-1141** SUBENDOCARDIALLY IMPLANTED ANNULOPLASTYING IN A PATIENT WITH PACEMAKER LEAD ASSOCIATED ENDOCARDITIS

*Thalmann, Markus*

**OP-1142** TRICUSPID VALVE INSUFFICIENCY: WHICH METHOD OF CORRECTION TO CHOOSE

*Knezevic, Ivan*

**OP-1143** CORRELATION BETWEEN AORTIC STENOSIS DEGREE AND THE LEFT VENTRICLE MASS

*Iglezias, Jose Carlos*

**OP-1144** TRICUSPID VALVE REPAIR WITH EDWARDS MC3 ANNULOPLASTY SYSTEM. HOSPITAL UNIVERSITARIO DE CARACAS

*Moreno, Orlando*

## Perfusion Track 1 (525)

**Type:** Plenary Session

Date: Saturday, May 03, 2008

Time: 08:30 - 10:30

Room: Syndicate 1

**Chair:** D. De Jong, Netherlands

**Co-chair:** F. Merkle, Germany C. Bezeveggi, Greece

Going from knowing to doing: applying evidence-based principles into practice

*D.S. Likosky, United States*

Using data to implement a quality improvement program

*O. Webber, United States*

Perfusion education: Perfusion education in Europe

*F. Merkle, Germany*

Observations from a National Cardiopulmonary Bypass (CPB) quality indicator program

*T. Dickinson, United States*

Blood management in cardiac surgery

*A. Iatrides, United States*

180cc and less: Cardiopulmonary bypass techniques to minimize hemodilution for the neonate and the small infant

*L. Mongero, United States*

## Parallel: Different Issues in Thoracic Surgery (530)

**Type:** Abstracts - Oral Presentation

Date: Saturday, May 03, 2008

Time: 08:30 - 10:30

Room: Melabus

**Chair:** P. Kormas, Greece

**Co-chair:** D. Dougenis, Greece

**OP-1145** QUALITY OF LIFE OF THE PATIENTS WITH LUNG CANCER AFTER LOBECTOMY AND PNEUMONECTOMY

*Georgiannakis, Emmanouil*

**OP-1146** THE ROLE OF INTERCOSTAL NERVE PRESERVATION ON POST OPERATIVE PAIN CONTROL AFTER THORACOTOMY; A DOUBLE CENTER STUDY

*Beshay, Morris*

**OP-1147** INFLAMMATORY MYOFIBROBLASTIC TUMOR OF LUNG (PSEUDOTUMOR OF THE LUNG) THE SECRET OF THE UNKNOWN

*AL-Masri, Ayman*

**OP-1148** PULMONARY METASTATECTOMY IN SARCOMA PATIENTS WITH EXTRA-THORACIC METASTASES

*Mehran, Reza*

**OP-1149** ROLE OF SURGICAL RESECTION FOR PULMONARY METASTASIS OF HEPATOCELLULAR CARCINOMA

*Han, Kook Nam*

**OP-1150** RECURRENCE OF THYMIC EPITHELIAL TUMORS: PREDICTORS, TREATMENT AND OUTCOME

*Marulli, Giuseppe*

**OP-1151** UNUSUAL CLINICAL ENTITIES AND RARE TUMORS OF THE THORACIC CAVITY: CASE SERIES

*Lioulas, Achilleas*

**OP-1152** MALIGNANT SUPERIOR VENA CAVA SYNDROME IS THIS A MEDICAL EMERGENCY

*Bagheri, Reza*

**OP-1153** SURGERY FOR MEDIASTINAL DISEASE

*Bilal, Amer*

**OP-1154** LONG TERM INDWELLING PLEURAL CATHETER FOR MALIGNANT PLEURITIS UNSUITABLE FOR TALC PLEURODESIS

*Sioris, Thanos*

**OP-1155** CAN SERUM INFLAMMATORY PARAMETERS ESTIMATE OUTCOME OF BLOOD PLEURODESIS IN CASES OF PERSISTENT AIR LEAK?

*Athanassiadi, Kalliopi*

**OP-1156** PROGNOSTIC SIGNIFICANCE OF TUMOR FREE LENGTH OF RESECTED BRONCHUS IN LUNG CANCER

*Gunluoglu, Mehmet Zeki*

#### Poster Session 4 (535)

##### Type: Abstracts - Poster Presentation

Date: Saturday, May 03, 2008

Time: 10:30 - 11:00

Room: Congress Exhibition (Ground Level)

**P-331** TYPE A AORTIC DISSECTION: LONG TERM OUTCOMES IN AN ACADEMIC HOSPITAL IN ARGENTINA

*Bracco, Daniel*

**P-332** RETROGRADE CEREBRAL PERFUSION IS STILL SAFE FOR SURGICAL TREATMENT OF ACUTE AORTIC DISSECTION

*Wu, Shye-Jao*

**P-333** TREATMENT EXPERIENCE OF NON-SPECIFIC AORTIC ARTERITIS IN A CHILD AGED 3 YEARS

*Murzina, Olga*

**P-334** PROTECTIVE EFFECTS OF LEVOSIMENDAN AND ILOPROST ON LUNG INJURY INDUCED BY LIMB ISCHEMIA-REPERFUSION: A RABBIT MODEL

*Yasa, Haydar*

**P-335** ABDOMINAL AORTIC ANEURYSM: A 5 YEARS EXPERIENCE IN THE NORTHWEST OF IRAN

*Hashemzadeh, Shahryar*

**P-336** SURGERY FOR RUPTURED NONDISSECTING THORACIC AORTIC ANEURYSMS

*Hajime, Ohzeki*

**P-337** EMERGENT OPERATION FOR ACUTE TYPE A AORTIC DISSECTION IN PATIENTS AGED 80 YEARS AND OLDER

*Okada, Syuichi*

**P-338** ARCH REPLACEMENT FIRST USING A HAND-MADE BIFURCATED OR TRIFURCATED ARCH GRAFT FOR STANFORD TYPE A ACUTE AORTIC DISSECTION

*Luo, Chwan-Yau*

**P-339** AORTIC ROOT SURGERY IN MARFAN SYNDROME

*Sheick-Yousif, Basheer*

**P-340** REOPERATIONS AFTER ASCENDING AORTA AND AORTIC VALVE RECONSTRUCTION

*Sirvydis, Vytutas*

**P-341** ACUTE UPPER EXTREMITY ISCHEMIA DUE TO FIBRIN GLUE EMBOLIZATION AFTER AORTIC DISSECTION REPAIR

*Piluiko, Vitaly V.*

**P-342** A NEW SURGICAL APPROACH FOR AORTIC ARCH REPLACEMENT: ARCH REPLACEMENT WITH TRIFURCATED GRAFT PRIOR TO CARDIOPULMONARY BYPASS

*Goksel, Onur*

**P-343** A CASE WITH LERICHE SYNDROME AND LEFT RENAL ARTERY DUPLICATION ANOMALY WITH SUBTOTAL OSTIAL STENOSIS IN BOTH

*Gurbuz, Ali*

**P-344** MASHHAD OPERATION "A NEW SURGICAL STRATEGY FOR MANAGEMENT OF ASCENDING AORTA / VALVE AND COARCTATION"

*Rajaii-Khorasani, Ahmad*

**P-345** USE OF PLEXUS VASCUTEK PROSTHESIS IN PATIENTS WITH PROXIMAL AORTIC DISSECTION

*Cherniavsky, Alexander*

**P-346** DESCENDING THORACAL AORTAFEMORAL BYPASS GRAFTING FOR THE TREATMENT OF THE COMPLETE JUXTARENAL AORTIC OCCLUSION

*Gemalmaz, Hoseyin*

**P-347** MODIFIED ARCH FIRST TECHNIQUE USING A TRIFURCATED GRAFT

*Nishimori, Hideaki*

**P-348** LONE DEEP HYPOTHERMIC CIRCULATORY ARREST FOR TYPE-A AORTIC DISSECTION REPAIR. A SINGLE CENTRE EXPERIENCE

*Villani, Massimo*

**P-349** THE ANATOMY OF THE AORTIC ROOT IN KOREANS

*Lim, Seung Pyung*

**P-350** FIRST EXPERIENCE OF AORTIC VALVE-SPARING OPERATIONS FOR TREATMENT OF AORTIC ROOT ANEURYSMS COMBINED WITH AORTIC REGURGITATION

*Uspenskiy, Vladimir*

**P-351** LONG TERM OUTCOMES AND MORTALITY RATE AFTER ACUTE ASCENDING AORTA DISSECTION SURGERY

*Susak, Stamenko*

**P-352** CEREBRAL PERFUSION DURING SURGERY FOR ASCENDING AORTA AND AORTIC ARCH

*Siminelakis, Stavros*

**P-353** ALTERNATIVE CANNULATION SITE FOR ACUTE AORTIC DISSECTION

*Micovic, Slobodan*

**P-354** ACUTE AND CRONIC AORTIC PATOLOGY COMPLICATIONS

*Como Birche, Josi Horacio*

**P-355** IMPACT OF SIMULTANEOUS ASCENDING AORTA AND ARCH REPLACEMENT ON THE SURGICAL TREATMENT OF TYPE A AORTIC DISSECTION

*Sorokin, Vitaly*

**P-356** EFFECTS OF SIVLESTAT SODIUM HYDRATE ON RESPIRATORY FAILURE AFTER THORACIC AORTIC SURGERY WITH DEEP HYPOTHERMIA

*Morimoto, Keisuke*

**P-357** ENDOVASCULAR ANEURYSM REPAIR vs OPEN ABDOMINAL AORTIC ANEURYSM REPAIR: COMPARISON AT A COMMUNITY HOSPITAL PERFORMED BY CARDIO-THORACIC SURGEONS

*Hashmi, Zubair*

**P-358** SUCCESSFUL SURGICAL MANAGEMENT OF GIANT AORTIC PSEUDOANEURYSM COMPLICATING PRIMARY AORTIC ROOT REPLACEMENT WITH COMPOSITE TUBULAR VALVED GRAFT

*Saeed, Giovanni*

**P-359** SUCCESSFUL EMERGENCY RESUSCITATIVE THORACOTOMY AND THORACOSCOPY IN AN INJURED PATIENT WITH IMPENDING DEATH  
*Rashid, Moheb*

**P-360** CARDIAC BYPASS TO PREVENT PARAPLEGIA IN THORACIC AORTIC RUPTURE  
*Rashid, Moheb*

**P-361** THORACIC AND MEDIASTINAL GREAT VESSEL TRAUMA: A SINGLE CENTER EXPERIENCE  
*Prokakis, Christos*

**P-362** PENETRATING PERICARDIAL TRAUMA DUE TO GUNSHOT WITHOUT ANY ASSOCIATED CARDIAC TRAUMA  
*Chamalakis, Georgios*

**P-363** COMPARATIVE STUDY OF 214 PEASETIME GUNSHOT WOUNDS OF THE CHEST  
*Tcherveniakov, Alexander*

**P-364** TREATMENT OF HARD OSSEOUS CHEST FRAME TRAUMA  
*Kolkin, Yan*

**P-365** A VERY UNUSUAL CASE WITH INJURY TO RIGHT LUNG, INFERIORCAVAE ATRIAL JUNCTION CAUSED BY A PENETRATING STAB INJURY TO THE RIGHT PARAVERTEBRAL THORACIC REGION  
*Topcuoglu, M. Sah*

**P-366** LEFT VENTRICULAR PSEUDOANEURYSM ACROSS THE CHEST WALL AS A LATE GUN SHOT COMPLICATION: CASE REPORT  
*Gamboa Cerda, Angel Mario*

**P-367** EFFECTIVENESS OF THE ANTIBIOTICS FOR PATIENTS SUBMITTED TO A CLOSED TUBE THORACOSTOMY AFTER A THORACIC TRAUMA SYSTEMATIC REVIEW  
*de Oliveira Carvalho, Paulo Eduardo*

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*Que, Do Kim*

**P-369** ESOPHAGEAL PERFORATIONS  
*Stupachenko, Denys*

**P-370** PENETRATING CARDIAC TRAUMA IN CHILDREN  
*Goz, Mustafa*

**P-371** ISOLATED RIGHT ATRIAL RUPTURE AFTER EXTERNAL CARDIAC MASSAGE IN A PATIENT UNDERWENT CORONARY ARTERY BYPASS SURGERY  
*Yavuz, Senol*

**P-372** USE OF ENDOBRONCHIAL BLOCKERS IN EMERGENCY SITUATIONS IN THORACIC SURGERY AT CHILDREN AND ADULTS  
*Khanykin, Boris*

**P-373** CARDIAC INJURIES IN ADANA PROVINCE AND IN TURKEY  
*Yaliniz, Hafize*

**P-374** STABILIZING THE CHEST WALL AFTER OPERATIONS OF THE STERNUM  
*Yordanov, Deyan*

**P-375** ACUTE HEART FAILURE WITH SEVERE MITRAL REGURGITATION FOLLOWING BLUNT CHEST TRAUMA  
*Danek, Tomas*

**P-376** HEART TRANSPLANTATION IN THE CASE OF ISOLATED VENTRICULAR NON-COMPACTION  
*Rucinskas, Kestutis*

**P-377** THE INTERVENTIONAL LUNG ASSIST DEVICE -NOVALUNG FOR RESPIRATORY FAILURE PATIENTS AWAITING LUNG TRANSPLANTATION  
*Bartosik, Waldemar*

**P-378** SKIN CANCER IN HEART TRANSPLANT RECIPIENTS IN THE CICLOSPORINE AREA: INCIDENCE AND RISK FACTORS AFTER 15 YEARS FOLLOW-UP  
*Roussel, Jean Christian*

**P-379** INTERSTITIAL LEUKOCYTES IN RIGHT VENTRICULAR ENDO-MYOCARDIAL BIOPSIES AFTER HEART TRANSPLANTATION IN PATIENTS WITH COMPLICATED VERSUS UNEVENTFUL POSTOPERATIVE COURSE  
*Koch, Achim*

**P-380** THE FUTURE ROLE OF EARLY MYOCARDIAL BIOPSY AFTER HEART TRANSPLANTATIONS: DETECTION OF REJECTION OR ASSESSMENT OF ORGAN DAMAGE  
*Sack, Falk-Udo*

**P-381** INFLUENCE OF ABO-COMPATIBLE TRANSPLANTATION ON LONG-TERM OUTCOME IN CARDIAC TRANSPLANT RECIPIENTS  
*Aliabadi, Arezu*

**P-382** MOBILE SKIN GRAFT EXTENSION FOR VENTRICULAR ASSIST DEVICE DRIVELINE EXITE SITE  
*Calderon, Moises*

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*Leoncini, Giacomo*

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*Panagiotakopoulos, Victor*

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*Vysotsky, Arkadiy*

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*Parissis, Harry*

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*Bernal, Jose M.*

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*Cem, Ariturk*

**P-390** RESECTION THE BULLAE OF PULMONARYEMPHYSEMA IS IT A GOOD SOLUTION IN THE EVENT OF CARDIAC SURGERY COMBINED? (ABOUT TWO CASE)  
*Belkhadir, Aziz*

**P-391** ROUTINE AND ON CALL PERICARDOSCOPIC IMPLANTATION OF PACEMAKER ELECTRODES  
*Kolesov, Evgenii*

**P-392** CARDIAC TAMPONADE DUE TO LYMPHOMA: CASE REPORT  
*Yaliniz, Hafize*

**P-393** CONGENITAL COMPLETE ABSENCE OF THE PERICARDIUM WITH ESOPHAGEAL LEIOMYOMA; AN UNIQUE PRESENTATION  
*Sen, Serdar*

**P-394** CARDIAC TAMPONADE AS THE FIRST CLINICAL PRESENTATION OF MALIGNANCY  
*Vural, Hakan*

**P-395** SIMULTANEOUS PECTUS CORRECTION AND VALVE REPLACEMENT IN TWO CASES

*Vural, Hakan*

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*Kuzucu, Akin*

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*Nazarov, Vladimir*

**P-398** ADENOCARCINOMA METASTASIS TO INTERNAL JUGULAR VEIN: REPORT OF A CASE

*Topal, Askin Ender*

**P-399** IMPACTS OF JUVENILE AGE ON THE ACCELERATION OF VASCULAR ALLOGRAFT CALCIFICATION: IMMUNOREACTION DID NOT MATTER

*Yamauchi, Haruo*

**P-400** INTRA-AORTIC BALLOON PUMP PLACEMENT IN OPEN HEART SURGERY: OUR 8-YEARS EXPERIENCE

*Elias, Karfis*

**P-401** LEFT OUT: ARE WE IGNORING OUR NON-DOMINANT HAND?

*Yadav, Rashmi*

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*Gemalmaz, Hóseyin*

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*Qaradaghi, Lawand*

**P-404** PROGNOSTIC SIGNIFICANCE OF EXERCISE STRESS ECHOCARDIOGRAPHY IN THE ERA OF AGGRESSIVE REVASCULARIZATION

*Moustafa, Sherif*

**P-405** PROGNOSTIC VALUE OF DOBUTAMINE STRESS ECHOCARDIOGRAPHY IN THE ERA OF AGGRESSIVE REVASCULARIZATION

*Moustafa, Sherif*

**P-406** SHOULD WE IMPLANT TEMPORARY PACEMAKER LEADS ON THE RIGHT OR LEFT VENTRICLE IN CABG PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION

*Dagenais, Francois*

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*Boran, Ertay*

**P-408** TIMING OF LEVOSIMENDAN USE IN CARDIAC SURGERY

*Aksun, Murat*

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*Kogan, Alexander*

**P-410** EARLIER APPLICATION OF PERCUTANEOUS CARDIOPULMONARY SUPPORT RESCUES PATIENTS FROM SEVERE CARDIOPULMONARY FAILURE "C USING APACHE III SCORING SYSTEM RUNNING HEAD: EARLIER APPLICATION OF PERCUTANEOUS CARDIOPULMONARY SUPPORT

*Yoo, Kyung-Jong*

**P-411** WOUND INFECTION AFTER CORONARY ARTERY BYPASS GRAFTING IN DIABETIC PATIENTS

*Hovakimyan, Arman*

**P-412** CLINICAL OUTCOME AND MEDIASTINAL BLOOD REINFUSION IN CARDIAC SURGERY

*Andrejaitiene, Judita*

**P-413** LOW MOLECULAR WEIGHT HEPARIN AS EARLY ANTICOAGULATION SCHEME IN MECHANICAL VALVULAR REPLACEMENT

*Baranda-Tovar, Francisco*

**P-414** THE CLINICAL AND ECHOCARDIOGRAPHIC FEATURES OF OUR PATIENTS WHO UNDERWENT UNILATERAL URGENT FEMORAL EMBOLECTOMY

*Yetkin, Ufuk*

**P-415** DETERMINATION RATIO OF ATRIAL FIBRILLATION AND SPONTANEOUS ECHO CONTRAST IN URGENT FEMORAL EMBOLECTOMY CASES

*Yetkin, Ufuk*

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*Prado, Guillermo*

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*Chitsaz, Sam*

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*Pfeiffer, Steffen*

**P-419** MULTIDISCIPLINARY REHABILITATION AFTER LUNG CANCER OPERATION

*Brocki, Barbara*

**P-420** SUBPLEURAL ADMINISTRATION OF ROPIVACAINE AND MUSCLE SPARING THORACOTOMY IMPROVES EARLY POST-THORACOTOMY OUTCOME

*Foroulis, Christoforos*

**P-421** DEEP STERNAL WOUND INFECTION AFTER CARDIAC SURGERY

*Zhou, Ziqiang*

**P-422** ISSUE QUESTIONS OF THROMBOELASTOGRAPHY RESULTS INTERPRETATION AT CARDIOSURGICAL PATIENTS

*Gladisheva, Vera*

**P-423** THE UTILITY OF RADIOGRAPHIC VASCULAR PEDICLE MEASUREMENTS IN ASSESSING THE HEMODYNAMIC STATUS OF PATIENTS WHO RECENTLY UNDERWENT CORONARY ARTERY BYPASS GRAFT SURGERY

*Tatco, Vincent*

**P-424** THE VALIDITY OF PORTABLE CHEST RADIOGRAPH FINDINGS IN APPRAISING INTRAVASCULAR VOLUME STATUS OF PATIENTS WHO RECENTLY UNDERWENT CORONARY ARTERY BYPASS GRAFT SURGERY

*Tatco, Vincent*

**P-425** OUR CLINICAL EXPERIENCES RELATED TO POLITETRAFLORETILEN GRAFT USING FOR PERFORMING ARTERIOVENOUS FISTULA IN THE PATIENTS WITH CHRONIC RENAL FAILURE REQUIRING HEMODIALYSIS

*Ergunes, Kazim*

**P-426** BY PASS SURGERY FOR INFRAPLOPLITEAL OCCLUSIVE DISEASE WITH POOR DISTAL FLOW ON ANGIOGRAPHY

*Yasa, Haydar*

**P-427** RARE CARDIAC TUMOR SIMULATING ACUTE PERICARDITIS

*Lima, Pedro*

**P-428** A GLOMUS CAROTICUM CASE ACCOMPANIED BY A GIANT THYROIDAL NODULE

*Tetik, Fmer*

**P-429** VASCULAR COMPLICATIONS ASSOCIATED TO PERCUTANEOUS FEMORAL ARTERY CLOSURE WITH ANGIO-SEAL  
*P. Negueruela, Carolina*

**P-430** COILING OF EXTRACRANIAL INTERNAL CAROTID ARTERY AS A CAUSE OF NEUROLOGIC DEFICITS  
*Yetkin, Ufuk*

**P-431** A LATE VASCULAR COMPLICATION OF CARDIAC CATHETERIZATION  
*Kazım, Ergünes*

**P-432** PRIMARY PULMONARY LYMPHOMA: A RARE CASE REPORT  
*Ceylan, Kenan Can*

**P-433** HEPARIN MISUSE CRIPPLES A PATIENT (CASE REPORT)  
*Aldousan, Nadheer*

**P-434** TRANSVENOUS PACEMAKER IMPLANTATION IN THE PRESENCE OF PERSISTENT LEFT SUPERIOR VENA CAVA  
*Edwin, Frank*

**P-435** HEARTMATE II AND QUALITY OF LIFE: ELECTROMAGNETIC FIELD AND PRECAUTIONS AT WORK  
*Rodermans, Ben*

**P-436** A DIAGNOSTIC CONUNDRUM - ATRIAL SEPTAL DEFECT COEXISTING WITH CHRONIC CONSTRICTIVE PERICARDITIS  
*Edwin, Frank*

**P-437** NORMOTHERMIC BYPASS IN PEDIATRIC CARDIAC SURGERY : EXPERIENCE WITH 1200 CASES  
*Ly, Mohamed*

**P-438** MID-TERM RESULTS OF HANCOCK II AND CARPENTIER EDWARD PERIMOUNT VALVE AT PULMONIC PORTION  
*Lee, Jeong Ryul*

**P-439** DIGIVENT - A NEW RESEARCH TOOL FOR AIR LEAKAGE IN LUNG SURGERY  
*Dernevik, Leif*

**P-440** LEVELS OF TNF-ALPHA, INTERLEUKIN-6 AND OTHER BIOMARKERS IN NSCLC PATIENT'S PLASMA BEFORE AND AFTER RADICAL SURGERY  
*Tretjakovs, Peteris*

**P-441** OUTCOMES OF SURGICAL TREATMENT OF MALIGNANT AND NONMALIGNANT PERICARDIAL TAMPONADE WITH CANCER PATIENTS  
*Celik, Sezai*

**P-442** OPEN THORACOTOMY AND DECORTICATION FOR CHRONIC EMPYEMA  
*Andrade-Alegre, Rafael*

**P-443** MANAGEMENT OF BULLOUS LUNG DISEASE  
*Bilal, Amer*

**P-444** MANAGEMENT OF EMPYEMA THORACIS PESHAWAR - EXPERIENCE OF 450 PATIENTS  
*Bilal, Amer*

**P-445** EARLY SURGERY FOR PULMONARY TUBERCULOSIS  
*Bilal, Amer*

**P-446** SURGICAL MANAGEMENT OF BRONCHIECTASIS AN EXPERIENCE OF 100 CASES  
*Bilal, Amer*

**P-447** ESTIMATION OF LIPID METABOLISM OF ATHEROSCLEROTIC CORONARY ARTERIES AT PATIENTS WITH UNSTABLE ANGINA  
*Iqbol, Adilova*

**P-448** NEONATE AND PEDIATRIC CARDIOPULMONARY BYPASS: EXPERIENCE IN QUEEN SIRIKIT NATIONAL INSTITUTE OF CHILD HEALTH  
*Grobtong, Winna*

**P-449** BLOOD MANAGEMENT DURING CPB - A REVIEW  
*Iatridis, Angelo*

**P-450** A NEW APPROACH FOR A HYPOTHERMIA TREATMENT WITH LESS INVASIVE CARDIOPULMONARY BYPASS CIRCUIT FOR CARDIOPULMONARY ARREST PATIENTS  
*Arimoto, Hideki*

**P-451** REVIEW OF CARDIOTOMY TRIAL THE EFFECT OF PROCESSING OF SHED BLOOD DURING CARDIOPULMONARY BYPASS ON TRANSFUSION AND NEUROCOGNITIVE FUNCTION  
*Saleem, Nusrat*

**P-452** PROGNOSTIC FACTORS AND RESULTS IN 18 SURGICALLY TREATED PATIENTS WITH PRIMARY SARCOMAS OF THE HEART AND GREAT VESSELS  
*Qedra, Naser*

**P-453** MANAGEMENT OF TRACHEAL INJURY DURING TRANSHIATAL ESOPHAGECTOMY  
*Pirmoazen, Nouradin*

## Aorta (540)

**Type:** Plenary Session

Date: Saturday, May 03, 2008

Time: 11:00 - 13:00

Room: Hippocrates (Main Hall)

**Chair:** M. Turina, Switzerland

**Co-chair:** I. Jelic, Croatia D. Boulafendis, Greece

Surgical indication for ascending aorta and arch in lone and associated surgery  
*P.R. Vogt, Switzerland*

*P.R. Vogt, Switzerland*

Arch first technique  
*N. Kouchoukos, United States*

Evolution of endovascular management of thoracic aortic disease  
*H. Shennib, Canada*

Traumatic rupture of the aorta  
*P. Dedeilias, Greece*

Thoracoabdominal aneurysms  
*K. Plestis, United States*

Re-operation after aortic surgery  
*C. Anagnostopoulos, Greece*

Long term results of aortic dissection  
*I. Toumpoulis, Greece*

**Parallel: Cardio-Thoracic & Multidisciplinary (545)**

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008  
Time: 11:00 - 13:00  
Room: Panacea

**Chair:** R. Kleinloog, South Africa  
**Co-chair:** Y. Schneider, Russia G. Missias, Greece

**OP-1157** EVALUATION OF THE LEVEL OF ANTIBODIES AGAINST CHLAMYDIA PNEUMONIAE AFTER CABG  
*Brykczynski, Mirosław*

**OP-1158** IMPENDING PARADOXICAL EMBOLISM: SYSTEMATIC REVIEW OF PROGNOSTIC FACTORS AND TREATMENT  
*Myers, Patrick O.*

**OP-1159** CIRCULATING MATRIX METALLOPROTEINASE-3 AT THE ACUTE PHASE OF MYOCARDIAL INFARCTION IN RABBITS  
*Kotsanti, Angeliki*

**OP-1160** RESULTS OF MITRAL VALVE REPAIR VERSUS MITRAL VALVE REPLACEMENT FOR ISOLATED ACTIVE INFECTIVE MITRAL VALVE ENDOCARDITIS: 20-YEAR SINGLE CENTER EXPERIENCE  
*Musci, Michele*

**OP-1161** IS MULTI SLICE CT ANGIOGRAPHY ADEQUATE AS THE SOLE DIAGNOSTIC CRITERIA TO PROCEED FOR CABG?  
*Bedi, Harinder*

**OP-1162** BILATERAL SKELETONIZED INTERNAL MAMMARY ARTERIES: "IN SITU" GRAFTS FOR MYOCARDIAL REVASCULARIZATION  
*Jonjev, Zivojin*

**OP-1163** INTERACTION OF THROMBOTIC GENE POLYMORPHISMS AND POSTOPERATIVE OUTCOME AFTER CARDIAC SURGERY  
*Emiroglu, Ozan*

**OP-1164** PROSTAGLANDIN E1(ALPROSTADIL) ALLOWS THE SAFE USE OF HEPARIN ANTICOAGULATION IN EMERGENT CARDIAC SURGERY PATIENTS POSITIVE FOR ANTI-PF4/HEPARIN ANTIBODIES  
*Dambra, Michael*

**Parallel: Minimally Invasive Surgery 2 (550)**

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008  
Time: 11:00 - 13:00  
Room: Aegle 2

**Chair:** I. Knezevic, Slovenia  
**Co-chair:** T.A. Sulling, Estonia I. Sharouf, Syria

**OP-1165** ENDOVASCULAR TREATMENT OF THORACIC AORTIC DISEASES: RESULTS OF A MULTICENTER STUDY  
*Saadi, Eduardo*

**OP-1166** THE CHANGING MANAGEMENT OF BLUNT THORACIC AORTIC INJURY: THE IMPACT OF ENDOVASCULAR REPAIR  
*Steinmetz, Oren*

**OP-1167** TOTALLY ROBOTIC INTERNAL MAMMARY ARTERY HAEVEST AND BEATING HEART CORONARY ARTERY BYPASS  
*Gao, Changqing*

**OP-1168** BLOOD TRANSFUSIONS IN MULTIPLE CORONARY ARTERY BYPASS GRAFTS: BENEFITS OF ENDOSCOPIC VEIN HARVESTING  
*Tartara, Paolo*

**OP-1169** SURGERY ON HYDATID CYST OF THE HEART, THAE OUTCOME

*Fakhry Al-Khateeb, Mutaz*

**OP-1170** THE IMPACT OF EMERGING PERCUTANEOUS AND ENDOVASCULAR TECHNOLOGIES ON CARDIAC SURGERY TRAINING: A SURVEY OF CANADIAN CARDIAC SURGERY RESIDENTS' PERCEPTIONS  
*Singh, Steve*

**OP-1171** MINISTERNOTOMY FOR MULTIPLE OPCAB  
*Zhang, Yong*

**OP-1172** THE ENDOSCOPIC VERSUS TRADITIONAL OPEN SAPHE-NOUS VEIN HARVEST: THE EFFECTS ON POSTOPERATIVE OUTCOMES  
*Tamim, Muhammed*

**OP-1173** THORACIC EPIDURAL ANESTHESIA IN OPEN HEART SURGERY- CONSCIOUS OPEN HEART SURGERY  
*Dhoble, Shirish M*

**OP-1174** WHICH ARE THE IDEAL CANDIDATES TO THE TRANSAPICAL TRANSCATHETER AORTIC VALVE IMPLANTATION? ANALYSIS OF MORE THAN 700 CONVENTIONAL AORTIC VALVE REPLACEMENTS  
*Rescigno, Giuseppe*

**OP-1175** SURGICAL EXPERIENCE WITH ENDOSCOPIC PORT-ACCESS SURGERY  
*Kamler, Markus*

**OP-1176** RESULTS OF INTENDED OFF-PUMP ROBOTIC TECAB FOR LAD GRAFTING  
*Jegaden, Olivier*

**Parallel: Coronaries 11 (555)**

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008  
Time: 11:00 - 13:00  
Room: Aegle 2

**Chair:** G. Kaoutzanis, Cyprus  
**Co-chair:** M. Romano, France K. Triantafillou, Greece

**"Euro-Asian Bridge", Invited Lecture:** Off pump coronary artery bypass surgery: Where do we stand?  
*M. Romano, France*

**OP-1177** ROLE OF LEFT HEART PUMP-ASSISTED IN BEATING HEART MYOCARDIAL REVASCULARIZATION  
*Pepino, Paolo*

**OP-1178** ASSOCIATION OF CHLAMYDIA PNEUMONIA DNA IN ATHEROSCLEROTIC PLAQUE AND CORONARY RISK FACTORS  
*Darehzereshki, Ali*

**OP-1179** ASSESSING QUALITY OF CARE IN CARDIAC SURGERY: COMPARISON BETWEEN ADMINISTRATIVE AND CLINICAL DATA  
*Seccareccia, Fulvia*

**OP-1180** ADENOVIRUS-MEDIATED OVEREXPRESSION OF NOGO-B PREVENTS NEOINTIMA FORMATION FOLLOWING VASCULAR INJURY  
*Wan, Song*

**OP-1181** EFFECTS OF MILRINONE ON EARLY OUTCOME OF PATIENTS WITH MYOCARDIAL DYSFUNCTION UNDERGOING CABG  
*Jebeli, Mohammad*

**OP-1182** REPRESENT THE FEMALE SEX A RISK FACTOR FOR MYOCARDIUM REVASCULARIZATION (CABG) IN OUR CENTER  
*Iglezias, Jose Carlos*



**OP-1183** MUPIROCIN OINTMENT FOR REDUCING THE POSTOPERATIVE SURGICAL SITE INFECTIONS AFTER ON-PUMP CORONARY ARTERY BYPASS

*Gormus, Niyazi*

**OP-1184** CORONARY ARTERY RECONSTRUCTION WITH INTERNAL MAMMARY ARTERY AND VEIN PATCH GRAFTING WITH OR WITHOUT ENDARTERECTOMY

*AL-Masri, Ayman*

**OP-1185** FACTORS INFLUENCING CORONARY ARTERY BYPASS GRAFTING OUTCOME IN THE AGED

*Hassantash, Seyed Ahmad*

**OP-1186** RISK FACTORS OUTCOMES AND THE EFFECT OF TIME DELAY OF RE-EXPLORATION FOR BLEEDING AFTER CORONARY ARTERY BYPASS SURGERY

*Salehi, Mehrdad*

### Parallel: Video 3 (560)

**Type: Abstracts - Video Presentation**

Date: Saturday, May 03, 2008

Time: 11:00 - 13:00

Room: Acceso

**Chair: C. Papakonstantinou, Greece**

**Co-chair: A.R. Khorassani, Iran Q.Y. Wu, China**

**"Euro-Asian Bridge", Invited Lecture:** AVR in Suprannular Position  
*A.R. Khorassani, Iran*

**VD-1320** ROSS PROCEDURE: MODIFIED (SUPPORTED) ROOT REPLACEMENT USING AUTOLOGOUS TISSUE

*Bougioukas, Ioannis*

**VD-1321** SURGICAL TREATMENT OF ISCHEMIC HEART DISEASE

*Mitrev, Zan*

**VD-1322** BILEAFLET MITRAL VALVE REPAIR

*Kelpis, Timotheos*

**VD-1323** THE USE OF REAL TIME ENDOBRONCHIAL ULTRASOUND IN THE EVALUATION OF MEDIASTINAL LYMPHADENOPATHY

*Bizekis, Costas*

**VD-1324** MANAGEMENT OF THE BRONCHIAL STUMP INSUFFICIENCY CLOSURE BY COMBINATION OF ENDOBRONCHIAL AND SURGICAL TECHNIQUES -VIDEO PRESENTATION

*Pereszlenyi, Arpad*

**VD-1325** THE ROLE OF HIGH THORACIC EPIDURAL ANESTHESIA AND ANALGESIA IN COMBINED ANESTHESIA AND IN THE POSTOPERATIVE PERIOD IN CARDIAC SURGERY

*Petrovski, Vlado*

**VD-1326** TRACHEOPLASTY FOR GRANULAR CELLS TUMOR IN YOUNG PATIENT

*Costa, Altair*

**VD-1327** REPAIR OF POSTINFARCTION VENTRICULAR SEPTAL DEFECTS: THE DOUBLE PATCH TECHNIQUE

*Teodori, Giovanni*

**VD-1328** MODIFIED TECHNIQUE OF PERCUTANEOUS TRACHEOSTOMY IN THE HIGH RISK ICU PATIENT

*Parekh, Justin*

**VD-1329** DIRECT CIRCULAR REPAIR FOR LEFT VENTRICLE ANEURYSM

*Mitrev, Zan*

### Round Table Discussion "Henry Dynant Hospital of Athens" (565)

**Type: Plenary Session - Nursing Track**

Date: Saturday, May 03, 2008

Time: 11:00 - 13:00

Room: Chiron

**Chair: I. Kalofissudis, Greece**

Application of the ISO 9001:2000 standard in the Henry Dunant Hospital of Athens

*Z. Kassarae, Greece*

Application of the HACCP system in the Henry Dunant Hospital of Athens,

*D. Christaki, Greece*

21 grams- A creative metaphor

*I. Kalofissudis, Greece*

Comparing neurocognitive function after on and off pump coronary artery by pass grafting

*E. Pavlou, Greece*

### Parallel: Congestive Heart Failure 2 (566)

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008

Time: 11:00 - 13:00

Room: Homer

**Chair: B. Biocina, Croatia**

**Co-chair: T. Gabrikelcic, Slovenia**

**OP-1187** EXPERIENCE HOME FROM USE OF SILDENAFIL IN REDUCTION OF ACUTE PULMONARY HYPERTENSION IN CARRIERS FROM ADVANCED HEART FAILURE: COMPARISON BETWEEN TWO DIFFERENT PROTOCOLS

*Oliveira, Josi de Lima Jr.*

**OP-1188** GEOMETRY OF LEFT VENTRICLE AND MITRAL VALVE APPARATUS AFTER SURGICAL TREATMENT OF ISCHEMIC HEART FAILURE

*Marchenko, Andrey*

**OP-1189** IMPACT OF INFARCTED AREA ON LEFT VENTRICULAR PERFORMANCE AFTER SURGICAL VENTRICULAR RESTORATION

*Ribeiro, Gustavo*

**OP-1190** SURGICAL VENTRICULAR RESTORATION FOR ISCHEMIC CARDIOMYOPATHY: INITIAL EXPERIENCE

*Mostafa, Marwan*

**OP-1191** MORPHOLOGICAL ASPECTS OF POSTOPERATIVE LEFT HEART REMODELING IN ISCHEMIC AND VALVULAR CARDIOMYOPATHY

*Shipulin, Vladimir*

**OP-1192** AN ELASTIC RING INTO DYSFUNCTIONING LEFT VENTRICLE IMPROVES CARDIAC MECHANICS IN AN ANIMAL MODEL

*Merlo, Maurizio*

**OP-1193** NON-TRANSPLANT SURGICAL TREATMENT OF PRIMARY DILATED CARDIOMYOPATHY AND CONGESTIVE HEART FAILURE - RADO OPERATION

*Radovanovic, Ninoslav*

**OP-1194** A POTENTIAL SURGICAL SOLUTION FOR UNMET PROBLEM - DIASTOLIC HEART FAILURE

*Elami, Amir*



**OP-1195** MINIMALLY INVASIVE EPICARDIAL LEAD PLACEMENT: AN ALTERNATIVE FOR CARDIAC RESYNCHRONIZATION THERAPY  
*Nento, Daniel*

**OP-1196** MITRAL VALVE REPLACEMENT WITH COMPLETE CHORDAE TENDINAE PRESERVATION IN END-STAGE DILATED IDIOPATHIC CARDIOMYOPATHY  
*Gaiotto, Fabio*

**OP-1197** BATISTA PROCEDURE AS ALTERNATIVE FOR HEART TRANSPLANTATION  
*Todurov, Boris*

### Cardio-Thoracic Track "Transplantations and Assist Devices" (570)

**Type: Plenary Session**

Date: Saturday, May 03, 2008  
Time: 11:00 - 12:30  
Room: Iasso

**Chair: F. Venuta, Italy**  
**Co-chair: P. Sfyakis, Greece**

Heart transplantation  
*J. Brink, South Africa*

Heart and lung transplantation  
*A. Simon, Germany*

Lung transplantation - State of the Art 2008  
*H. Reichenspurner, Germany*

Heart assist devices  
*T. Mussivand, Canada*

Lung assist devices  
*A. Simon, Germany*

### Cardio-Thoracic Track "Combined cardio-thoracic surgery" (571)

**Type: Plenary Session**

Date: Saturday, May 03, 2008  
Time: 12:30 - 13:00  
Room: Iasso

**Chair: A. Lioulis, Greece**  
**Co-chair: C. Foroulis, Greece**

**Combined cardio-thoracic surgery for CABG and lung cancer**  
*D. Fillipou, Greece*

### Perfusion Track 2 (575)

**Type: Plenary Session**

Date: Saturday, May 03, 2008  
Time: 11:00 - 13:00  
Room: Syndicate 1

**Chair: A. Iatrides, United States**  
**Co-chair: L. Mongero, United States T. Sakorafas, Greece**

Click n run extracorporeal life support in a suitcase  
*A. Iatrides, United States*

The biocompatibility issue: Where we are today?  
*F. Merkle, Germany*

Intermittent antegrade warm blood cardioplegia  
*A. Calafiore, Italy*

Brain protection in aortic arch surgery  
*C. Rokkas, Greece*

Present state of mechanical circulatory support  
*S. Schueler, United Kingdom*

Trends and alternatives in heart failure  
*T. Kofidis, Singapore*

### Parallel: Beginning Thoracic Entities (580)

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008  
Time: 11:00 - 13:00  
Room: Melabus

**Chair: R. Jakovic, Serbia**  
**Co-chair: A. Toker, Turkey D. Petrov, Bulgaria**

**OP-1198** THORACIC TRAUMA: SEVEN YEARS EXPERIENCE IN NAPLES  
*Bergaminelli, Carlo*

**OP-1199** INSERTING THE CHEST TUBE THROUGH THE STAB WOUND AT THORACIC INJURIES  
*Han, Serdar*

**OP-1200** TUBE THORACOSTOMY IN CHEST TRAUMA PATIENTS: IS IT WITHOUT COMPLICATIONS?  
*Sallam, Ayman*

**OP-1201** THE FACTORS AFFECTING THE MORBIDITY AND MORTALITY IN FLAIL CHEST; COMPARISON OF THE ANTERIOR AND LATERAL LOCALISATION  
*Kilic, Dalokay*

**OP-1202** SURGICAL MANAGEMENT OF VASCULAR THORACIC OUTLET SYNDROME  
*Bayram, Ahmet Sami*

**OP-1203** PULMONARY DESTRUCTION SECONDARY TO TUBERCULOSIS: CLINICAL FINDINGS AND SURGICAL RESULTS  
*Mingarini Terra, Ricardo*

**OP-1204** MANAGEMENT OF COMPLICATED HYDATID CYST OF THE THORAX  
*Kilic, Dalokay*

**OP-1205** COMPLICATED PULMONARY HYDATID CYST CAN MIMICK VARIOUS PULMONARY DISEASE  
*Han, Serdar*

**OP-1206** RELATIONS BETWEEN INSURGENCE OF SPONTANEOUS PNEUMOTHORAX AND METEOROLOGICAL FACTORS  
*Bertolaccini, Luca*

**OP-1207** LUNG HAMARTOMAS IN ALEXANDRIA, EGYPT  
*Onakpoya, Uvie*

**OP-1208** COMPARISON BETWEEN SINGLE AND BILATERAL LUNG TRANSPLANTATION IN A BRAZILIAN COHORT  
*Afonso Junior, Josi Eduardo*

**OP-1209** MEDIAL HYPERTROPHY IN PATIENTS WITH PULMONARY EMBOLISM: ANATOMOPATHOLOGICAL STUDY  
*Biscegli Jatene, Fabio*

**OP-1210** PULMONARY ENDARTERECTOMY COMBINED WITH MAZE OPERATION: INDICATION, FIRST RESULTS  
*Lindner, Jaroslav*

**OP-1211** EFFECTS OF BRONCHIAL TRANSECTION AND CYCLOSPORINE A ON MUCOCILIARY TRANSPORT IN RATS  
*Biscegli Jatene, Fabio*

**OP-1212** PNEUMONIA AFTER LUNG TRANSPLANTATION IN A BRAZILIAN COHORT STUDY  
*Vidal Campos, Silvia*

**OP-1213** TREATMENT OF BRONCHIAL COMPLICATIONS AFTER LUNG TRANSPLANTATION  
*Jatene, Fabio Biscegli*

**OP-1214** EFFECTS OF CYCLOSPORINE A ON AIRWAY MUCOCILIARY CLEARANCE IN RATS  
*Biscegli Jatene, Fabio*

**OP-1215** CLINICAL EVOLUTION AND INFECTIOUS COMPLICATIONS IN CYSTIC FIBROSIS PATIENTS SUBMITTED TO LUNG TRANSPLANTATION  
*Carraro, Rafael*

**OP-1216** THE ROLE OF PNEUMONECTOMY IN PULMONARY EDEMA AND NITRIC OXIDE SYNTHASE EXPRESSION IN REMAINING LUNG OF RATS  
*Jatene, Fabio Biscegli*

**OP-1217** EFFECTS OF AZATHIOPRINE ON MUCOCILIARY CLEARANCE AFTER BRONCHIAL SECTION IN A RAT MODEL  
*Biscegli Jatene, Fabio*

## Where We Were (585)

**Type: Plenary Session**

Date: Saturday, May 03, 2008  
Time: 14:30 - 17:00  
Room: Hippocrates (Main Hall)

**Chair: P. Spyrou, Greece N. Kouchoukos, United States**  
**Co-chair: F. Benetti, Argentina I. Hassoulas, Greece**

The aphorisms of Hippocrates  
*F. Robicsek, United States*

Classic by - pass operation  
*D. Wheatley, United Kingdom*

Three surgeons started CABG: historic perspective  
*V. Kolesov, Ukraine*

OPCAB - Historical records  
*E. Buffolo, Brazil*

MV repair - Hisotrical records  
*A. Carpentier, France*

Heart transplantation: The contributions of Christiaan Barnard and the University of Cape Town/ Groote Schuur Hospital  
*J. Brink, South Africa*

The History of surgical treatment for cardiopulmonary failure  
*S. Jamieson, United States*

## Thoracic Track - Past, Present and Future (590)

**Type: Plenary Session**

Date: Saturday, May 03, 2008  
Time: 14:30 - 17:30  
Room: Iasso

**Chair: I. Bellenis, Greece**  
**Co-chair: W. Walker, United Kingdom K. Athanassiadi, Greece**

TNM Staging for lung cancer: the Past, the Present and the Future?  
*P. Goldstraw, United Kingdom*

Lung cancer surgery  
*K. Jeyasingham, United Kingdom*

Esophageal Surgery  
*A. Duranceau, Canada*

Trauma Surgery  
*M. Gerazounis, Greece*

## Parallel: Perfusion 1 (595)

**Type: Abstracts - Oral Presentation**

Date: Saturday, May 03, 2008  
Time: 14:30 - 17:30  
Room: Syndicate 1

**Chair: A. McCarthy, Ireland**  
**Co-chair: P. Bainbridge, Greece A. Tsiiorva, Greece**

**OP-1218** THE INFLUENCE OF CARDIOPULMONARY BYPASS PERFUSION PRESSURE ON RENAL FUNCTION  
*Andrejaitiene, Judita*

**OP-1219** DOES MINI-BYPASS SYSTEM IMPROVE BLOOD CONSERVATION FOLLOWING CARDIAC SURGERY  
*Tuladhar, Sampurna*

**OP-1220** AN EXPERIENCE OF USE DIFFERENT ARTIFICIAL BLOOD CIRCULATION SYSTEMS IN PATIENTS RECEIVING CARDIAC SURGERY  
*Gatina, Alsu*

**OP-1221** COMPLEMENTARY MEASURES DURING CARDIOPULMONARY BYPASS IN VERY HIGH- RISK CARDIAC SURGERY PATIENTS  
*Siminelakis, Stavros*

**OP-1222** REDUCTION OF THE INFLAMMATORY RESPONSE WITH MINIMAL EXTRACORPOREAL CIRCULATION IN CARDIAC SURGERY  
*Deleuze, Philippe*

**OP-1223** BIVALIRUDIN ANTICOAGULATION FOR CARDIOPULMONARY BYPASS (CPB)  
*Nikolaidis, Nicolas*

**OP-1224** EFFECTS OF CONVENTIONAL AND MODIFIED ULTRAFILTRATION ON BLEEDING AFTER ADULT CARDIAC SURGERY  
*Cunha, Claudio Ribeiro*

**OP-1225** ULTRAFILTRATION TO REMOVAL INFLAMMATORY MEDIATORS DURING CARDIOPULMONARY BYPASS IN CORONARY ARTERY BYPASS GRAFT SURGERY

*Petrucci, Orlando*

**OP-1226** THE IMPACT OF THE CARDIAC SURGERY ON LEUKOCYTE EXPRESSION OF Fcγ RECEPTOR (CD64) AND THE SCAVENGER RECEPTOR (CD163)

*Lonsky, Vladimir*

**OP-1227** EFFECT OF ENRICHED BLOOD CARDIO PLEGIA ON MYOCARDIAL PROTECTION IN COMPARISON WITH CRYSTALLOID AND BLOOD CARDIO PLEGIA

*Ghanbari, Amene*

**OP-1228** EFFECTS OF PROCESSING OF SHED BLOOD DURING BYPASS ON TRANSFUSION AND NEUROCOGNITIVE FUNCTION

*Saleem, Nusrat*

**OP-1229** INTEGRATED MINIMAL PRIME CIRCUITS FOR CORONARY ARTERY BYPASS SURGERY IMPROVES CLINICAL OUTCOMES

*Serrick, Cyril*

## Where We Are (600)

**Type:** Plenary Session

Date: Saturday, May 03, 2008

Time: 17:30 - 20:30

Room: Hippocrates (Main Hall)

**Chair:** E. Chlapoutakis, Greece A. Aytac, Turkey

**Co-chair:** R.V. Batista, Brazil C. Lolas, Greece

Current Status of Minimally Invasive Coronary Surgery: A Decade of Experience

*V. Subramanian, United States*

Future prospects in robotic surgery

*J. Bonatti, Austria*

Thoracic Aortic Aneurysm: Reading the Enemy's Playbook

*J. Eleftheriades, United States*

Is there something behind the curtain? CABG vs PCI in multivessel disease; A Cardioepidemiologic perspective

*O. Soran, United States*

CABG - The Surgeon's Point of View

*D.P. Taggart, United Kingdom*

Geometric Surgical Solutions to CHF in Dilated Left Ventricles from Many Causes

*G. Buckberg, United States*

Effective combined Off-Pump surgical treatment and autologous bone-marrow transplantation for end-stage Ischemic Cardiomyopathy

*S. Prapas, Greece*

## Parallel: Perfusion 2 (605)

**Type:** Abstracts - Oral Presentation

Date: Saturday, May 03, 2008

Time: 17:30 - 19:30

Room: Syndicate 1

**Chair:** S. Brown, United States

**Co-chair:** K.Mintzaridis, Greece

**OP-1230** THE EFFECT OF NORMOTHERMIA ON POSTOPERATIVE BLEEDING IN CORONARY ARTERY BYPASS GRAFTING

*Sobhani, Sepideh*

**OP-1231** MILD HYPOTHERMIC CIRCULATORY ARREST WITH SELECTIVE CEREBRAL PERFUSION: A MODIFIED TECHNIQUE OF ANTEGRADE CEREBRAL PERFUSION DURING THORACIC AORTIC SURGERY

*Anagnostou, Efstratios*

**OP-1232** COMBINED CORONARY ARTERY BYPASS SURGERY AND CAROTID ARTERY SURGERY WITH UTILITY OF MILD HYPOTHERMIA

*Yetkin, Ufuk*

**OP-1233** TRANSCRANIAL DOPPLER MONITORING AND AORTIC CANNULA MALPOSITION DURING MITRAL VALV REPLACEMENT SURGERY

*Boran, Ertay*

**OP-1234** IMPACT OF PRE-OP VERSUS INTRA-OP IABP INSERTION ON MORBIDITY AND MORTALITY ON OPCAB WITH AORTA NON TOUCH TECHNIQUE

*Tsiorva, A.*

**OP-1236** PERITONEAL CHEMOTHERAPY FOR EPITHELIAL MALIGNANT MESOTHELIOMA

*Mongero, Linda*

**OP-1237** OBSERVATION OF SPINAL CORD FUNCTION AFTER DESCENDING AORTA CLAMP IN CHRONIC PORCINE MODEL

*Guan, Yulong*

**OP-1238** HEAT SHOCK PROTEIN 70 GENE ANTI-Ca<sup>2+</sup> OVERLOAD PROTECTS RAT MYOCARDIUM CELL AGAINST ANOXIA-REOXYGENATION INJURY

*Liu, Jichun*

**OP-1239** 100% MASSIVE AIR EMBOLI PROTECTION SAFETY VALVE DURING CPB

*Paul, Vishwas Kiran*

**OP-1235** PEDIATRIC CARDIOPULMONARY BYPASS IN MOZAMBIQUE-A MULTINATIONAL MISSION-OUR EXPERIENCE

*Lazaros, E.*

**OP-1240** POSSIBILITIES OF DESIGNING A MINIMISED EXTRACORPOREAL CIRCULATION (ECC) SYSTEM TO OPERATE NEW-BORNS AND INFANTS, BASED ON STANDARD PRODUCTS AVAILABLE ON THE MARKET

*Karczewski, Piotr*

## Where We Will Be (610)

**Type:** Plenary Session

Date: Saturday, May 03, 2008

Time: 20:30 - 21:00

Room: Hippocrates (Main Hall)

**Chair:** V. Sirvydis, Lithuania B.K. Cho, Korea

**Co-chair:** P. Balas, Greece C. Papakonstantinou, Greece

The future of the cardiac surgery

*T. Salerno, United States*

**WSCTS 2008**  
**Closing Remarks**

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# Presentation of Abstracts

## ORAL PRESENTATIONS

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## CARDIAC I

### OP-450-IMMEDIATE AND LONG-TERM FOLLOW-UP AFTER ENDOVASCULAR TREATMENT OF THE TRUE DESCENDING AORTIC ANEURYSMS

*Kim, Hyung; Palma, Jose Honorio; Gaia, Diego; Alves, Claudia Rodrigues; Souza, Jose Augusto; Buffolo, Enio*  
Federal University of Sao Paulo, Sao Paulo, Brazil

**BACKGROUND:** Aortic aneurysms are defined as an increase in aortic diameter. This increased diameter predisposes the vessel to rupture, justifying an intervention. Surgical standard treatment involves considerable mortality and morbidity. In the last few years, endovascular approach has become a viable alternative in selected cases. Unfortunately, consistent evidence regarding its immediate and long term follow-up is not established.

**METHODS:** Fifty patients with true descending thoracic aneurysms underwent endovascular treatment, using a self-expandable prosthesis from 1998 to 2004. Demographic and operative data were acquired. The same surgical technique and inclusion/exclusion criteria were used in all cases. Evolution, immediate and long-term follow-up, using consecutive computed tomography evaluation was performed.

**RESULTS:** Median age was 61,9 years. Risk factors for aneurysm formation were present in a large number of patients. Forty percent had systemic hypertension. Eighty-eight percent were symptomatic and admittance. All patients had a mediastinal enlargement at initial simple radiographic evaluation. Diagnostic and patient selection for endovascular approach were performed using only the computed tomography and clinical assessment. Eighty-two percent received more than one prosthesis. Immediate success was achieved in 84%, long term in 68%. Follow-up was 18-88 months.

**CONCLUSIONS:** Endovascular treatment of true thoracic aneurysms was a feasible treatment with sustained results in long-term follow-up. Correct patient selection through pre-operative radiologic analysis seems to be the cornerstone of success or failure.

### OP-451-VIDEO-THORACOSCOPIC PERICARDIAL WINDOW IN THE TREATMENT OF PERICARDIAL EFFUSIONS

*Gaia, Diego; Guilhen, Jose Cicero; Branco, Joao Nelson; Palma, Jose Honorio; Teles, Carlos Alberto; Catani, Roberto; Buffolo, Enio*  
Federal University of Sao Paulo, Sao Paulo, Brazil

**BACKGROUND:** Video-thoracoscopic pericardial window is a minimally invasive method used to diagnose and treat pericardial effusions. It allows a wide thoracic and pericardial inspection with a great visibility of mediastinal structures. We present the review of 26 cases performed at our institution.

**METHODS:** Twenty-six patients needing pericardial drainage and/or biopsy underwent a video-thoracoscopic procedure. All patients had an echocardiography diagnostic prior to the procedure. An informed consent was obtained. Procedures were performed from April 2005 to December 2007. Ten male patients were in the sample. Left side was the preferred approach. General anesthesia and selective orotracheal intubation were done in all cases. Samples for virology, microbiology and histological analysis were taken from all cases.

**RESULTS:** Cultures and microbiology were negative in all cases. Findings suggestive of malignant effusion/biopsy were found in 5 cases. Tuberculosis was found in 3 cases using histological analysis. In 8 cases, a non-specific pericarditis was found. Simultaneous pleural procedures were done in 4 cases. There were no related procedure deaths. The medium operative time was 35 minutes. Follow-up time was 1-31 months with a 1 reincident case.

**CONCLUSIONS:** Video assisted pericardial window is a safe and reproducible procedure, without significant related morbidities. The procedure allowed combined pleuro-pericardial procedures guiding the correct diagnostic and treatment.

### OP-452-LONG TERM RESULTS OF PROSPECTIVE RANDOMIZED STUDY OFF PUMP VS ON PUMP CORONARY REVASCULARIZATION

*Benetti, Federico; Rizzardi, Jose Luis; Concetti, Claudio; Angeletti, Ernesto; Patel, Amit N.; Bergese, Mariana; Benetti, Ines Maria*  
Benetti Foundation, Rosario, Argentina

**BACKGROUND:** Off -Pump coronary revascularization (OPCAB) has been adopted by many surgeons as an alternative to conventional on -Pump coronary artery bypass surgery (CABG). However, there is very little long term follow information. The goal of this study was to evaluate the long term outcome of patient who have been treated with both techniques.

**METHODS:** From 1978 to 1983, 44 patients who were undergoing primary coronary revascularization were prospectively enrolled in a randomized study evaluating OPCAB vs. conventional on -Pump CABG. All patients were operated on via a median sternotomy. The OPCAB was performed with manual stabilization of the myocardium and temporary proximal artery occlusion. The on-Pump CABG was performed with arrested heart technique using crystalloid cardioplegia. In both groups only veins were used as a conduit. These patients have been followed for 28 years for the following variables: adverse cardiac events, need for reintervention, renal dysfunction, stroke, and overall survival. The following demographics were obtained for the OPCAB vs. On -Pump group: Age 60 ( $\pm 8.3$ ) vs. 55 ( $\pm 8.4$ ) years ( $p=0.06$ ), women 0% vs 9% ( $p=0.2$ ), Diabetes 23% vs 23% ( $p=1$ ), Hypertension 41% vs 18% ( $p=0.0016$ ), number of bypass 1,6 vs 2,8 ( $p=0.003$ ) all patients had successful revascularization into the study arm that they were randomized.

**RESULTS:** There was no in-hospital or 30 day mortality in either group. At follow-up 28 years, OPCAB vs. On -Pump group: need for PTCA 4,5% vs 9% ( $p=0.3$ ), reoperation 4,5% vs 32% ( $p=0.005$ ), stroke 4,5% vs 4,5% ( $p=1$ ), renal dysfunction 0% vs 0% ( $p=1$ ), the causes of death, were, cardiac 18% vs 73% ( $p=0.000004$ ), accident 4,5% vs 0% ( $p=0.3$ ), cerebrovascular accident 9% vs 14% ( $p=0.3$ ), infection 0% vs 9% ( $p=0.16$ ), peripheral vascular disease 9% vs 0% ( $p=0.16$ ), Aortic dissection 0% vs 4,5% ( $p=0.3$ ), the actuarial survival at 28 years (Kaplan Meier) was 25% vs. 10% ( $p=0.03$ ).

**CONCLUSION:** Although this is a small prospective randomized study before a number of improvements in cardiac surgery such as mechanical/suction stabilizers or blood cardioplegia were used, there is significant difference in the overall survival, reoperation, and, cardiac cause of death in OPCAB vs. On Pump. The possible effects of crystalloid cardioplegia on endothelial dysfunction in vitro have shown to be dramatic. This may play a role in the cardiac related deaths but be very difficult to prove in this small study. However, in this study OPCAB is superior to On pump coronary revascularization and should continue to be performed as a successful treatment for coronary disease.

### OP-453-PREDICTORS FOR THE SUCCESS OF ON TABLE EXTUBATION AFTER ENDOSCOPIC HEART SURGERY

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**BACKGROUND:** New technique of cardiac operations using the Port-Access system (Heartport, Cardioversions, Somerville, NJ) avoiding sternotomy enables development of ultra-fast track protocol with extubation of the patient still in the operating room (1, 2). The aim of the study was to determine which patient characteristics before and during the operation could predict successful extubation immediately after the operation.

**METHOD:** 104 patients were involved in the study. They all underwent endoscopic cardiac surgery using the Port-Access system, because of mitral or tricuspid valve dysfunction, cardiac tumor removal or atrium septal defect. Prior to surgery, all the patients were marked for fast track recovery protocol, meaning that during the operation short-term anaesthetics (propofol, sevoflurane) and analgetics (fentanyl, remifentanyl) were used. They were intubated with double lumen tube. Hypothermic (29 C) cardiopulmonary bypass (CPB) with the standard Port-Access cannulation was used with intermittent cold blood antero-grade cardioplegia. For postoperative analgesia the administration of local anaesthetic ropivacaine or bupivacaine through the catheter in the surgical wound was used. If the patients fulfilled the extubation criteria (awake, cooperative, hemodynamic stable, without arrhythmia, spontaneous breathing,

core temperature  $>36.5^{\circ}\text{C}$ ) in 10-15 minutes after the final stitch was made, they were extubated in the operation room (OR group). Otherwise they were reintubated with a single lumen tube and transferred to the intensive care unit (ICU group). Both groups were compared regarding variables that could influence early extubation. That were: preoperative characteristics: age, sex, NYHA (New York Heart Association) classification, function of left ventricle, EUROSCORE (European System for Cardiac Operative Risk Evaluation), lung function, and presence of pulmonary hypertension; and intraoperative variables: CPB time, cross clamp time of the aorta, and the need for high inotropic support at the end of the operation; .

**RESULTS:** Out of 104 patients 78 (75%) patients (OR group) fulfilled the extubation criteria and were extubated in the OR. 26 (25%) patients (ICU group) were not extubated in the OR. There was no difference between the group regarding preoperative characteristics: age, sex, NYHA classification, function of the left ventricle and pulmonary hypertension. The patients from the OR group had statistically significant lower EUROSCORE than the patients from ICU group ( $p = 0.25$ ). The preoperative variables: pulmonary total vital capacity and forced expiratory volume in the first second (FEV1) before the operation were statistically significantly higher in the OR group in comparison with the ICU group ( $p = 0.001$ ,  $p = 0.001$ ). There was no difference between the groups regarding intraoperative characteristics.

**DISCUSSION:** With our study we proved that after less invasive cardiac surgery the extubation in OR can be predict. For this three preoperative characteristics of the patients are important. Those are: EUROSCORE, vital capacity of the lungs and FEV1. The intraoperative characteristics do not have the influence on the success of on table extubation.

**REFERENCES:** 1. Gersak B, Sostaric M, Kalisnik JM, Blumauer R. The preferable use of port access surgical technique for right and left atrial procedures. *Heart Surg Forum*. 2005; 8 (5):E354-63. 2. Kehlet H, Wilmore DW. Fast-track surgery. *Br J of Surg* 2005;92: 3-4.

#### OP-454-ROBOTIC ATRIAL SEPTAL DEFECT REPAIR-PRELIMINARY EXPERIENCE WITH DA VINCI S SYSTEM IN CHINA

*Gao, Changqing*

*Cardiovascular Surgery, PLA General Hospital, Beijing, China*

**BACKGROUND:** As the first robotic da Vinci S surgical system (Intuitive Surgical, Inc, CA) in China, Big atrial septal defect repair (ASD) were performed in 30 patients using the robotic da Vinci S surgical system. Prospectively, we evaluated safety and efficacy in performing the secundum type ASD repairs.

**METHODS:** Eligible patients had big ASD with mild to moderate pulmonary hypertension. Operative techniques included peripheral cardiopulmonary perfusion, a 2- to 2.5-cm working port only in the 4th intercostal space, transthoracic aortic occlusion, and antegrade blood cardioplegia. Transesophageal echocardiograms (TEE) were done intraoperatively with three-dimensional (3D) reconstructions. Successful repairs were defined.

**RESULTS:** Enhanced 3D visualization of ASD allowed safe, dexterous intracardiac tissue manipulation. All patients had successful repairs including direct suturing in 20 cases, as well as autogenous pericardial patching in 10 cases. There were no operative deaths, strokes, or device-related complications. One patient was reexplored for bleeding. There were no incisional conversions. The mean cardiopulmonary bypass times and aortic crossclamp times were 109.5 minutes and 46.6 minutes respectively. Both robotic repair and total operating times decreased significantly respectively. Total ICU length of stay for patients was 1 day.

**CONCLUSIONS:** This study shows that the da Vinci S surgical system (Intuitive Surgical, Inc) has no limitations in performing the secundum type big ASD repairs. Articulated wrist-like instruments and three-dimensional visualization enabled precise tissue telemanipulation.

#### OP-455-THE USE OF THE TRANSAORTIC EDGE TO EDGE MITRAL VALVE REPAIR IN PATIENTS WITH CONCOMITANT AORTOTOMY

*Kelpis, Timotheos; Ninios, Vlasios; Visouli, Aikaterini; Nikoloudakis, Nikolaos; Mpakas, Andreas; Kokkinomagoulou, Amalia; Deliaslani, Despina; Pitsis, Antonis*  
*St Luke's Hospital, Thessaloniki Heart Institute, Panorama, Thessalonica, Greece*

**BACKGROUND:** The aim of this study is to determine the feasibility and effectiveness of the transaortic edge-to-edge (E-E) mitral valve repair in patients undergoing concomitant aortotomy.

**METHODS:** From March 2002 to November 2007, 49 patients (mean age  $68 \pm 11.3$  years, range 29-87) underwent a transaortic E-E repair of the mitral valve. Indication was mitral regurgitation either functional in origin or due to organic disease (myxomatous, rheumatic, endocarditis, or congenital). At admission, 2(4%) patients were in NYHA functional class I, 11(23%) were in class II, 27(55%) were in class III and 9(18%) were in class IV. Concomitant aortic valve replacement was performed in 45 patients (92%), myectomy in 2(4%), aortic valve sparing operation in 1(2%) and Bentall procedure in 1(2%). Mitral valve repair was performed through the aortic annulus using a central E-E stitch approximating the anterior and posterior leaflets of the mitral valve. Preoperative MR was 4+ in 6 patients (12%), 3+ in 22(45%) and 2+ in 21(43%). All patients underwent perioperative transesophageal echocardiography before and after the procedure.

**RESULTS:** Mitral regurgitation on echocardiogram improved from a mean of  $2.69 \pm 0.68$  preoperatively to a mean of  $0.36 \pm 0.48$  postoperatively. Mean cross-clamp time was  $70.5 \pm 23.4$  min and cardiopulmonary bypass time was  $96.5 \pm 34.6$  min. Two patients underwent reintervention on the mitral valve at the time of the initial operation. There were no operative mortalities. Thirty-day mortality was 3 of 49 (6%) patients.

**CONCLUSIONS:** In patients that require mitral valve repair with concomitant aortotomy, transaortic E-E repair is a feasible, technically simple and reproducible technique with excellent short term results.

#### OP-456-BIOPROSTHETIC VALVE MODIFICATION FOR FULL RETENTION OF THE NATIVE MITRAL VALVE

*Hugh, Paterson; See, Valerie; Seitz, Michael; Symes, Michael; Lu, Juntang; Thomas, Lisa*  
*Cardiothoracic Surgery, Westmead Hospital, Westmead, Australia*

**BACKGROUND:** The anterior leaflet of the mitral valve supports left ventricular function by maintaining the kinetics of blood flow through the ventricle during diastole. This function can be preserved at the time of mitral prosthetic insertion but at the risk of left ventricular outflow tract obstruction (LVOTO). The aim of this study was to identify the predictors of LVOTO caused by prosthetic mitral valve insertion with full retention of the native anterior mitral leaflet.

**METHODS:** Twenty-three adult sheep underwent insertion of 47 mitral prostheses on normothermic beating heart cardiopulmonary bypass. The prostheses used were the high profile Mosaic porcine (Medtronic Inc), the low profile Biocor porcine (St Jude Medical Inc) and non-commercial rigid circular annular rings. Following prosthetic insertion the sheep separated from bypass with sufficient inotrope support to restore pre-bypass blood pressure. Pressure monitoring was performed to determine the gradient from the left ventricle to the aorta and echocardiography through a hand held transducer on the left ventricular apex determined mitral valve function and LVOT velocity. Bioprosthetic distortion was achieved with a cinching suture passed externally through the left atrial wall and snared to permit application of intermittent and variable tension.

**RESULTS:** Bioprosthetic sizes used were 33mm (N=22), 31mm (N=4), 27mm (N=9), 25mm (N=1) and composite valves (N=3). Circular rings of various sizes were used in 8 sheep. The valves were inserted with the stent posts adjacent the commissures, N= 29 (orthotopic position) or with a stent post adjacent the mid point of the anterior leaflet, N= 7 (malrotated). There was no significant difference in the incidence or severity of LVOTO between the high and low profile valves. No LVOTO occurred with any rigid circular rings. LVOTO with echocardiographic evidence of systolic anterior movement of the anterior leaflet (LVOTO/SAM) was identified in 12 sheep following orthotopic prosthetic insertion with a trend towards an increased incidence in the smaller sizes  $p=0.085$  (33mm, 5 of 17 and 27mm, 5 of 7). LVOTO/SAM was reduced or abolished by reducing the antero-posterior diameter of the prosthesis by external cinching (N=6) and was reproducible. In 2 sheep a 31mm Mosaic valve was inserted with the widest stent post angle (135 degrees) anteriorly and then exchanged with the narrowest angle (105 degrees) anteriorly with greater LVOTO/SAM caused by the narrower angle. A composite valve comprised of the largest leaflet from a 33mm Mosaic attached to 2 leaflets from a 25mm Biocor was inserted into 2 sheep with no evidence of LVOTO or SAM. Mild rotation of the



composite valve in a third sheep was associated with LVOTO/SAM.

**CONCLUSIONS:** The proximity of the bioprosthetic stent posts under the anterior mitral leaflet is the dominant predictor of LVOTO/SAM. Elliptical bioprostheses with a short antero-posterior diameter cause less LVOTO/SAM than circular bioprostheses of equivalent circumference. A bioprosthesis with a large anterior leaflet and elliptical orifice may allow safe retention of the full function of the native anterior leaflet at the time of bioprosthetic insertion.

#### **OP-457-PULMONARY NITRITE EVALUATION WITH THE AID OF EXHALED BREATH CONDENSATE IN THE PER-OPERATORY AND LATE POST-OPERATORY (24 HOURS) TIMES OF ON-PUMP CARDIAC SURGERY**

*Evora, Paulo Roberto B; Augusto, Viviane dos Santos; Reis, Graziela Saraiva; de Souza, Maria Eliza Jordani; Rodrigues, Alfredo Jose*

*Department of Surgery and Anatomy, Ribeirao Preto, SP, Brazil*

**BACKGROUND:** Nitric oxide (NO) is an essential molecule for human body physiology, mainly on pulmonary vascular smooth muscle tone regulation. Only recently proper knowledge of the impact of NO on cardiac physiology has been recognized. Exhaled NO has been considered as a potential pulmonary injury biomarker after on-pump cardiac surgery and the use of the exhaled breath condensate (EBC) as a non-invasive method to investigate pulmonary injuries has gained progressive interest. By means of this prospective and non-randomized study, the authors aimed to verify the possible association between the levels of plasma and condensed pulmonary exhaled nitrite (NO<sub>2</sub><sup>-</sup>) in per-operative and late post-operative (24 hours) periods of on-pump cardiac surgery.

**METHODS:** Twenty eight adult patients of both genders and between 26 and 71 years of age were selected and subdivided into two groups: 1) control (non-surgery) and 2) surgery (valve surgery and myocardium revascularization). EBC and blood samples of each and every patient were frozen and stored at - 70°C. Plasma and EBC nitrite levels were performed by the chemiluminescence method (Nitric Oxide Analyzer, 280i, SIEVERS- NOA-Sievers). Data are presented as means and standard deviation, and for statistical analysis the non-parametric tests of Mann-Whitney and Wilcoxon were adopted.

**RESULTS:** The main results were: a) the levels of EBC NO<sub>2</sub><sup>-</sup> collected with dry ice on the per-operative surgery group were higher than on control group collected with the same method ( $p < 0,05$ ); b) EBC NO<sub>2</sub><sup>-</sup> concentration of per-operative valve correction were higher than the post-operative period (24h) ( $p < 0,05$ ), which were collected with dry ice; c) no statistical significance was found for plasma NO<sub>2</sub><sup>-</sup> when comparing groups control, valve surgery and myocardium revascularization on the per-operative period; d) on myocardium revascularization surgery group plasma NO<sub>2</sub><sup>-</sup> was higher comparing the per and post-operative periods ( $p < 0,05$ ); e) no correlation was found for plasma and EBC NO<sub>2</sub><sup>-</sup> levels.

**CONCLUSIONS:** These results suggest that EBC nitrite dosage is viable, as well as of easy sampling and worthy for experimental clinical studies. The lack of correlation between plasma and exhaled nitrite may reflect mainly the localized rather than the systemic formation of this essential molecule. FAPESP, FAEP, CNPq, CAPES.

#### **OP-458-INFLAMMATORY MARKERS PREDICTS FUTURE CARDIOVASCULAR AND NEUROLOGICAL EVENTS IN PATIENTS UNDERGOING CAROTID STENTING**

*Versaci, Francesco; Del Giudice, Costantino; Pellegrino, Antonio; Bellos, Kiriakos; Condorelli, Gian Luigi; Pellegrino, Antonio; Mauriello, Alessandro; Liberatoscioli, Laura; Igino, Proietti; Simonetti, Giovanni; Spagnoli, Luigi Giusto; Cortese, Claudio; Chiariello, Luigi*

*Cardiology, Rome, Italy*

**BACKGROUND:** C-Reactive protein predicts cardiovascular events after coronary stenting implantation. The aim of this study was to assess whether baseline inflammatory markers predicts future neurological and cardiovascular events after carotid stenting and to correlate systemic inflammation and histomorphometric analysis of the carotid plaque evaluated from the filters utilized as protective devices during the procedure.

**METHODS:** Eighty consecutive patients (mean age 70,8±8,32, 55 men) with

stable severe carotid stenosis were treated with stent implantation with distal filter devices. Levels of high-sensitivity C-reactive protein (hs-CRP) and Interleukin-6 (IL-6) levels were measured before the procedure. Histomorphometric analysis of the debris from the filters was performed in all patients. All patients were followed-up for 5 years and major cardiovascular events (death, myocardial infarction and stroke) were recorded.

**RESULTS:** Procedural success was 98.75%. The incidence of cumulative disabling stroke, myocardial infarction and death at the follow-up was 19%. Higher pre-procedural levels of hs-CRP and IL-6 were associated with clinical events at follow-up ( $p = 0.0044$  and  $0.04$  respectively). Furthermore, a significant correlation was found between preprocedural hs-CRP and IL-6 and both the total number of particles (respectively  $p = 0.03$ ;  $r = 0.3$  and  $p = 0.02$ ,  $r = 0.3$ ) and the mean debris area per filter (respectively  $p = 0.04$ ;  $R = 0.3$  and  $p = 0.02$ ,  $r = 0.3$ ). Finally mean debris area per filter was significantly associated with a higher incidence of events at follow-up ( $p = 0.048$ ).

**CONCLUSIONS:** Preprocedural levels of hs-CRP and IL-6 are predictive of neurological and cardiovascular events at follow-up. Patients with higher levels of hs-CRP and IL-6 presents a greater number of debris embolizing particles suggesting that systemic inflammation is associated with a higher plaque instability

#### **OP-459-THE EFFECT OF ANEUMASTAT ON AORTIC ANEURYSM FORMATION IN A RABBIT EXPERIMENTAL MODEL**

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**OBJECTIVE:** To determine whether treatment with epigallocatechin-3-gallate (EGCg) can influence the development of experimental aortic aneurysms.

**METHODS:** A total of 24 rabbits were randomized in group I ( $n = 3$ ) where the abdominal aortas were exposed to 0.9% NaCl and in groups II ( $n = 7$ ), III ( $n = 7$ ) and IV ( $n = 7$ ) where the abdominal aortas were exposed to CaCl<sub>2</sub> 0.5 mol/L for 15 minutes after laparotomy. Groups I and II received placebo whereas groups III and IV received AneuMastat daily containing 10 and 5 mg/kg of EGCg respectively, starting the day of surgery. Aortic diameters were measured at baseline and 4 weeks after aneurysm induction. In addition, aortas were harvested at 4 weeks and evaluated for inflammation (grade 0-3) and calcification (grade 1-3) by an independent pathologist.

**RESULTS:** Group I had normal aortas with 5% increase in aortic diameter without inflammation (mean score 0) and without calcification (mean score 1.00). The mean increase in the diameter of the aortas was 58% in group II compared to 27% in group III ( $P = 0.025$ ) and 26% in group IV ( $P = 0.021$ ). The grade of inflammation compared to group II was reduced both in group III (1.43 vs. 2.57,  $P = 0.006$ ) and IV (1.85 vs. 2.57,  $P = 0.115$ ). There was no difference in the degree of calcification between groups III (2.43) and IV (2.23) compared to group II (2.43,  $P = 0.999$  and  $P = 0.591$  respectively).

**CONCLUSIONS:** AneuMastat containing EGCg in doses of 10 and 5 mg/kg/day significantly reduced the aortic aneurysm formation in this experimental model. The grade of inflammation was significantly reduced with the use of 10 mg/kg/day. AneuMastat may be useful as an adjuvant therapy to suppress the growth of small aortic aneurysms.



## DEVICES I

### OP-460-EARLY EXPERIENCE WITH IMPLANTABLE MECHANICAL CIRCULATORY SUPPORT DEVICES (MCSD) IN SEVERELY AND MORBIDLY OBESE PATIENTS

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**BACKGROUND:** The dual epidemics of heart failure and obesity are changing the practice of cardiac transplantation for heart failure. We describe our early experience with long term MCSD's in severely obese (Body Mass Index, BMI > 35) or morbidly obese (BMI > 40) patients.

**METHODS:** Over the past three years, 10 MCSD were implanted at the Ohio State University Medical Center in patients whose BMI was greater than 35 (BMI range 35 to 49.4, mean 40.3). These patients were ineligible for cardiac transplantation at the time of the initial surgery. Eight patients were implanted with a HeartMate XVE and two with a HeartMate II device. All but two patients were implanted with the intention of destination therapy. All were dependent on pre-operative inotropes, two of whom had a pre-operative intra-aortic balloon pump. Mean ejection fraction was 17%. Mean left ventricular end diastolic diameter was 6.9 cm.

**RESULTS:** All implantations were successfully completed. There were no operative mortalities. There were no cerebral vascular accidents. None of the patients required re-exploration for hemorrhage. No patients required unplanned right ventricular assist device placement. All patients were eventually discharged home; mean length of stay was 28 days (14 to 42 days). To date, only one patient has been transplanted. There has been one death after 16 months of support (an intracranial hemorrhage in an outpatient).

**CONCLUSIONS:** Implantation of long term MCSD can be performed safely in patients with severe or morbid obesity, without significant perioperative morbidity in this critically ill patient cohort. The usefulness of MCSD as a bridge to transplant in this cohort remains a question.

### OP-461-USE OF HAEMOFILTRATION DURING CARDIOPULMONARY BYPASS HAS NO EFFECT ON THE INCIDENCE OF ATRIAL FIBRILLATION AFTER CORONARY BYPASS GRAFTING SURGERY

*Musleh, Ghassan; Datta, Subir; Prior, Natasha; Prendergast, Brian; Kotoulas, Christophoros; Grotte, Gier; Keenan, Daniel; Younan, Nizar; Farid, Shakil; Hasan, Raghib*  
Heart centre, Manchester Royal Infirmary, Manchester, United Kingdom

**OBJECTIVES:** Assessment of the effects of hemofiltration during Cardiopulmonary Bypass (CPB) in Coronary Artery Bypass Grafting (CABG) on the incidence of Atrial fibrillation and any correlation with IL6 and IL10 levels.

**METHODS:** Seventy-seven patients scheduled for elective CABG were prospectively randomized into two groups. Group A (38 patients) with a Hemofilter attached to arterial line of the CPB circuit and Group B (39 patients) without a Hemofilter. The two groups were comparable in their sex, and previous history of myocardial infarction, Left Ventricular function, cross clamp time, bypass time and total grafting per patients and Inotropes use in the ITU. The filter group was significantly older (68.4 years versus 63.9 years) and more symptomatic. IL 6 and IL 10 were measured in blood samples collected 1 h before surgery, on arrival to ITU and after 12 h. IL6 and IL10 levels were measured using ELISA test.

**RESULTS:** Atrial fibrillation occurred in 28 patients. 15 in the hemofilter group and 13 in those without hemofilter. There were no difference between the groups in IL6 level during the first 12 hours post operatively. IL10 level were significantly higher in the Hemofilter group at 12 hours postoperatively. There were no effects of the Hemofilter on postoperative IL6 and IL10 levels. Use of Hemofiltration during CPB was found to no effect on the incidence of atrial fibrillation after Coronary Bypass surgery.

**CONCLUSIONS:** Hemofilter use during cardio-pulmonary bypass in Coronary Artery Bypass Grafting surgery has no effects on effect on the incidence of Atrial fibrillation.

### OP-462-IMPROVEMENT IN OUTCOME FOR CHILDREN WITH SEVERE HEART FAILURE UNDERGOING MECHANICAL SUPPORT

*Griselli, Massimo; Crossland, David; Kirk, Richard; Haynes, Simon; Cassidy, Jane; Hasan, Asif*  
Freeman Hospital, Newcastle-upon-Tyne, United Kingdom

**BACKGROUND:** The technology for supporting children with severe heart failure continues to evolve. We reviewed our 10 year experience of mechanical support in these children and assessed the impact of the introduction of new devices.

**PATIENTS AND METHODS:** From 1998 to 2007, thirty-six children (median age 45 months, range 1-191) in severe heart failure were mechanically supported at our institution. Twenty four had dilated cardiomyopathy, one restrictive cardiomyopathy, one myocarditis, two anthracycline related cardiomyopathy, seven congenital heart disease and one neonatal myocardial infarction. Extra Corporeal Membrane Oxygenation (ECMO) has been used throughout, in 17 patients as the only method of support and in six patients as resuscitation prior to pulsatile assist. The MEDOS HIA-VAD Biventricular Assist Device was introduced in 1999 and used in seven patients. This was replaced by the Berlin Heart EXCOR® in November 2005 which was implanted in 10 patients. In 2007 the Levitronix® device was introduced for selected cases and has been used in two patients.

**RESULTS:** Twenty-two of the 36 patients survived to discharge (61%). Twenty-five (69%) children were bridged to transplant with four early postoperative deaths. The survival to discharge rate was 45% prior to the introduction of the Berlin heart and 80% afterwards. The duration of support has increased from a mean of nine days (3-23) to a mean of 56 days (2-150) since November 2005. An eight month old child was supported for 120 days with a Berlin heart to recovery from myocarditis. The device was successfully explanted and he has normal ventricular function three months following discharge home. Eight patients with a Berlin Heart were extubated and could be managed on the ward. Eight of the 10 deaths before transplantation were the direct result of either thromboembolic neurological complications or cerebral haemorrhage. One patient supported with Levitronix® had a embolic stroke at the time of transplantation and clots were seen inside the native left ventricle. He has a residual hemiplegia. None of the other survivors supported since 2005 have a clinically significant neurological deficit.

**CONCLUSIONS:** Introduction of the Berlin Heart has enabled smaller children to be supported for longer periods in a high-dependency setting with improved survival. This extended period may allow time for recovery in selected patients who previously would have been transplanted or died.

### OP-463- LVAD IMPLANTATION AS DESTINATION THERAPY IN NON-HEART-TRANSPLANT PATIENTS - A SINGLE CENTER EXPERIENCE

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**BACKGROUND:** Life expectancy and quality of life is severely reduced in NYHA IV patients. When conservative treatment options (optimal medication, CRT) are exhausted and transplantation is not indicated, LVAD-implantation may improve clinical symptoms, exercise capacity and prognosis of these patients.

**METHODS:** Between 4/2006 and 11/2007 a Heartmate II LVAD (Thoratec Inc.) was implanted in 12 patients (10 male, 2 female). At the time of implantation the mean age was 61.4 yrs (48 -70 yrs). All patients were in NYHA IV preoperatively. Mean ejection fraction was 18% (12%-24%) and all patients were immobilized due to heart failure. All patients had preoperatively impaired kidney and/or liver function. 10 patients had concomitant heart surgery procedures (advanced valve disease, bypass surgery) and in 1 patient weaning off catecholamine support was unsuccessful 22 days after emergency surgery (decompensated AVR, CABG after acute myocardial infarction). Contraindication for transplantation was age (n=7), patients refusal to heart transplantation (n=2), prostate cancer (n=1), severe diabetes and peripheral vascular disease (n=1).

**RESULTS:** 1 Patient died postoperatively on day 17 due to pneumonia/sepsis. 1 patient developed a chronic drive-line infection at skin-level and died on day 594 of sepsis/multiorgan failure. 9 patients are fully mobilized and discharged home. Complete postoperative observation time is 2112 days (8-593 days). All surviving patients are in NYHA I-II postoperatively. We did not observe a neurological event or device dysfunction. Kidney and liver function regained nor-

mal values in all patients. Postoperatively the Karnofsky-Index increased from 22% (10-30%) to 84% (50-100%).

**CONCLUSIONS:** The improved technology of currently available assist devices offers a reliable treatment option for selected patients with end-stage heart failure.

#### **OP-464-MECHANICAL CIRCULATORY SUPPORT. IMPROVED RESULTS WITH OPTIMISED PATIENT SELECTION IN A NON TRANSPLANT CENTRE**

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**BACKGROUND:** Although mechanical circulatory support (MCS) with implantable left ventricular assist devices (LVADs) has been proven more beneficial in terms of survival and quality of life in comparison to optimal medical treatment (OMT), it has been related to several and serious adverse events. Patient selection and newer generation devices promised to overcome these limitations and recent data suggested better results justifying optimism. The purpose of this study is to present the cumulative results of application of implantable LVADs in a non transplant centre.

**METHODS:** Five patients with advanced chronic heart failure received MCS with implantable devices as permanent support (Novacor, n=1, Jarvik 2000, n=2) or bridge to recovery (Levacor WorldHeart, n=2). The patient implanted with the Novacor was suffering from ischaemic cardiomyopathy, having an INTERMACS profile 2 ("sliding on inotropes"). He required biventricular support in the early postoperative period. The 2 patients implanted with the Jarvik 2000 were suffering from non compaction cardiomyopathy, having an INTERMACS profile 3 ("inotrope dependent stability"). The two patients electively bridged to recovery were suffering from idiopathic dilated cardiomyopathy, having an INTERMACS profile 4 ("frequent flyer"). A combined treatment including reparative heart failure surgery, elective MCS, resynchronization treatment (CRT) and OMT was employed.

**RESULTS:** The patient implanted with the Novacor was successfully weaned from right ventricular support, but died on left ventricular support due to sepsis related cerebral haemorrhage. This poor outcome was at least partly attributed to very advanced disease and right heart failure requiring support with an extracorporeal pump (Centrimag, Levitronix). There were no major adverse events during or after support in the other 4 patients. Two patients were successfully and electively bridged to recovery after a support period of approximately 3 months and remain alive and well (NYHA class II) 18 and 16 months respectively after device explantation. The two patients implanted with the Jarvik 2000 remain alive and well 14.5 and 13 months after device implantation. The total support period is 35 patients - months (mean: 210±193 days, median: 87 days, range: 40 to 440). The cumulative survival at almost 2 years is 80% (survival on support at three months was 80% and the 1-year survival was 80%). All survivors live near normal lives, free of hospitalizations.

**CONCLUSIONS:** In this study we present the cumulative outcomes with long term MCS in a non transplant centre. Although the small number of patients does not allow generalized conclusions, we believe that careful patient selection as well as application of newer generation devices and careful management has probably contributed to excellent medium term results.

#### **OP-465-PREDICTION OF CARDIAC RECOVERY DURING MECHANICAL UNLOADING IN PATIENTS WITH DILATED CARDIOMYOPATHY**

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**BACKGROUND:** During ventricular assist device (VAD) unloading clinical recovery which allows reliable weaning from VADs is possible even in patients with chronic heart failure. After 13 years of weaning experience, we searched for parameters that are predictive for post-weaning cardiac stability and thus helpful for future weaning decisions.

**METHODS:** Among 81 patients weaned since 3/1995, a homogenous group of 35 patients with idiopathic dilated cardiomyopathy (IDCM) weaned from LVADs were selected for evaluation. We evaluated echocardiographic data obtained before LVAD implantation and during final "off pump" trials before LVAD removal, histological changes and serum anti- $\beta$ -1-adrenoreceptor autoantibody disappearance during unloading, duration of mechanical support

and duration of HF.

**RESULTS:** The 10-year post-weaning survival reached 70.7 ±9.2%. Freedom from HF recurrence at 5 years after weaning was 61.3 ±9.0%. Patients with post-weaning cardiac stability were younger, history of HF and recovery time during unloading shorter, and pre-weaning LV assessment revealed higher LVEF, lower short/long axis ratios, higher end-diastolic relative wall thickness (RWT) and higher systolic wall motion velocities ( $p < 0.05$ ). For LVEF ≥ 45% at LV enddiastolic diameter (LVEDD) ≤ 55mm the positive predictive value for ≥ 5 years cardiac stability reached 87.5%. The time course of LVEF during the first 6 months after LVAD removal also appeared predictive for long-term stability after weaning. Also history of HF > 5 years and pre-weaning instability of unloading-induced cardiac recovery appeared predictive for HF recurrence after LVAD removal. Neither reduction in myocardial hypertrophy and fibrosis nor serum anti- $\beta$ -1-adrenoreceptor autoantibody disappearance during unloading appeared predictive for post-weaning stability.

**CONCLUSIONS:** In IDCM, weaning from LVADs can be successful for > 13 years even with incomplete cardiac recovery. Pre-explantation LVEF, LVEDD and enddiastolic RWT, stability of unloading induced recovery before LVAD explantation, duration of LVAD support and duration of HF before LVAD implantation allow distinction between patients with and without the potential to remain stable for > 5 years after LVAD removal. Time course of LVEF during the first 6 post-weaning months is helpful for prognostic assessment.

#### **OP-466-A METANALYSIS ON THE USE OF EXTRACORPOREAL MEMBRANE OXYGENATION FOR CARDIAC ARREST IN ADULTS**

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**BACKGROUND:** The use of Extracorporeal Membrane Oxygenation (ECMO) for the treatment of adult cardiac arrest of any etiology continues to be based on personal experiences, subjective considerations and ECMO availability rather than evidence based criteria. To define predictors of mortality we performed a meta-analysis of individual patient's data from observational studies and case reports.

**METHODS:** A Pubmed search (January 1990 - March 2007) of English language publications retrieved 141 abstracts. Following pre-established exclusion criteria a total of 20 publications were selected, 11 clinical series and 9 case reports. Unadjusted odds ratios of dying before hospital discharge were calculated using logistic regression with single independent variables. The independent variables crudely associated with dying by discharge were considered when developing multiple logistic regression models.

**RESULTS:** Individually identified patients (n=135) were integrated in our meta-analysis. The Male: Female ratio was 1.6:1. Overall survival to hospital discharge was 39.9% (54/135). Survival was higher but not enough to be statistically significant for females (46.5%). Median age of patients was 56 years (range 18 - 83) and median ECMO run was 54 hours (range 0-3881), with females having a significantly shorter run ( $p=0.04$ ). The most common diagnosis leading to cardiac arrest was acute myocardial infarct (48/135 patients). Mortality for those with cardiac arrest due to cardiomyopathy or heart transplant failure was 100% (n=12) but not significant due to small number of cases. Odds ratio for mortality were higher for age group 41-56 years (OR 2.9 95%CL 1.6-8.2) and those above 67 years of age (OR 3.4 - 95%CL 1.2-9.7). Length of ECMO support in days was also a predictor of mortality with significant better outcome for those supported between 0.875 and 2.3 days (OR 0.2- 95%CL 0.07-0.6). There was a negative trend in survival when manual Cardiopulmonary Resuscitation lasted over 30 minutes without prompt ECMO initiation (OR 1.9 95%CL 0.9-4.2).

**CONCLUSIONS:** This meta-analysis on the use of emergency ECMO support for cardiac arrest in adults confirms better outcomes when ECMO is employed for shorter periods in younger patients and after an expeditious implementation. Although a Cost-Benefit analysis is needed, the use of this technique in elder patients should be seriously reconsidered. The incidence of neurological complications on survivors is likely high but inadequately described in the reviewed literature.

#### **OP-467-OUR EXPERIENCE WITH THORATEC MECHANICAL HEART SUPPORT**

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**MATERIAL:** From April 2003 to November 2007 we used Thoratec mechanical

heart support at 50 patients as bridge to transplant (HTx) - 40 men and 10 women of an average age 48 years (18-66). The basic disease was: dilatational cardiomyopathy at 24 patients, CHD at 20 patients, valve disease at 4 and congenital heart defect at 2. Heart failure had indicated the introduction of support at 43 patients, ventricular arrhythmia at 4 patients and high pulmonary vascular resistance at 3. The BIVAD support was introduced at 47 patients and LVAD at 3 patients. We used the PVAD at 46 patients, IVAD at 2 patients and Heart Mate II at 2 patients.

**RESULTS:** Out of the total number of 50 patients 36 were transplanted, 12 died because of thrombo-embolism or infective complications and two patients are on device. The mean waiting time on device was 78 days (max.209) and total experience is 3224 patients/days. One-year survival after HTx is 88%. During the support the function of kidneys and livers was improved, the pulmonary vascular resistance was normalized so the patients could be transplanted.

**CONCLUSION:** VAD is an effective method as a bridge to transplant. The HTx results after VAD are comparable with HTx without VAD. It is a good therapeutic modality for patients with high pulmonary vascular resistance.

### OP-468-THE SWEDISH EXPERIENCE WITH THE IMPELLA RECOVERY® AXIAL-FLOW SYSTEM IN ACUTE HEART FAILURE

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**BACKGROUND:** The Impella® recover is a minimally invasive mechanical assist system to be used in acute or advanced heart failure with applications for both right and left ventricular failure. In this retrospective study the use of this device is reported from three institutions in Sweden.

**METHODS:** 51 patients (35 men, mean age 55.8 years, range 26 to 84 years) underwent implantation of 26 Impella®LP 2.5/5.0 (support time 0.1 to 14 days, mean 4.6 days), 16 Impella®LD (support time 1 to 7 days, mean 4.1 days) and 9 Impella®RD (support time 0.1 to 8 days, mean 4.1 days) between 2003 and 2007. Implantations were performed as a consequence of "failure-to-wean" (n=19), cardiogenic shock (n=20) or myocarditis (n=6). Indications were mainly "bridge-to-recovery" (n=35) or "bridge-to-bridge" (n=9). Patients were further stratified according to whether they had undergone cardiac surgery (surgical group, n= 33) or not (non-surgical group, n= 14).

**RESULTS:** Overall early mortality (30 days) was 44 % (22/50). Early mortality in the surgical and non-surgical groups was 45.5 % and 21.4 %, respectively. The 1-year mortality was 64% (21/33) and 21% (3/14) respectively. Overall morbidity was mainly respiratory infections and/or septicemia in 32 %, impaired renal function necessitating dialysis in 38 %, right ventricular failure in 32 %. The survivors in the surgical group had a significantly higher cardiac power output (CPO) at 6 hours, higher CPO, cardiac output and mixed venous oxygen saturation (SVO<sub>2</sub>) 12 hours postoperatively than the non-survivors.

**CONCLUSIONS:** Impella®recover axial flow pump system is a user friendly and minimally invasive short-time mechanical assist system with applications for both right and left ventricular failure. The Impella device has in our hands been easy and safe to use and this device has its role in the treatment of severe heart failure after cardiac surgery for short-term use as bridge-to-recovery, bridge-to-bridge or bridge-to-decision. Optimised hemodynamics postoperatively seem to be of importance for the long-term survival.

### OP-469-SIGNIFICANTLY BETTER HEALTH STATUS FOLLOWING THIRD GENERATION LEFT VENTRICLE ASSIST DEVICE THERAPY

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**BACKGROUND:** The VentrAssist left ventricular assist device (LVAD) is one of the more recently developed LVADs designed for patients who potentially require long-term circulatory support. The purpose of this study was to describe functional status over time following VentrAssist LVAD implantation.

**METHODS:** The "Better Results and Cost Effectiveness" (BRACE) trial is an open, non-randomised, case-controlled observational trial conducted at centres in Europe. The trial is not an "intention-to-treat" trial and the inclusion criterion is "need for mechanical left ventricular support". Quality Of Life status (EuroQOL) was recorded at baseline and at subsequent visits for each patient. The responses for morbidity, self-care, usual activities, pain/discomfort and depression/anxiety were recorded along with current health status.

**RESULTS:** The average Health Status Score at 1 year follow-up was (77.5±10.6)

which is significantly better than at baseline (32.2.1±21.6). Showing that patients perceived better health status was inline with observed benefits in self-care, less morbidity, less problems with daily activities, some problems with pain/discomfort and the same level of depression/anxiety at 1 year follow-up.

**CONCLUSIONS:** The patient perceived better health status and actual health state improved significantly after implantation and continued during the first year of follow-up after VentrAssist LVAD implantation.

### OP-470-VENTRICULAR ASSIST DEVICE IMPLANTATION IN A NON-TRANSPLANT CENTER - A SINGLE CENTER EXPERIENCE

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**BACKGROUND:** More and more patients undergoing cardiac surgical procedures with borderline cardiac function or reaching the hospital after fatal heart attacks. Furthermore, because of donor shortage, the number of patient with terminal heart failure awaiting heart transplantation is increasing. Nowadays implantation and handling of VADs are standardized and should not restrict only to transplant centers.

**METHODS:** Between 2001 and 2007, 15 patients, all male, received a ventricular assist device in our center. We used Thoratec paracorporeal (uni- and bi), Heart Mate I and II system. 6 patients received a biventricular and 9 patients a left ventricular assist device.

**RESULTS:** Mean age at the time of implantation was 47.6 years, all patients suffering from severe cardiogenic shock, caused by coronary artery disease in 12 patients and cardiomyopathy in 3 patients. In 5 patients the VAD was implanted after cardiac resuscitation. The average time on the device was 120.7 days (range 1-407 d). Six patients were transplanted and are still alive, one patient was weaned and the device explanted and one patient (407days) is on the device, listed for heart transplantation. 3 patients died early from multi organ failure (day 1-13.) after implantation. Only 1 of 4 late deaths (day 69-101) was related to a driveline infection.

**CONCLUSIONS:** Today, doing high risk cardiac surgery is only possible with an assist device program in the background. Our experience showed a good survival rate (53 %) of our patients, although all patients were preoperative in a cardiogenic shock or under resuscitation. Without assist device all of them would have died.

### OP-471-A NEW INTRAVASCULAR LEFT VENTRICULAR ASSIST DEVICE: THE IMPELLA RECOVER LP 5.0.

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**OBJECTIVES:** We present the preliminary results of the Impella Recover LP5.0 microaxial left ventricular pump in different indications.

**METHODS:** Five patients presenting with left ventricular heart failure were implanted. Indications were: heart failure unsuitable for external LVAD pump in one, cardiogenic shock due to massive anterior infarction for the second, bridge to transplant in another, abdominal aortic aneurysm surgery in one and post cardiomy for a last patient. One implantation was done through femoral way, the others being implanted through right subclavian artery after interposition of an 8mm Dacron™ graft. All implantations were done under fluoroscopy guidance.

**RESULTS:** The first patient was weaned after 15 days as the colonoscopy revealed a metastatic adenocarcinoma (patient died), the second was weaned after 18 days and is scheduled for heart transplantation, and the third was transplanted after 14 days of heart support. For the fourth patient, the abdominal aortic aneurysm surgery was performed with cardiac uneventful recovery. The last patient was switched for external BiVAD on POD3 and died on POD7 from multiple organ failure. All the patients implanted via a subclavian way were rehabilitated early. We didn't note any wound infection in any patient.

**CONCLUSION:** The Impella Recover LP5.0 microaxial left ventricular pump seems to be a very efficient and easy to implant pump. Used in selected patients in bridge to recovery, bridge to transplantation or bridge to bridge, it allows early rehabilitations of the patients. The right subclavian way seems to be the most adapted way for elective implantation



## CORONARIES I

### OP-472-CORONARY ARTERY BYPASS SURGERY IN OLD AGE GROUP: IS AGE ITSELF A MATTER?

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**BACKGROUND:** Although coronary artery bypass graft (CABG) surgery is frequently performed operation in patients aged seventy years and older. There are few studies available who determine the causes of operative mortality in this age group. Therefore we analyse the data to identify risk factors that may adversely effect mortality in this age group.

**METHODS:** Between Jan. 2002 to Dec. 2006, 53 consecutive patients of 70 years or older underwent primary isolated CABG on cardiopulmonary bypass (CPB) in our unit. Thirty six (68%) were male. The mean age was  $72 \pm 3$  years (range 70 to 81 years), preoperative 80% were in New York Heart Association (NYHA) class III or IV, Left main stem (LMS) lesion (more than 70%) was present in 17(32%), renal impairment (RI)with creatinine more than 2mg/dl was present in 9 (17%) patients, stroke was present in 6(11%) . Emergency surgery {within 48 hours after Myocardial Infarct (MI)} was performed in 28 (53%) patients.

**RESULTS:** the overall hospital mortality (30 days) was 11%. The mean parsonet score was  $23 \pm 3$ , and  $10 \pm 3$  in those who died or survive respectively. Mean intensive care unit stay was  $2 \pm 1.2$ , mean ward stay was  $6.2 \pm 3$ . Preoperative RI, LMS lesion or MI less then 48 hours, poor left ventricular function, prolonged CPB time and post operative stroke were the significant independent predictors of operative mortality.

**CONCLUSIONS:** CABG can be performed in a selected elderly population with low morality. Careful high risk factors determination can helpful to improve post operative morality. Only age itself may not responsible for high morality.

### OP-473-CORONARY VASCULAR RESISTANCE - AN EASY MEASUREMENT GIVES EARLY WARNING FOR GRAFT FAILURE

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**BACKGROUND:** After the completion of a distal anastomosis the surgeon usually injects cardioplegic solution through the graft and, in doing so, gets an impression of the run-off into the vessel. An experienced surgeon can decide if the run-off is good or bad, and if he/she must redo the anastomosis. This impression is totally subjective and needs to be quantified. If the resistance over the graft, anastomosis and receiving vascular bed could be measured reliably, guidelines could be created. In an earlier study, we measured the resistance with a motor driven syringe and pressure transducers. The level of the resistance peroperatively correlated well to the flow measured after bypass.

**METHODS:** The tedious set up we used earlier can now be replaced with a syringe equipped with a data chip and a wire to a laptop. A manual injection can be performed exactly as in routine surgery, but pressure, flow and resistance are automatically calculated (Myoflow). We used this system experimentally in ten pig hearts and sutured 6 mm GoreTex grafts to the LAD. Multiple injections were performed in every heart by two surgeons simulating different conditions of run-off such as kinking the graft and compromising the native vessel.

**RESULTS:** Measurements were successful in 100 %. Pressures were kept within acceptable limits, 56 - 69 mm Hg, by a warning signal if the pressure tended to rise. Flow varied between 35 and 51 ml/min. Mean coronary vascular resistance (mCVR) varied between 1,1 and 1,94 resistance units. All of the data were stored automatically on the computer and were displayed graphically.

**CONCLUSION:** We know from earlier experiments that CVR 2,5 - 3 correlates to inferior flow during flow measurements post bypass. Calculating the CVR during the construction of anastomoses thus will give an early warning of possible malfunction alerting the surgeon to the necessity of correcting the problem at an early stage. Low flow may also be due to competition of different vascular beds, and in such a case, a good CVR measured with the heart at rest can be a reason not to go on bypass and try to redo the anastomosis. The CVR

measurement could be advantageous for teaching. It could also be a new research tool as conditions measured with the heart at rest, and one vascular bed at a time being measured, could be compared with the measurements performed on a beating heart subjected to stress hormones and vasoactive amines with all vascular beds filled.

### OP-474-USE OF THE CARDICA PAS-PORT AORTIC CONNECTOR SYSTEM: EARLY RESULTS IN CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** The PAS-port device eliminates the need for aortic clamping during coronary artery bypass grafting (CABG) for the proximal anastomoses between vein grafts and aorta, and may reduce the incidence of stroke in the elderly and in patients with severe atherosclerotic or calcified aorta.

**METHODS:** Thirty-six PAS-Port devices were used in 34 patients (mean age  $67 \pm 9.8$  years, six females) with logistic EuroSCORE  $5.1 \pm 5.5$  submitted to CABG between October 2006 and December 2007. Outcome variables studied were intraoperative device performance and 30-day mortality, 6-12-month (earlier implants, n=10) CT-scan angiographic graft patency, and clinical follow-up.

**RESULTS:** Off-pump CABG was performed in 21 patients (61.8%), mean number of grafts per patient was  $2.5 \pm 0.5$ ; bilateral internal thoracic artery was used in 5 patients (14.7%); in 5 patients (14.7%) was performed a Y-graft between PAS-Port anastomosis and other vein graft for other territories, in order to avoid aortic clamping; PAS-Port-dependent distal anastomoses were 41/74 (55.4%). Deployments of PAS-Port devices were successful in all patients. No bleeding was recorded. One patient died during hospitalization for pulmonary sepsis, with graft patency evaluated with angio-CT scan and another patient during rehabilitation, for AV block. CT-scan angiographic graft patency for PAS-Port device proximal anastomoses and for PAS-Port-dependent distal anastomoses was observed in all patients studied. No cardiac related death or myocardial infarction was observed in all survivors during 12-month follow-up period.

**CONCLUSIONS:** In-hospital results, 6-12-month patency rate and clinical follow-up data using PAS-Port device are very good; patency and 12-month clinical follow-up results compare favorably with data from hand-sewn controls. PAS-port system safely allows the clampless creation of proximal aorta anastomoses in CABG surgery.

### OP-475-REPEAT SURGERY FOR CORONARY ARTERY BYPASS GRAFTING - THE ROLE OF THE LEFT THORACOTOMY APPROACH

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**BACKGROUND:** Repeat coronary artery bypass surgery has increased risk compared to the first operation, including low cardiac output and injury to a patent left internal mammary to left anterior descendens (LIMA-LAD) graft. The left Thoracotomy approach has recently been advocated specifically in patients with intact LIMA-LAD grafts needing lateral wall grafting. Thus, we have evaluated the efficiency of this technique, using an off pump (OPCAB) procedure in all patients.

**METHODS:** From 2000 to 2007, 48 patients underwent redo coronary bypass via a left thoracotomy OPCAB procedure, by a single surgeon (DGH). There were 6 female patients (12.5%). Mean age was 63.8 years (45-81), and age at previous operation was 51.7 years (33-69). Four patients (8.3%) were undergoing their third operation. There were 23 diabetics (47.9%), seven (14.6%) had renal dysfunction (defined by a creatinine over 200 mmol/l), seven had a calcified ascending aorta (14.6%) confirmed by multislice CT scanning, four (8.3%) had carotid disease, ten (20.8%) had peripheral vascular disease, and ten (20.8%) had previous coronary stents. Five patients (10.4%) had a pre-operative intra aortic balloon pump inserted. The overall risk of operative mortality was 14.2%, as predicted by the logistic EuroSCORE.

**RESULTS:** Thirty six had an intact LIMA-LAD graft, and needed lateral wall grafting. Twenty patients (41.6%) required a major posterolateral thoracotomy, and in 28 patients (58.4%) we managed with a minor thoracotomy. Nine patients (18.8%) had stents placed during the same admission, as a hybrid procedure. Twelve patients (25%) additionally underwent anterior wall grafting (LAD to first marginal area). Twenty patients (41.7%) had 1 distal graft, 26 patients (54.2%) had 2 grafts, and 2 patients (4.1%) had three distal grafts performed.

The LIMA was used in 7 patients, where it had not been used before. In total 78 distal grafts were performed (including 3 sequential grafts). A total of 46 venous, and 22 radial artery grafts were used. Radial arteries were used only if the proximal stenosis was more than 70% (often the vessels were completely occluded), and were very useful as they were less likely to kink around the hilus of the lung when routed from the descending aorta. The proximal grafts were constructed onto the proximal descending aorta just distal to subclavian in 19.1%, the distal aorta at the level of the inferior pulmonary vein in 70.6%, and the left subclavian artery in 10.3%. It was possible to graft the distal branches of the right coronary (posterior descendens or right posterolateral) in 9 patients (18.8%). An indwelling subpleural catheter was placed in 31 patients, and local anaesthetic infusion gave excellent pain relief. Postoperative blood loss in the first 24 hours was 380 mls (125-1100). Mean ventilation time was 5.25 hours (0-12), length of stay in ICU 2.7 days (2-8), and length of stay in hospital 6.5 days (5-20). There were no major complications, except for one patient who died soon after extubation from suspected torsion of a graft around the hilus of the lung (mortality rate 2.1%). On follow up there was one late death. Two patients underwent cardiac catheterisation for chest pain, and the grafts were shown to be open.

**CONCLUSION:** The left thoracotomy OPCAB procedure provides a safe avenue for repeat CABG, especially in patients with intact LIMA-LAD grafts needing lateral and inferior wall revascularisation. Multislice CT scanning allows better preoperative planning especially regarding the site of the proximal graft implantation, allowing a less invasive incision. Using the off pump technique allows preservation of cardiac and pulmonary function. The in hospital mortality rate (2.1%) compares very favourably with the EuroSCORE predicted mortality (14.2%) in this challenging group of patients.

#### **OP-476-COMPARISON OF VASODILATORS ON RADIAL ARTERY VASOSPASM: ILOPROST VERSUS DILTIAZEM**

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**INTRODUCTION:** The increasing prevalence of the routine use of radial artery in CABG has rendered the pharmacological prevention of spasm of this artery in the early period a critical point. With this purpose, the effects of iloprost and diltiazem on vasospasm were compared in our study.

**METHODS:** Seventy patients who underwent CABG using the radial artery were randomized into two groups and the vasodilator effects of iloprost and diltiazem were studied prospectively. RA flow was measured using Doppler USG. Following harvesting, a 5-mm piece was removed from the RA distally for pathological examination. In Group B, diltiazem infusion was made prior to removal of the RA, while iloprost infusion was initiated 5 days prior to surgery in Group A. At the end of a two-year follow-up, each case underwent coronary angiography.

**RESULTS:** Doppler flow measurements made during harvesting revealed statistically significant flow reduction and pathological examination of the RA revealed significant luminal narrowing in Group B. Two-year angiographic follow-up revealed patent all of RA grafts in Group A. However, in the RA grafts in Group B, total occlusion was found in 3 cases (8.56%), and irregular and stenotic RA segments were found in 4 cases (11.43%).

**CONCLUSION:** The results evaluations revealed superior efficiency of iloprost over diltiazem in prevention of RA spasm in the early period and these results have been supported by two-year angiographic findings.

#### **OP-477-LONG-TERM CLINICAL IMPACT OF REMOVAL OF THE RADIAL ARTERY AS CORONARY ARTERY BYPASS GRAFT ON HAND, FOREARM PERFUSION AND FUNCTION**

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**BACKGROUND:** The radial artery (RA) has been revived in 1992 and is gaining a new interest as coronary bypass graft for arterial myocardial revascularization because of better clinical results and improved patency rate. However, a justified concern about the risk of post removal forearm and hand underperfusion, ischemia or neurological disabilities of the operated forearms is still present.

These potential complications explain partially the opposition against the routine use of the RA. The aim of this clinical study is to investigate the long-term clinical consequences and outcome of removal of the RA on perfusion, hemodynamics and functional status of the operated forearms of patients underwent coronary artery bypass grafting (CABG) with the RA conduits.

**METHODS:** Since 1997 our patients selection for CABG with the RA has been based on precise clinical criteria and careful preoperative assessment of adequacy of ulnar collateral circulation. Allen's test, Doppler study and pulse oximetry are routinely used to assess the ulnar circulation. Positive Allen's test, Raynaud's disease, Dubuytren's contracture, renal insufficiency, vasculitis and advanced peripheral vascular disease are contraindications for RA harvesting. 42 patients who underwent CABG with the RA between July 1997 and July 1998, were submitted 8-9 years later to Doppler testing for assessment of systolic flow velocities, diameter and morphology (calcifications and narrowing of lumen) of the Ulnar (UA) arteries of the operated forearms. The control side was the non operated arm. Regarding the functional status of the forearms, the patients were somministrated with questionnaires relating to symptoms resulting from underperfusion, ischemia and neurological disabilities.

**RESULTS:** This long-term clinical study confirms excellent clinical functional status of the operated forearms after RA removal. Neither symptoms of underperfusion nor ischemia (claudication and pain) were documented. Functional disabilities of the operated forearms were not observed; the patients did not complain about functional limitations or discomfort in their daily activities. Three patients (3/42) reported numbness of thumb and other four (4/42) patients reported slight hand tingling. The Doppler studies showed an increase in diameter and systolic flow velocities of the UA arteries compared to the non operated forearms. Neither calcifications nor significant increase in intima-media thickness index of the UA arteries relating to the removal of the RA were documented.

**CONCLUSIONS:** Careful preoperative patients' selection should be based on objective clinical criteria and instrumental findings for safe removal of the RA. Chronic compensatory mechanisms, as "remodeling" phenomena, develop after the removal of the RA to readjust the hemodynamics in order to offer an adequate blood supply to the operated forearms. An atraumatic surgical harvesting technique of the RA which avoids damage to important structures of the operated forearms is also mandatory to prevent long-term undesirable pathological sequelae.

#### **OP-478-NEW TECHNOLOGIES IN CORONARY SURGERY: MINIMAL EXTRACORPORAL CIRCULATION AND OFF-PUMP COMPARED TO CONVENTIONAL CARDIOPULMONARY BYPASS**

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**BACKGROUND:** Cardiac Surgery offers three options to perform coronary artery bypass grafting (CABG), conventional cardiopulmonary bypass (CCPB), minimal extracorporeal circulation (MECC) and off-pump coronary artery bypass (OPCAB). At present advantages of each technique are under discussion. In recent publications patency rates of OPCAB are inferior to those of CABG performed with cardiac arrest.

**METHODS:** We investigated 1472 coronary operations, 1143 using CCPB, 220 were performed using MECC and 109 using the OPCAB technique. All patients were recorded prospectively. Perioperative follow up was focused in the occurrence of arrhythmia, neurocognitive outcome and the need of blood and blood products.

**RESULTS:** Operative mortality was comparable in all groups. The mean number of bypass grafts reached an average of 3.2 +/- 0.6 in the MECC group, 3.4 +/- 0.7 in the CCPB group and 1.9 +/- 0.8 in the OPCAB group (p<0.01). Arrhythmia occurred in 24.8% in the MECC group, 35.6% in the CCPB group (p<0.05) and 21.7% in the OPCAB group. Neurocognitive disorders occurred in 8 patients (3.6%) of the MECC group, in 74 patients (6.5%) of the CCPB group (p<0.05) and in 3 patients (2.8%) of the OPCAB group. The median number of blood transfusions per patient was 0.8 in the MECC group, 1.8 in the CCPB group and 0.8 in the OPCAB group (p<0.0001).

**CONCLUSIONS:** Perioperative morbidity of the MECC and OPCAB technique is comparable and less compared to CCPB. The MECC technique allows coronary surgery with cardiac arrest. The benefits of longer patency rates and completeness of revascularizations favours MECC over OPCAB.

### OP-479-PREDICTORS OF ADVERSE NEUROLOGICAL OUTCOME FOLLOWING CARDIAC SURGERY

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**BACKGROUND:** Stroke is a debilitating complication of cardiac surgery. Many intraoperative and postoperative factors predict the likelihood of post-cardiac surgery stroke. We evaluated pre-operative and intra-operative parameters, seeking correlations with adverse neurological outcome following cardiac surgery. We investigated the possibility of a pre-operative carotid ultrasound scan to select patients for carotid endarterectomy pre- or intra-operatively.

**METHODS:** We conducted a retrospective analysis of 61 patients who suffered neurologic events post-cardiac surgery from 2003 to 2006. Data were collected for patient and disease characteristics, pre-operative status, intra-operative events and post-operative course. Post-operative neurologic complications were subdivided into 3 groups: mild/temporary events, moderate events, and severe events such as seizures and stroke. Mild/temporary event was defined as a focal neurologic deficit of less than 24h in duration.

**RESULTS:** A total of 2226 cardiac cases were retrospectively evaluated. Stroke occurred in 61 patients (2.7%). Mean age of these patients was  $63.7 \pm 7.4$  years; 40 (65.6%) were males. Pre-operatively, 5 (8.2%) patients had pre-operative atrial fibrillation; 27 (44.3%) patients belonged to New York Heart Association Class 3; 18 (29.5%) to NYHA Class 2, 14 (23.0%) to NYHA Class 4 and 2 (3.3%) to NYHA Class 1. The mean left ventricular ejection fraction assessed by 2-dimensional echocardiogram was  $47.2 \pm 16.7$  %. Pre-operative coronary angiography showed that 47 (77.0%) patients had triple vessel disease; 7 (11.5%) had double vessel disease and 2 (3.3%) had single vessel disease. Intra-aortic balloon pump (IABP) insertion was required pre-, intra- and post-operatively in 5 (8.2%), 7 (11.5%) and 5 (8.2%) patients respectively. In the 61 patients who suffered post-cardiac surgery neurologic complications, mortality rate was 18.0%. Twenty-nine (47.5%) suffered stroke; another 29 (47.5%) suffered mild / temporary neurological events and 3 (4.9%) suffered generalized tonic-clonic seizures. The logistic EuroSCORE of our 61 patients is found to be significantly correlated with stroke and seizures (P: 0.025) and with seizures and mild / temporary neurological events (P: 0.044). LVEF (2D ECHO) is significantly correlated with stroke and seizures (P: 0.035) and with seizures and mild/temporary neurological events (P: 0.036). Pre-operative congestive cardiac failure is significantly correlated with post-op neurological events (P: 0.040). In addition, aortic cross-clamp time correlated significantly with stroke and seizures (P: 0.004) and with seizures and mild / temporary neurological events (P: 0.001). Aortic calcification is found to be significantly correlated with the development of post-operative neurological events (P: 0.041). There is a significant correlation between presence of pre-operative carotid disease (as proven by pre- and post-operative carotid ultrasound scan) and post-op neurological events (P: 0.033). Out of the 61 patients who suffered post-cardiac surgery neurological complications, a total of 15 post-operative carotid ultrasound scans were performed and 12 (80%) indicated the presence of significant carotid artery disease, i.e. stenosis greater than 70%. However, atrial fibrillation did not correlate with post-operative stroke.

**CONCLUSION:** Obesity, pre-operative congestive cardiac failure, ejection fraction, presence of carotid stenosis, aortic calcification and aortic cross-clamp time as well as EuroScore correlate with stroke and may all predict adverse neurological outcome.

### OP-480-COMPLICATIONS AND CLINICALLY PROVEN OCCLUSIONS IN 3281 CONSECUTIVE INTERRUPTED CORONARY ANASTOMOSES PERFORMED OFF-PUMP IN 815 PATIENTS

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**BACKGROUND:** Interrupted technique was used for the construction of coronary artery anastomoses in favorable early reports on long-term patency of coronary artery bypass grafts. Experimental and clinical studies have suggested that an interrupted anastomosis may be associated with better long-term patency because of improved anastomotic compliance.

**METHODS:** Retrospective STS database analysis of 1200 consecutive unselected patients who underwent off-pump coronary artery bypass grafting in four hospitals by a single surgeon revealed 3,281 interrupted distal anastomoses

performed in 815 patients and 1,612 continuous distal anastomoses in 385 patients over an eight year period. STS data was used for comparative analysis. Clinically proven anastomotic occlusion data was obtained by analysis of the American College of Cardiology (ACC) databases for the same four hospitals over the eight year study period. Review of 42,238 cardiac catheterization procedures at the four hospitals revealed 205 patients out of the original group of 1200 (17.1%) who underwent 359 cath post-operatively.

**RESULTS:** STS complication reports reveal few differences in mortality and morbidity between the two groups. Re-operation for bleeding was 1.1% in the interrupted group and 0.8% in the continuous group (p=ns). Analysis of post-operative cardiac catheterization data revealed that in 359 cath in 205 patients 116 occluded anastomoses were identified (2.4% of 4,892 anastomoses). There were 51 occluded anastomoses out of 3,281 interrupted (1.55%) and 63 occluded anastomoses out of 1,612 continuous anastomoses (3.9%) (p<0.10).

**CONCLUSION:** Interrupted anastomotic technique does not appear to be associated with increased bleeding risk and may be associated with better anastomotic patency.

### OP-481-ATRIAL PACING IS SUPERIOR TO ATRIO-VENTRICULAR SEQUENTIAL PACING POST CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** A.V sequential pacing post coronary artery bypass grafting is considered the gold standard to date. We investigated if AAI pacing is superior to dual chamber pacing in patients with normal A.V conduction.

**METHODS:** 20 consecutive post coronary artery bypass grafting patients with a heart rate less than 70 beats per min were selected. Comparative analysis of their cardiac output and conduit flows were performed using the following pacing modalities-AAI, DDD, Bi VENTRICULAR, VVI. In all pacing modes the rate was kept at 85 Beats/minute. Data acquired was statistically analysed using the non parametric analysis, Wilcoxon Sign-Rank test.

**RESULTS:** AAI was superior to patients own rate and VVI pacing mode both in the conduit flows (p<0.001, p<0.008) and cardiac output (p<0.001, p<0.005) respectively. The cardiac output of patients who were paced AAI mode was significantly higher than on DDD mode (p<0.02), however the conduit flows were not statistically significant.

**CONCLUSION:** This study highlights that AAI pacing is the ideal mode of pacing in patients who have preserved A.V Conduction to optimize their cardiac output.

## CONGENITAL I

### OP-482-ONSET OF PULMONARY STENOSIS AFTER ARTERIAL SWITCH OPERATION FOR NEONATAL TRANSPOSITION OF GREAT ARTERIES WITH INTACT VENTRICULAR SEPTUM

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**BACKGROUND:** Pulmonary artery stenosis remains the most frequent late complication and cause of reintervention after the arterial switch operation for neonatal transposition of the great arteries. We investigated the onset, incidence, and outcomes of acquired neopulmonary stenosis, either valvular or supravalvular, after arterial switch operation in neonates with transposition of great arteries and intact ventricular septum.

**METHODS:** Arterial switch operation using Lecompte maneuver was performed in 222 neonates (162 males, mean age at operation  $1.7 \pm 0.42$  days) with transposition of great arteries with intact ventricular septum. Eighty-three (37.3%) had other associated cardiac anomalies. Medical records including follow-up (mean follow-up  $14.4 \pm 0.54$  years) and echo- or angio-cardiograms of 174 (73%) patients were reviewed for incidence of postoperative pulmonary stenosis, at either the valvular or supravalvular level. Pulmonary stenosis was defined as a thickened and doming pulmonary valve and/or a pressure gradient of 20 mmHg or greater.

**RESULTS:** During a mean follow-up of  $14.4 \pm 0.54$  years, 53 (30.4%) patients had developed pulmonary valve stenosis while 21 (12%) eventually developed supravalvular pulmonary stenosis. Serial echocardiographic studies of these 74 patients showed that at 1 month postoperatively, they started having pressure gradients in the range of 16-23 mm Hg. Onset of significant stenosis occurred as early as 90 days and as late as 7 years after arterial switch operation. Over time, mean peak pressure gradient across the valve increased to  $55 \pm 17$  mmHg. Interventional dilatation was performed without complications in 18 patients with supravalvular stenosis (main pulmonary artery, bifurcation, right and/or left pulmonary branches) while balloon dilatation and stent implantation were performed in 3 patients. Post-interventional peak pressure gradients were reduced to a mean of 16 mmHg. During follow-up of 6-12 months after intervention, severe restenosis occurred in 3 patients (2 post-interventional dilatation and 1 post-stent implantation), and operation was deemed necessary. In 53 patients, pulmonary valve stenosis was determined to have occurred at a mean of 9 months with mean peak pressure gradient across the valve of 25 mmHg. Over a mean of  $3.4 \pm 1.8$  years, the ventriculo-arterial pressure increased to  $>50$  mmHg. Hence, over a span of 12 years postoperatively, these patients (mean age  $6.3 \pm 0.4$  years) underwent pulmonary valve surgery (commissurotomy=3, homograft valve replacement=4 jugular bovine vein conduit=46). Kaplan-Meier estimates of freedom from any intervention were 94% (95% confidence interval, 90% to 99%) at 1 year and 68% (95% confidence interval, 64% to 94%) at 5 years.

**CONCLUSION:** These data indicate that over a period of time, supravalvular as well as valvular pulmonary stenosis developed after arterial switch operation for transposition of great arteries with intact ventricular septum. Relief of stenosis may be done either by balloon dilatation for supravalvular pulmonary stenosis or surgical treatment for both supravalvular as well as valvular pulmonary stenosis. However, surgical intervention is the treatment of choice for those with pulmonary valve stenosis with ventriculo-arterial pressure gradients of  $>50$  mmHg and for re-stenosis after intervention or stent implantation.

### OP-483-CONTINUOUS SELECTIVE CEREBRAL PERFUSION FOR REPAIR OF INTERRUPTED AORTIC ARCH

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**BACKGROUND:** Traditional techniques for repair of interrupted aortic arch

(IAA) necessitate deep hypothermic circulatory arrest with attendant risks of cerebral injury. Direct innominate artery cannulation allows continuous cerebral perfusion. We applied this technique in all neonates regardless of weight and review our data to determine its applicability in this population.

**METHODS:** Between September 1999 and August 2006, 19 consecutive children with IAA (11 type A, 8 type B) underwent repair using continuous, hypothermic ( $18^\circ\text{C}$ ) low flow CPB without circulatory arrest. Associated cardiac lesions (VSD [16], DORV [2] and aortopulmonary window [1]) were corrected in all except the DORV which were banded.

**RESULTS:** Age at surgery was 7 days (4-120 days) and weight 3.1 kg (2.1 to 5.8 kg). Selective cerebral perfusion was maintained at 30 mls/kg/min in all patients throughout aortic reconstruction. Aortic cross clamp, low-flow, and total CPB times were 64 (42-86), 29 (18-41) and 126 (102-205) minutes respectively. There were no deaths or neurological injury. Postoperative ventilation time and length of ICU and hospital stay were 3 (2-14), 6 (4-21), and 14 (9-25) days respectively. Follow-up, complete at 24 months (8-87), revealed no late neurologic sequelae nor innominate artery complications. There was one late aortic arch re-stenosis which required balloon dilatation.

**CONCLUSIONS:** Direct innominate arterial cannulation with continuous selective cerebral perfusion can be safely applied during repair of IAA even with low birth weight neonates. It is technically easy and associated with excellent clinical outcome.

### OP-484-REINTERVENTION AFTER ARTERIAL SWITCH OPERATION FOR THE TAUSSIG-BING ANOMALY

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**BACKGROUND:** The incidence of surgical and catheter reinterventions after arterial switch operation (ASO) for the Taussig-Bing anomaly is expected to be higher than after ASO for simple transposition of the great arteries because of the underlying morphology and due to frequently associated cardio-vascular lesions.

**PATIENTS AND METHODS:** The 37 patients who underwent ASO for Taussig-Bing heart from 1984 to 2007 were reviewed. Associated subaortic right ventricular outflow tract obstruction ( $n=29$ ), unusual coronary artery patterns ( $n=26$ ) and obstruction of the aortic arch ( $n=24$ ) were common. Total correction as a single procedure was performed in 30 patients. Events were estimated by the Kaplan-Meier method.

**RESULTS:** There were one early and 3 late deaths. Survival was  $86.2 \pm 6.6\%$  from month 54 onwards. Survivors were followed-up for a median duration of 74 months, range: 8 - 224 months. Twelve patients underwent 21 reinterventions to manage neo-pulmonary valve stenosis ( $n=9$ ), aortic arch obstruction ( $n=4$ ), regurgitation of the neo-aortic valve ( $n=3$ ), subvalvular neo-aortic stenosis ( $n=2$ ) and complete AV block ( $n=1$ ). Freedom from reintervention was  $57.5 \pm 11.4\%$  from month 112.

**CONCLUSION:** Incidence of reoperation or catheter reintervention is high after ASO repair of the Taussig-Bing heart. Right and left ventricular outflow tracts are equally involved.

### OP-485-IMPROVED SURVIVAL FOR THE MODIFIED NORWOOD PROCEDURE IN CHILDREN WITH DIMINUTIVE ASCENDING AORTA

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**BACKGROUND:** End-to-side implantation or patch reconstruction techniques of the diminutive ascending aorta ( $<2.5$  mm) frequently produce poor results, probably due to coronary insufficiency conferring significant risk for these patients during the Norwood procedure. Side-to-side anastomosis of the ascending aorta to pulmonary artery appears to reliably produce unobstructed coronary flow; we examined outcomes for this approach.

**METHODS:** Since August 2003, 9 consecutive patients with hypoplastic left heart syndrome underwent a modified Norwood procedure with side-to-side anastomosis of a diminutive ascending aorta to the pulmonary artery. All repairs employed hypothermic circulatory arrest (HCA) and a modified Blalock-Taussig shunt. After transecting the main pulmonary artery, the diminutive ascending aorta was clipped and transected proximal to the arch with cardio-



plegia administered into the ascending aorta via hand-held catheter. The ascending aorta was opened longitudinally to the bulb between the left and right coronary arteries and anastomosed to the pulmonary artery just posterior to the facing commissure of the pulmonary valve. The circulation was then arrested and the arch was reconstructed in all cases with native tissue without the use of patch material. Results with this approach were compared to 9 consecutive preceding patients (encountered July 2000-July 2003) managed with end-to-side implantation of the diminutive ascending aorta to the pulmonary artery.

**RESULTS:** 30-day and hospital survival were 100% and 88% for the side-to-side group versus 56% and 44% for the end-to-side implant group. There was no difference for total bypass or aortic cross-clamp times; however, HCA times were reduced for the side-to-side group ( $34 \pm \text{S.D. } 3.9$  minutes versus  $50 \pm \text{S.D. } 8.8$  minutes;  $p=0.0001$ ). One death occurred after discharge in the side-to-side group; all eight survivors in the side-to-side group have undergone a bidirectional cavopulmonary anastomosis [median follow-up 24 months (range 8-39 months)].

**CONCLUSIONS:** 1) In our institution, early survival and HCA times were substantially improved using side-to-side anastomosis of the diminutive ascending aorta to the pulmonary artery during the modified Norwood procedure. 2) Deaths from coronary insufficiency may be reduced with this technique compared to end-to-side implantation.

#### OP-486-RIGHT VENTRICULAR REMODELING SURGERY IN CONGENITAL HEART DISEASE USING VALVED PORCINE PROSTHESIS

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**BACKGROUND:** The reconstruction of the right ventricle outflow tract in congenital heart disease has deserved, for many years, the interest of cardiac surgeons determined to alive the anatomic obstruction and return the ventricular function.

**METHODS:** One hundred and sixty-two consecutive patients, aged 4 months to 35 years were operated. The patients were classified in 5 groups, conforming the diagnosis of the cardiac malformation: G1-Tetralogy of Fallot with pulmonary hypoplasia, 126 (77.7%) cases; G2-Pulmonary atresia with ventricular septal defect, 10 (6.1%) cases; G3-"Truncus arteriosus", 10 (6.1%) cases; G4-Transposition of the great arteries with pulmonary stenosis, 9 (5.5%) cases and G5-Pulmonary atresia with intact ventricular septum, 7 (4.3%) cases. Repair consisted of patch closure of the ventricular septal defect ( $n=145$ ), tricuspid valve repair ( $n=15$ ). In all cases a trans-pulmonary annular prosthesis, with reconstruction of the pulmonary valve, was made. In all 9 cases of the G4, the Lecompte procedure was employed. In 4 (57.1%) cases of the G5, took advantage of moderated hypoplastic right ventricle, to use a technique of one and a half ventricle repair with pulsatile bidirectional Glenn anastomosis.

**RESULTS:** There were 19 hospital deaths (11.7%) and one (0.6%) late death. One hundred and thirty surviving patients were followed from 4 months to 185 months (thirteen patients were lost during the followed up). Ten (7.6%) cases were submitted to reoperation for correction of residual lesions or prosthesis dysfunction. There was one (10%) hospital death. Actuarial survival at 185 months was estimated in 87%.

**CONCLUSION:** Right ventricular remodeling constitutes a safe and standardized technique. We believe that, the earlier reconstruction of the pulmonary valve and right ventricle outflow tract, could be preserving the ventricular performance for a long period, while is analyzed the prosthesis function. Nevertheless, the porcine pulmonary prosthesis has shown satisfactory results for a long time

#### OP-487-LATE PULMONARY VALVE REOPERATIONS AFTER CORRECTION OF TETRALOGY OF FALLOT

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**BACKGROUND:** Correction of Tetralogy of Fallot (TOF) has excellent long-term results. The aim of this study was to investigate incidence and indications for pulmonary valve reoperations late after correction of TOF.

**METHODS:** Retrospective data analysis of patients operated from 1960 through 2002 was performed.

**RESULTS:** Out of 914 consecutive patients with TOF repair, 30 reoperations on

pulmonary valve were performed. Pulmonary valve was replaced in 13 cases for severe regurgitation ( $n=7$ ) or stenosis ( $n=6$ ). Replacement was done with xenoprosthesis ( $n=5$ ) or homograft ( $n=8$ ). Mean interval between correction and replacement was  $18.3 \pm 11.1$  years (median 20.5 years). Deterioration or failure of implanted valved pulmonary artery conduits resulted in 17 replacements of conduit including concomitant procedures on peripheral pulmonary arteries ( $n=3$ ) and residual VSD ( $n=4$ ). Mean interval between valved conduit implantation and replacement was  $8.5 \pm 4.3$  years (median 11 years). In two patients it was the second replacement of valved conduit and in other two patients the third replacement.

**CONCLUSIONS:** Pulmonary valve reoperations late after TOF correction were rare in our cohort. Primary use of conduits led to increasing number of reoperations for conduit exchange, due to degeneration or failure.

#### OP-488-EVALUATION OF A RIGHT VENTRICULAR OUTFLOW SURGICAL RECONSTRUCTION BY PLACEMENT OF A STENTLESS BIOPROSTHESIS

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**BACKGROUND:** Numerous techniques for the correction of right ventricular outflow tract (RVOT) cardiac congenital disorders have been used but the perfect technique not yet exist. We evaluated the results of a stentless bioprosthesis technique as a surgical alternative in the treatment of these disorders. The porcine stentless bioprosthesis has a morphology similar to that of the native valve. Its profile allows placing in different positions, facilitating a more anatomical and physiological reconstruction, and its porcine composition obviates the need for postoperative anticoagulant use.

**METHODS:** Retrospective review of records, between January 2002 and June 2007. Sixty patients with congenital heart disease who underwent surgery for reconstruction of the RVOT were identified. We evaluated seven parameters: 1, time of cardiopulmonary bypass; 2, time of aortic clamp; 3, bioprosthesis size; 4, early postoperative outcome (30 days); 5, complications; 6, late postoperative outcome; and 7, mortality. Of the 60 patients, 27 had tetralogy of Fallot, 9 had pulmonary atresia with or without intact ventricular septum, 8 had pulmonary stenosis, 7 had double outlet right ventricle, 5 had congenital absence of the pulmonary valve leaflets, 2 had transposition of the great arteries and 2 had truncus arteriosus. We used a technique consisting of the reconstruction of the RVOT using a stentless porcine aortic root bioprostheses (AJ III) made in our institute.

**RESULTS:** Length of follow up was 3 to 48 months (mean 25). Mean time of cardiopulmonary bypass was 173 minutes, and mean time of aortic clamp was 115 minutes. Two patients underwent hybrid procedures (1 with right branch pulmonary artery balloon angioplasty and 1 with left branch pulmonary artery stenting). Currently all surviving patients are in NYHA class I or II heart failure. It was possible to place a stentless bioprosthesis greater than that corresponding to the body surface area in all patients, with an average size of 23 mm. Early postoperative outcome: Eighteen percent of patients had complications inherent to the procedure. Three patients required reoperation (1 had right branch pulmonary artery stenosis, 1 had right ventricular outflow stenosis and 1 right ventricular dysfunction). Late postoperative outcome: Five cases developed stenosis of the stentless bioprosthesis (mean time of 24 months after surgery). Of these, 2 required reoperation, 2 required balloon dilatation and 1 required stenting. Mortality: Two patients, 1 patient with a stentless bioprosthesis stenosis died during reoperation, and 1 patient with a tear of the stentless bioprosthesis developed uncontrollable bleeding.

**CONCLUSIONS:** This procedure performed at our institution appears a viable option for the reconstruction of the RVOT in patients with congenital heart disease. It is associated with low complication and mortality rates and with acceptable clinical results in the early postoperative period. Time to reoperation is increased compared to other RVOT reconstruction techniques, likely due to the greater size of the stentless bioprosthesis and a better hemodynamic profile.

#### OP-489-SURGICAL MANAGEMENT OF PENTALOGY OF CANTRELL - A 10 YEAR EXPERIENCE

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**BACKGROUND:** Pentalogy of Cantrell is a congenital syndrome consisting of cardiac defects, omphalocele, anterior diaphragmatic hernia, lower sternal cleft, and absence of the diaphragmatic pericardium. The syndrome usually presents at birth and is most often fatal. Surgical management is complicated by a thoraco-abdominal cavity which is inadequate to accommodate the heart, lungs and abdominal contents.

**METHODS:** We reviewed our cardiac surgical management of 9 consecutive infants with Pentalogy of Cantrell between 1997-2007. Patient birth weight ranged from 1.25kg-3.2kg and weight at complete cardiac repair 2.1-8.6kg (age 4 weeks to 7 months). Cardiac defects were variations of Tetralogy of Fallot (n=9) with anatomical pulmonary atresia in 1 and bilateral SVC in 3. Prior to repair, 8 patients were ventilator dependant, 3 had tracheostomies, 3 had unrepaired omphaloceles with enterocutaneous fistulae, and 3 had resistant Staphylococcal sepsis. Omphaloceles were large in 4, moderate-sized in 3, and small in 2. Four patients had initial palliation by Blalock-Taussig shunt (n=3), or pulmonary artery banding (n=1). Five patients had primary complete cardiac repair without initial palliation.

**RESULTS:** The 30 day mortality was 0% (0/9). Two premature birth infants died prior to discharge from ongoing sepsis 2 months and 2.5 months after surgery. One additional patient died 4 months postoperatively at home from a complication of tracheotomy. This patient was a term infant who weighed 2.1 kg at repair. The least complicated hospital courses occurred in term babies whose omphaloceles were able to be repaired prior to cardiac repair. Complications were common and related mostly to feeding issues and aspiration pneumonias. These seemed less frequent when parenteral nutrition was the predominant form of feeding during the first few weeks postoperatively. Venous thrombosis, sepsis, and prolonged ventilation were common postoperatively. Two patients required home ventilation for a period of months.

**CONCLUSION:** The surgical management of Pentalogy of Cantrell in infancy poses significant surgical and postoperative challenges, and successful outcome requires multi-disciplinary expertise. Although overall mortality remains substantial, early 2-ventricle repair seems advisable for most patients. Successful outcome in very premature birth infants remains elusive.

#### OP-490-EARLY AND INTERMEDIATE TERM RESULTS OF MODIFIED CARPENTIER'S REPAIR FOR EBSTEIN'S ANOMALY

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**BACKGROUND:** Ebstein's anomaly is rare congenital heart defect with hinges of septal and or posterior leaflets are displaced downward to right ventricle. Anterior leaflet not displaced, but enlarged, sail-like with valve closure displaced downwards resulting into variable atrialised right ventricle. Conversion of tricuspid Valve to mono or bileaflet in various repairs, may reduce size of annulus, resulting in gradient across Tricuspid valve or significant regurgitation, if Septal Leaflet is hypoplastic.

**METHODS:** We describe experience of Nine patients. There were four males and five females, mean age was 20.8 years ranging 9 to 45. The indications for operation were advanced NYHA functional class (III-IV) in 6 cases, cyanosis in 2 and severe arrhythmia in 1. Associated malformations were present in 6 patients. All patients had Carpentier repair, with augmentation of septal leaflet by pericardium, atrialised right ventricle was plicated by vertical and horizontal mattress sutures. Simultaneously mobilising displaced leaflets and annulus was reduced at posterior commissure, five patients had ablation of localised aberrant conduction pathways.

**RESULTS:** No early or late death. Follow up ranged 39 to 106 months. Clinical examination, x-ray chest, ECG, Echocardiography, yearly holter study were done. Eight patients are in NYHA class I, one patient had episodes of supraventricular tachycardia, residual tricuspid regurgitation, requiring right atrial plasty and right ventricle offloading by bidirectional Glenn, later converted to Fontan.

**CONCLUSION:** Repair of Ebstein is challenging. Plication of thin walled atrialised right ventricle with tricuspid annuloplasty and augmentation of septal leaflet by pericardium, (Modified Carpentier) Repair gives optimum results.

#### OP-491-THE INFLUENCE OF RIGHT VENTRICULAR DYSSYNCHRONY ON EARLY OUTCOME FOLLOWING TETRALOGY OF FALLOT REPAIR

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**BACKGROUND:** Post-operative right ventricular function and the presence of residual pressure and/or volume loading are known determinants of acute outcome following Tetralogy of Fallot (TOF) repair. While wall motion dyssynchrony has been shown as a potential mechanism of chronic RV impairment late after repair, the extent of RV dyssynchrony early after surgery is unknown. We studied the consequence of RV dyssynchrony and abnormal loading on early post-operative outcome following TOF repair.

**METHODS:** 23 TOF patients (13 males, age 0.3-12.3 years, median weight 10.1 kg) undergoing repair were prospectively studied. Tissue Doppler echocardiography was performed on induction and 24 hours post-repair. Segmental dyssynchrony, defined by delayed peak myocardial contraction, was determined at the base, mid, apical segments of the septum, RV and LV free walls. RV dyssynchrony was scored by the total number of affected segments. Pulmonary regurgitation (PR) was graded from absent to severe and the degree of volume overloading was quantified by RV end-diastolic area index (RVEDAI). Post-operative outcome measures included cardiac index (CI) by pulse contour analysis, mixed venous oxygen saturation (SvO<sub>2</sub>), lactate, ventilation and ITU time.

**RESULTS:** Pre-operatively, synchronous myocardial contraction was evident in the RV and LV free walls in all patients. Five patients had a single delayed apical segment in the septum. Post-operatively, dyssynchronous segments were noted in the RV in 23(100%) and septum in 16(70%) patients, whilst the LV remained synchronous. PR grading (9 absent, 6 mild, 5 moderate, 3 severe) was not predictive of RVEDAI or early outcome. However, in the presence of PR, the magnitude of RV dyssynchrony (median 3 dyssynchronous segments, range 1-6) correlated with increased RVEDAI ( $r=0.73$ ,  $p=0.004$ ), longer ventilation ( $r=0.64$ ;  $p=0.01$ ), ITU time ( $r=0.68$ ;  $p=0.008$ ), and development of pleural/pericardial effusion requiring drainage ( $p=0.007$ ); but not with CI, SvO<sub>2</sub>, and lactate. In contrary, the association between RV dyssynchrony and RVEDAI or early post-operative recovery course was not seen when PR was absent.

**CONCLUSION:** The magnitude of RV dyssynchrony interacts with pulmonary regurgitation to influence early post-operative outcome after Fallot's repair. Early post-operative RV dimension appears to increase with the combination of pulmonary regurgitation and RV dyssynchrony, which may ultimately affect future right ventricular performance.

#### OP-492-RESULT OF BOVINE JUGULAR VEIN (CONTEGRA®) USED FOR RIGHT VENTRICULAR OUTFLOW TRACT RECONSTRUCTION

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**OBJECTIVES:** In search for the perfect conduit for right ventricle to pulmonary artery reconstruction, we evaluated the surgical and echocardiographic results of a bovine jugular vein conduit (contega®).

**METHODS:** Between October 2000 and April 2005, 70 conduits were implanted at a median age of 10 months. Indication for implantation was, absent connection in 50, stenotic connection in 13, and used to replace pulmonary autograft in 7. Mean conduit diameter was 15 mm. All children were evaluated by echocardiography immediately after repair and at regular intervals postoperatively.

**RESULTS:** There was one early death (2%). Clinical follow up is up to 5 years (mean 30 months) and echocardiographic follow up is up to 45 months (mean 25 months). During the follow-up there were two late mortalities. Latest echocardiographic follow up revealed none or mild pulmonary regurgitation (PR) in 79%, moderate PR in 19%, and severe PR in 2%. The valve leaflet function was seen to be normal in 65%. Mild conduit stenosis seen in 5. Bilateral branch stenosis was seen in 5 children, three of which have been explanted and one was stented. During follow up transient clot formation on one leaflet was seen resolving spontaneously. Unique features of this conduit include, flow reversal in the conduit with no significant PR, reduced or absent leaflet motion identified early improves at follow-up.

**CONCLUSIONS:** Results of the contegra® in reconstruction of the right ventricular outflow tract are good. Echocardiographic characteristics are unique. The need for anticoagulation may become necessary.

#### **OP-493-IS THE PRESENCE OF INTERRUPTED IVC A RISK FACTOR IN BILATERAL CAVOPULMONARY ANASTOMOSIS?**

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**ABSTRACT:** Introduction: Bilateral superior vena cava-to-pulmonary artery anastomosis is technically challenging. We had the impression that bilateral superior vena cavae are a risk factor for poor outcome in children needing single ventricle palliation.

**METHODS:** The available demographic, operative, angiographic, and follow-up data were analyzed in 40 children undergoing bilateral cavopulmonary anastomosis (b-CPA) and the overall outcome was analysed.

**RESULTS:** Forty Patients had bilateral bidirectional glenn shunts in KFSH&RC Jeddah in the last 7 years. They were 31 males and 9 females. Interrupted IVC was present in 8 patients. Twenty four patients had a hypo right ventricular morphology and 16 had a hypo left ventricular morphology. Reoperation was needed in 3 patients for bleeding and technical stenosis. Chylothorax was found in 4 patients. Most of the survivors of a b-CPA without IIVC were converted to a Fontan circulation at 5 years of follow up.

**CONCLUSIONS:** In single ventricle anatomy, bilateral superior vena cava is more associated with interrupted Inferior vena cava than single SVC. Bilateral cavopulmonary anastomosis with IIVC has a tough early postoperative course and needs immediate postoperative anti-coagulation. We should look at and exclude or prove IIVC in cases of Bilateral SVCs. Postoperative anticoagulation in children with b-CPAs is important but should still be more explored.

## CARDIO-THORACIC I

### OP-494-REOPERATIVE AORTIC ARCH PROCEDURES: A COMPARISON WITH CONTEMPORANEOUS PRIMARY OPERATIONS

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**BACKGROUND:** Long-term survival and risk factors affecting outcome after reoperative aortic arch procedures have not been clearly described.

**METHODS:** 100 patients (67 male, 61.7±14.6yrs, 55% > 60 yrs; 17% urgent / emergent) underwent reoperative aortic arch (N=100) procedures at our institution from 1/98-12/04, and were compared to patients undergoing 145 primary transverse arch procedures. Among the 100 patients undergoing reoperation, 58 had undergone previous aortic root / arch repair; 14 had had aortic valve replacement / repair; 13 patients had had previous CABG (+ valve other than aortic); and 15 patients had miscellaneous previous cardioaortic surgery. The interval to arch reoperation (median and IQ range in years), was 12.4 (4.6-16.5) after previous aortic valve replacement; 7.0 (3.0-9.7) after previous aortic surgery; 3.3 (1.0-9.5) after previous coronary artery bypass grafting (N=13), and 6.0 (4.0-7.6) after miscellaneous other cardioaortic surgery.

**RESULTS:** Hospital mortality was not significantly different after primary and after reoperative arch procedures: 9 vs 10% (p=0.97). Multivariate analysis identified diabetes as a highly significant risk factor for mortality following arch surgery, whether primary procedure or reoperation (hazard ratio: 3.3; p=.007). Non-elective surgery and COPD (hazard ratio 2.2; p=.03) were also significant risk factors for mortality after arch replacement. Age was of borderline significance (1.02 / year; p=0.06). Reoperation (p = 0.4) had no significant impact on overall mortality following arch operations. Although operative mortality according to standard definitions was very similar between arch replacement whether as a primary or a subsequent procedure, excess mortality during the first year was higher after reoperations than in patients undergoing primary arch surgery when calculated using standardized mortality ratios (SMR's), p = 0.04. Late mortality-after one year-was 1.6 to 1.8 times that of a normal population (p=.01 for primary, and p=.10 for reoperative patients).

**CONCLUSIONS:** In this series, although crude operative mortality does not differ between primary and reoperative arch replacement, analysis of one-year mortality compared with age and sex-matched controls suggests significantly poorer one-year survival for reoperative patients. After the first year, primary and reoperative arch patients have an equivalent survival, but their late mortality is still significantly higher than that of a normal population.

### OP-495-AORTIC ROOT REPLACEMENT WITH XENOGRAFT STENTLESS VALVED BIOCONDUIT: HAEMODINAMIC BENEFITS AND CLINICAL OUTCOMES

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**BACKGROUND AND AIM OF THE STUDY:** Surgery for Aortic Root disease remains a challenging procedure: Currently Composite graft, Homograft, Autograft and Valve-Sparing procedure are the most accepted surgical options to replace it. Alternatively a new stentless aortic valved bioconduit (Shelhigh, No-React) is now available to handle aortic root disease with biologic conduit. We present our experience correlated with haemodynamic benefits and clinical outcomes.

**METHOD:** Between June 2001 and October 2007, 320 patients underwent thoracic aorta surgery and 141 had aortic root replacement; Among this 51 patients (30 males, 21 females, mean age 72±5 years) underwent aortic root replacement with implantation of Shelhigh bioconduit at our institution. 25 patients had aortic valve regurgitation, 7 had aortic valve stenosis, 12 had combined pathologies, 7 had aortic bioprosthesis failure. Concomitant procedure was myocardial revascularization in fifteen patients, five patients had concomitant mitral valve replacement and four patients had additional aortic arch

replacement.

**RESULTS:** Two patients died for multiorgan failure (2/51;3.9%) and 2 patient need chest exploration for bleeding; At follow-up (mean 26.3±14.8 months, range 1-49 months) there was no need for re-operation; in fact there was neither residual regurgitation nor residual stenosis. The mean LV end-systolic diameter decreased from 4.4 ± 0.5 cm to 3.5±0.5 cm, the LV end-diastolic diameter from 6.6 ± 0.5 cm to 4.6±0.7, and the NYHA class from 2.8 ± 0.9 to 1.27±0.4. Peak gradient evolution was favourable for all patients. At 6- month follow-up, the mean peak gradient was less than 17 mmHg for all the conduit sizes. There was no conduit-related adverse event.

**CONCLUSIONS:** Our experience with Shelhigh Bioconduit for aortic root replacement is satisfactory. The structural characteristics of this xenograft stentless aortic valve conduit ensure, easy availability, no anticoagulation therapy, excellent haemodynamical performance, high durability and an optimal alternative to homograft for treatment of the infected aortic root.

### OP-496-NEW PERFUSION CONCEPT FOR THE SURGERY OF TYPE A AORTIC DISSECTION

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**BACKGROUND:** Treatment of acute type A aortic dissection remains a surgical challenge due to prolonged operative times, bleeding complications and a considerable risk of neurologic morbidity and mortality. The following study investigates clinical results following modification of perfusion technique for cardiopulmonary bypass (CPB) as well as temperature management.

**METHODS:** Between January 2000 and August 2006, 120 consecutive patients underwent repair of acute type A dissection. Selective antegrade cerebral perfusion via the right subclavian artery combined with mild systemic hypothermia (30 °C) was used in all patients.

**RESULTS:** Mean CPB time was 144±53 minutes and mean myocardial ischemic time was 98±49 minutes. Isolated cerebral perfusion was performed for 25±12 minutes. Mean core temperature amounted to 30.1±2.2 °C. Chest tube drainage over the first 24 hours was 525±220 ml. Mean ventilation time was 54±22 hours. Elevation of serum lactate levels at 1h, 12h and 24h postoperatively rose to 22±14, 18±11 and 19±8 mg/dl respectively. We observed new postoperative permanent neurologic deficits in 5 patients (4.2%) and temporary neurological deficit in 3 patients (2.5%). The 30 day mortality rate was 5% (n=6). After a mean follow up period of 2.8 years, 104 patients (87%) were still alive.

**CONCLUSIONS:** Antegrade cerebral perfusion in combination with mild hypothermia offered sufficient neurologic protection in our patient cohort, provided adequate distal organ protection, and reduced perioperative complications in surgery for type A dissection. This perfusion strategy may help reducing perioperative complications in this particular patient population.

### OP-497-ARE Ca<sup>2+</sup> SENSITIZERS SUPERIOR TO CATECHOLAMINES DURING MYOCARDIAL STUNNING?

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**BACKGROUND:** After open-chest cardiac surgery, ventricular function remains depressed (= myocardial stunning). Catecholamines (epinephrine) improve ventricular function by increasing the intracellular Ca<sup>2+</sup> concentration. In parallel, the oxygen consumption is increased, so that hitherto intact myocardium can be jeopardized. In the very insufficient ventricle, epinephrine can even become ineffective. Since Ca<sup>2+</sup> sensitizers provide another therapeutical avenue, the effects of epinephrine and levosimendan on postischemic hemodynamics were investigated. **METHODS:** After hemodynamic steady state, isolated, blood-perfused hearts were subjected to 25 min normothermic, no-flow ischemia and 20 min reperfusion. Heart rate (HR), cardiac output (CO), left ventricular pressure (LVP), coronary blood flow (CBF), and arterio-venous oxygen difference (AVDO<sub>2</sub>) were recorded during reperfusion and after administration of either epinephrine (n=16; 0.03 µmol), or levosimendan (n=11; 0.75 µmol) or epinephrine plus levosimendan (n=5).

**RESULTS:** Epinephrine increased HR (+19%) and improved hemodynamics in terms of CO (+62%), stroke volume SV (+46%), stroke work W (+158%), LVP-max (58%), maximal pressure increase dP/dtmax (+140%), minimal pressure



increase dP/dtmin (+104%), LVPed (-9%; n.s.), and coronary resistance CR (+31%). Epinephrine impaired hemodynamics in terms of AVDO2 (+63%), myocardial oxygen consumption MVO2 (+67%) and MVO2/HR (+36%). External efficiency  $\eta$  was increased by +92% ( $p<0.05$ ). Levosimendan in post-ischemic hearts increased HR (+32%) and improved hemodynamics in terms of CO (+85%), SV (+44%), W (+115%), LVPmax (+95%), dP/dtmax (+133%), dP/dtmin (121%), LVPed (-63%), and CR (-17%; n.s.). It altered hemodynamics in terms of AVDO2 (+7.0%; n.s.) and MVO2 (+32%) and MVO2/HR (+2.3%; n.s.), ( $p<0.05$ ). External efficiency was increased by 307% ( $p<0.05$ ). In 5 additional extremely dysfunctional hearts, epinephrine was ineffective. Additional levosimendan increased hemodynamics in terms of HR (+56%; n.s.), CO (+159%), SV (+89%), work (+588%), Power (+409%), LVPmax (+168%), dP/dtmax (+102%), dP/dtmin (+78%), LVPed (-98%; n.s.), and CR (-50%), ( $p<0.05$ ). It altered hemodynamics in terms of AVDO2 (-11%; n.s.), MVO2 (+131%) and MVO2/HR (+171%), ( $p<0.05$ ). External efficiency was increased by 212% ( $p<0.05$ ).

**SUMMARY:** In contrast to epinephrine, levo-simendan improves ventricular function without increasing oxygen demand, thereby considerably improving external efficiency. Even during epinephrine resistance in extremely dysfunctional hearts, levosimendan is able to improve ventricular function.

#### OP-498-THE INITIATION OF A LUNG TRANSPLANT PROGRAMME - CHALLENGE IN 21 CENTURY

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**BACKGROUND:** Lung transplantation have gained wide acceptance in end stage lung disease. The International Society for Heart and Lung Transplantation reported 2169 lung transplants from 110 centers in 2005. Can a new transplant programme be undertaken, with results comparable to established centers? We reviewed Irish 2 years experience following initiation of a lung transplant programme in 2005.

**METHODS:** Fifty seven patients were referred for lung transplantation to the Irish Lung Transplant Programme. Sixteen patients underwent lung transplantation between May 2005 and November 2007. Fourteen patients died awaiting transplantation. The mean age of transplanted patients was 53.8 (between 29 and 65). The indication for lung transplantation included COPD ( $n=8$ ), idiopathic pulmonary fibrosis ( $n=4$ ), bronchiolitis obliterans ( $n=2$ ), cystic fibrosis ( $n=1$ ) and lymphangioleiomyomatosis ( $n=1$ ). One self-ventilated patient was supported with interventional lung assist device (Novalung) for 140 days. Immunosuppression regimen included Basiliximab, Steroids, Tacrolimus and Cellcept. First biopsy was performed 1-month post transplantation. The mean follow up time was 16.6 months (range 0.7-30).

**RESULTS:** Sixteen patients (6 male and 10 female) underwent lung transplantation between 2005 and 2007. Ten single lung transplants were completed. Six patients underwent double sequential lung transplant. Cardiopulmonary bypass was used in 2 patients (12%). Total ischemic time was between 90 to 300 min. The operative and post operative mortality was 0%. 1 patient died 10 months post double lung transplant secondary to obliterative bronchiolitis. The hospital morbidity included caecal volvulus ( $n=1$ ), sternum dehiscence ( $n=1$ ), phrenic nerve paresis ( $n=1$ ), renal failure ( $n=1$ ) and cerebral stroke ( $n=1$ ). Primary graft dysfunction was observed in 2 (12%) patients, whom required prolonged ventilation. Poorly differentiated adenocarcinoma of the native lung was detected in 1 patient one-year post single lung transplantation; this was successfully treated with pneumonectomy. Rejections were observed in 5 patients (grade A2  $n=3$ , grade A3  $n=2$ ). The cumulative 2-year survival was 92.8%, which compare favorably to international standard of 72%.

**CONCLUSIONS:** Initiation of a new lung transplant can be undertaken and provide results comparable to established lung transplant programs.

#### OP-499-THE EFFECTS OF DONOR-RECIPIENT ETHNIC MISMATCH ON EARLY AND LATE RESULTS OF HEART TRANSPLANTATION

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**BACKGROUND:** The possible linkage between donor-recipient ethnic mismatch (DREM) in heart transplantation patients and the incidence of early

rejection and cardiac allograft vasculopathy (CAV) - two major causes of increased morbidity and mortality - has been poorly studied so far.

**METHODS:** We studied all 111 patients who underwent heart transplantation between 1990 and 2006, and are under follow-up in our clinic. Clinical, demographic and endomyocardial biopsy data were retrieved from patient records. Recipient ethnic origin was Jewish in 97, Arabic in 7, non-Jewish Caucasian in 6 and Hispanic in 1 patient. Donor ethnic origin was non-Jewish Caucasian in 47, Jewish in 46, Asian in 8, Arabic in 7 and Hispanic in 3 patients. Cardiac rejection was defined as mild (ISHLT grades 1, 2) and moderate/severe (ISHLT grades 3A, 3B, 4). CAV was diagnosed by annually performed coronary angiographies, and defined for this study as luminal obstruction above 50% in at least one vessel.

**RESULTS:** DREM was found in 60 patients and ethnic matching in 51 patients. Acute rejection in cardiac biopsies performed within the first 3 months after transplantation was significantly associated with ethnic matching: No rejection was found in 57.7% of 275 biopsies in the ethnic matched group compared to 40.4 % of 241 biopsies among the DREM patients. Mild rejection was identified in 31.9% of the biopsies in the ethnic-matched, compared to 48.7% in the DREM group ( $p=0.0002$ ). There was no difference in the rate of moderate/severe rejection between the two groups (10.4% vs 10.9%). Linkage between ethnic matching and rejection in biopsies performed later than 3 months after transplantation was not statistically significant. Rejection rate was independent of transplantation venue or donor-recipient gender match. During a mean follow up period of 5.9 years (range 1 to 14) CAV was detected in 28.3% of the DREM group, compared with 19.6% among the ethnic-matched patients ( $P=NS$ ). However, average time to develop CAV was significantly shorter in the DREM group (3.5 vs. 6.0 years,  $p=0.009$ ).

**CONCLUSIONS:** Appropriate donor-recipient ethnic matching is associated with a significant decrease in early acute mild rejection rate following heart transplantation. In contrast, ethnic mismatching seems to be a risk factor associated with early mild rejection episodes and earlier development of CAV in the transplanted hearts.

#### OP-500-NEUROLOGICAL COMPLICATIONS AFTER LUNG TRANSPLANTATION

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**BACKGROUND:** Following lung transplantation (LuTX), several neurological complications (NC) occur in the post-transplant period. In this study we analyzed the frequency and factors related to the development of NC.

**METHOD:** We retrospectively reviewed 87 consecutive patients undergoing primary lung transplantation from 01/2006 till 12/2006. Underlying diseases were cystic fibrosis in 23% ( $n=20$ ), idiopathic fibrosis in 23% ( $n=20$ ), COPD in 35% ( $n=31$ ) and other indications in 19%. Mean age was 44,  $7\pm 16$  years. Analysis included the incidence of seizure (SZ), polyneuropathy (PNP), and ischemic or hemorrhagic strokes (ST). A statistical evaluation was performed by Mann-Whitney and Kaplan Meier survival curve method. The impact of possibly related factors to the development of NC was explored.

**RESULTS:** 16 events occurred in 13 patients (14.9%): 8 PNP (50%), 4 SZ (25%) and 4 ST (25%). 7 women and 6 men with a mean age of  $41.5\pm 15$  years presented NC. Mean time to development of a NC was  $36.9\pm 77.4$  days (range 6-93). Young patients developed SZ (SZ vs. non SZ:  $25.2\pm 8.2$  ys vs.  $45.7\pm 15.7$  ys,  $p=.022$ ). SZ were significantly related to the underlying disease (CF vs. non CF: 15% vs. 1.5%,  $p=.001$ ). PNP was associated with length of stay on ICU (PNP vs. non PNP:  $29.7\pm 28.8$  days vs.  $11.0\pm 12.0$  days,  $p=.018$ ) and with preoperative intubation (50% of patients transplanted on assist device). Patients transplanted on assist device showed in 13.3% ( $n=4$ ) ST, 3 in the early (day 6, 9, 11), and 1 in the late postoperative period (day 290). ST did not occur in patients, who were transplanted without assist device ( $p=.008$ ). No difference was found in survival of patients with or without NC.

**CONCLUSION:** The incidence of NC after LuTX is significant. Young patients with CF have a higher incidence of SZ; whereas transplantation on assist device is associated with a higher risk for ST. PNP is significantly related to the length of stay on ICU and to intubation before LuTX. However, occurrence of NC had no influence on survival.

## OP-501-HEART TRANSPLANTATION AFTER FAILED SURGICAL VENTRICULAR RESTORATION. IS IT AN HIGHER RISK PROCEDURE?

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**INTRODUCTION:** Patients with end-stage ischemic cardiomyopathy (IDC) and left ventricular dilatation are increasingly treated by means of surgical ventricular restoration (SVR). In some patients, SVR can delay heart transplantation (HTX). Trying to define if HTX after a failed SVR (fSVR) represents a higher risk procedure, we retrospectively analysed our experience.

**PATIENTS AND METHODS:** Since 1985 744 HTX have been performed in our Institution. From June 1999 to September 2007, 82 IDC patients underwent HTX: group A (not redo, n.37), B (redo after CABG, n.33) and C (redo after fSVR, n.12). Each group was analysed in order to establish how many patients had died in hospital after HTX. The patients in group B and C were analysed in terms of clinical characteristics, time between fSVR and HTX listing, and causes of death after HTX.

**RESULTS:** In-hospital mortality occurred respectively in group A, B, and C in 4/37(10.8%), 12/33(36.4%), and 2/12(16.7%). The mean time from CABG (group B) and SVR (group C) to the waiting list was respectively 58.1±57.3 (range 1-216) and 45.6±43.3 months (range 7-156). Preoperative clinical characteristics before HTX were similar in group B and C patients (respectively mean age 55.8±5.9 and 54.7±4.8 years - p=NS, female sex 9.1% and 8.0%, NYHA class 3.63±0.49 and 3.67±0.5 - p=NS, serum creatinine 1.4±0.3 and 1.6±0.5 mg/dl - p=NS, cardiac index 2.1±0.5 and 1.8±0.5 l/min/m<sup>2</sup> - p=NS, transpulmonary gradient 9.1±4.9 and 8.5±3.8 mmHg - p=NS), exception made for urgency, that was more frequent in group C patients (83.3%) than in group B (45.4%). In group B, mortality after HTX was due to infective complications (4 cases of septic shock, 2 cases of pneumonia), sudden cardiac arrest in the ward (2 cases, respectively on postoperative day 7 and 25), intractable low output syndrome (1 case), aortic dissection (1 case), disseminated intravascular coagulation (1 case), and systemic thromboembolism (1 case). The two group C patients who died after HTX (respectively 31 and 80 days after surgery) had multisystem organ failure; the other ten group C patients were successfully weaned from artificial ventilation a mean of 19.3±9.6 hours after surgery, and were discharged from the intensive care unit after 3.9±1.6 days; the complications observed in these patients were acute renal failure (3 cases), massive pericardial effusion (1), and acute rejection (2 episodes).

**CONCLUSION:** Our experience seems to confirm previous findings that HTX in patients with prior sternotomy represents a higher risk procedure. Nevertheless, HTX after a failed SVR does not seem to have a poorer outcome than HTX after previous conventional bypass surgery.

## OP-502-ROUTINE USE OF ANTEGRADE CEREBRAL PERFUSION WITHOUT DEEP HYPOTHERMIA FOR OPERATIONS ON THE AORTIC ROOT

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**BACKGROUND:** Several techniques have been described to protect the brain from hypoxic insult during aortic arch. Hypothermic circulatory arrest has been used since the beginnings of cardiac surgery, but continues to carry a significant risk of stroke. We describe here our experience with antegrade cerebral perfusion via the axillary artery for surgery of the proximal aortic arch.

**METHODS:** We performed a retrospective review of all patients undergoing aortic surgery with axillary cannulation at a single institution from 2004-2007. Our method for axillary cannulation involves an infraclavicular incision, exposure of the axillary artery and an end-to-side anastomosis using an 8mm PTFE graft which is cannulated for arterial flow. Following resection of the proximal aorta, cardiopulmonary bypass rate is decreased and the innominate artery clamped proximal to the carotid artery take-off. Flow is then reinitiated at 10cc/kg/min. Cerebral oximetry is not measured and temperature is maintained at 28°C. Following repair of the aortic arch, the graft is deaired and the clamp moved proximally on the aorta and normal antegrade flow to the left carotid artery and descending aorta is restored.

**RESULTS:** This technique was used on 244 patients (175 m, 69 f) over a three year period (median age 64.8 yrs, range 19.1-92.6). Forty-three patients had ascending aortic dissection, the rest had aneurysmal dilatation. Operations per-

formed included: 41 aortic root replacements, 174 hemi-arch replacements, 10 isolated arch replacements, and 19 elephant trunk procedures. Median cardiopulmonary bypass time was 151 minutes. Median postop LOS and ICU LOS were 6 and 2 days. Strokes occurred in 4 patients (1.6%); 2 were in emergent cases for dissection or rupture. Death prior to discharge or within 30-days occurred in 11 (4.5%) patients.

**CONCLUSION:** Antegrade cerebral perfusion via the axillary artery at 28°C provides a safe method for cerebral protection during aortic surgery with neurological event rates equivalent to or lower than published series with either circulatory arrest or deep hypothermic antegrade perfusion.

## OP-503-DISTAL AORTIC REINTERVENTIONS AFTER PREVIOUS ROOT SURGERY IN MARFAN PATIENTS

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**BACKGROUND:** Distal aortic disease may evolve in Marfan patients after previous aortic root surgery and its incidence may be underestimated. The aim of this study was to analyse the results of distal aortic reoperations in Marfan patients after previous proximal aortic surgery.

**METHODS:** A total of 95 Marfan patients (56 male, mean age 34.5±10.9 years) have been treated at our institution between November 1994 and December 2007. Fifteen patients, who required distal aortic reinterventions after previous root / ascending aortic surgery, were identified from our institutional aortic surgery database. The in-hospital and long-term results of this subgroup were analyzed.

**RESULTS:** Fifteen Marfan patients (9 male, mean age 39.1±7.5 years) underwent distal aortic reinterventions at mean interval of 45.1±32.3 months after primary root surgery. The indications for distal aortic surgery included type B dissecting aneurysm in 12 patients (80%) and non-dissecting aneurysm in 3 patients (20%). The distal procedure was performed on the thoracoabdominal aorta in 9 patients, descending thoracic aorta in 4 patients, and aortic arch in 2 patients. The mean CPB time was 153±52.8 minutes with circulatory arrest performed in 5 cases (mean time of 28.6±15 minutes at oesophageal temperature of 21±0.8°C). Antegrade cerebral perfusion was used in all circulatory arrest cases. One patient (6.7%) died postoperatively due to pulmonary thromboembolism. Neurological morbidity included one patient with paraplegia and one with temporary paraparesis. A total of two patients died during a mean follow-up of 36.2±25.5 months. The 1- and 5-year survival was 92.3±7.4% (both time intervals). Three patients required additional interventions on the downstream aorta during follow-up.

**CONCLUSIONS:** Distal reoperations in Marfan patients can be performed with good short- and long-term results. Most Marfan patients requiring distal aortic reinterventions have residual type B dissection. Aortic arch replacement during the initial procedure facilitates the subsequent thoracoabdominal reinterventions and may reduce the associated morbidity and mortality in these patients.

## OP-504-IS THE COMBINED SURGICAL AND ENDOVASCULAR THORACIC AORTA REPAIR EFFECTIVE?

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**BACKGROUND:** The purpose of this study was to evaluate the aneurysm and false lumen after a new combined surgical and endovascular technique for the treatment of thoracic aortic aneurysms and dissections.

**METHODS:** Between August 2005 and December 2007, ten patients (53.5±15.7 years; 7 male, 3 female) with aortic pathologies (7 dissections, 3 aneurysms) underwent replacement of the ascending aorta and the aortic arch, and simultaneous stent graft implantation into the descending aorta. Size dynamics of the false lumen and aneurysm sac were analyzed on the basis of computed tomography before hospital discharge and every six months thereafter.

**RESULTS:** The technical success rate was 100%. All patients survived during the follow-up period. The follow up period ranged from 1 to 18 months. There were no instances of aneurysmal rupture during the follow-up period. Postoperative computed tomography scans showed complete thrombosis of the aneurysm or dissection within the entire zone of the stentgraft placement.

**CONCLUSION:** The combined surgical and endovascular technique described



in this report proved effective for the treatment of extended aortic lesions. The perigraft space thrombosed completely after successful placement of the stent-graft.

#### **OP-505-SURGICAL MANAGEMENT OF COMPLICATIONS DUE TO TAKAYASU ARTERITIS. A 30 YEARS EXPERIENCE**

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**BACKGROUND:** Takayasu Arteritis affects the aorta and its major branches, appears like obstructive process, the most common surgical indications are organ preserved surgery and bypass surgery.

**METHODS:** A retrospective study of surgical patients with Takayasu Arteritis. Analyzing operative variables, long term results after surgery and survival rates of 71 surgical patients, operated between 1977 and 2006. All of that with 4 or more criteria for TA (ACR), data base collected from hospital records and actual follow up.

**RESULTS:** 87 procedures, 54 female/17 male, age at operation  $25.41 \pm 9$  Y  $28 \pm 7$ . Numano clasification: Type I 8 (11%) II 2 (3%) III 21 (30%) IV 17 (24%) V 21 (30%); Total operations: 30 organ preserved surgery (36% renal auto-transplant, 36% renal revascularization, 20% carotid revascularization, 6% others), 18 bypass surgery (61% aorto-aortic, 17% Bifemoral bypass, 11% aorto-iliac, 11% others), 15 replacement surgery (47% Bentall and De Bono, 26% Bifemoral, 26% others), 13 cardiac surgery (46% valvular, 38% CABG, 15% others), 11 exclusion surgery (100% Nephrectomy). Three operative deaths, exploration for bleeding 2.8%, mesenteric thrombosis 1.4%, follow up graft occlusion two cases (2.8%). Factors of poor pronostic were: High hypertension, failure in the kidney function, ischemic cardiomyopathy. The presence of occlusion in many arteries decreased survival in these patients to five years (65%) (Log-Rank  $P=0.03$ )

**CONCLUSION:** Early surgical interventions are considered the gold standar in estenotic or oclussive lessions in patients with Takayasu Arteritis. Graft reestenosis are rare, its possible to preserve organ function. Surgery demonstrate his efficacy in long term series but is neccesary to analyze prognosis through of stratification in the time evolution in each of interventions in surgery. However this vasculitis is rare and multicenter studies are required.

## MINI PRESENTATIONS I

### OP-506-LEFT VENTRICULAR ASSIST DEVICE INDUCES HIGH LEVELS OF SCD30 WITH NO EFFECT ON GRAFT REJECTION RISK

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**BACKGROUND:** Ventricular-assist devices (LVAD) are increasingly used in end-stage heart failure patients as a bridge to heart transplantation. As interactions between the implanted biomaterial and the host immune system could have potentially adverse clinical consequences, elucidation of the immunobiology of the host-LVAD interaction is imperative. So far, aberrant T-cell activation has been described as a result of monocyte-T-cell interactions on the LVAD surface, with consequent alterations in the recipient T-cell cytokine profiles and Th1/Th2 balance. Serum soluble CD30 (sCD30), a glycoprotein released from the surface of CD30<sup>+</sup> T-cells and considered as a marker of Th-2 type response, is used in the present study to explore the effect of LVAD on the Th1/Th2 balance in the immune response of end-stage heart failure patients.

**METHODS:** Retrospective quantitative detection of serum sCD30 levels by enzyme-linked immunosorbent assay (ELISA) was performed in 200 consecutive end-stage heart failure patients immediately prior to transplantation. LVAD was implanted in 28 patients (14% of the total) and their serum sCD30 levels were compared to those of 172 patients with no LVAD (86%). The potential association was also explored between serum sCD30 levels and one-year allograft rejection rate and graft survival rate in order to evaluate the relevant potential immunologic significance.

**RESULTS:** Patients on LVAD had significantly higher median level of serum sCD30 comparing to those with no LVAD (64U/ml vs. 37 U/ml respectively,  $P < 0.001$ ). There was no difference in the one-year allograft rejection rate between recipients with and without LVAD (53% vs. 50% respectively). There was no association between serum sCD30 levels and recipient one-year rejection rate or graft survival rate.

**CONCLUSIONS:** The use of LVAD in end-stage heart failure patients as a bridge to transplantation is associated with higher serum levels of sCD30. As sCD30 is considered a marker of Th2 type immune response, it is implied that LVAD-host immune interactions affect the recipient Th1/Th2 cytokine balance in favour of a Th2-type immune response, which however has no effect on the recipient one-year allograft rejection risk or graft survival rate.

### OP-507-BENEFITS OF THE PRE-EMPTIVE INTRA-AORTIC BALLOON PUMP (IABP)

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**BACKGROUND:** The Intra Aortic Balloon Pump (IABP) is a mechanical support for the failing heart. Recent evidence suggests that pre-emptive IABP is associated with better outcomes in high-risk patients undergoing Cardiac Surgery. This retrospective study compares pre-emptive use (planned use) of the IABP to emergency (unplanned) use in a regional cardiothoracic centre.

**METHODS:** All patients who required an IABP from February 2003 to June 2006 were identified from the theatre records. Data was obtained to include patient demographics, preoperative state, operative details, morbidity due to the IABP and operative mortality. Data was obtained from the electronic Patient Administration System (PATS) and case notes. Patients were divided into two groups: planned use [preoperative + elective intraoperative]; and unplanned use (postoperative + emergency intraoperative). Preoperative mortality risk was calculated using the logistic EuroSCORE.

**RESULTS:** One hundred and thirty five (75% male) patients were identified. There were no significant differences between the groups as regards age; pre-operative state; type of operation; logistic EuroSCORE or myocardial ischaemic times. There was a significant difference in mortality between the two groups

with planned insertion 17% and unplanned 45% ( $p = 0.001$ ). Multivariate analysis of the study population showed the logistic EuroSCORE (OR 0.974 [0.950 - 0.998]  $p = 0.035$ ) and timing of the IABP (OR 4.728 [1.932 - 11.566]  $p = 0.001$ ) as independent predictors of mortality. There was reduced morbidity in planned placement.

**CONCLUSIONS:** The pre-emptive use of the IABP in this cohort of patients was associated with a 50% mortality advantage when compared to emergency use. The logistic EuroSCORE may be used pre-operatively to guide IABP use. Complications are rare and can be treated successfully. The risk to benefit ratio of pre-emptive IABP use in this cohort of patients is low.

### OP-508-TEMPORARY CARDIAC SUPPORT WITH A MINI-CIRCUIT SYSTEM CONSISTING OF A CENTRIFUGAL PUMP AND A MEMBRANE VENTILATOR

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**BACKGROUND:** Commonly used ECMO systems for cardiac support in adults are limited to a run time of 7 days. Thereafter, associated complication rates tend to elevate. Bleeding complications occur in up to 80% of cases in the literature, which is due to the required high-level anticoagulation. Recently, we have switched our strategy from the use of a conventional ECMO circuit to a miniature circuit including a centrifugal pump (Levitronix®) and the Novalung membrane ventilator. This system allows us to use less heparin to target the ACT at 140-160 sec.

**METHODS:** Between January 2005 and August 2007, 4328 patients underwent cardiac surgery at our department. 24 patients required temporary post-operative ECMO support. 5 patients underwent CABG surgery, n=3 patients received valvular replacement, 2 patients had aortic surgery done, n=8 patients underwent heart transplantation and 6 others. All data were prospectively recorded. Retrospective data analysis of the 24 patients was performed.

**RESULTS:** The mean age of the 24 patients was  $48 \pm 15$  years (n=14 males) with a mean duration of ECMO support of 4.8 days (ranged between <1 and 21 days). 14 patients (58%) were successfully weaned from ECMO. The 30 day survival was 42% and the 100 day survival was 37.5%. 71% of all patients developed hemodialysis requiring renal failure. A re-thoracotomy due to bleeding was necessary in 6 patients (25%) under ECMO support. The mean cause of death was cardiac failure in n=6 patients, multi organ failure in n=5, sepsis in n=4 and intra-cerebral bleeding in n=1 patient.

**CONCLUSION:** The new system of ECMO support with a Levitronix pump in combination with a Novalung ventilator seemed to be a suitable technique of middle-term duration until 21 days with a lower rate of bleeding complications.

### OP-509-ACCEPTABLE LOW MORTALITY AFTER MITRAL VALVE OPERATIONS IN MULTI-MORBID PATIENTS WITH SEVERELY DEPRESSED LV-FUNCTION

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**BACKGROUND:** The number of patients with end-stage cardiomyopathy and mitral valve incompetence that are presented for cardiac surgery is increasing. We retrospectively investigated operative outcome and intermediate-term survival in a cohort with isolated severe mitral valve regurgitation (MI) and poor LV-function.

**METHODS:** Between January 2002 and August 2007 31 patients (18 men, 13 women; mean age 67; range: 46-80) with severe MI and LV-EF < 30% were operated. 17 were in NYHA class III, 14 in class IV, 17 had pulmonary hypertension >60 mmHg, 8 suffered from renal insufficiency, 4 had previous CABG. Mean logistic Euroscore was 25.69% (range 4.37-69.66). Mean follow-up was 16 months.

**RESULTS:** Patients underwent either mitral valve repair (n=17) or replacement (n=14). Tricuspid valve and rhythm surgery was simultaneously performed in 4- and 8 patients respectively, none required CABG. All patients were subjected to a staged peri-operative treatment protocol including catecholamines, fosfodiesterase inhibitors, iloprost and IABP. There were no peri-operative deaths. Three patients died within 30 days post-operatively (2 septic, 1 cardiogenic shock), two required hemofiltration; one IABP support. Thirty-day mortality was

significantly lower than Euroscore-predicted (9.6% vs 25.69%;  $p < 0.001$ ). NYHA class improved from 3.4 to 1.80 at follow-up and EF from 23% to 35%. Four patients needed a reoperation without mortality for recurring MI due to persistent (2) or new endocarditis (1). Medium-term survival was 77% and 70% at 1- and 2 years respectively.

**CONCLUSION:** Despite high operative risk mitral valve surgery can successfully be performed with acceptably low mortality in multi-morbid patients with end-stage cardiomyopathy. Patients experience substantial clinical improvement and mild recovery of left ventricular function.

## OP-510-OFF PUMP SURGICAL REVASCULARIZATION IN ISCHEMIC HEART FAILURE

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**BACKGROUND:** Incidence of Ischemic Heart Failure is rising and is associated with high morbidity and mortality. Options of Cardiac transplant / ventricular assist devices are far beyond reach in emergent nations. Morbidity of ventricular restoration and valve repair is also high. We perform off pump revascularization in such patients and present here our excellent results.

**METHODS:** Between January 2005 to August 2007 off pump revascularization was done in 2192 patients, among them 442 had LVEF  $< 35\%$  ( $< 25\%$  n=52, Group-A and 26-35% n=390, Group-B). Majority of them were NYHA Class III (Group-A 76.8%, Group-B 74.6%) with tripple vessel disease (Group-A 93.3%, Group-B 84.3%). Associated co-morbidities were diabetes (Group-A 40.4%, Group-B 50.7%), hypertension (Group-A 46.2%, Group-B 62%), recent MI (Group-A 30.8%, Group-B 32.6%), mechanical stabilization, and intra coronary shunts were used to facilitate anastomosis. LITA was used in 43.6% (Group-A) and 66.7% (Group-B) apart from saphenous vein grafts.

**RESULTS:** Mean grafts were  $2.9 \pm 0.6$  (Group-A) and  $2.82 \pm 0.5$  (Group-B). Pre-operative IABP was required in 9.6% (Group-A) and 7.2% (Group-B) and intra-operatively in 26.92% (Group-A) and 15.2% (Group-B). Mean ventilation time ( $22.36 \pm 16.08$  hours vs  $17.01 \pm 12.84$ ), high inotropic requirement (16% vs 13.4%) and longer ICU stay was more in Group-A and ventricular arrhythmias (4.2% vs 3.1%), low cardiac output (10.4% vs 3.1%) were also more frequent. Mortality was 6.3% Group-A and 1.9% (Group-B). In follow up majority were NYHA Class II with marked improvement in LVEF ( $14.49 \pm 4.08$ , Group-A and  $11.04 \pm 3.62$ , Group-B). Mitral regurgitation regressed in 60% while in 6.2% it became worse.

**CONCLUSION:** Off pump revascularization provides symptomatic relief in patients with ischemic heart failure. Although morbidity and mortality is more in patients with LVEF  $< 25\%$ , significant improvement in LVEF is seen in majority of the patients after revascularization.

## OP-511-DEVELOPMENT AND TESTING OF A NOVEL DEVICE FOR LEFT ATRIAL APPENDAGE OCCLUSION

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**OBJECTIVE:** The left atrial appendage (LAA) is thought to be the source of many thromboemboli complicating atrial fibrillation. There is keen interest in developing safe and more effective methods for excluding the LAA from the systemic circulation. Toward this goal, a unique implantable device was developed and tested for LAA occlusion that could be used through open and minimally invasive approaches, and would provide 3-dimensional conformability to the complex structure of the LAA region.

**METHODS:** We implanted the device in four adult dogs weighing ~35 kg and survived two for one month and two for three months. The implantation was performed through a sternotomy on the beating, working heart. Acute occlusion was documented by containment of radiopaque dye in the LAA stump. After sacrifice, gross and microscopic examination was performed of the heart, nearby coronary vessels, the residual LAA, and distant organs.

**RESULTS:** All device applications were completed with one firing. A second device was placed in one animal because of inadequate apposition to the LAA origin; this narrowed the lumen of the circumflex artery and a partial infarct resulted. No other single application affected the circumflex. Complete LAA exclusion was confirmed in all cases acutely and at necropsy. After one and three months, the LAA atrophied significantly. No local or embolic damage was

noted in the lung, pulmonary artery, pulmonary vein, liver, brain or kidneys. The LAA orifice had become a fully occluded, endothelialized, slit-like structure.

**CONCLUSIONS:** This device can easily and safely occlude the LAA. Acute assessment is simple and easy to perform. Over one and three months' recovery time, the device remains safe and effective, without evidence of any endocavitary clot formation or damage to nearby or distant structures; it remains soft and flexible. Longer-term survival studies are currently underway.

## OP-512-ATRIAL FIBRILLATION SURGERY IN EUROPE: A NEED FOR STANDARDISATION AND DOCUMENTATION

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**INTRODUCTION:** The cut and sew maze has been proven to be efficient in treating chronic permanent atrial fibrillation. Different endo- or epicardial ablation procedures showed to be nearly as effective. This resulted in a steep increase of its use during concomitant procedures. Whilst scientific papers present individual experiences, the surgical community has no evidence of the whole number of procedures in Europe performed per year, due to the fact of missing databases.

**METHODS:** To get an idea of procedures performed in Europe, a market and literature research was performed for 2006. A questionnaire was sent to all companies.

**RESULTS:** In the year 2006 an estimated number of 8.000 to 13.000 procedures were performed in Europe. On average one procedure was done per 34.000 inhabitants. As energy source, radiofrequency was used in about 66%, microwave in 18% cryoablation in 9% and high focussed ultrasound in about 7% of all cases. The lesion concepts, as well as the inclusion criteria (permanent vs. paroxysmal, length of AF, atrial diameter), definition of success (rhythm, contractility) and follow up measures (single ECG, Holter-ECG, 7-day-ECG) vary widely.

**CONCLUSION:** Still there is a variety in the lesion concepts used and in inclusion criteria. Even more striking is the inconsistency in the definition of procedural success. In future it has to be clarified if rhythm alone or rhythm in conjunction with atrial contractility defines success. In addition, it seems to be mandatory to scrutinise patients with multiple long term ECGs in the follow up period, to unveil the AFib burden of the patients.

## OP-513-PRELIMINARY RESULTS OF QUIXIL UTILIZATION IN CARDIAC SURGERY

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**BACKGROUND:** Quixil<sup>TM</sup> is a human surgical sealant without any bovine sourced proteins recently introduced to facilitate surgical hemostasis and reduce operative and postoperative bleeding. Preparation of Quixil is very easy and quick and it can be then either gently applied with a syringe either sprayed onto the surface depending on the action needed. Its clinical efficacy has been initially proved in several surgical speciality (mainly orthopaedic and liver surgery) and more recently even in vascular surgery. No data are available so far regarding Quixil utilization in Cardiac Surgery. Since January 2007 we have used routinely Quixil at our department and here we present our preliminary observations.

**MATERIALS AND METHODS:** Quixil has been used in 67 patients undergoing cardiac surgical procedures. In the majority of patients (46 pts, 68%) it has been used as routine application following aortic valve replacement (AVR) or other valve surgery procedure (see table) to prevent postoperative bleeding. In 21 patients (32 %) has been used in case of active bleeding to facilitate hemostasis.

**RESULTS:** In all 46 patients receiving Quixil application routinely to prevent postoperative bleeding one single application of 2ml preparation of Quixil was sufficient to achieve complete hemostasis without any further utilization of different products. Only 1 out of these 45 patients (1,5 %) underwent revision for bleeding and the source of bleeding was not related to the area of application of Quixil. In the subgroup of patients undergoing AVR (31 patients) the amount of postoperative trasfusion of blood products was significantly reduced compared to a similar group of patient undergoing AVR in the same period and not receiving routinely Quixil application ( $0.4 \pm 0.3$  and  $0.8 \pm 0.4$  units respectively,  $p < 0.05$ ). In all 21 patients receiving Quixil to facilitate hemostasis in case of active and diffuse bleeding (including 3 cases of revision for bleeding), more

than one single application was needed (mean  $2.8 \pm 0.9$ ) and in 15 patients the combined use of other products was needed.

**CONCLUSIONS:** Quixil application in cardiac surgery seems safe, useful and cost-effective. From our preliminary experience routinely application in valve surgery, especially AVR and root procedure, seems to reduce postoperative bleeding and need for blood transfusion, and has been therefore become our standard practice. As far as the use of Quixil in case of diffuse postoperative bleeding, it also seem to enhance hemostasis especially in appropriate combination to others products. Procedure Patients Elective Use Quantity used (ml) AVR 31 yes  $2 \pm 0$  Bentall 9 yes  $2 \pm 0$  MVR/MVP 5 yes  $2 \pm 0$  TMR 1 yes 2 CABG 15 no  $5.8 \pm 1.7$  Other 6 no  $3.9 \pm 1.6$  Table 1: AVR= Aortic valve replacement; MVR/MVP= Mitral valve replacement/plasty; TMR= Trans-myocardial revascularization; CABG= Coronary artery bypass graft

### OP-514-SUCCESSFUL OUTCOME IN PATIENTS WHO HAVE UNDERGONE VALVE REPLACEMENT/REPAIR AFTER PREVIOUS CORONARY ARTERY BYPASS GRAFTING

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**INTRODUCTION:** Re-operation for valve replacement/repair following Coronary Artery Bypass Graft (CABG) represents a challenge for the cardiac surgeon. Technical difficulties compounded by several co-morbid factors may lead to increased morbidity and mortality. The aim of this study was to analyze the outcome in patients following valve replacements/repair after previous CABG.

**METHODS:** 76 patients who underwent valve replacement/repair after previous CABG between 1997 and 2006 were prospectively analyzed.

**RESULTS:** Procedures performed were Aortic Valve Replacement (AVR) in 43 patients, Mitral Valve Replacement/Repair (MVR) in 25 patients, AVR and MVR in 7 patients and Tricuspid Valve Replacement in one patient. One patient had 2 previous CABG operations. The mean time interval between previous CABG and Valve replacement/repair was  $97 \pm 56$  months. 31 patients underwent a simultaneous CABG. 44 patients received a mechanical valve, 24 received a bio-prosthesis valve and 7 underwent Mitral valve repair and one had a tricuspid valve repair. Overall Parsonnet score was  $20.6 \pm 6.6$  and Euroscore was  $9.7 \pm 2.1$ . Comparing AVR (Group I) with MVR (Group II), Group I had a higher euroscore ( $p < 0.04$ ) and more re-entry (re-sternotomy) problems ( $p < 0.05$ ) than Group II. Commonest re-entry problems included tear across venous graft near the anastomosis on the aortic root and visualization and dissection of the internal mammary artery graft. Skeletonised internal mammary artery graft was easily dissected from the surrounding tissue for clamping during cardiopulmonary bypass compared with pedicle internal mammary grafts. Additionally, post-operative bleeding was more in Group I ( $p < 0.05$ ) compared to Group II. Actuarial survival between the two groups was not significantly different. Overall, 30-day mortality was 13% ( $n=10$ ) and after a follow-up of  $37 \pm 28$  months, mortality was 12.5% ( $n=6$ ). Predictors of early mortality were Euroscore ( $p < 0.04$ ) and ejection fraction ( $p < 0.012$ ).

**CONCLUSION:** Valve replacement may be pursued despite prior CABG when hemodynamically significant valve pathology develops. Skeletonised internal mammary artery was found to be easier to dissect compared to a pedicle graft after re-sternotomy. However, both AVR and MVR after previous CABG is associated with a mortality that is higher than that seen after repeat CABG or valve surgery.

### OP-515-TRICUSPID VALVE REPAIR WITH COSGROVE RING IN AGED PATIENTS RECEIVING COMPLEX PROCEDURES IS ASSOCIATED TO A SIGNIFICANT FUNCTIONAL CLASS IMPROVEMENT

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**BACKGROUND:** Many surgical institutions observed a functional class amelioration in patients (pts) receiving tricuspid valve repair (TVR). However, an evidence about the role of TVR in aged pts receiving complex concomitant and/or ReDo procedures is lacking.

**METHODS:** Between April 2002 and March 2007, 61 TVR were performed at our institution. Males to females ratio was 19/41. Mean age at operation was  $70.45 \pm 13.14$  years. Mean NYHA class and EF before intervention were  $2.55 \pm 0.81$  and  $53.68 \pm 11.44$  % respectively. ReDos represented 31.15% (19) of pts. In 10 pts (16.39%) and in 55 pts (90.16%) an aortic valve replacement and

a mitral valve procedure were associated, respectively. Fourteen pts (22.95%) received concomitant CABG. In 57 pts (93.44%) a simple anuloplasty was performed; complex tricuspid repairs with or without anuloplasty represented 2/61 (3.28%) of all procedures each. Almost all patients (57/61; 93.44%) received a Cosgrove flexible ring, whose diameter ranged from 28 to 32 mm (mean  $31.11 \pm 1.09$ ). Mean CPB time was  $122.75 \pm 53.50$  minutes; mean aortic cross clamp time was  $83.71 \pm 32.49$  minutes.

**RESULTS:** A reoperation for bleeding was necessary in 4/61 (6.56%) pts. Eight patients (13.33%) died during hospitalisation; all but one deaths were cardiac-related. All pts but one of remaining were alive at PO day 90. Among remaining 52 pts, one was readmitted for atrial fibrillation and one was reoperated for endocarditis. At 90 days follow up visit, mean NYHA class was  $1.42 \pm 0.50$ ; t test showed a significant difference between preoperative and postoperative NYHA ( $p < 0.001$ ).

**CONCLUSIONS:** In our practice, TVR was associated with a consistent mortality and usually it was a part of a complex procedure in a female, low EF and aged patient; functional class appears improved after TVR. However, more research is needed to identify TVR as an independent factor of functional class amelioration in complex procedures.

### OP-516-RESULTS OF SURGERY IN DIFFERENT TYPES OF ISCHEMIC MITRAL VALVE REGURGITATION

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**BACKGROUND:** Surgical intervention is playing an increasingly important role in management of patients with moderate or severe ischemic mitral regurgitation as result of left ventricular geometrical distortion. Different types of mitral valve abnormality has been advocated, although clear influence on outcome of it has not been established. The aims of our study was to review survival rates and results of various types of mitral valve repair after surgical treatment of ischemic mitral insufficiency in addition to CABG.

**METHODS:** Using prospectively maintained database, patients undergoing mitral valve reconstruction with different types of ring, semiring and band were divided on the basis of preoperative MV and LV assessment. Combined CABG and mitral surgery for ischemic MR was performed on 170 (14 females, 156 males) consecutive patients from January 2006. According to MV abnormality 103 pts (60.4%) was in symmetric group (SG) and 67 in asymmetric one (ASG). Average patient age was  $56.1 \pm 7.8$  years. The 1-year outcome was observed.

**RESULTS:** The average risk of operation on EUROSCORE has made  $5.5 \pm 2.84$  and number of distal anastomoses was  $2.95 \pm 1.03$  (range: 1-6). Operative ( $< 30$  days or in-hospital) mortality rate was 5.7%. 1-year survival was 94.1%. In SG before operation indexes of EDV and ESV, local and global contractility, configuration of mitral valve were impaired significantly in compare with ASG. During follow-up we observed severe reduction of LV volumes only in SG, but they were still significantly larger than in ASG (EDVi  $85.2 \pm 25.1$  vs  $65.2 \pm 17.8$  ml/m<sup>2</sup>; ESVi  $53.2 \pm 20.5$  vs  $33.6 \pm 12.6$  ml/m<sup>2</sup>,  $n < 0.05$ ). Despite this ASG patients have had more severe level of residual MR ( $1.21 \pm 0.64$  vs  $0.87 \pm 0.5$ ,  $n < 0.05$ ) and worse parameters of MV deformation (tenting area  $1.87 \pm 0.46$  vs  $1.5 \pm 0.6$  cm<sup>2</sup>,  $n < 0.05$ ). In ASG improvement in global contractility (LCi  $1.39 \pm 0.52$  vs  $1.46 \pm 0.18$ ,  $n < 0.05$ ) observed without any changes on the level of posterior papillary muscle (LCi PPM  $2.04 \pm 0.51$  vs  $1.96 \pm 0.18$ ,  $n < 0.05$ ).

**CONCLUSION:** The type of undersized anuloplasty used did not influence outcome. In asymmetric MV abnormality the increased risk of recurrence of MR on follow up was related to severe residual postoperative mitral deformation and different involvement in remodeling anterior and posterior papillary muscles.

### OP-517-MITRAL VALVE REGURGITATION CORRECTION WITH SYNTHETIC TAPE

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**OBJECTIVE:** The aim of the study is to present our experience in mitral regurgitation correction of different origin using anuloplasty with the tape of synthetic material "Ecoflon".

**METHODS:** From 2005 till 2007 115 patients undergone mitral valve plasty



with the tape of synthetic material "Ecoflon". In 62 (53,9 %) cases mitral regurgitation was of ischemic etiology. Myxomatous degeneration - 15 (13,1 %) cases. Rheumatic - 3 (2,6 %). Myxoma - 8 (7,0%) cases. Congenital heart defects - 5 (4,3%). Myxomatous degeneration and ischemic heart disease - 5 (4,3 %). Rheumatic and ischemic heart disease - 5 (4,3 %). Endocarditis and ischemic heart disease - 4 (3,5 %). Mean age of the patients was  $59,1 \pm 9,4$  years. 84 (73,0%) were male. Mean ejection fraction was  $42,6\% \pm 14,3\%$ . Mean additive EuroSCORE was 5,8, logistic - 7,9%. Mitral regurgitation of 4 degree was in 33 (28,7 %) of the patients, 3 degree - in 43 (37,4 %) of the patients and 2 degree - in 39 (33,9 %) of the patients.

**RESULTS:** In all cases mitral regurgitation correction with "Ecoflon" synthetic tape was performed. In 62 patients with mitral regurgitation of ischemic origin mitral plasty was performed with coronary artery bypass grafting and in 23 patients also with left ventricle aneurism resection. Mean number of grafts per patient was  $2,8 \pm 1,3$ . Menicanti papillary muscle plasty was performed in 36 patients. In 8 patients additionally myxoma was deleted. Tricuspid valve plasty was performed in 54 patients. In 12 patients additionally quadriangular resection of mitral valve was performed. Atrial septal defect closure was performed in 3 patients and ventricular septal defect closure was performed also in 3 patients. Lung resection due to cancer was performed in 1 patient. Thoracic aorta replacement was performed in 2 patients. Carotid endarterectomy - 2 patients. Mini-maze procedure - 4 patients. Aortic valve replacement - 25 patients. In 4 (3,5 %) patients mitral regurgitation of high degree persisted. They were undergone mitral valve replacement. 1 patient needed valve replacement after operation due to mitral regurgitation progression. In 86 (74,8 %) persisted mitral regurgitation of 1 degree. In 3 (2,6%) patients persisted mitral regurgitation of 2 degree. Intraaortic conpulsation was performed in 7 (6,1 %). 7 (6,1 %) died in postoperative period, 5 from heart failure, 1 from bleeding and 1 from mesenterial thrombosis. 46 patients are still under periodical investigation. Increasing of mitral regurgitation to 2 degree was found in 2 (4,3 %).

**CONCLUSIONS:** Mitral regurgitation correction of different origin and additional pathology using annuloplasty with the tape of synthetic material "Ecoflon" could be successfully performed with acceptable immediate and follow-up results.

#### OP-518-MITRAL INSUFFICIENCY CAUSED BY SYSTEMIC LUPUS ERYTHEMATOSIS REQUIRING VALVE REPLACEMENT IN THE SOUTHERN REGION OF SAUDI ARABIAN POPULATION-A CASE REPORT.

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**BACKGROUND:** Systemic lupus erythematosus is an autoimmune disease frequently accompanied by the presence of an anti-phospholipid antibody. A large percentage of patients affected are women. The overall pattern of the disease observed in Saudi Arabia was comparable to that observed in other series. Current therapeutic guidelines for systemic lupus include antithrombotic prevention with long term anticoagulation.

**METHODS:** We present a case study of a 32-year-saudi female of antiphospholipid syndrome with lupus nephritis on anticoagulation, cyclophosphamide and steroid therapy. She had an old cerebrovascular accident with no residual neurological deficit. She underwent balloon mitral valvotomy for mitral stenosis elsewhere 8 years prior to her presentation here. Her presenting symptoms were dyspnoea on exertion functional class 3 and palpitations. Her hemoglobin was 9.6g/dl with a negative antiphospholipid antibody. Electrocardiogram revealed sinus tachycardia with both left atrial and ventricular enlargement. Transthoracic echocardiogram revealed calcified anterior leaflet with a mobile verrucose nodular mass in the atrial side of the posterior mitral leaflet indicative of libman-sacks endocarditis, it also revealed severe mitral regurgitation with moderate pulmonary hypertension.

**RESULTS:** A mitral valve replacement was performed on her through a mini sternotomy utilizing a 29 size St.Jude mechanical prosthesis. Her post-operative course was uneventful. She was discharged on anticoagulation and steroid therapy.

**CONCLUSIONS:** The experience with mitral valve replacement in lupus patients is limited. There are 36 cases of mitral valve replacement/repair in lupus patients reported in the world literature till 2000. Chauvaud et al suggested that a conservative operation does not alter the progression of the disease and that continued valve thickening and calcification will affect the repaired valve. Morin's group reviewed 25 cases of lupus patients who under-

went mitral valve replacement published in the literature and they suggested that valve replacement is generally uneventful.

#### OP-519-PREDICTIVE FACTORS TO REOPERATION AND LATE MORTALITY IN PATIENTS WITH RHEUMATIC MITRAL VALVE DISEASE WHO UNDERWENT REPAIR

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**BACKGROUND:** This retrospective study evaluated risk factors to reoperation and late mortality in patients with rheumatic disease who underwent mitral repair.

**METHODS:** Eight hundred and eighty four patients underwent valvar procedures in our institution from 1994-2005. We included only patients with mitral disease regardless tricuspid insufficiency. All patients with associated procedures or mitral valve replacement were excluded. One hundred and four patients were included. The survival and reoperation were evaluated with Kaplan-Meier analysis and Cox regression. The total follow up was 90%. The median follow up was  $63 \pm 39$  months (CI 95% 36 to 74 months) ranging from 3 to 130 months.

**RESULTS:** Mean age was  $32 \pm 14$  years. Functional class (NYHA) III and IV was present in 65.4 %. Mitral insufficiency was present in 35.7 %, mitral stenosis in 27.8 %, and both in 36.5. Annuloplasty was performed in 33 cases, commissurotomy in 21 cases, and annuloplasty and commissurotomy in 50 cases. There was no operative mortality. The late mortality was 2.8% (3 cases). The predictive independent factors for reoperation were residual mitral insufficiency ( $p < 0.00005$ ), prior pulmonary hypertension ( $p < 0.01$ ), age ( $p < 0.04$ ), and post operative functional class ( $p < 0.0005$ ). Freedom from reoperation at late follow up with 5 and 10 years was  $91.2 \pm 3.4$  % and  $71.1 \pm 9.2\%$  respectively.

**CONCLUSION:** There are pre and post operative predictive factors in patients with rheumatic mitral valve disease. These patients have different outcome when compared with patients without any predictive factors, therefore they need closer attention. The mitral valve repair is safe and has good outcome in late follow up.

#### OP-520-MITRAL VALVE SURGERY AFTER PERCUTANEOUS BALLON VALVULOPLASTY. A TWENTY-YEAR EXPERIENCE

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**BACKGROUND:** Percutaneous mitral valve balloon valvuloplasty is currently the treatment of choice for rheumatic stenosis but as a palliative treatment a significant number of patients will require an open heart operation.

**METHODS:** From 1985 to 2007, 616 patients underwent percutaneous mitral valvuloplasty. From this series of patients 143 (23.2%) required a open heart procedure for percutaneous mitral valvuloplasty failure. Early failure was the indication of surgery in 34 patients (23.8%) and late failure in 109 (76.2%). The causes for surgical indication were cardiogenic shock in 14 patients (9.8%), technical problems in 21 (14.7%), mitral insufficiency in 41 (28.7%) and progression of the rheumatic disease in 86 (60.1%).

**RESULTS:** Surgery consisted in mitral valve replacement (n: 125, 87.4%) or repair (n: 18, 12.6%). Associated surgery was repair of cardiac chambers lesions in 38 patients (26.6%) tricuspid valve intervention in 52 (36.3%), aortic valve replacement in 33 (23.1%) or CABG in 7 (4.9%). Hospital mortality was 7.0% (10 patients) and mean duration of in-hospital stay was  $14.1 \pm 10.9$  days.

**CONCLUSIONS:** Failure mitral valvuloplasty is a iatrogenic disease with different characteristics. The technical failure has been more frequently in the initial experience, whereas the progression of the rheumatic disease is the most common cause for surgical indication. The ability of mitral valve repair in a valve previously dilated diminish considerably. The high incidence of associate surgery shows a different criterion used to indicate valvuloplasty or surgery.

## CHEST WALL RECONSTRUCTION

### OP-521-PRIMARY CHEST WALL NEOPLASMS, AN EXPERIENCE OF 84 PATIENTS

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**AIMS:** To evaluate treatment approaches role of surgical resection and reconstruction and outcome of patients with primary chest wall tumor.

**STUDY DESIGN:** A prospective observational study.

**PLACE AND DURATION:** The study was conducted at the Department of Cardiothoracic Surgery, Postgraduate Medical Institute, Lady Reading Hospital from March 1997 to April 2001.

**PATIENT AND METHODS:** A total of 84 patients underwent resection for primary chest wall tumors. Male female ratio was 57:27. Age range was 15 years - 55 years with a mean age of 23-2 years. 75% of patients presented with a painless mass while 25% complained of pain. Thirty seven were on right side, 31 were on the left side while 16 extended onto the sternum. Sizes were <3cm 19, 3-5cm 39, 5-10cm 19 and >10cm 7. Chest radiograph and CT thorax were done in all cases. Out of 84 cases, 25 had previous biopsies attempted by other surgeons leading to ulceration and fungation in 18 cases. Chest wall resection and primary closure was done in 63 cases. In 15 cases marlex mesh alone was used while in 6 cases it was reinforced with Methyl Methacrylate.

**RESULTS:** Mean operative time was 68 (±40) minutes. Postoperatively, 26 patients required ventilation. Out of these, 18 patients were extubated the same day, 6 the next day while 02 patients died despite prolonged ventilation. Post-operative flail was observed in 3 cases without respiratory compromise. Histopathology reporting were chondrosarcoma in 54, fibrosarcoma in 19 cases while the rest were not reported. Sixty nine patients were followed-up for up to one year with no evidence of disease while the remaining were lost to follow up.

**CONCLUSION:** To conclude primary chest wall tumors can be safely managed by resection and primary closure or chest wall reconstruction and are associated with long term survival

### OP-522-RECONSTRUCTION OF THE CHEST WALL IN EXTENDED RESECTIONS:a 25 years follow-up

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**BACKGROUND:** Many techniques of chest wall reconstruction may be used in extended resections by tumors. Many synthetic materials as polypropylene mesh, vycril and methacrylate can be employed. However, the repair with soft tissues is the best choice in order to protect internal thoracic organs and to prevent cases of infections.

**METHODS:** 270 cases of thoracic wall primary and metastatic tumors were undergone to resections (skeletal and soft tissues) in the period of 1977 to 2007 in two institutions. The age of patients ranged from 3 to 82 years old, 160 were male and 110 female. Among them, 24 patients were children with primitive neuro-ectodermic tumors (PNET). In these cases induction chemotherapy prior resection was used. Chest wall reconstruction employing isolated muscular tissues or and combined prosthetic materials was performed. The most common surgical procedure used for reconstruction was polypropylene mesh covered by muscle flaps. Sternal bone reconstruction was performed in 44 patients. Long term follow-up was available in 132 patients (49%) during 5, 10 and 25 years.

**RESULTS:** Aesthetic late results were good in the majority of the followed patients. Early and late complications due to post-operative bleeding, infections and displacement of the methacrylate prosthesis in 4% of the cases were observed. Regarding the survival, 5-years survival rate was 35%, 10-years was 18% and 25-years was 15% when only malignancies were considered. In the group of PNET (Askin tumors) in children the 5-years survival rate achieved was 50%.

**CONCLUSIONS:** Long term follow-up is necessary to conclude the effective rate of late complications concern synthetic prosthesis, aesthetic results and quality

of patient's life. A long post-operative follow-up time shows severe atrophy of muscle flaps, increasing paradoxical movement of the chest wall and partial methacrylate prosthesis absorption with displacement and fractures.

### OP-523-EARLY AND SHORT-TERM RESULTS OF CHEST WALL RESECTION AND RECONSTRUCTION

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**BACKGROUND:** Since the first known chest wall resection in the 18th century, improvements in surgical technique and anesthesia, critical care units, antibiotics, and the development and refinements in reconstruction techniques have allowed extensive chest wall resections to be performed with acceptable morbidity and mortality.

**METHODS:** We conducted a retrospective review of 22 patients underwent chest wall resection and reconstruction in our unit from December 2002 up to April 2004. All patients with chest wall masses (Soft tissue - Bony or cartilaginous) amenable to resection and reconstruction, were included in this study. Patients with sternal infections after median sternotomy for cardiac surgery were not included in this study. All patients received conventional chest roentgenography to spot the light on the origin of the mass and occasionally detect a defect. For patients with a mass, a computed tomography (CT) scan or magnetic resonance imaging (MRI) scan of the chest was done to evaluate the extent and exact nature of the lesion, and a tissue diagnosis utilizing fine needle aspiration was attempted.

**RESULTS:** Patients age ranged from 18 to 65 years (mean 40.8 years), it was apparent that females were more suffered from chest wall masses (54.45 %) than males (45.54). According to the location of the masses, 19 cases (86.36 %) were located at the anterior chest wall, two cases (9 %) were at the back of chest wall, one case (4.5%) only was found at left side of chest wall, the table also shows that masses with soft consistency were in 5 cases (22.7 %), firm in 14 cases (63.63 %), and hard in 3 cases (13.6 %). According to the mobility of the mass showed that 17 cases (77.27 %) were with immobile masses, and others were mobile. Our study encompassed 22 patients, 9 of them had benign chest wall tumors; 8 patients had primary malignancy; and 5 patients had metastatic chest wall malignancies. Chest wall resection; Resection of the chest wall skeleton was performed in 18 cases (81.8 %), and resection of chest wall layers (except the bony skeleton) was performed in 4 cases (18.1 %). EN BLOC RESECTION (Resection of all layers of chest wall: bones, muscles, subcutaneous layers, their skin covers, and lobectomy was done in 4 cases (18.1 %)). Palliative resection was performed in 1 case (4.5%), this case was chondrosarcoma of the sternum. Reconstruction procedures; Immediate closure of the defects was performed in all cases.

**FOLLOW UP AND PROGNOSIS:** Blood transfusion was required for 5 cases (22.7 %), 3 cases (13.6 %) intra operatively, and 2 cases (9 %) post operative. All the patients in our series were extubated within two hours. Average time spent in ICU was one day; average duration of hospitalization was 10 days. No mortality was recorded in the early post operative period, but 1 case (4.5 %) died late post operatively after about 6 months due to distant metastasis.

**CONCLUSION:** Successful outcome in these complex cases is the coordinated effort by the surgical teams in individualizing the care of these patients utilizing total resection of the disease process, reconstruction of the chest wall integrity, and soft tissue coverage of the defect. The team of surgeons should be well versed in chest wall reconstruction utilizing prosthetic materials and free or pedicled muscle flaps.

### OP-524-RECONSTRUCTION OF CHEST WALL AFTER STERNECTOMY WITH A TOMOGRAPHY-PERSONAL MADE POLYETHYLENE STERNAL PROSTHESIS - REPORT OF TWO CASES. WHY NOT TO DO IT EVER?

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**BACKGROUND:** The resections of the sternum always have been followed by a question: How to stabilize the chest wall and with what? If structural stability is required, either autogenous tissue or prosthetic material can be used. Various materials for reconstruction of the anterior chest wall have been reported: myocutaneous flap, Marlex mesh, a rigid prosthesis and the combination between them. More common, a custom-made "Marlex mesh-methylmethacrylate-Marlex mesh sandwich" to minimize the chest wall movement.



The personal sternal prosthesis, made by a computer-tomographic model was described in 1998, by Meyers. It stabilized the chest wall with the new sternum, protecting the underlying organs, avoided prolonged postoperative ventilation and achieved a satisfying cosmetic result.

**METHOD:** We report the two cases well-documented: a 34-year-old male who developed a sternal metastasis of Primitive neuroectodermal tumor, submitted a total sternectomy and fixation of polyethylene prosthesis with a good evolution. This patient continuous his snow skiing activities until, unfortunately, he died of disease progression two years after the operation. The other, a 22-years-old male with a sternal metastasis of Ewing tumor, either with a total sternectomy and reconstruction chest wall by a better personal polyethylene prosthesis. After two years post operative, he is doing well. Both resection of the chest wall was followed by replacement with a computer-aided custom made polyethylene sternal prosthesis and myocutaneous flap.

**CONCLUSION:** Tumors of the sternum have been considered a challenging problem for a long time. Stability and reconstruction of chest wall defects have caused the main difficulties in radical resections. Improvement of surgical techniques, especially by prosthetic materials, has resulted in successful sternectomies and simultaneous reconstructions. The development of safe techniques for chest wall reconstruction has expanded the role of surgery in this field. The personal sternal prosthesis, made by a computer-tomographic model is a unique device for each patient, with his individual size. It is a rigid material and innocuous. We believe that it is the future of chest wall diseases and reconstructions.

#### **OP-525-MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM IN ADULT PATIENTS: THE NUSS PROCEDURE. MULTICENTER FRENCH STUDY OF 64 CASES**

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**BACKGROUND:** The Minimally Invasive Repair of Pectus Excavatum (MIRPE or NUSS procedure) is well established in pediatric surgery. Often used in Europe, it is still uncommon in France and its application in adult patients is questionable. Our study analyses the efficacy and indications of MIRPE in a multicenter coordinated series of adult patients.

**METHODS:** From august 2004 to December 2007 we performed 64 MIRPE procedures in adult patients in France, by the same surgeon or under his direct supervision, using a uniform technique. A "Pectus-Bar" (MedXpert Inc.) was inserted in retrosternal position, under videothoroscopic control, using two small lateral incisions, with two stabilizers to prevent bar displacement. Eighteen patients (28%) required 2 bars. Post-operative pain control was provided by patient controlled epidural analgesia (PCEA). Clinical and X-ray checks were performed 1 week, 1 month, 3 months and then annually after discharge. Incomplete or unsatisfactory results (parasternal asymmetry: 3 cases, persistent costal flaring 1 case) could be later corrected by a Ravitch procedure in 4 patients.

**RESULTS:** Sixty four patients (58 men, 6 women, mean age 19.9 years) were included. The chest wall deformation was mild to moderate with rather a cosmetic impact than a cardio-pulmonary function impairment with compression. Mean operating time was 70 min. (range 30-120 min.), hospital stay was 5-7 days. A minor residual pneumothorax occurred in 4 patients (no drainage). Middle-term complications included 1 chronic inferior bar infection (removed with upper bar in place), 1 early bar displacement and 2 prolonged pain syndroms. One long term chronic infection developed after 30 months. Cosmetic results is good or excellent in 58/64 cases, fair in 2 cases (inferior costal flaring) and incomplete in 4 deep asymmetrical cases (3 patients reoperated using a Ravitch procedure).

**CONCLUSIONS:** This multicenter french coordinated series indicates the feasibility of MIRPE using the NUSS procedure in teenagers and young adult patients, if precise inclusion criteria are observed: age under 30 years, still compliant chest wall (auto-correction test mandatory), moderately deep pectus, only mild asymmetry, and no inferior costal flaring.

#### **OP-526-LONG -TERM RESULTS AFTER THE MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM. A PRELIMINARY REPORT**

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**BACKGROUND:** The Minimally invasive repair of pectus excavatum (MIRPE) was first reported in 1998 by D. Nuss. This technique has gained a world-wide acceptance during the past nine years. In the meantime, several modifications

of the technique have been introduced by different authors. There is Long-term results are still lacking. There are only a few reports available regarding the influence of this operation on the lung function. Our retrospective study reports our own experience over the last 6 years.

**METHODS:** From 6/2002 to 11/2007, 322 patients underwent MIRPE. Patients' mean age was 18 years (7 to 47 years). 79 patients were evaluated after the completed treatment. The bars were removed on average after 29, 7 months following the insertion (range 19, 2 to 43, 9 months). The follow-up was performed from one to twelve months after bar removal. The standard evaluation included the physical examination, chest x-ray, static spirometry and photo documentation. The indexes of deformation were calculated from chest x-rays. The results of correction after bar removal were compared with the data prior to the initial operation.

**RESULTS:** 95% of all patients showed a very good and good correction. The indexes of deformation significantly changed, revealing diminishing of depression and remodeling of the thoracic wall. At 1 to 12 months after Nuss bar removal the FVC, FEV1, MEF25 and Tiffenau -index showed a significant increase compared to the preoperative values. There is no correlation between this improvement and the extent of the deformity, age, height and body weight. There is a statistically significant correlation between the improvement and a grade of preoperative impairment of the lung function. The data revealed an improvement of psychosocial and physical well-being after bar removal.

**CONCLUSIONS:** The MIRPE procedure is an effective method with excellent cosmetic and functional results. The most frequent visible functional result is a subjective improvement in the ability to physical exercise. Partially, this improvement is due to the improvement of the lung function. The MIRPE significantly improved the patients' self-esteem, which was also concurred by the parental assessment.

#### **OP-527-EARLY RESULTS FOLLOWING THE NUSS PROCEDURE FOR PECTUS DEFORMITY - A TWO INSTITUTION EXPERIENCE**

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**BACKGROUND:** The Nuss procedure has become the treatment of choice for pectus excavatum in the last decade as it is a minimally invasive technique and has been performed with a high degree of success. A modified technique of Nuss procedure for pectus carinatum was defined by Abramson and has started to gain support in the last few years.

**MATERIALS:** From August 2005 to October 2007 a total number of 55 patients were operated on for pectus deformity in two institutions. The median age was 19.2 years (ranging from 6 to 35) and 48 patients were males. The deformity was symmetric in 40 patients.

**RESULTS:** 52 patients underwent a Nuss procedure for pectus excavatum and 3 patients underwent an Abramson modification for pectus carinatum. A satisfactory result was achieved with 1 pectus bar in 41 patients, with 2 bars in 12 and with 3 bars in 2 patients. Average operating time was 60.5 minutes (ranging from 30 to 180). The most common complication was pneumothorax in 7 patients. Early bar removal was performed in 2 pectus excavatum and 1 pectus carinatum patients due to intractable pain. Three patients were reoperated due to dislocation of the bars. None of the bars have been removed yet.

**CONCLUSIONS:** Both the Nuss procedure and the Abramson modification can be implemented with satisfactory results and few complications. These two minimally invasive procedures should be the preferred techniques for the repair of pectus deformities for the short operating time, low morbidity and high levels of patient satisfaction.

#### **OP-528-SYMPTOMATIC PECTUS EXCAVATUM IN THE ELDERLY, INDICATION AND SURGICAL TREATMENT: PRESENTATION OF TWO CASES**

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**BACKGROUND:** Symptomatic pectus excavatum in the elderly is a syndrome for which surgical intervention leads to significant reduction of symptoms. Treatment of pectus excavatum (PE) can be accomplished by open and minimal invasive techniques. The minimal invasive technique has become the treat-

ment of choice for patients from childhood up to adolescence. The indications for surgical treatment for elderly patients having PE changes from aesthetics to symptomatic disorders. Besides an anatomical disorder it causes dyspnoea and tachy-arrhythmias. Due to the rigidity of the thorax an open correction is more appropriate in the elderly. We present two family members, both with symptomatic PE who were accepted for surgical treatment with excellent outcome.

**METHODS:** Presenting with gradual complaints of recurrent tachycardia and progressive dyspnoea a local general practitioner, 69 years old was diagnosed with symptomatic PE. Medical and ablative therapy for his tachycardia was unsuccessful. Pulmonary function tests were all normal. A connection between the anatomical disorder and the clinical symptoms was suspected. After evaluation by different cardiothoracic surgeons in the Netherlands the decision for surgical intervention was not made. A literature search lead up to the possibility of symptoms reduction by correcting the PE. At surgery the choice was made for an open technique instead of the minimal invasive bar placement due to the expected rigidity of the costasternal attachment at elderly age. His younger sister, aged 60 years, with the same syndrome, also underwent surgery after seeing the result of her older brother. Both patients underwent the Ravitch technique in which on both sides the costosternal joints are removed from the distal portion of the sternum followed by an osteotomy and elevation of the sternum with temporary fixation with Kirschner wires.

**RESULTS:** In the male patient the Kirschner wires were removed earlier than planned due to an infection. Re-correction was performed at a later stage. Impressive improvement was seen in the exercise intolerance and the arrhythmias were almost completely absent in both patients. The female patient even described significant changes in body posture and breathing volumes although not objectively noticeable with pulmonary function tests.

**CONCLUSIONS:** Symptomatic pectus excavatum in the elderly is a syndrome that is treated with surgical intervention. Patients present with exercise intolerance, cardiac arrhythmias and progressive dyspnoea. When non surgical treatment does not lead to reduction of symptoms the indication can be made to perform a correction of the anatomical disorder. The open technique described by Ravitch is in the elderly the first choice.

#### OP-529-TECHNICAL MODIFICATION OF THE NUSS OPERATION FOR THE CORRECTION OF PECTUS EXCAVATUM

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**BACKGROUND:** Pectus excavatum is a deformity of the thoracic wall and its treatment is surgical correction. The most employed techniques are those proposed by Ravitch and by Nuss. The first one is considered the conventional technique, while the Nuss procedure is minimally invasive.

**OBJECTIVE:** Our goal is to propose 2 technical modifications to the Nuss operation regarding the patient position on the surgery table and the site of introduction of the optical trocar.

**METHODS:** Patient is placed in the supine position on a 12 cm-high cushion that extends from the head to the waist that is placed longitudinally on the surgical table. Arms are stretched along the body. Optical 5mm (30 degrees) trocar is inserted 2 intercostal spaces cranially to the space where the metal bar will be introduced at the median axillary line. Otherwise, the operative technique remains as originally described by Nuss.

**RESULTS:** The following benefits of this new approach have been observed as detailed below: 1) Increased safety regarding the trocar introduction, reducing the risk of diaphragmatic lesion. 2) Better visualization of bar inserter during dissection of the anterior mediastinum and of the pleural cavity as the deformity does not obstruct image. 3) Easier passing of fixation wires of the metal bar in the right side. 4) Better positioning of a chest tube when necessary, 5) more aesthetically result as scars are covered by the arms and 6) minimization of brachial plexus lesion risk.

**CONCLUSIONS:** We consider these modifications contribute to better performance of this surgery.

#### OP-530-QUALITY OF LIFE OF PATIENTS WHO HAVE UNDERGONE THE NUSS PROCEDURE: PRELIMINARY FINDINGS

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**BACKGROUND:** The surgical repair of the pectus deformities are mostly performed due to the cosmetic and psychosocial problems. The Nuss procedure has become the treatment of choice for pectus excavatum repair for the last ten years, also a modified Nuss procedure defined by Abramson has started to gain support for the pectus carinatum repair in the last few years. This prospective study was conducted to explore the changes in quality of life and overall satisfaction in patients who have undergone a Nuss procedure or its Abramson modification.

**METHODS:** From August 2005 to October 2007 a total number of 32 patients were operated on for their pectus deformities. 30 patients had Nuss procedure for pectus excavatum and 2 patients had Abramson modification of this procedure for pectus carinatum. Two patients who had undergone an early bar removal (one pectus excavatum and one pectus carinatum patients) due to intractable pain were excluded while 30 patients (25 males) between 7 and 27 years of age (median 16.5) were included in the study. A two-step Nuss evaluation Questionnaire was used twice on both the patients and their parents, preoperatively and on the postoperative 6th month. The data was analysed using Paired T Test to determine statistical significance of differences, with a <0.05 level of significance.

**RESULTS:** The results based on these preliminary data revealed a statistically very significant improvement ( $p<0.0001$ ) on the overall quality of life and a high level of satisfaction following surgery. Both the psychosocial ( $p<0.0001$ ) and physical ( $p<0.005$ ) components revealed a statistically very significant improvement.

**CONCLUSIONS:** The Nuss procedure has a positive impact on both the physical and psychosocial well-being of the patients who are suffering from pectus deformities, and it makes important contributions to patients' quality of life.

#### OP-531-SURGICAL CORRECTION OF PECTUS EXCAVATUM AND ASSOCIATED HYPOMASTIA

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**BACKGROUND:** Major pectus excavatum deformity can be associated with hypomastia in females. Correction of this condition by mammary prosthesis without prior correction of the pectus excavatum shows unsatisfactory cosmetic results. This study investigates the clinical and radiological outcome of female patients who underwent combined two stages surgical correction of a double harm.

**METHODS:** Since 1990, 18 female patients aged from 17 to 47 (mean age 27) underwent a two-stage correction using a modified Ravitch procedure with steel or STRATOS titanium osteosynthesis first. After one year the material was removed and mammary prostheses were implanted in the subpectoral plane during this second procedure through the same incisions. The mean follow-up was 8 years. Our study was based on the following criteria: function (questionnaire and pulmonary function tests), morphology (CT Haller index), cosmesis (evaluation on a scale of 1 to 10 by both surgeons and patients) and psychology (questionnaire).

**RESULTS:** Despite minor pulmonary function tests changes, a significant subjective improvement of physical capability during exercise was observed following pectus excavatum repair. Correction of anterior chest wall deformation increased sterno-vertebral distance of mean 3.2 cm (range 1.5-5.5) resulting in cardio-pulmonary decompression. The CT (Haller) index decreased from mean 6.4 (range 3.2-12.5) to mean 3.1 (range 2.4-4.0). The cosmetic result was scored grade 8.7 (range 7.0-10.0) by the patients while only graded 7.6 by the surgeons (range 5.0-9.2). The psychological benefit was always considered as major after surgical treatment.

**CONCLUSIONS:** Repair of both pectus excavatum and severe hypomastia is feasible using a combined two-stage procedure merging thoracic and plastic surgery: sterno-costo-chondroplasty with osteosynthesis first, then material removal and mammary prostheses implantation one year later. These well established and reliable surgical techniques lead to excellent cosmetic and psychological results with a low complication-rate, in female patients suffering from a double deformity. In opposition to the current technique using silicone presteral prosthesis implantation only, the modelling sterno-costo-chondroplasty leads to definitive results, corrects functional cardio-pulmonary disorders and is perfectly compatible with secondary placement of breast implants. However, this invasive intervention should only be indicated in patients with major funnel chest deformity.

## CORONARIES II

### OP-532-LONG-TERM SUPERIORITY OF TWO OR MORE ARTERIAL GRAFTS IN PATIENTS WITH MULTIVESSEL CORONARY ARTERY BYPASS GRAFTING

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**OBJECTIVE:** The long-term superiority of two or more arterial grafts ( $\geq 2$ art) versus single internal thoracic artery (SITA) coronary artery bypass grafting (CABG) remains unresolved. The aim of this study was to compare the long-term survival of SITA and  $\geq 2$ art CABG with or without concomitant saphenous vein grafting for multivessel CABG (3-vessel disease,  $\geq 3$  distal anastomoses).

**METHODS:** Between January 1992 and March 2002, 2981 consecutive patients from our audited database underwent multivessel CABG. Long-term survival data were obtained from the National Death Index (mean follow-up 5.1 years). Groups were compared by Cox proportional hazard models and risk-adjusted Kaplan-Meier survival plots were constructed.

**RESULTS:** Patients with  $\geq 2$ art ( $n=1865$ ) had lower EuroSCORE (5.81 vs. 7.11,  $P<0.001$ ) compared to SITA patients ( $n=1116$ ). Patients with  $\geq 2$ art were younger with higher ejection fraction and had less diabetes, recent myocardial infarction, left ventricular hypertrophy, chronic obstructive pulmonary disease and preoperative use of intra-aortic balloon pump than SITA patients. SITA patients had higher 30-day mortality (4.6% vs. 3.1%,  $P=0.044$ ), prolonged length of stay (12.6 vs. 9.8 days,  $P<0.001$ ) and more gastrointestinal complications (2.0% vs. 1.0%,  $P=0.035$ ) - unmatched groups. However there were no differences in other major postoperative complications. Patients with  $\geq 2$ art had better 5-year actuarial survival (86.0% vs. 77.3%,  $P<0.0001$ ). Multivariate Cox regression analysis determined that CABG with  $\geq 2$ art had beneficial effect on long-term survival (adjusted hazard ratio 0.787, 95% confidence intervals 0.667-0.928,  $P=0.004$ ). Risk-adjusted Kaplan-Meier curves (adjusted for all independent predictors for long-term mortality: age, ejection fraction, diabetes, recent myocardial infarction, chronic obstructive pulmonary disease, peripheral vascular disease, emergent operation, congestive heart failure and renal failure) confirmed the beneficial effect of  $\geq 2$ art on long-term survival.

**CONCLUSIONS:** Patients with  $\geq 2$ art had a significantly better long-term survival compared to SITA patients. The operation with two or more arterial grafts for multivessel CABG should not be denied, especially if life expectancy is higher than 10 years.

### OP-533-MANAGEMENT OF PATENT INTERNAL MAMMARY ARTERY GRAFTS DURING REOPERATIVE VALVULAR SURGERY: A COMPARISON OF TWO APPROACHES

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**OBJECTIVE:** The complexity of reoperative cardiac surgery is increased in patients with previous coronary artery bypass grafting. The further presence of patent pedicled IMA grafts presents particular challenges with respect to myocardial protection, necessitating either temporary occlusion of these grafts or alternative cardioplegic approaches. At our institution, these situations have been handled either by IMA isolation and clamping or by use of more profound hypothermia. The aim of this study was to compare the intraoperative morbidity and postoperative outcomes associated with each of these approaches.

**METHODS:** This retrospective study focused on operations performed over a decade. This analysis is focused only on patients undergoing isolated valvular procedures in setting of patent IMA grafts from a previous CABG; pts having repeat revascularization were excluded. Data was analyzed using SPSS.

**RESULTS:** 164 patients with previous CABG and patent IMA grafts underwent reoperative valvular surgery. In 121 (74%) of these (Gp A), myocardial protection included IMA graft isolation and clamping; in 43 (26%), the IMA grafts were not isolated, and myocardial protection was achieved with a combination of more profound hypothermia and/or more frequent or continuous cardioplegia administration (Gp B). Choice of approach was driven by surgeon preference. Preoperative demographics and clinical characteristics did not differ between the two groups. Although there was no difference in aortic crossclamp time between the groups, patients in Gp B had significantly lower minimum core temperatures ( $26.0 \pm 4.9$  degrees C vs.  $31.4 \pm 3.1$  degrees C,  $p<0.0001$ ) and longer cardiopulmonary bypass times ( $163 \pm 88$  min. vs.  $124 \pm 51$  min,  $p=0.001$ ) than those in Group A. Despite increased dissection required for isolation of IMA grafts, patients in Gp A had similar rates of IMA or other graft injury (2 cases, 1.7%) as those in Gp B (1 case, 2.3%). There were no statistically significant differences between the groups with respect to perioperative complications or 30day mortality.

**CONCLUSION:** Isolation and occlusion of patent IMA grafts during reoperative valvular surgery.

### OP-534-FACTORS DETERMINING THE DURATION OF INTUBATION AFTER CORONARY ARTERY GRAFT SURGERY

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**BACKGROUND:** The study was designed to identify those factors associated with early tracheal extubation following cardiac surgery. Previous studies have tended to concentrate on surgery for coronary artery bypass or on other selected cohorts.

**METHODS:** Retrospective analysis of 2095 unselected patients undergoing coronary artery bypass graft surgery was performed from January 2005 until July 2007.

**RESULTS:** In total, 39% of all patients were extubated within 6 h, 89% within 24 h and 94.9% within 48 h. Delayed extubation ( $>6$  h after surgery) appeared unrelated to age, gender, body mass index, a previous pattern of angina or myocardial infarction, diabetes and preoperative atrial fibrillation, as well as other factors. Delayed tracheal extubation was associated with poor left ventricular, renal and pulmonary function, and urgency of surgery. Early extubation ( $<6$  h) was not associated with a reduced length of stay in either the intensive care unit or in hospital compared with patients who were extubated between 6 and 24 h. Patients who were extubated after 24 h had a longer duration of hospital stay and a greater incidence of postoperative complications. Postoperative complications were not adversely affected by early tracheal extubation.

**CONCLUSIONS:** Our study both patient- and surgery-specific factors may be influential in determining the duration of postoperative ventilation of the lungs following cardiac surgery. In view of the changing nature of the surgical population, regular re-evaluation is useful in reassessing performance.

### OP-535-LOW HEMATOCRIT DURING CARDIOPULMONARY BYPASS IS NOT ASSOCIATED WITH ADVERSE OUTCOME AFTER CORONARY BYPASS SURGERY

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**BACKGROUND:** This study aims to investigate the effects of low hematocrit level during cardiopulmonary bypass on outcome parameters after coronary bypass surgery.

**METHODS:** Data of 2632 patients who underwent isolated on pump coronary bypass surgery at one institution with the same surgical team between 1999 and 2007 have been analyzed for mortality and adverse outcomes. Hematocrit level of  $\leq 20\%$  during cardiopulmonary bypass was defined as low hematocrit. Multivariate analysis of risk factors were applied, perioperative characteristics and outcome variables including; cardiopulmonary bypass time, cross clamp time, ventilation time, transfusion rate, total drainage, intensive care unit stay time, hospital stay time, rate of inotropic drug use, rate of low cardiac output syndrome, new onset atrial fibrillation, pulmonary complications, new onset stroke and renal failure, sepsis, mediastinitis, gastrointestinal complications,



reoperation, readmission and the rate mortality according to the lowest hematocrit level during cardiopulmonary bypass were analyzed.

**RESULTS:** The mean lowest hematocrit level of the patients was  $27.6 \pm 4.8\%$ . A total of 131 patients with the lowest hematocrit level  $\leq 20\%$  (Low hematocrit group; range: 11.6-20.0 mean:  $18.5 \pm 1.8\%$ ) and 2501 patients with the lowest hematocrit level  $> 20\%$  (High hematocrit group; range: 20.2-50.6%, mean:  $28.1 \pm 4.4\%$ ) were defined. Risk factors for developing hematocrit levels of 20% or lower during cardiopulmonary bypass were found to be: preoperative hematocrit  $\leq 30\%$  ( $p=0.0001$ ; OR=28.5; 95%CI =13.0-62.2), female sex ( $p=0.0001$ ; OR=5.2; 95%CI =3.1-8.8), serum creatinine  $> 200$  mmol/l ( $p=0.01$ ; OR=4.4; 95%CI =1.5-12.5), body mass index  $< 25$  kg/m<sup>2</sup> ( $p=0.006$ ; OR=2; 95%CI =1.2-3.4) at the multivariate analysis. The mean postoperative drainage (ml) ( $582.4 \pm 315.0$  vs.  $608.2 \pm 343.3$ ), ventilation time (hours) ( $4.5 \pm 2.4$  vs.  $4.7 \pm 7.2$ ), intensive care unit stay time (hours) ( $24.5 \pm 36.9$  vs.  $22.9 \pm 34.3$ ), hospital stay time (days) ( $5.6 \pm 3.3$  vs.  $5.3 \pm 3.6$ ), transfusion rate (%) ( $0.64 \pm 0.9$  vs.  $0.56 \pm 1.2$ ), rate of new onset postoperative renal failure (%) ( $0.4$  vs.  $0.3$ ), rate of postoperative stroke (%) ( $1.5$  vs.  $1.1$ ), rate of readmission to the intensive care unit (%) ( $1.5$  vs.  $1.9$ ), rate of readmission to the hospital (%) ( $2.3$  vs.  $2.9$ ) and rate of mortality (%) ( $1.0$  vs.  $1.0$ ) in low hematocrit group vs. high hematocrit group respectively were statistically similar ( $p>0.05$ ). Evaluation of other perioperative variables and outcome parameters also revealed no significant difference between two groups.

**CONCLUSION:** In this study, we observed that hematocrit level of  $\leq 20\%$  during cardiopulmonary bypass is not associated with adverse outcome after coronary bypass surgery. This information may be helpful for limiting unnecessary transfusion during cardiopulmonary bypass and prevent transfusion related complications after coronary bypass surgery.

#### OP-536-EARLY AND MIDTERM RESULTS OF CORONARY ARTERY BYPASS USING PAS-PORT SYSTEM

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**BACKGROUND:** The PAS-Port system (Cardica, Redwood City, CA) allows the rapid deployment of a clampless proximal anastomosis between a saphenous vein graft and the aorta. Results of early and midterm follow-up study of the patency rate of this system are controversial. The purpose of our study was to investigate the early and midterm patency rates in saphenous vein grafts used PAS-port system.

**METHODS:** From May 2005 and September 2007, forty-two patients underwent off-pump or on-pump beating coronary artery bypass grafting for proximal saphenous vein graft anastomoses with the PAS-Port system. Outcome variables were intraoperative device performance; early angiographic graft patency and midterm clinical follow up.

**RESULTS:** The study enrolled 42 patients; 25 males and 17 females. Age was from 63 to 92-year-old (mean 77.3). Sixty-three PAS-Port devices were used in 42 patients. Two PAS-Port device deployments were unsuccessful (3.1%) because of incomplete anastomoses. One anastomosis re-did with an another PAS-Port device and the other anastomosis were put the another saphenous vein graft as Y-graft. Of the 42 patients, 14 patients underwent emergency surgery owing to acute myocardial infarction or unstable angina pectoris and 28 patients underwent elective surgery. 40 patients underwent off-pump coronary artery bypass and 2 patients did on-pump beating. Number of anastomosis was from one to four (mean 2.3 anastomoses). There were no intraoperative mortality and no hospital death. There were no major complications, such as reoperation for bleeding, perioperative myocardial infarction, stroke, and deep wound infection. Forty-one patients underwent coronary angiogram before discharge. One patient refused to do it. At discharge, all grafts were patent resulting in a patency of 100%. The mean follow-up was 15.6 months (range 2-30 months). At 4 months postoperatively, one patient had died of colon cancer. During the follow-up period, two patient re-presented hospital because of ischemic events. One patient showed SVG (to RCA #3) occlusion and other patients who refused to undergo coronary angiography postoperatively showed SVG (to OM) occlusion angiographically. Two of 61 grafts using PAS-Port system (3.2%) were occluded in the midterm period. Forty patients were event free and no ischemic symptom during follow-up period.

**CONCLUSIONS:** Early results (100% patency) were excellent and mid-term clinical results were acceptable. The potential key advantages of coronary artery bypass using PAS-Port system are (1) to avoid manipulating the aorta, (2) time savings, (3) facilitate limited access surgery, and (4) to create a standardized

anastomosis with a predefined orifice area. Long term follow-up is necessary to evaluate that the PAS-Port system is beneficial for off-pump or on-pump beating coronary artery bypass.

#### OP-537-IS SINGLE CROSS CLAMP TECHNIQUE REDUCING RISK OF STROKE IN CORONARY ARTERY SURGERY

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**BACKGROUND:** Stroke is a devastating complication of coronary artery bypass graft surgery (CABG). The single-clamp technique may decrease its risk by avoiding manipulation of the aorta. The aim of this study was to evaluate neurological outcome after coronary surgery using two different techniques for proximal anastomosis.

**METHODS:** Between 2002 and 2007 825 patients had isolated CABG with use of multi side clamp technique (group A) and 435 with single cross clamp technique (group B) for proximal anastomosis. All data were prospectively entered into a database. Clinical characteristics, mortality and morbidity were analysed in both groups. A comparison of incidence of postoperative stroke was made between the two groups.

**RESULTS:** In group A patients had lower preoperative risk assess by standard EuroSCORE 3.7 (SD 2.8) vs. 4.6 (SD 3.5) ( $p<0.001$ ) and logistic EuroSCORE 4.2 (SD 6.3) vs. 6.5 (SD 9.9). In group B patients more frequently required preoperative IABP 29 (3.5%) vs. 37 (8.5%) ( $p<0.001$ ), had preoperative neurological dysfunction 12 (1.5%) vs. 14 (3.2%) ( $p=0.018$ ) and peripheral vascular disease 79 (9.6%) vs. 83 (19.1%) ( $p<0.001$ ). They also had longer cross clamp time 55.6 (SD 15.6) vs. 89.1 (SD 24.6) ( $p<0.001$ ), however mean number of grafts per patient in this group was higher 3.6 (SD 0.8) vs. 4.0 (SD 0.9) ( $p<0.001$ ). There were no differences in terms of postoperative stroke 8 (1%) vs. 3 (0.7%) ( $p=0.3$ ) or other neurological complications 28 (3.4%) vs. 12 (2.8%) ( $p=0.27$ ) and mortality 8 (1%) vs. 6 (1.4%) ( $p=0.26$ ).

**CONCLUSION:** There was no benefit of using single cross clamp technique concerning reduction in the incidence of postoperative stroke in our population. However this technique was used in patients with higher preoperative risk of neurological complications. Also the number of postoperative strokes in both groups was relatively low.

#### OP-538-FEMALE RISK USING OPCAB, n-CIRCUIT CORONARY REVASCLARIZATION

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**AIM:** We investigate the impact of gender on morbidity and mortality parameters in off pump CABG patients.

**MATERIALS AND METHODS:** From 02/2001 to 11/2005, in our institution 1359 patients underwent isolated coronary revascularization with the n-circuit technique, consisting of: 1) Beating heart, 2) OPCAB 3) aorta non-touch 4) use of composite grafts 5) arterial revascularization. There were 1159 men (Group A) and 200 women (Group B). Both groups were compared regarding pre-op risk factors, intra-op parameters and post-operative morbidity and mortality. Follow-up lasted from 4-60 months. Chi-square, Fisher's exact test and Cox's model for regression analysis were used to analyze data.

**RESULTS:** Female patients were older ( $p<0.0005$ ). Obesity was more prevalent among them ( $p<0.0005$ ), as was arterial hypertension ( $p<0.0005$ ) and diabetes ( $p<0.0005$ ). Emergency operations were more frequent in this group ( $p<0.027$ ). There was no difference in the use of IABP pre-op. There were fewer distal anastomoses performed in females ( $2.48 \pm 0.88$  vs.  $2.79 \pm 0.92$ ,  $p<0.0005$ ). 30-days mortality (1.1 vs 4%) as well as 7-days mortality (0.3 vs 0%) was not statistically different in the two groups. Use of IABP was comparable post-operatively. Cognitive disturbances and frank stroke were rarely encountered (0.6 and 0.2% respectively). Females had more pulmonary complications early post-operatively ( $p<0.014$ ). During the follow-up period survival seemed to favor the male group ( $p<0.001$ ). Further analysis using Cox regression model with exclusion of confounding pre-op morbidity factors (more prevalent in Group B), showed similar survival. As a group, women were 1.06 times more likely to die of a cardiac cause compared to men ( $p<0.897$ ).

**CONCLUSIONS:** The use of the n-circuit technique is equally effective for both gender subgroups. Females are more prone to pulmonary complications early

post-operatively. The apparent difference in survival favoring males can be attributed to higher prevalence of pre-operative risk factors in females.

### OP-539-RESULTS OF USING DRUG ELUTING STENTS IN THE TREATMENT OF THE PATIENTS WITH DIFFERENT TYPES OF ISCHEMIC HEART DISEASE

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**BACKGROUND:** Comparative analysis of the follow-up results of using drug eluting stents in the treatment of the patients with different types of IHD and different types of coronary arteries lesions.

**METHODS:** Since June, 2002 to November, 2007, we have performed 1700 endovascular procedures with implantation of 3250 "Cypher" stents.

**RESULTS:** Single vessel disease - we received the study of using 129 bare metal stents in 106 patients and 157 drug eluting stents in 128 patients. Follow-up results (mean 14.2±4.3 month): cardiac events rate was 23% vs 7,4%; recurrent angina rate was 20,7% vs 5,7%; restenosis rate was 22,4% vs 6,4%; AMI rate 4,6% vs 4,7% and rate of mortality was 2,3% vs 1,9%. Multiple vessel disease - we received the study of using 275 bare metal stents in 132 patients and 395 drug eluting stents in 137 patients. Follow-up results (mean 15.1±2.7 month): cardiac events rate was 41,7% vs 15,4%; recurrent angina rate was 34,1% vs 9,3%; restenosis rate was 34,6% vs 8,9%; AMI rate 5,7% vs 4,2% and rate of mortality was 3,5% vs 2,7%. Acute myocardial infarction - we received the study of using 192 bare metal stents in 130 patients and 124 drug eluting stents in 72 patients. Follow-up results (mean 14.8±2.8 month): cardiac events rate was 41,2% vs 13,5%; recurrent angina rate was 27,5% vs 8,6%; restenosis rate was 32,7% vs 12,5%. Rate of mortality in stable patients was 0%, and in patients with ACS 16,7%. Total chronic occlusion - we received the study of recanalization of 295 occluded coronary arteries in 269 patients with using bare metal stents in 92 patients and drug eluting stents in 116 patients. Rate of angiographic success was 70,9%. Follow-up results (mean 16.5±5.6 month): recurrent angina rate was 40,3% vs 9,4%; restenosis rate was 41,7% vs 9,2%; AMI rate 6,2% vs 4,8% and rate of mortality was 4,1% vs 2,7%. Bifurcational lesions - we received the study of 149 bifurcational stenting in 133 patients. Follow-up results (mean 12.7±5.6 month): restenosis rate in BMS was 36,3% in main branch and 54,5% in marginal branch vs 4,5% and 13,6% in DES. Coronary heart disease with diabetes - we received the study of using bare metal stents in 35 patients and drug eluting stents in 45 patients. Follow-up results (mean 13.9±5.6 month): restenosis rate was in BMS 30% vs 10% in DES. Stenting of small diameter vessels - we received the study of using 368 stents in 289 patients. Follow-up results (mean 12.7±3.7 month): restenosis rate was 45,5% vs 9,3%.

**CONCLUSIONS:** Using drug eluting stents in the treatment of the patients with different types of IHD and different types of coronary arteries lesions improved clinical follow-up. Rate of restenosis decreased in 2-3 times in DES.

### OP-540-QUALITY OF LIFE AFTER CORONARY BYPASS GRAFTING VERSUS PERCUTANEOUS CORONARY INTERVENTION

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**BACKGROUND:** Coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI) have a long history as invasive options for treating patients with coronary artery disease (CAD). When selecting the mode of treatment for coronary revascularization, the technical outcome may not be the only consideration. Post procedural health status, including symptoms, functionality and health-related quality of life (HRQoL) are also important endpoints. The aim of the present study was to assess HRQoL, functional state and relief from angina after CABG versus PCI in the management of stable CAD.

**METHODS:** A total of 469 patients were analysed. The CABG group consisted of 240 patients (mean age 66.1 yrs, male 80.4%) whereas 229 patients (mean age 64.5 yrs, male 68.6%) were treated with PCI. A mean number of 4.1 ± 1.3

anastomoses was performed by surgery whereas the mean number of dilated coronary artery lesions was 1.2 ± 0.4 among PCI patients, 88.6% of stenoses were treated with stent. HRQoL was measured preoperatively by the 15D instrument, a generic and multidimensional measure. Follow-up questionnaires were mailed after 6 and 18 months and a follow-up visit was made by the research nurse after 36 months postoperatively.

**RESULTS:** CABG patients had poorer left ventricular ejection fraction ( $p < 0.001$ ), higher NYHA class ( $p < 0.001$ ) and higher frequency of both left main stenosis and 3-vessel disease ( $p < 0.001$ ). 30-day mortality was 0.8% in the CABG group and 0% in the PCI group and the three year survival 95.0% and 95.6% ( $p = 0.677$ ), correspondingly. CABG patients had initially both poorer structural and functional state of the heart and, moreover, a higher NYHA class. Frequency of repeat angiographies (3 year cumulative frequency 36.7% vs. 4.2%,  $p < 0.001$ ), PCI (14.8% vs. 1.3%,  $p < 0.001$ ) and CABG (5.7% vs. 0.8%,  $p = 0.003$ ) was higher in the PCI group. The baseline HRQoL was equal between the groups and improved significantly during the first 6 months in both groups but evened out towards the end of follow-up. Clinically evident improvement (a change of the 15D score  $> 0.03$ ) of the HRQoL ( $p = 0.008$ ), decrease of NYHA class ( $p = 0.025$ ) and freedom from angina ( $p = 0.022$ ) was detected more frequently among CABG patients at 36 months.

**CONCLUSIONS:** Although CABG was associated with more early mortality, long-term survival did not differ between the two treatment methods. Despite more serious preoperative state and more demanding procedure CABG patients achieved an equal level of HRQoL compared to PCI patients, but achieved better physical performance and greater freedom from angina. Additionally, the need for repeat procedures was significantly lower in CABG patients, which may serve to equalise the total costs.

### OP-541-IS THERE A LONG-TERM SURVIVAL BENEFIT IN CORONARY ARTERY BYPASS GRAFTING BECAUSE OF BLOOD CARDIOPLEGIA OR MICROSCOPE USE IN A 16-YEAR FOLLOW-UP STUDY?

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**BACKGROUND:** There is a paucity of long-term results regarding the optimal method for myocardial protection as well as the degree of optical magnification. The availability of a 16-year database as well as a variety of statistical methods allowed us to attempt such an analysis.

**METHODS:** Consecutive patients ( $n=5832$ ) underwent isolated CABG between January 1989 and March 2005 and were prospectively entered in the State database. Long-term survival data were obtained from the National Death Index. Group I ( $n=2762$ , microscope with magnification 10x to 12x and crystalloid cardioplegia), group II ( $n=722$ , blood cardioplegia and no microscope) and group III ( $n=2348$ , crystalloid cardioplegia and no microscope) were compared by risk-adjusted (EuroSCORE and major postoperative complications) Kaplan-Meier curves. In addition, we studied subgroups Ia, IIa, IIIa which comprised of only patients with 2 or more arterial grafts (BITA+).

**RESULTS:** Actuarial 150-month survival was 59.6%, 58.8% and 58.4% respectively and at 199 months was 50.1% and 45.9% for groups I and III respectively ( $P=0.0085$ ). However, there was no statistically significant difference in risk-adjusted Kaplan-Meier curves ( $HR=1.028$ , 95% CIs 0.980-1.077,  $P=0.267$ ). Surprisingly though, the results in the BITA+ groups were different and statistically significant,  $HR=0.842$ , 95% CIs 0.776-0.913,  $P<0.001$ , in favor of group IIIa. Mean age was 64.6 years for group Ia, 62.3 for group IIa and 62.9 for IIIa.

**CONCLUSIONS:** In this single-institutional study actuarial results favor microscope use (group I). When risk-adjusted, there is no long-term benefit survival up to 16 years whether blood or crystalloid cardioplegia or microscope is used. Patients with multiple arterial grafts fare better in group IIIa.

## ARRHYTHMIA I

### OP-542-ATRIAL FIBRILLATION TREATMENT CONCOMITANT WITH ELECTIVE CARDIAC SURGERY. FIVE YEARS EXPERIENCE

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**BACKGROUND:** Atrial fibrillation (AF) is the most frequent cardiac arrhythmia in patients for elective cardiac surgery. Irrigated radiofrequency (RF) offers faster and less invasive alternative to the maze-cox procedure to treat AF. The objective of the present study is to evaluate effectiveness and safety of the RF in concomitant procedures

**METHODS:** 100 consecutive patients (October 2002-April 2007) 58% Female; average age 66,2years ,who underwent valvular surgery (16 with concomitant coronary revascularization) and were in AF. Irrigated RF mimicking the Maze III lesions ,was preformed in all patients . Parsonnet score risk average 11,23 % (5-18%). Follow-up in a basis of presentially visits with ECG , every 6 months.

**RESULTS:** Early mortality was 4 (4%) unrelated to the RF procedure. One more patient dead in the second year after the operation due to Stroke despite a correct anticoagulation ratio. After a follow-up average of 34 months: 63 patients were in sinus rythm, 2 with atrial pacemaker and others 30 in persistent AF.

**CONCLUSIONS:** Irrigated RF is a reliable technic to treat concomitant AF in patients for elective cardiac Surgery. The better results were in patients with paroxysmal or within the first year of instauration of a permanent AF. The technique does not add morbi-mortality to the cardiac procedure. Although only 16 patients remain without anticoagulants, we think Sinus Rythm improves functional class, quality of life and Stroke risk. So, we applying RF even in patients with mechanical prosthesis

### OP-543-SURGICAL ABLATION OF ATRIAL FIBRILLATION WITH HIGH INTENSITY FOCUSED ULTRASOUND: OPERATIVE TECHNIQUE AND MID-TERM RESULTS IN 55 PATIENTS

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**BACKGROUND:** High-intensity focused ultrasound (HIFU) energy has been recently introduced as an alternative to the classic Cox-Maze procedure for the surgical treatment of atrial fibrillation (AF). The first studies have shown excellent results. Here we report our experience with this new technique in patients undergoing cardiac surgery and concomitant AF ablation.

**METHODS:** From January 2006 to July 2007, fifty-five patients with structural heart disease underwent cardiac surgery and concomitant AF ablation with HIFU energy. There were 29 males (53%) and the mean age was  $67 \pm 8$  years. Permanent AF was present in 35 patients (63%), persistent AF in 12 (22%) and paroxysmal AF in 8 (15%) patients. The mean duration of documented AF was  $87 \pm 170$  months. Concomitant procedures performed were: aortic valve surgery in 14 patients (25%), mitral valve surgery in 18 (33%), double valve surgery in 13 (24%) coronary revascularization in 6 (11%) and valvular plus coronary surgery in 4 (7%) patients. In two patients undergoing mitral valve repair a minimally invasive approach through a right mini-thoracotomy was used, the remaining cases were operated on through a median sternotomy. In all patients the left atrium was encircled and a continuous box lesion was performed epicardially on the beating heart using a multiple (8 to 14) transducers ultrasound ablation device. In twenty-three (42%) patients an additional lesion toward the mitral annulus was also created from the epicardium using the complementary ultrasonic handheld device. In five patients (9%) right atrial lesions were also performed. Total ablation time was 10 minutes or less in all cases.

**RESULTS:** The function of the device was normal in all cases, no adverse events were noticed. Hospital mortality was 1.8% (1 patient), another patient died 3

months postoperatively. The cumulative mortality was 3.6 %. None of the deaths was related to the ablation procedure. Mean and median follow-up were 260 and 325 days respectively, three patients were lost to follow-up (follow-up 94.3 % complete). At 6 months 29 patients (58 %) were in SR, 20 patients (40 %) remained in AF, 1 patient (2 %) showed atrial flutter. In five patients (10 %) a pace maker had to be implanted. Thirty-three patients reached a 12 months follow-up. Among them, 14 were in SR (42.4 %) and 15 were in AF (45.5 %).

**CONCLUSION:** In our experience, surgical ablation of AF with epicardial HIFU energy can be performed safely and fast. Nevertheless, we could not confirm the excellent results reported in other series in terms of successful conversion to SR. More studies with larger numbers of patients and longer follow-up are needed, in order to define the role of HIFU energy in the surgical therapy of AF.

### OP-544-THAIS' EXPERIENCE OF MODIFIED MAZE PROCEDURE IN ATRIAL FIBRILLATION ASSOCIATED WITH MITRAL VALVE DISEASE

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**BACKGROUND:** The association between mitral valve disease and atrial fibrillation is well known. The excellent result of the Maze III operation demonstrated that a surgical cure of atrial fibrillation is possible. A simplified Maze procedure with radiofrequency ablation of the atrial tissue added to mitral valve surgery may help to cure permanent AF with low risk.

**METHOD:** From June 2004 to November 2007, an radiofrequency ablation concomitant with mitral valve operation was performed on 110 patients. All patients presented with permanent atrial fibrillation. The underlying diseases were Rheumatic heart disease in 81 patients (73.6%), Degenerative heart disease in 24 patients (21.8%), congenital heart disease in 1 patient (0.9%). Left atrial reduction was done on 100 patients (90.9%).

**RESULT:** Mitral valve replacement was performed in 67 patients (60.9%), mitral valve repair in 33 (30%), double valve replacement in 10 (9.1%), concomitant coronary bypass surgery in 6 (5.4%), and combined with tricuspid valve repair in 9 (8.2%). Mean cardiopulmonary bypass time for the complete procedure was 128 minutes with mean ablation time of 37 minutes. We had 2 operative deaths (1.8%), five 90 days mortality, and four late deaths; 4 major morbidity composed of one perioperative stroke, one right ventricular infarction, and one low cardiac output syndrome. No any patient needs permanent pacemaker implantation. Atrial fibrillation disappeared in 95.3% immediate after operation, 87.2% on day one, 68.9% on day seven, 69.6% at one month, 84.2% at 3 month, 83.5% at 6 month, and 88.4% at one year. We found no any significant factors influence the success except no left atrial reduction in left atrial size more than 45 mm. when compare to reduction group ( $p = 0.014$ )

**CONCLUSION:** Radiofrequency ablation combined with mitral valve surgery proved to be safe to do. Left atrial reduction in large left atrial size enhance better result however the long-term results still have to be confirmed with further regular patient follow-up examinations.

### OP-545-EPICARDIAL VERSUS ENDOCARDIAL RADIOFREQUENCY ABLATION - TWO DIFFERENT METHODS OF ATRIAL FIBRILLATION TREATMENT, TWO DIFFERENT GROUPS OF PATIENTS, ONE YEAR EXPERIENCE

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**OBJECTIVES:** To compare early results of surgical treatment of atrial fibrillation using epicardial and endocardial radiofrequency ablation.

**METHODS:** A retrospective study of 61 consecutive patients operated from January 2007 to December November 2007 was performed. 27 mitral valve prostheses, 8 mitral rings and 13 aortic valve prostheses were implanted. CABG/OPCAB alone or as a concomitant procedure were performed in 29 patients. Atrial fibrillation both paroxysmal and permanent was diagnosed in every case. Radiofrequency ablation of left atrium using MEDTRONIC Cardioblate system was performed as a concomitant procedure - in 38 patients endocardial ablation using monopolar device and in 23 patients epicardial ablation using bipolar device. All patients had echocardiography and ECG performed pre and postoperatively.



**RESULTS:** Mean ejection fraction was good - 48,47 % (range 25-65%). Mean EuroSCORE logistic was 5,83% (range 0,88 - 23,37). Preoperatively mean LA diameter was 55,57 mm ( range 32-75mm). We noticed 3 deaths after the operation (4,92%) in 42nd (LOS, respiratory insufficiency, renal failure, MOF, ), 27th (LOS, respiratory insufficiency, renal failure, MOF) and 2nd (bleeding, LOS, renal failure) post operative day respectively. Mean length of stay was 11,09 days (range 4-42). In the day of discharging from hospital 75,43% patients were in sinus rhythm (71,05%, after endocardial ablation and 82,06% after epicardial ablation) and 1 patient needed pacemaker because of bradycardia. However mean LA diameter of patients treated with endocardial device was significantly higher than epicardial group (55,05 mm versus 43,17 mm).  
**CONCLUSIONS:** Both epicardial and endocardial methods appear to be safe and effective method of treatment of atrial fibrillation in different groups of patients.

#### **OP-546-QUANTIFICATION OF SINUS NODE 'S BLOOD CAPILLARY DENSITY IN PATIENTS WITH CHRONIC ATRIAL FIBRILLATION**

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**BACKGROUND:** The ultimate physiopathologic mechanisms responsible for AF are still uncertain.

**METHODS:** Sinus node biopsy specimens were obtained from 16 patients in chronic atrial fibrillation undergoing open heart surgery. Control specimens were obtained from the autopsies of 4 subjects in sinus rhythm who died from non-cardiac causes. All specimens were collected and processed in the same manner and subsequently stained with Masson 's trichrome for histologic comparison. Morphometric quantification of sinus node 's Blood Capillary Density (BVD; defined as the proportion of tissue corresponding to blood capillaries), was estimated with the aid of a grid in each specimen. Five atrial fibrillation specimens, in which only fibrous tissue (with no blood vessel content) could be demonstrated, were excluded for capillary quantification purposes.

**RESULTS:** Average estimated BVD was  $1.06 \pm 1.47\%$  for the remaining atrial fibrillation specimens and  $2.71 \pm 2.15\%$  for control specimens ( $p < 0.0001$ ).

**CONCLUSIONS:** Our findings would support the hypothesis that atrial tissue ischemia, and sinus node ischemia in particular, could play a relevant role in the pathogenesis of atrial fibrillation.

#### **OP-547-RESULTS OF THE TREATMENT OF ATRIAL FIBRILLATION WITH MICROWAVE ABLATION USING RIGHT MINI-THORACOTOMY APPROACH**

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**BACKGROUND:** The aim of our study was to evaluate the results of off-pump epicardial microwave (MW) ablation procedure with the FLEX 10 and Flex 4 devices (Guidant, Indianapolis, IN) in patients with atrial fibrillation (AF).

**METHODS:** From May 2006 through August 2007, 20 patients aged  $49 \pm 11$  years (range 33-76) with drug-resistant paroxysmal or persistent AF underwent a peripulmonary vein (box) ablation using FLEX 10 device through a 5-6-cm video-assisted right mini-thoracotomy. Additional ganglionic plexi MW ablation and right atrial ablation lines using FLEX 4 device were performed. Mean duration of AF was  $57 \pm 34$  months (range, 6-120 months). The first eight patients underwent ablation using 65W/90s microwave energy exposure; another sixteen patients received higher - 70W/120s energy applications for each ablation line point.

**RESULTS:** There were no in-hospital deaths. Postoperative in-hospital complications were minimal with 1 patient (5%) experiencing pleural effusion. No patient required a permanent pacemaker implant. Total procedure time was  $154 \pm 27$  min. Mean length of postoperative stay in intensive care unit was  $19.5 \pm 0.2$  hours. The pulmonary vein isolation was confirmed in 1 of 10 patients. Follow-up duration was 3-15 months. In 5 patients (20%) subsequent transvenous catheter ablation using CARTO system to cure left atrial flutter was performed. After 6 months, 85% patients (12/14) were in stable sinus rhythm; at 12 months of follow-up 75% patients (6/8) had no atrial flutter/fibrillation.

**CONCLUSIONS:** Treatment of paroxysmal and persistent atrial fibrillation with a video-assisted right mini-thoracotomy approach using MW is feasible. Initial

results demonstrate abolishing AF in 75% of drug-resistant symptomatic patients at 12 months of follow-up. However, even higher energies do not ensure complete pulmonary vein isolation. In 20% of patients it is necessary to perform endocardial ablation procedure for left atrial flutter.

#### **OP-548-ARE THERE ANY PREDICTORS FOR THE SUCCESS RATE OF CONCOMITANT ATRIAL ABLATION IN PATIENTS WITH ATRIAL FIBRILLATION UNDERGOING CARDIAC SURGERY?**

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**OBJECTIVES:** We analysed outcome in patients undergoing intraoperative ablation for concomitant AF in order to identify predictors like concomitant cardiac disease, left ventricular ejection fraction (LVEF), the duration of AF and the enlargement of the left atrium (LA) which may influence the postoperative incidence of re-established stable sinus rhythm.

**METHODS:** 140 patients (m=90; f=40) with persistent or intermittent (57,4% vs. 42,6%) AF underwent either endomyocardial high frequency- (n=92) or epimyocardial cryo-ablation (n=48) with concomitant cardiac surgery (CABG only: n=19; Valve-Surgery only: n=118; combined-procedures: n=29, others: n=3) between 01/2003 and 12/2006; mean LVEF was  $50 \pm 7\%$ . Duration of persistent AF was  $>5$  years in 53% and  $< 5$  years in 47%. Average size of LA was  $55 \pm 13$  mm (range 36-72). Up to present completeness of follow-up is 82%.

**RESULTS:** There was no intra- or perioperative ablation-related complication. Perioperative mortality was 2,8% (4/140) due to non-ablation related reasons. Stable SR was found in 36,4% at discharge and in 70,7% after 12 months. No positive correlation (Pearson test and multivariate Cox analysis) with re-established SR was found in our group for LA diameter, AF duration, underlying cardiac disease or type of ablation procedure.

**CONCLUSIONS:** Concomitant ablation for AF is safe and successful in over 70% of cases. Neither duration of persistent AF nor excessive LA-diameter had a negative impact on the success of ablation.

#### **OP-549-VIDEO-ASSISTED PULMONARY VEIN ISOLATION FOR LONE ATRIAL FIBRILLATION USING BIPOLAR RADIOFREQUENCY**

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**OBJECTIVE:** Atrial fibrillation (AF) is the most common arrhythmia, having a strong impact on long-term stroke and heart failure prevalence and mortality. Nowadays, rapid development in the field of minimising the invasiveness of surgical ablation of AF can be observed.

**AIM:** To report on the feasibility and mid-term results of the novel technique of minimally invasive video-assisted beating heart bilateral surgical ablation for lone paroxysmal AF using irrigated bipolar radiofrequency technique.

**METHODS:** Between February 2006 and December 2007, 22 patients with highly symptomatic paroxysmal AF, resistant to pharmacological treatment, underwent video-assisted beating heart bilateral pulmonary vein isolation using irrigated bipolar radiofrequency combined with vein of Marshall dissection. Left atrial appendage closure was performed in 9 patients. In 7 patients at least 2 unsuccessful percutaneous ablations had previously been performed. Follow-up using Holter ECG and echocardiography was performed in all patients 3, 6 and 12 months postoperatively.

**RESULTS:** There were no major complications except for 1 TIA on the fourth postoperative day. Ablation time was on average  $88 \pm 12.1$  seconds. At least one recurrence of AF was observed in 16 patients in the early postoperative period; in 11 of them an electrical cardioversion was performed. All patients were discharged home in stable sinus rhythm. Mean follow-up was 11,4 (2-22) months. 9 patients were on antiarrhythmic drugs. 1 patient converted to persistent AF, 2 patients had 1 recurrence of paroxysmal AF after a year treated pharmacologically.

**CONCLUSIONS:** Minimally invasive video-assisted beating heart bilateral surgical ablation for lone paroxysmal AF using irrigated bipolar radiofrequency is effective and safe. These promising results have to be confirmed by larger studies.

### OP-550-IRRIGATED RADIOFREQUENCY MODIFIED MAZE PROCEDURE IN PATIENTS WITH PERMANENT ATRIAL FIBRILLATION UNDERGOING CARDIAC SURGERY FOR RHEUMATIC HEART DISEASE

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**BACKGROUND:** Atrial fibrillation is the most common sustained arrhythmia and its incidence is higher in countries with a high prevalence of rheumatic heart disease. Techniques have been developed to make atrial fibrillation surgery minimally invasive and reduce the length of procedure. Among these modalities radio frequency is the most frequently used source of energy.

**METHODS:** We used radio frequency energy for treatment of atrial fibrillation in 30 cases of known rheumatic heart valve disease. Who were candidate for surgery because of their primary valvular disease.

**RESULTS:** Between Feb 2007 and Dec 2007, 30 patients with documented permanent atrial fibrillation, preexisting for more than one year and concomitant rheumatic heart disease underwent modified maze saline irrigated radio frequency ablation in combination with the surgery for their organic heart disease. Patients data were as following: mean age = 51.8 yrs, male to female ratio =13/17 mean EF = 48%, mean LA diameter = 5.6cm, mean duration of AF = 3.46 yrs. primary rheumatic heart disease and corresponding surgeries were (AVR = one case , MVR ±TV repair =13cases , MVR+AVR ±TV Repair =12 cases , MVR+CABGS =2cases , MVR+AVR +CABGS= 2 cases ) and operative data were as following : (MVR ± TV repair , mean Cx = 58 min, mean CPB = 85 min) and (MVR + AVR ± TV repair , mean Cx = 79 min, mean CPB = 103 min ) and (MVR + CABGS ,mean CX = 52 min , mean CPB = 72 min ) and (MVR + AVR + CABGS mean Cx = 92min , mean CPB = 125min). Radio frequency energy was used in all 30 cases for atrial fibrillation ablation. Our expected mortality according to logistic regression model of euroscore was 4.5 and the observed mortality was zero. late pericardial effusion in 2 cases and one case of reoperation for paravalvular leakage was our morbidities. 60% of patients discharged from hospital in NSR and all of the patients followed up with 24 hour holter monitoring. According to our latest data at least 2 months after operation, 69% of our patients are in normal sinus rhythm.

**CONCLUSION:** Atrial fibrillation ablation is a safe and effective modality for atrial fibrillation treatment in the group of permanent atrial fibrillation patients who are candidate for valve surgery.

### OP-551-INCISIONAL ATRIAL TACHYCARDIAS IN CHILDREN, POSSIBILITIES OF CATHETER ABLATION

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**AIM:** to assess catheter ablation (CA) efficacy in the eliminating atrial incisional tachycardias in children.

**MATERIAL AND METHODS:** Results of radiofrequency ablation (RFA) of post-operative tachycardias in 12 patients aged 3-14 years were analyzed. Congenital valvular diseases included isolated atrial and ventricular septal defects (n=11), (combined atrial septal defect and anomalous drainage of pulmonary veins n=2), aortic valve prosthesis (n=1).

**RESULTS:** CA using non-fluoroscopic electric-anatomic mapping system "Carto" was performed if antiarrhythmic drugs were ineffective or non-tolerated. Mechanism of all tachycardias was re-entry. Electrophysiologic study (EPS) revealed isthmus-dependent atrial flutter in 7 (58%) patients. Circulation of excitation front occurred around scars on lateral and anterior right atrial walls in 4 children and on posterior left ventricular wall in 1 child. No complications associated with RFA were seen. Follow-up period was 3 years. No tachycardia recurrences were observed during this time. Subsequently, artificial pacemakers were implanted because of sick sinus syndrome in 2 children.

**CONCLUSION:** CA of incisional tachycardias is an effective and safe surgery in children. It is method of choice in case of non-tolerated antiarrhythmic therapy and cardiac insufficiency associated with incisional tachycardias.

### OP-552-CRYOABLATION FOR ATRIAL FIBRILLATION CURE: 1 YEAR EXPERIENCE

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*Several techniques and energy sources were proposed to treat surgically atrial fibrillation (AF). None of them has demonstrated definitely to be better. In our group we had chosen cryoablation because its security and easy of use.*

**OBJECTIVES:** Evaluate our first results with cryoablation in patients with cardiac surgery and concomitant AF.

**MATERIALS AND METHODS:** Between July 2006 and November 2007, 65 patients (31male, 34 female) were scheduled for cardiac surgery (isolated mitral valve surgery 16, isolated aortic valve surgery 8, CABG 2 and polivalvular and/or combined surgery 39) with a mean age of 71 ± 8,5 years (43-84). 54 patients (86%) had permanent AF, 10 (15,4%) paroxysmic AF, 1 (1,5%) patients had Atrial Flutter. Follow up: at discharge, a month, three months, six months and one year after the operation.

**RESULTS:** Hospital mortality was 4 (6,2%), no related with the technique. There's no complications related. Follow up mortality: 1 patient after 3 months (unknown cause). Patients n1 at: -Discharge: 61 -1 months: 52 -3 months: 37 -6 months: 23 -12months: 7 Rhythm at discharge: -Sinus:38(62.3%) -AF: 15(24.6%) -Pacemaker: 5 (8.2%) -Nodal:0 -Flutter: 3 (4.9%) Rhythm 1 month: -Sinus: 26 (50%) -AF: 20(38.5%) -Pacemaker: 4 (7.7%) -Nodal: 1 (1.9%) -Flutter: 1 (1.9%) Rhythm 3 months: -Sinus: 25(67.6%) -AF: 7 (18.9%) -Pacemaker: 4 (10.8%) -Nodal: 1 (2.7%) -Flutter: 0 Rhythm 6 months: -Sinus: 18(78.3%) -AF:2 (8.7%) -Pacemaker: 3 (13%) -Nodal:0 -Flutter: 0 Rhythm 1 year: -Sinus: 6 (85.7%) -AF:1\*(14.3%) \*AF paroxysmic Drugs at discharge: -Amiodarone: 31(50.8%) -Betablockers:21(34.4%) -Anticoagulants : 59(96.7%) Drugs 1 month: -Amiodarone: 22(42.3%) -Betablockers: 15(28.8%) -Anticoagulants: 50(96.2%) Drugs 3 months: -Amiodarone: 14(38.9%) -Betablockers: 10(27.8%) -Anticoagulants: 31(86.1%) Drugs 6 months: -Amiodarone:6 (26.1%) -Betablockers: 9 (39.1%) -Anticoagulants:17(73.9%) Drugs 1 year: -Amiodarone: 1 (14.3%) -Betablockers: 2 (28.6%) -Anticoagulants: 3 (42.9%)

**CONCLUSIONS:** Although the number of patients that had completed each stage of the follow up is still small, cryoablation has demonstrated that is a safe technique and these results are similar to current published series.

### OP-553-INCIDENCE OF PREOPERATIVE ATRIAL FIBRILLATION IN CARDIAC SURGERY PATIENTS AND IMPACT OF CONCOMITANT RHYTHM SURGERY ON OUTCOME

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**BACKGROUND:** Atrial fibrillation (AF) is associated with a significant mortality and morbidity. Aim of the study was to register the incidence of preoperative AF and the outcome regarding hospital mortality, major adverse cardiac and thromboembolic events and heart rhythm with and without concomitant rhythm surgery.

**METHODS:** A total of 2109 consecutive patients underwent between 01 January 2006 and 30 June 2007 a major heart operation at our institution. Prospectively recorded preoperative, intraoperative, and postoperative data for all the patients suffering from AF were screened for in-hospital mortality, rhythm outcome and major adverse events.

**RESULTS:** An incidence of preoperative AF of 16,9% (356 of 2109) among all patients scheduled for open heart surgery, 11,1% receiving CABG (141/1266), 24,2% in patients undergoing aortic valve replacement (80/330), 41,0% in patients undergoing mitral valve repair/replacement (25/61) and 24,3% among patients having combined procedures (110/452) was observed in our institution. Of those patients 98 underwent rhythm surgery (group A) and 258 patients had no concomitant rhythm surgery (group B). Patients of both groups were matched for age, gender, and left ventricular ejection fraction however patients of group A had more mitral valve procedures than patients of group B. Mortality was 5,1% in group A and 7,0% in group B. Major adverse thromboembolic events occurred in 1 Patient of group A (1,0%) and 5 patients of group B (1,9%), LOS in 1 Patient of group A (1,0%) and 3 Patients of group B (1,2%), Ventricular arrhythmias occurred in 4 patients of group B (1,6%) and reexploration because of bleeding in 1 Patient of group A (1,0%) and 2 Patients of group B (0,8%). Sinus rhythm (SR) rates were during discharge and 1 month postoperative 59, 6 and 64, 9% in group A and 12, 9% and 10% in group B retrospectively.

**CONCLUSION:** AF is a serious problem involving more heart surgery patients as expected. Preoperative AF is associated with increased mortality and major adverse cardiac and thromboembolic events if not treated. Moreover patients having concomitant rhythm surgery showed higher SR rates postoperatively.

## CARDIAC OTHER I

### OP-554-LEFT ATRIAL MYXOMA ASSOCIATED WITH ATRIAL SEPTAL DEFECT IN A PATIENT WITH ACUTE MYOCARDIAL INFARCTUS; AN UNCOMMON ASSOCIATION WITH AN UNUSUAL PRESENTATION

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**INTRODUCTION:** Myxomas account for 30 to 50% of primary cardiac tumors and they have a predilection for the atria in particular the left. Myxomas usually represent with dyspnea and hemoptysis similar to hemodynamic symptoms of mitral stenosis, or neurologic symptoms due to embolization. In the literature a few myxoma cases were reported to be presented with myocardial infarction. Previous studies rarely reported myxomas associated with an atrial septal defect. We herein report a patient with a left atrial myxoma associated with a secundum atrial septal defect diagnosed following an acute myocardial infarctus.

**CASE REPORT:** A forty-six year old woman was admitted to our emergency service with complaints of chest pain and dyspnea. Acute inferior myocardial infarctus diagnosis was made. Heparin, acetylsalicylic acid, metoprolol were administered. Patient had no cardiac risk factor or family history. Angiography revealed critical lesions at the midsegment of the right coronary artery and at D1 together with an abnormal arterial branch originating from the proximal RCA radiating to the left atrium supplying the left atrial mass. Echocardiography was revealed a left atrial myxoma together with a secundum type atrial septal defect. Myxoma was resected and the atrial septal defect was repaired with a pericardial patch. ACBG was also performed for RCA crux and D1 with vein grafts. Patient's recovery was uneventful.

**DISCUSSION:** Left atrial myxoma is the most common primary cardiac tumor and its association with congenital heart defects is rarely reported. Newman et al. noted only two atrial septal defects in 312 patients with atrial myxomas. Presentation with myocardial infarction is also very rare. Panos et al. reported 26 such cases in the literature. Systemic embolization is one of the common complications of myxomas but coronary embolization is extremely rare with an incidence of 0.06%. Our case is unique because of its presentation with myocardial infarctus and secundum atrial septal defect. We found no similar case reported in the Pubmed search. Although myxoma presentation with myocardial infarction is extremely rare, this is an important point to be kept in mind even in patients with no cardiac risk factor.

### OP-555-PULMONARY ARTERY CATHETER ENTRAPMENT BY INADVERTENT SUTURING DURING CARDIAC SURGERY: SURGICAL REMOVAL AND A WORD OF CAUTION

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**BACKGROUND:** Although pulmonary artery (PA) catheter is a useful monitoring tool in cardiac surgery, it can be the source of serious complications such as its inadvertent suturing and entrapment within the heart or the PA. At the Northern General Hospital, over a seven year period (2000-2007), this problem was encountered in five patients.

**METHODS:** Following an AVR, the catheter was trapped in the PA by the over-sewing suture of the PA vent insertion site (case 1). In a 78 year-old lady undergoing an AVR & MVR, the PA catheter was caught by the over-sewing suture of the retrograde cardioplegia catheter insertion site (case 2). In a 75 year old lady undergoing a MVR & CABG, the catheter was trapped by the suture used to repair an inadvertent opening of the right atrium (RA) (case 3). In a 70 year old lady having a re-do MVR, the catheter was included in the left atriotomy suture line (case 4). In a 64 year old gentleman who underwent MVR & CABG, the

catheter was sutured by the purestring used for the insertion of the inferior vena cava (IVC) cannula (case-5).

**RESULTS:** All 5 patients required re-sternotomy. In the first case, the over-sewing suture was cut releasing the catheter, without using cardiopulmonary bypass (CPB). In the second and third case, the catheter was removed with the aid of aorto-bicaval CPB and caval snares. In the fourth case, initial attempts to remove the catheter without using CPB were abandoned due to torrential bleeding. Control of the life-threatening haemorrhage and catheter removal in this case became possible with emergent institution of aorto-bicaval CPB and caval snares. In the fifth case, CPB was not used. A pledgetted 4/0 Prolene suture was placed across the sutures used to close and over-sew the IVC cannulation site and after cutting these sutures the PA catheter was pulled back by the anaesthetist. Massive fatal bleeding ensued due to a tear involving the RA and the IVC. The remaining four patients did well and were discharged from the hospital.

**CONCLUSIONS:** Surgical removal of PA catheters trapped by sutures in the cardiac chambers might be hazardous. Their safe removal necessitates the elective (ab initio) use of CPB. Since prevention is better than cure, it is recommended that when a PA catheter is floated prior to surgery, it should be withdrawn and re-floated at the end of the procedure.

### OP-556-THE TEACHING OF ADULT CARDIAC SURGERY: A CONTEMPORARY RESIDENT EXPERIENCE

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**BACKGROUND:** Adult cardiac surgery remains difficult to teach. We sought to describe the resident experience as surgeon in adult cardiac surgery at a large academic medical center.

**METHODS:** Description and analysis of adult cardiac surgery cases performed as surgeon in a contemporary cardiothoracic surgery residency program.

**RESULTS:** During a two-year residency program (1/05 - 12/07), 238 adult cardiac surgery procedures were performed as surgeon by a single cardiothoracic surgery resident. 198 (83%) of these cases were performed during the last six months of training. The distribution of case types was: 65 (33%) isolated CABG, 63 (32%) isolated valve, 29 (15%) combined valve/coronaries, 19 (10%) heart transplants, 1 (0.5%) ventricular assist device, 50 (25%) aortic procedures, and 12 (6%) others. 25% (n=49) of these cases were reoperations. Of isolated CABG procedures, 52% were performed "off-pump." 90 procedures included an operation on the aortic valve, including 39 isolated AVRs, 16 AVR + CABGs, 7 AVR/MVRs, 14 root replacements, and 12 aortic valve repairs +/- an aortic procedure. Mitral valve procedures were performed in 29 cases - including 9 mitral valve repairs and 20 mitral valve replacements. The 50 aortic procedures included 13 root replacements, 12 valve sparing root replacements, 10 ascending aorta replacements +/- hemiarch, 8 dissections, 2 thoracoabdominal aorta repairs, and 4 other aortic procedures. Mean length of stay in this patient group was 11.8 +/- 12.3 days. There were no intraoperative deaths. Mortality was 8.2% with the most common cause being respiratory failure/sepsis. Significant perioperative morbidity occurred in 13.4% of these patients.

**CONCLUSIONS:** Adult cardiac surgery, including off-pump coronary revascularization and aortic and mitral valve repairs, can be taught effectively within the structure of cardiothoracic surgery residency with acceptable outcomes.

### OP-557-CARDIAC SURGERY IN OCTOGENARIANS. HOW FAR CAN WE GO?

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**BACKGROUND:** Life expectancy has increased during recent decades, leading to older growing populations. Cardiac surgery is being applied with increasing frequency in patients 80 years of age and older.

**METHODS:** We reviewed the records of 51 consecutive patients (33 men, 18 women) aged 80 years and older (mean age 81.7 years), who underwent a cardiac surgery procedure at our institution from 1998 through 2006.

**RESULTS:** Thirty-three patients (65%) had coronary grafting (CABG), eight patients (16%) had isolated aortic valve replacement (AVR), six patients (12%) had AVR+CABG, two patients (4%) had combined CABG+Carotid endarterectomy, while two patients (4%) underwent ascending aortic replacement due to



aneurysm. The majority of patients (74%) were in functional status NYHA II-III. Mean intensive care unit stay was 31,8 hours and mean duration of postoperative hospitalization was 13,85 days. The incidence of various postoperative complications was 49,1% and overall hospital mortality was 7,8%.

**CONCLUSIONS:** Cardiac operations are successful in most octogenarians with increased hospital mortality and longer hospital stay. Meticulous preoperative and postoperative care, including aggressive early mobilization is mandatory to minimize complications and shorten postoperative stay.

#### **OP-558-A SYSTEMATIC COMPARATIVE STUDY OF CLINICAL OUTCOME OF OPEN HEART SURGERY IN ADULT JEHOVAH'S WITNESS PATIENTS**

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**BACKGROUND:** A minority of patients having cardiac procedures (15% to 20%) consume more than 80% of the blood products transfused at operation. Jehovah's Witnesses is a Christian faith whose members will not accept blood or blood products under any circumstances on the basis of religious grounds. The present study was conducted to systematically compare the clinical outcome after open cardiac surgery in Jehovah's Witnesses versus non-Jehovah's Witnesses.

**METHODS:** It is a paired-group retrospective cohort study. From September 1998 to October 2007, 25 adult Jehovah's Witness patients (15 male and 10 females) with mean age of 62 years (range 32 - 75) undergoing open heart surgery (Group 1) were studied. The blood conservation program used for these patients included the use of aprotinin (full Hammersmith regimen), retrograde priming of perfusion circuit, intraoperative autologous blood donation, intraoperative cell salvage, drawing as few blood specimens as possible and occasional use of high-dose erythropoietin and oral iron supplementation. The data on these patients were studied from our Patient Analysis and Tracking System database, case notes, perfusion database and microfilm copies of ICU charts. Their data were compared with those of a contemporaneous control group (Group 2) of 25 non-Jehovah's Witnesses. These two groups were matched in a 1:1 ratio using propensity scores.

**RESULTS:** The clinical characteristics of Jehovah's Witnesses were similar to those of the control group with mean Euro Score of 4 (range 0 - 9) in each group. The patients underwent surgery involving myocardial revascularisation, mitral and/or aortic valve replacement. Logistic regression analysis was used to compare operative mortality, postoperative intensive care unit care, and hospital length of stay between the 2 groups, controlling for preoperative risk factors. No significant differences were identified in unadjusted major stroke ( $p = 0.5$ ), acute myocardial infarction ( $p = 0.6$ ), new-onset atrial fibrillation ( $p = 0.10$ ), prolonged ventilation ( $p = 0.72$ ), acute renal failure ( $p = 0.70$ ), and hemorrhage-related reexploration ( $p = 0.29$ ) rates between the 2 groups. On multivariate analysis, Group 1 had ICU stay (odds ratio 1.36, 95% CI 0.46 to 3.97,  $p = 0.58$ ), postoperative length of stay (odds ratio 1.23, 95% CI 0.92 to 2.20,  $p = 0.16$ ) and operative mortality (odds ratio 0.56, 95% CI 0.12 to 3.59,  $p = 0.53$ ) comparable to those of Group 2, after controlling for preoperative risk factors through matching. The Post operative bleeding was significantly less as shown by chest tube output in group 1 patients was less than 40 percent of that for group 2 patients at all points measured after operation ( $p < 0.01$ ). Hemoglobin and hematocrit levels were higher in Jehovah's Witnesses both before (13.2 g/dL vs 12.7 g/dL;  $P = .01$ , and 41.2% vs 39.5%;  $P = .09$ ) and after (11 g/dL vs 10 g/dL;  $P = .003$ , and 35.3% vs 30.4%;  $P = .001$ ) surgery. A low-prime circuit in combination with antegrade and retrograde autologous priming, the total amount of priming was reduced to  $\pm 50$  mL.

**CONCLUSION:** In conclusion, cardiac surgery in Jehovah's Witnesses is associated with clinical outcomes comparable to those of non-Jehovah's Witnesses by adhering to blood conservation protocols.

#### **OP-559-ACUTE PULMONARY EMBOLISM: THE SURGICAL OPTION**

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**BACKGROUND:** Acute pulmonary embolism usually carries a high rate of mor-

tality specifically if it is not diagnosed early and treated aggressively. Thrombolytic therapy is used as definitive treatment in the vast majority of cases. Emergency surgical embolectomy is often reserved as an ultimate treatment when all other methods have failed or the patient is cardiogenic shock. A review of our experience is presented in this case series study.

**METHODS:** From March 2001 until June 2007 7 patients 5 male 2 female, aged 17 to 79 (mean  $47.85 \pm 23.63$ ) underwent emergency pulmonary embolectomy (1 salvaged). 6 patients had NYHA Class III or IV functional status and 1 NYHA Class II before the operation. All the patients had symptoms of congestive heart failure and PA pressure ranged from 20 to 80 mmHg (mean  $45.71 \pm 25.23$ ). The diagnosis was established primarily by clinical symptoms and angiopulmonary CT or Transoesophageal echocardiography.

**RESULTS:** 5 patients (71.4%) survived and were discharged from hospital. The operative mortality was 28.5%. 1 patient had salvage operation and expired on the 3rd post-operative day due to multiple organ failure, DIC secondary to intracranial bleeding. The second patient had a massive pulmonary embolus and expired the 3rd post-operative day despite ECMO support. 6 surgical embolectomies were performed with cardiopulmonary bypass and 1 with Total Circulatory Arrest (24 minutes). Cardiopulmonary bypass time ranged from 24 to 159 minutes (mean  $69 \pm 44$ ) and cross clamp time from 6 to 59 minutes (mean  $39.4 \pm 20.7$ ). 1 patient required re-intubation and ventilation for further support and was discharged on the 8th post operative day. The hospital stay ranged from 5 to 21 days (mean  $11 \pm 6.69$ ) and stay in ITU ranged from 1 to 10 days (mean  $3.33 \pm 3.38$ ). The follow up ranged from 9 to 81 months (mean  $39 \pm 37.49$ ). 1 patient died late (9 months post discharge from other cause) and the rest are alive and have had no complications.

**CONCLUSION:** Early surgical pulmonary embolectomy with the use of extra corporeal circulation is an acceptable option of treatment for acute PE, with very promising results both short and mid term. We believe that this surgical treatment of acute PE should be considered as one of the initial methods of treatment and not as a last resort.

#### **OP-560-COMPARATIVE EVALUATION OF E-LEARNING IN HEART SURGERY**

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**BACKGROUND:** E-Learning with various approaches has a growing influence in heart surgery education. Despite enthusiastic endorsements, there is little evidence which particular instructional techniques and media lead to better application of knowledge and performance in the operation room.

**METHODS:** From 2002 to 2007, 197 students participated in self-study courses about aortic valve replacement and were divided into 3 groups: (i) interactive, case-based multimedia-teaching-program (ICBT;  $n = 69$ ), (ii) video-based multimedia-teaching-program (VBMT;  $n = 69$ ) and (iii) paper-based print-group (PBPG;  $n = 57$ ). Motivation, computer-knowledge and didactic quality were evaluated with standardized psychometric tests. All groups performed multiple-choice (MC) pre- and post-tests and participated in live-surgery during which their performance was assessed by standardized tasks.

**RESULTS:** Computer-knowledge was comparable; motivation and didactic assessment were significantly lower in the ICBT group ( $p < 0.001$  vs. VBMT and PBPG). There was a highly significant gain in factual knowledge (MC pre- and post-tests) in all groups ( $p < 0.001$ ). Study-time was only significantly faster in the VBMT group ( $p < 0.0001$  vs. PBPG). During live-surgery, the ICBT ( $79.2\% \pm 16\%$ ) and VBMT groups ( $82.9\% \pm 10\%$ ) performed significantly better than the PBPG group ( $64.7\% \pm 12\%$ ; both  $p < 0.0001$ ).

**CONCLUSIONS:** Print-Media are as effective as multimedia-programs when factual knowledge has to be retained. Multimedia-driven training (ICBT and VBMT) led to improved performance in the operation room and can be more efficient in terms of study time (VBMT). ICBT was less motivating than more traditionally structured content (VBMT and PBPG).

#### **OP-561-RISK FACTORS OF RED CELL TRANSFUSION IN ISOLATE OFF PUMP CORONARY ARTERY BYPASS**

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**OBJECTS:** As autologous red blood cell transfusion has been associated with an

increase in early morbidity and reduced long-term survival, so the cardiac surgery without transfusion is increasingly important. Off pump coronary artery bypass surgery (OPCAB) is the one of proper operation to reduce the transfusion. We evaluate transfusion trigger factors and how to reduce autologous transfusion in OPCAB.

**METHODS:** We retrospectively analysed 113 patients (M:F=35:78, Mean age 66.7 $\pm$ Y9.9) underwent isolated OPCAB, between March 2006 and September 2007. When the level of hemoglobin was below 8.5gm/dL, we decided to start transfusion in intra and post operation. In only case of the bleeding tendency, we used the platelet and fresh frozen plasma. Preoperatively, 103 patients (91.1%) had taken aspirin and 35 patients (30.9%) had taken clopidogrel. 99 patients (87.6%) used the both thoracic artery grafts.

**RESULTS:** There was no autologous transfusion in 48 patients (42.5%), we transfused the 2.2 $\pm$ Y3.2 unit red blood cell (median 2.0 unit) on average in 65 patients (57.5%) and only 18 patients (15.9%) used the platelet and fresh frozen plasma. Intra operation transfusion was only 26 patients (23.0%) but, 55 patients (48.7%) needed a transfusion, during post operation care. Between transfusion and non transfusion group, there was no difference in mortality, neurological problem, arrhythmia, re-operation rate ( $p>0.05$ ) but, total complication, ventilator care time, ICU stay and admission duration, were significantly difference ( $p<0.05$ ). Time passes, post operation hematocrit increased rapidly. ( $p=0.00$ ), It increased from 30.7 $\pm$ Y4.0% to 35.4 $\pm$ Y4.2% during immediate post operation and first out patients department visiting. We analyzed the multivariate transfusion trigger factors. In patients factors, medication of clopidogrel ( $p=0.00$ , OR=5.61) and pre operate low hematocrit ( $<37.5\%$   $p=0.03$ , OR=28.12) were important trigger factors. In operation factors, graft harvesting time ( $>75$ min  $p=0.01$ , OR = 6.40) and total operation time ( $>3.5$ hrs,  $p=0.05$ , OR=6.10) were important transfusion trigger factors. But, aspirin medication, acute coronary syndrome, graft number, graft type and distal anastomosis number did not increase the autologous transfusion ( $0.05>p$ )

**CONCLUSION:** As we applied the proper transfusion guide line (Hb=8.5gm/dL), we effectively reduced the autologous transfusion. And if we consider the patients and specially surgical trigger factors, we can reduce the autologous transfusion without complication.

#### OP-562-RESULTS AND OUTCOMES OF TARGETED EARLY EXTUBATION AND FAST TRACK RECOVERY POST CARDIAC SURGERY

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**BACKGROUND:** With the refinement of surgical techniques and anaesthesia, early extubation and fast track recovery following cardiac surgery has evolved with the aim of reducing healthcare costs without compromising patient care. Fast track recovery is now standard practice in our unit. Pre-selected patients are admitted to a free standing recovery unit following surgery and then to a high dependency unit (PCU) altogether bypassing the intensive care unit. Our selection criteria are age less than 75 years, good or moderated left ventricular function, preoperative creatinine  $< 125$  mmol/L, controlled or no diabetes. The exclusion criteria includes mitral valve or redo surgery, a history of CVA and significant intraoperative events. In this study we examine the results of actively targeting patients for early extubation and fast tracking for a single surgeon over a 1-year period.

**METHODS:** Since the inception of our fast tracking protocol we have prospectively collected data about patient outcomes. In this study we selected a 1-year period from April 2006 - March 2007.

**RESULTS:** In the study period, 102 patients (97 males, 16 females; mean 63 $\pm$ 9 years; mean EuroScore 2.6 $\pm$ 1.8) were targeted for early extubation and fast track recovery. 95/102 (93%) were successfully fast tracked. 7 patients were not fast tracked to the recovery unit because of insertion of IABP in 1 patients (14%), high dose inotropes in one patient (14%), immediate re-exploration for bleeding (14%), no PCU beds for 4 patients (57%). 6/95 patients (6.3%) failed to progress from the recovery unit to PCU. 2 patients required re-exploration for bleeding; 3 patients required prolonged respiratory support and 1 patient had unexplained pyrexia. Once transferred to PCU, 5/95 patients (5.2%) required re-admission to intensive care unit - respiratory failure in 2 patients, renal dysfunction in 2 patient and sternal rewiring in one patient. Our overall mortality in the study period was 0.98% (1/102 patients) due to arrhythmia subsequently progressing to multi-organ failure. All other patients were discharged at a mean of 8.0 $\pm$ 4 days. 93 patients (97.9%) underwent coronary bypass grafting while the remaining 2 patients (2.1%) had isolated aortic valve replace-

ment. The mean number of grafts was 2.5 $\pm$ 0.8 with the left internal mammary artery used in 86/93 (92.4%) and the radial artery in 60/93 (64.5%). All operations were done using the normothermic cardiopulmonary bypass using antegrade cold blood cardioplegia. Mean CPB was 78 $\pm$ 29 minutes and mean aortic cross clamp time was 51 $\pm$ 29 min.

**CONCLUSION:** Early extubation and fast track recovery of pre-selected cardiac surgical patients can be implemented without compromise in patient care. It facilitates rapid recovery and decrease the need for limited and expensive intensive care resources.

#### OP-563-SURGICAL TREATMENT OF CARDIAC MYXOMAS - 27 YEARS OF SINGLE CENTER EXPERIENCE IN 150 PATIENTS

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**BACKGROUND:** Myxoma is the most common benign intracardiac tumor. In recent years both an increasing awareness of doctors and new diagnostic techniques lead to a better detectability of cardiac tumors. In this report we reviewed our experience with a surgical treatment of 150 cardiac myxoma cases.

**METHODS:** We conducted a retrospective analysis of perioperative data of 150 patients who underwent evaluation and surgical treatment for cardiac myxoma from 1980 to 2006. Presumptive diagnosis of myxomas was made, in most cases, by echocardiography and confirmed postoperatively by pathologist. 20 pts required coronarography as a consequence of either symptoms or past medical history. The evaluated group of pts comprised 100 females and 50 males with a mean age of 55 (range 19-79). Myxomas originated from the left atrium in 138 pts (92%), from right atrium in 10 pts (6,6%) and from both atria in 2 pts (1,3%). The most common clinical presentation were dyspnoea (44%), heart failure (18%), palpitations/ arrhythmia (17%), central nervous system emboli (12%) and peripheral emboli (10%). All patients were operated on an urgent basis using median sternotomy, cardiopulmonary bypass, and crystalloid or blood cardioplegia. The surgical approach comprised excision of a tumor through left or/and right atriotomy. On the basis of preoperative studies 16% of pts required additional surgical procedures as follow: ASD closure, CABG, MV-plasty MV-replacement, AV-replacement, TV-plasty.

**RESULTS:** Overall early mortality was 3,3%(5pts) and morbidity was 27%. Low cardiac output syndrome occurred in 14,6%(22pts). Mean intubation time was 18 hours, ICU stay was 45 hours and mean hospital stay was 8 days.

**CONCLUSIONS:** Surgical resection of myxomas is the treatment of choice and can be done with a low mortality rate. Echocardiography remains the primary mode of diagnosis in terms of accuracy and availability. Early implementation of surgical treatment is a mainstay in terms of relieving symptoms and avoidance of tumor dislodgment and subsequent embolic consequences.

#### OP-564-POSTOPERATIVE TEMPORARY NEUROLOGICAL DYSFUNCTION AND INFLAMMATORY ACTIVITY FOLLOWING CARDIAC SURGERY

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**BACKGROUND:** In spite of progressive improvements, cardiac surgery with cardiopulmonary bypass (CS-CPB) has been related to systemic inflammation and postoperative neurological complications. Neuron-specific enolase (NSE) and S100 $\beta$  protein are recognized early markers of neurological damage although their relationship with temporary neurological dysfunction (TND) - defined as a subtle, diffuse and presumably transient brain injury undetectable by conventional image techniques - is not already well established. We have previously published that circulating levels of macrophage migration inhibitory factor (MIF) are associated to postoperative sepsis and pulmonary dysfunction in patients submitted to CPB. This study aims to investigate eventual relationships between neurological postoperative short-term outcomes, especially TND, and the intensity inflammatory activity.

**METHODS:** In a prospective cohort of 138 patients submitted to CS-CPB, peripheral blood was harvest immediately before surgery and also at the end, and 1, 3, 6 and 24h after CPB. Using ELISA-sandwich technique (R&D Systems,



Minneapolis, USA), we measured levels of MIF, macrophage chemoattractant protein (MCP-1), soluble CD40 ligand (CD40L), interleukins 6 (IL6) and 10 (IL10). NSE and S100 $\beta$  blood levels were measured by double antibody immunoluminometric assay (Liason NSE and SANGTEC 100 - DiaSorin Inc, Saluggia, Italy) before and 24h after CPB.

**RESULTS:** Within the first 48h postoperative, neurological evaluation was performed in all but three patients because of deep sedation. One patient had postoperative stroke. TND was observed in 21 patients (15.2%) and this outcome was associated with higher levels of NSE ( $p=0.020$ ) and S100 $\beta$  ( $p=0.001$ ) measured 24h after CPB. S100 $\beta$  postoperative levels were directly associated with MIF 3h post CPB ( $p=0.046$ ), and indirectly associated with IL6 24h post CPB ( $p=0.034$ ), although weakly correlated in both cases ( $\rho=0.217$  and  $-0.229$ , respectively). Moreover, levels of MIF 3h post CPB and MCP1 6h post CPB were independently related with postoperative TND ( $p=0.015$  and  $0.007$  respectively).

**CONCLUSION:** Postoperative temporary neurological dysfunction may be associated not only with NSE and S100 $\beta$ , but also with higher inflammatory activity especially concerning MIF blood levels. These findings are consistent with previous studies describing MIF as a valuable marker of organ dysfunction after CPB.

### **OP-565-UROCORTIN II ACUTELY CAUSES CRFR2-DEPENDENT NO PRODUCTION IN PORCINE AORTIC ENDOTHELIAL CELLS**

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**BACKGROUND:** Urocortin II, a member of the corticotropin-releasing factor (CRF) family highly expressed in the cardiovascular system, has been shown to exert beneficial myocardial effects mainly through the interaction with the subtype 2 of CRF receptors (CRFR2). In anesthetized pigs, urocortin II intra-coronary administration was able to augment coronary blood flow and myocardial function through the release of nitric oxide (NO) and the activation of the CRFR2. The present study was planned to determine the intracellular pathways involved in NO production caused by urocortin II and to examine the related role of CRFR2.

**METHODS:** Experiments were performed in porcine aortic endothelial cells (PAE) cultured in Dulbecco's modified Eagle's medium and maintained at 37°C with 5% CO<sub>2</sub>. In these cells the acute effects of urocortin II 1  $\mu$ M on the production of NO measured through the Griess method were examined in absence or presence of NO synthase (NOS) inhibitor (L-NAME, 10 mM) and of cAMP-PKA-dependent intracellular signalling agonist (forskolin, 1  $\mu$ M) and antagonist (2'5' dideoxyadenosine, 1  $\mu$ M). The involvement of ERK 1/2, PI3-K/Akt and p38 MAPK proteins, widely involved in the NO production, has been tested through the stimulation of PAE with urocortin II in presence of ERK1/2 inhibitor (UO126 10  $\mu$ M), PI3-K inhibitor (wortmannin 100nM) and p38 MAPK inhibitor (SB203580 1  $\mu$ M). In addition the level of phosphorylation of the above proteins has been analyzed through Western Blot. Finally, the role of CRFR2 in the effects of urocortin II on NO production has been examined by repeating experiments in presence of the highly selective CRFR2 blocker astressin 2B (1  $\mu$ M).

**RESULTS:** In PAE urocortin II 1  $\mu$ M caused in 1.5 min an increase of NO production by about 34.5% ( $p<0.05$ ) of control values, an effect which was prevented by treatment of cells with L-NAME ( $p>0.05$ ). The co-stimulation of urocortin II and forskolin induced a significant increase of NO production (130%;  $p<0.05$ ) in comparison with the effects of the two agents given alone (34.5% and 56% respectively); moreover the above effects were almost abolished in presence of 2'5' dideoxyadenosine which prevented both the response to urocortin II administration alone (-3%;  $p>0.05$ ) or in co-stimulation with forskolin (7.1%;  $p>0.05$ ). These findings evidenced the involvement of cAMP-PKA-dependent intracellular signalling in the effect of urocortin II on NO induced release also in PAE, thus confirming data present literature. The results of Western Blot analysis and of experiments performed in presence of UO126, wortmannin and SB203580, which abolished all effects of urocortin II, highlighted the involvement of ERK 1/2, PI3-K/Akt and p38 MAPK proteins in the above effects. Moreover treatment of PAE with astressin 2B completely prevented any effect of urocortin II on NO production.

**CONCLUSION:** In conclusion, in PAE urocortin II caused CRFR2-dependent NO production, thus confirming previous data obtained in anesthetized pigs regarding this issue. It could be assumed that the interaction of urocortin II with CRFR2 would initiate an intracellular signalling, leading to NOS activation through the involvement of cAMP-PKA dependent phosphorylation of ERK 1/2, PI3-K/Akt and p38 MAPK proteins.

## CORONARIES III

### OP-566-CLINICAL CHARACTERISTICS OF IRANIAN PATIENTS WITH PREMATURE CORONARY ARTERY DISEASE

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**BACKGROUND:** Coronary artery disease (CAD) primarily occurs in patients over the age of 40; however younger men and women can be affected as well. Most studies have used an age cut-off of 40 to 45 years to define "young" patients with CAD. The prevalence of CAD in younger subjects is difficult to establish accurately since it is frequently a silent process. Premature coronary artery disease (PCAD) is of great importance due to young age of the affected patients who are in their productive years of their life. This study aimed to evaluate clinical characteristics and conventional risk factors of PCAD patients who were underwent coronary artery bypass graft (CABG) surgery in an Iranian university hospital during 2005-2007.

**METHODS:** In this descriptive study, 83 consecutive PCAD cases among all CAD patients who undergone CABG, were evaluated. PCAD defined as CAD under the age of 45 in males and 55 in females. Conventional risk factors like hyperlipidemia, diabetes mellitus, hypertension, obesity, smoking, and positive family history were recorded. Data analyzed with SPSS 11.5 software package using chi-square and t-tests and p-values less than 0.05 considered statistically significant.

**RESULTS:** Eighty three patients studied, which 48 patients were male (57.8%) and 35 patients (42.2%) were female. Mean affected vessels were  $2.58 \pm 0.7$ . Mean (SD) affected vessels were significantly higher in male patients ( $2.63 (0.6)$  vs.  $2.29 (0.8)$ ,  $P = 0.04$ ). 38 patients had previous history of myocardial infarction (MI). Mean (SD) pre-operative left ventricular ejection fraction (LVEF) was 45.5 (6.8) percent. Hyperlipidemia (68 cases, 82%) was the most common detected risk factor. Following hyperlipidemia, hypertension (65 cases, 80%), diabetes mellitus (41 cases, 49%), smoking (25 cases, 30%), obesity (21 cases, 25%), and positive family history (15 cases, 18%) were the common detected risk factors. Majority of patients (51 cases, 61.5%) had three-vessel disease. Two-vessel and single-vessel diseases were found in 20 patients (24%) and 12 patients (14.5%), respectively. Regarding the gender of patients, smoking was higher in males ( $P < 0.001$ ) and diabetes mellitus was higher in females ( $P = 0.001$ ). There were no significant difference in the other risk factors between males and females. Mean LVEF of patients at discharge was  $50.6 \pm 6.6\%$  which increased significantly from its pre-operative value ( $p < 0.0001$ ).

**CONCLUSION:** According to obtained results, there is a discrepancy between the detected risk factors in comparison to former reports. Positive family history and smoking are the best known conventional risk factors in PCAD. However, hyperlipidemia and hypertension were the most common findings in our patients. Racial differences can be a causal factor for this difference. CAD is an uncommon entity in young patients and constitutes an important problem for the patient and the treating physician because of the devastating effect of this disease on the more active lifestyle of young patients.

### OP-567-INFLUENCE OF PREOPERATIVE INTRA-AORTIC BALLOON PUMP ON THE OUTCOME OF CORONARY BYPASS PATIENTS WITH PREEXISTENT LOW-OUTPUT-SYNDROME

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**BACKGROUND:** The intra-aortic balloon pump (IABP) has a well-established place in algorithms for managing low-cardiac-output-syndrome (LCOS) following cardiac surgery. The aim of the present study was to determine the effect of preoperative IABP in pts. undergoing coronary artery bypass grafting (CABG)

in a LCOS situation.

**METHODS:** In a five year period 33 consecutive pts. (27 male, six female, mean age 64.9 years) who had CABG presenting severe LCOS entered the study. All pts. were treated by preoperative IABP and maximal pharmacological support. 25 pts. had a 3-vessel-disease, six pts. had 2-vessel-disease and two pts. had a 1-vessel-disease. Eight pts. were in LCOS because of an acute dissection of one coronary artery after PTCA. In six pts. rupture of papillary muscle was diagnosed.

**RESULTS:** A mean number of 2.6 bypass grafts was performed. Six pts. underwent additional mitral valve replacement. Weaning from extracorporeal circulation was possible in 28 cases under IABP and low or medium dosages of catecholamines. In three cases additional mechanical circulatory support was necessary (2 Biomedicus, 1 Abiomed). Two pts. received a CardioWest total artificial heart in irreversible myocardial infarction shock with consecutive successful Htx. Eight pts. (24%) died because of multiorgan failure (6) or brain death (2).

**CONCLUSIONS:** Preoperative insertion of IABP can be performed safely in LCOS pts. undergoing CABG. Implantation of IABP leads to rapid hemodynamic stabilization in the majority of cases and may avoid catastrophic outcomes in these high-risk patient groups.

### OP-568-SAFETY AND EFFICACY OF FIBRIN SEALANT IN CORONARY ARTERY SURGERY

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**BACKGROUND:** Fibrin sealants continue to exhibit their pedigree as adjuncts to achieving haemostasis during all forms of cardiac surgery. However, their safety and efficacy have been questioned recently, and they have been notionally implicated in graft thrombosis and mortality after coronary artery surgery. We report our experience of sealant use in isolated coronary artery bypass grafting (CABG) to illustrate their safety and efficacy.

**METHODS:** To look at the effects of fibrin sealant, we reviewed the peri-operative data and outcomes of consecutive CABG patients operated by a single surgeon between 1997 and 2007. The author has routinely used fibrin sealant for major vascular and complex valvar surgery for over 10 years. Since May 2002, all patients, including those having isolated CABG, received Tisseel fibrin sealant as a matter of course. Thus, redo and aortic root surgery were excluded from the analysis. Those operated before May 2002 (group 1: "pre-Tisseel") were compared to those operated in the subsequent five years (group 2: "post-Tisseel").

**RESULTS:** Of over 1500 patients over the study period, 1049 were included in the study. No sealant was used in 482 (group 1), and Tisseel was used routinely in 567 (group 2). The mortality was low in both groups (0.8% vs 0.35%, groups 1 and 2, respectively,  $p = \text{NS}$ ), which were similar with regards to age, sex, risk factors and number of grafts. The post-Tisseel group had a higher number of acute cases, reflecting a probable increased risk of bleeding complications. However, blood loss (mediastinal drainage) at 12 hours post-operatively was more than 30% lower in group 2, total blood loss was a third lower, and mediastinal drains were removed earlier. Blood transfusion rates fell by more than 40%, and the amount transfused fell by more than half. In those receiving blood transfusion, the number of transfused units was more than 40% lower in the Tisseel group (group 2), with a dramatic fall in platelet and FFP use. Re-exploration rates were lower in group 2 (0.7% vs 1.7%;  $p = \text{NS}$ ) and post-operative stay was shorter. Moreover, in a subset of group 2 patients, Thrombelastography demonstrated that patients in whom sealant was used exhibited less hypercoagulability than patients where no sealant was used.

**CONCLUSIONS:** The routine use of fibrin sealant during cardiac surgery reduces re-exploration rates, blood loss, blood transfusion, blood product usage, ITU and hospital stay, and, by inference, cost. There is no evidence of increased hypercoagulability, morbidity or mortality. As more patients are receiving anti-platelet agents, operated urgently, or have bleeding diatheses, haemostatic adjuncts will grow in importance. We advocate the wider use of fibrin sealant as an effective adjunct to haemostasis after all forms of cardiac surgery.

## OP-569-EFFECT OF DIABETES MELLITUS ON OUTCOME IN CORONARY SURGERY - SINGLE CENTRE EXPERIENCE

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**BACKGROUND:** Diabetes mellitus is a known independent risk factor for morbidity and mortality in coronary artery bypass surgery (CABG). The aim of this study was to assess the effect of diabetes on outcome in CABG.

**METHODS:** Between 2000 and 2006, 3446 patients underwent isolated multi-vessel CABG in our institution. Preoperatively 818 (23.7%) patients (group A) were treated for diabetes, 2628 (76.3%) patients without diabetes were a control group (group B). All data were prospectively entered into a database. Clinical characteristics, mortality and morbidity were analysed in both groups.

**RESULTS:** There were no differences in preoperative risk factors and postoperative outcome between diet, tablets and insulin control diabetes subgroups. In group A patients had higher Parsonnet score 10.24 (SD 5.4) vs. 6.59 (SD 5.8) ( $p<0.001$ ), standard 4.2 (SD 3.1%) vs. 3.9 (SD 3.1) ( $p=0.007$ ) and logistic EuroSCORE 5.3 (SD 8.1) vs. 4.8 (SD 7.7) ( $p=0.049$ ). Due to preoperative CHF 54 (6.6%) vs. 81 (3.1%) ( $p<0.001$ ), renal impairment 32 (3.9%) vs. 55 (2.1%) ( $p=0.002$ ), higher BMI 29.3 (SD 4.6) vs. 27.8 (SD 4.1) ( $p<0.001$ ), history of CVA 85 (11.1%) vs. 13 (6.6%) ( $p<0.001$ ) and PVD 139 (17%) vs. 307 (11.9%) ( $p<0.001$ ). Diabetic patients had more grafts per patient 3.5 (SD 0.9) vs. 3.4 (SD 0.9) ( $p<0.001$ ), longer CPBT 90.9 (SD 39.8) vs. 87.7 (SD 38.8) ( $p=0.038$ ), longer intubation time 15 hrs (SD 26.6) vs. 12.1 (SD 21.9) ( $p=0.019$ ), more frequently required CVVH 48 (6.3%) vs. 42 (1.8%) ( $p<0.001$ ) and had infective complications 132 (17.4%) vs. 259 (10.9%) ( $p<0.001$ ) postoperatively. Also in hospital mortality in group A was higher 21 (2.6%) vs. 42 (1.6%) ( $p<0.001$ ).

**CONCLUSIONS:** Diabetes was associated with higher postoperative morbidity and in hospital mortality. However the group of patients with diabetes had higher preoperative risk. There was no difference between subgroups with different diabetes management.

## OP-570-SIMULTANEOUS CARDIAC AND CAROTID DISEASES: TWO PROBLEMS, ONE SOLUTION.

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**BACKGROUND:** The surgical approach to concomitant cardiac and carotid disease remains controversial: "staged" versus "combined" surgical strategies and controversy exists also concerning carotid procedures (carotid endarterectomy versus carotid stenting). We report about early result from our experience with combined treatment of cardiac disease and carotid artery occlusive disease over a 3-year period in non-emergent patients submitted to primary heart procedures at our institution. Especially we compare carotid endarterectomy versus carotid stenting in term of heart performance during carotid operation (using cardiac biomarkers concentration, transesophageal echocardiographic and electrocardiographic monitoring) and in term of neurological outcome.

**METHODS:** A total of 45 consecutive patients (mean age,  $71.7 \pm 5.8$  yr) underwent elective, combined treatment of cardiac disease and carotid artery occlusive disease over the 3-year study period. The study population was divided in two groups: Group I consisted of 27 (60%) patients who underwent concomitant carotid endarterectomy and cardiac procedures, Group II consisted of 18 (40%) patients who underwent concomitant carotid stenting and cardiac procedures. To detect myocardial suffering during carotid time, arterial blood samples (2-3 mL) for cardiac biomarkers were performed before carotid time (T1), and at the end of carotid time (before sternotomy) (T2). Moreover, heart performance during carotid operation was assessed using transesophageal echocardiographic and electrocardiographic monitoring.

**RESULTS:** No transesophageal echocardiographic and electrocardiographic modifications were observed in these patients during carotid time and maximum levels of cardiac biomarkers did not show a significant difference between groups (Table 1). Neurological outcome did not significantly differ between the two groups; only two patients in group I were died.

**CONCLUSIONS:** Our results suggest that concomitant carotid (carotid endarterectomy or carotid stenting) and cardiac operation can be performed with an acceptable overall mortality and morbidity. No transesophageal echocardiographic and electrocardiographic modifications were observed in

these patients during carotid time and also in the light of laboratory values of the study population we deduce that the hearts of these patients are able to tolerate carotid time whether the procedure performed is carotid endarterectomy versus carotid stenting.

## OP-571-A NEW HIGH RISK PATIENT IN CARDIAC SURGERY- CABG AFTER PREVIOUS STENT ANGIOPLASTY

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**BACKGROUND:** An increasing number of patients are undergoing emergency CABG after previously treated with PCI and stent implantation due to acute stent thrombosis or acute coronary artery dissection. These patients are challenging cardiac surgeons because of their higher risk and complication profile due to the preoperative treatment with very powerful anticoagulants like clopidogrel and aspirin and their impaired preoperative conditions.

**METHODS:** 1730 patient underwent CABG in 2004 and 2005 at our institution. 124 patients (7.1 %) underwent emergency CABG after previously treated with stent angioplasty ( $n=108$  critical stent stenosis or thrombosis,  $n=16$  acute coronary artery dissection). Several items as number of vessel diseased, localisation of the stents, preoperative anticoagulation, amount of blood loss, need of transfusion, length of stay in ICU and 30 day mortality were investigated and compared to all patients that underwent CABG in this period.

**RESULTS:** The majority of the patients suffered from a 3-vessel-disease (67%) and 75.8% needed emergency revascularisation. Although blood loss, need of transfusion, cardiogenic shock and length of stay in ICU and hospital were significantly higher compared to the control group, no significant increase in mortality was observed.

**CONCLUSIONS:** CABG after stent angioplasty lead to an increasing consumption of resources and costs compared to patients undergoing CABG without previous stent intervention. The majority of the investigated patients suffered from a 3VD at the time of stent angioplasty and should have underwent primary CABG. Although these patients are high risk patients (average EuroScore 11.8%), no increasing mortality was observed.

## OP-572-SYSTEMATIC BEATING HEART CORONARY ARTERY BYPASS GRAFT SURGERY IN 2078 CONSECUTIVE PATIENTS

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**BACKGROUND:** Off-pump coronary artery bypass surgery (OPCAB) is currently used as an alternative to conventional On-pump surgery (CAB), but there are still very little data available on its systematic use. The aim of this study is to evaluate early and mid-term results on 2078 consecutive patients.

**METHODS:** From March 2003 to October 2007, 2078 patients (male/female 1685/393; mean age  $64.5 \pm 9.9$ ) underwent coronary artery surgery. Indication for OPCAB was systematic in all the patients and only 5.4% were converted to CPB without receiving cross-clamp and cardioplegic arrest. Acute coronary syndrome and congestive heart failure were not considered absolute contraindications to OPCAB. All procedures were performed by 3 staff-surgeons. Disposable devices for coronary stabilisation and intra-coronary shunts were used. The data, prospectively collected, were retrospectively analyzed.

**RESULTS:** The number of graft-per-patient was  $2.6 \pm 0.8$  (min 1, max 6). Left internal thoracic artery (ITA) was used in 98% of patients. Sixty-six percent of patients received more than one arterial graft (bilateral ITA, and left radial artery). Mean postoperative extubation time was  $8.4 \pm 6.6$  hours, mean 24-hour bleeding was  $450 \pm 230$  ml, and mean length of postoperative hospital stay was  $5.2 \pm 4.5$  days. Operative 30-day mortality was 0.8 % in elective and 2.1 % in emergency surgery. There was no difference on mortality in the group converted to on pump surgery. Follow-up time was 95.4% complete. The actuarial survival and freedom from new revascularisation at 12, 36, 55 months was 96.9, 95.2, 88.7 and 97.6, 96.4, 92.8 respectively. Age, congestive heart failure, peripheral vascular disease, BPCO and obesity were risk factors for mid-term mortality. Survival free of any cardiac events (cardiac death, myocardial infarction, unstable angina, heart failure or reintervention) was  $86 \pm 2.8\%$ . Conversion



to on pump was not predictor of mid-term mortality or the need for repeat revascularisation.

**CONCLUSIONS:** Systematic OPCAB is possible and safe, with good early and mid-term results, respecting the criteria of complete revascularisation, the use of arterial conduits and also feasibility and reliability in routine use.

### **OP-573-EXPERIENCE AND EARLY RESULTS OF ENDARTERECTOMY WITH EXTENDED SAPHENOUS VEIN PATCHING WITH LIMA IMPLANTATION IN CABG SURGERY FOR DIFFUSELY DISEASED LAD CORONARY ARTERY**

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**BACKGROUND:** Coronary artery bypass grafting (CABG) with Coronary Endarterectomy (CE) is claimed to cause increased morbidity and mortality. This study was carried out to evaluate the impact of operative and perioperative management on outcomes after CABG combined with CE.

**PATIENTS AND METHODS:** This prospective study was carried out starting from December 2001-until-December 2006. Of 120 CABG patients, 20 patients (16.6%) were chosen. Those 20 patients (10 men and 10 women), underwent concomitant CABG surgery with LAD Endarterectomy. Criteria of inclusion were presence of single or multi-vessel ischemic heart disease with total or near-total occlusion of LAD. All were submitted to elective surgery for coronary artery bypass graft surgery using cardiopulmonary bypass, moderate hypothermia (28 C) and intermittent blood-cardioplegia. The mean patient age was 55 years. Six patients (30%) were in New York Heart Association Functional Class III-IV; with impaired left ventricular function (LVEF less than 45 %); and a mean EuroSCORE of 5.5. All CABG operations were carried out between 2001-2004. Revascularization was done using combined procedures of LAD endarterectomy, extended saphenous vein patching followed by LIMA implantation. Patients were postoperatively followed-up from 2004-till-2006. Ten patients (50 %) agreed to perform postoperative follow-up angiocatheterization.

**RESULTS:** The 30-day mortality rate was 5 % as one patient died. This 66-year old patient had long-standing systemic hypertension, diabetes mellitus, and poor preoperative myocardial functions (LVEF of 42 %). He died in the 12th. postoperative day due to fulminant mediastinitis. The mean total operative time was 89 minutes (range 105-180 minutes). Mean number of grafts done was 2.0 (range 2-5). The mean cardiopulmonary bypass time was 99 minutes (range 34-130 minutes). Mean postoperative ICU stay time was 25 hours. Patients were extubated after a mean time of 6 hours. The mean length of hospital stay was 7 days. A mean of 2 units of blood were transfused postoperatively, but none of our patients required reexploration for bleeding. Postoperatively, all patients were angina free with only 2 of them (10 %) were in NYHA Class III-IV. Postoperative dysrhythmias (in the form of Ventricular Tachycardia) occurred in one patient (5 %); and Atrial Fibrillation in another patient (5 %). All were controlled using Amiodarone by IV then oral routes. No patient suffered from postoperative myocardial infarction. Three patients (15 %) (who had preoperative LMS), developed postoperative CHF for which they needed Inotropic and IABCP Support. Neurological manifestations did not occur in any of our patients.

**CONCLUSION:** LAD Endarterectomy, combined with extended saphenous vein patching and LIMA implantation was both safe and feasible and achieved surgical revascularization in patients with diffuse coronary artery disease, without major short term complications.

### **OP-574-INTRAOPERATIVE GRAFT FLOW: LUXURY OR NECESSITY?**

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**BACKGROUND:** Outcome of CABG depends critically on the quality of anastomoses. Traditionally, the vein graft outflow is assessed, which is simple and cheap, but only semi-quantitative. In this study, this graft outflow was compared with the more expensive, quantitative Transit Time (TT) measurement after cessation of ECC. These data were correlated with early postoperative markers of ischemia and the clinical outcome. **PATIENTS AND**

**METHODS:** From 2/05 to 9/05, 32 patients (Pts; m: 27; age: 67±10ys; LVEF>50%; blood cardioplegia/Calafiore). After completion of the distal vein graft anastomoses, flow through these grafts was assessed using a rollerpump.

After cessation of ECC, graft flow was measured by non-invasive TT. Early postoperative markers of ischemia (CK, CK-MB) were measured, and 8 days and 6 months postoperatively, LV function was assessed using echocardiography.

**RESULTS:** Graft outflow did not correlate with TT measures. Neither graft outflow nor TT nor pulsatility-index correlated with postoperative markers of ischemia or outcome. In two cases, suspicion of graft closure was confirmed by TT, and the graft could successfully be revised. Early mortality was zero. Late postoperatively, all Pts were alive and in good clinical condition (NYHA I). LVEF (echocardiography) was 58±5%. All Pts were in sinus rhythm.

**CONCLUSIONS:** Measurement of graft outflow permits only information on whether or not, the distal graft anastomosis is open. Routine quantitative TT measurement did not allow prediction of postoperative ischemia-related complications. After completion of revascularization, the grafts should be scrutinized by TT in case of doubt.

### **OP-575-CARDIAC SURGERY IN OCTOGENARIANS - OUTCOME AND LONGTERM RESULTS FROM AUSTRALIAN DATABASE REGISTRY**

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**BACKGROUND:** The increasing incidence of cardiovascular disease with age, together with the extension of life expectancy, is leading to an increased proportion of elderly patients being considered for CABG surgery. Previous studies have suggested that octogenarians undergoing isolated CABG are at higher risk for postoperative complications<sup>1</sup>. There is no multi-institutional data on the outcome for octogenarians in Australia, which may be different due to differing patient characteristics.

**METHODS:** Clinical outcomes of 480 octogenarians having isolated CABG procedures between 1 July 2001 and 30 June 2006 (Australasian Society of Cardiac and Thoracic Surgeons Registry collects data from 6 Victorian cardiac units) were reviewed. They were compared with 8,650 non-octogenarians (mean age of 64.8 ± 9.6 years) undergoing similar procedures during the same time interval. The majority of patients underwent elective/urgent CABG surgery and only 6% underwent emergency/salvage CABG procedures.

**RESULTS:** In comparison to the younger age group, more octogenarians were women (38.3% versus 22.1%, p<0.001), had unstable angina (35.9% versus 28.9%, p=0.002) and congestive heart failure (31.9% versus 18.8%, p<0.001). The 30-day mortality rate was significantly higher in octogenarians (4.1% versus 1.2%, p<0.001) undergoing isolated CABG. They were more likely to require readmission to ICU (4.3% versus 2.6%, p=0.02) and develop new renal failure (8.4% versus 3.3%, p<0.001). Octogenarians also had a longer post-procedure length of stay (median of 8 days versus 6 days, p<0.001), ICU stay (median of 25 hours versus 22 hours, p<0.001) and ventilation time (median of 10 hours versus 8 hours, p<0.001). There was no difference in the rate of deep sternal wound infection (0.8% versus 0.7%, p=0.90) and return to theatre for haemorrhage (3.4% versus 2.3%, p=0.12). The actuarial survival rate at 5 years was 78% for patients older than 80 years and 92% for the younger patients (p<0.001).

**CONCLUSIONS:** Octogenarians undergoing isolated CABG required increased resource utilisation, and had a significant higher postoperative morbidity and 30-day mortality. Isolated CABG surgery in the elderly can be performed with an acceptable operative risk and a favourable long-term outcome. 1. Johnson, W.M., Smith, J.M., Woods, S.E. et al, Cardiac surgery in octogenarians: Does age alone influence outcome? Arch Surg, 140:1089-1093, 2005

### **OP-576-TOTAL ARTERIAL REVASCLARISATION WITH RADIAL ARTERY T-GRAFTS IN SIGNIFICANT LEFT MAIN STEM STENOSIS**

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**BACKGROUND:** Total arterial revascularisation (TAR) using radial artery T-grafts as composite grafts with in situ left internal thoracic artery raised the concern, that patients with significant left main stem stenosis may have a higher perioperative risk due to single inflow to all bypasses and possible vasospasms of the LITA.

**METHODS:** To compare the early postoperative outcome after TAR in patients

without (Group A) and with left main stem stenosis (Group B), we reviewed the data of 562 consecutive TAR patients (54 female, 508 male, 62±9 years, Group A: 418 pat., Group B: 144 pat.) who underwent first time coronary bypass surgery in our clinic.

**RESULTS:** The incidence of three vessel disease (70,8% vs. 81,1%), preoperative myocardial infarction (37,5% vs. 48,6%) and diabetes (16,7% vs. 33,49%) was significantly lower in Group B ( $P<0,05$ ). Group B patients had a higher ejection fraction (59,3% vs. 55,6%). Postoperative outcome including myocardial infarction (1,4% vs. 1,4%,  $P=0,64$ ), low cardiac output (2,1% vs. 2,4%) or use of IABP (1,4% vs. 1,4%,  $P=0,64$ ) were comparable. Group B patients were discharged earlier (8,9 vs. 11,2 days,  $P<0,05$ ). In hospital mortality was slightly (but not significantly) higher in patients with left main stem stenosis (2,1% vs. 1,2%,  $P=0,44$ ).

**CONCLUSIONS:** Total arterial revascularisation using radial artery T-grafts in patients with left main stem stenosis can be achieved at low operative risk. The shorter length of stay may partly be caused by pre-selection of patients with less comorbidities for TAR, in presence of left main disease.

### **OP-577-HORMONAL VARIATION DURING OFF-PUMP AND ON-PUMP MYOCARDIAL REVASCULARIZATION: B-TYPE NATRIURETIC PEPTIDE (BNP) EVALUATION**

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**BACKGROUND:** To evaluate BNP values variations occurring after Off (OPCAB) and On-Pump (CABG) Myocardial Revascularization.

**METHODS:** Eighty two consecutive eligible patients undergoing elective Surgical Myocardial Revascularization (42 CABG and 40 OPCAB) were enrolled prospectively between June 2005 and November 2005. BNP was tested before and after surgical revascularization. BNP assay was performed 15 minutes after induction of anesthesia (T0), 30 minutes after the end of the cardiac dislodgement or after weaning of CPB (T1), 24 hours after the surgical procedure (T2) and in VII postoperative days (T3). Patients with perioperative acute myocardial infarction and death were excluded from the study. Preoperative echocardiographic, clinical (NYHA, CCS) and intraoperative parameters as Length of Heart Displacement, Length of CPB and CC times were correlated (Spearman) with postoperative BNP values.

**RESULTS:** Age, sex distributions, clinical and echocardiographic preoperative parameters and number of grafts were statistically similar in CABG and OPCAB pts ( $p=n.s.$ ). Length of ICU and hospital stay was statistically similar in CABG and OPCAB groups ( $p=n.s.$ ). Preoperative (T0) ( $203.7\pm294.50\text{pg/mL}$  CABG vs  $162.7\pm240.72\text{pg/mL}$  OPCAB;  $p=n.s.$ ) and immediately postoperative (T1) ( $194.3\pm263.72\text{pg/mL}$  CABG vs  $188.9\pm277.14\text{pg/mL}$  OPCAB;  $p=n.s.$ ) BNP are statistically similar in both groups ( $p=n.s.$  t test for paired data). Conversely, BNP values at Time 2 ( $471.6\pm426.21\text{pg/mL}$  CABG vs  $473.9\pm442.63\text{pg/mL}$   $p=n.s.$ ) and Time 3 ( $492.1\pm541.02\text{pg/mL}$  vs  $519.9\pm608.10\text{pg/mL}$   $p=n.s.$ ) were similar if compared CABG and OPCAB pts groups and significantly higher than those before surgery ( $p<0.001$ ). Duration of Heart Dislodgement during exposure of the vessels in OPCAB pts was not correlated with postoperative peptide concentrations ( $p=n.s.$ ). No statistical correlation was observed between postoperative T2 and T3 BNP values and CPB and CC times ( $p=n.s.$ ). No correlation was observed between number of By-pass grafts and postoperative ( $p=n.s.$ ) or pre-discharge ( $p=n.s.$ ) BNP values in both groups. Any correlation between preoperative echocardiographic and clinical parameters and pre and postoperative BNP values was observed ( $p=n.s.$ ).

**CONCLUSIONS:** The increase of postoperative serum BNP values was observed after On and Off-Pump myocardial revascularizations. These variations are not correlated with the CPB or CC time but with hemodynamic stress (volemic expansion, anesthesia, cardiac displacement, inotropes, catecholamines release) during cardiac surgery.



## MULTIDISCIPLINARY I

### OP-578-UTILIZATION "ROLLER PUMP" AS A VENTRICULAR ASSIST DEVICE IN CRITICAL CONDITIONS, WHEN NO VAD IS AVAILABLE.

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**OBJECTIVE:** In Iran till now (Dec2007) no VADs is available. In critical conditions especially after open heart surgery when weaning of CPB is not successful, using IABP is not effective, and maximal doses of inotrops are unable to provide successful weaning, the patient is going to die. But we design a VAD system with roller pump and use it for 9 patients' since 1999. We designed VAD with usual tubes and roller pumps. (Will be shown in Pictures)

**METHOD:** Since 1999 this procedure was done for 9 patients in which weaning of CPB was impossible and they were going to die. This system was used for 9 patients in 3 different centers in University hospitals in Iran.

**RESULT:** 4 patients were survived (44%). The mean age of patients was  $50 \pm 6$ , and all of them was undergone CABG, and mean EF of them was  $40\% \pm 10\%$ , and mean duration of using the VAD was 2 days in alive patients.

**CONCLUSION:** Although not written in literature, but in countries and in centers in which no VAD is available, this procedure may save the patients and is recommended as the last option for surviving the patients.

### OP-579-IMPACT OF THE INTENSIVIST-LEAD TEAM ON POSTOPERATIVE OUTCOMES IN A SPECIALIZED CARDIAC SURGERY INTENSIVE CARE UNIT

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**INTRODUCTION:** Increasing complexity of cardiac surgical cases requires a new level of critical care performance. This study sought to evaluate the impact of a newly appointed intensivist on cardiac surgical intensive care unit patient outcomes and quality of care variables.

**MATERIALS AND METHODS:** We performed an observational cohort study with historical controls in eight-bed cardiac surgical intensive care unit (CSICU) in a tertiary care university hospital. Mortality, ventilation time, length of stay in the CSICU and hospital (LOS) were compared between two 10-month periods, before and after the appointment of intensivist. Data regarding these patients were collected using the departmental database.

**RESULTS:** We analyzed 712 patients before and 680 after the intensivist appointment. The unadjusted in-hospital mortality decreased from earlier 6.6% to 2.94% in the second period (95% confidence interval, 1.3 to 3). The mortality predicted according to EuroSCORE was  $8.5 \pm 11.4\%$  in the first period and  $8.8 \pm 11.6\%$ . Mean ventilation time increased from 31 hours to 43.1 hours (95% confidence interval, 1.7 to 2.7). Median ventilation time remained unchanged - 10 hours. Reintubation rate significantly decreased during second period (4.9% vs. 2.5%, 95% confidence interval 1.09 to 1.23). Mean ICU LOS increased from 2.8 to 3.8 days (95% confidence interval, 0.2 to 0.9), but median ICU stay was unchanged - 24 hours. ICU readmission rate also decreased from 4.8% to 31%. Mean hospital stay was 8.2 and 8.4 days respectively (median 6 days).

**CONCLUSIONS:** The intensivist-led team model was associated with a positive impact on patient outcomes, including lower intensive care unit mortality.

### OP-580-THE PREDICTORS OF SURVIVAL AFTER GASTRO-INTESTINAL COMPLICATIONS IN CONTEMPORARY OFF-PUMP AND ON-PUMP CORONARY ARTERY BYPASS GRAFTING: THE HAREFIELD EXPERIENCE

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**BACKGROUND:** Analysis of risk factors to allow early identification of patients at risk for gastro-intestinal (GI) complications after contemporary coronary artery bypass grafting (CABG) may lead to the development of strategies to mitigate this as well as to minimise associated mortality.

**METHODS:** Between April 2001 and December 2005 data was collected prospectively from 2320 consecutive patients who underwent first-time CABG. Step-wise logistic multiple regression analyses were carried out to determine the independent predictors of GI complications and death following this.

**RESULTS:** 65 major GI complications were identified in 65 patients (2.8%). The five most common complications were: Paralytic Ileus (14), Mesenteric ischaemia (12), Upper GI bleeding (16), Lower GI Bleeding (7), Small Bowel obstruction and Pseudo-obstruction (5 each). The 30-day mortality of the whole group was 21.5% (n=14). The mortality in the mesenteric ischaemia group was higher (10/12) and death occurred at  $30.0 \pm 29.74$  days after heart operation as compared to  $17.5 \pm 16.65$  days with other complications (p=0.33). Multivariate analysis identified that female sex, pre-operative creatinine  $>200$  mmol/L, previous history of GI pathology, peri-operative low cardiac output, re-admission to intensive care unit (ITU) after CABG, post-operative pulmonary complications and arrhythmias, post-operative need for haemofiltration and re-operation for bleeding/tamponade were the independent predictors of major GI complications. The use of heart-lung machine and vice-versa was not significant. Predictors of death from GI complications post-CABG included readmission to ITU, need for haemofiltration, re-operation and ischaemic bowel.

**CONCLUSIONS:** This study has identified risk factors for adverse GI outcome after CABG in contemporary practice. It suggests that strict haemodynamic control and optimisation of peri-operative organ perfusion are important to minimise the mortality associated with major GI complications post-CABG.

### OP-581-INTRAVASCULAR CATHETER COLONIZATION AND RELATED BLOODSTREAM INFECTION IN THE HEART SURGERY INTENSIVE CARE UNIT

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**BACKGROUND:** Catheter-related infection (CRI) is one of the most serious complications of the use of central venous catheters (CVCs) and arterial catheters (ACs), with an incidence of 2-30/1000 days in different studies. No prospective study has evaluated the rate of CRI in cardiac surgery intensive care unit (SICU) in the northwest Iran.

**METHODS:** Since 2006, we have had a through program for the insertion and care of all catheters used at our cardiac SICU. Our purpose was to study the incidence of catheter tip colonization and CRI and their risk factors, and to compare these data with other studies.

**METHODS:** We studied prospectively 183 catheters in 150 patients in relation to insertion data and catheter characteristics, catheterization time and microbiological cultures. These catheters were in place for  $> 48$  hrs over a 16 months period. Risk factors were analyzed by multivariate analysis.

**RESULTS:** The analysis included 115 CVCs, 65 ACs and 3 PACs inserted in 150 patients. The median time of catheter placement was 4 days. The incidence of positive tip culture was 9.8% and ten microorganism isolated from 18 colonized catheters. Thirteen Gram-negative bacilli, four Gram-positive cocci and one yeast were isolated. Escherichia coli was the dominant isolated (27.7%). From multivariate analysis,  $>6$  days of catheterization and insertion site (CVCs) were the variables associated with significantly increased risk of catheter colonization.

**CONCLUSION:** Gram-negative bacilli and Gram-positive cocci are the commonest microorganisms colonizing CVC and AC from cardiac SICU patients. Duration of catheterization and catheter insertion site were independent risk factors of catheter related infection.

## OP-582-INSIGHT OF THE 2000 BERNSTEIN-PARSONNET VERSUS EUROSCORE AT THE HEART INSTITUTE OF SFO PAULO-BRAZIL

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**BACKGROUND:** Nowadays we must develop and strictly apply Guidelines for prevention, diagnosis, follow up, indication and contra-indication of the patients that undergo heart surgery and thus optimizing the benefits of surgical procedures. The objective of this study is to evaluate the performance of 2000 Bernstein-Parsonnet and Euroscore additive to predict hospital mortality in patients submitted to cardiac surgery at the Heart Institute of Sao Paulo-Brazil.

**METHODS:** It was a prospective, observational and longitudinal study. The study group (SG) was 744 consecutive patients, average age  $59.53 \pm 14.04$  years; submitted to surgery for coronary, valve or combined disease in the elective, urgent or emergency indications from May to October of 2007. The outcome was hospital mortality defined as death occurring before hospital discharge. In order to assess the applicability of the 2000 Bernstein-Parsonnet (2000BP) and Euroscore (ES), an adjustment was made using a logistic regression model of Observed Mortality (OM) on the Expected Mortality (EM). The Calibration was determined by the test of Hosmer-Lemeshow and Discrimination was assessed by the area under the ROC curve.

**RESULTS:** The patients were stratified by their scores in five groups for the model 2000BP and three groups for the ES. So in 2000BP: Score 0-8.5: OM (0.70%), EM (1.17%); Score 9-15: OM (1.28%), EM (1.97%); Score 15.5-22: OM (2.01%), EM (3.36%); Score 22.5-31.5: OM (8.22%), EM (6.42%); Score  $\geq 32$ : OM (21.33%), EM (20.58%). For ES: Score 0-2: OM (1.36%), EM (1.57%); Score 3-5: OM (2.64%), EM (3.41%); Score  $\geq 6$ : OM (15.50%), EM (14.52%). There was a higher prevalence of risk factors in SG compared to the ES. The area under the ROC curve was greater for the model 2000BP (0.835; Point Cutting  $\geq 27$ : OR 11.6, 95% CI = 5.7-23.7; S = 80%, E = 74.4%, PPV = 18.4%, NPV = 98.1%, A = 74.7%, P < 0.001) that for the ES (0.807; Point Cutting  $\geq 6.5$ : OR 11.8, 95% CI = 5.9-23.6; S = 78.0%, E = 77.0%, PPV = 19.6%, NPV = 98.0%, A = 77%, P < 0.001). The p value of the Hosmer-Lemeshow test was 0.7041 to the 2000BP and 0.3940 for the ES, indicating a good fit for both models.

**CONCLUSIONS:** The initial validation of 2000BP jointly with ES in a heterogeneous population as the Brazilian equal to that in other populations suggests that the differences in ethnic not hamper the good applicability of these risk scores. In this study both models are simple and goals in the estimation of hospital mortality in patients submitted to cardiac surgery at the Heart Institute of Sao Paulo-Brazil with a slight advantage of 2000BP on ES.

## OP-583-VASSOPRESSINE INFUSION IN CARDIAC SURGERY PATIENTS: EFFECTS IN HAEMODYNAMICS, DIOURESIS AND BLEEDING

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**BACKGROUND:** The preoperative administration of angiotensin converting enzyme inhibitors (ACE-I) and the decreased left ventricular Ejection Fraction (EF), are independent factors for the appearance of vasodilatory shock after the extracorporeal circulation (ECC) in cardiac surgery. Aim of our study, is to examine in patients with preoperative use of ACE-I and low ventricular function the consequences of vassopressine administration in haemodynamics, diuresis and bleeding after cardiac surgery.

**METHODS:** Our study population was 50 patients aged between 30-85 years, with EF < 35% and preoperative therapy with ACE-I at least 2 weeks before the procedure. We divided them in 2 groups, randomly. The group I (N: 25) was treated with vassopressine 0,03 U/min, and the group II (N: 25) with placebo (N/S 0,9%). The medications were given 20 min before the ECC until the second postoperative hour. The biometric informations, the EF, the diuresis, the postoperative bleeding and the influence of vasodilatory shock were recorded in all patients. Statistical analysis was performed with paired t-test and independent t-test.

**RESULTS:** The incidence of vasodilatory shock the 1st postoperative day for

the 2 groups was 12% and 48%, respectively. One hour after the beginning of ECC in group I was observed an important increase of the mean arterial pressure ( $87,16 \pm 12,73$  vs.  $78 \pm 12,95$  mmHg,  $p=0,015$ ), the central venous pressure ( $8,96 \pm 2,90$  vs.  $7,40 \pm 2,36$  mmHg,  $p=0,04$ ), the systemic vascular resistance ( $1236,16 \pm 395,6$  vs.  $1088,2 \pm 490,24$  dyn/cm,  $p=0,000$ ) and the EF of the left ventricle ( $39 \pm 5,02$  vs.  $36,16 \pm 5,05\%$ ,  $p=0,006$ ). In the same group the 1st postoperative day, the diuresis was increased ( $5621,6 \pm 1546,58$  vs.  $3924,8 \pm 1035,06$  ml,  $p=0,000$ ) and the bleeding was decreased ( $717,3 \pm 213,6$  vs.  $919,2 \pm 301,03$  ml,  $p=0,049$ ).

**CONCLUSIONS:** In patients, with use of ACE-I preoperatively and low left ventricular EF, who underwent cardiopulmonary bypass, vassopressine reduces the frequency of vasodilatory shock without complications like hypertension attacks. The EF improvement in patients who were treated with vassopressine is an important finding and further studies will be needed to the future.

## OP-584-COGNITIVE IMPAIRMENT BEFORE AND AFTER CORONARY ARTERY BYPASS GRAFTING - HIGHER THAN EXPECTED?

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**BACKGROUND:** Cognitive impairment is a common problem after cardiac surgery affecting short- and long-term outcome. Neuropsychological testing is time consuming and often obscured by organisational and psychological constraints preoperatively in the clinical setting. The assessment of cognitive function with a reliable and simplified method would therefore be valuable.

**METHODS:** Between March and April 2007 31 unselected male patients subjected to elective coronary artery bypass grafting (CABG) were asked to undergo cognitive assessment with the "test battery for attentional performance" (TAP) before and 7 days after operation. The TAP is a computer-based program, where candidates have to perform several tests on a portable laptop with simple keystroke after a standardized instruction. The tests covered several cognitive domains. We chose to test alertness, working memory, go-nogo, and divided attention. Impaired cognitive performance was defined as 1SD under the mean of an age-, sex-, and educational standardized sample. A postsurgical decline of individual test performance greater than 1 SD was assumed to be meaningful.

**RESULTS:** 31 patients performed pre- and 30 patients postoperative testing. Test performance took  $41 \pm 3$  min at each session. Preoperatively a relatively large number of patients obtained test results inferior ( $> 1SD$ ) to the denoted standardized test values. We found that in the tests alertness without audio warning 21/31 patients (68%), in alertness with audio warning 18/31 patients (58%), in divided attention 14/31 patients (45%) and in the test go-nogo 24/31 patients (77%) were meaningful cognitive impaired. Only 10 patients (32%) were able to perform the working memory test. After CABG the amount of cognitive impaired patients did not significantly change. We found in alertness without audio warning 19/30 patients (63%), in alertness with audio warning 15/30 patients (45%), in divided attention 10/30 patients (33%) and in go-nogo 24/30 patients (80%) cognitive impaired patients. A decline of  $> 1SD$  between pre- and postoperative testing at least in one test was observed for 7/30 patients (23%).

**CONCLUSION:** The TAP is a practical tool for the assessment of cognitive function in a routine clinical setting. The majority of patients undergoing CABG had an impaired cognitive test performance before surgery.

## OP-585-USE OF TRANEXAMIC ACID IN OFF-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY TO REDUCE BLEEDING AND BLOOD REQUIREMENTS

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**BACKGROUND:** The goal of this study was to evaluate the ability of tranexamic acid to decrease bleeding and transfusion requirements in patients undergoing coronary artery bypass graft surgery on the beating heart.

**METHODS:** 100 consecutive patients were in a double-blind manner, randomized into two groups: 50 patients received tranexamic acid (bolus of 1 gram 20 minutes before skin incision, and infusion of 400 mg/hr as maintenance), and

50 patients received saline as placebo. Perioperative hematological variables, postoperative blood loss at 4 and 24 hours, transfusion requirements and postoperative thrombotic events were recorded.

**RESULTS:** Postoperative bleeding was significantly lower in the tranexamic acid group at 4 hours ( $87 \pm 62$  vs  $210 \pm 195$ ) and 24 hours ( $471.8 \pm 182.9$  vs  $844.1 \pm 363$ ) compared with control group. The treatment group had lower need for allogenic blood products ( $P = 0.003$ ). Treatment with tranexamic acid was not associated with higher incidence of myocardial infarction or other thrombotic events.

**CONCLUSION:** It appears that tranexamic acid to be effective in reducing postoperative bleeding and the need for allogenic blood transfusion in off-pump coronary artery bypass graft surgery.

#### **OP-586-CAROTID ENDARTERECTOMY FOR AMELIORATING THE SYMPTOMS OF TRANSIENT ISCHEMIC ATTACK**

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**ABSTRACT- BACKGROUND:** Carotid endarterectomy has certain risks, but it has obvious effects on preventing the occurrence of stroke.

**METHODS:** Sixteen patients with carotid atherosclerotic stenosis accompanied by ischemic symptoms were selected from the Department of Vascular Surgery, Union Hospital Affiliated to Tongji Medical College, Huazhong University of Science and Technology from March 2005 to May 2007. There were 11 males and 5 females, aged from 40 to 81 years old with a mean age of 60 years old, and they were all clearly diagnosed by carotid color Doppler ultrasound. All the 16 patients were performed with unilateral stripping of arteriosclerotic plaque and Carotid endarterectomy, and 6 of them with bilateral stenosis was operated on the side with more serious stenosis. The clinical symptoms, physical signs before and after operation, and the operative complications were observed. The patients were followed up for 6 months postoperatively. The smoothness of carotid arteries was detected with color Doppler ultrasound. The degrees of satisfaction to the quality of living were evaluated.

**RESULTS:** All the 16 patients were involved in the final analysis of results. A. Amelioration of clinical symptoms and physical signs: The postoperative muscle strengths of 3 patients with stroke history were significantly ameliorated; For the 8 patients with TIA symptoms, and the symptoms disappeared completely in 6 cases of them; For the 5 patients with atypical nervous symptoms, the symptoms disappeared completely in 3 cases, and obviously alleviated in 2 cases. B. The degree of satisfaction to the quality of living was a little satisfied in 2 patients, very satisfied in 1 patient, and satisfied in the others. C. Postoperative complications: The complications were injury of hypoglossal nerve in 4 patients (25%) and injury of recurrent laryngeal nerve in 1 patient (6%), and the complications recovered or turned better after conservative treatments for 1-3 months.

**CONCLUSION:** Carotid endarterectomy can ameliorate the symptoms and physical signs of patients with cerebral ischemia, and it has mild postoperative complications. Key Words: carotid endarterectomy; cerebral ischemia; stroke

#### **OP-587-FORWARD WITH WEANING: AN INITIAL CASE STUDY OF THE FOCUSED OXFORD RESPIRATORY WEANING AND RATIONAL DECISION PLAN**

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**OBJECTIVES:** To reduce the level of time a patient spends categorised as level 3, to reduce length of stay and to achieve an 80% target of measured successful weaning days

**METHODS:** The authors have plotted graphical representations of respiratory mechanics, oxygen uptake and tissue perfusion, allocating different areas on the graph a colour code. Each colour leads to a flow chart of actions which a nurse may follow. Mixed methodology was used, collecting initial case histories, the patients colour codes throughout each 24 hour period they remained ventilated, and comments on the actions taken. This was followed up with focus group interviews to assess the wider perspectives of staff. Data collected was measured against a retrospective cohort, measuring time ventilated from day three onwards. Successful weaning days (10% reduction in ventilatory support) were counted.

**RESULTS:** A reduction in time ventilated and a in length of stay was noted

between the pilot study group and the cohort

**CONCLUSIONS:** This appears to offer an opportunity to streamline the weaning process. The research and depth of experience encumbant in the tool, allows all grades of staff with differing levels of knowledge and experience, to maintain momentum within the weaning process whilst ensuring the safety and security of the patient. The study was conducted on an average size cardiothoracic unit and whilst the initial results are encouraging the authors are aware of a need to broaden the exposure of the tool to further validate its benefits. The possibilities of a multi centre trail are currently being explored.

## MINI PRESENTATIONS II

### OP-588-TRICUSPID PAHOLOGY IN THE CONTEXT OF VALVULAR SURGERY

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**BACKGROUND:** We make present study to analyze the influence of tricuspid pathology and different risk factors in this valvular surgery, usually associated to others valvular pathologies.

**METHODS:** We analyze 226 patients age 61.7 yrs. 183 women, 43 men. 177 were mitrals, and 49 has mitral and aortic pathology. 202 tricuspid insufficiencies were w functionals and 24 has organic disease. Reoperation was present in 85 cases. 49 in IV NYHA class, 5 were urgent. Pulmonary Hipertension >50 in 118 patients. EF 0-75  $\pm$  0,11.

**RESULTS:** In 102 was made De Vega technique. Plastic Ring in 52. Prostesis in 6. Tricuspid comisurotomy was associated in 13 patients. In 53 tricuspid correction was not made. We made surgery in other valves, with implantation of 168 mitral prostesis, 41 mitral plastic surgeries, 41 aortic prostesis, 2 aortic plastic surgeries and 8 prostetic dehiscence The mortality in 17 (7.5%), and was correlated with NYHHA class IV, (15% vs 6%  $p < 0.05$ ). Pulmanary hypertension (12% vs 4%  $p < 0.05$ ). With associated aortic surgery (13% vs 6,8%  $p = ns$ ). Tri-cuspid prostesis (33% vs 8%  $p < 0.05$ ). There was no correlation whit plastia type, age, EF, mitral lesion type, reoperation or gender. The more frecent complications were: respiratory insufficiency 15%, arritmias 9,5% and low output in 7.7%.

**CONCLUSIONS:** 1. Significant risk factors of tricuspid surgery were: pulmonary hypertension, NYHHA IV and prostesis replacement. 2. These results could be improved with early surgical attention

### OP-589-CORONARY ENDARTERECTOMY- PREDICTORS OF POST OPERATIVE MORTALITY

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**BACKGROUND:** Advances in interventional cardiology has led to aggressive multi vessel coronary artery stenting. This has resulted in a high prevalence of patients with diffuse coronary artery disease in the surgical cohort.

**METHODS:** One hundred and seventy three patients out of 1912 who underwent CABG between Feb 2004 and Oct 2007 had 201 coronary endarterectomies. 152 had single vessel endarterectomy, RCA (n=112), LAD (n=27) and others (n=13). Multi vessel endarterectomies were performed on 21 patients, LAD combined with other vessels (19 patients 43 endarterectomies), RCA combined with vessels other than LAD (2 patients 4 endarterectomies).

**RESULTS:** The mean age was 57.6 years (SD-9.04). Ten were females. 92 patients had DM (53.2%), 99 had hypertension (57%), 31 were smokers (18%), 32 had dyslipidemia (18%) and eleven (13%) had a strong family history. Eight patients had co-existing carotid artery disease, four had renal artery stenosis and one had diffuse peripheral vascular disease. forty-three patients had sustained a previous MI (25%). Twelve patients required prolonged (>24hrs) inotropic support. Peri-operative IABP was required in eleven patients (6.4%). Nineteen patients (11 %) developed arrhythmias (VT/VF 6, SVT 7, AF 3, AV block 3). Twelve patients died in the postoperative period (7%). Sixteen patients had ECG changes suggestive of non-fatal perioperative MI (9.2%). Multi variable analysis identified age, LV function, pre-operative renal failure and LAD endarterectomy as the predictors of mortality.

**CONCLUSION:** Coronary endarterectomy is necessary in those with diffuse disease to enable vital vessels to be grafted. It can be done safely in one or more vessels with an acceptable risk of mortality. Coronary endarterectomy becomes an essential tool in the armamentarium of a cardiac surgeon.

### OP-590-CORONARY ENDARTERECTOMY HAS NO DETRIMENTAL EFFECT ON OUTCOMES AND SURVIVAL FOLLOWING BYPASS SURGERY

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**BACKGROUND:** We aimed to assess the effect of coronary endarterectomy (CE) performed in addition to coronary artery bypass surgery (CABG) on mortality and morbidity, with particular focus on left CE.

**METHODS:** 3,025 consecutive patients who underwent CABG between January 1999 and March 2004 were identified from a prospectively collected cardiac surgery database. CE was performed in 239 (7.9%). To account for differences in case-mix between the groups, we performed a one-to-many propensity-matched analysis. A propensity score for CE group membership was developed with a C statistic of 0.73. Variables used in the propensity score included patient demographics, co-morbidities, extent of coronary disease, ejection fraction, priority, prior cardiac surgery, type and site of bypass graft, and year of operation. All patients were followed up at one-year to assess mortality status.

**RESULTS:** A total of 238 patients from the CE group were successfully matched to 714 patients with no CE performed. Patient characteristics were well matched (EuroSCORE 4 (IQR 2-5) versus 3 (IQR 2-5);  $p = 0.98$ ). There was no statistically significant difference in the In-hospital mortality (2.5% versus 2.7%;  $p = 0.91$ ) and morbidity between the CE group and the No CE matched-groups. There was a marginal increase in the incidence of clinically diagnosed myocardial infarction (6.7% versus 2.1%;  $p < 0.001$ ) between the CE group and the No CE group. However, this did not impact on the in hospital mortality or on the one-year survival (96.2% versus 95.9%;  $p = 0.67$ ). Whether left or right CE was performed did not have an adverse impact on one-year survival (94.8% versus 96.9%;  $p = 0.43$ ) or other outcomes.

**CONCLUSIONS:** Coronary endarterectomy of the Left and right coronary territories can be performed safely, except for a marginal increase in cardiac enzyme release and clinically diagnosed myocardial infarction. However, this is not adversely associated with an increase in mortality during the hospital stay and at one-year.

### OP-591-BLEEDING FOLLOWING CORONARY ARTERY SURGERY IN NORMOTHERMIC VERSUS HYPOTHERMIC CARDIOPULMONARY BYPASS

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**BACKGROUND:** Post-operative bleeding is an important problem following cardiopulmonary bypass (CPB). CPB in normothermic condition may improve function of coagulation factors and maintains hemostasis, resulting in decrease of post-operative bleeding. This study aimed to compare bleeding, coagulation factors assays, and blood product requirement after coronary artery bypass grafting (CABG) in normothermic and hypothermic CPB patients.

**METHODS:** This randomized trial performed on 63 candidates of primary isolated CABG. Inclusion criteria were age between 35 to 65 years, left ventricular ejection fraction (LVEF)  $\geq 40\%$ , and normal coagulation factors (prothrombin time or PT, partial thromboplastin time or PTT, and platelet count). Patients were randomized in two groups: normothermic (N) and hypothermic (H). In H group (n = 30, 30B°C), mean arterial pressure maintained in range of 40 to 65 mmHg. In N group (n = 33, 35-37B°C), patients did not cool down actively and mean arterial pressure maintained between 60 to 90 mmHg. Blood loss and transfusion were recorded 12 and 24 hours after surgery. Coagulation factors (PT, PTT, and platelet count) were assessed 6 hours after surgery.

**RESULTS:** There was no statistically significant difference regarding age, weight, preoperative LVEF, number of involved coronary arteries, NYHA class, and CPB time between two studied groups. Blood loss during first 12 and 24 hours post operatively were respectively 395.6 mL and 512.6 mL in N group ( $P = 0.1$ ), and 441.8 mL and 626.9 mL in H group ( $P = 0.5$ ). The mean blood transfusion was 0.87 units in N group, and 1.36 units in H group ( $P = 0.1$ ). PT and PTT assays were also not statistically significant. Although mean platelet count was significantly higher in N group (134.5  $\pm$  103 vs. 104.6  $\pm$  103;  $P = 0.003$ ), it was not ended in higher requirement of blood transfusion in N group (mean platelet transfusions were 0.37 units in N group vs. 0.52 units in H group,  $P = 0.7$ ).

**CONCLUSIONS:** According to obtained results, hypo- and normothermic CPBs



do not influence post-operative blood loss during first 24 hours in patients undergoing primary isolated CABG. The only significant difference between groups was platelet count which did not result in increased platelet requirement.

#### **OP-592-SKELETONIZED INTERNAL MAMMARY ARTERY IN CABG; THE CURRENT VIEWPOINTS**

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**BACKGROUND:** The internal mammary artery (IMA) has been the most reliable conduit used in coronary artery bypass grafting with an excellent long-term patency rate. It has been traditionally harvested as a pedicle. Several studies, however, have investigated the best techniques for harvesting this valuable graft material. Recent evidence suggests that skeletonization technique lengthening the IMA provides complete arterial revascularization and may simplify making composite grafts. This review summarizes the current viewpoints regarding the role of using skeletonized IMA in patients undergoing CABG.

**METHODS:** A search of the Medline database was performed using internal mammary artery and skeletonization as keywords. Studies of different technical and physiological aspects of SKT-IMA or of its outcomes in patients with CABG were assessed.

**RESULTS:** There is little evidence to verify anatomical differences between skeletonized and pedicled IMA. Physiological characteristics of SKT-IMAs are rather preferable to pedicled IMAs. The skeletonization of internal mammary artery improves graft length, early blood flow and sternal blood supply. It also seems that complications of skeletonization are considerably less than pedicled technique.

**CONCLUSIONS:** Skeletonization is an acceptable and safe method for IMA harvesting and provides longer conduits as well as suitable composites.

#### **OP-593-SURGICAL EXPERIENCES IN MYOCARDIAL BRIDGING AND INTRAMYOCARDIAL LEFT ANTERIOR DESCENDING ARTERY**

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**BACKGROUND:** Myocardial bridging was recognized and described in 1796 by Black (3). Myocardial bridging occurs when a band of myocardial muscle overlies a segment of the coronary artery resulting in mechanical stenosis due to systolic compression. A transient systolic narrowing disappears during diastolic period (2). The incidence of myocardial bridging ranges from 0.5% to 4.5% on coronary angiography and varies between 5.4% and 85.7% in autopsy studies (1, 2, 4, 5).

**METHODS:** When we retrospectively researched 7797 coronary by-pass operation during the period from 1994 to 2007, we found intramural LAD in 44 (0.6%) patients and myocardial bridging in 10 (0.2%) patients. All patients were operated in Ege Saglık Hospital. The intramural LAD group was formed of patients without angiographic significance such as bridging in patients. This group of patients was seen during the operating period while LAD was being harvested for anastomosis. When these 54 cases were reviewed, 45 (83.3%) male patients and 9 (16.7%) female patients were found. The youngest patient was 38 years-old, the oldest one was 72 years old.

**RESULTS:** The right ventricle was opened and repaired in 2 (4.5%) of the myocardial bridging patients. While in the intensive care unit following surgery, bleeding was observed in 2 (4,5 %) intramural LAD and myocardial bridging patients and, thus, they were reoperated. Atrial fibrillation developed in 7(12,9%) of the patients and amiodarone therapy was applied in these patients. Because of resistance to amiodarone therapy, cardioversion was applied under sedation in 1 myocardial bridging patient. Mortality has not been observed.

**CONCLUSIONS:** Intramyocardial coronary artery and myocardial bridging which are generally seen with minor symptoms, are a birth defect. However, in recent years, unstable chest pains, arrhythmia, myocardial infarction and sudden death observed in some cases have increased its importance. For this reason, the mortality and morbidity rates of myocardial bridging are, as high as those of atherosclerotic coronary artery disease. Surgically, its therapy results do not differ from those of atherosclerotic coronary artery disease.

#### **OP-594-INTROPERATIVE IN SITU RADIAL ARTERY CONDUIT FLOW ASSESSMENT**

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**BACKGROUND:** Radial artery (RA) is increasingly preferred as the second best conduit in coronary artery bypass grafting (CABG). Considerable skepticism still exists among cardiac surgeons for the use of RA due to its vasospastic potential and unsettled long-term patency. The aim of this study was to describe a simple intraoperative technique that allows assessment of RA quality prior to its harvesting during CABG.

**METHODS:** The study group consisted of 46 patients who underwent CABG. A 2-cm vertical incision was made over the non-dominant RA pulse. A limited pedicle of RA was positioned inside the metal cradle of the flexible flow probe. Baseline transit-time ultrasonic flow and the pulsatility index were measured. If the systolic blood waveform associated with a flow of 10ml/min was obtained, then the incision was extended and RA was harvested.

**RESULTS:** Average in situ RA flow was 24 ml/min (range=12 to 50 ml/min). Of 46 in situ RAs, all but two RAs were found to have adequate flow characteristics and they were used as conduits. In those two unsuitable RAs, one had complete obliteration and no flow; the other had visible calcification and very low flow.

**CONCLUSIONS:** Routine assessment of in situ RA flow characteristics via a 2-cm incision provides useful information about RA conduit quality prior to its formal harvesting during CABG.

#### **OP-595-CHARACTERISTICS OF PATIENTS PRONE TO ATRIAL FIBRILLATION AFTER CORONARY BYPASS SURGERY**

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**BACKGROUND:** Various factors contributing to atrial fibrillation after heart surgery, especially, electrophysiological properties of the heart and cardiac autonomic modulation have been recognized as increasingly important. Despite successfully quantifying levels of sympathetic and vagal modulation after coronary artery bypass grafting (CABG) by conventional Heart Rate Variability measures and determining ventricular repolarization, we could not find any differences between patients that develop postoperative atrial fibrillation and those remaining in sinus rhythm after heart surgery. Advanced analyses applying non-linear dynamics and chaos theory as well as heart rate turbulence are nowadays the most powerful tools to provide additional information about the behavior of the heart and strongest predictors of sudden death and/or malignant arrhythmias. Thus, our aim was to compare autonomic modulation and non-linear dynamics of the heart after beating heart coronary artery bypass grafting in the group with postoperative atrial fibrillation vs. postoperative sinus rhythm group.

**METHODS:** 66 consecutive patients, 43 men, mean age 63.5 yrs with isolated stable three-vessel coronary artery disease, taking  $\beta$  blockers chronically were scheduled for off-pump CABG. High-resolution 15-minute ECG and 24-hour Holter recordings were performed to assess autonomic modulation and non-linear heart rate dynamics by determining Heart Rate Turbulence (Turbulence Slope (TS) and Turbulence Onset (TO)), detrended fluctuation analysis (DFA) along with short- ( $\leq 11$  beats, a1) and long-term ( $> 11$  beats, a2) correlation (fractal) properties of R-R intervals and Fractal dimension (FD, High and Low) in postoperative atrial fibrillation (PostopAF, 27) vs. normal sinus rhythm (NSR, 39) group preoperatively, on the third and seventh postoperative day. Analyses were performed using Aspel HolCard (Zabrze, Poland), Hr-DEKG package (Ljubljana, Slovenia), freely available DFA software (www.physionet.org) and FD software developed by Acharya et al. available upon request. Statistical analyses included paired-samples t-test, Mann-Whitney or Fischer exact test. Results were reported as mean  $\pm$  SE;  $p < 0.05$  was considered significant unless stated otherwise.

**RESULTS:** There was one conversion to on-pump surgery due to hemodynamic instability. One patient from sinus rhythm group was reoperated for bleeding and one from atrial fibrillation group experienced transitory ischemic attack without any late consequences. PostopAF group had preoperatively significantly lower values of TS:  $4.091 \pm 0.696$  vs.  $9.079 \pm 1.648$  ms/beat,  $p < 0.01$ . Index  $\_TS$  (Preoperative TS  $\_$  Postoperative TS) was significantly lower in



PostopAF group ( $p < 0.05$ ). DFA a1 was consistently lower in PostopAF group preoperatively ( $1.048 \pm 0.057$  vs.  $1.252 \pm 0.030$ ;  $p < 0.001$ ), on the third post-operative day ( $0.800 \pm 0.059$  vs.  $1.134 \pm 0.071$ ;  $p < 0.001$ ) and on the seventh postoperative day ( $0.859 \pm 0.066$  vs.  $1.178 \pm 0.060$ ;  $p < 0.001$ ). Fractal dimension »Low FD« was significantly higher in PostopAF before ( $1.741 \pm 0.26$  vs.  $1.792 \pm 0.036$ ;  $p < 0.05$ ) as well as after operation ( $1.681 \pm 0.015$  vs.  $1.671 \pm 0.029$ ;  $p < 0.05$ ).

**CONCLUSIONS:** Patients prone to postoperative atrial fibrillation after myocardial off-pump revascularization exhibit profoundly altered non-linear heart rate dynamics and heart rate turbulence indexes already preoperatively whilst in "normal" sinus rhythm. The latter might help us recognize the patients with highest risk of developing AF before operation enabling us to optimize therapeutic measures.

### OP-596-DIABETES MELLITUS SHOULD NOT BE A LIMIT FOR HARVESTING BOTH INTERNAL THORACIC ARTERIES FOR CORONARY ARTERY BY-PASS GRAFTING

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**BACKGROUND:** Diabetes mellitus (DM) is a well-known risk factor for sternal wound infection in patients submitted to coronary artery by-pass grafting (CABG), therefore it seems logical to conclude that harvesting both internal thoracic arteries (ITA) in patients with DM would increase the occurrence of such complications.

**METHODS:** Between January of 1995 to December of 2007, 5,058 patients received isolated CABG in our institution, of these, 1,437 had DM. Mean sample age was 62 years, and total mortality was 2.2 % (112 patients). We have used double ITA grafting in 835 patients, that here are split in two groups, with DM (184 patients), and without DM (651 patients). Patient selection for double ITA grafting was based on coronary artery anatomy and bone quality of the sternum, the later was evaluated during transection. When these two factors were considered favorable, we harvested both ITA's, not mattering if the patient had or had not DM. During ITA harvest, care was taken not to open the pleural spaces.

**RESULTS:** There was a small but not significant difference between the two groups in terms of morbidity and mortality.

**CONCLUSIONS:** Our data suggest that patients with DM can benefit of double ITA grafting, with little increase in risk for complications if its application is carefully indicated.

### OP-597-CORONARY OSTIAL RECONSTRUCTION: SURGERY OR STENTING?

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**BACKGROUND:** We compared our experience of surgical reconstruction of isolated coronary ostial stenosis over 14 years with unprotected PCI with stenting during last 8 years.

**METHODS:** All operations [n19] were performed from 8/1993 to 7/2006 on moderately hypothermic CPB and antegrade and retrograde cold blood cardioplegic arrest. Surgical ostioplasty [group 1] were accessed through anterior approach for LMCA plasty in 17 and RCA plasty in 2. Pericardial patch was used in 12 and saphenous vein patch in 7. Routine intraoperative post procedure TEE confirmed wide open ostia [5-10 mm] in all. Unprotected LM stenting [group 2 - n12] was performed at a later period of 2/1999-1/2006 - bare metal stent in 9 and drug-eluting stent in the last 3 patients.

**RESULTS:** Women dominated gr1 [Men: women 5:14] as opposed to gr 2 [8:4]. Surgical patients were younger [mean age 58.4(42-79) yrs vs mean 67 (49-70) yrs in PCI group]. LMCA ostial calcification was noted in 1 in gr 1 but in 6 in gr 2. Nonelective cases were 10 in surgical group but only 4 in PCI cohorts. Associated procedures included AVR in 3, LV myomectomy in 1 in group 1 but none in PCI group. Operative/procedural success was 100% in both groups with no operation/procedure-related hospital death. Mean follow up was 59.5 [6-174] mo in gr 1 and 25.6 [3-84] mo in gr 2. Recurrent angina was noted late in 5 in gr 1 and in 1 in gr 2 at 6 mo. No patch aneurysm or calcification was noted in any surgical patient on follow up imaging. There were

2 late deaths [7,120 mo] in surgical group. Preop NYHA of 2.8 improved to 1.5 at last follow up in gr 1.

**CONCLUSIONS:** Surgical cohorts constituted a different category of younger patients. Despite a higher percentage of high-risk patients, PCI for unprotected LMCA disease was not associated with an increase in immediate or medium-term complications compared with surgical reconstruction. Our data suggest that surgical ostioplasty provided a durable alternative in selected subset of isolated ostial stenosis. A randomized comparison between the two revascularization strategies for isolated coronary ostial stenosis may be warranted.

### OP-598-CORONARY ARTERY BYPASS USING ONLY COMPUTED TOMOGRAPHY AS A PRE-OPERATIVE ANGIOGRAM

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**BACKGROUND:** Coronary artery bypass graft (CABG) is a well established procedure with current precise indications. The advent of this technique was possible after the introduction of the coronary angiogram. The technique allowed precise identification of coronary stenosis and thus correct graft placement. Besides many evaluation methods have been improved, many of them non-invasive, until now, none could replace the invasive coronary angiogram as a pre-operative exam. Recently, the computed tomography angiography (CTA) has emerged as an alternative to invasive coronary angiogram. The main focus of the method, regarding cardiac surgery, is the evaluation of bypass patency. Until now, there are no reports of CABG performed only using CTA as the only pre-operative form of coronary angiogram.

**METHODS:** Two special cases of CABG were performed using only the computed tomography as a pre-operative angiogram. CASE 1: A 68 year-old-male, with stable angina pectoris and a plenty of risk factors (tobacco, hypertension, high serum cholesterol and sedentarism) was admitted to our facility to a routine evaluation. Non-invasive stress test (echocardiogram) showed an ischemic area in the anterior left ventricle wall, besides a normal ejection fraction (60%) and ventricular diameters. Sinus rhythm was present. A 64-slice CTA (Sensation Cardiac) was performed indicating a single severe obstruction in the proximal left anterior descending (LAD) artery. No artifacts images were present at exam and good visualization of the vessel was achieved. Superimposing of ischemic areas of the two non-invasive studies allowed a safe assessment of the coronary anatomy and stenosis. CASE 2: A 62-year-old male, with previous myocardial infarction and multiple risk factors (tobacco use, hypertension and diabetes) was admitted to our unit with stable angina and a positive non-invasive ischemic test for evaluation. A 64-slice CTA (Sensation Cardiac) was performed indicating a single severe obstruction in the proximal LAD. No artifacts images were present at exam and good visualization of the vessel was achieved. Superimposing of ischemic areas of the two non-invasive studies allowed a safe assessment of the coronary anatomy and stenosis.

**RESULTS:** The special coronary anatomy and the lack of intense calcium allowed a precise anatomy evaluation and stenosis quantification. An informed consent was obtained. The two patients underwent off-pump CABG with a left internal mammary artery (LIMA) to LAD graft performed. Intra-operative and post-operative period was uneventful. Control non-invasive ischemic test could demonstrate relief of ischemia and the patients became asymptomatic.

**CONCLUSION:** We reported two special cases of CABG using only CTA as a pre-operative angiogram. A not intense calcium presence, absence of arrhythmias and a low cardiac frequency favorable favored the angiogram. The constant evolution of CTA images and software to reduce artifacts with improved acquisition speed will probably in a near future provide images comparable to the gold-standard invasive coronary angiogram. This evolution will represent a cornerstone in coronary artery disease assessment and treatment, giving a better opportunity to the patient, cardiologist, interventional cardiologist and surgeon to choose the better approach to CAD in each specific situation not more under the pressure of an in site catheter presence.

### **OP-599-TOTAL ARTERIAL MYOCARDIAL REVASCULARIZATION: ITS IMPORTANCE AS IT APPEARS IN REDO CORONARY ARTERY BYPASS CRAFTING**

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**BACKGROUND:** In nowadays recurrent angina after Coronary Artery Bypass Grafting (CABG) is a frequent problem. The aim of this retrospective study is to point out the role of Saphenous Vein Grafts (SVG) failure as a cause factor for redo CABG as well as to evaluate our results of Total Arterial Myocardial Revascularization in our patients.

**METHODS:** Between May 2000 and November 2007, 65 consecutive patients, 62 men and 3 women underwent elective or emergency CABG for second, third or fourth time, three months to twelve years after the first procedure. The mean age was 71 years for men and 56,3 years for women. Mean period of follow-up was 35.9 months. Most of the patients (55/65) 84.6%, undergoing REDO-CABG were on the Canadian Cardiovascular Society (CCS) class III-IV, and 20 patients (30.7%) had left main stem stenosis of greater than 60%. Twenty-two patients (33.8%) were diabetics and seven (10.7%) had chronic renal insufficiency. Preoperative Euroscore was 7.3 for male and 8.3 for female. The mean preoperative left ventricular ejection fraction was 45.5%. Twenty patients (30.7%) had a previous LIMA to LAD graft that was patent in 7 patients and occluded in 13 patients whereas in nine patients LIMA was harvested but not used in the previous surgical procedure. In 61 patients (93.84%), 116 vein grafts (1.9 mean vein grafts) had severe stenosis >60% or occlusion. Sixty patients (92.3%) underwent Redo-CABG exclusively with arterial grafts, IMA's or Radial arteries and in three patients the patent LIMA was recycled. The mean number of coronary anastomoses was 2.32 grafts per patient.

**RESULTS:** Early mortality was 7.7% (5/65). Preoperative renal insufficiency, diabetes and short time interval from primary-CABG were all added risk factors. Postoperatively 11 patients (16.92%) were supported with inotropic support and intraaortic balloon pump and 15 patients (23%) had prolonged ventilatory support (> 24 h). Six patients (9.23%) needed blood transfusion more than six units due to coagulopathy. During follow-up period, all but one patient are in CCS angina class I, with a survival rate at 96.6% (58/60). There was one cardiac death (1.66%) and another non-cardiac death (1.66%).

**CONCLUSIONS:** Reoperation for coronary artery disease may be effective, despite the increased operative mortality and morbidity as Euroscore predicts, caused by relevant and/or independent risk factors. Unstable angina, poor preoperative left ventricular function, renal insufficiency, insulin dependent diabetes and an interval shorter than 1 year from the initial operation were independent risk factors for mortality. Since vein grafts insufficiency seems to be a main cause of coronary artery disease recurrence after CABG, we strongly support routine Total Arterial Myocardial Revascularization for Redo as well as for primary cases.

### **OP-600-THE CLINICAL PROFILE OF PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTS: DO RECENT TRENDS DIFFER BETWEEN DEVELOPED AND DEVELOPING COUNTRIES? THE SRI LANKAN EXPERIENCE**

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**BACKGROUND:** The worldwide trend in patients undergoing coronary artery bypass grafts (CABG) is said to be changing as older patients with added comorbid factors, advanced coronary artery disease and previous angioplasty/surgery are being referred for surgical revascularisation. This trend may, however, be different in developing countries from where fewer studies have been reported. The clinical profile of CABG patients in Sri Lanka is unknown and we postulate that it is different from the western trend. Our objective was to assess the current patient population undergoing CABG within our unit.

**METHODS:** We retrospectively reviewed the medical records of all consecutive patients who underwent isolated CABG from 15th April 2006 to 14th April 2007 in cardiothoracic unit II of the National Hospital, the largest tertiary referral centre in Sri Lanka.

**RESULTS:** Of a total of 112 who underwent CABG over a 12 month period 83 (74.1%) were males. The mean age was 57.7 years (range 43 - 74) years. The commonest risk factor, hypertension, was seen in 58 (51.8%). Smoking was

seen in 51 (45.5%) and this, interestingly was seen exclusively in males. Diabetes, the third commonest factor was seen in 42 (37.5%) followed by hyperlipidaemia in 28 (25%), and a positive family history in 21 (18.8%). The average body mass index was 21.2 (range 21-26) making obesity unimportant as a risk factor. Of the comorbid factors 16 (14.2%) had chronic obstructive pulmonary disease and 8 (7.1%) renal impairment. Extracardiac vasculopathy was very low with peripheral vascular disease in 3 (2.6%) and carotid artery disease in none. Ninety-five (84.8%) were in the New York Heart Association categories II and III. Left main stem disease affected 37 (33%). Patients had relatively advanced coronary artery disease at presentation as judged by the number of vessels involved with 80 (71.4%) having triple vessel disease and 48 (43.8%) having had myocardial infarction. The ejection fraction was 50% or less in 42 (37.5%). The average number of distal anastomoses done was 3.3. Only 9 (8%) had undergone angioplasty. There were no redo CABGs. All were elective operations done on cardiopulmonary bypass. The in-hospital mortality was 1 (0.9%).

**CONCLUSIONS:** The recent changes in the clinical profile of CABG patients seen worldwide are not seen in Sri Lankan patients. This could well be the case in other developing countries making it inappropriate to simply extrapolate data from developed countries to these patients. There is a need for further studies on a larger scale along this line which in turn will have implications on risk reduction strategies, resource allocation for coronary artery disease and cardiothoracic training practices in developing countries.

### **OP-601-IS IT NECESSARY TO STOP CLOPIDOGREL FIVE DAYS BEFORE ELECTIVE CORONARY ARTERY BYPASS GRAFTING?**

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**BACKGROUND:** It has been conventional to stop Clopidogrel at least five days prior to elective coronary artery bypass grafting. The scientific basis of this practice is however controversial. We analyzed data of patients in whom clopidogrel was stopped less than five days before elective CABG.

**METHODS:** Among patients who underwent CABG at our centre from April 2007 till September 2007, 50 patients were identified who had stopped Clopidogrel for less than five days before surgery (Group I). Another fifty patients who had stopped Clopidogrel for more than five days prior to surgery were randomly selected for comparison (Group II). Data was retrospectively collected from medical records.

**RESULTS:** Both groups had similar preoperative profiles except that Group I had more patients with left main stem disease (18 vs 3,  $p < 0.05$ ). The median of duration for which Clopidogrel was stopped was 3 days in Group I and 6 days in Group II. Postoperative bleeding and re exploration rates (1 vs 2,  $p = 0.1$ ) were not significantly different between both the groups. More blood products were transfused in patients in Group II but the difference was not statistically significant. There were no significant differences in the incidence of postoperative MI, wound complications or mortality.

**CONCLUSIONS:** It is safe to perform elective CABG on patients who have stopped Clopidogrel for less than five days.

## TRACHEAL SURGERY

### OP-602-RECONSTRUCTIVE LARYNGOTRACHEAL SURGERY

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**BACKGROUND:** To evaluate current treatment options of combined lesions of the trachea and larynx.

**METHODS:** We managed 311 patients with combined laryngotracheal diseases (93.3%) and injuries (6.7%) (323 operations). Most patients (67%) had cicatricial stenosis. In 75% of them a tracheostomy had been performed, whereas 10% had been operated on with staged reconstruction of the trachea and larynx. Both methods have led to ample laryngotracheal stenosis developed. In 78 (25%) patients several types of associated lesions of mediastinal structures (esophagus, thyroid gland, major vessels) were diagnosed. They required additional interventions to be performed.

**RESULTS:** 36 out of 37 patients (11.9%) were successfully treated endoscopically. Endoscopic treatment was effective only in limited and granulation stenosis. Different types of surgical resection and reconstruction were employed in 274 (88.1%) patients. In spite of lesion's severity and magnitude we state that one-stage complete resection and reconstruction is the treatment of choice. For this purpose we proposed and successfully used in 62.6% of patients new methods of figure laryngotracheal plasty. Rest of the patients (37.4%) received suture of the defect, circular laryngotracheal anastomosis, excision of cicatrices and T-tube placement. Simultaneously reconstruction of the esophagus was done in 36 patients, thyroidectomy - in 35 or major mediastinal vessel surgery - in 7 patients. Complications, which required 31 surgical procedures to deal with (circular resection of the larynx and trachea - 7, laryngotracheal fissure - 10, corrected procedures 11, other - 3), were noted in 24 (7.7%) patients. 8 (2.6%) patients died.

**CONCLUSIONS:** In limited and granulation stenoses of larynx and trachea endoscopic surgery is rational. In extended organic stenoses radical one-stage resection with reconstruction is operation of choice.

### OP-603-BENIGN TRACHEAL STENOSIS-OUR EXPERIENCE

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**BACKGROUND:** Postintubation tracheal stenosis is an obstructive lesion caused by high pressure dilatated cuff of endotracheal tube or tracheotomy canula during the period of prolonged mechanical ventilation. Main cause for developing of postintubational stenosis seems to be a tracheal wall necrosis. More often they are circumferential with sand watch shape.

**METHODS:** Analysis of surgical therapy in 18 patients, operated between 2001. and 2006., has been given.

**RESULTS:** In 15 of patients cervical approach has been used, while in 3 of them we used sternotomy. Resection of stenotic segment (from 1,5 to 3,5cm) and end-to-end anastomosis has been performed. Postoperatively, we have had three complications: one mediastinitis with consequent anastomosis dehiscence; one dehiscence caused by over distending traction due to accidentally patient's downfall and one fistula between truncus brachiocephalicus and trachea with consequent bleeding and suffocation.

**CONCLUSION:** Postintubational tracheal stenosis can successfully be managed by surgery. Certain amount of experience is needed in intention to avoid complications, which, although rare, are usually fatal.

### OP-604-CARINAL OPERATIONS

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**BACKGROUND:** We aimed to present our results about patients who underwent a carinal operation which is grouped as carina resection, tracheal sleeve pneumonectomy and tangential pneumonectomy.

**METHODS:** Four carina resection, 6 tracheal sleeve pneumonectomy and 5 tangential pneumonectomy were performed in a 5 years period in our clinic. Age, sex, operations, postoperative diagnosis, postoperative morbidity and mortality were evaluated prospectively.

**RESULTS:** Carina resection group: Four patients composed of 3 male, 1 female whose ages ranged between 25 and 62 (mean: 38.2) underwent carina resection without any lung resection due to a tumoral lesion involving carina. Histopathological diagnosis were squamous cell carcinoma (N0) in 1 patient, adenoid cystic carcinoma in 1, inflammatory myofibroblastic tumor in 1 and polymorphous low grade adenocarcinoma in 1. Any perioperative or long term mortality and recurrence was not observed. Observed morbidities were a minimal narrowing in main bronchus secondary to radiotherapy in 1 patient and a postoperative infection of incision in 1 patient. Tracheal sleeve pneumonectomy group: Six male patients whose ages ranged between 40 and 58 (mean:50.5) underwent right sided tracheal sleeve pneumonectomy due to lung cancer invading carina. Histopathological diagnosis was squamous cell carcinoma in 5 patient and adenocarcinoma in 1. Lymph node involvement status was N0 in 2 patients, N1 in 3 and N2 in 1. Postoperative infection of incision and empyema on postoperative 3rd year were observed in 1 patient. One patient who had been operated in emergent conditions died on postoperative 6th day due to dehiscence of anastomosis. Tangential pneumonectomy group: Five male patients whose ages ranged between 46 and 66 (mean: 53.6) underwent tangential pneumonectomy due to lung cancer originating from right upper lobe bronchus. Histopathological diagnosis was squamous cell carcinoma in 3 patient and adenocarcinoma in 2. Pathological stagings were stage 1B in 1 patient, stage 2B in 3 and stage 3A in 1. Any perioperative mortality was not observed. Observed complications were chylothorax and empyema in 1 patient and tracheoesophageal fistula in 1. One patient died due to disease progression in postoperative 1st year and 1 died due to pneumonia secondary to tracheoesophageal fistula in postoperative 15th month.

**CONCLUSION:** Carinal operations are succesful in selected patients and should be performed because they provide a complete resection chance to the patients.

### OP-605-BRONCHIAL AND CARINAL RESECTION AND RECONSTRUCTION WITHOUT LOSS OF PULMONARY PARENCHYMA

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**BACKGROUND:** Resection of tumors with main or lobar carinal involvement remains a challenge because of specific problems of operative techniques and airway management.

**METHODS:** In a prospective study between 1st January 1999 and 31st December 2006 different surgical techniques of main or lobar carinal resections without parenchymal loss were analyzed. The intraoperative management consisted of high-frequency jet ventilation.

**RESULTS:** In 12 patients (six male, six female, aged 18-70) the indication for resection were carcinoid tumors (n=6), adenoid cystic carcinoma (n=1), NSCLC (n=1), blunt chest trauma (n=2) and stenosis (n=2). The performed right-sided resections were isolated resection of the bifurcation with double anastomosis (n=2), bifurcation resection with reconstruction of a "neo-trifurcation" (n=1), main stump bronchus resection with preservation of all three lobes (n=4), isolated bronchus intermedius resection (n=1) and middle lobe carinal resection and reconstruction (n=1). Left-sided resections were isolated main stump bronchus resection (n=1) and main stump bronchus resection with upper lobe and lower lobe carinal resection with reconstruction (n=2). No mortality occurred. No appearance of stenosis. In only one of 12 anastomosis the cure was delayed. Postoperative radiation was indicated in 4 patients. All patients are still alive.

**CONCLUSIONS:** Localised malign or benign tumors, stenosis or bronchial rupture of main stump bronchus or lobar carina can be successfully resected and reconstructed without loss of lung parenchyma.



#### OP-606-TRACHEAL RESECTIONS: ANALYZES OF COMPLICATIONS AND INTERVENTIONS

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**BACKGROUND:** The aim of this study was to analyze indications, complications and management of complications after tracheal resections.

**METHODS:** Between January 2000 and October 2007 we performed 34 tracheal resections in 33 patients. Benign Tracheal Stenosis was the reason for a resection in 27 patients, benign trachea-oesophageal fistula (TEF) in 5 patients, secondary tracheal tumor in 1 patient and primary tracheal tumor in 1 patient. Patients were analyzed as age, gender, type and timing of complications. Complications were recorded as immediate postoperative complications (within 1st 24 hrs), early postoperative complications (1 to 10 days) and late (after 10 days) complications.

**RESULTS:** Mean age was calculated as 47.8 (7-84 years). Twentyeight of them were male. Three patients developed immediate postoperative complications. Emergency tracheostomy was performed in two and revision for hemorrhage in one patient. One out of two had a permanent tracheostomy. Four patients developed incisional infection as early complications. Six patients developed restenosis of anastomosis as late complications. Five of the patients underwent dilatation for 2 times and three of them had a Montgomery T tube. One patient had resection. Argon laser treatment and stenting were performed in unsuccessful cases. One patient with benign tracheo-oesophageal fistula died due to sepsis.

**CONCLUSION:** Tracheal resections are performed mainly for benign tracheal stenosis and benign TEF. Complications after first 24 hours to 10 days were only incisional problems. Restenosis was the most common complication to deal with after 10 days. Mortality rate was 3.3 % in our series.

#### OP-608-MANAGEMENT OF ADULT CONGENITAL AND ACQUIRED TRACHEOESOPHAGEAL FISTULA "CASE SERIES"

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**INTRODUCTION:** Non malignant tracheo-oesophageal fistula (TEF) is a rare entity, which is usually post traumatic, post inflammatory or could be a delayed presentation of congenital TEF.

**PATIENTS AND METHODS:** During a period of 10 years 5 cases (2 congenital and 3 acquired) of adult tracheo-oesophageal fistulae were managed. Two congenital cases were presented in late twenties with swallow-cough sequence (Ono's sign). Acquired cases had prolonged intubations after head injury, encephalitis and poisoning. All of them had pneumonia or food particle in tracheal secretion.

**RESULTS:** Congenital cases and one case of acquired TE had uneventful surgery but one of acquired TEF patient was expired before transfer to operation theatre in medical ICU. The other was managed with tracheal T tube because of intracranial bleeding and vegetative state.

**DISCUSSION:** Chest trauma, granulomatous mediastinal infections, immunodeficiency syndrome, and iatrogenic traumas are recognised etiologic factors generating acquired non-malignant TEF. Presentation of TEF may range from subclinical to severe respiratory distress. Although the introduction of high-volume, low-pressure cuffs has reduced the incidence of cuff-related TEF to 0.5%, long term intubation still accounts for the majority of acquired non-malignant TEF. Although most patients in ICU had aspiration pneumonia but we should highly concern about TEF in such cases. Late presentation of congenital TEF and other causes of TEF should be considered as other etiologic factor. Bronchoscopy, esophagoscopy and imaging are needed before surgical correction. Operative closure is always necessary, but the timing and type of operative repair require careful consideration.

**CONCLUSION:** Being a benign disease with fatal complications, early diagnosis and early surgical intervention is the key to successful management of non-malignant TEF. Key word. Tracheo-oesophageal fistula, congenital, acquired, tracheostomy, prolonged intubation

#### OP-609-LASER IN AIRWAY PALLIATION:A SINGLE CENTRE EXPERIENCE

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**BACKGROUND:** Tracheobronchial obstruction is a distressing cause of morbidity and mortality in patients with malignant and benign conditions. Surgery offers curative treatment for a few, but for the majority of patients there is a need for an effective method of palliation either due to fitness or the disease is too extensive for resection. We use bronchoscopic LASER (Light Amplification by Stimulated Emission of Radiation) for palliation of various conditions. We sought to review our results and outcomes of LASER palliation for tracheobronchial obstruction in our regional centre.

**METHODS:** We retrospectively reviewed the results of our experience in 219 patients with major airways obstruction ablated using LASER over a six year period. All patients had their procedure performed under general anaesthesia with a rigid and flexible bronchoscope.

**RESULTS:** 219 patients underwent 224 sittings of LASER ablation between March 2000 and November 2006. There were 149 male patients (68%) with a median age of 64.7 (range: 17 to 95). One hundred and ninety six patients (89%) had their procedures performed for malignant conditions (Lung cancer: 154 Secondaries: 42). The in hospital mortality was 4.5% with a 30 day mortality of 14.6%. The patients who were discharged tolerated the procedures well and had a symptomatic relief however succumbed to their disease process with time.

**CONCLUSION:** Laser ablation of the airway is a useful tool in the surgeon's armamentarium in providing symptomatic relief to the patients with severe airway compromise due to tracheo bronchial obstruction.

#### OP-610-PALLIATION OF MALIGNANT CENTRAL AIRWAY OBSTRUCTION: A REVIEW OF EXPERIENCE FROM UNIVERSITY HOSPITAL OF SOUTH MANCHESTER

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**OBJECTIVES:** Malignant airway obstruction causes extremely distressing symptoms of dyspnoea and stridor. Recent advances in surgical management present opportunities to achieve palliation. We reviewed our experience to identify the spectrum of interventions, benefits and survival.

**METHODS:** Prospective collection of data was carried out from January 2005 to September 2007 on all patients who underwent interventions for malignant central airway obstruction. Kaplan Meier survival analysis with log rank comparison was performed to identify intergroup differences.

**RESULTS:** 85 patients with a mean age of 65 years (range 46-80) underwent 123 procedures. 17.6% of patients presented with stridor. Aetiology of airway obstruction was primary lung cancer in 78.8% and secondary lung cancer in the remaining. The airway interventions included stenting alone, debulking with argon plasma / cryotherapy and stenting with debulking procedures in 51.8%, 24.7% and 23.5% respectively. Symptomatic improvement occurred in 95.3% of the patients with no mortality. Overall mean survival was 6.5 months. Patients with airway obstruction due to primary lung cancer had a significantly better prognosis compared with secondary lung cancer (7.1 months vs 3.5 months, p=0.01).

**CONCLUSION:** Surgical management of malignant airway obstruction provided satisfactory palliation. Patients are likely to succumb from the effects of malignancy rather than asphyxiation.

#### OP-611-TRACHEOESOPHAGEAL FISTULAS OF MALIGNANT ORIGIN: TREATMENT WITH EXPANDABLE WALLSTENTS

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**BACKGROUND:** To present our experience with endoscopic placement of esophageal endoprosthesis with self-expandable wallstents in patients with malignant tracheo-oesophageal fistulas.

**PATIENTS AND METHODS:** 16 patients were retrospectively evaluated, in whom 16 stents were positioned at the esophagus because of tracheoesophageal fistulas: 12 of them suffered of malignant tumors of the esophagus and 4 of malignant tumors of the lung. All stents were placed with guide wire. We used self-expandable wallstents with internal silicon-based covering with flared ends, made of a stainless-steel alloy woven into a tubular mesh.

**RESULTS:** Stents were successfully placed in all patients. No procedure-related mortality or significant morbidity occurred. Two patients complained of transient swallowing discomfort, but none of them required any additional analgesia. Thirty-day mortality was nil. Immediate leak occlusion was obtained on erect contrast assessment after the procedure in all patients.

**CONCLUSION:** Self-expandable wallstents endoprosthesis in the esophagus for fistulas of malignant origin is an easy, well tolerated, safe and effective procedure without important complications or mortality.

## OP-612 -LARYNGOTRACHEOBRONCHIAL INJURY

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Laryngotracheobronchial injuries are uncommon and their successful diagnosis and treatment often requires high level of suspicion. This article reviews my experience in diagnosis and management of traumatic injuries to the larynx, trachea and major bronchi.

**METHODS AND MATERIAL:** From March 26, 1994 to March 20, 2007, 37 patients with major upper airway trauma were managed. The mechanism of injury was blunt trauma in 17 patients, stab and other penetrating wounds in 7, gunshot in 2 patients, thermal injury in 1 and iatrogenic in 10. Three patients had associated esophageal injury. Twenty-nine patients were male and 7 were female. Nine patients had major bronchial injury, 12 had cervical tracheal injury and 8 had mediastinal tracheal injury. Isolated laryngeal injury and pharyngolaryngo-tracheal injury, and laryngotracheal were seen each in 4 and 1, 1. Nine patients had re-implantation of main bronchus (8 right and 1 left), and two patients had repair of bronchus with concomitant bi-lobectomy in one of them. In cases of cervical tracheal injury, 6 patients had primary repair of trachea with distal tracheostomy in two, sleeve resection 3 with T tube in 1 and conservative in 3. Among 7 patients who were managed conservatively I did later sleeve resection of trachea and laryngotracheal anastomosis in three patients. In mediastinal tracheal injury repair was done in 5, sleeve resection in 1 and 1 patient has conservative approach. In patient with laryngeal, complex injury, and thermal injury T-tube were used in 6 patients with tracheal resection or repair of laryngo- tracheo- esophago-pharyngeal injury. There was no morbidity but three patients died.

**DISCUSSION:** Tracheobronchial injury is extremely challenging due to its early threat to life. A high level of suspicion and the liberal use of bronchoscope are critical in the diagnosis of tracheobronchial injuries. Surgical repairs should be individualized for each type of injury. Avoidance of further iatrogenic complications, expertise, primary repair and use of autogenous tissue for wrapping or buttressing increases successful rate.

**CONCLUSION:** Tracheobronchial injuries are rare, but potentially life threatening. It requires early diagnosis, skillful airway management, and prompt surgical repair. Key words: Trauma, laryngotracheobronchial injury, reimplantation

## OP-613-TRACHEAL REPLACEMENT WITH AORTIC ALLOGRAFT

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**BACKGROUND:** Impressive advancements in the management of tracheal pathology have been achieved in the last 50 years. Despite numerous experimental attempts to replace long tracheal defects, no clinically applicable protocol has been developed to manage defects greater than 50% of the length of the adult trachea. Recent reports describe the use of aorta for tracheal replacement. Allogeneic and autologous aortic grafts have been used in large animal models to bridge long tracheal defects. Three to nine months after transplantation, the authors report replacement of the aortic graft by what appears to be a functional neotrachea consisting of new cartilage in the form of tracheal rings and a mucociliary epithelium. The objective of this project is to assess the feasibility of utilizing aortic segments for tracheal replacement.

**METHODS:** Male sheep underwent resection of eight to 10 centimeters of cervical trachea. The tracheal defect was reconstructed with allogeneic thoracic aortic graft. The aortic segment was radially stabilized by a silicone endotracheal stent. No immunosuppression was administered. Animals were sacrificed between 45 and 365 days. Tracheal transplants underwent gross and histological analysis.

**RESULTS:** Nine sheep underwent tracheal replacement with aortic graft. Three died unexpectedly from anesthetic or infectious complications. Six animals survived to an elective necropsy. The mean time from transplantation to graft excision was 202 (45-365) days. Gross analysis revealed dense scar formation at the site of aortic interposition. Longitudinal contraction of the scar reduced the tracheal defects by 56%  $\pm$  10. Histological analysis of the aortic grafts revealed preservation of the external elastic lamina but replacement of the media with dense fibrous tissue. Two specimens had evidence of immature islands of chondrogenesis within the fibrous tissue. No organized cartilage formation or new tracheal rings were seen. The intima was replaced in a time dependent fashion by continuous squamous metaplasia (n=4) and mucociliary epithelium (n=2). There was no evidence of acute or chronic rejection. Long-term morbidity was limited to cough and sputum production. Three animals required intermittent bronchoscopy for management of secretions.

**CONCLUSIONS:** Reconstruction of the trachea with allogeneic aorta may be a feasible strategy for the management of long segment defects in the trachea. Scar contraction led to a significant decrease in the length of the tracheal defects. Over time, epithelium can migrate from the native trachea along the graft lumen and span the length of the aortic segment. Foci of immature, disorganized cartilage can be identified in the wall of the graft with out the development of neotracheal rings. Although a neotrachea with cartilaginous rings was not observed, scar formation with migration of respiratory epithelium and contraction of the defect may provide an acceptable biologic replacement for long tracheal defects.

## OP-614-RETAINED FOREIGN BODIES FROM PENETRATING CERVICOTHORACIC INJURIES

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**PURPOSE/BACKGROUND:** Retained foreign bodies (FBs) in the cervicothoracic area from the wounding agent are sometimes seen accompanying penetrating injuries. This retrospective study presents our experience with the surgical management of this entity.

**METHODS:** A database search from June 2003-July 2006 for patients with retained foreign body (FB) from cervicothoracic injuries with retrospective review of the surgical management of these patients was done. Retained FB included embedded and impaled foreign objects due to penetrating cervicothoracic injuries.

**RESULTS:** A total of 1017 patients were found with penetrating trauma injuries, 813 (40%) have penetrating cervicothoracic injuries. Among these, 27 patients (3.3%) presented with retained cervicothoracic FBs. The ages ranged from 6-42 years (median age: 29) and majority were males (25/27). There were 15 stab wounds (SW) and 12 gunshot wounds (GSW). Nine patients had retained FB in the neck while 18 patients had retained FB in the chest. Among SW patients, the wounding agents were knife blade (6), nail (3), barbecue stick (2), screw-driver, improvised arrow, metal rod and an ice-pick. All patients with retained cervical FBs had an unremarkable post-operative course. Morbidity and mortality were mostly found in patients with retained thoracic FB. The 3 mortalities were SW patients with retained thoracic FB who all died of sepsis.

**CONCLUSIONS:** Retained FB from penetrating cervicothoracic trauma requires prompt diagnosis and recognition of possible major airway, cardiovascular and esophageal injuries and aggressive resuscitative measures. The management of each patient including decision making in the pre-operative course and appropriate surgical management should be individualized. Impaled cervicothoracic FB should be removed while embedded FB may or may not be removed depending on its location.



## ARRHYTHMIA II

### OP-615-SINUS RHYTHM AFTER ABLATION: CARDIAC AUTONOMIC MODULATION UNDEPENDENT ON TYPE OF ATRIAL FIBRILLATION

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**BACKGROUND:** Disbalances of sympathetic versus parasympathetic modulation of the heart promote atrial fibrillation onset. Unlike paroxysmal it has been shown that electrical as well as structural remodeling occurs over time in permanent atrial fibrillation. In the present study, we assessed cardiac sympathetic and parasympathetic autonomic regulation after successful ablation for either paroxysmal or permanent atrial fibrillation.

**METHODS:** Twenty-six patients were electively admitted for cardiac revascularization, mitral/aortic valve replacement and concomitant ablation for either paroxysmal (14) or persistent (12) atrial fibrillation. Digital 24-hour electrocardiograms were recorded. Recordings were taken 12 months after the procedure. The two groups were matched to have comparable demographic and clinical characteristics. Heart rate variability time domain and frequency domain parameters were determined to assess the level of autonomic modulation: mean RR interval, standard deviation of normal RR-intervals (SDNN) reflecting overall heart rate variability, and representing vagal as well as sympathetic function, root mean square of standard deviation (rMSSD) which is more specific for vagal function, normalized low-frequency power indicating modulated sympathetic activity (LF:0.04-0.15 Hz), normalized high-frequency power indicating vagal modulation (HF:0.15-0.40 Hz), and total power (TP: 0.0033-0.40 Hz). LF to HF ratio represented sympathovagal balance. Differences between the two groups were tested using Fisher's exact test for categorical variables, and exact Mann-Whitney test for numeric variables.

**RESULTS:** The following values of analyzed indices were obtained: mean RR interval  $825 \pm 124$  versus  $866 \pm 137$  ms, standard deviation of normal RR-intervals (SDNN)  $136 \pm 109$  versus  $106 \pm 31$ , root mean square of standard deviation (rMSSD)  $110 \pm 135$  versus  $65 \pm 49$ , normalized low-frequency power (nLF)  $0.28 \pm 0.12$  versus  $0.28 \pm 0.07$ , normalized high-frequency (nHF)  $0.43 \pm 0.07$  versus  $0.45 \pm 0.07$ , total power (TP)  $38965 \pm 64641$  versus  $16236 \pm 11199$  and sympathovagal balance ratio (LF/HF)  $0.68 \pm 0.40$  versus  $0.63 \pm 0.20$  for PERMAF and PAROXAF group, respectively. None of the statistical comparisons reached the level of significance at  $p < 0.05$  for difference between groups.

**CONCLUSIONS:** Similar levels of cardiac autonomic modulation were found one year after successful ablation both in permanent and paroxysmal atrial fibrillation group. Preoperative type of atrial fibrillation, namely permanent or paroxysmal does not affect the potency of autonomic drives provided sinus rhythm is restored.

### OP-616-COMPARATIVE STUDY OF MONOPOLAR VERSUS BIPOLAR DEVICES FOR THE RADIOFREQUENCY ABLATION OF ATRIAL FIBRILLATION DURING MITRAL VALVE SURGERY: MIDTERM RESULTS

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**BACKGROUND:** To assess and compare two different devices in radiofrequency treatment (Monopolar Pen vs Bipolar Device) for treatment of paroxysmal or chronic Atrial Fibrillation (AF), in patients who underwent Mitral Surgery.

**METHODS:** Between March 2003 and December 2006, 118 patients (66 M / 52 F; mean age  $67.8 \pm 11$  years) with paroxysmal AF (47.5%) or chronic AF (52.5%) underwent left atrial Maze procedure during their Mitral Valve Surgery (Mitral Valve Plasty (n= 59) or Mitral Valve Replacement (n= 59). Concomitant tricuspid valvuloplasty was carried out in 11 patients, aortic valve surgery in 23

and coronary artery bypass grafting in 18. Two different devices were used: Monopolar pen (Group I n= 79) and Bipolar device (Group II n=39).

**RESULTS:** Hospital Mortality was 8.4%. Both groups were comparable. Mean follow-up was  $22.1 \pm 11$  months [12 - 45 months]. Only one patient was lost from follow-up. At 24 months postoperatively, freedom from AF was 86% and 92% in groups I and II respectively for patients suffering from paroxysmal AF ( $p=0.8$ ) and freedom from AF was 54% and 60% in groups I and II respectively for patients suffering from chronic AF ( $p=0.5$ ). Four and two DDD Pace Maker for atrio-ventricular bloc were necessary in groups 1 and 2.

**CONCLUSIONS:** Surgical treatment of AF using monopolar or bipolar devices of radiofrequency gives good and comparable midterm results. Sinus conversion remains stable even 24 months after surgery.

### OP-617-IS CONCOMITANT ABLATION OF PAROXYSMAL ATRIAL FIBRILLATION JUSTIFIED?

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**BACKGROUND:** Approximately 6% of the patients undergoing heart surgery suffer from paroxysmal atrial fibrillation (AF). Those patients are oft highly symptomatic. It's well known that the conversion rate to a stable sinus rhythm (SR) of paroxysmal AF after CABG, MVR or AVR is very low. Therefore those patients must be postoperative anticoagulated, something that leads eventually to further problems and complications. The aim of this study was to evaluate the efficacy, safety and feasibility of ablation procedures in patients with paroxysmal AF undergoing major heart operation.

**METHODS:** Between May 2000 and September 2007, 212 patients underwent unipolar (n= 142) or bipolar high frequency ablation (n= 70) as a concomitant procedure. Fifty-one patients (24,1%) had preoperative paroxysmal AF. By 19 patients (37,3%) two encircling isolation lesions around the left and the right pulmonary veins (PVs), a connection line between both and a connection line between the left PVs and the mitral valve ring were created endocardial (Group A). Thirty-two patients (62,7%) received epicardial pulmonary vein isolation (Group B). We retrospectively studied the patients' data regarding the preoperative and postoperative course and the operation. The patients were routinely controlled 3 and 6 months after the operation.

**RESULTS:** Mortality and pacemaker implantation postoperative were 0%. There were no procedure related complications. The SR-rates by discharge, 1, 3 and 6 months after the operation were 89,5%, 78,9%, 94,7% and 94,4% for group A and 87,5%, 78,1%, 90,3% and 90,3% for group B retrospectively. There is a high incidence (39,2%) of perioperative atrial arrhythmias. However only 3 patients (15, 8%) suffered AF after endocardial ablation whereas 17 patients (53,1%) had AF after epicardial procedures. Ablation time was 5,6 minutes for endocardial ablation and 2,8 minutes for epicardial PV isolation.

**CONCLUSIONS:** Paroxysmal AF represents a serious clinical problem for a lot of heart surgery patients due to the complications, symptoms and of the anticoagulation and antiarrhythmic medication needed postoperative. The use of ablation procedures represents a safe and a very effective option to cure paroxysmal AF. We highly recommend the use of ablation procedures concomitant to major heart operation by patients having paroxysmal AF for at least 3 months preoperatively.

### OP-618-SURGICAL RADIOFREQUENCY MAZE III ABLATION FOR TREATMENT OF ATRIAL FIBRILLATION DURING OPEN HEART SURGERY IN SHAHID MADANI

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**BACKGROUND AND OBJECTIVE:** Atrial fibrillation is a common arrhythmia in patients with rheumatic mitral and other valve disease who candidate for valve surgeries. Conversion of rhythm to sinus has positive effects on quality of life and lowering medication use. The aim of this clinical study was to evaluate the effectiveness of the radiofrequency ablation Maze III procedure in the treatment of atrial fibrillation associated with rheumatic heart valve.

**METHODS:** We applied one kind of modified Cox III Maze procedure with the use of radiofrequency ablation in the treatment of atrial fibrillation associated with rheumatic heart valve disease and evaluated the outcome of 60 patients of atrial fibrillation associated rheumatic valve disease who underwent radiofre-

quency ablation Maze III procedure plus heart valve surgery. Demographic, echocardiographic, electrocardiographic and Doppler study data calculated before surgery, six month and one year after surgery.

**RESULTS:** No preoperative deaths occurred in the study group. Duration of additional time for radiofrequency ablation procedure was about  $18 \pm 4$  minutes. Freedom from atrial fibrillation was 80%, 75% and 75% at six months, one year and 3 years follows up respectively.

**CONCLUSIONS:** The addition of the radiofrequency ablation Maze procedure to heart valve surgery is safe and effective in the treatment of atrial fibrillation associated with rheumatic heart valve disease.

#### OP-619-A NOVEL DEVICE TO DETECT ATRIAL FIBRILLATION IN FOLLOW-UP AFTER SUCCESSFUL MAZE PROCEDURE

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**BACKGROUND:** Surgical ablation of atrial fibrillation (AF) is now an accepted adjuvant procedure. The best way of follow up after these procedures and the determinants of success remain to be universally established. A novel device "AF Alarm" (Medtronic Inc, USA) was developed recently to detect automatically cardiac arrhythmia within a week period.

**METHODS:** From February 2004 till November 2007, surgical ablation of AF was done in 150 patients. AF Alarm device was applied to detect episodes of AF at 6 months and more after surgery in patients who were in normal sinus rhythm according to follow-up done by Holter monitoring and at least two follow up visits.

**RESULTS:** Preoperatively 75 patients had persistent atrial fibrillation (50%), 65 suffered from permanent AF (43%) and 10 patients had paroxysmal AF (7%). One hundred eleven patients underwent left atrial ablation and 39 - biatrial ablation. Eighty four percent of patients were in sinus rhythm at follow-up. AF Alarm device was used among these patients with normal sinus rhythm according to Holter monitoring and follow up visits without any subjective complaints of arrhythmia at 6 months and more after the procedure. In half of them short episodes of AF were found.

**CONCLUSION:** Determination of success after AF ablation is controversial. Some patients considered to be in normal sinus rhythm after ablation still can have some silent episodes of AF. AF alarm can provide more precise estimation of procedural success. These data can influence anticoagulation and antiarrhythmic protocols after ablation.

#### OP-620-ARRHYTHMIAS, REPOLARIZATION AND CARDIAC AUTONOMICS IN BEATING AND ARRESTED HEART REVASCU-LARIZATION

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**OBJECTIVE:** Susceptibility of the heart to arrhythmic events in the early post-operative period hampers results of coronary artery bypass grafting (CABG). Electrical stability of the heart depends predominantly on ventricular repolarization, while altered cardiac autonomic modulation could promote arrhythmias. We sought to compare postoperative arrhythmic disturbances after CABG with (on-pump) and without (off-pump) the use of cardiopulmonary bypass and relate it to cardiac autonomic as well as ventricular repolarization changes.

**METHODS:** Among 57 patients admitted for CABG 28 were referred to on- and 29 to off-pump procedure. High-quality 15-minute digital electrocardiograms were recorded, RR and QT intervals were determined from stationary 5-minute segments. Heart rate variability depicting the levels of cardiac autonomic modulation, namely vagal component (subrange 0.15 - 0.40 Hz) and sympathetic component (0.04 - 0.15 Hz) were calculated. QT interval variability was evaluated by a T-wave template matching algorithm. Slope/correlation of QT/RR interval was computed using linear regression. Fisher exact test, nonpaired t-test and ANOVA were applied to test the results, a  $p < 0.05$  was considered significant. The two groups were comparable regarding clinical characteristics and postoperative characteristics.

**RESULTS:** Arrhythmic events were significantly more frequent postoperatively. One week after on - pump CABG they occurred significantly more often in the on-pump group. The RR interval shortened after CABG in both groups ( $p < 0.001$ ). QT variability index increased from  $-1.2 \pm 0.6$  to  $-0.8 \pm 0.4$  after off-

pump and from  $-1.3 \pm 0.5$  to  $-0.5 \pm 0.6$  on the fourth day after the operation ( $p < 0.05$ ), further deteriorating to  $-0.2 \pm 0.6$  one week after CABG in on-pump group only ( $p < 0.05$ ). QT-RR correlation decreased from 0.39 to 0.24 in off-pump versus 0.34 to 0.17 in on-pump group ( $p < 0.05$ ) and remained significantly reduced as long as four weeks after CABG in both groups.

**CONCLUSIONS:** Loss of coupling of RR/QT interval CABG occurs postoperatively regardless of the technique applied. Autonomic derangement with excessive adrenergic activation and loss of rate-dependent regulation correspond with arrhythmia occurrence. However, slower normalization towards preoperative levels was observed after on-pump procedure, suggesting presence of additional proarrhythmic factor. The observation of impaired electrical stability in both groups provides new insights into proarrhythmic mechanisms after CABG.

#### OP-621-DOSE RADIOFREQUENCY MODIFIED MAZE NEED LEARNING CURVE IN PATIENTS WITH ATRIAL FIBRILLATION UNDERGOING A CONCOMITANT CARDIAC SURGERY?

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**BACKGROUND:** Ablation using an energy source is currently believed to be a technically less challenging procedure than classic Maze and is, therefore, applied as curative mode of therapy for chronic atrial fibrillation (AF) concomitantly with other cardiac surgery procedures. We evaluated if the results of this technique produces different outcome with increased experience and needs a learning curve.

**METHODS:** All cases were performed by one operator who learned the method in two other almost referral centers (3 days in each) and observation of 10 cases by experienced cardiac surgeons. A total of 24 patients with chronic AF (all  $> 8$  months) underwent intra-operative modified maze procedure using saline irrigated radiofrequency ablation in a period of 18 months ending September 2006, in addition to valve surgery. Patients were divided to two equal groups the: the first 12 patients and the second subsequent 12. The two groups were compared with each other at 6th and 12th postoperative month in regards to their heart rhythm. Three electrocardiograms in 3 consecutive days was used for this purpose. All patients received medication after surgery which was gradually tapered in 4-9 months.

**RESULTS:** Patients' characteristics were statistically similar in both groups. More patients were female (62.5%), and a mean age of  $53 \pm 14$  years was observed. All patients also underwent mitral valve (15 patients), aortic valve replacement (4 patients) or both (5 patients). Two patients had redo surgeries in each of the groups. There was no mortality during the follow-up. At 6 months 10 and 9 patients were in sinus rhythm (SR) in group 1 and 2, respectively. At twelfth post-operative month 10 patients (83%) had SR in both groups. One AVR+MVR redo patient in the first group (with 8 years of AF) had nodal rhythm of 52/minute which was tolerated well not requiring pacemaker. No patient required more than 3 days of pacing.

**CONCLUSION:** Surgical cardiac ablation needs to be the standard of care for patients with AF requiring other cardiac surgery procedures. Comprehensive learning and observation of the method closely promotes excellent results from the beginning not necessitating learning curve.

#### OP-622-LEFT ATRIAL ABLATION FOR ATRIAL FIBRILLATION: A 10-YEARS SINGLE CENTRE EXPERIENCE

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**BACKGROUND:** At our institution we have been performing left atrial ablation for atrial fibrillation since 1997. In the 10 years-period we have been alternating 3 different energy sources and mostly 3 ablation patterns, performed either endocardially or epicardially.

**METHODS:** in this time-frame we performed 243 left atrial ablation; 46 performed by Microwave (19%), 27 by bipolar-radiofrequency (11%), and 170 by cryoenergy (70%) by the means of two systems: Frigitorix<sup>®</sup> and Cryocath<sup>®</sup>.

**RESULTS:** 48 (19%) patients were in paroxysmal AF, the rest were in chronic resistant; 212 patients (88%) received a concomitant mitral procedure. The overall (sinus rate) RS rate at discharge from hospital was 73%, and the RS rate at the latest follow-up was 68%. Significant difference was found between ener-

gy sources, although the limited number of our study population doesn't allow any significant statistical confrontation. Briefly microwave- ablation RS discharge rate was 63% the same found at follow up, consistently lower than the overall population. The RS discharge rate for the population receiving bipolar RF ablation was 70% and at follow-up RS rate was 75%. In the cryo group the RS at discharge was 78% and at follow up 83%.

**COMMENT:** left atrial ablation for atrial fibrillation is a well established procedure at our institution. Can be safely performed during concomitant cardiac surgery, also through a minithoracotomical access. In our experience cryoablation resulted more efficacious in restoring RS either at discharge or at long term follow up.

#### **OP-623-MULTI-DEVICE COMPARISON TRIAL OF FIVE DIFFERENT ENERGY SOURCES IN A CLINICALLY RELEVANT MODEL: STUDY ON LESION WIDTH, DEPTH, VOLUME AND THE EFFECT OF EPICARDIAL FAT**

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**BACKGROUND:** Atrial fibrillation is a significant cause of morbidity and mortality. Ablative treatments are proving to be highly effective and safer than pharmacologic therapies. It is not yet clear which of the several technologies used to create lesions is most effective. We tested five different devices (ESTECH Cobra Adhere XL, Boston Scientific FLEX 4, Boston Scientific FLEX 200, St. Jude Medical Epicor, and AtriCure Isolator) in a controlled, clinically realistic manner and compared their abilities to create lesions through muscle and fat.

**METHODS:** Blocks of bovine ventricular muscle (6cm long x 4cm wide x 6mm thick) were bathed with  $37\pm 1^{\circ}\text{C}$  saline flowing at 4 liters per minute. Each block was ablated according to the manufacturers' Instructions for Use (Two adjoining lesions per block, repeated six times). Cross-sections were taken at the lesion edge, lesion middle and lesion overlap; lesion width and depth measurements were taken from digital photographs of TTC-stained tissue. Additional lesions were made on 6mm-thick blocks of tissue with varying amounts of epicardial fat.

**RESULTS:** The Isolator made the shallowest lesions whereas the FLEX devices made the deepest. Epicor lesions were narrowest at the epicardium and FLEX 200 lesions widest. There was no significant difference in lesion widths at full depth. The Isolator created the smallest volume lesions; in addition, fat significantly adversely affected its ability to penetrate. The FLEX 4 was able to penetrate fat well.

**CONCLUSIONS:** To the extent that lesion creation predicts a device's ability to create conduction block, there are few significant differences among currently available devices except that the AtriCure Isolator made consistently shallower, smaller lesions. The FLEX 200 created somewhat deeper, wider lesions but lesion volume was no different. The Isolator was significantly adversely affected by epicardial fat.

#### **OP-624-THE IMPACT OF PREOPERATIVE ATRIAL FIBRILLATION IN PATIENTS UNDERGOING MITRAL VALVE SURGERY**

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**BACKGROUND:** Atrial fibrillation (AF) is the most common sustained arrhythmia in adults and it increases importantly overall and cardiovascular morbidity and mortality.

**OBJECTIVES:** To establish the preoperative prevalence of AF in patients undergoing mitral valve surgery and to identify associations between preoperative AF and events correlated to in-hospital postoperative morbidity and mortality.

**METHODS:** A retrospective cohort study with a cross-sectional component was conducted with 234 mitral valve surgeries performed between 1992 and 2006 in a Cardiac Surgery Service, whose patient's demographic and clinical preoperative characteristics as well in-hospital postoperative informations were statistically analyzed.

**RESULTS:** The preoperative AF prevalence was 59% and these patients were older than those without AF [ $(52.4 \pm 2.2$  versus  $44.0 \pm 2.9$  years),  $(p<0.0001)$ ]. Were also significantly associated with preoperative AF: history of hypertension [prevalence ratio (PR)=1.3,  $(p=0.046)$ ], history of AF [(PR=17.5),  $(p<0.0001)$ ], history of stroke or transient ischemic attack [(PR=1.8),  $(p<0.0001)$ ]; New York Heart Association (NYHA) functional classification IV [(PR=1.5),  $(p=0.0003)$ ];

use of antiarrhythmic [(PR=2.0),  $(p<0.0001)$ ], use of platelet inhibitors [(PR=1.6),  $(p=0.0021)$ ], use of anticoagulants [(PR=1.8),  $(p<0.0001)$ ], use of digitalis [(PR=1.4),  $(p=0.0019)$ ] and use of diuretics [(PR=1.5),  $(p=0.0029)$ ]. The preoperative AF increased the number of mitral valve replacements compared to mitral valve repairs [relative risk (RR)=1.4,  $(p=0.0158)$ ], increased the length of stay at coronary intensive care unit after surgery [ $(4.2 \pm 1.0$  versus  $2.3 \pm 0.2$  days)  $(p=0.0019)$ ], increased the overall length of stay at hospital after surgery [ $(12.5 \pm 2.5$  versus  $11.1 \pm 1.5$  days)  $(p=0.0241)$ ], increased the incidence of thromboembolic complications [(RR=3.6),  $(p=0.0196)$ ], increased the incidence of non-thromboembolic complications [(RR=2.6),  $(p=0.0006)$ ] and increased the incidence of death [(RR=5.5),  $(p=0.0072)$ ].

**CONCLUSIONS:** The preoperative prevalence of AF in mitral valve surgeries was 59% and it increased significantly the length of stay at coronary intensive care unit and at hospital after surgery, the incidence of thromboembolic and non-thromboembolic complications, and the incidence of death.

## VALVES I

### OP-625-SORIN FREEDOM® AND FREEDOM SOLO® - EARLY CLINICAL EXPERIENCE WITH A PERICARDIAL STENTLESS AORTIC VALVE PROSTHESIS

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**BACKGROUND:** Parameters which define a good valvular substitute for aortic valve disease are easyness to handle intraoperatively and to implant resulting in a minimized x-clamp time, postoperative hemodynamic performance and durability of the valve, if possible without the necessity of lifelong anticoagulant therapy for the patient. The aim of the study was to evaluate the Sorin Freedom® and Freedom solo® with regards to these parameters.

**METHODS:** Medical records from patients undergoing aortic valve replacement with either the Sorin Freedom® or Freedom solo® pericardial stentless valve, as a sole procedure or with additional cardiac surgical procedure(s) were retrospectively analyzed. Survivors were included in the prospective observational study. After cardioplegic arrest, the Sorin Freedom prosthesis is implanted by single sutures for the inflow sleeve and a running suture line for the infracoronary and commissural part of the implant whereas the Freedom solo is implanted by a single running suture line positioned supraannularly.

**RESULTS:** Between September 2002 and November 2007, 77 valves (28 Freedom, 49 Freedom solo) were implanted in 39 males and 38 females. 32 patients needed supplementary cardiac surgery (21 CABG, 4 MV-reconstruction or other more complex surgery (7)), 45 patients underwent an exclusive aortic valve replacement. Mean age of all patients was  $71 \pm 6$  years, height  $166 \pm 9$  cm (range 150; 188), weight  $76 \pm 13$  kg (range 47; 106), BMI  $28 \pm 4$  (range 21; 40), log Euro score  $9.5 \pm 12$  (range 1.5; 72.5). The patients received valves with a mean effective orifice area index (EOAI) of 2.3 (range 1.3; 3.5) with no EOAI below the critical EOAI of 0.85. Mean X-clamp time for the 45 patients undergoing exclusive aortic valve replacement was  $63 \pm 10$  (Freedom,  $n = 17$ ) and  $56 \pm 11$  min (Freedom solo,  $n = 28$ ), respectively. Mortality in this patient cohort was 4 % (2/45). Early postoperative non invasively by trans thoracic echocardiography measured mean of the peak pressure gradients was  $21 \pm 9$  mmHg, the mean of the mean pressure gradients was  $11 \pm 5$  mmHg.

**CONCLUSIONS:** The Sorin Freedom and Freedom solo stentless pericardial valves can be implanted with acceptable X-clamp times and perioperative risk, even in patients with concomitant cardiac pathology and in high risk patients. Implanted sizes did not result in patient prosthesis mismatch and suggest sufficient EOA for even very small patients avoiding the necessity of root enlargement. Early postoperative hemodynamic performance of the valve is good and longer term follow up will show whether the performance is preserved.

### OP-626-PROGNOSTIC VALUE OF B-TYPE NATRIURETIC PEPTIDE AFTER CARDIAC SURGERY: A NEW FOLLOW-UP TOOL

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**INTRODUCTION:** Following cardiac surgery; various clinical and biochemical parameters were used to choose the optimum inotropic and volume support regimen. No ideal biochemical parameter is described so far, as a direct marker of ventricular function or volume overload except A-type or B-type natriuretic peptides. BNP being the most powerful marker of left ventricular dysfunction may be considered as a predictive factor of ventricular preload. Previous studies reported BNP as an effective midterm follow-up parameter especially in mitral valve repair patients. We herein emphasize to feasibility of BNP in the immediate postoperative period as a biochemical follow-up tool for cardiac failure and volume overload in a patient operated on for open mitral commissurotomy.

**CASE REPORT:** An eighty year old man was admitted to our institution with complaints of shortness of breath, fatigue and peripheral edema. Patient was tachypneic and orthopneic, with an arterial pressure of 110/70 mm/hg. His heart

rate was 80 beat/min in sinus rhythm, and his temperature was  $36^{\circ}\text{C}$ . Auscultation revealed crepitation on both lungs fields and a 2/6 systolic murmur on the fourth left intercostal space beside the sternum. Transthoracic echocardiography documented severe mitral stenosis, mild aortic regurgitation, and moderate pulmonary hypertension. Mitral valve area was measured as  $1.3 \text{ cm}^2$  with a peak pulmonary artery pressure of 45 mmHg. Patient's hemogram and C-reactive protein were within the normal range, where BNP was 339 pg/ml (Immulite 2000 chemiluminescent - Siemens Deerfield USA). Patient underwent open mitral commissurotomy with median sternotomy under cardiopulmonary bypass. Mitral valve was severely calcified so only commissurotomy was performed. On the first postoperative day, hemodynamic parameters were stable, chest X ray was normal and the BNP was 394 pg/ml (age adapted normal range: 0-450 pg/ml). Patient was extubated and blood gases were normal, dopamine was decreased to 2.2 mcg/kg/min. On the second postoperative day: arterial pressure was decreased to 85/55 mmHg, tachycardia appeared with 120 beats/min. Hypotension was controlled with fluid replacement but the heart rate did not recover. Urine output was also decreased, and a desaturation began with diffuse crepitations in both lungs together with an chest X-ray (CXR) of edematous appearance (figure 1). BNP was measured as 1323 pg/ml, dopamin was increased to 4.4 mcg/kg/min and furosemid was added three times a day. At the end of the second day patient's fluid balance was (+) 2250 cc. The day after balance was (-) 1200 cc but the BNP increase resisted (2475 pg/ml). CXR aeration was better than the day before and edematous state resolved (figure 2). The following day fluid balance was (-) 1300 cc, urine output was approximately 150 cc/hour, heart rate was 110 mm/hg, arterial pressure was 110/75 mmHg, tachypnea disappeared and on the pulse oxymetry saturation was 97% with nasal 3 l/min O2. Patient was digitalized, CXR showed clear lung fields (figure 3). On the fourth postoperative day fluid balance was (-) 1300 cc, heart rate was 95 beats/min, arterial pressure was 120/70 mmHg, auscultation revealed no crepitation, BNP decreased to 1591 pg/ml with an absolute correlation with the clinical presentation. Postoperative echocardiography demonstrated a competent  $1.9 \text{ cm}^2$  mitral valve. Patient was transferred to the surgical wards on the 5th postoperative day under stable conditions.

**DISCUSSION:** In advanced heart valve diseases; ventricle dysfunction or cardiomyopathy due to ventricular hypertrophy and dilatation secondary to increased volume and/or pressure overload is the natural end point. This state causes postoperative low cardiac output characterized with increased pulmonary artery and central venous pressures, hypotension, increased inotropic demand, compensatory tachycardia and arrhythmias in valve repair or replacement patients. In this patient population, volume and inotropic management is crucial in the immediate postoperative period. Increased preload may cause a sudden heart failure clinic. In patients with severe AS, plasma levels of natriuretic peptides provide important prognostic information beyond clinical and echocardiographic evaluation. NtBNP predicts symptom-free survival in asymptomatic patients, and preoperative NtBNP independently predicts postoperative outcome with regard to survival, postoperative symptomatic status, and LV function. Thus, neurohormones may gain particular importance in the timing of surgery in asymptomatic patients with severe AS. Similarly some groups advised periodic BNP measurement for surgery timing in mitral regurgitation cases. In conclusion BNP is a safe marker for the estimation of volume overload and ventricle dysfunction in patients undergoing heart valve surgery especially in the immediate postoperative period.

### OP-627-THE ROSS PROCEDURE FOR THE TREATEMENT OF AORTIC VALVE DISEASE IN ADULT PATIENTS: MID AND LONG TERM RESULTS AT A SINGLE REFERRAL SURGICAL CENTER

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**INTRODUCTION:** The Ross procedure is a widely accepted surgical option in the pediatric population requiring surgical treatment of aortic valve disease. There is no general agreement regarding its indication in the adult population, being certain technical issues, and the potential need for reoperation, the main concern.

**OBJECTIVE:** to assess mid and long-term results of the Ross procedure for the treatment of aortic valve disease in the adult population.

Methods: from July 1995 to May 2006, 161 patients 18 years of age or older underwent the Ross procedure for aortic valve replacement, with the free-standing root technique. Clinical and echocardiographic follow-up was made. Valve-associated events (death, endocarditis, thromboembolism, reoperation,



valvular dysfunction) were analyzed with Kaplan Meier curves. Log-rank test, chi-square and the Cox model were used for variable analysis.

**RESULTS:** Mean age was 39<sub>-</sub>63 years; 79% were male. Preoperative ejection fraction was 55% $\pm$ 12%. Surgery was indicated for aortic stenosis in 88 p (55%) and for aortic insufficiency in 73 p (45%). In 124 patients the aortic valve was bicuspid, in 4 patients surgery was indicated in the setting of active infective endocarditis, and in 6 for prosthesis dysfunction. In 139 p (86%) an isolated Ross operation was performed, while 22 p (14%) required an additional surgical procedure. In-hospital mortality was 2.5% (4 patients). Survival at one and ten years was 97% (95% CI, 93-99) and 95% (95% CI, 91-98). Freedom from endocarditis at 10 years was 95% (95% CI, 84-98), and freedom from valve-related events was 95% (95% CI, 90-98) and 88% (95% CI, 75-94) at one and ten years respectively. Four patients required reoperation: one for recurrent mitral regurgitation after previous mitral valve repair, and the other three for autograft dysfunction and disease of other valves. In our experience, and during the follow-up period, the presence of aortic regurgitation as the baseline aortic lesion was not associated with the requirement of reoperation.

**CONCLUSIONS:** The Ross procedure is a surgical technique with a low event rate at ten years in the adult population. It may be considered as a valid surgical alternative for the treatment of aortic valve disease in this subgroup of patients.

#### OP-628-POSSIBLY INDICATIONS FOR THE MITROFAST-DEVICE IN MITRAL VALVE REPAIR

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**BACKGROUND:** Although many studies showed, that Mitral Valve Repair (MVR) should be possible in 80-90% of the patients, the truth is, that 30-40% of the diseased valves will be replaced. The reason for replacement is the sometimes very complex pathology of the mitral valve (MV) disease, especially if the underlying problem is an insufficient coaptation area of the posterior mitral leaflet (PML) with a so far normal anterior mitral leaflet (AML) due to severe restriction (ischemic, rheumatic), destruction (endocarditic) or hypoplasia of the PML. The repair of such diseased valves is very time-consuming, challenging and implies a great experience of the surgeon. Therefore many MV are replaced. Aim of the study was to elaborate which repair of the PML are feasible using the MitroFast™ device, a partially replacement of the PML with a D-shaped annuloplasty ring imitating the PML in closed position.

**METHODS:** During 08/04 and 11/06 we analysed the coaptation of the AML with the MitroFast™-Sizer, which is an identically imitation of the MitroFast™-Device, by random selection in 54 patients undergoing mitral valve surgery at our department. The functional sizer was placed at the posterior ring of the MV, covering the whole PML, and saline was injected to fill the ventricle. By filling the ventricle, the AML closes against the sizer, which imitates a PML in closed position.

**RESULTS:** Repair was possible in 30/54 patients, 24 patients received MVReplacement. Good coaptation with the sizer was established in 31/54 patients. 25/31 (79.7%) of the MV that showed good coaptation were repaired. 6/31 (19.3%) MV which showed good coaptation were replaced. The reason for replacement in this patients were severe restriction (ischemic/rheumatic) n=4, papillary muscle rupture n=1 and a huge myxoma adherent in P1/P2 n=1.

**CONCLUSIONS:** The MitroFast™-Sizer, an identical imitation of the MitroFast™-Device, established good coaptation with the AML in severe alteration of the PML, which usually led to MVReplacement. Using the MitroFast™-Device as a partial replacement device of the PML and leaving the AML in place offers a new additional possibility of MVR. The patient could leave the hospital with his own mitral valve. Practicable indications could be severe restriction (ischemic/rheumatic), massive prolaps (papillary muscle rupture), hypoplastic PML, endocarditis or calcification.

#### OP-630-MIDTERM OUTCOMES OF AORTIC ROOT REPLACEMENT: A COMPARISON BETWEEN MECHANICAL AND BIOLOGICAL VALVE CONDUITS

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**BACKGROUND:** Aortic root replacement is indicated in patients with aortic root pathology, such as aneurysm or dissection, with concomitant aortic valves dis-

ease. Untreated, aortic root aneurysms and dissections are associated with high morbidity and mortality. Replacement of the aortic root with a mechanical valve conduit provides a durable repair at the expense of life-long anticoagulation. Alternatively biological valve conduits provide freedom from anticoagulation, but their long-term durability for this application has not been established.

**METHODS:** From January 1998 to May 2007, 144 patients underwent aortic root replacement with either a mechanical (MECH, n = 51) or biological (BIO, n = 93) valve conduit. Clinical outcomes were prospectively collected from patient charts and recorded in the Alberta Provincial Project for Outcomes Assessment in Coronary Heart Disease (APPROACH) database. In addition, health related quality of life (EuroQoL EQ-5D), angina (Seattle Angina Questionnaire [SAQ]), depression and anxiety (Hospital Anxiety and Depression Scale [HADS]) were measured by telephone interviews or self-administered questionnaires.

**RESULTS:** Overall operative mortality was 2.1% at 40.2  $\pm$  25.4 months (follow-up 100% complete). One and five year actuarial survival for the MECH group was 95.9% and 89.0%, versus 93.0% and 84.0% for the BIO group (p = 0.2). Mean follow-up for morbidity was 34.9  $\pm$  26.0 months. MECH and BIO groups did not differ significantly in regards to valve-related complications including reoperation, thromboembolism and bleeding. However, logistic regression analysis showed that mechanical valve conduit, age, diabetes and aortic dissection were independent predictors of a composite one-year mortality and morbidity endpoint. In addition, seventeen patients (31.5%) in the BIO group were found to be on anticoagulant therapy at follow-up. The overall response rate for the quality of life questionnaire among surviving patients was 62.5%. Patients in the BIO group had significantly more physical limitations (SAQ score of 72 versus 95) and were more likely to be depressed (HADS score of 3.0 versus 1.0) than the MECH group.

**CONCLUSIONS:** Aortic root replacement with a BIO conduit is safe with no significant difference in short- or mid-term actuarial survival between MECH and BIO conduits. However, mechanical conduits were identified as a significant risk factor of a combined one year mortality and morbidity endpoint. Furthermore, a relatively high number of patients (31.6%) in the biological valve conduit groups were on anticoagulation at follow up. These results suggest a potential advantage of using biological valve conduits for aortic root replacement. In order to prove long term durability in the biological valve conduit a longer follow up will be necessary.

#### OP-631-AORTIC VALVE REPLACEMENT USING THE FREEDOM SOLO VALVE. SUPERIOR EARLY HEMODYNAMIC RESULTS

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**BACKGROUND AND AIM:** Stentless aortic valve for aortic valve replacement offers superior hemodynamics. The new Freedom SOLO aortic valve, as a modification of the Pericarbon™ Freedom stentless valve requires only one running suture line. This study aim was to compare the above two valves prostheses with regard to early postoperative hemodynamics.

**METHODS:** During the period of one year 36 patients underwent primary elective isolated or combined aortic valve replacement with the use of the Pericarbon™ Freedom stentless valve (group A) and the new Freedom SOLO aortic valve (group B). The new Freedom SOLO aortic valve was implanted in 10 patients using a supra-annular, subcoronary technique with one running suture line. For comparison, to the rest of the patients (26 patients) the Pericarbon™ Freedom stentless valve was implanted. Echocardiography was performed to monitor gradients and regurgitation.

**RESULTS:** Isolated aortic valve replacement in group A was performed at 19 patients and in group B at 5 patients. Combined procedures included coronary artery bypass grafting, mitral procedures, replacement of the ascending aorta and atrial ablation. The mean extracorporeal circulation time and cross-clamp time were significantly shorter with the new Freedom SOLO aortic valve. At discharge, hemodynamic parameters were most favorable for the Freedom SOLO valve, with low mean (7,9  $\pm$  4,5 mmHg) gradients, with no paravalvular leakage or transvalvular regurgitations.

**CONCLUSION:** The Freedom SOLO aortic valve implanted supra-annular, subcoronary is safe and reliable. It demonstrates superior early postoperative hemodynamics, reduced cross-clamp time and represents an attractive alternative in elderly patients.



### OP-632-AORTIC ROOT RECONSTRUCTION WITH CRYOPRESERVED AORTIC HOMOGRAFTS. A SINGLE INSTITUTION'S EXPERIENCE (5 YEARS)

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**BACKGROUND:** Aortic root replacement with cryopreserved aortic homografts can be performed safely for various pathological conditions involving the aortic valve and root. An evaluation of early and mid term results is presented in this case series study.

**METHODS:** From June 2002 through December 2007, 24 patients (16 male 8 female) aged 26 to 73 years old (mean 45.3  $\pm$  13.4) underwent aortic root replacement with cryopreserved aortic homograft. 11 patients (45.8%) had NYHA Class III or IV functional status before the operation. 10 patients (41.7%) had NYHA II and 13 patients (54%) had symptoms of congestive heart failure. 9 patients (37.5%) underwent urgent operation and 4 (16.6%) emergency. 4 (16.6%) procedures were combined (CABG, MVR, MAZE), 7 patients (29.1%) had undergone previous cardiac operations and 3 (12.5%) were re-operations. The cause of Aortic disease was acute endocarditis in 12 (50%) patients, degenerative is 6 (25%) congenital in 3 (12.5%) and rheumatic in 3 (12.5%). Euroscore ranged from 3 to 16 (mean 6.91  $\pm$  4.16) and Logistic Euroscore ranged from 2.08 to 62.21 (mean 14.07  $\pm$  17.88). Follow up was complete with an average between 1 to 63 months (mean 24.4  $\pm$  17.16).

**RESULTS:** The operative mortality was 2/24 (8.3%) and was associated with Acute endocarditis, combined procedure, ARDS and re-operation. 2 patients (8.3%) had re-exploration for bleeding and 1 requiring postoperative emergency laparotomy for splenic rupture. Duration of extracorporeal circulation ranged from 109 to 275 minutes (mean 197.5  $\pm$  74.201) and duration of aortic cross clamp ranged from 96 to 308 minutes (mean 162.25  $\pm$  51.36 minutes). Total circulation arrest required in 8 (33.3%) patients and ranged from 2 to 21 minutes (median 7.2 minutes). Hospital stay was between 4 and 59 days (mean 16.01  $\pm$  13.64 days) and stay in ITU was between 1-51 days (mean 4.18  $\pm$  10.5 days). 3 patients (12.5%) required pacemaker insertion (1 due to MAZE procedure, 1 due to 3rd degree heart block and the last due to history of VT). ARDS developed in 2 (8.3%) patients with 50% mortality and 2 patients required chest drain insertion for pleural effusions. During the follow up period there was no re-operation due to structural valve failure. 1 patient (4.5%) died in 52 post op month due to recurrence of endocarditis. Follow up with echocardiography in 19 out of 21 patients (90.4%) showed 10 patients (52.6%) with no or trace of aortic valve regurgitation, 9 (42.4%) with mild regurgitation and absence of stenosis of the homograft in 100% of the patients. Thromboembolic and anticoagulant related bleeding events were not reported. All these patients are in NYHA functional class 0 or I.

**CONCLUSION:** Aortic root replacement with cryopreserved homograft can be performed with acceptable hospital morbidity and mortality in selected cases with a very good short and mid term results

### OP-633-RELEVANCE OF CLOSED MITRAL VALVOTOMY FOR MITRAL STENOSIS IN TWENTY FIRST CENTURY IN DEVELOPING COUNTRIES

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**BACKGROUND:** According to WHO number of children with Rheumatic Heart disease (RHD) was 12 million in the year 2000. In India the number is 1.4 million. The prevalence of RHD between 1940 to 1983 was 1.8 to 11 per 1000. Between 1984 to 1995 the prevalence of Rheumatic fever is 0.05 to 1.7 per 1000 and it increased to 0.18 to 3 per 1000 between 1984-1995. Out of 229829 children from 6 to 18 years between 2001 to 2002, in rural area the prevalence is 0.68 per thousand. In another study total prevalence of RHD was 4.54 per thousand whereas the prevalence in urban area was 2.56 per thousand, while it was 7.42 per thousand in rural area. The prevalence of Rheumatic fever was 0.75 per thousand, while it was 1.2 per 1000 in rural and 0.42 per thousand in urban areas. In Pakistan the prevalence of RHD was 5.1 to 5.7 per 1000 while 500000 are from rural areas. In Karachi National Institute of cardiovascular diseases out of 4000 patients in 1988 only 13% were offered surgery due to prohibitive cost. In Nepal the prevalence is 5 per 1000. In Bangladesh the prevalence was 7 per 1000 between 1977 and 1980, 4 per 1000 between 1990 and 1993 and 3 per 1000 in 1997. With prevalence of

RHD in rural population who live in poverty, unhygienic conditions and low socioeconomic status, a financially affordable and viable treatment has to be offered. 74% of the population in India lives in rural areas. 80% of them are self financing.

**METHODS:** Out of 4896 cases of closed mitral valvotomies performed by the author 2000 cases performed during 1 decade were compared with 207 cases of mitral valve replacements performed by him during the same period. During this period in the same center where valve replacements were done, 195 balloon mitral valvotomies were performed. The demographic, socioeconomic status, the age were compared. Echocardiography formed an important investigation to decide on closed mitral valvotomy. The cost and hospital stays were compared. Closed surgery was 15 to 25% of openheart surgery. Postoperative follow up with reference to return to work, cost of postoperative medication and medical management and complications and reoperations performed were compared. The cost of balloon valvotomy was also high due to the cost of the disposables, the necessity of having a cardiac catheterization laboratory, the need to travel to the urban centre were compared.

**RESULTS:** The average cost of a closed mitral valvotomy was 15000 to 20000 Indian rupees. This was roughly 375 to 500 US dollars. The average cost of a Balloon mitral valvotomy was about 80000 Indian rupees, which was roughly 2000 US dollars. The cost of a mitral valve replacement was about 125000 to 200000 Indian rupees depending on the type of prosthesis used. This was out 3000 to 5000 US dollars. Out of the 2000 cases of closed mitral valvotomies nearly 900 were performed in small hospitals in rural and semi urban areas where only one theatre with basic monitoring equipment was available. The nearest cardiac centre with catheterization laboratory was 200 Km away. 7 had embolic episode in the perioperative period 1 died and 6 recovered fully of the CNS consequences. 12 had moderate to severe mitral regurgitation in the immediate postoperative period. 3 had to undergo mitral valve replacement as an urgent procedure. 1 died as she could not afford a mitral valve replacement. Out of the remaining 8 only 4 had mitral valve replacement in 2 years time. The average hospital stay was 7 days. The average blood requirement was less than 1 unit per surgery. Very minimal postoperative medication beyond first 3 months except penicillin prophylaxis was needed. 14 underwent a redo closed surgery in less than two years. Out of the 207 cases of valve replacement 2 died in the perioperative period due to low cardiac output. 6 had embolic episode and 1 had a stuck valve in 2 years time and had to be reoperated. 4 had bleeding complications in two years require 9 had in 2 years follow up. The average hospital stay was 10 days. The average blood requirement was 4 units per patient. Out of 195 balloon valvotomies two required emergency surgeries, one for pulmonary oedema, and one for M.R. In the initial phases 9 cases had hemopericardium and 6 needed surgical intervention to close the cardiac rent various sites and closed mitral valvotomy through the median sternotomy in the catheterization laboratory itself. Only the 6 patients who underwent surgery needed blood. Average hospital stay was 3 days.

**CONCLUSIONS:** Rheumatic heart disease is still a major cardiac affliction in developing countries. Among the rheumatic valvular heart diseases mitral stenosis is the most common. This disease is prevalent in low socioeconomic, rural and semi urban population more. The patients are adolescents, young and middle aged, adults. Majority of these patients can not afford the cost of open heart surgery and valve repair or valve replacement. Closed mitral valvotomy is an economically viable and medically suitable option and will help the younger patient population to return to work. It can be performed in less equipped centers with reasonable facilities. With this background, even in 21st century it is a suitable procedure especially in developing countries where this affliction is still present and is common.

### OP-634-EFFECT OF PATIENT-PROSTHESIS MISMATCH ON LONG-TERM SURVIVAL: ASSESSMENT TO 15 YEARS WITH AORTIC VALVE REPLACEMENT

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**BACKGROUND:** Patient-prosthesis Mismatch (PPM) has been considered a determinant of early and late mortality following aortic valve replacement (AVR). The impact of PPM in an overall risk analysis of long-term mortality is evaluated in 4,313 patients [mechanical prostheses (MP) - 1,140; bioprostheses (BP) - 2,991] to 15 years.

**METHODS:** PPM effective orifice area index (EOAI) grades were as follows: (A) normal  $\geq 0.85\text{cm}^2/\text{m}^2 = 1,998$ , (B) mild-to-moderate  $>0.65\text{-}0.85 = 1,887$ , and (C) severe  $\leq 0.65 = 246$  patients. The inclusion criteria was patients had opportunity for 16 years of follow-up. The total follow-up was 28,369 years, mean  $6.55 \pm 5.1$  years (median 5.9 years). The mean age for MP was  $57.89 \pm 11.96$  years and BP  $71.21 \pm 9.67$  years. The analysis was based on initial intent to treat. Ten preoperative variables were evaluated in the risk analysis, those with  $p < 0.25$  were considered for multivariate analysis.

**RESULTS:** Early mortality was A - 3.8%, B - 4.3% and C - 4.1% ( $p=0.025$ ). The overall survival at 15 years: A -  $38.1 \pm 1.7\%$ , B -  $37.9 \pm 1.8\%$  and C -  $26.6 \pm 5.7\%$  (overall  $p=0.036$ ) (A vs C,  $p=0.011$ ). The multivariate predictors of overall mortality were [p-value and hazard ratio (HR)]:

Age -  $p < 0.0001$ , HR=N/A

Age Group=50yrs -  $p=N/A$ , HR=N/A

Age Group=51-60yrs -  $p=0.0002$ , HR=1.67

Age Group=61-70yrs -  $p < 0.0001$ , HR=2.80

Age Group=71-80yrs -  $p < 0.0001$ , HR=4.78

Age Group= $>80$ yrs -  $p < 0.0001$ , HR=8.03

Preop NYHA III/IV -  $p=0.0001$ , HR=1.31

Concomitant CABG -  $p=0.000001$ , HR=1.30

Ejection Fraction  $<35$  -  $p=0.001$ , HR=1.49

Valve Type BP -  $p=0.016$ , HR=1.18

Rhythm AF/P/HB -  $p=0.026$ , HR=1.18

Preop CHF -  $p=0.008$ , HR=1.18

The freedom from valve related mortality at 15 yrs between the 3 EOAI grades was not different ( $p=0.819$ ). The freedom from cardiac related mortality at 15 yrs by EOAI grades was not different ( $p=0.052$ ). EOAI was predictive of overall mortality in patients with ejection fraction  $<35\%$  (A vs B,  $p=0.046$ ). EOAI was also predictive of overall survival in patients with ejection fraction  $\geq 35\%$  (A vs C,  $p=0.006$ ). EOAI was also predictive in BMI  $\geq 25$  (severe obesity) (A vs C,  $p=0.014$ ).

**CONCLUSION:** EOAI was NOT an independent predictor of early mortality. EOAI ( $\leq 0.65\text{cm}^2/\text{m}^2$ ) was a univariate predictor of overall mortality & cardiac mortality, but not a predictor of valve-related mortality. EOAI was NOT an independent predictor of overall mortality, cardiac mortality or valve-related mortality. EOAI ( $\leq 0.65\text{cm}^2/\text{m}^2$ ) was an independent predictor of overall mortality with body mass index ( $\geq 25$ -severely obese). EOAI ( $>0.65\text{-}0.85\text{cm}^2/\text{m}^2$ ) was an independent predictor for overall mortality, for ejection fraction  $<35\%$  (EOAI  $<0.65\text{cm}^2/\text{m}^2$ ) had a small number of patients & did not achieve significance as an independent predictor. EOAI was an independent predictor of overall mortality for ejection fraction  $\geq 35\%$  (EOAI  $<0.65\text{cm}^2/\text{m}^2$ ).

## MULTIDISCIPLINARY II

### OP-635-THE EFFECTS OF BODY MASS INDEX ON OUTCOMES AND BLEEDING INDICES FOLLOWING ADULT CARDIAC SURGERY

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**BACKGROUND:** The effect of obesity and morbid obesity on outcomes following cardiac surgery remains controversial and the effect on bleeding indices has not been well described. The aim of the present study was to determine the impact of body mass index (BMI) on perioperative outcomes, complication rates, and 30-day mortality following adult cardiac surgery.

**METHODS:** A billing database was utilized to identify cases that met inclusion criteria [age > 18 years, cardiothoracic surgery (not transplant or congenital in nature) requiring CPB]. A retrospective chart review of each patient's medical record was conducted to ascertain demographic data, outcomes data, and stratify severity of disease via the STS and EUROscore risk calculators. Primary endpoints investigated were mortality, perioperative outcomes, and bleeding indices. The patients will then be stratified to 3 BMI categories: <30 (control), 30 to <40 (obese), and ≥40 (morbidly obese) in order to determine the effect of obesity on each endpoint of interest.

**RESULTS:** A total of 267 patients met inclusion criteria and were reviewed. These patients were separated into three groups: BMI < 30 (n=169), BMI 30 to < 40 (n=84) classified as obese, and BMI ≥ 40 (n=14) classified as morbidly obese. There was a significantly higher 30-day mortality rate in the obese group (10%) as compared to controls (1.7%), while there were no deaths in the morbidly obese group. The hospital length of stay was higher in both the obese (9.0 days) and morbidly obese (8.7 days) as compared to controls (7.8) as was the ICU length of stay (4.8 and 5.9 vs 3.5 days). The two study groups were also associated with a higher incidence of renal dysfunction (obese = 12.3%, morbidly obese = 12.5%) as compared to controls (4.1%) and the obese group had higher percentage of patients requiring new renal replacement therapy (3.0 %) versus controls (0.8%). The obese and morbidly obese groups had less chest tube drainage (745 and 783 ml vs 999ml) and average total donor units transfused (3.8 and 4.1 vs 8.9) and a higher percentage of patients that were transfusion independent (50% and 50% vs 37%) as compared to controls. Reexploration for bleeding was necessary in 4% of control and obese patients while no patients in the morbidly obese group required reoperation.

**CONCLUSIONS:** In our patient population, obesity was associated with higher hospital and 30-day mortality rates and prolonged hospital and ICU length of stay as compared to control patients with a BMI ≥ 30 despite the STS and EUROscore predicted mortalities being similar across groups reflecting the fact that BMI is not one of the variables considered in either model. The study group patients also had higher rates of renal dysfunction and the need for renal replacement therapies postoperatively than controls. We also evaluated common bleeding indices to determine if increased bleeding or exposure to transfusions contributed to the increased mortality. Interestingly, the obese and morbidly obese groups had less chest tube drainage, lower rates of transfusion, and fewer units transfused than controls and reexploration rates were similar.

### OP-636-CORRELATION PREOPERATIVE MAXIMAL MOUTH PRESSURE AND PULMONARY MORBIDITY AFTER CARDIAC SURGERY

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**BACKGROUND:** Postoperative pulmonary complications (PPC) in cardiac surgery have a major impact on morbidity, mortality and hospital stay. Literature suggests preventive value of preoperative inspiratory muscle training regarding

the development of postoperative pulmonary complications. Before starting the training program, we examined the correlation between preoperative pulmonary status and the development of PPC.

**METHODS:** 123 consecutive patients undergoing cardiac surgery were evaluated: pulmonary function testing (FEV1%, diffusion capacity, Tiffeneau index), maximal inspiratory (MIP%) and expiratory (MEP%) mouth pressure estimation (compared to predicted values) were tested along with risk profiling of the patient (sex, body mass index (BMI), age, type of operation, diabetes, smoking, pulmonary risk score (PRS) (Hulzebos Jama, October 18, 2006-Vol 296, No.15), left ventricular function (LVF) and extracorporeal circulation time (ECCT)). Multiple regression analysis was performed. Outcome parameters: development of postoperative pulmonary complications, intensive care unit (ICU) and hospital stay. Descriptive statistics N Minimum Maximum Mean Std.Deviation Age 123 40 86 66,93 9,807 BMI 123 18 46 27,16 4,657 FEV1% 123 55 182 100,99 21,89 Tiffeneau 123 43 91 74,56 8,797 Diffusion 122 24 126 79,66 18,783 MIP 123 18 125 67,89 24,554 MIP% 123 23 185 91,97 30,749 MEP 123 34 182 118,34 39,175 MEP% 123 29 241 108,88 38,326 EEC time 123 0 198 96,56 36,639 ICU stay 123 1 22 2,54 2,826 Hospital stay 123 6 40 10,66 5,634 Gender Male : 93/123 (75,60 %) Female: 30/123 (24,40 %) Type of operation CABG: 58/123 (47,15%) Off-pump cabg: 4/123 (3,25%) Valve: 31/123 (25,20%) Combi: 28/123 (22,76%) (combi = cabg+valve or more than one valve) Other: 2/123 (1,62%) Redo operation: 4/123 (3,25%) Left ventricular function Ejection fraction < 30%: 10/123 (8,13 %) 30% - 50% : 29/123 (23,57%) > 50% : 84/123 (68,29%) Incidence PPC (Kroenke et al Arch.Int Med.1992;152:967-971) grade 0 : 84/123 (68,29%) grade 1 : 5/123 (4,06%) grade 2 : 15/123 (12,19%) grade 3 : 18/123 (14,63%) grade 4 : 1/123 (0,81%)

**RESULTS:** One patient (1/123 = 0,81%) died due to multi organ failure following a bilateral pneumonia. Significant correlation between BMI (p=0,011), LVF (p=0,0224), FEV1% (p=0,035) PRS (p=0,0128) and the incidence of PPC. Intensive care stay is significantly influenced by the FEV1% (p=0,0307) and LVF (p=0,0373) Significant correlation between FEV1% (p=0,0036), left ventricular function (p=0,0001) BMI (p=0,0478), PRS (p=0,0183) and hospital stay. No correlation regarding preoperative MIP% or MEP% for any of the outcome parameters so far.

**CONCLUSION:** Higher body mass index, higher Pulmonary risk score and worse LVF are independent predictors for development of postoperative pulmonary complication and a longer hospital stay after cardiac surgery. Low FEV1% and worse LVF predict a longer stay in the intensive care unit. The Hulzebos scoring system is useful, but worse preoperative MIP and MEP values do not predict a higher pulmonary risk for developing PPC so far.

### OP-637-QUALITY OF LIFE ASSESSMENT AFTER MITRAL VALVULAR SURGERY IN OCTOGENARIANS

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**BACKGROUND:** In the last years, the number of octogenarians referred for mitral valve operations in the Western countries is increased. Aim of this study was to evaluate the long-term quality of life after mitral valve surgery in this high-risk subset of patients.

**METHODS:** Quality of life of 55 consecutive octogenarians (median age 81 years, range 80 to 87 years) undergoing mitral valve surgery between January 1998 and December 2006 was retrospectively reviewed. Clinical follow-up was integrated with a modified Seattle Angina Questionnaire to assess the quality of life.

**RESULTS:** Thirty-eight patients (69.1%) were female. Mitral valve disease aetiology was degenerative disease in 21 (38.1%) cases, ischemic mitral regurgitation in 13 (23.6%), functional mitral regurgitation in 10 (18.2%), rheumatic mitral disease in 4 (7.3%), mitral annular and/or leaflet calcification in 4 (7.3%), and other in 3 (5.5%). Twenty-five (45.5%) patients were in New York Heart Association functional class III-IV, and 9 (16.4%) had a left ventricular ejection fraction <50%. Preoperative atrial fibrillation was present in 21 (38.2%) cases. Isolated mitral valve replacement and repair were performed in 7 (12.7%) and 14 (25.5%) patients, respectively. Concomitant coronary artery bypass grafting and aortic valve replacement were performed in 25 (45.5%) and 9 (16.4%) cases, respectively. In-hospital mortality occurred in 3 patients (5.5%) with previous cardiac surgery (P=0.025) and preoperative diagnosis of unstable angina (P=0.044) as independent risk factors on multivariate analysis. Follow-up was complete in all the 42 survivors (mean length 44±26.4 months, range 10.5 to 112.7 months). Kaplan-Meier survival rates at 2-year and 6-year were 78.7±5.7% and 71.3±7.4%, respectively. Causes of late death were non cardiac

in 5 patients (50%), cardiac in 2 (20%), and unknown in 3 (30%). Freedom from cardiac events (reoperation, cardiac-related re-hospitalization, and percutaneous cardiologic procedure) at 5-year was  $80.2 \pm 6.5\%$ . Quality of life was noteworthy in all the patients. Thirty-six patients (85.7%) were not or little disabled in their daily activity. Thirty-nine patients (92.9%) were free or considerably less symptomatic with a New York Heart Association functional class I-II. Forty-one patients (97.6%) reported to be satisfied or very satisfied about the treatment of their heart disease, as well as 36 (85.7%) patients declared to be satisfied or very satisfied about their current quality of life.

**CONCLUSION:** Mitral valve surgery in octogenarians can be performed with acceptable operative risk. Furthermore, a remarkable quality of life with improvement in the functional status and full treatment satisfaction paired with satisfactory long-term survival justify surgery in this high-risk subset of patients.

#### OP-638-TIMING OF CARDIAC CATHETERIZATION AND ACUTE RENAL FAILURE AFTER CARDIAC SURGERY

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**BACKGROUND:** The incidence of acute renal failure (ARF) after cardiac surgery and the risk of mortality associated with it continues to be high. The aim of this study was to evaluate if timing of cardiac catheterization influences the incidence of postoperative ARF.

**METHODS:** Four hundred and eight patients undergoing cardiac surgery were prospectively evaluated. Mean age was  $66 \pm 10$  years, 22% were female, 38% diabetic, 69% had hypertension and 15% had peripheral vascular disease. Preoperative creatinine level and calculated creatinine clearance (CrCl) were  $1.05 \pm 0.6$  and  $82 \pm 27$  respectively. Of the study population 39% underwent surgery within 24h of cardiac catheterization, 30% underwent surgery between the first and fifth day of catheterization, and 31% underwent surgery more than 5 days after cardiac catheterization. Endpoints were ARF, defined as a decrease in the calculated CrCl of 25% or more by the third postoperative day, and hospital mortality.

**RESULTS:** 47% of patients who underwent surgery within 24h from cardiac catheterization have shown a decrease in calculated CrCl of 25% or more, as apposed to 29% in patients who underwent surgery between the 1st and 5th day after catheterization, and 23% in those who underwent surgery more than 5 days after catheterization ( $p=0.05$ ). Mortality rate among patients who underwent surgery within 24h from catheterization was independently associated with acute renal failure ([OR]=1.9,  $p=0.02$ ). Preoperative calculated CrCl of less than 60ml/min and cardiac surgery within 24h from catheterization was independently related to hospital mortality ([OR]=8,  $p=0.005$ ).

**CONCLUSION:** Cardiac surgery performed within 24h from cardiac catheterization is a significant risk factor for acute renal failure, especially among patients with preoperative reduced renal function. Proper timing and patient selection is highly recommended.

#### OP-639-WHAT IS THE INCIDENCE OF MRSA INFECTION FOLLOWING CARDIAC SURGERY AMONG KNOWN MRSA CARRIERS?

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**BACKGROUND:** We routinely screen all patients prior to surgery for MRSA carriage. Carriage can be eradicated but this requires delaying surgery. This presents a dilemma when the surgery is urgent. We analysed the incidence of pre-operative MRSA carriage and subsequent development of MRSA infection.

**METHODS:** Patient data was collected prospectively from 2000 to 2007 ( $n=3789$ ) and compared to the hospital microbiology database. Group 1 consisted of elective patients who attended a pre-admission clinic which included MRSA screening. Patients identified at this stage as MRSA carriers were treated to achieve eradication. Group 2 consisted of patients requiring urgent surgery who did not attend the pre-admission clinic and were screened on admission to hospital prior to surgery. Surgery was not delayed pending the outcome of screening.

**RESULTS:** Among group 1 patients, 22 were identified as MRSA positive. Eradication measures were successful in all but one case. None of these patients sub-

sequently developed an MRSA infection. In group 2, 103 patients were identified as MRSA carriers at the time of admission, although this result was usually only available after surgery. This group consisted of some admissions from home but was dominated by intra- and inter-hospital transfers. Among the 103 carriers, eradication measures were started on confirmation of carriage. There were 11(10%) MRSA infections during their subsequent inpatient course.

**CONCLUSION:** MRSA carriage prior to surgery is associated with a significantly higher rate of subsequent MRSA infection. The success of eradication among the pre-admission clinic population shows that it is possible to clear carriage and reduce the risk of MRSA infection. This may require a delay in surgical treatment which must be balanced with the clinical urgency of the case.

#### OP-640-APROTININ REEXPOSURE: RISK OF ANAPHYLACTIC REACTION STARTS IMMEDIATELY AFTER FIRST EXPOSURE

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**BACKGROUND:** The incidence of anaphylactic reaction (AR) to aprotinin is rising and the final decision of suspension is still pending. The risk of AR to aprotinin after reexposure is time dependent. Most reported AR occurred between 2 and 12 weeks after first exposure. Previous studies examined the immunological response within focus on the first 6 months; however, no study has been focused on antibody formation within the first week. The aim of this study was to investigate aprotinin specific antibody formation - a major risk factor for AR - during the first eight days post exposure.

**METHODS:** 190 adult patients undergoing surgery for acquired heart disease were studied pre- and postoperatively. 15 patients underwent reoperation. All patients received aprotinin intraoperatively. Serum samples were taken preoperatively, 2, 4, 6, 8 and 40 days postoperatively and tested for aprotinin specific IgG antibodies (ELISA).

**RESULTS:** 12 patients were positive for aprotinin specific antibodies preoperatively. Two of them had no documented previous aprotinin contact. No AR to aprotinin occurred intraoperatively. Among the 178 patients without preoperative antibodies, four were positive after 2 and four days, 11 patients after 6, 16 patients after 8, and 77 patients after 40 days.

**DISCUSSION:** Although there are no reported AR to aprotinin within the first week after first exposure the presence of specific antibodies is considered as the major risk factor for AR. We could demonstrate that antibody formation starts immediately after aprotinin exposure. The reuse of aprotinin within 12 months is contraindicated. Individuell indications for the early reuse of aprotinin requires a careful risk/benefit assessment.

#### OP-641-THE NEED FOR INTRA AORTIC BALLOON PUMP (IABP) IS ASSOCIATED WITH HIGHER ADVERSE OUTCOME IN PATIENTS REQUIRING VALVE SURGERY

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**BACKGROUND:** Analysis of early and late outcome of patients requiring IABP in a single institution.

**METHODS:** The data were collected prospectively. 2697 patients underwent cardiac surgery over 4-year period; 136 patients required IABP (5.04%).

**RESULTS:** The in hospital mortality was 36%. The operation specific mortality was: CABG 21.2%, Valve 64.3% ( $p<0.05$ ). The mortality (%) as per time of balloon insertion was: Preoperative 18.2, Intraoperative 33.3, postoperative 58.3 ( $p<0.05$ ). The incremental risk factors for death were: Female gender (Odds Ratio (OR)=3.87 with Confidence Intervals (CI)=1.3-11.6), Preop Creat>120 (OR=3.3, CI=1.14-9.7), Cross Clamp time>80 min (OR=4.16, CI=1.73-9.98) and IABP insertion postoperatively (OR=19.19, CI=3.16-116.47). The incremental risk factors for development of complications were: Poor EF (OR=3.16, CI=0.87-11.52), Euroscore >7 (OR=2.99, CI=1.14-7.88), PVD (OR=4.99, CI=1.32-18.86). The 5 years survival was 79.2% for the CABG population and 71.5% for the valve group. (Hazard ratio=1.78, CI=0.92-3.46).

**CONCLUSIONS:** The need for IABP especially in a Valve population is associated with early unfavourable outcome, however the positive long term results further justify its use.



### OP-642-PLASMA NITRATE/NITRITE IS NOT A BIOMARKER TO PREDICT VASOPLEGIC SYNDROME IN PATIENTS UNDER CARDIOPULMONARY BYPASS SURGERY

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**BACKGROUND:** There were strong evidences that nitric oxide (NO) has capital importance in the progressive vasodilatation that associated with varied circulatory shock forms, including SIRS vasoplegic syndrome in patients undergoing cardiac surgeries under cardiopulmonary bypass (CPB). If CPB procedures per se is the inciting stimulus for inflammation, plasma nitrate/nitrite (NOx - index of NO) excretion would be expected to be higher in those patients than in patients operated on CPB. In consequence, we hypothesized that increased levels of NOx would be predictive for vasoplegic syndrome.

**METHODS:** Thirty patients were randomly assigned to three groups: Group 1: CABG rollerpump CPB; Group 2 - CABG centrifugal vortex pump CPB (to add one more plastic superficie), and; Group 3 - heart valve surgery roller pump CPB (thinking in aorta and myocardial interventions as SIRS triggers). Sampling of venous blood for chemiluminescence plasma NOx dosage, was achieved at the following time points: 1) Before anesthesia induction; 2) After anesthesia induction; 3) Before heparin infusion; 4) After heparin infusion; 5) CPB-30 minutes; 6) CPB 60 minutes; 7) Before protamine infusion; 8) After protamine infusion and; 9) On return to the recovery area.

**RESULTS:** There were no inter-group differences regarding to age, anesthetic regimen, and number of arteries grafted were not different between the CABG groups. There were no crossclamp time differences between the CABG groups but it was shorter for the heart valve surgeries. There were not find any NOx statistics differences neither among the three groups of patients, neither among the surgery time -related venous blood samples. In addition, there were not find any correlation among NOx, lactate and hemoglobin

**CONCLUSIONS:** As CPB inflammatory reaction is noninfectious, this study reinforces the idea that plasma NOx is not useful as a biomarker to alert against vasoplegic syndrome. FAPESP, FAEPA, CNPq, CAPES

### OP-643-APPLICATION OF THE SEQUENTIAL ORGAN FAILURE ASSESSMENT SCORE IN PREDICTION OF MORBIDITY AND MORTALITY AFTER CARDIAC TRANSPLANTATION IN COMPARISON WITH BIOLOGICAL MARKERS

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**BACKGROUND:** The sequential organ failure assessment score SOFA has been shown to predict mortality and morbidity in heterogeneous cardiac surgical patients but not after heart transplantation (HTx) (1, 2). As patients after HTx need early postoperative catecholamines we evaluated the application of SOFA in prediction of 30-day mortality and morbidity following HTx.

**METHODS:** We retrospectively studied 126 consecutive heart transplant recipients (age: median 47, 12-70 years). The SOFA was calculated postoperatively and daily until intensive care unit (ICU) discharge or for a maximum of 7 days. C-reactive protein (CRP) values and WBC were reviewed. Lengths of intensive care unit (ICU) stay and 30-day mortality were assessed.

**RESULTS:** From the 1st until the 7th postoperative day (POD) only SOFA values, not CRP or WBC counts, were significantly higher in non-survivors (12.5%) than in survivors (Mann-Whitney test:  $p < 0.001$ ). For SOFA area under the receiver operating characteristic curve (ROC-AUC) for risk of 30-day mortality at ICU admission was 0.90 (95% CI 0.83 to 0.98). The highest value (0.94, 95% CI 0.88 to 0.99) was reached on the 4th POD. A SOFA value of  $> 12$  points as a predictor for 30-day mortality had a specificity of 79% and sensitivity of 88%. In survivors the maximum of SOFA, but not of CRP or WBC counts, correlated significantly with the length of ICU stay ( $p < 0.001$ ).

**CONCLUSION:** Although patients after HTx need catecholamines in the early postoperative period, SOFA can be used to grade the severity of morbidity and to identify the risk of 30-day mortality without specific modifications. As an independent score, SOFA is therefore helpful in early therapeutic decision making and resource planning in heart transplant recipients. 1. Ann Thorac Surg. 2006 Dec;82(6):2080-7 and 2072-8, 2. Chest. 2003 Apr;123(4):1229-39

### OP-644-PREDICTIVE ACCURACY OF EUROSORE: IS END-DIASTOLIC PRESSURE A MISSING VARIABLE?

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**BACKGROUND:** Left-ventricular function has been shown to be an important prognostic factor in estimating operative risk of coronary artery bypass grafting (CABG) and as such left-ventricular ejection fraction (EF) is included in the EuroSCORE. However, left-ventricular function is more comprehensively assessed by measures of both systolic and diastolic dysfunction. We hypothesized that end-diastolic dysfunction is an additional independent indicator for predicting outcome following CABG.

**METHODS:** We retrospectively assessed all patients undergoing isolated off-pump CABG between October 2000 and September 2004 by two surgeons. 1178 consecutive patients identified. Left-ventricular end-diastolic pressure (EDP) measured during coronary angiography was used as a measure of left-ventricular diastolic dysfunction. Logistic regression was used to assess the association between EDP (treated as a continuous and dichotomous variable) and mortality, while adjusting for EuroSCORE.

**RESULTS:** 925 patients with complete EDP data were analyzed. EDP was identified as an independent predictor of mortality after adjusting for EuroSCORE (OR 1.1 for each unit increase of EDP [95% CI 1.03-1.17]  $P=0.002$ ). ROC curve improved from 0.7 with EuroSCORE alone to 0.78 when EuroSCORE combined with EDP. Logistic equation: odds of death =  $\exp(-6.3283 + [\text{EuroSCORE} \times 0.1813] + [\text{EDP} \times 0.0954])$ . In a sub-group analysis, operative mortality in patients with moderate to good ejection fraction is independent of EDP; however, for patients with impaired ejection fraction operative mortality is higher when EDP reaches 20mmHg. Substituting ejection fraction for CASS score produced similar results.

**CONCLUSIONS:** EDP is an important variable in predicting patient specific risk and should be incorporated in future risk models



## CARDIAC OTHER II

### OP-645-SURGICAL TREATMENT OF ATRIAL MYXOMA: 14 YEARS EXPERIENCE

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**BACKGROUND:** Primary tumors of the heart are very uncommon. The most likely of benign heart tumors are atrial myxoma. Radical cure for this kind of tumor is only by surgical treatment.

**PATIENTS & METHOD:** Retrospective study in 143 primary tumors which were resected at the Heart Institute of Ho Chi Minh city-Viet Nam from Jan 1992 to Dec 2005.

**RESULTS:** Among that, 136 cases were atrial myxoma, left atrial myxoma was 90.4% and right atrial myxoma was 9.6%. Female patients were 70.6% (96). The patients live in more than 36 city and provinces of Viet Nam and the majority of patients had lived in Ho Chi Minh city (31.6%). Clinical features were as follows: dyspnea: 74.3%; heart murmur 84%; arrhythmias 29.4%; faint: 23.5%; right heart failure 16%; hemoptysis: 6.6% and loss weight 6%. Before operation, NYHA class II was 85%, class III and IV was 9% of cases. Emergency operation was carried out in 17 cases. 6 cases suffered inferior member or cerebral embolization before operation. Severe mitral insufficiency associated with left atrial myxoma were in 13 (9.5%). Mean systolic pulmonary artery pressure was  $61 \pm 23$  mmHg. Mean maximum diameter of tumor:  $46 \pm 13.9$  mm. Operative mortality was only one case. Mean time of follow-up was  $82 \pm 6.4$  months. No late death and no recurrence after 14 years follow up. The specific of echocardiographic diagnosis was reached about 96%. When confirmed diagnosis, resection atrial myxoma must be done as soon as possible to prevent embolism and severe mitral leaflet damage.

**CONCLUSION:** Surgical treatment is only the best choice because it's simple and effective radical treatment. Verify the severity of mitral insufficiency associated with left atrial myxoma in all cases is always necessary before closing.

### OP-646-ISCHEMIA AND REPERFUSION INDUCE PHOSPHORYLATION OF CYTOCHROME C OXIDASE AND ALTERNATE OXYGEN TURN OVER

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**BACKGROUND:** Respiratory control is still under investigation [1, 2], especially after ischemia and reperfusion. Recently, production of high energy phosphates by mitochondrial oxidative phosphorylation seems to be attenuated when myocardial perfusion is compromised. This study focuses malfunction of mitochondrial respiratory chain and hereby the altered activity of Cytochrome c oxidase (CcO).

**MATERIAL AND METHODS:** Hearts were harvested from male Wistar rats (weight 6 months; narcosis protocol ketamine/xylazine administration i.p.). Langendorff-perfusion was performed with MEM (Tconst = 37 °C) and after adaption arrested for 20 minutes. After reperfusion of 30 minutes, hearts were frozen-clamped, minced and mitochondria were separated. Respiration was measured with the Hansatech-system, polarographically. Mitochondrial membranes were solubilized with Triton 114 and Triton 100, respectively. CcO was isolated by DEAE-Ion-Exchange-Chromatography and successive Ammonium sulfonic extraction. After purification with Sephadex 6B filtration, CcO-subunit detection was carried out by SDS-PAGE. Phosphoprotein detection proceeded by mon AB against P-Ser, P-Tyr and P-Thr (Biomol®, Berlin) in Western blot technique.

**RESULTS:** Different CcO activity and oxygen turn over dependent on ADP and ATP addition was found after ischemia and reperfusion. In this case a Serin-phosphorylation appeared an subunit I and IV. Different phosphorylation patterns in the enzyme preparation were not detected.

**CONCLUSION:** Preliminary data suggest an ATP-dependent inhibition of CcO initiated in case of myocardial ischemia and reperfusion. Because of this regulation an additional release of Radical Oxygen Species and their harmful

action on myocardial tissue is prevented. This mechanism could be a sufficient approach for understanding myocardial protection mechanisms. A shift in enzyme activity is obviously caused through selective phosphorylation at subunit I and/or IV. [1] Kadenbach B, Arnold S. FEBS Lett. 1999; 447: 131-4 [2] Vogt S, Rhiel A, Koch V, Kadenbach B. Curr Enzyme Inhibition 2007; 3: 189-206

### OP-647-DELAYED STERNAL CLOSURE IN PATIENTS UNDERGOING CARDIAC SURGERY

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**BACKGROUND:** Sternal closure at the end of the surgery is sometimes associated with difficulties and complications. During post-operative course, however, re-opening of the sternum and secondary delayed sternal closure (DSC) become necessary particularly in patients experiencing remarkable decrease in cardiac index following sternal closure. This review analyses the literature on the DSC in patients undergoing cardiac surgery.

**METHODS:** A search of the Medline database was performed using delayed sternal closure and cardiac surgery as keywords. Selected studies were comprehensively assessed to highlight different clinical and technical aspects of DSC in patients undergoing cardiac surgery.

**RESULTS:** Risk factors of DSC, its indications and accurate time of sternal closure as well as the advantages, limitations and some technical aspects of DSC in patients undergoing cardiac surgery were described in this study.

**CONCLUSIONS:** DSC is an effective technique in patients with severe reduction in cardiac output, respiratory failure, uncontrolled bleeding, severe arrhythmia, shunt dysfunction and some very ill patients with hemodynamic instability. It can end in reasonable mortality and morbidity rate if used appropriately. Right decision regarding the accurate time of sternal closure might be better made considering the condition of each individual case. However, surgeons should be aware of its proper use and also physiologic changes and management of the patients when the sternum is still open.

### OP-648-EXCIMER LASER FOR SAFE REMOVAL OF INFECTED OR DYSFUNCTIONAL PACEMAKER OR ICD LEADS: A SERIES OF 137 CONSECUTIVE PATIENTS

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**BACKGROUND:** Due to restrictive adhesions lead removal without technical support is mostly impossible in patients > 1 y after implantation. In addition some patients reveal to have subclavian or caval vein occlusions complicating the implantation of new leads. Laser-lead-extraction using the excimer laser offers the possibility for secure lead removal and for re-canalization of occluded veins.

**METHODS:** LLD locking stylets, 12 - 16 French "Laser Sheaths" and an excimer laser as energy source were used. Lead replacement was performed in Seldinger technique using the canal created by the laser sheaths.

**RESULTS:** Between 2001 and 2007 137 patients with pacemaker or ICD-lead infection or dysfunction (mean time after implantation  $6 \pm 4.8$  years) underwent laser-lead-extraction. 12 patients showed subclavian or caval vein occlusion in phlebography. Leads were extracted from the right ventricle and/or the right atrium. Lead extraction and when necessary new lead implantation was securely performed in all patients. Mean operation time was  $49 \pm 29$  min. Mean fluoroscopy time was  $4.1 \pm 2.8$  min. 4 of 137 patients (2.9%) developed significant bleeding and underwent immediate sternotomy for surgical hemostasis with uneventful postoperative course. No complications occurred in the recanalization group. There were no long-term complications in any of those patients.

**CONCLUSIONS:** In the hands of experienced surgeons laser extraction in patients with or without vein occlusions allows complete removal and replacement of pacemaker or ICD leads. However possible complications of this technology necessitate close hemodynamic monitoring including continuous TEE and cardiovascular surgery back up.

## OP-649-NON-DIALYSIS-DEPENDENT MILD RENAL DYSFUNCTION IN CABG

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**BACKGROUND:** Acute renal failure following cardiac surgery is a major complication. The aim of this study is to evaluate the influence of non-dialysis-dependent mild renal dysfunction in patients undergoing CABG.

**METHODS:** 384 patients referred to cardiac surgery were evaluated. Demographic factors, clinical data, operative and postoperative variables were analysed. The glomerular filtration rate (GFR) was estimated using the Cockcroft-Gault formula preoperatively and up to the fifth postoperative day. Acute renal failure was defined as the requirement of dialysis therapy. A hundred and eight patients with GFR  $\leq$  60 ml/min were enrolled in the study group.

**RESULTS:** Patients with GFR  $\leq$  60ml were older (69.3 $\pm$ 8.1 vs. 62.7 $\pm$ 55.3 years;  $p \leq 0.05$ ), presented lower left ventricle ejection fraction (38.2 $\pm$ 8.7% vs. 53.4 $\pm$ 7.5%;  $p \leq 0.05$ ), presented higher EuroSCORE (7.8 $\pm$ 2.7 vs. 3.6 $\pm$ 2.1 scores;  $p \leq 0.05$ ), presented more frequently hypertension (42% vs 27%;  $p \leq 0.05$ ) and previous myocardial infarction (63.7% vs. 49.2%;  $p \leq 0.05$ ). The number of grafted coronary vessels and frequency of diabetes were comparable in both groups. Patients with GFR  $\leq$  60ml/min developed more frequently ARF (7.4% vs. 2.1%,  $p \leq 0.05$ ), needed more often inotropic support (37% vs. 21%;  $p \leq 0.05$ ), stayed more in the ICU (4.3 days vs. 2.1 days,  $p \leq 0.05$ ), presented more often reoperation for bleeding (5.5% vs. 2.1%,  $p \leq 0.05$ ), and had higher mortality rates (14.8% vs. 3.6%,  $p \leq 0.05$ ).

**CONCLUSIONS:** Non-dialysis-dependent mild renal dysfunction in patients with left ventricle dysfunction increases morbidity and mortality after CABG.

## OP-650-ATRIAL MYXOMAS : A SINGLE UNITS EXPERIENCE IN THE MODERN ERA

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**BACKGROUND:** Although an atrial myxoma is the commonest cardiac tumour, it is still relatively rare, with an annual incidence of approximately 0.5 per million population. In our unit which performs 1000 major cardiac procedures per year, this equates to approximately 3 patients annually. We therefore sought to evaluate our experience of managing this type of tumour over the last 5 years.

**METHODS:** A retrospective review was performed of prospectively collected data from the departmental database. We analysed consecutive patients who were operated upon between 2002 and 2007. Three patients were found to have papillary fibroelastoma at histological examination and were therefore excluded from this study.

**RESULTS:** [expressed as median $\pm$ range] We have performed excision of atrial myxoma upon 18 patients, (12(66%) female, aged 64 (35-80) years, logistic euroscore 5.22% (1.51-27.82)). 15/18(83%) were deemed urgent, 2 elective and 1 emergency. 16/18(89%) tumours were left sided. Symptoms attributable to the tumour were found in 16/18 patients (embolic n=6, chest pain n=3, palpitations n=2, incidental finding n=2, others n=4), and time from diagnosis to operation was 3 days (range 0 - 22months). Operating times were 260 (110-410) minutes; Cardiopulmonary bypass times were 87 (28-228) minutes, with the aortic cross clamp time being 61 (16-175) minutes. The approach used was transeptal via right atriotomy (n=8), biatrial/Dubost (n=4), left atrial (n=4), and right atrial (n=2); the interatrial septum was involved in 14 patients. The resultant defect was closed using a pericardial (n=8), or prosthetic patch (n=5), or directly sutured (n=5). Concomitant procedures were performed in 8 patients (CABG n=4, MVR n=2, valve+grafts n=2). All tumours were completely excised. Postoperatively there were no deaths within 30 days of the procedure. Indeed only two patients have died at 4 and 25 months post op respectively, both of unrelated causes. ITU stay was 2 (1-9) days, and hospital stay 10 (5-20) days. Permanent pacemaker was required in only 1 patient, and blood loss was 340ml (140-1760). Atrial fibrillation was the commonest complication affecting 6/18(33%) of patients.

**CONCLUSIONS:** Excision of atrial myxoma can be performed using a variety of intra operative approaches and closure techniques; all with acceptable postoperative morbidity and low mortality rates. All patients are reviewed annually with echocardiographic surveillance. To date no recurrences have been found at median 2 years follow up. This ongoing study will be extended to ascertain long term recurrence and mortality data.

## OP-651-PREOPERATIVE STATIN USE DECREASES THE RISK OF SEPSIS IN PATIENTS UNDERGOING CARDIAC SURGERY

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**BACKGROUND:** The statin medications possess a multitude of pleiotropic effects including the ability to modulate the immune response. Statins improve survival in animal models of severe sepsis and observational studies in humans have suggested that statin use may be associated with decreased rates of sepsis. The impact of preoperative statin use on the incidence of deep sternal wound infection (DSWI) and/or sepsis following cardiac surgery is unknown. We hypothesized that statin use would be associated with a decreased risk of DSWI/sepsis. Accordingly, we examined the impact of preoperative statins on the occurrence of DSWI/sepsis following cardiac surgery and assessed the relationship of statin use to the risk of hospital readmission for sepsis in the long-term.

**METHODS:** All patients having isolated coronary artery bypass grafting (CABG), valve, and combined CABG/valve surgery between May 1, 1998 and June 30, 2007 (n=9485) were identified from the Maritime Heart Center (MHC) computerized database. A logistic regression model was generated to assess the relationship between preoperative statin use and the postoperative occurrence of DSWI/sepsis. Long-term follow-up was available in 7106 (75%) of the original cohort of 9485 patients through linking with Provincial Administrative Health Databases. A Cox proportional hazards model was constructed and the impact of statin use on the freedom from hospital readmission for sepsis in the sub-group of patients having long-term follow-up was examined.

**RESULTS:** Of the 9485 patients, 6749 (71.1%) were on statins preoperatively and 2736 (28.9%) were not. Patients receiving statins were more likely to be <70 years old, male, diabetic, receive bilateral internal thoracic arterial grafts, and undergo elective, isolated CABG surgery (all  $p < 0.0001$ ); and, less likely to have pre-existing renal failure (RF), congestive heart failure (CHF), or a reoperation (all  $p < 0.0001$ ). Post-operative DSWI/sepsis occurred in 301/9485 (3.2%) patients with an overall mortality of 32.8% (99/301). The mortality associated with DSWI/sepsis was significantly reduced in patients receiving statins (27.7% vs 42.5%,  $p = 0.01$ ). After adjusting for co-variables, preoperative statin use was associated with a strong trend towards decreased DSWI/sepsis (OR=0.82) although this did not reach statistical significance (95% CI=0.6-1.06,  $p = 0.14$ ). Median follow-up was 4.2 yrs (IQR=2.5-6.1 yrs) in the 7106 patients included in the long-term analysis. A Cox proportional hazards model identified the independent predictors of readmission to hospital for sepsis in this group to be urgency of the procedure (OR=1.6, 95% CI=1.05-2.37,  $p = 0.02$ ), chronic obstructive pulmonary disease (OR=1.6, 95% CI=1.05-2.4,  $p = 0.02$ ), RF (OR=3.05, 95% CI=1.86-5.0,  $p < 0.001$ ), and diabetes (OR=2.0, 95% CI=1.4-2.9,  $p = 0.0003$ ). Statin use emerged as an independent predictor for the freedom of hospital readmission for sepsis (OR=0.62, 95% CI=0.42-0.91,  $p = 0.01$ ).

**CONCLUSIONS:** Preoperative statin utilization may decrease the mortality associated with the complications of DSWI/sepsis in patients undergoing cardiac surgery. Furthermore, statin use appears to decrease the risk of subsequent hospital readmission for sepsis in patients who have undergone previous cardiac surgery.

## OP-652-LEVOSIMENDAN ACUTELY INDUCES AN INCREASE OF NO PRODUCTION IN PORCINE CORONARY ENDOTHELIAL CELLS

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**BACKGROUND:** Levosimendan has been reported to cause vasodilation through the activation of KATP channels of smooth muscle cells. Moreover the intra-coronary administration of levosimendan was recently shown in anesthetized pigs to induce a dose-dependent increase in coronary blood flow through the endothelial release of nitric oxide (NO). Even if reported data evidence a relationship between KATP channels and NO release, the information regarding the effect of levosimendan on the above issue is scarce. Moreover, the intracellular pathway involved in NO production by levosimendan has not been investigated yet. Thus, the purpose of the present study was to examine the effects of levosimendan on NO production in porcine coronary endothelial cells (CEC) and to examine the role of KATP channels on the above effects. In addition, the involvement of PI3K/Akt, ERK/MAPKs and p38/MAPK pathways in the intracellular signalling leading to NO synthase (NOS) activation has been evaluated.

**METHODS:** The experiments have been performed in CEC isolated by collage-

nase digestion from coronary arteries of pigs in absence or presence of K<sup>+</sup> 5 mM in the medium. In the first set of experiments NO production from CEC was measured in culture supernatants using the Griess method. These cells were treated with levosimendan (1 and 10  $\mu$ M) for 1 min given alone or in association with the nitric oxide synthase inhibitor L-NAME (10 mM) and with the KATP channels agonist cromakalim (1  $\mu$ M) and antagonist glibenclamide (1  $\mu$ M) given alone or in co-stimulation with levosimendan. In some experiments the effect of levosimendan on NO production has been tested after the blockade of adenylyl cyclase by 2'5' dideoxyadenosine (1  $\mu$ M) and in presence of p38 MAPK inhibitor (SB203580 1  $\mu$ M), PI3-K inhibitor (wortmannin 100nM) or MEK1 inhibitor (UO126 10  $\mu$ M). In the second set of experiments the effects of levosimendan on the level of phosphorylation of PI3K/Akt, ERK/MAPKs, p38/MAPK and NOS have been characterized through Western Blot analysis.

**RESULTS:** In absence of K<sup>+</sup> in the medium levosimendan 1 and 10  $\mu$ M caused a dose-related increase of NO production amounting to about 12.7% and 40% of control values ( $p < 0.05$ ); this effect was significantly increased in presence of 5 mM K<sup>+</sup> ( $p < 0.05$ ). Interestingly, the co-stimulation of levosimendan (10  $\mu$ M) and cromakalim caused a significant increase of NO production (145%;  $p < 0.05$ ) in comparison with the effect of levosimendan (40%) and cromakalim (47.3%;  $p < 0.05$ ) given alone. The pre-treatment of CEC with glibenclamide abolished any effect of levosimendan alone or in co-stimulation with cromakalim ( $p > 0.05$ ). Similarly, in presence of L-NAME, 2'5' dideoxyadenosine, SB203580, wortmannin and UO126 all effects of levosimendan on NO production were prevented ( $p > 0.05$ ). Western blot analysis evidenced the phosphorylation of the above intracellular signalling proteins in the activation of NOS.

**CONCLUSION:** In porcine CEC levosimendan acutely induced NOS phosphorylation through Akt, ERK1/2 and MAPK, thus causing NO production. This intracellular cAMP dependent signalling is related to the activation of KATP channels. Moreover, a role for K<sup>+</sup> levels has been highlighted, thus evidencing the importance of resting potential membrane rate in the above effects.

#### OP-653-CASUISTIC IN CARDIAC SURGERY

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**BACKGROUND:** Quick decision making and performing something unusual sometimes occur in our daily practice.

**METHODS and RESULTS:** We present some especially rare cases from our practice which were unforgettable and may be useful for everyone. The case of biatrial myxoma, lymphoma with heart lesion, sepsis with paraaortic abscess and fistula from aorta to pericardium, giant aneurism of left ventricular, rare case of aortic aneurysm, left kidney carcinoma with tumor in inferior vena cava and right atrium, rear combination of ischemic disease with septic endocarditis. All those patients were successfully treated and patient survived.

**CONCLUSIONS:** Those cases required significant efforts to be taken, however they taught us new skills.

#### OP-654-INFLUENCE OF DIFFERENT ANTICALCIFICATION TREATMENT ON VALVE TISSUE

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**BACKGROUND:** With the beginning of cardiac surgery, the replacement of diseased heart valves became a reality. However, the demand for prostheses and the shortage of allogenic donor valves soon led to the use of porcine and bovine tissue. If untreated, the natural response to these xenografts is acute rejection with cytotoxic elimination of donor cells and degradation of the extra cellular matrix. The most effective treatment to overcome this prohibitive predicament seemed to be cross linking, which was shown to mask xenogenicity and to mitigate degradation. New anticalcificant treatments have been developed because tissue calcification is a major contributing factor for bio-prosthetic valve failure. So, current research is investigating the development of additional anticalcificant treatments.

**METHODS:** Aortic valve leaflet, aortic root tissue and mitral valve leaflet samples were harvested from fresh porcine in local slaughterhouse. Valved conduits were prepared and pretreated with glutaraldehyde (glu) alone or in association with different compounds (ethylenediaminetetraacetic acid (EDTA), sodium

ethylenediaminetetraacetic acid (Na EDTA), D Alanine, D Norvaline) As opposite treatments were tested acil azide or carboimide alone, or together with other compounds. All samples were implanted subcutaneously in 30 days old Wistar rats. Explantation performed after 60 days. Residual calcium level was assessed, also histological examination was performed.

**RESULTS:** All data were divided into two groups: first - analysing how all different agents effect on each biomaterial, second group - comparing how each agent separately influences all materials. Aortic valve leaflet explants showed the lowest calcium level in samples treated with carboimide alone  $0.64 \pm 0.15$  mg/g and it was statistically different from all agents in this group. In samples from aortic wall the lowest calcium concentration was revealed also in carboimide alone treatment -  $8.3 \pm 1$  mg/g, surprisingly, the mean was statistically different comparing to all agents. Low residual calcium amount was found in mitral valve samples treated with glu/Na EDTA -  $0.69 \pm 0.18$  mg/g, and carboimide treatment in this group caused  $2.5 \pm 0.4$  mg/g calcium amount - a second best result in this group, but comparing their means we do not find it statistically not different. Comparing each agent effect on the different biomaterials we found the best effect almost in all groups of agents was on mitral valve. And statistically different it was in cases when carboimide in association with other agents was used. Respectively low level of calcium was found in aortic valve tissue ( $0.7 \pm 0.1$  mg/g) when treated with carboimide alone, as a fact it was statistically different in this group.

**CONCLUSIONS:** We find the most effective anticalcification treatment comparing all agents is in case of usage carboimide alone and with glu/Na EDTA in mitral valve. Comparing single agent the best effect was found when used glu/Na EDTA in most cases.

#### OP-655-SUBMITRAL MEMBRANOUS CURTAIN: A POTENTIAL ANATOMICAL BASIS FOR CONGENITAL SUBMITRAL ANEURYSM

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**OBJECTIVE:** To seek an anatomic basis for congenital submitral aneurysms

**MATERIAL AND METHODS:** 75 normal autopsy hearts were incised between the right and left coronary cusps up to the apex. The membranous septum was illuminated from the right side. The mitral valve was lifted anteriorly to observe extension of any membranous tissue to the submitral region.

**FINDINGS:** In 17 out of 75 hearts, the tissue of the membranous septum extended beyond the nadir of the noncoronary cusp, beneath the aortic leaflet of the mitral valve, up to the posteromedial commissural line. In 28 hearts, this submitral membranous extension continued beyond the posteromedial commissural line beneath the annulus of the mural leaflet, to a distance varying from 4mm to 21mm, with a height between 0.5 to 4mm. This extension of the membranous tissue beyond the nadir of the non coronary cusp, caudal to the aortic and mural leaflets of the mitral valve is preferably labeled 'submitral curtain'. The submitral curtain was incontinuity with the membranous septum and subaortic curtain by varying extent of opaque area due to tissue of the central fibrous body, right fibrous trigone and ventricular musculature.

**CONCLUSION:** The membranous submitral curtain of the mitral valve seen in 45 out of 75 hearts is potentially a weak area through which congenital submitral true aneurysms can occur. The presence of submitral curtain supports a congenital etiology as in sinuses of Valsalva, membranous septum and subaortic curtain. The basic pathology is the malunion / disjunction of the left ventricular musculature with the left atrium-mitral valve region due to disturbance of the complex embryogenesis which ties up the left atrium, left ventricle and the mitral valve ensuring electrical isolation. Acquired sub-mitral aneurysms have been reported in Takayasu's arteritis, tuberculosis and rheumatic endocarditis. The association may be coincidental. A genetic basis has also been suggested because of racial predilection. Considering the possibility of weak areas of junction between the mitral annulus and left ventricle, care should be taken in handling the heart to avoid the dreaded complication of disruption at the atrio-ventricular junction. The area surrounding the central fibrous body and right fibrous trigone is of increasing interest to electrophysiologists during ablation therapy for arrhythmias. Future studies: An obvious limitation of this study was the reliance on transillumination. Extension of submitral curtain anterior to the midmitral line could be missed. It is desirable to focus on the junction between the left ventricle and the mitral annulus during echocardiography in different races to look for the anatomically demonstrable submitral membranous curtain before or soon after they form submitral aneurysms. The central fibrous body and right fibrous trigone need to be more precisely defined. There is a need for

a detailed histologic study of the interrelationship between membranous septum, right fibrous trigone, central fibrous body, submitral membranous curtain and the subaortic curtain along with the aortic cusps and the intervening inter-leaflet triangles.

#### **OP-656-MANAGEMENT OF OPEN CHEST AND DELAYED STERNAL CLOSURE WITH THE VACUUM ASSISTED CLOSURE SYSTEM**

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**BACKGROUND:** To investigate the efficacy and safety of a Vacuum Assisted Closure (VAC) System as an alternative management of open chest and bridge to delayed sternal closure.

**METHODS:** 19 patients after various cardiac surgical procedures who underwent open chest management with delayed sternal closure during 2005 and 2007. Mean age was  $65 \pm 11$  years, EuroScore  $9 \pm 4$ . The management of open chest with the VAC system was evaluated in terms of impact on cardiac hemodynamics, respiratory parameters, complications, incidence of wound infection, overall handling and outcome.

**RESULTS:** The decision to leave the sternum open was made at the time of primary operation or first reexploration. In 4 patients the VAC was implanted during the primary operation. In the remainder ( $n=15$ ) the VAC was implanted after a mean of 3 days (1-10) after the primary operation. The overall mortality rate was 37% attributable to right heart failure after RVAD explantation ( $n=2$ ), respiratory insufficiency, liver failure in 1 patient each and MOF in 3 patients. In all but 1 patient, the sternum was closed and the VAC explanted before death. No hemodynamic or respiratory impairment was observed. None of the patients developed a sternal wound infection, nor where there any VAC related complications. The dreaded complication of right ventricular rupture and massive bleeding due to vacuum can be effectively prevented.

**CONCLUSION:** Management of open chest with the VAC system can be considered as an alternative to sterile draping. The feared complication of right ventricular rupture and massive bleeding can be effectively prevented. Because of the stabilisation of the thoracic cage, the patient can be easily moved and mobilized for nursing reasons and pneumonia prevention. Furthermore the VAC effectively prevents the contamination of the wound and the mediastinum with potential subsequent infection.



## CONGENITAL II

### OP-657-RUPTURE OF SINUS OF VALSALVA, EARLY AND LATE RESULTS, OUR EXPERIENCE

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**BACKGROUND:** Congenital Aneurysm of sinus of valsalva is rare anomaly. Presentation varies from asymptomatic to severe acute cardiac failure requiring emergency repair, is common in Oriental Countries, and still a surgical challenge.

**METHODS:** From September 1997 through March 2007, 17 patients 16 to 47 years (mean 29) underwent surgery of Rupture Sinus of Valsalva Aneurysms, originating in right (12) or noncoronary (5) sinuses, communicating right ventricle (11) or right atrium (6). Associated lesions were, ventricular septal defect (VSD) 7, Atrial septal defect Secundum 3, patent foramen ovale 3, significant Aortic insufficiency 5. We found correlation between aortic insufficiency and presence of subarterial VSD. Excision of aneurysms and repair of sinuses using double patches of pericardium and PTFE(Gore-tex), was routine with Aortic valve repaired in five using pericardial patch augmentation, (Modified Duran's Repair), VSD were closed with PTFE patch, Atrial septal defect using pericardial patch.

**RESULTS:** There was no hospital mortality. Follow up ranged 10 to 108 months. Clinical examination, x-ray chest, ECG, Echocardiography, were routinely done. One patient developed late severe aortic insufficiency requiring aortic valve replacement and closure of small recurrent fistula to right ventricle. Aortotomy without right ventriculotomy was used during repair. One patient developed large clot in right atrium with pulmonary embolism to left pulmonary artery responded to thrombolysis.

**CONCLUSION:** Long-term survival of Aneurysm of Sinus of Valsalva is excellent. The risk for recurrent fistula or residual VSD is less; late aortic insufficiency is still a risk, especially in right sinus of Valsalva-to-right ventricle fistula with associated subarterial VSD.

### OP-658-CLOSURE OF ATRIAL SEPTAL DEFECTS VIA LIMITED ANTERO-LATERAL THORACOTOMY AS A MINIMALLY INVASIVE APPROACH IN FEMALE PATIENTS

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**BACKGROUND:** The Closure of Secundum type of Atrial Septal defects via Sternotomy is a low risk and high benefit procedure. Limited right antero-lateral Thoracotomy is an alternative approach with regard to cosmetic aspects especially in female patients.

**MATERIAL AND METHODS:** The perioperative and long-term outcomes (mean follow up time 19.5 months) of 25 female patients mean age 16.4 years (range from 5 - 42 years) operated on for Secundum type of ASD via limited right antero-lateral thoracotomy between Jan 2004 and Sep 2007 were analyzed retrospectively. Most of the patients were asymptomatic. Few patients presented with breathlessness on exertion. Special features of operation technique were a limited skin incision and protection of mammary gland tissue.

**RESULTS:** Mean bypass time was 40 minutes. Mean cross clamp time was 18 minutes. There were no intraoperative complications. One patient had postoperative bleeding in excess of 500 ml. Two patients developed minor wound infection. All patients underwent repeat Echocardiography at the time of discharge, one month and 6 months after surgery respectively, which showed no residual defect. Cosmetic results were considered excellent and good in 87% and satisfactory in 10% and 3% of the patients had broad scar where as restriction of shoulder movement and breast asymmetry were rare.

**CONCLUSION:** Limited right antero-lateral thoracotomy has a high cosmetic acceptance and was proven to be safe and effective for closure of ASD's. Therefore it is recommended as standard approach for atrial septal defects especially in female patients.

### OP-660-IMPROVED OUTCOME OF NORWOOD PROCEDURE FOR UNIVENTRICULAR CONGENITAL HEART ANOMALIES

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**OBJECTIVES:** The management of hypoplastic left heart syndrome (HLHS) represents one of the greatest challenges in pediatric cardiac surgery. Reports regarding outcome continue to improve. This study was designed to review our short and midterm experience with patients who underwent staged surgical palliation with the Norwood procedure.

**METHODS:** The database of all patients who underwent Norwood procedure and Damus-Kaye procedure at our institution between the periods of January 2001 until September 2007 were examined. Patient data, echocardiographic findings; operative, ICU and hospital course had been reviewed including short-term and midterm outcome. The outcome measure was survival to hospital discharge.

**RESULTS:** 30 patients underwent Norwood and Damus-Kaye procedures for single ventricular pathology during the study period. Median age at operation was 19 days (range 1 to 660 days) and mean weight was 3.82 kg (range 2.4 to 10.3 kg). 17 patients (56.7%) had classic hypoplastic left heart syndrome. The remaining 13 patients had other forms of univentricular anomalies. The majority of our patients underwent the Sano modification of the Norwood procedure (28 patients). The mean cardiopulmonary bypass time was 141 min (range 51 to 338 min). The mean cross clamp time was 62.8 min (range 36 to 132 min). Deep hypothermia circulatory arrest was used in four patients only (15.3%), with a mean period of 54.75 min (range 46 to 60 min). The rest of children were managed with selective brain perfusion. Three patients died within 30 days after surgery (10% 30-days mortality). We had no early mortality in the last 27 patients of our experience. Delayed sternum closure was done in 19 patients (63.3%). Five patients (16.6%) required reintervention in the form of recoarctation balloon dilatation, right ventricular aneurysm resection, tricuspid valve repair, recoarctation surgical repair and conduit replacement due to conduit stenosis. Of the survivors, 17 already underwent Glenn and four had Fontan completion of Norwood procedure.

**CONCLUSION:** Although it is known that, the Norwood procedure remains one of the highest risk procedures in pediatric cardiac surgery: Sano modification of the Norwood procedure and the avoidance of deep hypothermia circulatory arrest in association with proper perioperative management can decrease the mortality and morbidity.

### OP-661-SEARCHING THE OPTIMAL TIMING TO RE-OPERATE FALLOT'S TETRALOGY WITH PULMONARY INSUFFICIENCY

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**BACKGROUND:** Survivors of Fallot's tetralogy (TOF) repair using trans-annular patch present right ventricle (RV) dysfunction due to pulmonary regurgitation. Timing of re-intervention (re-op) is variable and not yet established. Follow-up using new tools might give more accurate anatomical and functional insight leading to better define markers for decision-making. We correlated significant diagnostic parameters pre and after RV outflow tract (RVOT) reconstruction in order to define an optimal timing for re-op.

**METHODS:** Sept. 2003 - March 2007. 122 operated TOF (mean age 19 ± 10 years) were evaluated by MRI, echocardiogram, cardiopulmonary exercise testing (CPT), Holter ECG and Amino-Terminal pro-Brain Natriuretic Peptide (NT-proBNP) blood level assay. 56 age and sex matched healthy volunteers served as control group. During the same period 17 pts (re-op pts) underwent RVOT reconstruction using a RV to pulmonary artery biological Hancock valved conduit. Insertion of the conduit represented a RV remodelling procedure with exclusion of aneurysmal portion of RV wall and dilated trans-annular patches. All re-op pts were re-evaluated 6 months after surgery.

**RESULTS:** compared to control group there was pre operatively in TOF pts a reduced CPT (peak VO<sub>2</sub>/kg 19.5 ± 6 vs. 30 ± 8 ml/kg/min, workload: 99 ± 34 vs. 159 ± 49 Watt, p<0.0001) and higher NT-proBNP (212 ± 246 vs. 37 ± 6 ng/L, p<0.001). NT-proBNP showed strict correlation with indexed telesystolic RV (tsRVi) volume (R=0.52, p<0.001) and tdRVi volume (R=0.44, p<0.001). All 17 re-op pts had pre-op NT-proBNP higher than overall TOF population (543 ± 185 vs. 210 ± 246; p<0.001). In 17 re-op pts the tdRVi and tsRVi were higher



than in all TOF pts :  $180 \pm 51$  ml/m<sup>2</sup> vs.  $134 \pm 43$  ml/m<sup>2</sup> ( $p < 0.001$ ) and  $96 \pm 36$  ml/m<sup>2</sup> vs.  $63 \pm 28$  ml/m<sup>2</sup> ( $p < 0.0001$ ); RVEF was in 17 re-op pts reduced  $46\% \pm 12$  vs.  $54\% \pm 9.5$  ( $P < 0.001$ ). After re-op tdVRi and tsRVi decreased from  $180 \pm 51$  ml/m<sup>2</sup> to  $91 \pm 22$  ( $p < 0.005$ ) and from  $96 \pm 36$  ml/m<sup>2</sup> to  $46 \pm 14$  ( $p = 0.001$ ); RVEF and RV systolic pressure changed from  $47 \pm 9\%$  to  $51 \pm 7\%$  and from  $55 \pm 50$  mmHg to  $36 \pm 9$  mmHg. NT-proBNP level significantly dropped from  $365 \pm 272$  to  $120 \pm 141$  ng/L ( $P < 0.05$ ) while CPT slightly increased from  $17.5 \pm 3$  ml/kg/min to  $20 \pm 1$  ml/kg/min ( $P < 0.05$ ). These values were not in normal range comparing to control group.

**CONCLUSION:** These results show, in operated TOF, a linkage between cardiac natriuretic expression and many of the RV overload markers. Six months after RVOT reconstruction, NT-proBNP plasma levels and RV volumes drastically decrease. Though the tdRVi volume decreases to normal values, CPT slightly increases without normalization and with no significant change in RVEF. Even if "normality" is probably not obtainable the longitudinal use of a standardized protocol (MRI, CPT and NT-proBNP plasma assay) could optimize the management of these pts.

### OP-662-LIVER FUNCTION OF DESFLURANE VERSUS SEVOFLURANE ANESTHESIA IN ACYANOTIC CHILDREN FOR OPEN HEART SURGERY

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**BACKGROUND:** There are few data on perioperative liver function in children with acyanotic congenital heart disease undergoing open heart surgery. We investigated the perioperative liver function in acyanotic children undergoing desflurane and sevoflurane anesthesia for open heart surgery.

**METHODS:** The perioperative liver function in 28 acyanotic patients who underwent open heart surgery was compared with sevoflurane and desflurane effect. Desflurane was given at concentration levels of 5-6% before cardiopulmonary bypass (CPB) and 2-3% during CPB, sevoflurane was given at concentration levels of 1-2% before CPB and 1% during CPB with BIS monitorization after standard anaesthesia induction. The induction of anesthesia was provided with thiopental, morphine, vecuronium. Two groups were given desflurane and sevoflurane before and during CPB. Group 1: Desflurane-acyanotic patients ( $n=14$ ), Group 2: Sevoflurane-acyanotic patients ( $n=14$ ). Blood samples were performed, before induction, at the end of the operation and 24th hours post-operatively. Liver function was assessed at these times by determining plasma concentrations of alanine aminotransferase (ALT), aspartate amino transferase (AST), g-glutamyltransferase (GGT) and alkaline phosphatase (AP).

**RESULTS:** There were no differences between the groups regarding to gender, age, body weight, CPB time and aortic cross clamping time. At the end of the operation and 24th hours postoperatively, plasma AP levels were significantly lower in the Group 2 than the Group 1 ( $p < 0.05$ ). The patients anesthetized with desflurane had significantly more liver dysfunction compared with the patients anesthetized with sevoflurane.

**CONCLUSION:** We conclude that liver function should be monitored more closely for AP changes and liver damage in children undergoing desflurane anesthesia for open heart surgery. Key words: liver function, congenital heart disease, desflurane, sevoflurane.

### OP-663-DEALING WITH DR JEKYLL AND MR HYDE - PERFORMING PEDIATRIC CARDIOVASCULAR SURGERY IN A DEVELOPING COUNTRY

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**BACKGROUND:** Although Brazil is a rich country, its resources are bad distributed and thus denying the poor access to adequate health care. The finest practices (the Dr Jekyll) live alongside centres for cardiac surgery plagued by delayed diagnosis, lack of hospital beds and poor follow-up (the Mr. Hyde) and hence impacting negatively on the surgical results. In this paper we describe

two medical cases we typically encounter in our practice to illustrate this situation. Case 1 A five year old female, born with tricuspid atresia type 1 C was submitted to pulmonary banding when she was eight months old. In spite of being a long time without medical attention, she had normal weight and height when arrived to our centre. The physical examination revealed only a harsh systolic murmur and the echocardiography showed the presence of effective banding of pulmonary trunk and no signs of pulmonary hypertension. She was therefore submitted to a successful bi-directional Glenn procedure and discharged in the seventh post operative day with good echocardiography control. Presently she receives aspirin to prevent platelet aggregation and is waiting for a Fontan surgery. Case 2 A four year old boy born with tricuspid atresia type 1 C who has not received medical attention until being referred to our centre. He was undernourished and showed strong signs of chronic cyanosis such as digital clubbing. The echocardiography showed the presence of marked pulmonary hypertension. The hemodynamic study revealed fixed pulmonary hypertension without reduction with the use of vasodilators. In view of his clinical condition, he could not undergo surgery.

**CONCLUSION:** Pediatric cardiac surgery has had a colossal development in the past decades since the first case of successful ligation of a patent ductus arteriosus performed by Gross in 1939 and the development of the systemic -to - pulmonary circulation shunt by Drs. Blalock and Taussig in 1944. In Brazil there is an annual demand for 23000 pediatric cardiac surgeries of which only 8000 are effectively performed thus leaving 15000 children each year without treatment. With a population of 190 million, there are not enough resources for correct diagnostics of the poor, especially those living in remotes areas as the best practices are concentrated on the rich southeast. This lack of resources also impacts negatively on the availability and quality of tertiary care facilities, where patients often receive late diagnostics or no medical attention after surgery. The social impact of this condition is very significant, as properly performed pediatric cardiac surgery can restore, in most cases, the child's health and allow a productive life. This contrast between the health services is more blatant when considering Brazil's contribution to pediatric cardiac surgery.

### OP-664-PERSISTENT DUCTUS ARTERIOSUS IN ADULTS - ARE DEVELOPING COUNTRIES PREPARED TO HANDLE CHALLENGES

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**BACKGROUND:** Ligation of PDA was the first successful surgical procedure to be performed for congenital heart disease (CHD). Though presentation is mostly in infancy and childhood, PDA manifesting in adult patients is not uncommon. Conventional surgical ligation of PDA is technically more difficult in adult patients. Thus careful evaluation is necessary in order to adopt appropriate therapeutic approach which may preclude conventional surgical ligation.

**METHODS AND RESULTS:** We report a case of 22 year old lady with Patent Ductus Arteriosus (PDA) that was successfully ligated surgically. Identifying the peculiarities of a developing country like Nigeria where low literacy level and unavailability of prompt cardiac evaluation may result in late presentation of patient with PDA, we reviewed the literature on current modalities available for the management of challenges in adult patients presenting with PDA. We use this review as a means of evaluating our ability to handle such challenges in Nigeria.

**CONCLUSION:** The challenges which may present in an adult patient with PDA are numerous and could be catastrophic if an inappropriate management option is employed. Though closure under CPB provides a controlled atmosphere for closure, fragility and presence of calcification remain major obstacles and presence of co-morbidities may limit its use. While VATS provides a less traumatic access it is not recommended for adults due to difficulty in mobilizing the rigid aorta and similar risk to thoracotomy exist in actual ligation of the ductus. TCDO or aortic stent graft techniques seem to be most suited for the adult patients with enumerated problems. Trauma of access is eliminated and risk of ductus injury is minimal. With newer modifications of these techniques, occlusion rates are excellent. However centers in the developing countries can not boast of these. In fact only few centers can conduct the full range of necessary investigation to identify or exclude the potential problems, and even fewer have facilities for occlusion under CPB!

### **OP-665-LECOMPTE PROCEDURE FOR CORRECTION OF THE TRANSPOSITION OF THE GREAT ARTERIES ASSOCIATED WITH VENTRICULAR SEPTAL DEFECT AND LEFT VENTRICLE OUTFLOW TRACT OBSTRUCTION**

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**BACKGROUND:** The Lecompte procedure, which is called - R'eparation ũ l'e-tage ventriculaire- used for the anatomic repair of transposition of the great arteries associated with ventricular septal defect and pulmonary stenosis, to day is employed in an effort to avoid the limitations of Rastelli operation.

**METHODS:** Between February 1994 and July 2007, eight patients with ages between 2 and 8 (median:2.9) with anomalies of Ventriculo-Arterial connection, ventricular septal defect and pulmonary outflow tract obstruction were considered to fulfill the conditions required for anatomic repair. After the intra-ventricular connection of the left ventricle to the aorta, to use the natural pulmonary orifice for the pulmonary outflow tract reconstruction. In six cases, were used Heterograft prosthesis (bicuspid=4 and tricuspid=2), one case, used Polytetrafluoroethylene prosthesis and one case, used Homograft. The first patient of this serie was converted from Rastelli operation to Lecompte procedure, due to right ventricular-pulmonary artery prosthesis obstruction.

**RESULTS:** There was one hospital death (12,5%) and not late reoperations or death . Seven patients whose follow-up time was 12 to 160 months (median 95.3) with clinical and echocardiographyc evaluation. No stenosis of the aortic flow tract was found. Three patients have a trivial to moderate pulmonary insufficiency.

**CONCLUSION:** Lecompte procedure has the following advantages: 1- surgical indication for infants. 2-Low morbidity and mortality. 3- Free from reoperation over the long term. 4- Possibility of conversion of Rastelli procedure to Lecompte procedure.

### **OP-666-OPEN CARDIAC SURGERY IN NEONATES AND INFANTS LESS THAN 3 KG BODY WEIGHT**

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**OBJECTIVE:** Low body weight is a risk factor for pediatric open cardiac surgery. We report our experience in neonates and infants less than 3 Kg body weight who underwent open cardiac surgical procedure.

**PATIENTS AND METHODS:** The hospital records for neonates and infants less than 3 Kg who underwent open cardiac surgery from June 2000 to August 2003 were reviewed regarding diagnosis, surgical procedure, outcome, length of ICU stay, ICU complications, and length of hospital stay.

**RESULTS:** There were 41 babies, 23 were males and 18 were females. Age ranged from 3 to 60 days. Weight ranged from 1.7 to 2.9 Kg. Preoperative diagnosis was: d-TGA intact septum in 10; d-TGA with VSD in 7; double outlet right ventricle in 5; large VSD in 4, total anomalous pulmonary venous drainage (TAPVD) in 3, pulmonary atresia with VSD in 2, pulmonary atresia with intact septum in 2, complete atrioventricular septal defect (AVSD) in 2, severe mitral regurgitation in 1, anomalous origin of left coronary artery from the pulmonary artery in 1, pulmonary artery sling in 1, aortopulmonary window in 1, cardiac tumor in 1, and dextrocardia with isolated ventricular inversion, LVOTO and VSD in one patient. Arterial switch operation was done in 17, Rastelli procedure in 6, VSD closure in 4, AVSD repair in 2, open pulmonary valvotomy in 2, intra-ventricular switch in 1, repair of TAPVD 3, and resection of LVOTO, pulmonary artery banding in 1, mitral valve replacement in 1, ALCAPA repair in 1, repair of A-P window in 1, resection of a cardiac tumor 1, and relieve of a pulmonary artery sling in one patient Only one patient died, from overwhelming sepsis, after open pulmonary valvotomy (3%). The sternum was electively left opened in five patients (15%), either because of bleeding or cardiac edema. Major complications occurred in six patients (17%). Some patients had had more than one complication. All have recovered without any sequele. ICU stay ranged from 2 to 20 days, while hospital stay ranged from one week to forty-seven days.

**CONCLUSION:** Corrective open cardiac surgery can be done with a very low mortality and acceptable morbidity in low body weight infants. Elective delayed sternal closure may be necessary in some babies. A dedicated pediatric cardiac ICU is essential to optimize the surgical outcome in this subset of critically ill infants.

## MINI PRESENTATIONS III

### OP-667-OFF PUMP VERSUS ON PUMP CORONARY ARTERY BYPASS GRAFTING: SEVEN YEARS SINGLE INSTITUTION EXPERIENCE

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**INTRODUCTION:** OPCAB was introduced in our institution in 2000; since then 460 (29%) out of 1540 coronary artery bypass grafting cases were done. The objective of this study is to compare the outcome measures between the off pump (OPCAB) and on pump coronary artery bypass grafting (ONCAB) groups in Saudi patients.

**METHODS:** This is a retrospective observational study done for patients operated on in the period from Jan. 2000 to August 2007.

**RESULTS:** The mean age was  $58.1 \pm 19$  years with no difference in the mean age between the two groups. The mean Euro- score was 2.9 in ONCAB vs. 2.5 in OPCAB group. The 30 days mortality was 14.2(3.1%) in OPCAB versus 37(3.5%) for ONCAB ( $p=0.6$ ). Perioperative MI was not significantly different between the two groups (6% in OPCAB Vs 8% in ONCAB patients). De-novo renal impairment developed in nine OPCAB cases (2%), whereas this occurred in 75 ONCAB cases (7%) ( $p = 0.02$ ). There was no difference with regards improvement or deterioration in preoperatively impaired renal function. Stroke rate was 2% in ONCAB cases whereas none was recorded for the OPCAB cases. Significant CCU psychosis was much lower in OPCAB group (23(5%) vs. 140(13%)) ( $p=0.004$ ). No significant difference in the number of grafts between the two groups (2.1 in OPCAB vs. 2.6 in ONCAB). Re-exploration for bleeding was needed in 3.3% in OPCAB cases versus 5.5% in the ONCAB group ( $p=0.01$ ). The mean length of hospital stay (LOHS) was  $9.2 \pm 3$  days in ONCAB whereas in OPCAB cases it is  $7.4 \pm 3.4$  days ( $p=0.05$ ).

**CONCLUSION:** OPCAB did not provide a survival advantage, but has shown, in this study, a renal protective advantage, less incidence of stroke and less LOHS.

### OP-668-IS IT FEASIBLE TO AVOID STROKE IN OFF-PUMP CORONARY ARTERY BYPASS GRAFTING?

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**BACKGROUND:** One of the major and devastating complications of the coronary artery bypass grafting (CABG) is the stroke. Avoiding cardiopulmonary bypass (CPB) may reduce this neurological complication. In the past years there was an increased interest in the off-pump coronary artery grafting (OPCAB). The benefit of this method of revascularization in term of stroke and mortality is controversially discussed.

**METHODS:** A retrospective analysis of collected data from 252 patients were operated without cardiopulmonary bypass out of 1516 CABG procedures from January 2004 through May 2006. The mean age of the patient population was ( $70 \pm 11$ ) within a range of 27 - 88 years. 48 patients (19%) were older than 80 years and there were 172 males (69%). Mean graft per patient was  $1.78 \pm 0.79$ . The internal mammary artery (IMA) graft was used in 95% of the patients. For 8 patients (3.17%) this was the second procedure.

**RESULTS:** Hospital mortality was 3.17%; Mean euro SCORE in these patients was  $10.36 \pm 6.67$ . No neurological complications occurred, six pts. (2.38%) had temporary psycho syndrome. Postoperative myocardial infarction occurred in 3 patients (1.19 %). Two patients required rethoracotomy as a result of bleeding. Thirty-eight patients (15%) needed postoperative therapy for atrial fibrillation.

**CONCLUSION:** CABG with OPCAB technique has the benefit of low mortality and morbidity in terms of Stroke. The advantages of this technique depends on the patient's general condition at the time of the operation, the sufficiency of pump function and coronary morphology, as well as on the surgeon's experience.

### OP-669-SELECTIVE RETROGRADE VENOUS REVASCULARIZATION OF THE MYOCARDIUM. AN EXPERIMENTAL PIG MODEL

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**BACKGROUND:** To investigate the possibility of nourishing the myocardium through selective retrograde coronary venous bypass grafting (CVBG) in a porcine model, using off-pump technique and evaluate various methods of monitoring the physiological effects of this procedure.

**METHODS:** The left internal mammary artery (LIMA) was anastomosed to the left anterior descending coronary vein (LAD vein) off-pump. The LAD vein was ligated proximal to the anastomosis. The LAD artery was ligated proximally. The physiological effects were monitored using microdialysis, tissue oxygen tension, blood flow in LIMA, blood samples, hemodynamically and histologically. As controls, five pigs were sham operated, i.e. LAD artery ligation without CVBG.

**RESULTS:** Sixteen pigs underwent CVBG with LAD ligation. Twelve survived CVBG and were monitored for 2-2½ hours while in sinus rhythm, indicating a 75% salvage-rate after an otherwise lethal LAD artery occlusion. Immediately after LAD artery ligation, the anterior wall of the left ventricle became cyanotic and hypokinetic. Over time it regained color and contractility, as flow in LIMA increased. Microdialysis showed a significant increase in lactate. Initially tissue oxygen tension decreased, but within time some recovery was seen. Cardiac troponin T was elevated. Histology showed ischemic changes. In control pigs, microdialysis was performed for 1½ h up to LAD artery ligation after which all pigs died in ventricular fibrillation arrest. No increase in lactate was observed.

**CONCLUSIONS:** Following LAD artery occlusion, CVBG can nourish the myocardium to a certain extent and in the majority prevent death, although with a varying degree of ischemia remaining.

### OP-670-CAROTID ENDARTERECTOMY / CORONARY ARTERY BYPASS GRAFTING: ARE THERE ANY MERITS?

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**BACKGROUND:** The choice of the optimal surgical management remains controversial for patients with carotid and cardiac disease. The options of treatment include combined carotid endarterectomy (CEA) and cardiac surgery or a staged approach. Furthermore, recent off-pump surgery (OPCAB) may also have an impact on patients with significant carotid stenosis. The purpose of this study is to examine the merits or disadvantages of combined CEA/coronary artery bypass grafting (CABG) in our institution.

**METHODS:** Our study population was 159 patients who underwent CABG with significant carotid disease, as all patients had a carotid color duplex examination before CABG. The coronary bypass operations were performed with standard surgical techniques, with use of at least one mammary artery in all cases. The myocardial protection was accomplished with cold blood cardioplegia and the operative monitoring included Swan Ganz catheter, SVO2, TE Echo and Cerebral oxymetry.

**RESULTS:** Carotid stenosis between 50-75% was found in 120 patients and 39 patients had stenosis  $\geq 75\%$ . From these 39 patients, 27 underwent combined CEA-CABG and 12 did not undergo simultaneously CEA but the operative strategy was modified to reduce the probability of postoperative stroke (CVA). None suffered from CVA.

**CONCLUSIONS:** Despite several investigations of the clinical efficacy of CEA the effect of combined CEA-CABG on perioperative stroke is unclear. In our institution the multifactorial approach as shown above, during the surgical treatment of these patients gives a great merit for them with no case of CVA. .

### OP-671-RELATIONSHIP OF ATRIAL FIBRILLATION AND STROKE AFTER CORONARY ARTERY BYPASS GRAFT SURGERY

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**BACKGROUND:** Atrial fibrillation (AF) is considered as a risk factor for stroke after coronary artery bypass grafting operations.

**METHODS:** A retrospective search in our hospital's medical record database was done to identify patients with postoperative strokes who underwent coronary artery bypass grafting operations from January 2005 until July 2007. All cases were individually reviewed, and the temporal relationship between neurologic event and postoperative episodes of AF was determined.

**RESULTS:** Of the 2095 coronary artery bypass grafting operations, 380 patients (18.1%) had AF and 38 patients (1.8%) suffered stroke. Twenty stroke patients maintained normal sinus rhythm during their hospital stay. Of the remaining 18 patients, 10 presented with neurologic deficit before the first episode of AF, with 5 having intraoperative and 5 having postoperative stroke. Of the 8 patients with AF before neurologic event, three strokes occurred within 1 week after spontaneous conversion to normal sinus rhythm. Two patient with pre-operative and also with intraoperative AF who underwent emergency coronary artery bypass grafting woke up with stroke. In the remaining three cases, the AF episodes lasted less than 6 hours each before the neurologic event. More aggressive anticoagulation as suggested in the published guidelines could not have prevented strokes in any of these 8 patients.

**CONCLUSIONS:** This retrospective analysis does not support the use of aggressive anticoagulation, particularly full intravenous heparinization as a bridging therapy to decrease the already low incidence of postoperative strokes after routine coronary artery bypass grafting surgery.

### OP-672-CLOSURE OF TRICUSPID VALVE FATIGUE FAILURE-A SERENDIPITOUS OBSERVATION TO AID DESIGN OF MITRAL VALVE

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**BACKGROUND:** Closure of tricuspid valve in single ventricle is an infrequent surgical procedure, which requires standardization. Few reports have been published without any emphasis on the procedure and use of the standard material for closure. We have chosen our indigenously processed bovine pericardium with tensile strength of 19 Mega Pascal and propensity for cellular growth, to close the tricuspid valve in single ventricle with other complexities.

**MATERIALS AND METHODS:** A twelve year old boy who had Pulsatile Bi-directional Glenn operation with atrial septectomy in 2003 presented with his basic problems of Double inlet and outlet left ventricle, large VSD, along with severe pulmonary stenosis and rudimentary right ventricle, trivial mitral regurgitation, severe tricuspid regurgitation because of annular dilatation and straddling tricuspid valve and aneurysmally dilated right atrium (RA). He was in atrial flutter with features of right ventricular (RV) failure. Fenestrated Extracardiac Fontan completion was performed in August 2007 with closure of right Atrio-ventricular (A-V) valve using bovine pericardial patch, and A-V Node ablation and excision of redundant Right Atrial wall with trans atrial endocardial lead placement in RA and RV with permanent dual chamber pacemaker implantation. Above procedure was performed under cardiopulmonary bypass. Post operative he was in sinus rhythm, without right A-V valve leak but with moderate LV dysfunction, and fenestration shunting from right to left. Within three months he came back with severe right A-V valve regurgitation. A conclusion was drawn that the peripheral suture of the pericardial patch might have given away at the entry point of the ventricular lead. It was proved wrong with a novel finding on re-operation to correct the leak. The ruptured patch had been taken off and replaced by a Polytetrafluoroethylene Patch after approximating the native tricuspid valve. Patch was examined under microscope.

**OBSERVATION:** The patch at the periphery appeared to be confluent with the annular tissue without any gap between the lead. Contrarily the patch has ruptured in a semilunar fashion giving the exact appearance of a mitral valve ori-

fice associated with deficiencies along the line of the position of secondary and the tertiary chordae if they were present. H&E stain; Transmission Electron microscopy and immunohistochemistry studies have shown the lines of deficiencies as well as host endothelial and smooth muscle cells deposition. This indicated the high-pressure exposure to the pericardial patch (acting as diaphragm) without pressure relieving perforation.

**CONCLUSION:** Despite the flowing pulmonary artery the patch that was two and half times stronger than native bovine pericardium needed the perforation as it was subjected to the systemic pressure continuously. Further tricuspid valve chordae were not approximated in the first occasion of Fontan completion leading to stress not being absorbed by the chordae and it ruptured. The appearance of the tear implies that normal mitral valve apparatus design is perfectly predestined to bear the impact of systemic ventricle as it has the load sharing papillary muscles and its chordae at their respective sites.

### OP-673-SHORT TERM RESULTS AFTER PULMONARY VALVE REPLACEMENT USING THE MATRIX P PLUS HEART VALVE

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**BACKGROUND:** Homografts and Contegra valves are frequently used for pulmonary valve replacement (PVR). However, long term results are disappointing because high degeneration and stenosis rates are observed. Therefore the choice of the right prosthesis for PVR is still matter of debate. Since November 2005 Matrix P Plus (MPP), a tissue engineered porcine pulmonary valve, is available.

**METHODS:** Between 04/2006 and 9/2007, 25 patients (20 male, mean age 9,5 years, range 11 days - 58 years, mean weight 40,5 kg) underwent RVOT-reconstruction with MPP. Diagnoses were: AS (6), TGA/VSD/PS (6), TOF (7), PA/VSD/MAPCA 3, HLHS 2, TGA 1. Eight patients underwent primary repair, 8 had prior homograft or biologically PVR and ten had other previous operations. Implanted graft sizes were: 26-28 (n=11), 23-25 (n=5), 17-19 (n=5) and 14-16 (n=5) mm. Mean follow up is 0,5 years.

**RESULTS:** Three children died 3 month following operation because of arrhythmia, RV-failure or sepsis. In one case a marked stenosis developed within six months. Ten patients are echo-cardiographically uneventful. Nine patients show a trivial insufficiency or an elevated flow. One patient had a higher grade insufficiency which later on showed a marked regression. Remodelling of this valve might have strengthened the leaflets and thereby improved patients' condition. Until now no thrombosis, embolism, endocarditis or calcification could be observed. All surviving patients are in good clinical condition.

**CONCLUSION:** The MPP is a good alternative compared to homografts or other biological valves for RVOT-reconstruction. However these are only short term results and therefore they can not be compared to long term results already achieved with other valves for RVOT reconstruction.

### OP-674-OFF-PUMP FONTAN OPERATION IN COMPLEX SINGLE VENTRICLE

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**BACKGROUND:** Fontan operation is usually performed with cardiopulmonary bypass. Extra-cardiac Fontan operation has advantages when compared to the conventional Fontan procedure. Also it can be performed off-pump. Off-pump Fontan is challenging in patients requiring pulmonary arterioplasty especially due to previous central shunt operations performed by median sternotomy and to the right pulmonary artery.

**METHODS:** 16 consecutive patients underwent Fontan operation without cardiopulmonary bypass at our institution.

**RESULTS:** 16 patients that underwent off-pump extra-cardiac Fontan included 5 patients who required pulmonary arterioplasty. All the patients underwent successful extra-cardiac Fontan procedure without cardiopulmonary bypass.

**CONCLUSION:** Off-pump Fontan can be performed in patients who do not require intra-cardiac surgical interventions. Extensive pulmonary arterioplasty can also be executed with off-pump technique.



### OP-675-EARLY REPAIR OF HEMITRUNCUS- SURGICAL MANAGEMENT WITH THE BEATING HEART TECHNIQUE

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**BACKGROUND:** Anomalous origin of a pulmonary artery from the ascending aorta is a rare congenital cardiac malformation which needs prompt surgical repair otherwise is associated with poor prognosis. We describe 5 cases with anomalous origin of the pulmonary artery from the ascending aorta that underwent successful complete surgical correction using the beating heart technique.

**METHODS:** Our medical records from 2001 to 2007 were reviewed. During that period two patients with hemitruncus had surgery in the neonatal period (< 30 days), two patients at 1 to 6 months and one patient at 2 years of age. Of these, 3 were male and 2 female. Diagnosis was established by angiocardiology in 2 patients and echocardiography alone in 3 patients. Four patients had anomalous right pulmonary artery origin from the aorta and one anomalous left pulmonary artery from the aorta. Common associated anomalies included patent ductus arteriosus in all patients and patent foramen ovale in 3 patients. All patients underwent complete surgical correction, 3 of them without the use of cardiopulmonary bypass (CPB) support and the rest 2 with the beating heart technique, without cardiac arrest.

**RESULTS:** There was no operative mortality. Four patients had direct implantation of the anomalous pulmonary artery to the main pulmonary artery (MPA). In one patient a 10 mm Gortex interposition graft was used between the right pulmonary artery (RPA) and the MPA, while the RPA was enlarged with the use of a pericardial patch. All patients had an uneventful recovery. Hospitalisation ranged from 7 to 30 days. During the 2 months to 5 years follow up period all patients remain in excellent clinical condition and free from further intervention.

**CONCLUSION:** Early surgery is indicated for hemitruncus with excellent hemodynamic and anatomic results. Correction of anomalous origin of a pulmonary artery from the ascending aorta with the beating heart technique is feasible and effective for complete repair of this rare congenital heart defect.

### OP-676-REOPERATIONS IN CONGENITAL HEART SURGERY

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**BACKGROUND:** Patients with congenital heart disease require life-long medical care, even they had a corrective heart operation. A significant number of these patients may need reoperations due to degenerated prosthetic materials, valved conduits or progression of the valvular lesions. Congenital heart reoperations are different from adult counterparts due to their inherent properties and special technical difficulties.

**METHODS:** Between February 2000 and April 2007, we performed 1108 congenital heart operations. 150 of them were reoperations with previous sternotomy (13.5%). Their ages ranged from 2 months to 58 years (mean 9.7±9.1 years). 43 patients who had previous palliation, underwent reoperation for total repair. Other reoperations were as follows: Right ventricle outflow tract reoperations in 28 patients; Atrioventricular valve reoperations in 18 patients; Left ventricle outflow tract reoperations in 15 patients; Fontan revisions in 9 patients; Arterial switch/double switch reoperations in 9 patients; Pulmonary venous return reoperations in 4 patients; Ross reoperations in 2 patients; and other reoperations in 21 patients. Surgical approach was re-sternotomy in all except clamshell incision in 3 patients.

**RESULTS:** Twelve patients died in early postoperative period (8 %) due to low cardiac output (n=5); Neurologic complication (n=3); Persistent pulmonary hypertension and sepsis (n=3); pulmonary hemorrhage (n=1). Intensive care unit stay was more than one week in 17 patients (11.4 %). Only in two patients, urgent commence of CPB was required because of abandon bleeding during re-sternotomy.

**CONCLUSION:** Causes of reoperations are mostly from inevitable causes, such as degeneration of the conduit/ native valve or long-term complications of special procedures (Fontan, atrial switch, arterial switch and Ross operation). Reoperations can be performed with similar risk as the primary operations. An experienced multidisciplinary team work, proper indication and timing for reoperation, detailed preoperative planning with meticulous and pre-cautious surgical technique play key roles for the success of these operations.

### OP-677-TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION : OUTCOME OF SURGICAL CORRECTION AND LONG TERM FOLLOW UP

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**BACKGROUND:** We report a retrospective analysis of the demographic and clinical profiles of patients in order to assess the results of operative repair for total anomalous pulmonary venous connection (TAPVC) and the long term follow up.

**METHODS:** In the period between January 1998 and september 2005, 28 patients (16 boys, 12 girls) underwent repair for total anomalous pulmonary venous connection. Their ages ranged from 2 weeks to 1.6 years (mean 4 months). The patients' weight ranged from 3 to 8 kg (mean 5 kg). About 80% of patients (n=22) were less than the 50th percentile of predicted weight for age and sex. The anomalous connection was supracardiac in 23 (82%), cardiac in 3 (11%), infracardiac in 1(3.6%) and mixed in 1(3.6%) patient. Six (21%) patients had obstructed drainage and 9 patients (32%) had moderate or severe pulmonary arterial hypertension. Five patients (18%) had to be operated upon on an emergency basis. For supracardiac and infracardiac connections, transcardiac approach was used for anastomosis. In cardiac type, coronary sinus was unroofed and the resultant defect along with atrial septal defect was closed with a single patch.

**RESULTS:** All the patients were operated upon using moderately hypothermic cardiopulmonary bypass except 4 patients (circulatory arrest was used). There were 2 (7.1%) in-hospital deaths. One patient died of pulmonary arterial hypertensive crisis and one developed severe chest infection (died 3 weeks post-operatively with no pulmonary venous obstruction). Follow-up ranged from 7 to 97 months (mean 57 months). There were no late deaths, but 2 patients developed venous obstruction and required balloon dilatation.

**CONCLUSIONS:** Mortality continues to be relatively high in infants with total anomalous pulmonary venous connection. Severe pulmonary arterial hypertension appears to be the most important predictor of operative mortality. Severe malnutrition, delayed diagnosis and late referrals possibly contribute to the high mortality.

### OP-678-TRANSESOPHAGEAL ECHOCARDIOGRAPHY- A PRICELESS TOOL IN PROVIDING SURGICAL EXCELENCE

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**BACKGROUND:** Post operative evaluation of the adequacy of surgical repair of congenital heart defects is of utmost importance. Trans Esophageal Echocardiography (TEE) has become the standard of care in providing real time information and in assessing the operative success, and has great influence on cardiac surgical decision making. For the last decade TEE is routinely performed at our institution following congenital heart surgery. We herein present our experience and clinical impact of the use of TEE in the operating room.

**METHODS:** Retrospective review of all intra-operative TEE studies performed in the operating room in the years 2004 to 2007.

**RESULTS:** 1000 TEE studies were performed in the operating room following congenital heart surgery in the years 2004 to 2007. In 5.5% of the cases (55 Pts) a second bypass run was needed in order to achieve optimal results due to residual RVOTO (51%, mostly TOF), residual LVOTO (7%), Valve dysfunction (18%), Ventricular dysfunction (5%) and Unexpected surgical errors (5%). In all 55 patients residual lesions were corrected.

**CONCLUSIONS:** TEE is a priceless tool in providing surgical excellence. Close collaboration between the cardiologist and the cardiac surgeon leads to a team approach, enabling the surgeon to safely walk the thin ice by precisely tailoring his surgical repair, knowing that TEE will guide him through in achieving the optimal result for the benefit of the patient.



### **OP-679-THE RIGHT VENTRICULAR OUTFLOW TRACT AFTER REPAIR OF TETRALOGY OF FALLOT - 44 YEARS OF INSTITUTIONAL EXPERIENCES WITH REOPERATIONS USING HOMOGRAFTS**

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Usually well tolerated for a long time, pulmonary valve incompetence may finally require reoperation. After repair of Fallot using transvalvular patch plasty, 363 primarily surviving patients were followed up till 44 years in order to evaluate the long-term outcome of the right ventricular outflow tract. 70 patients (19,3 %) underwent one reoperation of the outflow tract, 9 a second one and 2 of them a third surgical intervention. At first reoperation, 49 (70 %) showed severe regurgitation, 21 stenosis. The interval between repair and first reoperation was 17 (6-42) years for regurgitation and 7 (0-14) years for stenosis. With respect to the year of repair, overall reoperation rate varied between 5.3 % and 37 %. Six patients with conduits (homograft or Polystan conduit, average 14 (12-20) mm) used at repair required replacement 6 (3-10) years thereafter. Since 1991, 73 conduits were used, thereof 70 homografts: 59 for the first and 11 for further reoperation. Before their second and third reoperations 7 patients suffered severe homograft stenosis. In all age groups the implantation of - 84 % pulmonary - homografts was easily feasible, mostly using pericardium as ventricular extension. Reoperation was uncomplicated due to previously routinely implantation of retrosternal pericardial substitute at repair. Overall in hospital mortality rate was 1.4 %. Out of all patients, estimated 20 % could retrospectively be considered candidates for stented valve procedure. The long-term outlook for the individual patient as well as the immunological implications and possible consequences should be considered at the initial and every subsequent operation.

### **OP-680-SURGERY FOR AORTIC COARCTATION IN THE ADULT: 25 YEARS EXPERIENCE**

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**BACKGROUND:** Aortic coarctation is a rare congenital disease in adult population, most of the times is associate a congenital heart defect. A retrospective study to review the experience at the Instituto Nacional de Cardiologia Mixico, with surgery for aortic coarctation over a period of 25 years (1980-2006).

**METHODS:** Criteria inclusion: (a) aortic coarctation in the adult, isolated or associated with congenital heart defect; (b) surgery between 1980 and 2006. We recorded base lines characteristics including: gender, age, presentation symptoms, coarctation type, associated lesions, procedure type (alone or simultaneous), reoperations, surgery complications, residual hypertension and mortality.

**RESULTS:** Eighty four patients underwent surgery for aortic coarctation: average age 27.1 years (18-49y), preoperatively no patient had normal blood pressure, we found associated lesions such bicuspid aortic valve (29%), aortic hypoplasia (12%), total aortic occlusion (10%), and ascending aortic aneurysm (6%). According to procedure type: aortoplasty (46.4%), resection and extended end to end repair (27%), prosthetic grafts (26%). Reoperations because of bleeding (6), recoarctation (2), Global mortality (3.5%)

**CONCLUSION:** Aortic coarctation in the adult requires and adequate surgical treatment because of the need of high blood pressure control. The low surgical mortality is related to anatomical complex and procedure complications. We found that surgical treatment reduces systolic blood pressure in younger patients and low rate of recurrence.

### **OP-681-EARLY AND LATE RESULTS OF TOTAL CORRECTION OF TETRALOGY OF FALLOT**

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**BACKGROUND:** The purpose of this study was to evaluate the early and late outcome after total correction of tetralogy of Fallot.

**METHODS:** Between 1995 and 2006, 101 consecutive patients with a mean

age of  $8.23 \pm 4.90$  years (range, 1 year to 25 years) underwent repair of TOF at one institution. Forty two patients had initial palliative operations. A transannular patch was inserted in 60 (58.5%) patients. Risk factors for operative mortality were analyzed. Follow-up was obtained from clinical appointments and telephone questionnaires.

**RESULTS:** The operative mortality was 6.9%. Aortic cross-clamp time more than 90 minutes ( $P < 0.01$ ) and cardiopulmonary bypass time more than 120 minute ( $P < 0.01$ ), affected operative mortality, whereas previous palliative procedure, hematocrit level, and use of transannular patch did not. Mean follow-up is  $34.08 \pm 31.09$  months (range, 1 month to 120 months). Actuarial survival is 91% alive 10 years after total correction. On Postoperative echocardiography, 22 patients had mild pulmonary regurgitation, 19 had a right ventricular outflow tract gradient more than 50 mmHg, and 10 had a small residual ventricular septal defect. There were two late deaths. Late sudden death from cardiac causes occurred in one patients.

**CONCLUSION:** Total correction of TOF can have low operative mortality and provide excellent long-term survival. This experience suggests that the key factor in the total correction of TOF is to correct the pathology completely, to protect the myocardium, and to manage the complication properly.

## ESOPHAGEAL SYRGERY

### OP-682-SYSTEMATIC REVIEW: CHEMOPREVENTION OF ESOPHAGEAL ADENOCARCINOMA WITH ASPIRIN OR NON STEROIDAL ANTI-INFLAMMATORY AGENTS

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**BACKGROUND:** Esophageal cancer ranks sixth as a cause of cancer mortality. There are two main types of oesophageal cancer with distinct etiological and pathological characteristics, squamous cell carcinoma and adenocarcinoma. The incidence of oesophageal adenocarcinoma (OAC) has increased considerably over the last 20 years. Existing treatments for OAC have generally had limited success. Active chemoprevention has become a major interventional approach following the epidemiological observation of the beneficial effect of non steroidal anti-inflammatory agents (NSAIDs) in colon cancer prevention. Concerning oesophagus, there is hope that chemopreventive agents might be able to interrupt the transition from normal squamous epithelium to adenocarcinoma. The purpose of the present study was to review current knowledge on the chemoprevention of OAC with aspirin or NSAIDs.

**METHODS:** Electronic databases (Pubmed, Scopus, Google Scholar) were searched for articles that specifically addressed the issue of chemoprevention of OAC with aspirin or NSAIDs. Experimental papers, epidemiological studies and clinical trials were included. The search identified 122 papers. The abstracts were examined and the full papers of the articles that probably fulfilled inclusion criteria were retrieved.

**RESULTS:** Experimental data indicate that cyclo-oxygenase-2 (COX-2) may play an important role in esophageal adenocarcinogenesis through the activation of the inflammation-metaplasia-dysplasia sequence. COX-2 upregulation has been described in Barrett's oesophagus and levels of COX-2 mRNA and protein seem to increase as the metaplastic cells progress through to dysplasia and adenocarcinoma. The mechanisms by which COX-2 is thought to be involved in oesophageal adenocarcinogenesis include resisting apoptosis, increasing cell proliferation, stimulating angiogenesis and modulating the invasive properties of cancer cells. The non steroidal anti-inflammatory agent nimesulide has been shown to decrease Barrett's oesophagus and OAC in rat models by suppressing COX-2 activity. However the involvement of other cyclo-oxygenase independent pathways in oesophageal adenocarcinogenesis cannot be excluded. In fact little is known on the mechanisms aspirin and NSAIDs modulate progression from Barrett's oesophagus to cancer. Esophageal biopsies from patients with Barrett's oesophagus have shown that NSAIDs are associated with reduced risk of OAC especially in patients with multiple high risk molecular abnormalities. Epidemiological evidence suggests that regular use of aspirin or NSAIDs reduces the progression of Barrett's to OAC. However, a recent trial of long term administration of the COX-2 inhibitor celecoxib in patients with Barrett's oesophagus with dysplasia did not prevent progression of Barrett's to cancer.

**CONCLUSION:** Experimental and epidemiological data suggest chemopreventive effect of aspirin and other NSAIDs against progression of Barrett's oesophagus to dysplasia and OAC. However, the results of double blind randomized placebo controlled trials are expected before firm conclusions can be drawn.

### OP-683-SERIAL ESOPHAGEAL DILATATION IS A BETTER OPTION THAN ESOPHAGEAL RESECTION FOR BENIGN STRICTURES

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**BACKGROUND:** The role of serial esophageal dilatation for benign strictures has long been underestimated. This study presents 70 patients with various etiologies of benign strictures who underwent serial dilatation and subsequently were able to swallow and have improved quality of life.

**METHODS:** Data were collected from the operating room rosters of Albany

Medical Center and Stratton Veterans Administration Hospital of all patients who underwent esophageal dilatation over a period of five years (01/2002 to 12/2006). Patients who had esophageal dilatation prior to stent placement for unresectable esophageal cancer were excluded from the study. Patient demographics, etiology of stricture and number of periodic dilatation per patient were recorded. All patients had their dilatations performed by the same attending physician and always using the Savary-Gillard dilators under video endoscopy and fluoroscopy guidance.

**RESULTS:** 70 patients had a total of 265 dilatation procedures. There were 51 males and 19 females with a mean age of 63 years. Etiology of strictures were post esophagogastrectomy anastomotic site stenosis (28), peptic (13), post radiation(8), post Nissen(7), post diverticulectomy(1), caustic ingestion(4), secondary to prolonged nasogastric tube(3), traumatic injury to esophagus(2), and achalasia(3). Patients with post esophagogastrectomy anastomotic site stenosis required the least number of periodic dilatation (mean=3) and patients with stricture secondary to prolonged nasogastric tube required the maximum number of periodic dilatation (mean=7). One female patient had 30 periodic serial dilatation for recurrent failed Nissens causing trauma to the GE junction. Complications included one gastric perforation requiring operative correction. There was no mortality.

**CONCLUSION:** Serial esophageal dilatation is a safe and viable option for benign esophageal stricture. This is especially valuable in young patients with caustic or proximal strictures where resection will severely compromise the quality of life

### OP-684-FACTORS AFFECTING PERIOPERATIVE MORTALITY OF OESOPHAGECTOMY FOR OESOPHAGEAL CANCER

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**BACKGROUND:** Despite the standardization of the operative technique, improvement of preoperative risk assessment and postoperative intensive care management, surgical therapy for oesophageal carcinoma continues to be associated with a high mortality rate. The present study was aimed to identify preoperative, intraoperative and postoperative factors that could potentially influence perioperative mortality after oesophagectomy for oesophageal carcinoma.

**METHODS:** We analyzed retrospectively 115 patients who underwent oesophagectomy for middle and lower third oesophageal cancer between January 2000 and December 2006. The influence of number of pre-, intra-, post-operative and tumor related risk factors on the development of perioperative mortality were evaluated. Factors with a possible influence on perioperative mortality were calculated using the logistic regression model (univariate and multivariate). The chi2 test with Pearson's correction and Fisher's exact test were used for comparison of the parameters for mortality. The risk of perioperative mortality associated with selected factors was evaluated using stepwise binary logistic regression analysis to estimate odds ratios (OR) and their 95% confidence intervals (CI). A p value of 0.05 or less according to univariate analysis was chosen as the criterion for submitting variables to the model.

**RESULTS:** The cohort study included 115 (70 men and 45 women; mean age, 59.3 years) patients. Resection was performed for squamous cancer (n = 81), adenocarcinoma (n = 31), and other histologic types (n = 3) in patients with stages I (n=12), IIA (n=46), IIB (n=8), III (n=49) disease. Technical complication (TC), general complication (GC) and perioperative mortality (PM) rates were % 24.3 (n=28), %54.3 (n=63) and %14.3 (n=17) respectively. Univariate analysis showed that following factors were predictors for PM: smoking status (p=0.05), diabetes mellitus (DM)(p=0.05), type of resection (p=0.019), conduit (p=0.024), postoperative transfusion (p=0.04), GC (p<0.001) and number of GC's (p<0.001). Multivariate analysis identified independent predictors of PM to be DM (odds ratio [OR], 6.44; 95% confidence interval [CI], 1.24-33.73; p= 0.026), postoperative transfusion (OR, 4.27; 95% CI, 1.23-14.5; p= 0.022), and smoking status (OR, 3.59; 95% CI, 1.06-12.14; p= 0.04).

**CONCLUSIONS:** The presence of diabetes, smoking, postoperative transfusion predicted the development of PM and an increased length of hospital stay. None of the other parameters tested predicted perioperative death. Smoking intervention before surgery could reduce the PM rates after oesophagectomy for oesophageal cancer. A prospective, randomised, controlled study could improve outcomes in this cancer.

### OP-685-RECURRENCE PATTERN AFTER SELECTIVE THREE-FIELD LYMPH NODE DISSECTION FOR THORACIC ESOPHAGEAL SQUAMOUS CARCINOMA

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**BACKGROUND:** Three-field lymph node dissection for esophageal carcinoma helps improve the completeness of resection and may transfer into improved long-term survival. However, it is also associated with increased surgical risks, especially recurrent laryngeal nerve palsy.

**METHODS:** Eight-seven patients with thoracic esophageal squamous carcinoma underwent esophagectomy with selective 3-field lymph node dissection based on preoperative neck ultrasonography.

**RESULTS:** Thirty-five (40.2%) patients had enlarged cervical nodes detected only by ultrasonography and underwent 3-field dissection. The other 52 (59.8%) patients had 2-field dissection. Cervical metastasis was proved in 17 patients (19.5%). Three-field dissection was associated with more morbidities (60%) than 2-field dissection (34.6%,  $p=0.020$ ), especially increased rate of recurrent laryngeal nerve palsy (22.9% vs. 9.6%,  $p=0.089$ ). The overall 5-year survival for the 82 patients' survived operation was 38.3%. The cause-specific survival for patients with cervical metastasis (pM1-LN, 37.4%) was comparable to patients without cervical metastasis (pM0, 49.1%,  $p=0.238$ ). Among the 72 patients completed the follow-up, 33 (45.8%) had recurrent diseases. Lymph node recurrence was detected in 16(22.2%) patients, 13(18.1%) in the neck, 8(11.1%) in the mediastinum. Local recurrence in adjacent organs occurred in 14(19.4%) patients, and distant metastasis in 19(26.4%) patients. T4 disease was associated with increased local recurrence, distant metastasis, and decreased survival. The rates of lymph node recurrence and distant metastasis were similar between pM0 and pM1-LN patients after selective cervical dissection.

**CONCLUSIONS:** Occult cervical lymph node metastasis is a common phenomenon in thoracic esophageal carcinoma. Three-field dissection is associated with increased surgical morbidity and therefore, should be reserved for those may benefit from the procedure. Selective 3-field dissection based on cervical ultrasonography is helpful in reducing surgical risk while assuring complete resection and satisfactory long-term outcome.

### OP-686-A SURGEON'S CASE VOLUME OF OESOPHAGECTOMY FOR CANCER DOES NOT INFLUENCE OPERATIVE MORTALITY

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**BACKGROUND:** To assess if individual case volume of oesophageal resections influences the operative mortality rate in a tertiary referral centre.

**METHODS:** Between June 1994 to June 2006, 252 total thoracic oesophageal resections (75% male, mean age 63 years) were performed by 5 surgeons in tertiary referral centre. Operative approach was standardised in all cases and consisted of left thoracotomy, resection of all intrathoracic and abdominal oesophagus and left cervical incision for anastomosis. Operative mortality, defined as in-hospital death irrespective of length of stay, was compared among consultants and also trainees.

**RESULTS:** A total of 207 operations were performed by five consultants with 9 deaths (4.3%) compared to 2 deaths after 45 operations by 17 trainees (4.4%) (Fisher's Exact Test,  $P=0.6157$ ). Individual case volume for consultants ranged from 5 to 12 cases/year with 0 to 5.4 % mortality rate (Chi-Squared Test,  $P=0.2415$ ). Overall hospital volume ranged from 30-57 cases/year.

**CONCLUSION:** This study confirms that surgeons who have been appropriately trained in oesophageal resection may get good results despite lower individual case volumes when a standardised approach is taken in an institution with a high case volume.

### OP-687-ACCURACY OF CT IN PREOPERATIVE ASSESMENT OF CARCINOMA ESOPHAGUS IN THE ABSENCE OF EUS AND PET/ CT

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**AIMS:** To assess use of CT scan as a preoperative staging tool for carcinoma oesophagus

**MATERIAL & METHODS:** This observational descriptive study was conducted at Department of Cardiothoracic surgery, Lady Reading Hospital, Peshawar from June 2002 to June 2006. Computerized clinical data of 359 cases of carcinoma oesophagus were retrospectively analyzed. All patients had apart from routine investigations, barium studies, endoscopy and biopsy, CT Thorax / Upper abdomen with oral and I/V contrast, abdominal ultrasound. Irresectable lesions had their scans reviewed independently by another radiologist, who was not aware of the operative findings.

**RESULTS:** Out of 359 cases, 210 were males and 149 were females with a mean age of 51.6 years. The age range was 17 - 80 years. 120(33.42%) cases were found to be inoperable on preoperative staging and 239 cases were deemed operable for oesophagectomy. Out of these 239(66.57%) cases despite being reported operable on preoperative CT scan, 20 (8.36%) cases were found to be irresectable on the operative table. Out of 20 irresectable carcinoma oesophagus, pancreatic involvement was found in 10(50%) cases, aorta was involved in 4(20%) cases, trachea 2(10%) cases, pulmonary hilum 2(10%) cases, liver mets 1(5%) case and malignant ascites/pleural effusion 1(5%) case, all of which had been missed by preoperative CT Thorax / upper and abdominal ultrasound. These 20 patients had their CT scans reviewed by another radiologist, who was not informed of the preoperative findings. Review revealed 3(15%) cases where previous report had missed out advanced disease like involvement of trachea in 2(10%) cases and aorta in 1(5%) case. In 6(30%) cases she agreed with preoperative reports. In 11(55%) cases she refused to commit as the scans were substandard and correct protocols for CT scan had not been followed.

**CONCLUSION:** Following recommended protocols religiously would greatly increases the accuracy of CT Thorax/Upper abdomen in preoperative staging of carcinoma oesophagus. 20/239 (8.36%) irresectable in what were preoperatively operable could have been reduced to 6/239 (2.51%) if correct protocols had been followed.

### OP-688-EVOLVING CONCEPTS IN THE MANAGEMENT OF ESOPHAGEAL PERFORATIONS: A TWENTY-SEVEN YEAR EXPERIENCE

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**BACKGROUND:** Perforation of the esophagus remains a challenging clinical entity for the thoracic surgeon to manage. Management of the perforation has traditionally been dictated by the site of perforation, the etiology of the perforation, time from perforation to treatment, and patient factors. Recently, primary repair of perforations has been increasingly used to deal with a greater subset of perforations, particularly those that present late ( $>24$  hr). Our single-institution experience over twenty-seven years, the largest to date, was used to examine the evolution of treatment strategies and outcomes.

**METHODS:** A retrospective review of 119 patients diagnosed with esophageal perforations admitted to London Health Sciences Centre from 1981-2007 was conducted. There were 15 cervical, 95 thoracic and 9 abdominal perforations.

**RESULTS:** The overall mortality rate was 19%, and was 8% in the cervical perforation group, 11% in the abdominal perforation group, 13% in the non-malignant thoracic group, and 53% in the malignant thoracic group. 45% (53/119) of our perforations were iatrogenic, 36% (43/119) were spontaneous, 15% (18/119) were malignant, and 4% (5/119) were due to a foreign body. Thoracic perforations were subdivided into malignant and nonmalignant, and treatments and outcomes were analyzed. 70 % of our nonmalignant thoracic perforations were treated with primary repair (mortality 10%, median length of stay 21 days). 22 % were treated with surgical drainage or conservative measures (mortality 20%, length of stay 35 days). 8 % of our nonmalignant thoracic perforations were treated with resection and diversion (mortality 20%, length of stay 34 days). 35% of patients with nonmalignant perforations presented at  $> 24$  hours. In this subgroup, primary repair was attempted in half of the patients, with a mortality rate of 13% and a length of stay of 21 days. The other half was treated with drainage alone (mortality rate 30%, length of stay 51 days), resection and diversion (mortality rate 17%, length of stay 44 days) or conservative measures (mortality rate 25%, 31 days). Using multi-variate regression, the determinants of mortality were: malignant perforations ( $p = 0.002$ ), patients requiring mechanical ventilation on presentation ( $p = 0.002$ ), severe malnourishment ( $p = 0.002$ ), and preoperative pulmonary co-morbidities ( $p = 0.008$ ). Time to presentation of  $> 24$  hours did not affect mortality ( $p = 0.422$ ).

**CONCLUSIONS:** We conclude that perforations of the esophagus continue to be highly morbid conditions and challenging clinical problems. Patients with



malignant perforations and those with preoperative pulmonary and nutritional impairments are more likely to succumb to their illness. Primary repair can safely be attempted in nonmalignant perforations presenting at greater than 24 hours from the time of perforation with acceptable mortality rates and length of hospital stay.

### OP-689-EARLY COMPLICATIONS AFTER RESECTION AND RECONSTRUCTION OF THE ESOPHAGUS

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**OBJECTIVE:** To show early complications after reconstruction of the esophagus occurred in the first 30 days in our patients.

**MATERIAL AND METHODS:** between 2000 and 2007 in our department were performed 58 resections with reconstruction of the esophagus. We used in reconstruction: 49 cases - gastric replacement, 7 cases - left colon graft, 1 case - ileocolon, 1 case - jejunal graft. As pathology, we had esophageal cancer in 45 cases, 11 caustic burns, 1 giant leiomyoma and 1 TB stricture. We always performed an open esophagectomy (with mediastinal lymphadenectomy where malignancy was involved). The anastomosis between the esophagus and the graft was mostly performed by cervical approach (47 cases), but we used intrathoracic anastomosis also (11 cases). We usually use the retrosternal space for the graft.

**RESULTS:** 2 postoperative deaths: 1 by an ARDS and myocardial infarction and one by an intestinal occlusion. As early complications we had: 1 postoperative bleed, 3 patients with ARDS, 5 patients with pneumonias, 24 cervical fistula.

**CONCLUSIONS:** This type of surgery is difficult and needs an experienced surgical and anaesthesiological team. The most frequent complication remains cervical fistula. Respiratory complications often appear and can be hard to deal with. We had no graft necrosis - the most dangerous early complication reported in the literature.

### OP-690-ROLE OF NEOADJUVANT PREOPERATIVE CHEMOTHERAPY IN SQUAMOUS CELL CARCINOMA OF ESOPHAGUS: A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL: EXPERIENCE FROM KASHMIR-A CANCER BELT

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**BACKGROUND:** Esophageal carcinoma is the fifth leading gastrointestinal malignancy and is one of the leading causes of cancer related death. Despite improvements in the surgical techniques over the last few decades, the outcome has been dismal, with over all 5 year survival not exceeding 15%-25%.

**AIMS AND OBJECTIVES:** To evaluate the effect of preoperative chemotherapy on resectability, complication rate and overall survival in patients with squamous cell carcinoma esophagus.

**METHODS:** 50 patients with histologically diagnosed SCC, with a local or loco-regional extent (stage IV excluded) were divided into 2 groups (A&B) matched properly for other confounding variables. Group A patients were subject to 2-3 cycles of chemotherapy (5FU-CDDP) and were later subjected to surgery, Group B patients were directly operated without any preoperative chemotherapy.

**RESULTS:** 3(12%) of patients in the group A showed complete pathological responses to chemotherapy and 18 (72%) showed partial response with four patients (16%) showing resistance to chemotherapy. There was no statistically significant difference in terms of response to chemotherapy with respect to degree of differentiation of tumor. There was no significant difference in the overall resectability rates between the two groups ( $p>0.05$ ), but rate of resection was achieved in 20 (80%) of study group patients and 10 (40%) of control group which was statistically significant. The rate of overall complications was much higher in control group. Initially there was significant difference in the survival between the two groups. But later (20 months) study group showed a slight advantage. Also to know the effect of chemotherapy on survival, the follow up period needs to be increased.

**CONCLUSION:** Esophageal cancer presents at an advanced stage with a very poor outcome attained by present therapeutic modalities. Preoperative chemotherapy significantly increases the rate of resectability without significantly increasing postoperative morbidity and mortality.

### OP-691-3 YEARS FOLLOW UP STUDY OF TWO HUNDRED CASES OF TRANSTHORACIC OESOPHAGECTOMY

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**AIMS:** To evaluate the outcome of Oesophagectomy with Feeding Jejunostomy and no gastric drainage procedure during 3 years follow up.

**MATERIAL AND METHOD:** Computerized clinical data of 200 surgically treated patients with post-op adjuvant therapy from July 2002 to December 2006 was retrospectively analyzed. All patients had preoperative CT Thorax/ upper Abdomen after endoscopy and barium study. No EUS/ PET scan were used. Left Thoracotomy and cervical anastomosis were done in 181 cases, McKeown in 3 cases and left Thoracotomy and Roux en Y in left chest were done in 16 cases. Witzel feeding Jejunostomy was done in all cases. All cases were sent to Oncologist for radio and Chemotherapy within six weeks. Barium study, Abdomen/ pelvic Ultrasound, chest X-ray, full blood count and liver function tests were done in all post follow-up. Specimen sent for histopathology in all cases. Mean hospital stay was 7 days.

**RESULTS:** A total of 200 patients (130 males and 70 females with a mean age of 42.3 years, age ranges from 18-82 years) underwent Oesophagectomy. In 27 cases the tumor was present in upper third oesophagus, middle third oesophagus involved in 63 cases, lower third oesophagus in 110 cases and stomach was involved in 96 cases. Histology showed squamous cell carcinoma in 66.6% and adenocarcinoma in 33.3% patients, proximal margins were free in all cases, distal margins were positive in 2 cases and circumferential thickness was positive in 24 cases. One or more lymph nodes were involved in 54 cases. Postoperative morbidity was 16.5% (33/200). The main complications of Oesophagectomy were anastomotic leak in 12(6%), aspiration in 9(4.5%) and hoarseness in 8(4%) patients. The one month mortality was 9% (18/200). Death were due to Tracheal injury in 2(3%), Pulmonary embolism in 6(2.5%), anastomotic leak in 7 (2%) and respiratory failure in 3 (1.5%) patients. At three years follow-up 148 patients out of 200 were seen, while of these 148 patients, recurrence occurred in 69 patients (46.62%), and were as: 7 at 6 months, 15 at 1 year, 19 at 2 years, and 28 at 3 years.

**CONCLUSION:** In the absence of EUS & PET/CT and with limited Oncology facilities in a high incidence area, pre-operative CT Thorax/upper Abdomen followed by oesophagectomy via (L) Thoracotomy & (L) neck anastomosis with feeding Jejunostomy, followed by adjuvant therapy within 6 weeks, is a workable formula giving a satisfactory morbidity / mortality and an acceptable survival rate.

### OP-692-TREATMENT OF ESOPHAGEAL PERFORATIONS. ANALYSIS OF 41 CASES

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**BACKGROUND:** Esophageal perforation is a potentially lethal condition. Despite the advancements made in thoracic surgery, the management of patients with esophageal perforations remains problematic and controversial.

**METHODS:** We reviewed the medical records of all patients treated for traumatic esophageal perforations in our department between 1980 and 2007.

**RESULTS:** There were 33 men and 8 women. (9 months-71 years) The cause of perforation was gunshot in 18 cases, stabbing in 6 cases, blunt trauma in 4 cases, foreign bodies in 13 cases. The perforation was in the cervical esophagus in 32 cases (78%) and at thoracic level in the 9 cases (22%). Two patients with cervical lesions and one patient with thoracic lesion were treated conservatively. The treatment procedures were two layer primary closure with or without drainage, drainage alone, and near-total oesophageal exclusion with cervical T-tube oesophagostomy. The global mortality was 17%.

**CONCLUSION:** Early diagnosis and intervention are necessary to prevent morbidity and mortality.

### OP-693-PHARYNGO-ESOPHAGEAL DIVERTICULA: DIAGNOSIS AND TREATMENT

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**OBJECTIVE:** Zenker's diverticulum is a rare entity with a prevalence between

0.01 and 0.11%. Its physiopathology is universally recognized. Lack of coordination between the propulsive pharyngeal contractions and the release of the upper esophageal sphincter creates abnormally high pressure in the pharyngeal chamber resulting in the collapse of the posterior wall of the hypopharynx. The mucosal hernia constitutes the diverticulum. We retrospectively reviewed 13 patients with pharyngo-esophageal diverticula and describe our experience in diagnosis and treatment of this pathology.

**MATERIAL AND METHOD:** There were 13 patients, 9 male and 4 female ranging in age between 42 and 91 years admitted at our institution with an esophageal diverticulum. Progressive dysphagia was the main symptom patients complained for. Definite diagnosis was accomplished in all of them by contrast radiographic examination (barium esophagogram). CT scan confirmed the diagnosis in 7 patients, while esophagoscopy was performed in all cases in order to exclude underlying pathology such as neoplasia. The median size of the diverticulum was 3.5 cm. Surgery was proposed but 2 patients denied. Transcervical excision plus cricomyotomy was performed in 10 patients, while diverticulopexy plus cricomyotomy was preferred in a psychiatric patient.

**RESULTS:** No complications were recorded. Postoperative recovery was uneventful in patients with Zenker's diverticulum and immediate relief was reported in all of them. In a follow up of 6 months to 10 years no recurrence was observed.

**CONCLUSION:** Surgical excision of Zenker's diverticulum is still the treatment of choice with immediate relief and low morbidity and mortality.

#### **OP-694-DELAYED DIAGNOSIS OF PERFORATIONS OF THE THORACIC ESOPHAGUS: RESULTS OF A MULTIMODAL APPROACH**

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**BACKGROUND:** The diagnosis of thoracic esophageal perforations is frequently made late. The treatment is controversial. Mortality rates as high as 30% are reported. Results of a multimodal approach are reviewed.

**METHODS:** Records of all patients with thoracic esophageal perforations observed between 1992 and 2006 were reviewed. Cancer-related cases were excluded. Object of the study are cases with late diagnosis (> 24 hours).

**RESULTS:** Forty patients with thoracic esophageal perforations were observed. A mean diagnostic delay of 65,8 hours (36-240 hrs) was observed in 21 patients (52,5%) (15 men, 6 women, mean age 64,4 yrs, range 45-90 yrs). Perforations were secondary to: iatrogenic trauma (14, 66,6%), spontaneous disruption (6, 28,6%), foreign body (1, 4,8%). The treatment was conservative in 6 patients (28,6%) and surgical in 15 (71,4%). The latter consisted in: primary repair (9), exeresis of perforated diverticulum (1), bipolar exclusion (2), T tube (1), esophagectomy (1), mediastinal drainage (1). Three patients died (14,3%) (conservative treatment, exclusion and T tube). Six patients experienced complications including 3 leaks following repair (3/10, 30%). Esophagectomy was finally needed in two cases. The esophagus was preserved in 16 patients overall (76,2%).

**CONCLUSIONS:** The treatment should be individualized according to multiple clinical and morphological features. The attempt at primary repair should be performed whenever possible being that not associated with increased mortality in spite of late diagnosis. A not negligible percentage of patients can benefit from conservative treatment. A strategy aimed at preserving the esophagus is not associated with increased mortality rates.



## VALVES II

### OP-695-CARDIAC RESYNCHRONIZATION THERAPY EARLY AFTER CARDIAC SURGERY FOR ISCHEMIC HEART FAILURE. THE IMPORTANCE OF A LEFTVENTRICULAR EPICARDIAL LEAD

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**BACKGROUND:** The lack of an adequate epicardial coronary vein may preclude trans-venous implantation of a left ventricular lead for cardiac resynchronization therapy (CRT). A thoracotomy approach may be not feasible in patients (pts) with very large hearts, pericardiac and lung adhesions or intolerance to one lung ventilation. CRT is currently indicated in chronic NYHA III heart failure patients with QRS > 120 msec and EF < 35%. Up to now it is not known how many pts with very low ejection fraction (LVEF) will require CRT-therapy early or late after successful cardiac surgery. Indication and usefulness of an epicardial LV lead implanted during cardiac surgery were the aim of this preliminary study.

**METHODS:** Between August 2006 and November 2007 16 pts (age 60 $\pm$ 12 years) with severe ischemic HF (LVEF=22 $\pm$ 6%), Euroscore 12 $\pm$ 4, underwent surgical myocardial revascularization off pump (n=8) with concomitant valve repair (MVR) (n=7) or LV aneurysmectomy (n=1). In these pts a prophylactic definitive epicardial bipolar lead (CapSure Epi 4968) was attached to the lateral LV-wall. At this point LVEF below 30% was the only indication. These pts did not fulfilled echo-cardiographic criteria for dyssynchrony and only 4 presented with QRS>120ms. Mean follow up was 9.5 $\pm$ 4.5 months.

**RESULTS:** In 7/16 pts (44%) an ICD- CRT device was indicated and implanted within 100 $\pm$ 167 days after cardiac surgery. Indication was persistent impaired or worsened LVEF (<35%) or mitral regurgitation, mechanical dyssynchrony and NYHA-III. Only 2 Patients showed class 1 indication with additional QRS>120ms. Electrical values of LV epicardial lead was comparable or better than at implantation (thresholds 0.9 $\pm$ 0.1 V. versus 1.6 $\pm$ 0.6 V, sensing 19.9 $\pm$ 8.4 vs. 13 $\pm$ 8.4 mV, impedance 730 $\pm$ 198 vs. 1168 $\pm$ 273 Ohm). At follow-up all 7 pts presented with improved LVEF (31.3 $\pm$ 3% vs 22 $\pm$ 3%, p<0.05), improved mitral regurgitation (Grade 0.6 $\pm$ 0.5 vs 1.4 $\pm$ 1.1 p<0.05) and better functional status. MVR pts had a tendency to benefit more from CRT. One patient died (overall mortality 6.5%) and one underwent successful cardiac transplantation.

**CONCLUSION:** In this first series CRT was indicated within a few months after cardiac surgery in the half of the pts, despite successful revascularization and especially in those who underwent MVR. The concomitant implantation of a LV epicardial lead during cardiac surgery is safe and effective, offering selection of the best pacing site. But criteria to predict which pts will benefit from CRT early or late after cardiac surgery remain to be defined.

### OP-696-EARLY EXPERIENCE WITH ALTERNATIVE PULMONARY CONDUIT FOR ROSS PROCEDURE IN ADULTS

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**BACKGROUND:** Homograft is the first choice valved conduit used in place of autotransplanted pulmonary valve in Ross procedure. Increasing demand and diminishing supply of homografts has resulted in a search for alternatives. We wish to present our early results of RVOT reconstruction with valved conduits made completely from the bovine pericardium to series of Ross operations in adult patients.

**METHODS:** New handmade valve complexes have been developed and used between December 2003 and May 2007. As tube as his three leaflets of conduit are made of bovine pericardium preserved in 0,625 % glutaraldehyde solution. Early clinical and echocardiographic results were analyzed retrospectively for 18 patients implanted of these conduits in a pulmonary position. Mean age at operation was 37,94 years (range 24 to 48), weights 68,7 kg (range 47 to 90). Mean size of implanted conduits 25,6mm $\pm$ 1,99 (range

21 to 28). Follow-up of patients was limited of last visit to the cardiologist. The comparative analysis of peak transconduit gradient in early postoperative and last follow-up periods is carried out by means of the t test for pair tests (Paired-Samples t test) with the SPSS for Windows (version 11.0) software package.

**RESULTS:** Follow-up was 94,4% complete (1 patient lost to follow-up). The mean follow-up period was 18  $\pm$ 15,9 months (range 0,7 to 44). Patients with new conduits were characterized by excellent parameters of a continuity of ways of pulmonary outflow (RVOT) and competence of new PA-valve. Early and last postoperative peak systolic transconduit pressure gradients have been measured 7,8  $\pm$ 4,5 (range 3,2 to 16) and 8,5 $\pm$ 4 mm Hg (range 3,2 to 18) accordingly (p=0,836). Sixteen patients had no insufficiency of new PA-valve and one was kept at a trivial level in last investigation.

**CONCLUSION:** This new completely bovine pericardial valved conduit can be a viable alternative to a homograft for adult patients in the Ross procedure. The early clinical and hemodynamic results are encouraging. Ease of availability and plastic property of bovine pericardium, favorable handling (construction and implantation) make it more attractive than a homograft. Xeno-origin of this conduit necessitates close follow-up for assessment of durability and long-term results.

### OP-697-MITRAL VALVE REPAIR IN ACUTE ENDOCARDITIS AFTER RESECTION OF THE INFECTED POSTERIOR LEAFLET USING THE MITROFAST™ VALVULOPLASTY DEVICE

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**BACKGROUND:** The common concept of mitral valve repair, especially if the posterior leaflet is involved, is to create a new sufficient coaptation area for the anterior leaflet. The MitroFast™ Annuloplasty Device is a D-shaped annuloplasty ring, made of medical grade polymer, covered with porcine pericardium that is designed to mimic the posterior leaflet in closed position to perform a new coaptation surface for the anterior leaflet.

**METHODS:** We report of two patients with acute mitral valve endocarditis undergoing mitral valve repair using the MitroFast Valvuloplasty Device: Case 1: A 69 year old male, suffering from severe mitral valve regurgitation (IV°), due to a massive flail of the posterior mitral leaflet. TEE showed multiple chordae tendineae ruptures of the posterior segments P2 and P3. Because of huge vegetations seen in the TEE, fibrile temperatures and inflammatory symptoms the clinical findings were suggesting an acute mitral valve endocarditis, although the blood cultures were negative. The patient underwent urgent operation in our center. Intraoperative findings showed a massive prolaps of P2 and P3 caused on degenerative alteration and chordae ruptures of the sub-valvular apparatus and coexisting endocarditis with multiple vegetations. The anterior mitral leaflet was still intact without any signs of endocarditis. Case 2: A 57 year old male, suffering from severe mitral regurgitation (IV°) and sepsis due to mitral valve endocarditis. TEE showed a severe mitral regurgitation and bacterial vegetation (1.4x1.3 cm) A1/P1, suspicious abscess cavity in the area of the anterior commissure. The patient underwent operation in our center. Intraoperative findings showed a massive infection of the posterior leaflet (P1) and an abscess cavity of the posterior ring which was removed.

**RESULTS:** In both patients the posterior leaflet was completely resected and the MitroFast sizer showed a perfect coaptation with the anterior leaflet after filling the ventricle. We implanted a 36mm/34mm MitroFast™ Annuloplasty Device. Intraoperative TEE showed a perfect coaptation with the anterior mitral leaflet without any residual regurgitation. The postoperative course was uneventful and the patients were discharged in time. TTE before discharge: no residual mitral regurgitation, no stenosis, good motion of the anterior leaflet, no vegetation or thrombus. Orifice area was 3.0 cm<sup>2</sup> respectively 2.35 cm<sup>2</sup> and mean pressure gradient 3 mmHg respectively 6 mmHg.

**CONCLUSIONS:** The MitroFast™ Valvuloplasty Device offers a new option in treatment of mitral valve endocarditis, especially if only the posterior mitral leaflet is involved. It is a less time consuming new concept of mitral valve repair which offers the advantage of preservation of the anterior leaflet and complete resection of the diseased posterior leaflet.

### OP-698-EARLY OUTCOME AFTER AORTIC VALVE REPLACEMENT IN OCTOGENARIANS

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**BACKGROUND:** The cardiac surgeons are constantly confronted with increasing number of the very old patients undergoing cardiac surgery, due to advancing age of the western population. The aim of this study was to evaluate the surgical outcome in 124 octogenarians after aortic valve replacement (AVR).

**METHODS:** This retrospective study identified 124 patients (84 women and 40 men) having aortic valve surgery between September 1989 and October 2007. Mean age was 83 years (range 80-93). Among them 67 patients (54%) underwent AVR alone, the remainder 55 patients (44,4%) AVR in combination with coronary artery bypass grafting (CABG) and 2 patients (1,6%) combined with mitral surgery.

**RESULTS:** Overall hospital mortality rate was 14 patients (11,3%). Mortality rate after isolated AVR was 9 patients (7,2%) and 5 patients (4%) died after AVR combined with CABG. Causes for death were cardiac insufficiency in 5 patients, multiorgan failure in 6 patients, sepsis in 2 patients and suicide in 1 patient. Numerous postoperative complications are identified like atrial fibrillation in 31 patients (25%), respiratory insufficiency in 33 patients (26,6%), stroke in 6 patients (4,8%), re sternotomy for bleeding in 5 patients (4%), perioperative myocardial infarction in 4 patients (3,2%) and sternal wound infection in 4 patients (3,2%). Only 23 patients (18,5%) were without any complication at all.

**CONCLUSIONS:** In octogenarians AVR alone or in combination with CABG, can be performed with higher but acceptable mortality, although with significant morbidity. Therefore, cardiac surgery for AVR should not be withheld on the basis of old age alone.

### OP-699-AORTIC VALVE REPLACEMENT WITH AORTIC OR PULMONARY HOMOGRAFT: 15 YEARS FOLLOW-UP IN 280 PATIENTS

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**BACKGROUND:** We analysed our global experience in aortic valve replacement (AVR) with aortic or pulmonary homograft harvested from different donors and processed with different methods.

**METHODS:** Between 1992 and 2005, 273 patients underwent 280 AVR (135 subcoronary and 45 aortic root) with 244 aortic (AH) and 36 pulmonary homograft (PH). Homograft were harvested from 191 heart transplanted patients, 85 multiorgan donors and 4 cold cadaver. All the homografts were processed in our bank: 72 were treated with antibiotics and 208 only with medium nutrient, 21 were implanted fresh (meanly after 36+32 hours) and 259 frozen (meanly after 129 + 198 days). Mean age of the recipient was 52,8 + 19 years (range 1,6-82) for AH and 72,8 + 5,8 (range 61-82,6) for PH. Diagnosis was aortic stenosis and/or regurgitation in 197, prosthesis dysfunction in 9, native valve endocarditis in 45 and prosthetic in 27, aortic dissection in 2; E.F. was < 40% in 33 cases. Fifty patients underwent prior cardiac surgery procedures.

**RESULTS:** Hospital mortality was 2,4 % in 163 with isolated AVR and 5,1% in 117 patients with concomitant surgical procedures. Follow-up (98% complete) was 92+49 months for AH (1867 patients years) and 79+53 for PH (236 patients years). During f-up 78 patients died: 68 with AH (f-up 68+45 months) and 14 with PH (f-up 56+32 months); there were 29 AH reoperation in 28 patients meanly after 69,7+44 months (13 for SVD) and 10 PH reoperation meanly after 62 +31 months (7 for SVD). Hospital mortality for reoperation was 5,2% (2/38). At present 136 AH-patients with mean f-up of 111+32 months and 10 PH-patients with mean f-up 140+16 months are alive, 98% and 90% respectively are in NYHA class I or II and aortic regurgitation is <= mild in 66% and 60%. By multivariable analysis younger patients age, pulmonary homograft and surgeon experience were variable independently associated with late homograft failure.

**CONCLUSION:** Our experience did not showed any difference in the long term results between homograft harvested from different type of heart-beating donors and treated with different methods. Compared with AH the late

results of PH are meanly significantly worst but it is interesting to note that 1/3 of PH with a mean f-up of twelve years showed the same results than AH.

### OP-700-BEATING HEART AORTIC VALVE REPLACEMENT AFTER PREVIOUS ALL ARTERIAL CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** Aortic valve replacement following coronary artery bypass grafting is a well known problem in cardiac surgery. Several techniques have been discussed and used in such cases like continuous application of cardioplegia, deep hypothermic circulatory arrest as well as beating heart technique with retrograde warm blood perfusion by the coronary sinus.

**METHODS:** We report our experience in a case of severe aortic valvular stenosis nine years after all arterial coronary artery bypass grafting with perfect patent grafts (LIMA-LAD, RIMA-t-graft-OM, gastroepiploic artery-PDA). The arterial canula was connected to an 8mm Dacron prostheses which had been anastomosed to the right subclavian artery, the venous canula had been inserted by the right groin. After sternotomy and preparation of the right aspect of the heart a vent was inserted by the right upper pulmonary vein. After cross-clamping and aortotomy a balloon-blocker was inserted into the left coronary ostium to prevent back-bleeding and a steel-phenomenon.

**RESULTS:** The patient was on sinus rhythm throughout the procedure. A 21mm Carpentier Edwards magna bioprosthesis was implanted without any difficulties. Weaning from cardiopulmonary-bypass was uneventfully. Postoperative blood-samplings didn't show relevant elevation of cardiac enzymes. The patient was extubated the next day and discharged from hospital after TTE-control which showed a perfect postoperative result.

**CONCLUSION:** Beating heart aortic valve replacement is an excellent alternative technique in redo-patients after previous CABG-surgery with patent grafts. As the variability of the morphology in these patients can be broad spreaded, patients have to be analysed individually before operation. Different techniques for redo-operations as well as the indication for valve replacement in primary CABG procedures with concomitant mild to moderate aortic valve stenosis will be discussed.

### OP-701-STENTLESS VERSUS STENTED PROSTHESIS FOR PRIMARY AORTIC VALVE REPLACEMENT: MIDTERM RESULTS OF MORBIDITY, MORTALITY AND QUALITY OF LIFE

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**OBJECTIVE:** To compare midterm morbidity, mortality and quality of life after primary AVR between stentless and stented prosthesis groups.

**METHODS:** Between August 1996 and August 2006, 310 patients (156 female, 109 (35,2%) >80 years old) underwent primary biologic AVR with or without concomitant CABG due to aortic stenosis. Biologic prosthesis was implanted in all patients older than 65, and in younger patients with a specific request. Clinical assessment, quality of life evaluation (the MOS questionnaire scores) and echocardiography measurements were performed during follow-up (mean 35 months).

**RESULTS:** Overall midterm mortality was 10 % (31/310). Stentless valves were implanted in 31,3% (97/310) of patients. Post operative mean gradients declined for patients with stentless or stented valves were 67.6 mmHg and 57.2 mmHg respectively (p<0.001). Multivariate analysis revealed that late mortality was associated with hyperlipidemia (O.R. =2.5, p=0.04). Overall mortality was associated with age over 80 (O.R. =2.0, p=0.003), CHF (O.R. =2.1, p=0.015), IDDM (O.R. =4.4, p=0.01), and CAF (O.R. =2.3, p=0.01) but not with any type of prosthesis. In addition, poor quality of life assessment (higher scores in the MOS questionnaire) was associated with CHF (O.R.=4.2, p=0.001), moderate patient-prosthetic mismatch (O.R. =7.1, p=0.036) but not with any type of prosthesis.

**CONCLUSIONS:** although the use of stentless biologic prosthesis in the aortic position reduces post operative mean gradients more significantly, no difference in midterm morbidity, mortality or quality of life was seen between groups.

## OP-702-AORTIC VALVE REPLACEMENT IN PATIENTS AGE 70 YEARS AND OLDER: EARLY AND LATE RESULTS

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**BACKGROUND:** Increased life expectancy has resulted in a growing elderly population frequently presenting with symptomatic severe aortic stenosis. Although age is not a contraindication for aortic valve replacement (AVR), decision-making in the elderly population could be very challenging to surgeons. The purpose of this study was to evaluate outcomes of patients 70 years and older undergoing isolated AVR or AVR with coronary artery bypass (CABG) and characterize predictors of early and late mortality.

**METHODS:** Between 1982 and 2002, 2311 patients (age 70 - 94 years, males 1431, females 880) underwent either isolated AVR (1061 patients), AVR + CABG (1250 patients). Three age groups were 70-74 years (AVR 466 patients, AVR+CABG 495 patients), 75-79 years (AVR 367 patients, AVR+CABG 457 patients), and ≥80 years (AVR 228 patients, AVR + CABG 298 patients). Twenty variables were considered as potential risk factors for early and late mortality.

**RESULTS:** Early mortality following either AVR or AVR + CABG was higher in patients ≥80 years than in patients 70-79 years (AVR: 7.2% vs 4.1%; AVR+CABG: 10.4% vs 6.1%). Early mortality in patients ≥80 years following either AVR or AVR+CABG was lower during the period of 1998-2002 than 1982-1997 (AVR: 5.8% vs 8.5%; AVR+CABG: 8.5% vs 12.2%). Late mortality (%/patient-year) increased with age (AVR: 6.4 in patients 70-79 years vs 11.8 in patients ≥80 years; AVR+CABG: 7.9 in patients 70-79 years vs 10.2 in patients ≥80 years). Late mortality was lower during the period of 1998-2002 than the period of 1982-1997 in patients 70-79 years (AVR: 5.7% vs 7.2%; AVR+CABG: 6.9% vs 9.0%), and in patients ≥80 years (AVR: 10.8% vs 12.3%; AVR+CABG: 8.6% vs 11.7%). 10-year actuarial survival was 54.1±3.0%, 42.8±3.8%, and 17.2±3.9% following AVR, and 48.2±3.0%, 29.9±3.3%, and 20.7±4.4% following AVR+CABG in patients 70-74, 75-79, and ≥80 years, respectively. Multivariate predictors of early mortality for AVR patients were age ≥80, status, previous intervention, renal failure, and mitral regurgitation, and for AVR+CABG patients included age ≥80, status, and pulmonary hypertension. Multivariate predictors of late mortality for AVR patients were age 75-79, age ≥80, female, peripheral vascular disease (PVD), and COPD, and for AVR+CABG patients age 75-79, age ≥80, status, LVEF <35%, PVD, and lesion-AR.

**CONCLUSION:** Early mortality increases in patients ≥80 years than younger patients, and declines during the recent years. Additional CABG in AVR patients increases early mortality, but does not influence late mortality. Relative to AVR alone, combined AVR +CABG appears to reduce long-term survival in patients 70-79 years, but not in those ≥80 years. Age ≥80 is an independent predictor of both early and late mortality following either isolated AVR or AVR+CABG.

## OP-703-IMPROVED PROSTHESIS DESIGN TO ENHANCE PATIENT-PROSTHESIS INTERACTION AND POSTOPERATIVE HEMODYNAMIC PERFORMANCE FOLLOWING STENTED AORTIC BIOPROSTHESIS IMPLANTATION

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**BACKGROUND:** Postoperative hemodynamic performances of valve prosthesis have been correlated to the internal diameter of the prosthesis and to their performance index (the ratio between effective area and geometric area of prosthesis). Patient-prosthesis interaction, depending upon the design of prosthesis and patient outflow characteristics, could be, however, as relevant as the prosthesis size in improving postoperative hemodynamic performances. To verify this hypothesis we compared hemodynamic performances of two groups of patients receiving identical size (n.23) of two bioprostheses with identical internal structure but different ring and cuff design (Perimount standard and Perimount Magna).

**MATERIALS AND METHODS:** 48 elective patients undergoing AVR (plus minus CABG) and receiving a size 23 Perimount standard bioprosthesis (Group PC 27 patients) or a size 23 Perimount Magna bioprosthesis (Group PM 21 patients) were enrolled in this retrospective study. Early postoperative hemodynamic performances (in terms of effective orifice area and trans prosthetic gradient) were recorded by mean of trans thoracic echocardiography (TTE) within 1 month

from surgery and were compared between two groups.

**RESULTS:** Patients of two groups did not differ in terms of mean age, BSA and combined CABG procedure (75±6 and 74±8 y.o., 1.8±0.2 and 1.8±0.3 cm<sup>2</sup>, 60% and 66% for group PC and PM respectively). Postoperatively hemodynamic performances of group PM were significantly superior compared to PC group in terms of both EOA (1.65±0.4 and 1.4±0.4 cm<sup>2</sup> respectively, p=0.037) and EOAI (0.92±0.2 and 0.8±0.2 cm<sup>2</sup>/m<sup>2</sup> respectively, p=0.045). Conversely the incidence of severe patient-prosthesis mismatch (EOAI<0.60 cm<sup>2</sup>/m<sup>2</sup>) was significantly reduced in patients of PM group compared to patients of PC group (0% and 18% respectively). Trans-prosthetic peak and mean gradient confirmed improved performances of PM group compared to PC group (15±6 and 23±9 mmHg p=0.001; 5±1 and 10±4 mmHg p<0.001 respectively).

**CONCLUSION:** Despite identical internal structure for a given size Perimount Magna allows for improved postoperative hemodynamic performances compared to standard Perimount. These data support the concept that patient-prosthesis interaction is a key factor in determinate post-implantation hemodynamic performance of a valve prosthesis.

## OP-704-NEW TECHNIQUE IN SURGICAL MANAGEMENT OF RIGHT SIDED ACUTE INFECTIVE ENDOCARDITIS

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**BACKGROUND:** Right sided infective endocarditis represents 5-10% of all cases of endocarditis, it has a unique propensity to infect the tricuspid valve. Mortality is reduced when treatment combines antibiotics plus surgical treatment. Simple reparative techniques can be applied in minimally destructed valves, however, when tissue destruction is extensive, few surgical options are available with their well known drawbacks.

**METHODS:** We have innovated a surgical patching technique for the extensively destructed tricuspid valve with re-establishment of the subvalvular chordal support (The pericardial curtain technique). This technique was applied in 6 patients with extensive destruction and severe dysfunction of the tricuspid valve. Patients were diagnosed and followed up postoperatively at 3, 6, 12 mo. By TTE, TEE and Lab. Studies.

**RESULTS:** There was no perioperative mortality in all patients with no recurrence of infection. Follow up was complete in all of the 6 patients (100%) with TTE and TEE. Immediate postoperative echo studies revealed satisfactory haemodynamic parameters across the tricuspid valve in all patients included in our series. The degree of regurg ranged from 0 to trivial and the mean PG (2-3 mmHg). Follow up period ranged from (8-24 mo.) mean of (15±6 mo.). There were insignificant changes in the haemodynamics across the valve during the follow up period. There were no apparent echocardiographic degenerative changes of the pericardial patch.

**CONCLUSIONS:** The Pericardial Curtain Technique is safe, reproducible and feasible saving the patient from the drawbacks of the currently available surgical techniques (valvectomy or valve replacement). Whatever the degree of valve destruction, the technique proved to be stable in terms of haemodynamic and structural outcome.

## OP-705-TREATMENT OF AORTIC VALVE ENDOCARDITIS WITH THE ROSS OPERATION: MIDTERM RESULTS

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**BACKGROUND:** Standard treatment of patients with infective endocarditis is radical debridement and valve replacement, in cases with advanced pathology the treatment is usually root replacement with either a composite graft or a homograft. The Ross procedure has gained increasing interest as an attractive alternative valve substitute within the last decade. Because of a probably better resistance to infection as one of its advantages, the pulmonary autograft is theoretically preferable for endocarditis. The objective of this retrospective study is to present the technique and results of our experience with aortic valve endocarditis treated with the Ross operation.

**METHODS:** Between September 1996 and March 2007 a pulmonary autograft replacement (root replacement or inclusion cylinder techniques) was performed in 34 patients for endocarditis. The diagnosis was based on clinical findings, echocardiography, blood cultures, operative findings, and specimen microscopy and culture. The infection was classified as active at the time of sur-

gery in 21 patients and remote (healed) in 13 patients. Twenty two patients had simple native endocarditis (infectious pathology limited to the valve cusps) and twelve patients with native (n=10) or prosthetic valve endocarditis (n=2) had advanced disease defined as pathology due to endocarditis extending beyond the valve cusps (annular abscesses (n=5), aorticomitral junction abscesses (n=1), aortic sinus wall abscesses (n=2), aorta-left atrium fistula (n=1), pseudoaneurysm (n=2), mitral valve affected (n=2). The causative organisms were identified in eleven patients. The right ventricular outflow tract (RVOT) was reconstructed with following valved conduits (VC): glutaraldehyde preserved homografts (n=11), xenografts (n = 13) and handmade tri-leaflet completely xenopericardial conduits (n=10). Continuous variables were expressed as the mean  $\pm$  standard deviation using SPSS 11.5 for Windows.

**RESULTS:** There were two operative deaths (5.8%), both related to severe disease and heart failure, one late sudden death. Survivors were followed for a mean period of 55,7  $\pm$  34,9 months (range 1,77-132). Follow-up was 90,6% complete (3 patients lost to follow-up). There were no recurrence of endocarditis and no reoperation events. 29 patients in last investigation had maximal gradient across autograft 6,5  $\pm$  3,7mmHg, respectively with no autograft insufficiency in 21, 1+ in 4, 2+ in 3, 3+ in 1. RVOT VC maximum pressure gradient was 10,1  $\pm$  7,2 mmHg respectively with no pulmonary insufficiency in 23, 1+ in 4, 2+ in 2.

**CONCLUSION:** The autograft may well be the satisfactory substitute for aortic valve replacement or root reconstruction in infective endocarditis, accompanied with low mortality and morbidity rates and a very low recurrence rate of infection process.



## VALVES III

### OP-706-MITRAL WEB: A NEW CONCEPT FOR MITRAL VALVE REPAIR - IMPROVED ENGINEERING DESIGN AND IN VITRO STUDIES

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**BACKGROUND:** Conventional mitral valve repairs are mostly surgeon dependent and necessitate a lot of experience. A new and simple concept of mitral valve repair, with a potential for treating mitral insufficiency caused by mitral valve prolapse (as in Barlow's disease) has been recently proposed in the clinical literature.

**METHODS:** The new repair approach is based on using a web/net attached to a standard annuloplasty ring spanning the annulus of the mitral valves. In spite of the successful animal experiments with healthy valves in a flaccid heart, neither of the published studies has focused on the feasibility of this concept under dynamic beating heart conditions. In this study we present an improved engineering design of this concept and report our preliminary in vitro studies performed on a left ventricular simulator using native porcine mitral valves. The valves were tested while oriented to their physiological positions, under adult physiological hemodynamic conditions. Under normal conditions, no mitral valve regurgitation or prolapse was observed. Then severe mitral regurgitation is created both by displacing the papillary muscles (bileaflet prolapse model) in two and transecting the marginal chordae inserting into the posterior leaflet free edge (posterior leaflet prolapse model) in 5 experiments. The mitral web was implanted onto the silicone annulus through the left atrial window and the valves were again tested under the same hemodynamic conditions. 0.9% saline solution was used as the working medium. The pressure in the left atrium and the left ventricle was continuously monitored and recorded using a differential pressure transducer (DP9-40, Validyne Inc, USA) and the mitral flow rate was measured using an electromagnetic flow probe (Carolina Medical Devices, NC, USA). The data was recorded using a DAQ-card (DAQ-1200, PCMCIA, National Instruments, TX, USA) and displayed and written to the hard drive using an in-house code based on LABVIEW (National Instruments, TX, USA). Regurgitant volumes were measured using 3D echocardiography (iE 33, Philips Medical Systems, Anover, MA, USA). A high speed video was used to observe the valve coaptation.

**RESULTS:** Videoscopic observations showed that proper coaptation of mitral valve leaflets under dynamic conditions with displaced, partially free and free papillary muscles (bileaflet prolapse model). Quantitative analysis was performed for posterior leaflet prolapsus model. Implantation of the mitral web reduced to regurgitation volume from  $10.43 \pm 3.76$  ml/beat to  $2.13 \pm 1.83$  ml/beat ( $p < 0.05$ ). No visual damage is observed on the mitral valve leaflets after 4 hours of continuous operation.

**CONCLUSION:** Preliminary in vitro experiments demonstrate that the mitral web is a feasible option for the repair of different types of mitral valve prolapse. The mitral web may significantly simplify mitral valve repair under the described complex pathological conditions. Further studies is needed to evaluate the possible complications, to understand the mechanics and improve the design.

### OP-707-IMPACT OF COMPLETE AND UN-COMPLETE PROSTHETIC MITRAL RINGS ON MITRO-AORTIC FUNCTION: AN MRI STUDY

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**BACKGROUND:** The perimeter of the aortic annulus changes proportionally with changes in LV volume, and it is largest at end-diastole and smallest at

end-systole. These dimensional changes in the aortic annulus improve LVOT haemodynamic and mitral anterior leaflet movement. This study investigates the impact of complete and un-complete prosthetic mitral rings on mitro-aortic function.

**METHODS:** Twenty patients that underwent CABG and restrictive annuloplasty with stringent down sizing of the mitral annulus by using an un-complete ring (Sovering-ring Sorin TM, size 40 or 50mm: 10 pts Group A) or a complete ring (Saddle ring St.Jude TM: 10 pts Group B) were evaluated using a superconductive 1.5T MRI (Intera Achieva, Philips, Netherlands) by mean of Balanced TFE T2w cine sequences on short axis and 2 and 4 chamber long axis. No differences in preoperative clinical data of group A and B were observed. At the moment of MRI control, all patients overcame 2-year of post-operative follow-up without any adverse events. Variations in end-diastole and end-systole LVOF diameter were measured (%) and compared between group A and B. BSA normalized mitral valve area was measured and compared between group A and B.

**Results:** Mean variation of .LVOT diameter was significantly higher in group A than in group B ( $12.7 \pm 4$  % versus  $3.6 \pm 5$  %,  $p < 0.01$ ). Mean BSA normalized mitral valve area was higher in group A than in group B ( $3.9 \pm 4$  cm<sup>2</sup> versus  $3.1 \pm 6$  cm<sup>2</sup>,  $p < 0.02$ ).

**Conclusion:** Our data show that un-complete mitral ring has a lower impact on mitro-aortic function than complete mitral ring.

### OP-708-MID-TERM RESULTS OF TRICUSPID VALVE ANNULOPLASTY WITH RINGS "MEDENG" IN COMPARISON SUTURE TECHNIQUE

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**BACKGROUND:** Tricuspid valve repair with annuloplasty rings is serious alternative to valve replacement. Used suture techniques annuloplasty is complicated high incidence of residual or recurrent valvular insufficiency.

**METHODS:** From 2005 to 2007 was observed 312 cases of tricuspid valve annuloplasty (added to others valves procedures) in patients with moderate insufficiency by different technique: in 142 (45,5%) cases was performed deVega suture annuloplasty (SA) and in 170 (54,5) patients - semiregird rings annuloplasty "MedEng" (RA). The age of the patients was from 43 to 64 y.o. ( $51,6 \pm 11,8$ ). The average Functional Class (NYHA) was 3,4. The size of a ring necessary to implantation was calculated by two ways: using sizer and Rowlatt formula. The feature, the geometrical form developed by us tricuspid valve ring (eminence of a ring in a region anterior-septal commissure) allows to prevent damage of conductive tissue: the zone is free from sutures and direct pressure of annuloplasty ring on His bundle.

**RESULTS:** The hospital mortality rate was 1,6% (5 patients) - 3 (2,1%) in SA group and 2 (1,2%) patients in RA. Echocardiography data of both groups in the short-term postoperative period were same: effective area tricuspid orifice -  $4,9 \pm 1,6$  and  $4,0 \pm 0,8$  cm<sup>2</sup> before and postoperation in SA group,  $5,1 \pm 1,8$  and  $4,2 \pm 0,5$  cm<sup>2</sup> in RA group; volume of regurgitation (at a volume bof right atrium) -  $34,9 \pm 7,1$  and  $12,1 \pm 5,6$  before and postoperation in SA group,  $37,2 \pm 9,3$  and  $14,6 \pm 6,3$  in patients with RA. During follow-up (20,2 $\pm$ 4,9 month) we reveal significant difference between SA and RA groups: volume of regurgitation -  $24,1 \pm 12,3$  in SA group and  $11,3 \pm 8,6$  in patients with RA. We analyzed patients with recurrent valvular insufficiency in SA group and reveal some preoperative predictors, allowed determe direct indication to RA - dilatation of tricuspid annulus more 55 mm, pulmonary hypertension 50 mmHg and higher, tricuspid valve lesion demanded complex repair (comissure and valvuloplasty added annuloplasty technique). In 7 (2,2%) cases annuloplasty ring was implanted to patients with recurrent valvular insufficiency after deVega annuloplasty (reoperation in occasion of mitral valve prostheses dysfunction) with excellent results in follow-up.

**CONCLUSIONS:** Mid-results of use semiregird annuloplasty rings "MedEng" allows adequately correct hemodynamic disturbances on tricuspid valve in patiens with high risk of recurrent insufficiency.



## OP-709-ARTIFICIAL CHORDAE IMPLANTATION IN REPAIR OF RHEUMATIC MITRAL VALVE DISEASE

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**OBJECTIVE:** Artificial chordae implantation has been extensively used in repair of degenerative mitral valve disease. However, the use of artificial chords in rheumatic valve repair is not established. In rheumatic valve disease, often the native chordae are diseased, shortened and not suitable for chordal procedures like transfer or shortening. Artificial chordae with ePTFE offers a suitable alternative. In this study we reviewed our early and mid term results of artificial chordae implantation in rheumatic mitral valve disease.

**METHODOLOGY:** Prospectively collected data of patients who underwent mitral valve repair between 2000-2006 from a single institution were reviewed. 528 patients with various etiology of mitral valve disease had mitral valve repair. 79 out of 262 patients with rheumatic mitral valve disease who had artificial chordal implantation as part of their repair procedure formed the study group.

**RESULTS:** The mean age of the patients was  $27.34 \pm 17.05$  years (64.6% females). The sites of artificial chordae implantation were anterior leaflet in 68 patients, both leaflets in 6 patients, and posterior leaflet in 5 patients. There was no early mortality. The follow up was complete in all patients by clinical and echocardiographic examination with range of follow up between 1 to 72 months. There was one late death. There was one failure requiring a redo repair procedure. During the latest follow-up, residual MR was absent in 27 (39%) patients, trivial in 10 (14%) patients, mild in 23 (33%) patients, moderate in 6 (9%) patients and severe in 4 (5%) patients. At 5 years postoperatively the estimated patient overall survival was 98.6% and freedom from reoperation was 98.6%.

**CONCLUSION:** In our population, mitral valve repair with artificial chordae implantation in patients with rheumatic disease resulted in good early and mid-term outcome. Extensive use of artificial chordae is therefore effective and can potentially increase the probability and durability of repair in this population of patients.

## OP-710-DOES PREOPERATIVE ATRIAL FIBRILLATION INCREASE THE OPERATIVE RISK IN PATIENTS UNDERGOING AORTIC VALVE REPLACEMENT?

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**BACKGROUND:** The purpose of this study was to investigate the independent effect of preoperative atrial fibrillation on 30-day and 6-month mortality in patients undergoing aortic valve replacement.

**METHODS:** Between 2000 and 2003 1241 consecutive patients underwent aortic valve replacement with (41%) or without concomitant coronary artery bypass grafting. The mean age was  $69 \pm 11$  years, 42% were female. 134 patients (11%) were identified with atrial fibrillation at the time of surgery. Patients were followed six month after AVR by mailed questionnaires or telephone interview. Follow-up was 99% complete. The impact of atrial fibrillation on mortality after 30 days, respectively six months was determined by multivariable logistic regression.

**RESULTS:** Mortality after 30 days and after six months was 10.4% versus 3.2% and 17.9% versus 6.4%, respectively for patients with and without atrial fibrillation. Atrial fibrillation was an independent risk factor for 30-day (Odds Ratio: 3.0 [1.5-6.0]) and 6-month mortality (Odds Ratio: 2.7 [1.5-4.5]). As further independent risk factors of 30-day mortality were identified age (Odds Ratio: 1.03 [1.0-1.07] per year), myocardial infarction (Odds Ratio: 2.7 [1.4-5.3]), endocarditis (Odds Ratio: 13.0 [2.1-78.5]), body mass index (Odds Ratio: 0.87 [0.80-0.94] per  $\text{kg/m}^2$ ) and serum creatinine (Odds Ratio: 1.4 [1.1-1.7] per  $\text{mg/dl}$ ). Further preoperative risk factors for 6-months mortality were diabetes mellitus (Odds Ratio: 2.0 [1.2-3.2]), left ventricular ejection fraction (Odds Ratio: 0.98 [0.97-0.99] per %), emergency surgery (Odds Ratio: 3.4 [1.5-7.6]), age (Odds Ratio: 1.02 [0.997-1.04] per year), body mass index (Odds Ratio: 0.89 [0.85-0.95] per  $\text{kg/m}^2$ ) and serum creatinine (Odds Ratio: 1.4 [1.1-1.7] per  $\text{mg/dl}$ ). Areas under the ROC curve were 0.76 and 0.75, respectively for 30-day and 6-months mortality.

**CONCLUSION:** Preoperative atrial fibrillation in patients undergoing aortic valve replacement is associated with increased operative mortality. These data support consideration of concomitant arrhythmia surgery in patients undergoing aortic valve replacement.

## OP-711-MASSIVE THROMBOSES OF LEFT ATRIUM IN SURGERY OF ISOLATED MITRAL VALVE DISEASE

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**OBJECTIVE:** To analyzed main problems in surgery of mitral valve diseases (MVD) complicated by left atrium's massive thromboses (LAMT) (thromboses more than 1/3 of left atrium's volume).

**MATERIALS AND METHODS:** 224 adult patients (pts) with MVD complicated LAMT were consecutive operated from 01.01.1984 till 01.10.2007 yy in Institute. Predominant genesis of MVD was rheumatism. Mitral stenoses was marked in all pts and all of them were in IV NYHA class. There were male 117 (52,2%) and females 107 (47,8%). The average age was  $49,2 \pm 7,6$  (19 - 69) yy. Calcification of MV was in 147 (70,3%) pts. Previous closed mitral commissurotomy (CMC) was marked in 39 (16,8%) pts. Previous episodes of emboli were in 48 (21,8%) pts. The following procedures were performed: mitral valve replacement (MVR) (n = 157), MVR + plastic procedure on TV by De Vega (n = 31), OMC (n = 29), OMC + plastic procedure on TV (n = 7). Only mechanical valves were used: in the most of pts- monodisk, bileaflet were only last 6 years. All operations were performed with CPB, moderate hypothermia ( $27-32^\circ\text{C}$ ) using St. Thomas crystalloid cardioplegia.

**RESULTS:** The hospital mortality (HM) at the period (1994-2007 yy) was 3,9% (n = 5/125) for MVR (including TV's correction) and 0% (n = 0/25) for OMC. The reasons of deaths were: heart failure (n=2), brain damage (thrombemboli) (n=2), bleeding (traumatic rupture of LA's posterior wall during removing of LAMT) (n=1). In all group (n=224) traumatic rupture of LA's wall during radical removing of LAMT was marked in 4 (1,5%) pts. Thrombotic events were marked in 5,8% (n = 12/188) during MVR and 2,9% (n = 1/36) during OMC (p < 0,05). The value of HM depends of following factors: small LV's volume -  $\text{ESVI} < 15 \text{ ml/m}^2$ . (for prostheses's size 29 mm and more), systolic pressure in pulmonary artery > 90 mm.Hg, previous CMC, giant LA, calcification of MV + 3. At the remote period (average  $14,2 \pm 3,8$  yy) mortality in three time and thrombotic lethal events in two times were higher for MVR's group (n = 91pts) than in OMC's group (n = 25 pts) (p < 0.05).

**CONCLUSION:** To perform correction of MVD with LAMT should be better without MVR as soon as possible. Thrombotic events at postoperative period is specific complicated factor for this pathology. Contraindication of operation is combination of 3 and more risk-factors.

## OP-712-IN PATIENTS WITH GRADE 2+ ISCHAEMIC MITRAL REGURGITATION, THE ADDITION OF MITRAL VALVE REPAIR TO CABG DOES NOT ADVERSELY AFFECT HOSPITAL OUTCOME

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**OBJECTIVE:** Management of moderate (grade 2+) ischaemic mitral regurgitation (IMR) in patients undergoing CABG has been controversial. However, evidence suggests that correction of MR in this setting improves long-term survival. Our aim was to examine whether adding mitral valve (MV) repair to CABG affects hospital outcome.

**METHOD:** Between June 2000 and June 2006, 79 patients with moderate (grade 2+) IMR underwent CABG and MV repair with an annuloplasty ring (group I), and 91 patients having also grade 2+ IMR underwent CABG alone (group II). Myocardial protection was provided with antegrade and retrograde cold blood cardioplegia.

**RESULTS:** Demographics, preoperative Logistic Euroscore, NYHA and CCS scores were similar in both groups. On postoperative TOE, MV repair was successful (trivial on no MR) in 94% of cases. Group I had longer bypass and cross-clamp times compared to Group II ( $108 \pm 17$  vs.  $71 \pm 14$  and  $89 \pm 50$  vs.  $39 \pm 12$  respectively,  $P < 0.001$ ). However, there were no significance differences in hospital mortality (6% vs. 4%,  $P = 0.7$ ) and rates of intra-aortic balloon pump use (11% vs. 8%,  $P = 0.6$ ), atrial fibrillation (29% vs. 33%,  $P = 0.28$ ), intensive care stay ( $3.9 \pm 3.1$  days vs.  $3.2 \pm 4.2$  days,  $P = 0.32$ ) and hospital stay ( $15 \pm 10$  days vs.  $12 \pm 8$  days,  $P = 0.12$ ) between the groups.

**CONCLUSIONS:** In the setting of moderate IMR, the addition of MV repair to CABG increases cardiopulmonary bypass and ischaemic times but does not adversely affect hospital outcome.

### OP-713-MULTIPLE VALVULAR HEART DISEASE: COMPARATIVE STUDY BETWEEN PATIENTS WITH TRIPLE VALVULAR CHANGE AND HIGH RISK UNIQUE VALVULAR CHANGE.

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**BACKGROUND:** The patients with triple valvular heart disease generally appear with severe heart failure with low cardiac output and marked heart chambers dilatation, furthermore, the triple valvular replacement surgery is long and complex.

**OBJECTIVE:** To determine Mortality prognosis factors, patients with triple valvular replacement surgery were compared with patients with high risk unique valvular change. Material and

**METHODS:** Since January 2000 to January 2005 a nested cohort study was designed, in which 73 consecutive patients were incorporated. Thirty three patients included in the triple valvular replacement Group (TVC), and forty three patients with high risk unique aortic valvular surgery Group (UVC). For a suitable comparing both groups were paired by: Age, EuroScore Index, NYHA Functional Class, Extracorporeal Circulation Time (ECT) and Aortic Clamp Time (ACT). Descriptive and comparative statistics were done using SPSS-13 program. We declare p value  $\sim 0.05$ .

**RESULTS:** Previous to surgical procedure: 70% were male, 85% had Rheumatic Heart Disease, 90% were in NYHA functional class III - IV, 8% with hepatic failure, 25% atrial fibrillation prior to surgery. Left Ventricular Ejection Fraction was  $47.8\% \sim 16.5$  in the TVC Group vs  $47.9\% \sim 7.1$  in the UVC Group ( $p=ns$ ), systolic pulmonary pressure was  $61 \sim 21.8$  mmHg in the TVC Group vs  $59 \sim 21$  mmHg in the UVC Group ( $p=ns$ ), EuroScore Index was  $9.2 \sim 10.6$  in the TVC Group and  $8.9 \sim 10.6$  in the UVC Group ( $p=ns$ ), ECT was  $96.8 \sim 23$  minutes in the TVC Group and  $97.2 \sim 28.3$  minutes in the UVC Group ( $p=ns$ ). When we compare both groups there were not significant differences in cardiac chamber diameters, NYHA functional Class and pulmonary systolic pressure (quantified by echocardiography). In the triple valvular surgery Group, all patients, had Rheumatic Valvular Disease versus 19% in the high risk unique valvular change Group ( $p \sim 0.001$ ), the Atrial Fibrillation existed in the group of triple valvular replacement in 76% vs 58% in the UVC Group ( $p \sim 0.001$ ). In-Hospital Mortality predictors, by Bivariate analysis, were: Bleeding (OR: 0.71, IC95: 0.15-3.32), Right Ventricular failure (OR: 1.21, IC95: 1.12-1.29), Mortal Arrhythmias (OR: 0.55, IC95: 0.07-4.56), Infections (OR: 0.85, IC95: 0.10-7.33), all variables without statistics significant. The overall hospital Mortality in the trivalvular surgery Group was 10% versus 11.6% in UVC Group ( $p=ns$ ), in long follow-up (median  $49 \sim 21.9$  months) survival was 82.7% in the TVC group vs 84.5% in the UVC group ( $p=ns$ ).

**CONCLUSIONS:** Prior surgical risk stratification, Mortality is permissible in patients undergoing triple valvular replacement, compared with high risk unique valvular change. Right Ventricular failure is the strongest and robust variable associated with hospital Mortality in this kind of patients.

### OP-714-MITRAL VALVE REPAIR WITH QUADRANGULAR RESECTION WITH THE DOUBLE TEFLON NO RING TECHNIQUE: 12 YEAR RESULTS

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**BACKGROUND:** The purpose of this paper is to present the late results of a modification in the technique of mitral valve repair with quadrangular resection, the DOUBLE TEFLON TECHNIQUE, which consists in quadrangular resection of the posterior leaflet, annulus plication with "pledgetted" stitches over a Teflon patch, and leaflet suture, without ring annuloplasty.

**METHODS:** One hundred and sixty four patients with mitral insufficiency due to myxomatous degeneration and ruptured or elongated chordae tendineae underwent mitral valve repair with this technique in the Heart Institute of University of Sao Paulo Medical School, between 1994 and 2004. The mean age was  $60.0 \pm 13.1$  years and 64.0% patients were male. In the preoperative period, 29.3% of the patients were in New York Heart Association functional class IV, 55.7% in class III and 15.0% in class II. Associated procedures were per-

formed in 33 patients (20.1%), the most common was coronary artery bypass grafting in 22 patients (13.4%). Associated techniques of mitral repair were employed in 17 patients (10.4%), the most common was chordal shortening.

**RESULTS:** There was one operative death (0.6%), due to stroke. Actuarial survival at 12 years was  $96.2 \pm 2.6\%$ . Linearized rates of reoperation, thromboembolism and endocarditis were 0.8%, 0.5% and 0.1% patient/year, respectively. There were no episodes of hemolysis. Late death was 0.6% patient/year.

**CONCLUSIONS:** Mitral repair with the DOUBLE TEFLON TECHNIQUE without ring annuloplasty presented good results in 12 years.

### OP-715-COMBINED TREATMENT OF ATRIAL FIBRILLATION AND ATRIOMEGALIA DURING MITRAL VALVE SURGERY

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**BACKGROUND:** Large left atrial diameter is reported to be a predictor for recurrent atrial fibrillation after the maze procedure, and left atrial diameter by itself influences the chance of sinus rhythm recovery, as well as maintenance of sinus rhythm [Marui A., Nishina T., Tambara K. et al, 2006].

**METHODS:** from 2001 to 2007 years in our clinic was performed 72 Maze procedure during mitral valve surgery. In 11 (15,3%) cases was used a technique of triangular resection plasty during Maze procedure if left atrial size was  $> 7,0$  cm. Our modification of original Maze procedure, which includes preservation of the right atrial appendage, without incision of atrial septum and incision from right atrial appendage to tricuspid annuli.

**RESULTS:** There was not mortality in group patients with atrial reduction plasty Maze procedure one patient (9,1%) was re-explored for bleeding. The echocardiography data before and postoperation: left atrium size -  $7,9 \pm 1,3$  and  $5,6 \pm 0,9$  cm before and post; volume of left atrium -  $329,3 \pm 72,2$  and  $129,3 \pm 72,2$  ml; active contractile fraction of left atrium - absence before operation and  $33,4 \pm 8,8\%$  postoperative; right atrium size -  $6,1 \pm 1,5$  and  $5,8 \pm 1,1$  cm before and post; volume of right atrium -  $268,6 \pm 42,8$  and  $134,2 \pm 39,8$  ml; active contractile fraction of right atrial - absence before operation and  $28,3 \pm 9,4\%$  postoperative. Postoperative atrial fibrillation occurred in 2 patients (18,2%), and was successfully controlled with additional antiarrhythmics as above. Postoperative transient sinus node dysfunction were observed in 4 (36,4%) patients and demanded implantation two-chamber pacemaker in one case. There was a significant decrease in the atrial natriuretic peptide levels after 7 days postoperative from  $62,3$  pg/ml to  $41,2$  pg/ml, but increase to  $49,6$  pg/ml - 14 days postoperative. At a follow-up time of  $23,5 \pm 12,1$  months, 10 (90,1%) of the 11 patients were in normal sinus rhythm with heart rate 60-70, no thromboembolic complications and New York Heart Association class I-II.

**CONCLUSIONS:** Our modification of left atrial reduction plasty maze procedure was effective in 90,1% of these "low success" atrial fibrillation patients. This simple procedure can extend indication of the maze procedure to more patients with chronic atrial fibrillation and giant left atrium.

## CARDIAC OTHER III

### OP-716-INTRANASAL MUPIROICIN IN NASAL CARRIERS OF STAPHYLOCOCCUS AUREUS TO PREVENT SURGICAL SITE INFECTIONS

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**BACKGROUND:** Background Patients with nasal carriage of Staphylococcus aureus have an increased risk of surgical site infections caused by that organism. Treatment with mupirocin ointment can reduce the rate of nasal carriage and may prevent postoperative S. aureus infections.

**METHODS:** Descriptive study - prospective observational study. The aim of the study was determine the incidence of nasal carriers of Staphylococcus aureus in population, to evaluate the efficacy of eradication with mupirocin and the prevention of the surgical site infections.

**PROTOCOL:** Staff and each patient undergoing cardiac surgery was nasally cultured for the presence of S aureus, MSSA and MRSA. Cotton swabs in the anterior vestibules of each naris were obtained when the patients were scheduled. If S aureus was isolated, was administered mupirocin ointment 3 times daily for up to five days. In urgent and emergent operation the patients were cultured for screening. Duration of the study 12 months.

**RESULTS:** We observed an effective eradication of the nasal carriers of the S aureus and a decrease in surgical site infections in patients treated with intranasal mupirocin.

**CONCLUSION:** Mupirocin was effective in eradicating nasal MS MRSA.

### OP-717-FACTORS INFLUENCING VASCULAR COMPLICATIONS IN INTRA-AORTIC BALLOON PUMP

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**BACKGROUND:** We evaluated the vascular complications of Intra-aortic balloon pump and risk factors associated with the development of these complications in patients undergoing myocardial revascularization.

**METHODS:** 103 consecutive patients with Intra-aortic balloon pump support were evaluated. Univariate and multivariate analyses were performed to identify risk factors for the development of vascular complications.

**RESULTS:** Seven (10%) patients developed major and 8 (12%) patients developed minor vascular complications. Ischaemia of the limb, requiring thromboembolectomy developed in 2 (3%) patients. Mean age of the patients was 59.2 years and 41% of the patients were female. Vascular complications (leg ischemia) were not affected by age. The overall mortality was 44%. Multiple logistic regression analysis revealed duration of intra-aortic balloon pump support, emergency of operation and diabetes as independent risk factors. The duration of intra-aortic balloon pump therapy ranged from 9 hours to 7 days (mean 2 days) and it had a direct linear relation with occurrence of limb ischemia so that the risk was about 16% of patients per 24h ( $p = 0.055$ ). Prevalence of limb ischemia proved to be higher in diabetic patients ( $p = 0.04$ ). The emergency of operation had clear impact on leg ischemia in patients with intra-aortic balloon pump ( $p < 0.02$ ).

**CONCLUSION:** We found no instances of limb ischemia, either minor or major, during the first 24 hours of intra-aortic balloon pump placement, and very importantly, a linear increase in this risk thereafter. Besides other preventive measures to reduce this complication (e.g. sheathless technique, smaller catheters, anticoagulation) earlier removal or placement at a different site, optimally before 36 hours, after insertion seems prudent specially in high risk groups of patients such as diabetic, those with Body Surface Area (BSA)  $< 1.65 m^2$ , evidences of Peripheral Vascular Disease (PVD) and emergent cases.

### OP-718-LEFT VENTRICULAR MYECTOMY FOR HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY - LOCAL EXPERIENCE IN PAKISTAN

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**BACKGROUND:** A 58 yrs old male who was diagnosed as a case of HOCM and coronary artery disease for the last 4 years with history of previous PCI to circumflex. He presented with severe symptoms of LVOT obstruction i.e., syncope, SOB (NYHA II) and Angina (NYHA III). Investigations performed on him including coronary angiography, ventriculogram and serial echocardiography showed severe LVOT obstruction with PG of 90 mm Hg, goose neck appearance of LVOT, Intense stenosis of circumflex, mid LAD stenosis, mild MR, normal aortic valve and preserved LV function.

**PROCEDURE:** Routine median sternotomy was performed. On Cardiopulmonary bypass with hypothermia of 32 C, using cold blood cardioplegia at 4 C via ante-grade and retrograde routes and after cross clamping, the aorta was opened. Longitudinal resection of hypertrophied interventricular septum measuring 1.5cm x 4cm performed well away from membranous part of interventricular septum through transaortic approach. Coronary artery bypass grafting of mid LAD and OM1 was also performed using pedicle LIMA and reversed long saphenous vein graft. Single layer closure of Aortotomy performed. After performing deairing heart resumed partial heart block for which ventricular pacing was used. Patient was then weaned off bypass uneventfully without any inotropic support. 2 Million IU of Trasylol (Aprotinin) were used at induction. No blood transfusion was required during this procedure. Patient developed heart block after few days for which VVI permanent pacemaker was inserted. Patient was discharged on 10th post operative day.

**RESULTS AND FOLLOW UP:** For the last 2 years patient is symptom free and is enjoying healthy life. Check echocardiography and CT Angio confirmed no residual LVOT obstruction and patent both grafts.

**CONCLUSION:** According to our local experience, the surgical resection for HOCM is safe and effective in relieving the symptoms.

### OP-719-THE TARDIEU'S SIGN IN CARDIAC SURGERY, LOCAL AND SYSTEMIC PERSPECTIVE

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**BACKGROUND:** Cardiac surgery involving ischemic arrest and extracorporeal circulation has been extensively used in the last decades; nevertheless, its benefits are limited by daily reports over newer surgical techniques with lesser lesions. A series of features has been described as complications, between them; aortic lesions, embolic events and a rise of inflammatory activity as the most relevant, this lately been emphasized by laboratorial analysis.

**METHOD:** We, in this work, present the macroscopic observation of this activity throughout the Tardieu's sign in 30 patients submitted to cardiac surgery with extracorporeal circulation. The Tardieu's sign, first described in 1859, is often used in forensic medicine and defined as sub pericardial and sub pleural petechiae observed at the heart surface of persons who have been death by strangulation or suffocation. We observed the pattern of appearance during surgery, size of spots and distribution at the end of surgery and compared them with surgical times and platelet count, besides clinical characteristics.

**RESULTS:** All patients hereby presented the sign. Appearance and petechiae distribution and in some cases spots of ecchymoses (six patients), were not significant related to perfusion times (54 + 11 min vs. 47+16 min,  $p=0.3$ ) or clamping times (47 + 9 vs. 39 + 15 min,  $p=0.23$ ), otherwise; greater times were observed in the ecchymoses group. There was lack of relationship between type of surgery or basal patient conditions.

**CONCLUSION:** We can consider that the signal of Tardieu as a macroscopic manifestation of vascular injury with etiologic implications in cardiac surgery, mainly in those with cardiopulmonary bypass and can characterizes an appraiser in future works that seek to limit this kind of injury.



## OP-720-IS THERE A SEX DIFFERENCE IN CAROTID DISEASE IN PATIENTS UNDERGOING CORONARY REVASCULARIZATION?

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**BACKGROUND:** Coronary and cerebrovascular disease are leading causes of death among women. The hormonal biology, delayed presentation and smaller vessel size have been considered negative predictors. Significant gender differences have been reported among patients with symptomatic carotid artery disease. Aim of this study is to examine if the female sex is a predictive factor for carotid stenosis in coronary artery bypass grafting (CABG) patients.

**METHODS:** Subjects were 169 female CABG patients compared to 796 males. They divided in groups based on the presence of risk factors for cerebrovascular accident (CVA) as: a) history of CVA, b) history of peripheral vascular disease (PVD), c) age  $\geq 65$  and d) the presence of left main disease. EuroSCORE was calculated as it predicts operative mortality for patients undergoing cardiac surgery.

**RESULTS:** The presence of carotid stenosis  $\geq 50\%$  in females in the CVA group is 50%, with PVD is 10%, with age  $\geq 65$  years 14.2% and  $<65$  is 16.7%. These rates are not statistically different from the observed rates in males. The average values of EuroSCORE are statistically significant different between males and females, with the latter scoring greater values.

**CONCLUSIONS:** The results of our study do not indicate a statistically significant difference in the presence of carotid disease between the male and the female population undergoing CABG. Although there are reports that the female gender is between the risk factors for carotid stenosis, it seems that the female sex is not a predictive factor for carotid stenosis in CABG patients.

## OP-721-VALIDATION OF EUROPEAN SYSTEM FOR CARDIAC OPERATIVE RISK EVALUATION IN SAUDI ARABIA

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**BACKGROUND:** EuroSCORE has been proven to work well across european countries as well as in Nort America to predict risk for cardiac surgery candidates. Our aim was to assess the performance of EuroSCORE on Middle East cardiac surgery patients.

**METHODS:** Simple additive EuroSCORE model was applied to predict mortality in 367 consecutive patients undergoing coronary and/or valve surgery at our hospital between January 2005 and July 2007. Predicted and observed mortality for the whole group as well as across the risk group was compared. Fischer's test was used to analyze our data.

**RESULTS:** ME population was significantly younger (mean age 53.4 vs 62.5 years) with less female patients (13.1 vs 27.8%). There were significantly more diabetics in our group of patients (66.2 vs 17%). More emergency procedures (10.89 vs 4.9%), patients in critical condition (7.9 vs 4.1%) and patients with recent MI (16.3 vs 9.7%) were operated on in our group. Combined procedures (12.26 vs 36.4%) and redo procedures (1.08 vs 7.3%) were performed less frequently in our hospital. Predicted overall mortality (5.04 vs 2.14%) as well as across all the risk groups closely matched observed one but was consistently lower in all of them (SCORE  $< 5\%$ : 0 vs 1.83%; SCORE 5-20%: 2.32 vs 9.65%; SCORE  $> 20\%$ : 30 vs 38.7%).

**CONCLUSION:** EuroSCORE can be recommended as a very simple and effective tool in predicting mortality among Middle East population of cardiac surgery candidates. Lower than predicted mortality can be explained by low-flow private character of our facility where "learning curve" can be completely avoided.

## OP-722-RESULTS OF THE SHELHIGH STENTLESS BIOPROSTHESIS IN PATIENTS WITH ACTIVE INFECTIVE ENDOCARDITIS: 7-YEAR SINGLE CENTRE EXPERIENCE IN 255 PATIENTS

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**OBJECTIVES:** To investigate early and mid-term results following valve replacement with Shelhigh stentless bioprosthesis made entirely of biological material in patients with active infective endocarditis (AIE).

**MATERIAL AND METHODS:** Over the last 20 years 1144 AIE operations were performed. Of these, 255 patients (mean age 59 years) received Shelhigh bioprostheses between 02/2000 and 03/2007. A total of 73.7% had native AIE and 26.3% prosthetic AIE. Surgery was regarded as urgent in 57.3 and as an emergency procedure in 38.4%. The mean follow-up time is 1.6  $\pm$  0.12 years (1 month to 6.6 years).

**RESULTS:** There was a highly significant difference in the survival rate between patients who were operated on urgently vs in an emergency (30-day, 1 years, 3-year and 5-year survival was 83.7%, 67.7%, 63.6%, 56.0% vs 57.3%, 45.3%, 34.9%, 31.0%;  $p < 0.0001$ ), single vs double valve replacement ( $p = 0.033$ ), and patients with and without abscess formation ( $p = 0.0245$ ). Main cause of early death was septic multiorgan failure. Only five patients required reoperation due to early reinfection (1.9%). TEE doppler gradients (3, 6, 12 months) showed good hemodynamics.

**CONCLUSION:** Our experience in the use of Shelhigh bioprostheses in patients with native and prosthetic endocarditis shows the early and mid-term results, in particular the low reinfection rate and the good hemodynamics, to be comparable with the results achieved using homografts. Better survival should be achieved if patients could be operated on earlier. Since these prostheses are readily available and their implantation straightforward, they are increasingly being used in patients with endocarditis. These promising results need to be verified in the long term.

## OP-723-VACUUM-ASSISTED CLOSURE AND BILATERAL PECTORALIS MUSCLE FLAP FOR DIFFERENT STAGES OF MEDIASTINITIS

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**BACKGROUND:** Deep sternal wound infection (DSWI) remains a serious complication of cardiac surgery. We aimed to assess the results of bilateral pectoralis major muscle flap (BPMMF) and vacuum-assisted closure (VAC) results for different stages of post-cardiac surgery mediastinitis.

**METHODS:** Between January 2000 and July 2007, 65 patients with DSWI after cardiac surgery were identified. The average age of patients was 61.3  $\pm$  10.9 (range 37 to 84) years. Pairolero and Arnold Type-I DSWI were treated with either commercial or off-the-shelf VAC therapy ( $\bar{x} = 33$ , 59.3  $\pm$  11.7 years of age) and type-II wounds ( $\bar{x} = 32$ , 63.3  $\pm$  9.8 years of age) were treated with early BPMMF and continuous irrigation; two patients required additional rectus abdominis muscle flaps. Delayed BPMMF reconstruction was necessary in 6 patients from the VAC group.

**RESULTS:** Overall incidence of DSWI at our unit was 1.04%. DSWI was diagnosed 15.9  $\pm$  10.8 days (range, 5 to 62 days) after surgery. Diabetes was more common in patients with type-II wounds compared to type-I wounds ( $p = 0.046$ ). Hospital mortality was 4.6% ( $\bar{x} = 3$ ) for the entire group. Causes of death were septic multi-organ failure and respiratory failure. At 6-month follow-up one recurrent sternum infection had occurred in the VAC group. The results of off-the-shelf VAC system were comparable to commercial system.

**CONCLUSION:** Early BPMMF is an effective choice of surgical treatment for type-II DSWI or unstable sternum. Both commercial and off-the-shelf VAC therapy can be considered for type-I sternal wounds. Primary VAC therapy can also be combined with secondary BPMMF in complex DSWI.

#### **OP-724-ACUTE CORONARY SYNDROMES: RISK FACTORS AND RESULTS OF PATIENTS OPERATED FOR REVASCULARIZATION**

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**BACKGROUND:** Patients with acute coronary syndrome (ACS) are candidates for revascularization. The optimal timing of surgery depends upon why it is being performed. Since CABG mortality is elevated for the 3 to 7 days after infarction, the benefit of revascularization must be balanced against this risk. Data suggest that revascularization performed within the first six hours after acute MI results in a greater degree of reperfusion injury and increased mortality. Aim of our study is to examine the risk factors that affect the early and late survival, therefore to predict the patients who will benefit from surgical treatment.

**METHODS:** Ongoing ischemia, cardiogenic shock, PCI failure and structural complications were indications for emergency operation, to maximize myocardial salvage and reduce the impact of severe hemodynamic compromise on other organ systems. The 50 patients with ACS who were treated in our department were divided in 3 groups: a) unstable angina (UA), b) ST elevation Myocardial Infarction (STEMI) and c) cardiogenic shock (CS). All the risk factors were recorded and EuroSCORE was calculated. Follow up was 4 ½ years.

**RESULTS:** 41 patients with UA or MI had expected mortality 2,05% - 39,7% but the observed was 2,5%. Intraortic balloon pump (IABP) was used in 40%. One high-risk patient with MI died (EuroSCORE: 10,5%). 9 patients with CS had expected mortality 9.97%- 57,7% but observed 77,7%. IABP was used in all these patients and 7 died with EuroSCORE 41,8%- 57,7%. After 4 ½ years, from the 34 patients with UA or MI, 3 patients (> 80 years) died and angina relapsed in 2 patients. From the 2 survivors with CS we contacted with one who was healthy.

**CONCLUSIONS:** Patients with UA or MI, after 48 hours of stabilization, can be operated using IABP with very good results (mortality 2,5%). On the contrary, patients with CS benefit from the operation if the calculated risk is < 40%. If the risk is ≥40% the morbidity is rising to 100%. The EuroSCORE is useful to predict the immediate survival after surgery but it is not correlated with late survival. Conversely, the late survival is correlated with the increasing age (>80 years) and the immediate postoperative complications (bleeding).

#### **OP-725-CORONARY ARTERY REVASCULARISATION IN ACUTE ST-ELEVATIONS MYOCARDIAL INFARCTION**

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**BACKGROUND:** Aim of our study was to retrospectively analyse results in patients operated on during acute phase of STEMI

**METHODS:** 32 patients, average age 55.25 years, were operated on between 12/2005 and 08/2007 with the diagnosis of acute STEMI. Mean duration of myocardial ischaemia prior to operation was 5.76 hours (1-22 hours). Cause of MI was acute coronary thrombosis in 25 (78.12%) and failed PTCA in 7 (21.2%). 18 patients were hemodynamically stable while transferred for operation, 14 presented with cardiogenic shock and/or CPR preoperatively. IABC was inserted in 8 patients before operation. Predicted mortality (EuroSCORE) was 22.3% for the whole group. One patient was operated off-pump, 19 on ECC with cardioplegic arrest and in 12 patients on-pump beating heart technique was used. LIMA graft was harvested after establishing of ECC in 26 (81.2%) patients including one patient with BIMA grafts.

**RESULTS:** Four patients died in our group with overall mortality of 12.5%. 14 (43.7%) patients underwent postoperative course free of any complication. None of the patients operated within first 4 hours of MI died despite of hemodynamic status including patients transferred to OR with ongoing CPR. None of the hemodynamically stable patients died in our group. Preoperative EF, CPR, shock and high EuroSCORE were factors significantly ( $p<0.05$ ) influencing mortality. No sternal dehiscence, permanent stroke, severe brain dysfunction or renal failure occurred among survivors. Standart statistical analysis of the data was performed (Rank test, Chi-Square, Fischer's Exact Test).

**CONCLUSIONS:** Hemodynamically stable patients with 3VD and acute STEMI can be operated on with excellent results and low morbidity in proper time window. Patients with catastrophe during elective PTCA have a good chance for survival even when transferred to OR with ongoing CPR.



## STEM CELLS - BIOENGINEERING

### OP-726-PARACRINE ACTION OF MESENCHYMAL STEM CELLS IMPROVES MYOCARDIAL PROTECTION AND FUNCTION ONE MONTH AFTER ACUTE ISCHEMIC INJURY IN PIGS

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**BACKGROUND:** Animal studies showed that transplantation of bone marrow-derived mesenchymal stem cells (MSC) improves the repair and function recovery following acute myocardial infarction (MI), but mechanisms underlying these effects remain controversial. It is postulated that MSC could achieve protection by paracrine mediators rather than cardiac regeneration by the implanted cells. Under hypoxic culture condition, biologically active factors are secreted by MSC and found in the MSC-conditioned culture medium (CM). We previously showed using a large animal model that indirect and paracrine effects of factors secreted by MSC could protect acute ischemic myocardium, and improve significantly cardiac function at seven days post MI. **OBJECTIVE:** In the current study, we investigated the role of a single intra-coronary injection of MSC-CM on early (3 days) and late (28 days) myocardial recovery.

**METHODS:** In this study, pigs were subjected to acute MI using a catheter balloon occluding left anterior descending (LAD) coronary artery. Following reperfusion, animals received either intra-coronary injection of MSC-CM or control medium. Animals (n=3 to 7/group) were evaluated for left ventricular function by echocardiography at 3, 7, 14 and 28 days and sacrificed. Inflammatory and healing responses were characterized histologically.

**RESULTS:** MSC-CM treated animals showed a significant early decrease in troponin serum levels:  $5.8 \pm 4.0$   $\mu\text{g/L}$  vs  $10.4 \pm 5.8$   $\mu\text{g/L}$  at 15 minutes, and  $6.8 \pm 2.9$   $\mu\text{g/L}$  vs  $11.7 \pm 3.3$   $\mu\text{g/L}$  at 60 minutes ( $p < 0.05$ ). Compared to baseline, echocardiographic parameters including ejection fraction (EF), fractional area shortening (FAS), wall motion score index (WMSI) and cardiac output (CO) demonstrated a favorable functional preservation in the MSC-CM treated group. Using a multivariate least square model fitting FAS change, we observed a significant improvement in the MSC-CM group of  $9.7 \pm 2.5\%$  independent of the post-MI day (Figure-1,  $p = 0.0007$ ). Leukocytes and inflammatory cells infiltration into ischemic tissues appeared to be decreased in the MSC-CM group, along with sparse areas of relatively well-preserved myocardium.

**CONCLUSIONS:** Following acute MI, a single intra-coronary MSC-CM injection could improve healing and preserve myocardial function. We speculate that early modulation of the inflammatory process by secreted factors may have important implications on the extent of myocardial injury and function recovery. Injection of MSC-CM could be used therapeutically to treat ischemic heart disease, rather than stem cells themselves, thus avoiding many practical and technical issues limiting cell therapy.

### OP-727-INDIGENOUSLY PROCESSED BOVINE PERICARDIUM FOR CARDIOVASCULAR USE

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**BACKGROUND:** Bovine pericardium is a natural biomaterial with a wide range of applications. Processing is quintessential to eliminate antigenicity, toxicity and infectivity before human application, thereby reducing the calcific degeneration and inflammatory reaction. We have standardized the processing of this xenogenic biomaterial in a non-conventional manner and optimized it by validation and in 233 patients it had been used after informed consent.

**MATERIALS AND METHODS:** The ethical committee had approved use of indigenously processed bovine pericardium for human pilot clinical trial and it had been used in various cardiac surgical procedures as patch or tube graft to correct the anatomy and physiology. 233 patients mostly children received this material in ASD patch, RV out flow reconstruction, Senning's and Mustard pro-

cedures, Rastelli procedure, re-construction of right atria, atrial septation, as a tube graft in unifocalisation, as a coarctoplasty patch in aorta, enlargement of aortic root, as a ventricular support in a scarred ventricle, Arterial switch operation, truncus etc. This is now ready for multicentric trial. Institutional research and ethical committee had approved the project of processing 129 large bovine pericardia, which were harvested in aseptic manner from SPF cattle and processed in the laboratory by decellularization followed by anticalcium treatment, crosslinking, antithrombotic processing and finally to long term storage solution after shaping them into smaller sizes. Under strict validation protocols, accounting for decellularization through common staining and microscopical examination and cellular proteomic studies and DNA detection were performed. Preservation of collagen architecture was proved by von Geisen's stain and FT-IR; collagen was further characterized by collagen digestion tests and thermal stability studies with Differential Scanning Calorimetry. Mechanical strength was evaluated. They were subjected to in-vitro and in-vivo toxicity studies along with guinea pig maximization test. Later they were compared to the conventionally available ones and qualified for large animal experimentation in sheep vascular system and also subcutaneous and cutaneous implantation studies. Following these above procedures and substantiating the efficacy the pilot study had been ventured.

**RESULT:** Complete decellularization was achieved preserving the collagen architecture and native collagen conformation. It was shown to acquire a better property than the existing commercially available ones both microscopically and macroscopically. Mechanical strength and thrombogenicity studies were far superior. There were no cytotoxicity or sensitization issues; contrarily they had permitted human blood cell division. Subsequently animal experiment showed autologous cell growth in the pericardium directing the material to become autologous tissue on implantation. Total 233 applications were instituted in complex surgical procedures as human trial without any adverse bio material effect.

**CONCLUSION:** This indigenously processed bovine pericardium is functioning without experiencing thrombogenicity, calcification and abnormal dilatation in cardio-vascular system. A follow up of three and half years in patients suggests evidence of growth and no sign of calcification by radiography, which was earlier evident in several animal experiments. This novel method of processing may be adopted for Homografts processing as well to make them conducive for autologous cell growth.

### OP-728-ASSESSMENT OF MYOCARDIAL CELL THERAPY EFFICACY WITH LONGITUDINAL STRAIN ECHOCARDIOGRAPHY ANALYSIS

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**BACKGROUND:** Novel echocardiographic techniques can quantify regional myocardial deformation (strain) and distinguish between passive and active wall motion. We hypothesized that this technique may help delineate cell therapy-induced changes in regional LV contractility.

**METHODS:** Ten patients with coronary artery disease and reduced LV function (LVEF < 35%) underwent CABG surgery plus intramyocardial injection of  $200 \times 10^6$  autologous bone-marrow mononuclear cells. Segmental strain analysis of the 2D echocardiography images was performed before and 1 year after surgery using two consecutive cardiac cycles of acquired loops. This system allows analysis of peak systolic longitudinal strain based on detection of natural acoustic markers within the myocardium and an algorithm which follows the acoustic markers accurately during consecutive frames.

**RESULTS:** All patients survived the procedure without major complications. Mean LVEF increased from  $24.5 \pm 10\%$  to  $32.1 \pm 11\%$  ( $p = 0.037$ ). The regional wall motion score index improved from 2.47 to 2.14 in untreated segments (13%), and from 2.6 to 2.13 in cell-treated segments (18%). Regional longitudinal strain improved from -9.9 to -10.6 (septal/lateral), -9.2 to -9.9 (anterior/inferior), and -7.8 to -9.6 (anteroseptal/posterior), respectively. The average strain in cell-treated segments improved from -6.6 to -8.5. The relative change in longitudinal strain in cell-treated segments was greater than average (29% vs. 11%,  $p = 0.004$ ).

**CONCLUSIONS:** In this pilot study, contractility of cell-treated LV segments seems to improve more than average after CABG surgery, but the increase in global LVEF is comparable to historic data of routine CABG surgery. Echocardiographic strain imaging may be a useful tool for assessing the regional effect of clinical cell therapy strategies.

### OP-729-CCR3- AND CXCR4-MEDIATED INTERACTIONS REGULATE MIGRATION OF CD34+ HUMAN BONE MARROW PROGENITORS TO ISCHEMIC MYOCARDIUM AND SUBSEQUENT TISSUE REPAIR

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**OBJECTIVE:** Hematopoietic progenitor cells are able to induce neovascularization of ischemic myocardium, inhibit apoptosis, and prevent heart failure. They express functional CCR3 and CXCR4 chemokine receptors however the role of those receptors in migration of progenitor cells into the ischemic myocardium is unknown.

**METHODS:** Myocardial infarction was surgically induced in athymic nude rats and human bone marrow derived CD34+ cells or saline were injected in the tail vein. Cell chemotaxis was studied in vitro using chemotaxis chambers with or without concomitant stimulation with eotaxin or SDF-1. Cell migration into ischemic myocardium was evaluated by immunohistochemistry. CCR3 and CXCR4 antibodies or local injections of SDF-1 were used to investigate the role of chemokine expression in the migration capacity of the injected cells. Morphological analysis included evaluation of apoptosis and capillary density in the ischemic myocardium.

**RESULTS:** Ischemic rat myocardium demonstrated induced mRNA expression for the CCR3-binding chemokines eotaxin, RANTES, and MCP-3, but not the CXCR4-binding chemokine SDF-1. Migration of human angioblasts to ischemic rat myocardium was inhibited by a blocking anti-CCR3 mAb, but not by a blocking anti-CXCR4 mAb which instead inhibited migration to bone marrow. Finally, intramyocardial injection of SDF-1 redirected migration of human angioblasts to ischemic rat hearts, resulting in augmented neovascularization, enhanced cardiomyocyte survival, and functional cardiac recovery.

**CONCLUSIONS:** CCR3-dependent chemokine interactions regulate endogenous migration of CD34+ progenitors from bone marrow to ischemic but not to normal myocardium. Manipulating CXCR4-dependent interactions could enhance the efficacy of cell therapy after myocardial infarction.

### OP-730-AUTOLOGOUS BONE MARROW CELL THERAPY FOR HEART FAILURE: MIDTERM FOLLOW-UP

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**BACKGROUND:** Autologous adult stem cell transplantation for cardiovascular disease has shown promising early results. Bone marrow derived stem cells as an adjuvant to conventional revascularization therapy in patients with congestive heart failure was evaluated and assessed at midterm follow-up.

**METHODS:** After IRB (Institute of Regenerative Medicine) and government approval, adult autologous stem cell transplantation was performed in patients with ischemic cardiomyopathy and an ejection fraction of <35% who were scheduled for primary coronary revascularization. Preoperatively, the patients had an echocardiogram, SPECT, and a cardiac catheterization to identify ischemic regions of the heart and to guide in the selection of stem cell injection sites. The patients were prospectively enrolled before the operative therapy was performed. Patient follow-up was up to 54 months.

**RESULTS:** There were fifty patients enrolled in the study. All patients except 1 (Mortality 2 %) had successful sub-epicardial transplantation of autologous stem cells into ischemic myocardium. There were 45 males and 5 females in each group. Four patients (1,5 ; 13; 21; and 44 months) died during the follow-up period. The survival rate at 54 months was 74% (KM). The ejection fractions of the preop  $31.6 \pm 4.3(\%)$ , 12 month  $44.2 \pm 3.7(\%)$ ; 24 months  $42.8 \pm 4.1(\%)$ ; 36 months  $41.3 \pm 3.8(\%)$ ; 48 months  $40.6 \pm 3.3(\%)$ , ( $P < 0.05$ )

**CONCLUSIONS:** Autologous stem cell transplantation led to significant improvement and maintenance in cardiac function in patients undergoing adjuvant coronary revascularization for ischemic cardiomyopathy. Continued follow-up is required to quantify optimal timing, dose and specific cellular effects of the therapy.

### OP-731-STEM CELL THERAPY IN A COATED SCAFFOLD MUSCLE PATCH FOR CARDIAC REGENERATION: WHICH CELL TYPE SHOULD WE USE?

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**BACKGROUND:** Cell transplantation and cardiac tissue engineering represent promising therapies for ischemic heart disease and myocardial infarction (MI). Cell transplantation approach is limited by poor cell survival and grafting due to cell trauma especially when cells are injected directly into the myocardium. A method of cardiac tissue engineering has been developed in which cardiac tissue is grown within a scaffold composed of a growth factor-laden, collagen-rich matrix. The identification of stem cells from bone marrow capable of contributing to tissue regeneration has kindled significant interest in the possibility that cell therapy could be employed therapeutically to repair damaged myocardium. BMC represents an heterogeneous population in which « the best cell » has to be determined. In a murine model, we tested the feasibility of a novel repair technique combining autologous scaffold muscle patch and different stem cell transplantation (unpurified Bone Marrow Cells-uBMC- or Mesenchymatous Cells-MSC- or Endothelial Progenitor Cells-EPC-) for cardiac regeneration after myocardial infarction (MI).

**METHODS:** MI was induced cryogenically in mice ( $n=180$ ). A metallic cryoprobe was applied to the left ventricle free wall to induce MI. Thirty days later, surviving mice ( $n=162$ ) were randomized to sham treatment (rethoracotomy only) ( $n=11$ ) or muscle patch + stem cells treatment using eGFP/uBMC or eGFP/EPC or eGFP/MSC ( $n=151$ ). A 1 x 1-cm patch of abdominal muscle was harvested and was cupped so as to be able to fit the left ventricular geometry and to form a tank in which to deposit stem cells. Muscle patches received  $5 \times 10^6$  eGFP/uBMC or  $5 \times 10^4$  eGFP/EPC or  $5 \times 10^5$  eGFP/MSC embedded in a collagen-rich 3-dimensional matrix and sutured on the epicardium directly above the infarct zone. Scar and scaffold patch were analyzed 15 days after patch implantation.

**RESULTS:** Mortality rate was 40% after coated-muscle patch implantation. As demonstrated by confocal analysis, eGFP/uBMC, eGFP/EPC and eGFP/MSC were able to migrate from muscle patch into infarct zone. This mechanism represented respectively 8%, 1% and 1% of all cells in the myocardial scar. Angiogenesis (CD 31 staining) in the scar was improved in patch + eGFP/EPC ( $490 \pm 26$  vessels/mm<sup>2</sup>) or patch + eGFP/MSC treatment ( $482 \pm 39$  vessels/mm<sup>2</sup>) although the effects were stronger in patch + eGFP/uBMC treatment ( $554 \pm 29$  vessels/mm<sup>2</sup>,  $p < 0.05$ ). Similar results were observed in cell survival. Left ventricular geometry and cardiac function were improved by the 3 coated-patches treatment compared to sham but no significant difference were observed between the 3 groups.

**CONCLUSION:** This original tool for cardiac regeneration represents a promising approach to restoring cardiac function after MI. This strategy allows stem cell migration into the scar, increases angiogenesis, cell survival and cardiac function. In contrast, in this model, use selected and purified stem cells (EPC or MSC) seem to be not effective compared to unpurified BMC.

### OP-732-BONE MARROW STEM CELLS FOR TREATMENT OF CHRONIC MYOCARDIAL INFARCTION WITH LOW EJECTION FRACTION

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**BACKGROUND:** About 500,000 new cases of heart failure are diagnosed each year in the United States. The most common cause of heart failure is chronic myocardial infarction which is characterized by irreversible loss of myocardial tissue that produces a progressive lowering in ejection fraction to a level of 20%, when left ventricular assistance device or heart transplantation are needed. Cellular transplantation consists of the injection of bone marrow derived stem cells into the perifibrotic myocardium, in order to promote the development of new myocardial tissue and angiogenesis to improve the functional capacity of patients with chronic heart failure.

**METHODS:** From June 2004 to July 2006, seventeen patients underwent bypass grafting plus transplantation of bone marrow derived stem cells (study group) and eleven patients were only revascularised (control group) at the "Edgardo Rebagliati Martins" hospital. The stem cells were implanted at the non viable myocardial areas while the bypass grafting was performed at the

viable myocardial areas.

**RESULTS:** We compared the results of two groups with similar clinical characteristics, finding that in the study group (bypass grafting plus stem cells transplantation) the ejection fraction increased 56.4% from the basal, while in the control group (revascularisation alone) the ejection fraction increased only 8.6% ( $p=0.007$ ) at fifteen months and sixteen months follow up respectively.

**CONCLUSIONS:** Stem cell transplantation associated to bypass grafting is feasible and safe in patients with low ejection fraction and could delay or avoid cardiac transplantation in patients with chronic myocardial infarction.

### OP-733-ISCHEMIC HUMAN ATRIAL TISSUE CONTAINS HIGHER NUMBERS OF CARDIAC RESIDENT STEM CELLS

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**BACKGROUND:** The possibility to isolate and expand autologous cardiac resident stem cells may be a breakthrough in myocardial restoration. BCRP (breast cancer resistance protein) and C-kit (CD117, stem cell factor receptor) have been described as specific marker proteins for resident cardiac stem cells. However, their frequency and distribution pattern before and after pathological events have not been determined in detail. Here we identify and quantify C-Kit+ and BCRP+ cardiac resident stem cells in ischemic and non-ischemic human heart.

**METHODS:** We obtained 55 biopsies from 50 patients during heart surgery from atria and ventricles and performed staining for BCRP and C-kit. Fluorescence microscopy was used for analysis and the BCRP+ cells were excluded from the microscopic field cell count if they co-stained for CD-31 (endothelial cell marker). Similarly, the C-kit+ cells which stained positive for mast cell tryptase were excluded too. A Titin stain was used to identify stem cells with a cardiac phenotype.

**RESULTS:** The highest frequency of BCRP+ cells was detected in ischemic tissue of the right atria with a maximum of 11.10 % vs. 7.75 % ( $5.62 \% \pm 2.51 \%$  vs.  $4.33 \% \pm 2.52 \%$ ) in non-ischemic atria. Further a higher amount of BCRP+ cells was found in ischemic ventricles within and around the area of an infarction ( $5.73 \% \pm 2.39 \%$  vs.  $1.39 \% \pm 1.79 \%$ ) compared to healthy myocardium. In fifty percent of the samples a low number of BCRP+ cells co-expressed Titin. Also C-kit+ cells were found in higher numbers within injured (ratio: 1: 25,000 of cell counts) vs. healthy myocardium (1:105,000). C-kit+ cells seemed round shaped, small, and did not stain for cardiac marker Titin. We did not find double staining BCRP+/C-kit+ cells.

**CONCLUSIONS:** The atria of a human heart contain higher numbers of resident stem cells than the ventricles. As very similar levels of these cells were detected in ischemic but also in non-ischemic atrial tissue the atria may be considered as a reservoir for resident stem cells. Their population is also higher within- and around infarcted ventricle (post acute infarction). A migration of stem cells to the ventricle is possible as a repair mechanism. BCRP and C-kit may be expressed by two distinct, stem cell populations. The suggestion of the human atria as a stem cell reservoir may have an important clinical impact for future stem cell therapy concepts.

### OP-734-CELL THERAPY IN CHRONIC CORONARY ARTERY DISEASE: BACK TO THE FUTURE

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**BACKGROUND:** Recent experimental works showed the extreme plasticity of bone marrow stem cell in differentiate into muscle, liver, fat or myocardial cell with possibility to produce a revascularization or regenerate muscle after myocardial infarction, Turin was the first Center in Italy to start a Cardiac Surgery Program in 1949 and since this date many techniques were used in myocardial ischemia as the Vineberg and the Sen Procedure. Moreover we first reported in 1989 the possibility to use cytokine to obtain an auto graft in hematological diseases. So our idea was to stimulate a stem cell mobilization by cytokine and then to made a scarification by needle punctures with intramyocardial bleeding, to produce a stem cell auto implantation

**METHODS:** Since June 2002 a total of 21 patients (4 females; age  $65 \pm 10$  y) with coronary artery disease, one or more ungraftable areas, and poor EF (less than 35%) received a cell therapy by using a combination of stem cell mobilization and myocardial scarification. They received before surgery cytokine administration 4 days in order to increase the CD34+ fraction of circulating stem cells. They received a surgical procedure of CABG, Mitral surgery, Ventriculoplasty associated to myocardial scarification by Sen procedure.

**RESULTS:** Preoperative Logistic Euroscore was  $15 \pm 8$ . The programmed surgical procedure was associated with a mean of  $70 \pm 30$  transmural needle punctures in the ungraftable areas of the left ventricle. We had one intra-operative and 1 case of neurological complications (aphasia with resolution after 1 month) At FU of  $29 \pm 23$  months we observed 4 late deaths and one patient received heart transplantation 1 year later. NYHA functional class and Canadian class improved and all patients survived received a echocardiography and Thallium scan study after 3-6-12 months showing an improvement in EF and an increased perfusion score also in the ungrafted areas.

**CONCLUSIONS:** It's interesting to observe that needle puncture of the left ventricle does not produce any haematoma tanks to the network of sinusoids. It is difficult to demonstrate a relationship between indirect revascularization procedures (Sen and Stem Cells) and improvement in clinical results but the idea of a possible synergy using this easy technique induced us to expand this application to less sick patients

### OP-735-BONE MARROW STEM CELLS AND MEDICAL LASER REVASULARIZATION AS AN ALTERNATIVE TREATMENT IN PATIENTS WITH END-STAGE CORONARY ARTERY DISEASE

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**BACKGROUND:** Leading cause of death in Poland and all European countries is ischemic heart disease. Civilization development, population aging and increase in mean longevity grow bigger the number of patients with disseminated atherosclerosis in whom routine treatment (percutaneous coronary intervention (PCI), coronary artery bypass grafting (CABG), intensive pharmacological treatment) is ineffective. This situation can lead to the development of end-stage coronary artery disease (ESCAD). Both PCI and CABG are the techniques of direct myocardial revascularization which may be supplemented by indirect approach such as gene therapy, stem cells and laser techniques to stimulate neoangiogenesis and increase blood supply to ischemic myocardium.

**METHODS:** Three patients, age 67, 69 and 73, with history of coronary artery disease (CAD), unstable angina (CCS IV) despite of intensive pharmacological treatment and disqualified from prior CABG or PCI were included. Applying operation technique, the decision was made on the strength of coronarography and segmental viability estimate in additional examinations (magnetic resonance, radionuclide examination of the heart, echocardiography). The first stage was to consist 150-200 ml collected from bone marrow using the Harvest system. Visual inspection of coronary arteries decided whether it was possible to perform direct myocardial revascularization. At sites where it was impossible transmyocardial laser revascularization (TLMR) was performed with the Holmium:YAG laser. In order to stimulate neoangiogenesis, bone marrow precipitate was transplanted in the amount of about 1 ml per channel. Additional histological examination of bone marrow was performed to determine the content of stem cells and growth factors. Prior to and 6 months after the operation patients undergo physical examination, chest pain evaluation, echocardiography, radionuclide and MR imaging to assess myocardial contractility and blood supply, quality of life measurement using SF 36 QOL.

**RESULTS:** In all patients, reduction of symptoms (CCS IV to CCS I) were observed, with improvement of physical efficiency confirmed in exercise tests. Compared to preoperative period, quality of life based on SF 36 questionnaire test improved. Global contractility improved in all patients, without evidence of left ventricular dilatation (EF: 42% vs. 48%, 46% vs. 57%, 48% vs. 62%, EDV 133 vs. 135 ml, 137 vs. 152 ml. 116 vs. 121 ml). Changes in localization and size of the scar in the heart muscle, diagnosed in delay of contrast intensify, were not observed.

**CONCLUSIONS:** Improvement of clinical condition, quality of life and global contractility in this group of patients, are good prognostic results and prove positive effect of laser therapy and bone marrow cell administration on heart muscle, especially in selected patients. Future investigation of this indirect treatment is necessary.



### OP-736-RESULTS OF ENDOCARDIAL STEM CELLS IMPLANTATION BY NOGA SYSTEM IN ISCHEMIC HEART FAILURE PATIENTS

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**BACKGROUND:** To evaluate the results of the endocardial stem cells implantation by Noga system in patients with ischemic heart failure.

**METHODS:** In our study we included 65 patients with ischemic heart failure. There were 56 men and 9 - women, with a mean age  $58 \pm 5$ , whom had prior one or more myocardium infarction, with 3-4 NYHA functional class, 2-3 CCS functional class and EF less than 35%. Patients were divided in two groups. In first group we included patients ( $n=32$ ), who had previous conventional revascularization (CABG or PCI) without clinical effect within at least 12 months of study enrollment. The second group consisted of the patients ( $n=33$ ), who had not possibility to initial conventional revascularization (CABG or PCI). There was no difference in preoperative status in patients of both groups. All patients underwent endocardial stem cells implantation by Noga system. The procedure consisted of 3 steps. Firstly, bone marrow is obtained by puncturing flat bones of the rear part of iliac bone edge and after that mononuclear fraction of stem cells was prepared. The second step included mapping of the left ventricle with the NOGA XP system, and identification of the akinetic and scar areas of myocardial tissue (it began after bone marrow harvest). And the last step included stem cells injection in target area. It will provide with 10 injections of autologous stem cells in target region. Each injection consists of 1 ml autologous stem cells and lasts during 40 seconds. The criteria of needle stability include extra bit and X-ray control.

**RESULTS:** There were no complications during procedure. The hospital mortality was 0%. 14 patients underwent control LV mapping with Noga system after 6 months follow up. The unipolar voltage of the ischemic area decreased from  $44.1 \pm 19\%$  to  $21.1 \pm 17\%$ . The defect myocardial perfusion decreased from  $55.6 \pm 18\%$  to  $25.1 \pm 11\%$ . The LVEF was  $36.1 \pm 5\%$  at follow up compare with  $30.8 \pm 4\%$  at base-line. The CCS and NYHA functional class decreased from 2.9 to 1.5 and 3.2 to 2.1 respectively at follow up.

**CONCLUSIONS:** Endocardial stem cells implantation by Noga system in patients with ischemic heart failure, ejection fraction less than 35%, III-IV NYHA and CCS angina functional class has showed to be a safe procedure and may improve left ventricular function and clinical status.

### OP-737-REDUCTION OF INFLAMMATORY RESPONSE AFTER MI: USE A BONE MARROW CELL MIGRATION MODEL AS A TOOL TO RELEASE FRZA IN THE SCAR

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**BACKGROUND:** FrzA, a Secreted Frizzled Related Protein, is a member of the Wnt/Frizzled Pathway. This system is highly implicated in cell proliferation, cell differentiation and in cell polarity. FrzA is expressed in the cardiovascular hood as well as in endothelial cells (EC), in smooth muscle cells and in cardiomyocytes. We have shown that FrzA could modulate EC proliferation and proved to be an angiogenic factor in different in vitro and in vivo models. We currently work on the effect of this secreted protein FrzA in the healing process after myocardial infarction (MI).

**METHODS AND RESULTS:** The mouse model of MI in different transgenic mice line (Tgm) was used to evaluate the effect of FrzA in healing process. Ubiquitous overexpression of FrzA in Tgm (CMV promoter) was able to reduce infarct size (IS), to improve cardiac function and to modify healing process reducing inflammatory response and improving tissue perfusion. However, IS and inflammatory response were not reduced in two others Tgm overexpressing FrzA in the EC (tie-2 promoter) or in cardiomyocytes (MHC promoter). During characterization of this 3 lines, we shown by RT-PCR that FrzA transgene was expressed in Bone Marrow Stem Cells (BMSC) and in circulatory mononuclear cells only in Tgm-CMV-FrzA mice. As these inflammatory stem cells play key role in healing process after MI, we would like to explore if secretion of FrzA by inflammatory stem cells during the first days after MI could act in reparation process. Our strategy was based on BMSC transplantation overexpressing specifically FrzA. BMSC of giver mice (Tgm-CMV vs Control mice) were extract-

ed from femur and purified in ficoll paque. Receiver mice (RM) were lethally irradiated. 24 hours after, RM were transplanted with 5.10<sup>5</sup> Tgm-BMSC mice or Control-BMSC (Cont- BMSC mice) by sub-claviar veinous injection. RM were subjected to MI two months after irradiation. At different days after surgery, hemodynamics study, infarct size and healing process were analyzed. During hemodynamics study, cardiac function was improved in Tg- BMSC mice as compared to Cont- BMSC mice,  $p < 0.001$ . Infarct size was decreased in Tg-BMSC mice as compared to Cont- BMSC mice,  $p < 0.01$ . Inflammatory response in the scar (myeloperoxidase staining) was decreased in Tg- BMSC mice at day 2 and 7 after MI,  $p < 0.001$ . RT-PCR shown a significant reduction in Interleukin 6 expression and a significant improvement in Interleukin 10 in Tg- BMSC mice compared to Cont- BMSC mice in the scar.

**CONCLUSION:** This report demonstrate that overexpression of this secreted protein FrzA specifically in BMSC reduced infarct size, improved cardiac function and reduced inflammatory response after MI. This study provides new insights into a potential role of stem cells as a tool for delivery anti inflammatory factors in healing process after MI.

## MINI PRESENTATION IV

### OP-738-THE RESULTS OF THE SURGICAL CORRECTION TAUSSIG-BING ANOMALY IN NEWBORNS AND INFANTS

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**BACKGROUND:** Retrospective analysis of the surgical results in Taussig-Bing anomaly treatment.

**METHODS:** From 1992 to 2006, 24 patients underwent surgical correction of Taussig-Bing anomaly. The mean age of the patients was 153 days (13-390 days) and the weight 4,1 kg (2.9-7.0kg). Taussig-Bing anomaly combined with coarctation of aorta revealed in 11 pts. According to the surgical strategy all patients divided into two groups. Group 1 (n= 11) pts with two-stage correction. Surgical interventions that were performed as a first stage correction in Group 1: resection of the aorta coarctation (n=1), resection of the aorta coarctation with pulmonary artery banding (n=5), divided banding of the pulmonary arteries (n=5). Second stage of the treatment was performed for 6 pts of Group 1. For all this patients arterial switch operation was applied. The second stage of the correction performed during 1-29 months (mean - 10 months). Group 2 (n= 13) patients with one-stage correction. Arterial switch operation was applied for 8 patients, for 5 patients arterial switch operation with resection of aorta coarctation was performed.

**RESULTS:** Mortality in Group 1 was 63,6%. After the first stage of the correction 5 (45,5%) lethal outcomes. Right after correction in the intensive care unit died 3 (27,3%) patients. Another 2 patients were discharged from the clinic and died at home. Second stage of the correction performed for 6 patients. Two of them died in the early postoperative period. Mortality in Group 2 was 7.7%. Functional status of 94% of survived patients is in I NYHA class. There were no significant degrees of aortic and pulmonary obstructions. Aortic and pulmonary valve insufficiency was minimal in all cases. There were no required reinterventions were for survived patients.

**CONCLUSIONS:** One stage correction is more preferable method of surgical treatment for Taussig-Bing anomaly even combined with coarctation of aorta. Arterial switch operation could be a method of surgical choice for Taussig-Bing anomaly correction due to satisfactory mid-term and late-term results.

### OP-739-DELAYED STERNAL CLOSURE IN PAEDIATRIC OPEN HEART SURGERY

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**BACKGROUND:** Delayed sternal closure is a well established procedure following complex congenital cardiac operations. Main indications included myocardial and chest wall oedema, haemodynamic instability and respiratory compromise.

**METHODS:** 98 patients underwent delayed sternal closure after paediatric open heart procedures from January 1998 to December 2007. The sternum was kept apart by using a plastic strut and the wound was covered with a silastic sheet sutured to the skin edges.

**RESULTS:** The operations which required delayed sternal closure included the procedures to correct Transposition of Great Arteries, Fallot's Tetralogy, Total Anomalous Pulmonary Venous Drainage, Pulmonary Atresia, Aortic Arch abnormalities and Truncus Arteriosus. Closure was delayed secondary to reasons of myocardial oedema and haemodynamic instability. Median duration before sternal closure was 3.0 days (range 1-10 days) and complication rates of wound infection (3.1%). There were 9 early (9.2%) and 2 late deaths.

**CONCLUSIONS:** Open sternal wound with transparent silastic sheet cover allows for clear assessment of cardiac action to plan the timing of sternal closure.

### OP-740-LAP VALVE VSD CLOSURE IN PATIENTS WITH SEVERE PULMONARY HYPERTENSION

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**BACKGROUND:** Ventricular septal defects especially malaligned and large present in early infancy with features of congestive cardiac failure and progressive pulmonary arterial hypertension. In developing countries with lack of either early referral to tertiary care centre or awareness among strata of population in which these congenital heart diseases present, often patients present with severe pulmonary hypertension and onset of bidirectional shunting across the septal defect prior to Eisenmengerisation.

**MATERIAL & METHODS:** We at Military Hospital (CTC), Pune, present our recent experience of three cases operated consecutively for VSD with Severe PAH with preop (2D Echo & Cath study), perop (TEE + visual inspection & measurement of PA pressures intraop) as well as post op evaluation of PA pressures. In all these cases the mean PA pressures were near systemic with remarkable drop in post operative period. The ventilation post operatively was 72 hrs. In All cases routine cardiopulmonary bypass (CPB) with moderate hypothermia was employed. Cold cardioplegic arrest with blood based cardioplegia was used in all cases. The flap valve fenestrated VSD closure patch was constructed of Double velour Dacron. All the patients made an uneventful recovery.

**METHODS:** The composite VSD patch was made before going on cardiopulmonary bypass to save CPB time. The Fenestrations in the centre of a large VSD patch were sized according to the expected aortic annulus size for each child as per available normograms based on BSA. The fenestration was one half of the expected aortic annulus diameter. A separate flap patch of same material at least 4 mm larger than the fenestration was then constructed and sewn onto the superior margin of the fenestration along one third of the circumference. A separate tethering stitch was placed at the inferior apex of the flap valve and tied loosely over a Hegar dilator that was the same size as the fenestration. Thus, the tethering stitch length approximated the diameter of the fenestration. The VSD patch was finally tailored after going on CPB and visual inspection of the size of VSD keeping the fenestration in the middle. When sewn into place the patch was such oriented so that the flap valve was placed on the left ventricular (LV) side and directing the flap so that it would open toward the LV apex. All patients made uneventful recovery.

**CONCLUSION:** With the placement of a unidirectional flap valve VSD patch, children with significant pulmonary hypertension and elevated PVR can undergo surgery without morbidity and mortality.

### OP-741-10 YEARS EXPERIENCE ACCORDING SUBCLAVIAN FLAP AORTOPLASTY FOR COARCTATION OF AORTA

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**BACKGROUND:** Coarctation accounts for about 5-9% of congenital heart disease and are 5th congenital heart disorder in children. Approximately 90% of untreated Patient die before age 50 years; about half of dead occur before age 10 years of heart failure. The main goal of this study is assessing of relation of recurrent coarctation after repair and determination of results and complication after subclavian flap aortoplasty.

**METHODS:** In this retrospective study the results of surgical repairs for coarctation of aorta in 188 patients with under than 14 years old treated at the Rajaei Heart Center were evaluated.

**RESULTS:** The average age of surgery was 5.5 years 72.3% of cases were male and 27.7% were female. The frequency of associated heart malformations was PDA (67.6%) VSD (21.8%) AS (20%) Bicuspid Aortic valve (15.4%) MS (6.4%) and shone complex (4.8%). The proportion of stenosis was 78% for discrete and 22% for long segment. The patients were followed mean 41.6 months (1-126 months). The most common methods of surgical treatments included patch-graft aortoplasty (59%), resection with end-to-end anastomosis (20.7%), SCFA (16.5%). None of them experienced paraplegia. In postoperative echocardiography, 29% of cases showed PG >25 mmHg that 10% of them had undoubted recoarctation according to angiography who were treated with Balloon Angioplasty. The most common recoarctation was in patch-graft aortoplasty method (12.7%) and the lowest one in SCFA (3.2%), no case experienced acute Ischemia, Gangrene or left hand dysfunction in SCFA method during follow up. The incidence of recoarctation in long segment stenosis was signifi-



cantly more than discrete one (30% versus 4% with  $P=0/001$ ) The patients younger than 1 year experienced less recoarctation in compare with older than 1 year and 5 years (4% versus 15% and 10%).

**CONCLUSIONS:** In conclusion we believe that surgical repair for neonatal and infantile coarctation gives no rise to incidence of recoarctation and decreases post operation complications such as HTN. There fore, it should be done as soon as possible. According to low complications and recoarctation in SCFA method, it provides an excellent method of surgical repair especially in young age.

#### **OP-742-DO PATIENTS IN ADULTHOOD BENEFIT FROM SURGICAL CLOSURE OF ATRIAL SEPTAL DEFECT? ABOUT 89 CASES**

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**BACKGROUND:** To evaluate whether age has an effect on the short and middle term outcome after surgical closure of atrial septal defects.

**Methods:** Retrospective study of 89 patients operated on between May 1995 and december 2005. Patients were divided into two age groups: group I (aged  $\geq 20$  years,  $n = 43$ ) and group II (aged  $< 20$  years,  $n = 46$ ). Follow-up was between 1 and 11 years (mean: 58 months).

**RESULTS:** One operative death occurred in the study period (group II). Preoperatively, 19 patients (44%) in group I were in New York Heart Association functional class III-IV compared with 18 patients (39%) in group II (NS). After operation, 38 patients (88%) in group I were found to be in class I-II compared with 33 patients (73%) in group II ( $p < 0.05$ ). Incidence of preoperative atrial fibrillation was higher in group II than those in group I (5(10.8%) versus 0%,  $p < 0.05$ ). After operation, incidence of atrial fibrillation didn't increase in the two groups. Echocardiography showed a greater reduction in right ventricular dimension in the group I ( $34.3 \pm 9.33$  mm versus  $22 \pm 5.16$  mm,  $p < 0.001$ ) and in the group II ( $40.6 \pm 4.82$  mm versus  $28.28 \pm 3.66$  mm,  $p < 0.001$ ). No residual intracardiac shunts were identified during follow up.

**CONCLUSION:** Surgical closure of atrial septal defect can improve clinical status in the two groups. This repair, even when performed late, as compared with medical treatment, increases long term survival.

#### **OP-743-PARTIAL ON- PUMP ATRIAL SEPTECTOMY: A LESS INVASIVE, MORE EFFECTIVE MODIFIED TECHNIQUE**

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**BACKGROUND:** Atrial Septectomy is still an important palliative cardiac surgery which is indicated in a spectrum of congenital heart defects. The patients, always in neonatal or early infancy period, present with deteriorated hemodynamic conditions and severe hypoxemia. Operation should be performed in urgent conditions with a meticulous and efficient technique. We introduce a new technique, called Partial On Pump Atrial Septectomy (POPAS) in order to overcome disadvantages of on-pump and prevent the complications of off-pump atrial septectomy.

**METHODS & MATERIALS:** From March 2006 to September 2007, 15 patients underwent POPAS. There were 10 male and 5 female patients. The mean age was 3 months and the mean body weight was 4400 grams. The underlying diseases were one case of Hypoplastic Left Heart Syndrome (HLHS), 2 cases of Tricuspid and pulmonary atresia, 4 cases of Transposition of great arteries (TGA) with intact ventricular septum and 8 cases of TGA with VSD. Utilizing CPB with an aortic and a venous cannulae, which drained just the upper body venous return during the operation, atrial septectomy was performed in all cases.

**RESULTS:** The mean cross clamp and pump time were 4 and 20 minutes, respectively. The mean arterial O<sub>2</sub> saturation rise was 32.2%. There were 3 deaths; two of them were due to preoperative sepsis and just one case of cardiac related death. We did not observe any cerebral, hepatic, renal or other major organ complication.

**CONCLUSION:** In our experience, POPAS is an efficient, simple and safe technique, compared with off- pump or conventional on- pump atrial septectomy. We would be glad to describe the technique in details, in the case of acceptance.

#### **OP-744-EXTENDING THE LIMITS OF THE PRIMARY ARTERIAL SWITCH OPERATION FOR TGA**

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**BACKGROUND:** The single stage arterial switch operation (ASO) has now become the treatment of choice for D-Transposition of Great Arteries (DTGA). Late presentation for surgery is common in developing countries like India and Sri Lanka. The purpose of this study is to assess the results of a treatment protocol offering a primary ASO to all patients presenting with DTGA irrespective of the age at presentation.

**METHODS:** A retrospective review was performed for all 100 children who underwent a primary ASO from July 2002 to July 2007. Sixty of them had DTGA with intact ventricular septum (TGA/IVS) and 40 had TGA or TGA with Double Outlet Right ventricle (DORV) with Ventricular septal defect (TGA/VSD). All patients underwent a single stage primary ASO with or without VSD closure and aortic arch repair irrespective of their age at presentation, status of the Left Ventricle (LV) or coronary artery anatomy. There were 15 children with TGA/IVS older than 6 weeks, upto 2 years age who underwent primary ASO, with controlled LV loading, despite having a regressed LV at presentation.

**RESULTS:** There were 4 hospital deaths. There were no reoperations for residual defects. All children had primary sternal closure. Only one of the 15 children with regressed LV, died. All 14 survivors with regressed LV recovered normal LV function in 7-10 days and continue to have a normal LV function on follow-up. One 6 month old patient with TGA, VSD died from advanced pulmonary vascular obstructive disease (PVOD). Survival and functional class are excellent beyond the early hazard phase soon after the operation in all groups of patients having the ASO.

**CONCLUSIONS:** This study over a period of 5 years has shown that primary ASO can be successfully performed in a broad spectrum of patients with TGA, irrespective of their age at presentation, status of the LV, coronary artery anatomy and aortic coarctation. Presence of a bicuspid pulmonary valve or mild LV outflow tract obstruction is not a contraindication for ASO. Primary sternal closure is possible in almost all cases after the ASO. Patients with TGA/VSD, often develop early severe pulmonary vascular obstructive disease within 3 to 6 months of life.

#### **OP-745-VAC SYSTEM AS TREATMENT OF STERNAL INFECTIONS AFTER CARDIAC SURGERY: OUR EXPERIENCE IN 126 CASES**

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**BACKGROUND:** Postoperative sternal infection occurs in 0.6 to 16% of patients underwent to cardiac surgical procedures by median sternotomy; to treat it we can use traditional methods or a new method called VAC.

**METHODS:** From January 2001 to June 2007, 126 patients underwent to cardiac surgery operations in median sternotomy out of 4000 (3,15 %) presented sternal infections with median age 68, 5 years  $\pm$  15. 59% male and 41% female; 24% with body mass index  $>30$ ; hyperglycemia was in 27%, pulmonary chronic disease in 18 %; hospitalization time before surgery was 4,2 days  $\pm$  2; 44 % underwent myocardial revascularizations, 25 % valve operations; 10 % vascular procedures and 21 % combined procedures. 84 % had fever 64 % had white blood cells over 15.000/mL, 80 % VES over 30 and 84 % had PCR over 20. 86,4 % had Vancocina 14mg/Kg 66 % Sulfametazolo/trimetoprim 800 mg every twelve hours

**RESULTS:** VAC System was removed after a mean of 14, 3 days, and 100 % of patients had definitive surgical closure; Primary sternal rewiring 84 % and primary flap reconstruction 26 %. In hospital staying after surgical closure was 4, 3 days. None death was VAC related and 30- day survival was 98,6 %.

**CONCLUSION:** VAC System is a safe and fast technique which allows fast development of a more suitable local tissue to have a successful reconstruction procedure; it is well complied by the patients. We recommended an early use of it to avoid mediastinitis complications and to have fast hospital discharge complications and to have fast hospital discharge.

## OP-746-ENDOVASCULAR REPAIR OF TRAUMATIC AORTIC RUPTURE

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**BACKGROUND:** Traumatic aortic rupture (TAR) after blunt chest trauma leads to immediate death in 75 to 90% of cases and so a mandatory surgical treatment has been in the past emphasized. In the great majority of the cases it is caused by rapid deceleration in road accidents, and patients have severe multiple injuries such as craniocerebral trauma, thoracic trauma with lung contusion and multiple rib fractures, intra-abdominal parenchymatous bleeding lesions, and bone fractures. Despite improvements on perioperative care and surgical techniques, conventional surgery for TAR still carries substantial risk of serious complications and mortality. Endovascular stent grafting has emerged as a valid alternative to open surgical treatment. In this study, we report our experience on thoracic endovascular aortic repair (TEVAR) of TAR.

**MATERIAL AND METHODS:** From March 2001 to June 2006, 70 patients underwent TEVAR: 7 patients (10.0%) had a TAR after road accident. The age ranged from 19 to 82 years. To evaluate the risk we follow: 1) the Glasgow Coma Score (GCS) in patients with head trauma; 2) the Injury Severity Score (ISS) in patients with multiple injuries; 3) the American Society of Anesthesiologist classification (ASA class) to describe the perioperative physical status. Five patients (71.4 %) showed an unstable clinical picture (ISS  $\sim$  40; ASA class  $\sim$  3); head injury (with stupor or coma) was present in 3 patients (GCS  $\sim$  12); multitrauma with leg, arm and/or vertebral fractures occurred in 4 (57.1%) and abdominal blunt trauma in 4 (57.1%), complicated by haemorrhagic shock, previously treated by splenectomy, in one (14.3%). The first patient, affected by a pseudoaneurysm complicated by dysphonia, had a delayed TEVAR after one month from the trauma; the remaining six patients required an emergency TEVAR. Computed tomography (CT-scan) was diagnostic in all. The stent-graft was delivered in the catheterization laboratory under general anaesthesia with controlled hypotension. Implant strategy was selected on the basis of aortic morphology and vascular access. Two different stent-grafts were implanted: 8 Talent in 6 patients and 2 Gore in 1. Criteria for successful deployment included absence of death or surgical conversion, and exclusion of transected tract.

**RESULTS:** There were no operative death and surgical conversion. Any neurological complication, including paraplegia, was observed. One major vascular complication, i.e. right common iliac artery laceration due to the stent-graft discrepancy, occurred, successfully treated by rescue prosthetic ileofemoral bypass. Two patients required prolonged mechanical ventilation and temporary haemodialysis. The intraoperative angiography and discharge CT-scan showed absence of endoleaks. At follow-up, ranging from 12 to 63 months, a patient showed at six month follow-up a late type I endoleak, successfully treated by secondary TEVAR.

**CONCLUSION:** TEVAR is a safe procedure in TAR patients, mostly in instable/emergent conditions. Moreover, TEVAR allows for prompt treatment of associated lesions in complex multitrauma patients. TEVAR could be considered as an hypothetical bridge to open surgery in case of late failure of the stent-graft. Finally, trauma centers should have thoracic endovascular grafts available for optimal patient care.

## OP-747-PERCUTANEOUS CANNULATION OF THE FEMORAL VESSELS FOR CARDIOPULMONARY BYPASS IN MINIMALLY INVASIVE MITRAL VALVE REPAIR

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**BACKGROUND:** In case of minimally invasive open heart surgery, access for intrathoracic cannulation is limited and therefore femoral vessel (FV) cannulation is necessary. Complications after surgical exposure of the femoral vessels are well known. We describe our technique for percutaneous femoral vessel cannulation, which allows a safe establishment of cardiopulmonary bypass, reduces the incidence of groin complications, and offers excellent cosmetic results.

**METHODS:** Between June 2006 and June 2007, 29 patients underwent mitral valve repair (MVR) with this technique. Mean age was  $56.3 \pm 8.5$  years; mean LVEF  $61.2 \pm 8.2$  % and mean body surface area (BSA)  $1.91 \pm 0.14$  m<sup>2</sup>. None had a history of peripheral vascular disease and the femoral pulses were well pal-

pable. After patient's positioning and sterile draping, the right internal jugular vein was percutaneously cannulated with a 16 French (F) cannula. Under TEE guidance, the cannula was positioned at the junction between the superior vena cava (SVC) and the right atrium (RA). The femoral artery was punctured and a guidewire advanced into the descending aorta under TEE guidance. Thereafter, the contralateral femoral vein was punctured and a second guidewire placed in the RA again under TEE control. Heparin was given. The arterial cannula and the venous cannula were introduced. The venous cannula was advanced over the guide-wire to the midpoint of the RA under TEE visualization. We used an 18 F arterial and a 22 F venous cannula in 23 patients with a BSA up to 2 m<sup>2</sup>. In six patients with a BSA  $> 2$  m<sup>2</sup>, the 20 F arterial and the 24 F venous cannula were used. MVR was performed through a small right anterior mini-thoracotomy. Venous return was increased by negative pressure between -30 and -50 mmHg to reach a flow rate of 2.5l/m<sup>2</sup> BSA. In all patients MVR was performed by ring annuloplasty with (n= 22) or without (n= 7) PTFE chordal replacement. Mean CPB time was  $92 \pm 11$  min and aortic cross clamp time was  $72 \pm 10$  min. After weaning from CPB, successful repair was confirmed by TEE. 10 to 15 minutes after administration of protamine, the venous cannula was removed first and a sterile packed sandbag applied for 6 hours. The arterial cannula was also removed immediately thereafter and manual compression was done until the end of the operation. Thereafter, a passive vascular closure device was applied.

**RESULTS:** There were no major complications. In two patients, in whom it was impossible to advance the venous cannula from the left side, the cannula was advanced without problems from the right side. No bleeding, thrombosis, wound seroma or leg ischemia was observed. Adequate flow rates were reached in all patients. Routine postoperative Doppler examinations were performed before discharge and showed no A-V-fistula, thrombus formation or false aneurysm.

**CONCLUSIONS:** Percutaneous FV cannulation for CPB during minimally invasive procedures is safe, minimizes the incidence of groin complications and offers an excellent cosmetic result. In addition, it can be particularly helpful in the setting of redo sternotomies or for emergent need of CPB.

## OP-748-CONVENTIONAL VS ENDOSCOPIC SAPHENOUS HARVESTING: PROPENSITY SCORE ANALYSIS

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**BACKGROUND:** The most frequently used conduit for coronary artery bypass is the greater saphenous vein. Open saphenous vein harvesting can be associated with wound complications, postoperative infection, incision pain, prolonged convalescence and poor cosmetic results. We use an endoscopic vein harvesting (EHV) technique using non-disposable instruments. The aim of this study is to answer at many questions. Can this technique be used as a standard technique for vein harvesting? Gas embolism is a known complication of minimal access procedures in which carbon dioxide insufflation is used. How is the rate of complications produced by insufflation of carbon dioxide (CO<sub>2</sub>)? Are the histological quality and long-term patency of harvested grafts comparable with grafts harvested by means of traditional technique?

**METHODS:** from September 2002 to September 2007, 270 patients who underwent CABG with venous grafts was including in the study. Both groups were similar for obesity, diabetes, age, peripheral vascular disease. In group A (135) the vein was harvested with the non disposable set of Wolf. In group B (135) the vein was harvested with a conventional open technique. Endpoints included wound complication (including infection), operative and harvest time, vein quality (including histology), measure of partial pressure of CO<sub>2</sub> in arterial blood (PaCO<sub>2</sub>), outcome and postoperative pain, evaluation of learning curve.

**RESULTS:** Wound complications at postoperative day three at discharge were significantly less in group A (3/135, 2%) versus group B (9/135, 6.5%), p value equal to or less than 0.001. Wound complications after six weeks were: Group A 1/135 0.7%, group B 6/135 4.4%. In the endoscopic group postoperative ambulation was significantly (p = 0.002) easier, patient satisfaction was significantly (p = 0.007) higher and postoperative leg swelling (p = 0.003) and haematoma (p = 0.004) could be reduced significantly. Mean time for harvesting in both group was similar (Group A mean time 35 min, group B mean time 45 min). Only in the first five patients the man time was longer in group A (mean 55 min). Histologic evaluation of vein samples showed that there was no difference between the groups and vascular structural integrity was main-

tained. No adverse hemodynamic effects were observed during CO<sub>2</sub> insufflation. Infact there was no evidence of significant systemic absorption of CO<sub>2</sub> as reflected in average arterial PCO<sub>2</sub>, which remained steady at 36.42 $\pm$ 5.19, 36.51 $\pm$ 4.59, and 37.10 $\pm$ 4.80 mm Hg before, during, and after endoscopic vein harvesting.

**CONCLUSION:** Despite a learning curve in using endoscopic techniques, the total procedural time for EHV is acceptable and superimposable to the traditional technique. Endoscopic vein harvesting results in significantly fewer wound complications, decrease in days to ambulation, and the total length of stay. It is recommended that PaCO<sub>2</sub> should be carefully monitored during endoscopic conduit harvesting for coronary artery bypass surgery. The technique appears to be safe and well tolerated. The EHV is less expensive. This is primarily from a shortened length of stay, a decreased rate of major wound infections, and a reduction in the need for early readmission

#### **OP-749-CLINICAL OUTCOME IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING USING MINIATURIZED EXTRACORPOREAL CIRCULATION**

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**BACKGROUND:** Using a relatively new miniaturized cardiopulmonary bypass (CPB) system, we performed coronary artery bypass grafting (CABG) on the beating heart in 110 patients. We called the procedure Assisted Coronary Artery Bypass (ACAB). There is limited experience with miniaturized CPB systems in CABG and beating heart surgery. We analyzed our clinical outcome in a group of patients.

**METHODS:** Between January 2004 and September 2006, 110 patients underwent CABG on the beating heart using ACAB. Mean patient age was 73 $\pm$ 8.1 years. The ACAB system uses a small prime volume of only 500 ml. The circuit is shorter than conventional CPB. Additionally, tubing and oxygenator system are surface coated with phosphorylcholine. The initial Heparin dose is 150 IU/kg with a target ACT of > 250 s. With this management, we never experienced system thrombosis. We do not use cardioplegia or aortic crossclamping and do not routinely retransfuse cardiomy blood. The data of 110 patients from an observational database were analyzed.

**RESULTS:** The mean number of anastomoses performed was 2.67. The rate of perioperative infarction was 1.8% (2 patients). Perioperative mortality was 7% (8 patients). The mean EuroSCORE for all patients was 6.4 $\pm$ 4.07, whereas it was 13.75  $\pm$  6.18 for the patients who died. Mean bypass time was 64.96 $\pm$ 16.66 minutes.

**CONCLUSION:** In our experience, beating heart CABG supported by a miniaturized cardiopulmonary bypass system is a safe procedure with acceptable perioperative results.

#### **OP-750-SURGICAL CORRECTION OF MIDVENTRICULAR OBSTRUCTION ASSOCIATED WITH THE SUBAORTIC OBSTRUCTION IN HOCM PATIENTS**

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**BACKGROUND:** In some HOCM patients the level of obstruction may be in the mid-left ventricular cavity rather than the subaortic cavity. In addition, midventricular obstruction may be associated with the subaortic obstruction. The classic Morrow technique does not allow performance of the complete resection of the muscular bar at the midventricular part of septum.

**METHODS:** The presented excision of the asymmetrical hypertrophied area of the interventricular septum causing midventricular and LVOT obstruction simultaneously was done from conal part of right ventricle anteriorly of the Lancisi muscle and moderator band but not trough the whole thickness of IVS that is without penetration into the left ventricular cavity. This excision implies avoiding damage of right branch of His bundle. Three patients with midventricular obstruction associated with the subaortic obstruction (mean NYHA class 3,0) underwent this procedure. Ages ranged from 27 to 50 years. The follow-up period was 14 $\pm$ 5 months.

**RESULTS:** The mean echocardiographic intraventricular gradient in LV decreased from 87,9  $\pm$  5,2 to 12,5 $\pm$ 3,1 mmHg, the mean value of gradient in LVOT reduced 75,7 $\pm$  11,3 versus 10,2  $\pm$  4,3 mmHg. Echocardiographically determined septal thickness was reduced 27,3 $\pm$  6,5 versus 15,1 $\pm$  2,7 mm.

Follow-up chocardiology showed reduction of atrial size from 46,8  $\pm$  4,1 to 41,5  $\pm$  3,2 mm. Sinus rhythm without block of His bundle right branch was noted in all patients after surgery.

**CONCLUSION:** This method of HOCM surgical correction is an effective and safe technique and advisable for use in cases of LV midventricular obstruction associated with the subaortic obstruction.

#### **OP-751-STERNOTOMY VERSUS CLAMSHELL INCISION FOR SINGLE SEQUENTIAL LUNG TRANSPLANTATION**

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**BACKGROUND:** The median sternotomy easily opened and with minimal chest wall disturbance, may however have disadvantages compared with clamshell incision in transplant for septic lung disease. We compared the two approaches in sequential single lung transplantation (SSLT).

**METHODS:** We retrospectively analysed 91 consecutive SSLT cases (clamshell: 73, sternotomy: 18) performed over 5.5 years.

**RESULTS:** Cystic fibrosis was the primary diagnosis in 62 (86.1%) clamshell and 11 (61.1%) sternotomy patients (p=0.023). There was no difference in the recipient age, weight and height, ischaemic time (341 $\pm$ 50.2 vs 338 $\pm$ 68.6 min)(p=0.87), operative time (6.4 $\pm$ 1.0 vs 6.3 $\pm$ 1.2 hours)(p=0.82), bypass time (236 $\pm$ 41.4 vs 237 $\pm$ 37.8 min)(p=0.9), median ventilation time (27.1 vs 17.8 hours)(p=0.074), postoperative bleeding (1861 $\pm$ 1108.7 vs 2001 $\pm$ 964.6 mls)(p=0.65), median intensive care unit stay (40.0 vs 25.6 hours)(p=0.11), median time to mobilisation (5 vs 4 days)(p=0.89), median hospital stay (18.0 vs 18.5 days)(p=0.46), post operative pain (p=0.15)(epidural analgesia was used in 82.2% of clamshell cases), early (FEV1: 1.8 $\pm$ 0.79 vs 1.9 $\pm$ 0.82 L/min)(p=0.09) and late lung spirometry (FEV1: 2.9 $\pm$ 0.83 vs 3.2 $\pm$ 1.27 L/min)(p=0.42) and median number of rejection episodes within the first year (1.0 [range: 0-5.0] vs 1.0 [range: 0-3.0])(p=0.83) between clamshell and sternotomy patients. There were 4 wound infections in the clamshell and 1 in the sternotomy (p=0.9). Clamshell was associated with significantly higher incidence of positive sputum microbiology (37.7 vs 9.3)(p=0.005) postoperatively, possibly due to the higher percentage of cystic fibrosis patients in this group. Survival was similar (30-day: 93% vs 94%; 1-year: 85% vs 94%; 3-year: 77% vs 86%; 5-year: 61% vs 52%) (p=0.67).

**CONCLUSIONS:** Sternotomy provides results comparable with clamshell in SSLT, and therefore could be advocated in selected cases.

#### **OP-752-BRAIN DEATH INDUCES EARLY CORONARY BUT NOT PULMONARY ARTERY ENDOTHELIAL DYSFUNCTION**

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**BACKGROUND:** Brain death (BD) has been suggested to induce coronary endothelial dysfunction, which could be responsible for early cardiac graft dysfunction. However, the characterization of the endothelial functional impairment and the effect of BD on the pulmonary vasculature are not clearly defined.

**MATERIAL AND METHODS:** Landrace Swine were randomly divided into 2 groups. Control group (CTRL, n = 7), Brain death group (BD, n = 7) in which animals were monitored for 2 hours after BD induction. After sacrifice, pulmonary and coronary arteries were used to construct concentration-response relaxation curves to acetylcholine (ACh), bradykinin (BK) and serotonin (5-HT) and BK respectively to explore the endothelium-dependant receptor-dependent relaxation pathway, and to calcium ionophore (A23187) for the coronary endothelium-dependent receptor-independent relaxation pathway.

**RESULTS:** BD induction was associated with an initial hyperdynamic state with a significant increase in cardiac index and mean arterial pressure compared to baseline, whereas mean pulmonary arterial pressure and pulmonary vascular resistance were not influenced by BD. Pulmonary arterial relaxation to ACh and BK were similar between both CTRL and BD groups. In contrast, coronary artery relaxation to 5-HT and BK were significantly altered in the BD group. As well, the relaxation curve to calcium ionophore was significantly impaired by BD.

**CONCLUSION:** This study demonstrates that brain death does not induce early pulmonary arterial endothelial dysfunction. In contrast cerebral death induces early both receptor-dependent and receptor-independent endothelial dysfunction. The better understanding of mechanisms implied in cerebral death-induced heart damage may lead to future therapeutic studies to improve cardiac allograft function.



## MINIMALLY INVASIVE PROCEDURES

### OP-753-THE ROLE OF THORACOSCOPY IN THE MANAGEMENT OF ORGANIZING EMPYEMA "PRESENT AN EXPERIENCE"

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**INTRODUCTION:** Patients proven to have an infected pleural effusion by thoracentesis and who satisfy laboratory criteria for intervention are candidates for thoracoscopic decortication. When the empyema is in the exudative or fibrinopurulent stage and has been present for approximately 3 weeks duration or less, thoracoscopic intervention is usually successful. When the empyema has been present for longer than 3 weeks (organizing phase), the ability to perform an adequate decortication may be more difficult due to denser adhesions and the presence of an adherent pulmonary visceral peel. Thoracoscopy is also indicated when the nature of the pleural process is undiagnosed, as this allows for a directed pleural biopsy that is likely to make the diagnosis while avoiding the morbidity of a thoracotomy.

**PATIENTS & METHOD:** Nineteen selected patients with organizing empyema who was admitted in our hospital (RAMC) during five last years (2001-2006). Among these were 12 male and 7 female with age from 23 to 72 years. All patients were considered for surgical intervention (Thoracoscopic lung decortication). These cases were explain for procedure from ethical point then underwent general anesthesia with double lumen endotracheal tube and proper position of thoracoscopy. Through the operating procedure, delineation of empyema cavity and evacuation of contents (pus and debrid materials) performed. Multiple strip of thickened peel resected up to full expansion of lung was achieved. In the all patients pleural cavity was drained with large bore chest tube.

**RESULTS:** In 14 patients reexpansion of lung and resolution of empyema cavity were achieved, but in the 3 patients retain space were developed who was managed with conservative therapy. In 2 another patients the procedure turned to open thoracotomy for inaccessibility of pleural cavity due to severe parenchymal involvement (one patient) and intolerance of one lung intubation (one patient). Air leakage were continued 3 to 11 days (mean 6 days) in these patients.

**CONCLUSION:** These data were showed, thoracoscopic decortication has high success rates and chest tube duration, hospital length of stay, postoperative pain, and recovery are improved over thoracotomy but conversions to open thoracotomy are more frequent than after other thoracoscopic procedures.

### OP-754-ROBOTIC VERSUS HUMAN VIDEO-ASSISTED THORACIC SYMPATHECTOMY CAMERA CONTROL: SAFETY AND EFFICIENCY EVALUATION

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**BACKGROUND:** Although recent technological advances allowed incorporating robotic devices in surgical practice, its safety and efficiency remain controversial.

**METHODS:** A prospective randomized double blind study was performed to compare surgical safety and efficacy between robot and human assisted operation. Surgical operation was VATS sympathectomy for axillary/palmar hyperhidrosis. It was compared a voice-controlled robot Automated Endoscopic System for Optimal Positioning (AESOP) for holding and maneuvering the endoscope (Ro group) to human assisted group (Hu group). Each group included 19 patients. Under general anesthesia, sympathectomy was achieved by electrodissection of the third ganglion between fourth and third rib. Operations were filmed and images stored. Two independent observers quantified the number of inadequate movements; dangerous movements (contact of laparo-

scopic lens with internal structures) and how many times camera were cleaned. Additional criteria were evaluated: safety criteria were surgical accidents, postoperative pain and aesthetical results; efficacy criteria were: surgical duration, camera use duration, axillary/palmar anhidrosis, length of hospitalization, compensatory anhidrosis and patient satisfaction.

**RESULTS:** There was no difference between Ro and Hu group regarding surgical accidents, number of inadequate movements, postoperative pain, aesthetical results, general satisfaction, number of times lens needed to be cleaned, anhidrosis, length of hospitalization, compensatory hyperhidrosis. The number of contacts of the laparoscopic lens with mediastinal structures was lower in the Ro group ( $p < 0.001$ ), but the total and surgical length was longer in this group ( $p < 0.001$ ).

**CONCLUSIONS:** Camera holding by a robotic arm in VATS sympathectomy for hyperhidrosis is safe and efficient when compared to a human camera holding assistant.

### OP-755-VIDEO-ASSISTED THORACIC SURGERY LOBECTOMY FOR BENIGN LUNG DISEASE

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**BACKGROUND:** Video-assisted thoracic surgery (VATS) lobectomy has been widely accepted and feasible for early stage of lung cancer. But, thoracoscopic resection of benign lung disease without rib spreading is still challenging due to inflammatory changes such as adhesions, enlarged lymph nodes, and neovascularization. We report our cases of thoracoscopic lobectomy for benign lung diseases.

**METHODS:** We tried to perform VATS lobectomies instead of conventional lobectomies, if indicated, regardless of diagnosis of lung lesion. From 2004 to 2007, we performed 322 cases of VATS lobectomies in 165 women (51.2%) and 157 men (48.8%). Fifty six patients (17.4%) of total VATS lobectomies had benign pulmonary disease; 34 were women (60.7%) and 22 were men (39.3%) with a median age was 42 years (16 - 69 years old). Diagnoses were as follows: aspergilloma (n=14), bronchiectasis (n=13), pulmonary sequestration (n=10), congenital cystic adenomatoid malformation (n=5), tuberculosis (n=5), organizing pneumonia (n=4), non-tuberculous mycobacterium lung disease (n=2), and miscellaneous (n=3). Lobectomies by anatomic hilar dissection with thoracoscopic visualization were performed through 2 to 4 ports including 3-5 cm incision working port without rib spreading.

**RESULTS:** With our widespread trial of VATS lobectomies even in suspect of pleural adhesion on preoperative CT scan, three conversions (5.1%) to thoracotomy in benign lung disease were necessary due to severe adhesions but there was no mortality or major complication out of them. Fifty three patients who underwent VATS lobectomies with benign lung disease showed no operative death. Median operative time was 157 minutes (70-300 minutes). Operative time in cases since 2006 (n=31, 153 minutes) was a little shorter ( $p=0.131$ ) compared to that before 2006 (n=25, 177 minutes). Blood transfusion was needed in 4 of 56 patients (7.1%). Median hospital stay was 5 days (2-85 days). There was no major complication such as cardiac or pulmonary distress. Six patients had prolonged air leak or space problem but were managed without sequelae. One patient died 85 days after lobectomy of underlying immune insufficiency.

**CONCLUSIONS:** VATS lobectomy can be performed with low mortality and morbidity in selected patients with various benign inflammatory lung diseases such as aspergilloma, bronchiectasis, and pulmonary sequestration. Conversion rate to thoracotomy was low and operative time has declined over time with more experiences in VATS lobectomy of benign lung diseases.

### OP-756-CURRENT SCENARIO IN MULTIFOCAL THORACIC AND ABDOMINO-THORACIC HYDATID DISEASE: A SURGICAL CHALLENGE AND RELEVANCE OF MINIMALLY INVASIVE SINGLE STAGE APPROACH TO THE MANAGEMENT

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**BACKGROUND:** Bilateral lung, combined liver/spleen and lung hydatid cysts are rare, but pose a challenge to a surgeon in terms of accessibility and staging



of surgery. The objective of our study was to find an alternative approach to conventional multistage approaches in bilateral pulmonary or concurrent hepatic-pulmonary or spleno-pulmonary hydatid disease.

**METHODS:** Twenty five patients with right lung and liver hydatid disease underwent right anterior transthoracic-transphrenic excision of hydatid cysts. Sixteen patients underwent single stage bilateral minithoracotomy for bilateral lung hydatid cysts. Nine patients underwent lower partial sternotomy for bilateral lung and liver hydatid cysts. Six patients were subjected to left transthoracic-transphrenotomy for spleno-left pulmonary hydatid cysts. Primary diagnostic tools were chest radiograph, ultrasonography, serology and computed tomogram.

**RESULTS:** Thirty six (13.5 percent) of 267 patients had concurrent hepatic and pulmonary hydatid cysts. Nine (3.3 percent) of 267 patients had bilateral lung and liver hydatid cysts. Six (2.2 percent) patients had left lung and splenic hydatid cysts and 3 had bilateral lung, liver and splenic cysts. Six patients (2.2 percent) were children in the age group of 5-14 years. Male:female ratio was 2:1. Mean operative time was 90 minutes. Morbidity was negligible and post operative recovery was prompt. All the patients survived. The mean hospital stay was 6.3 days. Overall observations were encouraging.

**CONCLUSIONS:** The minimally invasive approach of anterior transthoracic-transphrenotomy and lower partial sternotomy are associated with less morbidity and better cosmetic results. These approaches are much economical, convenient and excellent alternatives to conventional staged procedures.

#### OP-757-SINGLE ACCESS TROCARLESS VIDEO-ASSISTED THORACOSCOPIC SURGERY FOR PARAPNEUMONIC THORACIC EMPYEMA IN INFANTS

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**BACKGROUND:** Video-Assisted Thoracoscopic Surgery (VATS) for parapneumonic thoracic empyema in infants is progressively becoming an accepted alternative for the sometimes troublesome conservative attitude. We report our experience with primary operative treatment in these cases, by means of Single Access Trocarless VATS (SATVATS).

**METHODS:** A retrospective single centre study of a consecutive series of 20 cases between 2003- 2007 was performed. Indication, medical history, preoperative imaging, operative technique and results were studied for each patient.

**RESULTS:** All 20 patients were referred by the Paediatric Intensive Care Unit (PICU). There were 11 boys (55%) and 9 girls (45%). Mean age was 42 months (range 20-75). Mean WBC count was 18.666/nL, mean CRP was 23,16mg/dL. General anaesthesia was used in all cases. VATS was performed for empyema drainage with a mean operating time of 71,5 minutes (range 25-125). All interventions were carried out using SATVATS via a lateral mini-incision without the use of any trocar. No perioperative complications were reported, most patients (19/20) were extubated in the operating room. Microbiological culture showed presence of Streptococci in 9 of 10 positive cultures (90%). There were no wound problems. Mean PICU stay was 7 days (range 4-21), completed by a mean stay in the paediatric ward of 6 days (range 3-8). Mean postoperative follow up of 22 (range 1-49) months showed no recurrences.

**CONCLUSIONS:** SATVATS for parapneumonic thoracic empyema in children seems to be a safe and effective therapeutic alternative technique.

#### OP-758-A SINGLE-STAGED COMPLETE RESECTION OF A DUMBBELL NEUROGENIC TUMOR VIA POSTERIOR APPROACH WITHOUT THORACOTOMY

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**BACKGROUNDS:** Approach to a posterior mediastinal dumbbell neurogenic tumor varies, but usually consists of a combination of laminectomy and thoracotomy, the latter of which has recently been replaced by thoracoscopic techniques. But the extrapleural location of dumbbell neurogenic tumors could avoid thoracotomy. We first reported our posterior approach without thoracotomy back in 1991. For the recent 20 years we have treated ten patients with

a dumbbell neurogenic tumor per this approach. We here present the results in these patients along with a video film.

**METHODS:** Our approach can be summarized as follows: With the patient in a prone position, a dorsal midline skin incision was made along the row of spinal processes under X-ray control. A pair of bi-polar forceps was effective in neighbouring area of the spine. A full or hemilaminectomy was then carried out by an air drill at the level of tumor intrusion, depending on whether the tumor was involving intradurally or remaining extradurally. The proximal tumor-free portion of the affected nerve root was severed intra- or extra-durally as needed, and the vertebral articulate processes in contact with the tumor was removed. From within the intervertebral foramen the tumor was then released. The paraspinal muscles were retracted or severed to expose the root of the ribs neighbouring the tumor. The root of the rib juxta-caudal to the tumor was resected for 4 to 5 cm with a rongeur, after which blunt dissection was carried out around the tumor whilst trying not to enter the pleural cavity. The distal intercostals and sympathetic nerve connections were then identified and severed in order and finally the tumor was extracted. The wound was then closed, following, if needed, the placement of multi-fine-holed vacuum suction drains.

**RESULTS:** The level of the tumor location varied from Th1 down to Th11. One patient underwent this procedure for a local recurrence forming a dumbbell tumor 2 years after the initial thoracotomy resection. All ten patients have been well without any evidence of recurrence of tumor. Furthermore none has developed any apparent skeletal deformity. Wound pain was none or minimal.

**CONCLUSIONS:** We propose that the method presented herein be employed as a standard procedure, ie. single-staged removal of a dumbbell neurologic tumor. A laminectomy followed by extrapleural dissection is reliable, easy, less invasive and therefore better tolerated by patients than by any other approach. 1): OSADA H et al. Dumbbell neurogenic tumor of the mediastinum: A report of three cases undergoing single-staged complete removal without thoracotomy. Jpn J Surg, 21, 224-228, 1991

#### OP-759-SINGLE SUPINE POSITION AND DOUBLE-PORT TECHNIQUE OF ENDOSCOPIC THORACIC SYMPATHECTOMY: A SERIES OF 11 HYPERHIDROSIS CASES

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**BACKGROUND:** Hyperhidrosis is a clinical diagnosis of excessive sweating involving the palmar, axilla and plantar regions. Some cases are very troublesome and socially disruptive. Hyperhidrosis cases not responding to medical treatment can be treated by surgery. In view of the high success rate (about 99%), low risk of complication, short hospital stay, cosmetic surgical scar, and affordable cost of surgery, endoscopic thoracic sympathectomy (ETS) or video assisted thoracoscopic sympathectomy (VATS) has increasingly become a very popular option.

**METHODS:** A prospective study of eleven (11) patients (5 males:6 females) with palmar and plantar hyperhidrosis. All cases were operated by a single surgeon in a private hospital from October 2006 until December 2007. These patients had general anaesthesia with double lumen endotracheal intubation, supine positioning with both arm outstretched, and two (2) endoscopic 5.0mm ports technique. T2 and T3 sympathetic ganglia were resected and sent for histology.

**RESULTS:** Mean operating time: 48.56 minutes. Mean Hospital Stay: 21.7 hours. Average total cost of surgery: USD 4211.76. There was no complication. Palmar and axillary dryness was achieved in all 11 cases (100%). Plantar dryness was achieved in 4 cases (36.3%). All eleven patients were happy with the cosmetic surgical scars.

**CONCLUSIONS:** Single positioning and double port endoscopic thoracic sympathectomy is a simpler, effective, acceptable and affordable approach.

#### OP-760-THE ROLE OF THORACOSCOPY IN THE MANAGEMENT OF HYDATID CYST OF LUNG PRESENT AN EXPERIENCE

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**OBJECTIVE:** Video assisted thoracoscopic surgery (VATS) now has become a popular procedure for management of most thoracic disease. In spite of this, debates exist for thoracoscopic intervention in the management of hydatid cyst. One of the most anxious points in the management of hydatid cyst is spillage of

hydatid fluid through bronchial tree or pleural space that may conducted to anaphylactic shock or hydatitis. The hydatid cyst is an alive parasite with high internal pressure and alkaline PH so, any change in these characteristic (such as rupture of cyst,...) can growing to a dead cyst and potentially doing as a lung abscess. In this setting we can evacuated of hydatid cyst thoroscopically without hesitancy of spillage and related complications.

**PATIENTS & METHOD:** Twelve selected patients with hydatid cyst who was admitted in our hospital (RAMC) during two last years (2005-2006). Among these were 7 male and 5 female with age from 11 to 64 years. The main criteria for selection of patients were rupturing and peripherally located (outer one third of lung) cysts. All patients considered for surgical intervention and were explain for procedure from ethical point. All patients underwent general anesthesia with double lumen endotracheal tube and proper position of thoracoscopy. Through the thoroscopic port, delineation of cyst and evacuation of contents (hydatid fluid and membranous portion) was performed. With resection of superficial portion of cyst wall and proper control of air leakage (as muresuplization or captonnage), pleural cavity was drained with a large bore chest tube.

**RESULTS:** In nine patients (75%) thoroscopic drainage was done successfully with mean hospital stay 4 days. In one case (8.3%) air leakage continued beyond the 7 days and in two patients (16.6%) thoracoscopy turned to open procedure due to inaccessibility of cyst and uncontrable air leakage. No recurrence was detected on the site of operation in the following patients (7 cases)

**CONCLUSION:** Debate exist for applicability of thoracoscopy in the management of hydatid cyst of lung, however in selected patients who have peripherally located cyst that considered for surgical intervention may be manage successfully with acceptable result.

#### **OP-761-CO2-VIDEO-ASSISTED THORACIC SURGERY (CO2-VATS) LOBECTOMY: A COMPLETELY CLOSED CHEST TECHNIQUE**

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**BACKGROUND:** Minimally invasive pulmonary surgery is a developing field. In recent times, video-assisted thoracic surgery (VATS) has broadened to include increasingly complex endeavors. Successful major anatomic pulmonary resection is the next phase in the evolution of minimally invasive thoracic surgery. The majority of such procedures described to date have been performed using a small utility incision, with thoroscopic assistance. We have developed a completely closed chest technique with thoroscopic dissection that employs intra-thoracic insufflation of CO<sub>2</sub>, and obviates the need for a utility incision. This technique provides an improvement in visualization, a reduction in the manipulation of the lung and tumor, and a more precise dissection. In this article we discuss our technique, learning curve, and initial results.

**METHODS:** We retrospectively reviewed all attempted CO<sub>2</sub>-VATS lobectomy cases performed between January 2004 and June 2006 at The University of Western Ontario in London, Ontario, Canada. Primary outcomes included success rate, 30 day mortality, operative time, time to discharge, and all post-operative complications.

**RESULTS:** We attempted a CO<sub>2</sub>-VATS lobectomy in 65 patients with suspected lung cancer. The technique was successfully carried out in 47 (72%) cases. All types of lobectomies were undertaken. The procedure was converted to an open thoracotomy in 18 patients: technical reasons in 12 cases and oncologic reasons in 4 cases. Bleeding prompted a thoracotomy in an additional 2 cases. There were no intra-operative mortalities and all 65 attempted VATS lobectomy patients survived to discharge. No patient required a transfusion of blood products, and no patient developed respiratory failure requiring assisted ventilation. The incidence for all post-operative complications was 49%: 7 (11%) patients experienced a prolonged air leak > 5 days and 6 (9%) of these were discharged home with a Heimlich valve; 2 (3%) patients were discharged with home O<sub>2</sub>; 3 patients (5%) had atelectasis requiring bronchoscopy. Post-operative atrial fibrillation occurred in 5 (9%) cases; 4 (6%) patients had a pneumothorax following chest tube removal; 1 (2%) patient developed an empyema; 1 (2%) patient developed a urinary tract infection; 1 (2%) patient developed urinary retention; and delirium occurred in 2 (3%) patients. The mean post-operative hospital stay was 6.4 days. An average of 2.2 mediastinal (N2) lymph nodes was sampled. Rates of conversion to open lobectomy decreased with increasing operative experience. There was only one conversion in the in the final 13 attempted CO<sub>2</sub>-VATS lobectomy cases. Operative time similarly decreased with increasing experience. The average operative time for the last 10 successful CO<sub>2</sub>-VATS lobectomy cases was 124 minutes.

**CONCLUSIONS:** We describe a completely closed chest technique for the per-

formance of VATS lobectomy as an alternate technique for minimally invasive pulmonary surgery. The procedure is safe, reproducible, and offers the advantage of a 'no touch' technique. Continuous insufflation of CO<sub>2</sub> improves visualization and facilitates dissection by the provision of a more complete atelectasis and an enlarged operative space. The CO<sub>2</sub>-VATS lobectomy may be considered as the next phase in the advancement of minimally invasive thoracic surgery.

#### **OP-762-THYMECTOMY FOR MYASTHENIA GRAVIS: VIDEO-ASSISTED THORACIC SURGERY IS NOT INFERIOR TO STERNOTOMY**

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**BACKGROUND:** There is great debate over the optimal surgical approach for thymectomy in myasthenia gravis (MG). Despite its proven advantages in reducing morbidity, some surgeons remain concerned that video-assisted thoracic surgery (VATS) may not achieve outcomes equivalent to those of more radical approaches. This study compares the VATS and trans-sternal approaches in contemporary cohorts, using MG Foundation of America (MGFA) clinical classifications and life table analyses.

**METHODS:** Over an 11 year period, 62 consecutive patients received thymectomy for non-thymomatous MG at the two university Cardiothoracic Surgery units of Hong Kong. At one institute a unilateral VATS (MGFA T-2a) approach was used exclusively in all 41 patients, while at the other institute an extended trans-sternal (MGFA T-3b) approach was used exclusively in all 21 patients. Although not formally randomized, patient allocation to each institute (and hence each surgical approach) was determined solely by the proximity of the patient's residential address to each institute. Data for all patients were collected from medical records and supplemented with telephone surveys.

**RESULTS:** Pre-operative demographic and clinical variables were comparable in the VATS and trans-sternal groups. The mean operating times in the VATS group and the trans-sternal group were 108 ± 31 minutes and 119 ± 30 minutes respectively (p=0.213), and complication rates were 12.2% and 14.3% respectively (p=0.816). The mean post-operative length of stay was significantly shorter in the VATS group compared to the trans-sternal group: 3.4 ± 3.5 days vs. 6.8 ± 2.8 days respectively (p=0.031). In the VATS group, after a median follow-up time of 107 months (range 21-159 months), 92.7% of patients experienced improvement and the crude complete stable remission (CSR) rate was 19.5%. In the trans-sternal group, the corresponding figures were 83 months (range 20-144), 81.0% and 9.5% respectively. Kaplan-Meier analysis demonstrated a 10-year CSR rate of 22.7% in the VATS group compared to 13.5% in the trans-sternal group (p=0.373). Kaplan-Meier estimates of 10-year rates of achieving MGFA Post-Intervention Status MM-3 or better were 73.4% in the VATS group compared to 56.7% in the trans-sternal group (p=0.393). On univariate analysis, pre-operative MGFA class I-II was the only variable associated with significantly better outcome (p=0.032), but there was also a trend for thymic atrophy to be predictive of failure to reach CSR (p=0.092). Although there was a trend for higher gross weights of resected tissue in the trans-sternal group, higher weights were not associated with better outcomes. Patients in the VATS group reported significantly greater satisfaction with their wounds than those in the trans-sternal group (p=0.035), and there were trends for lower reported pain and paresthesia scores in the VATS group.

**CONCLUSIONS:** VATS provides equivalent outcomes on life table analysis to extended trans-sternal thymectomy for non-thymomatous MG. However, VATS is associated with shorter hospital stays and potentially greater patient satisfaction.

#### **OP-763-VIDEO-ASSISTED THORACOSCOPIC SURGERY FOR MYASTHENIA GRAVIS**

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**BACKGROUND:** Minimal-access thymectomy has become increasingly popular as surgical treatment for patients with myasthenia gravis (MG). We compared the results of video-assisted thoracoscopic thymectomy (VATT) and transternal

thymectomy (TT) in patients with MG at our institute.

**METHOD:** We retrospectively review all patients who underwent thymectomy for MG at Siriraj hospital between 2005-2007 (N=42). Nineteen patients (45.3%) underwent VATT. Twenty-two patients (54.7%) underwent TT. The mean follow up was 6.4 months in VATT group versus 14.4 months in TT group (P=0.005).

**RESULTS:** There were no statistical differences between the two groups of patients in terms of sex, age, and severity of MG. All VATT procedures were performed through a right-side approach with one early conversion because of none-suitable anatomy. The mean length of stay for the VATT group was 4.1 days (range, 2-9 days) and was 4.9 days (range, 2-18 days) in the TT group (P = 0.26). Both groups had 1 patient each with respiratory failure after the operation. There was no statistically significant difference in the postoperative Osserman classification (P=0.54) and DeFillipi classification (P=0.42) between the two groups.

**CONCLUSION:** Video-assisted thoracoscopic surgery thymectomy for myasthenia gravis is technically feasible and safe and is as effective as transsternal approach with comparable postoperative outcome.

#### **OP-764-VIDEO - ASSISTED CERVICAL MEDIASTINOSCOPY (VACM): OUR 7 YEARS EXPERIENCE**

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**BACKGROUND:** Lymph node sampling is an important intervention for the diagnosis and management of the mediastinal nodal diseases, including benign and malignant etiologies. Mediastinal exploration is a common procedure used for the diagnosis of the thoracic diseases and the staging of lung cancer. The cervical mediastinoscopy is the "gold standard" for the assessment of mediastinal lymph nodes and it remains the clinical method with the highest sensitivity and specificity for exclusion of mediastinal lymph node involvement. A retrospective review was performed to assess sensitivity, specificity, accuracy and morbidity of Video Assisted Cervical Mediastinoscopy (VACM).

**METHODS:** From 1999 to 2006 we performed a total of 139 VACM procedures in 138 patients. There were 113 men (81.9 %) and 25 women (18.1 %), aged from 12 to 84 years (mean  $\pm$  std dev of  $59.3 \pm 14.2$  years). Mediastinal nodal enlargement by Computed Tomography Scan (CT scan) was the main absolute indication for VACM (lymph node enlargement of more than 1.0 cm in a short axis diameter) in lung cancer patients. Other indications to perform VACM were possible mediastinal lymphomas, mediastinal tumors and other lung diseases with mediastinal involvement. 87 patients were evaluated for known or suspected lung cancer (CN2 or CT scan) - Group 1. 51 patients underwent VACM for the evaluation of adenopathies or masses having no indication of lung cancer - Group 2. If lung cancer was the final diagnosis in the second group the patient was finally grouped in the first one.

**RESULTS:** The mean operative time was 41.7 min. Mean number of sampled nodal stations was 1.9. The majority of patients (93%) were discharged the day of operation. In the Group 1 the diagnosis of lymph node (LN) involvement was certified in 55 patients -sensitivity 80.8%. The remaining 27 patients (28.7%) were negative and underwent thoracotomy. The specificity of the procedure in this group was 100% and accuracy was 85%. Positive predictive value was calculated 100% and negative predictive value was 59.3%. In Group 2, we obtained a definitive diagnosis in 57 patients -sensitivity 93.6%. The specificity was 100% and accuracy 94.1%. In the negative patients the definitive histological diagnosis was obtained by means of thoracotomy or other procedure. The more frequent pathologies were lymphomas in 15 patients, sarcoidosis in 13 and reactive lymphadenitis in 14 patients. Overall sensitivity was 86.1%, specificity 100% and accuracy 88.4%. Overall positive predictive value was calculated 100% and overall negative predictive value was 59%. There were 2 patients with complications (1.4%) - one bleeding because of trauma to azygous vein and one mediastinitis because of manipulations in purulent lymph nodes. The mortality rate was 0%.

**CONCLUSIONS:** The development of the video systems made the procedure of mediastinoscopy more comfortable by adding much improved view. VACM is safe with zero mortality and minimal only morbidity is a highly effective and additionally the first choice to diagnose mediastinal lesions.

#### **OP-765-THE APPLICATION OF VIDEO-ASSISTED THORACIC SURGERY IN THE DIAGNOSIS AND TREATMENT OF SOLITARY OR MULTIPLE PULMONARY NODULES**

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**BACKGROUND/OBJECTIVES:** To review our experiences about the use of video-assisted thoracic surgery (VATS) in the diagnosis and treatment of indeterminate of pulmonary nodule, and related pre- or peri-operative localization techniques.

**DESIGN:** Prospective non-comparative study of patients with single or multiple pulmonary nodules in which malignancies cannot be excluded after pre-operative evaluations.

**METHODS:** One and sixty-two (92 male, 70 female) out of 1,260 patients undergoing VATS procedures received resection of pulmonary nodule(s) from June, 1995 to December, 2006. Their ages ranged from 13 to 89 years of age (mean 52 years). All of these patients underwent complete evaluations including the CT and/or PET evaluation. The sizes of pulmonary nodules ranged from 0.2cm to 4cm in diameter. The VATS Operations were performed for diagnosis, therapy, or both. There were only four cases requiring pre-operative hook-wire localization by the CT scan. Seventy-one (43.8%) of them have ever undergone pre-operative needle biopsy under the guide of CT or sonogram.

**RESULTS:** All of them completed successful VATS resection. There were 122 (75%) patients underwent wedge resection for diagnosis or treatment (for benign lesion, primary lung carcinoma with compromised condition, and metastectomy). Forty (25%) of them (31%) were converted into open thoracotomy and underwent lobectomy with mediastinal lymph node dissection for the treatment of primary lung carcinoma. There was one post-operative mortality due to the progression of carcinoma, one patient with postoperative bleeding requiring re-exploration, and three patients suffered from post-operative prolonged air-leakage, which were recovered after conservative treatment.

**CONCLUSION:** VATS is a safe and reliable procedure for the diagnosis and treatment of indeterminate solitary or multiple pulmonary nodules.

#### **OP-766-VIDEO ASSISTED THORACOSCOPIC EXTRACTION OF SHARP INTRA-THORACIC FOREIGN BODIES**

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**BACKGROUND:** Surgical extraction of sharp intrathoracic foreign bodies used to present with significant morbidity and risk. Traditionally these extractions would require a thoracotomy or even a sternotomy. But the advent of Video Assisted Thoracoscopic(VAT) device has changed this scenario. Here we present our case series using the same device.

**METHODS:** We performed a retrospective review of the medical records and investigations of patients who presented with sharp intrathoracic foreign bodies, between 1997 and 2007. The etiology, presentation, surgical intervention and follow-up results were reviewed.

**RESULTS:** We had 7 patients in our series. 2 were females and 5 males. The age range was 18 to 70 years. 2 of the patients presented acutely following trauma. The rest of the presentations were elective. The foreign bodies identified were glass fragments (1), broken knife (1), migrating broken sternal wires (2) and slipped pectus bars (3). All these were removed in their entirety by VAT technique successfully and without any complications. There was no mortality in our series. 1 patient required further laparotomy for extraction of a glass fragment in the pelvis. The median post-operative stay in the hospital was 2 days. At 3 months follow-up, all the patients were doing well without any residual complications.

**CONCLUSION:** Video Assisted Thoracoscopy now has a definite role in extraction of sharp intrathoracic foreign bodies. Its use, however has to be rationalised for each case depending upon the accessibility, tolerance of single lung ventilation and maintenance of stable hemodynamics in an acute presentation.



## OP-767-THORACOSCOPIC SPLANCHNICECTOMY WITH PATIENTS WITH EXTREME ABDOMEN PAIN

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**BACKGROUND:** The constant, unbearably strong pain in the abdomen is the most stressful and depressing symptom for patients with different inoperable tumors, most often in the pancreas. Consistent use of analgetic medicine quickly exhausts its analgetic effect. Transcutaneous blockade of plexus coeliacus has not proved to be satisfactory enough. The open transhiatal splanchnicectomy is an effective, but rather traumatic method for this kind of patients. The same refers to splanchnicectomy through thoracotomy. Videothoroscopic splanchnicectomy combines the low morbidity of transcutaneous interventions with the high effectiveness of open operations. Unilateral operations are performed when the pain is localized in one side of the abdomen. In cases of pain in the whole abdomen the operation can be done in both sides simultaneously.

**METHOD:** From January 2003 to September 2007 in the Department of Thoracic Surgery in the Military Medical Academy, 32 thoracoscopic splanchnicectomies were done. The patients were only men, aged 41 to 65, with inoperable tumors in the pancreas. All the patients had a strong, constant pain, mainly in the epigastrium. With 15 of the patients the pain was mainly in the right side of the abdomen, and with 12 - mainly in the left side. With 5 of the patients the pain was in the whole abdomen. All the patients underwent a thoracoscopic operation, which in the latter group of 5 patients was performed in both sides simultaneously.

**RESULTS:** 15 right-side, 12 left-side and 5 two-side splanchnicectomies were done. The average time for an operation is 21 minutes for the unilateral and 60 minutes for the bilateral splanchnicectomy. We achieved almost complete elimination of the pain and long-term stop of medication or transfer to non-narcotic analgetics with all the patients. We used only antitrombotic prevention during and after the operation. We monitored the patients for 56 to 160 (100 in average) days after the operation. There was no recurrence of pain, no mortality. The patients left the hospital on the 3rd postoperative day.

**CONCLUSIONS:** Unilateral and bilateral thoracoscopic splanchnicectomy is an effective and non-traumatic method to manage the pain in inoperable tumors in the pancreas and chronic pancreatitis.

## OP-768-VATS APICAL BULLECTOMY AND TALC POWDRAGE IN THE TREATMENT OF SPONTANEOUS PNEUMOTHORACES: EFFECT ON PULMONARY FUNCTION AND 1-YEAR RESULTS

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**BACKGROUND:** There exists some controversy in the use of talc poudrage in the management of patients with spontaneous pneumothoraces and in the effect of talc on pulmonary function. We present our preliminary results using video-assisted thoracoscopic (VATS) talc poudrage in the treatment of spontaneous pneumothoraces.

**METHODS:** Seventy-two patients with spontaneous pneumothoraces treated with VATS apical bullectomy and talc poudrage were prospectively followed for one year. The indications for surgery were recurrent pneumothoraces (58), bilateral pneumothoraces (8) and persistent air leak (6). Chest radiographs and pulmonary function tests were administered preoperatively (preop) and at 6 months (6m) and 12 months (12m) postoperatively. Results were analyzed using paired t-tests.

**RESULTS:** There were 46 males and 26 females, with a mean (standard deviation) age of 29 (13.7) years; 35 (49%) of who were smokers. There were no conversions to open. There were no recurrences within the 12 month follow-up period. There were 4 complications (6%): a wound infection, a pneumonia, and two persistent air leaks each lasting one week. Pulmonary function data were complete for 41 patients. At 6 and 12 months the mean FEV1 were significantly lower than the preoperative values (preop 95%; 6m 90%; 12m 89%;  $p=0.02$ ). The FEV1/FVC decreased at 6 months, but returned to preoperative values at 12 months (preop 95%; 6m 78%; 12m 94%  $p=0.9$ ). The diffusion capacity (DL/VA) was unchanged (preop 86%; 6m 87%; 12m 91%;  $p=0.33$ ). The total lung capacity (TLC), vital capacity (VC) and residual volume (RV) all decreased statistically but not clinically at one year (TLC: preop 106%; 6m 101%; 12m 98%;  $p=0.002$ ) (VC: preop 100%; 6m 96%; 12m 96%;  $p=0.05$ ) (RV: preop 122%; 6m 114%; 12m 107%;  $p=0.002$ ).

**CONCLUSIONS:** VATS apical bullectomy and talc poudrage is a very effective

treatment for spontaneous pneumothoraces with a low complication rate and no recurrences for at least one year. Flow rates and diffusion capacities are preserved, but lung volumes are slightly reduced.

## OP-769-THE FEASIBILITY OF MEDICAL THORACOSCOPY IN THE TREATMENT OF SUBACUTE EMPYEMA

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**BACKGROUND:** The staging of empyema is necessary for VATS decortication. However the conventional staging tools such like clinical onset time, chest CT findings are not enough to stage empyema. The medical thoracoscopy is the ideal diagnostic tool of pleural examination, and simple surgical procedure is possible during examination. The purpose of this study is to evaluate the feasibility of medical thoracoscopy in the staging and treatment of empyema.

**PATIENTS AND METHODS:** From June 2004 to December 2006, 143 medical thorascopies were performed for the diagnosis of undermined pleural effusion, and 55 patients were diagnosed as subacute empyema. Subacute empyema was divided into early and late stage according to thoracoscope findings, and different surgical procedures were selected according to subgroups. In early subacute empyema, loculation broken up & adhesiolysis was performed during medical thoracoscopy. In late subacute empyema, VATS or open decortication under general anesthesia were performed within one week after medical thoracoscopy.

**RESULTS:** There was no mortality & morbidity during the medical thoracoscopy. The mean age was 51.0~Y20.6years (range, 12-86 years). 74.5% (41/55) subacute empyema was diagnosed as early stage and treated with loculation broken up & adhesiolysis. 25.5% (14/55) was late stage empyema. Except one who was necessary thoracotomy conversion due to diaphragm tear during VATS decortication, all patients were underwent VATS decortication. One additional chest tube insertion was performed to drain remnant empyema sac in early subacute empyema, and one thoracotomy was necessary due to postoperative prolonged airleakage in late subacute empyema. The mean duration of chest tube drain was 9.6 ~Y 5.8 days (range, 3-27 days) The mean follow up duration was 6.7~Y6.9months (range, 1-30 months), except one who developed severe pleural thickening, there was no sequela of empyema in all cases.

**CONCLUSIONS:** The medical thoracoscopy is useful diagnostic method in the staging of empyema. And the combined simple surgical procedure is reduced the incidence of general anesthesia in the treatment of subacute empyema.



## CARDIAC II

### OP-770-RETROGRADE CARDIOPLEGIA IN CORONARY ARTERY DISEASE: BLESS OR CURSE? A COMPUTER MODEL APPROACH

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**ABSTRACT/BACKGROUND:** Our computer model study aimed to compare the effectiveness of retrograde cardioplegia alone with antegrade, in patients with coronary artery disease (CAD).

**METHODS:** We studied the flow of the cardioplegic solution in different parts of the myocardium using both a symmetric and an asymmetric human capillary unit model with CAD. The analysis of our results was made with software from the School of Mechanical Engineering, National Technical University of Athens, Greece (artnet.for: arterial network solver (FORTRAN)).

**RESULTS:** Our study suggests that retrograde cardioplegia alone offers nothing in addition when compared to antegrade in patients with CAD, but on the contrary it seems to "overprotect" the less ischemic areas supplied by non-occluded arteries. It was also demonstrated that retroperfusion reaches the myocardial cells only on condition that the occluding lesion of the supplying artery is less than 100% and/or there are open collaterals.

**CONCLUSION:** The administration of retrograde cardioplegia alone as routine or in specific cases of patients undergoing coronary artery by-pass grafting (CABG) - e.g. porcelain aorta - is inadvisable.

### OP-771-A NOVEL METHOD FOR A SIMPLIFIED MITRAL VALVE REPAIR

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**BACKGROUND:** The superiority of mitral valve repair in terms of outcomes has been long and well established. However repair techniques often prove challenging. We present our initial experience with a novel mitral valve repair system that appears to simplify the need for repair of certain types of valve pathology.

**METHODS:** Between April and October 2007, twelve patients undergoing surgery for mitral valve disease, received the Mitrofast repair system (Shellhigh Inc, Union, NJ, USA). It comprises of a D-shaped annuloplasty ring with a curved surface made of a polymer, incorporated in the region of the annulus corresponding to the posterior leaflet. The whole device is covered by bovine pericardium. It mimics the posterior leaflet in the closed position, forming a "trap-door" mechanism against which the anterior leaflet may coapt.

**RESULTS:** There were no perioperative deaths. 8 patients were male. The mean age was 68.2 years (range 57- 85) and mean logistic Euroscore was 8.04 (2.27-25.66). All patients had isolated posterior leaflet prolapse of degenerative aetiology. All but 2 patients were in NYHA class 2 or 3 and all but one patient had MR grade 4. Concomitant procedures included RFA in 3 patients and TV repair in 1. The average CPB time was 79.3 mins and cross-clamp time 50 mins. Only two patients had trivial MR in post implantation transoesophageal echocardiography. The mean hospital stay was 11.7 days (6-23).

**CONCLUSION:** The Mitrofast repair system represents a promising tool for simplified and reproducible mitral valve repair, particularly in the cohort of patients with complex posterior leaflet pathology.

### OP-772-REVALENCE OF CAD RISK FACTORS AND THEIR RELATIONSHIP WITH NUMBER OF INVOLVED CORONARY ARTERIES IN CABG

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**BACKGROUND:** Recent studies suggest the role of risk factors and risk modification in prediction of following risks and primary and secondary prevention of ischemic heart disease. This study has been conducted to evaluate the prevalence of coronary risk factors and their relationship with the number of involved coronary arteries in patients undergoing coronary artery bypass graft.

**METHODS:** 100 patients undergoing isolated CABG in Shariati Hospital were enrolled in this cross-sectional study and evaluated in terms of major coronary risk factors (including Smoking, Hypertension, Family History of Coronary Artery Disease, Hyperlipidemia and Diabetes Mellitus) as well as obesity and behavior type (A, B and depressed). Based on their last year angiographic data, patients were categorized into three groups: single vessel disease (SVD), two vessel disease (2VD) and three vessel disease (3VD).

**RESULTS:** Of the 100 patients studied, 86% were male and the mean age was 50 (30-70) years. Hypertension was found in 60%, positive family history in 50%, smoking in 47%, Hyperlipidemia in 38% and DM in 21% of patients. DM was significantly lower in 2VD group ( $P=0.0055$ ) and behavior type B was significantly higher in this group ( $P=0.0083$ ). No significant differences in the relation of other major risk factors and variables with the number of involved coronary arteries were observed between groups. 3VD (56%) was the most prevalent form and 2VD and 3VD were 32% and 12% respectively.

**CONCLUSIONS:** HTN was the most common coronary risk factor observed in 60% of patients. This may be due to ethnic differences, under diagnosis or late detection and treatment of HTN among Iranian patients. In the group of 2VD, DM was significantly lower and behavior type B was higher significantly. There was not any significant difference in the relation of other major risk factors and variables with the number of involved coronary arteries. **KEY WORDS:** Risk factor, CABG, Number of involved vessel

### OP-773-SIMULTANEOUS HYBRID REVASCULARIZATION BY CAROTID STENTING AND CORONARY ARTERY BYPASS GRAFTING: THE SHARP TRIAL

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**BACKGROUND** and purpose: Preventing stroke and cardiovascular events after coronary artery revascularization in patients with elevated surgical risk is a complex and multifaceted problem. In an attempt to reduce postoperative events we investigated a new therapeutic strategy consisting of a simultaneous hybrid revascularization by carotid artery stenting (CAS), immediately followed by coronary artery bypass grafting (CABG).

**METHODS:** Eighty patients with severe carotid and coronary artery disease and a EuroSCORE  $\geq 5$  were included in this multicenter study. Immediately after CAS, patients underwent CABG. The primary end point was the incidence of stroke, acute myocardial infarction (AMI) or death at 30 days. Secondary outcomes were transient ischemic attacks (TIA), major local complications, bleeding and systemic complications within 30 days after treatment, and any stroke, AMI or death occurring from the 31st day to the end of the twelve-month follow-up. All clinical outcomes were assessed by an independent monitoring board.

**RESULTS:** The rate of procedural success was 98.8%. The 30-day cumulative incidence of disabling stroke, AMI or death was 2.5%: one patient died (1.2%) and one patient had a stroke immediately after CAS. Two patients died from the 31st day to the 12th month after the procedure.

**CONCLUSIONS:** Our findings indicate that in high risk patients with coronary and carotid artery disease suitable for CABG, the hybrid revascularization by CAS, immediately followed by CABG is a feasible and promising therapeutic strategy.

## OP-774-WHERE ARE WE GOING WITH CONVENTIONAL CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** Results of conventional coronary artery bypass surgery (CABG) continues to improve over the years. Although in recent years the outcome of this operation has been questioned. This operation has a remarkable adaptability to a wide variety of clinical settings; reproductibility and durability while performed by a vast number of surgeons all over the world; and its proven track record for safety and effectiveness as the gold standard. Now, in the era of minimal invasive and off pump CABG (OPCAP) and drug eluting stents, we opt for looking at our results in isolated conventional CABG.

**METHODS:** Retrospective review of 663 cases of isolated conventional CABG were performed a single surgeon. 117 OPCAP cases were excluded leaving the study population of 546. Pre, intra., and postoperative data were examined.

**RESULTS:** Mean age was 58.6 years (rang of 30-100 y). Female to male ratio 1:4.2. Diabetics was present in 59%, hypertension in 57%, smoking 33%, carotid stenosis was present in 8.2% and preoperative CVA 3%. Left ventricular dysfunction (ejection fraction <50%) was present in 45%. Mean number of graft/ patient was 3.7. Postoperative 30 days outcome: Cardiac mortality 0.5%. CVA 0.7%, post op. MI 1.6%, grafts revision 0%, angioplasty reintervention was 0.2%. Renal failure needing dialysis 0.5%. Atrial fibrillation 15.9%. Blood transfusion 21.8% and median hospital stay was 6.7 days.

**CONCLUSION:** Out come of conventional CABG still poses a tough competition to all newer modalities

## OP-775-A REGENERATIVE CARDIAC SCAFFOLD FOR USE IN VENTRICULAR REMODELING

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**INTRODUCTION:** Myocardial infarctions damage heart muscle, depress ventricular function and often result in aneurysm formation. Recent advances in ventricular remodeling have benefited patients with post-infarction aneurysms, yet only synthetic patches have been used in these procedures. We hypothesized that replacement of infarcted tissue with a scaffold that supports cardiac muscle regeneration while maintaining mechanical integrity would further enhance the benefit of the ventricular remodeling procedure.

**METHODS:** A 1x2 cm full thickness right ventricular defect was created in the normal canine heart (n = 4) and replaced with a pericardial-based bio-scaffold or woven polyester as control. Eight weeks after implantation, regional function was determined within the implant region using a novel high resolution technique in order to test for regenerative capacity and functional performance. The implant region was also immunostained for myocyte and fibroblast content. Tensile strength and suture retention were used to determine the mechanical integrity of the bio-scaffold.

**RESULTS:** The tensile strength of the bio-scaffold was sufficient to withstand an intracavitary pressure of >300 mmHg. In addition, the suture retention capabilities exceeded the specifications. After 8 weeks' recovery, regional stroke work and systolic contraction in the bio-scaffold exceeded that of Dacron. Immunostaining showed striated myocytes that were positive for actinin within the implant boundary, many of which demonstrated connexin 43 staining, suggesting the formation of gap junctions between myocytes.

**CONCLUSIONS:** A pericardial-based bio-scaffold can support cardiac myocyte regeneration after implantation in the working heart and demonstrate mechanical function while providing mechanical integrity. Its performance in these regards exceeds those of commonly used inert implants such as woven polyester.

## OP-776-MINIMAL EXTRACORPOREAL CIRCULATION V.S. OF PUMP SURGERY

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**BACKGROUND:** One comparative study was performed focusing on the potential benefits of mini bypass versus off-pump coronary artery bypass grafting (OPCAB) in our institution. The intention of this study was to evaluate the mini bypass system in routine revascularization cases as compared to OPCAB in terms of Troponin, blood components, blood product use, post operative bleeding, and routine intraoperative/post operative patient parameters.

**METHODS:** We study, retrospectively 493 patients comparing 210 bypass (Sorin Group SynergyTM) to 283 off pump (OPCAB) in CABG.

**RESULTS:** There were no statistical differences in terms of patient demographics. There was a statistically significant difference between the groups in terms of number of actual grafts in mini bypass as compared to OPCAB ( $2.48 \pm 0.63$  vs  $2.22 \pm 0.64$ ,  $p < 0.05$ ), Cardiac Index at closure ( $2.93 \pm 0.8$  vs  $2.31 \pm 0.7$ ,  $p < 0.001$ ) and at admission ICU ( $2.60 \pm 0.74$  vs  $2.28 \pm 0.62$ ,  $p < 0.001$ ) ICU ventilation time ( $6.86 \pm 1.88$  vs  $7.73 \pm 2.39$ , hours  $p < 0.05$ ), intra-aortic balloon pump usage ( $4.9\%$  vs  $17.9\%$ ,  $p < 0.05$ ), post operative bleeding ( $532 \pm 540$  ml vs  $756 \pm 616$  ml  $t = 24$  hr; and mortality ( $0.9$  vs  $2.4$   $p = n.s$ ). There was no statistical difference in hematorcit, leucocyte count or platelet count, though post operatively there was a drop in platelets at ICU admission ( $160$  vs  $189 \times 10^6$   $p > 0.001$ ). There was no statistically significant difference in Troponin I between the two groups.

**CONCLUSIONS:** 11 Mini bypass was better in terms of postoperative hemodynamics, level of revascularization, bleeding, ventilation time and the need of circulatory assistance by balloon pump. 21 The use of mini bypass is more comfortable for surgeon on tend to have better mortality results. For these reasons is the usual technique, actually in our department.

## OP-777-THE IMPACT OF MAJOR POSTOPERATIVE COMPLICATIONS ON IN-HOSPITAL MORTALITY FOLLOWING CORONARY ARTERY BYPASS GRAFTING - ARE THEY UNEXPECTED OR PREVENTABLE?

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**BACKGROUND:** Numerous studies have been conducted to identify risk factors for in-hospital mortality among CABG patients, mainly based on preoperative risk factors. We sought to determine the impact of major postoperative complications on early mortality after CABG.

**METHODS:** We studied 4,140 consecutive patients with isolated CABG from 1992 to 2003. Multivariate logistic regression analysis was used to determine independent predictors for in-hospital mortality. We included all available pre, intra and postoperative factors in this analysis.

**RESULTS:** The mean EuroSCORE of all patients was  $6.2 \pm 3.4$  and there were 122 (2.9%) in-hospital deaths. Major postoperative complications included: intraoperative stroke (n=102 or 2.5%), stroke over 24 hours (n=36 or 0.9%), myocardial infarction (n=23 or 0.6%), deep sternal wound infection (n=49 or 1.2%), bleeding requiring reoperation (n=76 or 1.8%), sepsis and/or endocarditis (n=38 or 0.9%), gastrointestinal complications (n=57 or 1.4%), renal failure (n=35 or 0.8%) and respiratory failure (n=194 or 4.7%). Multivariate logistic regression analysis revealed that intraoperative stroke (OR 3.65, 95%CI 1.65-8.10;  $P = 0.001$ ), myocardial infarction (OR 10.91, 95%CI 3.01-39.54;  $P < 0.001$ ), sepsis and/or endocarditis (OR 7.87, 95%CI 2.91-21.29;  $P < 0.001$ ), gastrointestinal complications (OR 8.15, 95%CI 3.58-18.59;  $P < 0.001$ ), renal failure (OR 3.25, 95%CI 1.12-9.48;  $P = 0.031$ ) and respiratory failure (OR 9.28, 95%CI 5.51-15.63;  $P < 0.001$ ) were strong independent predictors for in-hospital mortality.

**CONCLUSIONS:** We showed that most major postoperative complications following CABG are strong independent predictors for in-hospital mortality. This data suggest the need for the development of risk stratification for both in-hospital mortality and specific major postoperative complications, which represent another manifestation of in-hospital mortality among patients with CABG.

## **OP-778-OFF PUMP REVASCULARISATION IN ACUTE MYOCARDIAL INFARCTION AND CORRELATION WITH TROPONIN- I LEVELS**

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**BACKGROUND:** Early off Pump Revascularization in patients with acute myocardial infarction (MI) having coronary lesions not suitable for PTCA salvages ischemic hibernating myocardium and avoids CPB related morbidity. Risk is higher in patients with extensive infarction of the myocardium, hemodynamic instability and intractable arrhythmias. We studied correlation of pre-operative Troponin- I levels, an indicator of severity of myocardial injury, and the timing of surgery after MI.

**METHODS:** Between December 2004 to November 2007 Off Pump Revascularization was performed in 407 patients with acute MI. In 316 patients (Group-A) surgery was done within three hours of coronary angiogram and included patients with pre-operative Troponin I levels < 10ng/mL and stable (Group A-1, n = 290) or troponin- I levels <10 but hemodynamically unstable with intractable arrhythmias or persistent angina despite optimum medical management and IABP (Group A-2, n=26). In 91 patients with initial higher Troponin I levels, revascularization was done later when troponin I levels declined below 10ng/ml if the patients were hemodynamically stable or immediately if unstable and were divided into Group B (Troponin- I levels 10 to 30ng/mL, n = 73), further divided into B-1 who had immediate surgery (n=23) and B-2 had surgery later when troponin I declined below 10, (n=50). In Group C (Troponin- I level 30 to 50ng/mL, n = 18), C-1 (n=3) had immediate surgery and C-2 (n=15) later. In Group D (Troponin - I > 50ng/mL, n = 26) 9 had immediate surgery (Group D-1) while 17 had surgery later (Group D-2). Arterial conduits were preferred and all territories with significant stenosis were grafted with help of mechanical stabilizers and intra coronary shunts. Peri-operative arrhythmias were controlled with Amiodarone and Beta Blockers.

**RESULTS:** IABP use in stable patients with Troponin I < 10 (Group A-1), was 9.3% but higher in Group B-1 (34.78%) and B-2 (12%), Group C-1(33.6%) and C-2(16.6%) , Group D-1(33.3%) and D-2(23.5%). One patient had left ventricular rupture and another had right ventricular rupture during off pump revascularisation and both had Troponin I levels >50 just before surgery. Post-operative high inotropic support, prolonged ventilation, perioperative arrhythmias, renal failure and mortality were also more frequent in those who had Troponin I levels higher than 10 and had early surgery. Mean improvement in LVEF post revascularization was  $11.4 \pm 3.6\%$ . Mortality were 11, Group A-1(2), A-2(1), Group B-1(1) Group B-2(1), Group C-1(1), Group D-1(4) and Group D-2(1) and cause of death was multiorgan failure(5), cardiac failure (2), intractable arrhythmias (2), septicemia (2).

**CONCLUSION:** Early off pump revascularization in acute MI is safe if pre-operative Troponin-I levels are less than 10ng/mL and patient hemodynamically stable. In patients with troponin I levels > 10ng/ml extensive myocardial injury has already occurred and Operative risk is high proportionate to the peak levels (Maximum in Troponin I > 50) and waiting for levels to come down in stable patients helps in decreasing morbidity /mortality. However in hemodynamically unstable patients with critical coronary occlusion immediate off pump revascularization can be life saving though IABP requirement and operative morbidity /mortality is higher.

## CORONARIES IV

### OP-779-THE INFLUENCING FACTORS OF ACUTE HEART FAILURE AND IABP INSERTION IN CABG PATIENTS WITH EF > 50%

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**BACKGROUND:** Intraaortic balloon pump (IABP) is usually the first choice of mechanical device used for decreasing myocardial oxygen demand by systolic unloading in perioperative heart failure and the low cardiac output state that was refractory to maximum pharmacologic treatment and judicious volume load. The aim of this study was to determine the perioperative factors that have influencing role in acute heart failure in the coronary artery bypass grafting (CABG) patients who had normal preoperative ejection fraction (>50%) and received the IABP.

**METHODS:** Between January 2002 and September 2006, 6635 patients who had preoperatively ejection fraction (EF) of more than 50%, underwent CABG. Perioperative IABP was inserted for 126 cases (1.9%) and 6509 patients (98.1%) were uneventfully weaned off cardiopulmonary bypass. The perioperative risk factors of these two groups were compared.

**RESULTS:** Perioperative IABP was inserted for 126 cases (1.9%). From variables entered into multivariate logistic regression following parameters identified as influencing factors for occurrence of acute heart failure and requiring IABP throughout CABG surgery: age (OR=1.03 CI=1.01-1.06), renal failure (OR=3.16 CI=1.02-9.81), hypertension (OR=2.33 CI=1.42-3.81), arrhythmia (OR=5.70 CI=2.64-12.30), prolonged cardiopulmonary bypass (OR=1.05 CI=1.03-1.07). Also the CCS in grade 4 (OR=0.001) and presence of angina (OR=0.20) identified as preventing factors for aforementioned events.

**CONCLUSION:** According to our study age, renal failure, hypertension, arrhythmia, prolonged cardiopulmonary bypass time are the factors that may influencing in occurrence of acute heart failure and difficult pump weaning. It seems we should be considering the risk of requiring IABP support for weaning of cardiopulmonary bypass even in patients with EF more 50%.

### OP-780-MINIMALLY INVASIVE HARVESTED RADIAL ARTERY FOR CORONARY ARTERY BYPASS OUR REVUE OF 185 PATIENTS

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Total arterial myocardial revascularisation is mainly recommended but the use of bilateral thoracic arteries is contraindicated in some patients especially the obese and diabetic. The radial artery seems to be a good alternative but a scar, paresthesia and the loss of force in the forearm can compromise the use of this graft by some surgeons. Can a minimally invasive radial harvesting procedure avoid these inconvenients? We reviewed our 185 patients operated on from October 1st 2002 to December 21st 2007 with the use of a minimally invasive harvested radial artery and are collecting the data in matter of forearm paresthesia, loss of force, patients postoperative comfort, major cardiac events, per and post-operative infarction and clinical evolution for some patients operated now five years ago. The first results are quite encouraging to continue this procedure.

### OP-781-RISK FACTORS OF CEREBROVASCULAR ACCIDENTS AFTER ON PUMP ISOLATED CORONARY ARTERY SURGERY

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**BACKGROUND:** Cerebrovascular accidents (CVAs) after surgical myocardial revascularization is one of the most hazardous complications. Its related mor-

tality remains high and patients who experience this event have lower long-term survival than patients who do not. Many reports focus on the relationship between the degree of atherosclerotic affection of the ascending aorta; degree of manipulation and postoperative CVAs. Different surgical strategies for myocardial revascularization with the least manipulation to the aorta of these patients were described in the literatures. Other independent predictors of cerebrovascular accidents (CVAs) following onpump isolated CABG(s) include Extracoronary Vasculopathy, Low output syndrome, Low EF. and others Identification of other risk factors allows preoperative risk stratification and may facilitate improved patient selection and contribute to reduce the risk of a stroke by providing an opportunity for adequate medical and surgical intervention.

**METHODS:** A retrospective study on a total of (1192) isolated coronary patients whom were operated upon ONPUMP at the Department of Cardiology and Cardiac Surgery, "G. D'Annunzio" University, Chieti, Italy, From January 1991 to December 2001. The patients who survived less than 24 hours and who had aortic cannulation without cross-clamping were excluded. Univariate and multivariate analyses were applied to identify independent predictors of higher incidence of CVAs.

**RESULTS:** Our study demonstrated that (23) patients out of the total number (1192) patients had experienced CVAs with an incidence of ( 1.93% ). Univariate analysis of risk factors in patients with and without a CVAs showed that there are seven independent factors: Low Output Syndrome ( LOS ) ( p .000 ) & Simultaneous (CEA) ( p .000 ) & LV dysfunction ( EF<0.35 ) ( p .003 ) & Previous CVAs ( p .034 ) ECV (Extra Coronary Vasculopathy ) ( p .024 ) & CVD ( Carotid Vascular Disease ) ( p .042 ) & COPD ( p .047 ). In all of them p<.05. Stepwise Logistic Regression analysis for CVAs confirmed five of them ( p<.05 ) Low Output Syndrome ( LOS ) ( p .0002 ) & LV dysfunction ( EF<0.35 ) ( p .0096 ) & Simultaneous carotid endarterectomy (CEA) ( p .0063 ) & Extra Coronary Vasculopathy ( ECV ) ( p .0315 ) & COPD ( p .0489 ) In all of them p<.05

**CONCLUSIONS:** Aortic manipulation must be avoided in patients with atherosclerotic changes of the ascending aorta. Maintenance of a good hemodynamic status is crucial for any patient to reduce CVAs incidence. Patients with low EF. ; Simultaneous carotid endarterectomy; extracoronary vasculopathy or COPD are at higher risk, and a correct surgical strategy should be tailored for each case.

### OP-782-OFF PUMP CORONARY ARTERY BYPASS GRAFTING SURGERY (OPCAB) IN ACUTE CORONARY SYNDROME (ACS)

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**AIM:** Off Pump Coronary Artery Bypass Grafting (OPCAB) is gaining popularity worldwide even in patients with multi vessel disease. The aim of this study was to evaluate the outcome of OPCAB in patients with acute coronary syndrome (ACS).

**METHODS:** Between June 2002 to November 2007, 1359 patients underwent OPCAB in this institute, of which 242 patients had ACS with in week preceding surgery. These patients were retrospectively analysed for their pre-operative status and post-operative outcome.

**RESULTS:** The indications for surgery included ACS in patients with severe triple vessel disease, failed Percutaneous Transluminal Coronary Angioplasty (PTCA), left main coronary artery disease and cardiogenic shock (with pre-operative ventilatory support). Average numbers of grafts were 3.7 per patient. Intra Aortic Balloon Pump (IABP) was inserted in 23 (9.5%) patient of which 19 (82.6%) IABP were removed in the operation theatre itself. 2 (0.82%) patients in our series died in the hospital, 1 (0.41%) had stroke and 1 (0.41%) had renal failure requiring dialysis after surgery.

**CONCLUSION:** We conclude that OPCAB can be performed safely and effectively in patients with ACS requiring emergency re-vascularisation.



### OP-783-DOES OFF-PUMP CORONARY ARTERY BYPASS GRAFTING REDUCE THE INCIDENCE OF POSTOPERATIVE ATRIAL FIBRILLATION?

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**BACKGROUND:** Atrial fibrillation, the common postoperative complication, has been observed after coronary artery bypass grafting in 5-40% of patients. Most of the previous reports show that off-pump surgery significantly reduces the incidence of postoperative atrial fibrillation. The aim of our study was to compare the postoperative atrial fibrillation incidence rate after on-pump and off-pump coronary surgery.

**MATERIAL AND METHODS:** We retrospectively studied 669 consecutive patients who underwent isolated coronary artery bypass grafting between 1999 and 2006 years. 402 patients underwent off-pump coronary surgery and 267 were operated using the conventional technique. Postoperative electrocardiogram monitoring was continued during the entire hospital stay to detect all episodes of atrial fibrillation and electrocardiogram recording was performed as necessary to confirm the rhythm abnormality. The presence of arrhythmia history was the reason of excluding 94 patients from the analysis. We compared the two groups for differences of atrial fibrillation incidence rate.

**RESULTS:** Demographic and preoperative factors, excepted age, were comparable in two groups. Patients who had conventional coronary artery bypass grafting were older compared with off-pump patients (66,7 and 65,7 years,  $p=0,005$ ). Analysis showed a statistically significant increase of the postoperative atrial fibrillation in patients after off-pump surgery compared with on-pump group (36,1% and 25,8%, respectively;  $p=0,003$ ).

**CONCLUSIONS:** Atrial fibrillation is a common postoperative complication after coronary artery bypass grafting. The previous studies show lower incidence rate of atrial fibrillation after off-pump coronary surgery compared with patients who had conventional coronary artery bypass grafting or didn't show that the incidence of postoperative atrial fibrillation is influenced by the technique of coronary surgery. In our study the prevalence of postoperative atrial fibrillation increases when coronary artery bypass grafting is performed on the beating heart.

### OP-784-RRHYTHMIAS AND AUTONOMIC HEART REGULATION AFTER OFF-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY

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**BACKGROUND:** One of the most common postoperative complications after coronary artery bypass graft surgery is the occurrence of cardiac arrhythmias. Irregular sympathovagal balance in conjunction with operative heart tissue damage is an important factor in initiation and promotion of arrhythmias. Derangement of postoperative cardiac autonomic modulation can be evaluated by heart rate variability study. Off-pump coronary artery bypass grafting is associated with lower degree of morbidity and mortality in high-risk patient group compared to conventional procedure using cardiopulmonary bypass. The goal of our study was to determine whether cardiac autonomic modulation is different in patients developing postoperative cardiac arrhythmias compared to the group without rhythm disturbances. Our objective was to check the following statements: Patients with lower preoperative indices of heart rate variability have higher incidence of postoperative atrial fibrillation. Patients with episodes of supraventricular tachycardia have lower heart rate variability compared to those without supraventricular tachycardia. Preoperatively existing bradycardia means lower chance of postoperative atrial fibrillation occurrence. Patients with quantitative and qualitative deterioration of ventricular arrhythmia experience additional fall in heart rate variability compared to those without deterioration of ventricular arrhythmia.

**METHODS:** Our prospective study included 67 patients programmed for off-pump coronary artery bypass grafting. Analysis of arrhythmic events and calculation of time and spectral heart rate variability indices was performed on preoperative and postoperative 24-hour Holter ECG recordings. Statistical analyses were performed using t-test or Mann-Whitney test for numeric variables and Fisher's exact test for categorical variables. Difference in occurrence of arrhythmias before and after operation was tested with Wilcoxon signed-rank test for ordinal values (Lown class) and McNemar's test for dichotomous variables. To adjust for potential confounding variables, multiple linear regression was used.

Statistical significance was set at  $p<0,05$ ; whenever a large number of related analyses were performed, significance level was adjusted for multiple testing.

**RESULTS:** We managed to obtain 66 preoperative and 59 postoperative patient ECG recordings for calculation of heart rate variability. Heart rate variability indices declined significantly after operation. Preoperative heart rate variability did not differ significantly between groups of patients with and without postoperative atrial fibrillation. Preoperatively present bradycardia did not show any effect on atrial fibrillation occurrence ( $p=0,367$ , Fisher's exact test). Ventricular arrhythmias were more complex and frequent postoperatively ( $p=0,022$ , Wilcoxon signed-rank test), but heart rate variability indices did not show any statistically significant difference between patients with arrhythmia deterioration or improvement ( $p>0,05$ , Mann-Whitney non-parametric test).

**CONCLUSIONS:** The results show profound impairment of cardiac autonomic modulation after off-pump coronary artery bypass surgery, mostly due to decline of vagal modulation. We did not establish a connection between fall in heart rate variability and higher incidence of cardiac arrhythmias.

### OP-785-MODIFIED T-GRAFT IS THE SAFE OPTION IN ARTERIAL REVASCULARISATION IN SELECTED PATIENTS

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**BACKGROUND:** the T-graft procedure achieves complete arterial revascularization in coronary three-vessel disease. In this technique, all bypass anastomoses are supplied by the left internal mammary artery. We present a new operative technique for multiple arterial revascularization using composite radial and internal thoracic arterial grafts.

**METHOD:** in this composite graft radial artery supplies either left anterior descending artery or marginal branches of the circumflex artery, being supplied by the end to side connections with left internal mammary artery. Between May 2000 and November 2007 we performed 47 Inverted T-graft procedures and more than 80 standard T-graft. We assess the effectiveness of such blood delivery system in order of revascularization, when distant anastomoses on left anterior descending artery is needed. We also compared the outflow blood volume with a standard T-graft and inverted T-graft.

**RESULTS:** inverted T-graft were found to have better outflow than standard T-graft (45ml/15sec +13ml vs 33ml/15sec +9ml), required less time for performing left internal mammary artery harvesting since we needed 10 cm of left internal mammary artery only (13 min. vs 19 min). We also gained the opportunity to making anastomoses as distal as we needed with no fear of tension. We also find that we had limited range of revascularization on the lateral wall. Furthermore the posterior descending is usually not in range.

**CONCLUSIONS:** inverted T-graft could be a good solution when performing revascularization in patients with distal or multiple narrowings of left anterior descending artery. It was found to be useful in patients with left ventricular hypertrophy when left internal mammary artery seems to be too short and too narrow to be a sufficient material for anastomoses. This method is less time consuming, and gives better than standard composite graft blood supply.

### OP-786-EVALUATION OF TOPICAL HEMOSTATIC EFFICACY AND SAFETY OF MICROPOROUS POLYSACCHARIDE HEMISPHERES COMPARED WITH CONVENTIONAL AGENTS IN PATIENTS UNDERGOING CARDIAC SURGERY

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**BACKGROUND:** Multiple topical hemostats have been approved for control of surface bleeding from vascular access sites. The majority of these agents, however, have few clinical data supporting their use. This study was conducted to assess the efficacy and safety of the new commercially available microporous polysaccharide hemispheres (MPH) compared to standard care.

**METHODS:** In a prospective, randomized, multi-center trial; 356 patients undergoing complex CABG and/or aortic valve surgery were screened and of these 149 patients were enrolled after standard surgical means to control bleeding had failed. After identification of a bleeding lesion requiring a topical hemostatic agent, the patients were randomized to fibrin sealant (Berioplast, Behring, Germany) (N=56), MPH (Arista™, Medafor, USA) (N=52) and control (Surgifoam Absorbable Gelatin, Ethicon, Turkey) (N=41). The bleeding severity at

each site was characterized as "oozing" or "heavy bleeding". After application of the hemostatic product, the occurrence of continued bleeding was recorded at 1, 2, 3, 6, and 10 minutes. Reapplication of the assigned product was allowed, and the primary endpoint was cessation of bleeding of the first treated site within 10 minutes. Secondary endpoints included the outcome of additional treated bleeding sites and time to cessation of bleeding. After use of products, surgeons were queried about handling characteristics. We have also collected aortic punch biopsy from each patient enrolled in the study, harvested endothelial cell culture and evaluated topical agents on biomaterial aspect with respect to cytotoxicity and foreign body reaction (MTS bioassay), adverse effect on wound healing, inflammatory reaction-resistance to infection (phagocytic capacity) and resorption-clearance time from the tissue (iodine testing and electron microscopy).

**RESULTS:** The patients in fibrin sealant group had a total of 94 bleeding sites, MPH group 101 and gelatine group 87 that were treated. For both the first bleeding site treated, and for all the bleeding sites treated, the times to hemostasis were significantly shorter for the fibrin sealant and MPH groups compared with the gelatin group ( $p < 0.05$ ; Gehan-Wilcoxon test). Hemostasis success (cessation of bleeding within 10 minutes) for the "oozing" category was 88% in the fibrin sealant, 86% in MPH and 69% in gelatin groups ( $p < 0.05$ ). For the "heavy bleeding" category, the success rates were 81% in fibrin sealant, 83% in MPH and 51% in gelatin group ( $p < 0.01$ ). Fibrin sealant and MPH stopped bleeding significantly faster than the gelatin in both the "oozing" group ( $p < 0.01$ ) and the "heavy bleeding" group ( $p < 0.05$ ). The responses to the question relating to the ease of applying product to the bleeding site were similar for both MPH and gelatin but significantly less for fibrin sealant ( $p < 0.05$ ). The MTS bioassay showed that contact of gelatin and fibrin sealant inhibited endothelial cell proliferation. The suppressed cell cycling were significantly more in fibrin sealant and gelatin than MPH ( $p < 0.05$ ). Resorption of agents from cultured media was  $61 \pm 10$  h for MPH,  $5.4 \pm 1$  days for fibrin sealant and  $14.5 \pm 3$  days for gelatin ( $p < 0.001$ ).

**CONCLUSION:** MPH is a safe and effective topical agent for use as an adjunct to hemostasis in patients undergoing complex cardiac surgery.

#### **OP-787-THE COMPARATIVE CHARACTERISTICS OF INVASIVE TREATMENT IN MULTIVESSEL DISEASE OF CORONARY ARTERIES**

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**BACKGROUND:** to compare the remote results of transluminal balloon angioplasty with stenting and coronary shunting in patients with multivessel damage of a coronary arteries.

**MATERIAL AND METHODS:** 131 patients with multivessel damage of a coronary arteries are treated for the period 2000 -2006 year. 1 group coronary bypass surgery were 87 and 2nd group transluminal balloon angioplasty were 44 patients.

**RESULTS:** In 1st group, 58 patients had a stable angina with III and IV functional class and 29 patients had an unstable angina. 87 coronary bypass surgeries have been executed. In 2nd group, the unstable angina is revealed at 21 patients, other patients had a stable angina. In 2nd group: there are executed transluminal balloon angioplasty in 9 cases, 27 - transluminal balloon angioplasty with stenting, 14 - direct stenting and double stenting in one vessel. Relapse of an angina is marked in 2,24 % of patients after stenting, in 2 and 3 years in 4,5 % of patients. After 3 years of supervision of this group, the relapse of an angina consisted of 4,35 %. Without angina symptoms after stenting there were 76 % of patients, after coronary bypass surgery - 87,1 %.

**CONCLUSIONS:** Invasive methods have encouraging results. It is noted, that in a one year of supervision, repeated interventions were higher in group of patients with transluminal balloon angioplasty that results in necessity of supervision of results for more long terms.

#### **OP-788-POSTOPERATIVE TROPONIN I IS AN INDEPENDENT PREDICTOR OF IN-HOSPITAL DEATH AFTER CABG**

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**BACKGROUND:** All types of cardiac surgery involve considerable injury to the myocardium. However little is known about the prognostic value of cardiac troponin (cTnI), a cardiac-specific biologic marker. The purpose of this prospective study was to evaluate the prognostic value of cTnI concentrations measured 20h after the end of surgery in patients undergoing coronary bypass grafting (CABG) surgery.

**METHODS:** Three hundred and twenty consecutive patients undergoing CABG surgery during 18-month period were enrolled. In-hospital death ( $n=10$ ), causes of death, major clinical outcomes, and relation between cTnI concentrations and clinical outcome, were recorded.

**RESULTS:** cTnI concentration was an independent predictor of in-hospital mortality (cTnI  $> 14$  ng/ml,  $P < 0.05$ ). The peri and postoperative variable independently associated with in-hospital death were female gender, combined surgery, ejection fraction  $< 30\%$ , and CPB duration and total chest tube drainage volume.

**CONCLUSION:** Our study indicates that cTnI concentration at 20h after the end of surgery is an independent predictor of in-hospital death after CABG. Further, high values of cTnI concentration were associated with a cardiac cause of death and major clinical outcomes.

## MULTIDISCIPLINARY III

### OP-789-SELF-MANAGED ANTICOAGULATION AFTER MECHANICAL HEART VALVE REPLACEMENT IMPROVES HEALTH RELATED QUALITY OF LIFE

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**BACKGROUND:** Self-management of anticoagulation after mechanical heart valve replacement decreases thrombotic and bleeding complications. A benefit of valve replacement regarding health related quality of life (HRQL) was consistently found. Yet the effect of anticoagulation management on the HRQL is not known. We therefore investigated the HRQL in patients undergoing mechanical aortic valve replacement (AVR) or mechanical mitral valve replacement (MVR) who were randomly assigned to either anticoagulation self-management (ASM) or to anticoagulation managed by the general practitioner (AMGP).

**METHODS:** HRQL was measured with the SF-36 questionnaire in 1066 patients (mean age = 59.5 y;  $\pm$  10.2) of which 864 had an AVR and 202 had a MVR. 549 patients were randomized to conduct ASM and 517 to AMGP. The questionnaire was completed before surgery and 6, 12, 18 and 24 months after surgery. ANOVAs for repeated measurements with subsequent post-hoc tests were performed regarding valve position (AVR vs. MVR) and anticoagulation management (ASM vs. AMGP), respectively, and their interaction on HRQL.

**RESULTS:** There were no differences regarding HRQL in patients undergoing AVR or MVR before surgery. After surgery the values of all eight SF-36 subscales increased significantly in all patients (highest  $p=0.005$ ). Patients with AVR had significantly higher scores than MVR patients. The benefit, measured as the difference between baseline and subsequent measures, was almost similar irrespective of valve position except for the subscale "pain" and "mental health", where MVR patients had less benefit. After surgery patients with ASM had higher SF-36 scores than patients with AMGP in several subscales (physical functioning ( $p<0.001$ ), role-physical ( $p<0.001$ ), general health ( $p=0.001$ ), social functioning ( $p=0.04$ ) and role-emotional ( $p<0.001$ )). After adjustment for the type of valve replacement ASM was independently associated with improved physical role functioning ( $p=0.01$ ), general health perception and role-emotional functioning ( $p=0.003$ ).

**CONCLUSION:** Our data reveal that patients experience a benefit with respect to HRQL after aortic and mitral valve replacement. Furthermore the study shows a significant impact of anticoagulation therapy on HRQL. Patients who had the opportunity to learn and to practice anticoagulation self-management had a better HRQL, which was independent of the type of valve replacement. Given the proven benefits with respect to bleeding and thrombotic complications as well as the improved quality of life, self-management of anticoagulation should be the preferred type of anticoagulation management.

### OP-790-LOW-DOSE ANTICOAGULATION WITH INR SELFMANAGEMENT: FINAL REPORT FROM THE EARLY SELF-MANAGEMENT ANTICOAGULATION TRIAL

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**AIMS:** In mechanical heart valve recipients, self-management of oral anticoagulation can reduce the risk to develop thromboembolic events and improves long-term survival compared with international normalized ratio (INR) control by a general practitioner. Here, we present data on the safety of low dose INR self-management.

**METHODS AND RESULTS:** In a prospective, randomized multi-center trial, 1,346 patients with a target INR range of 2.5-4.5 and 1,327 patients with a target range of INR 1.8-2.8 for aortic valve recipients and INR 2.5 - 3.5 for mitral or double valve recipients were followed up for 24 months. The incidence of

thromboembolic events that required hospital admission was 0.37% and 0.19% per patient year in the conventional and the low dose group, respectively ( $P=0.79$ ). The incidence of bleeding events that required hospital admission was 1.52% and 1.42%, respectively ( $P=0.69$ ). In the majority of patients with bleeding events, INR values were below 3.0.

**CONCLUSION:** Data demonstrate that low dose INR self-management does not increase the risk of thromboembolic events compared to conventional dose INR self-management. Even with the low INR target range however the risk of bleeding complications is still unsatisfactorily high, indicating that the INR target range should be further reduced.

### OP-791-BETAINE A TRIMETHYLGLYCINE IN PATIENTS WITH SEVERE PULMONARY ARTERIAL HYPERTENSION

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**INTRODUCTION:** Pulmonary arterial hypertension (PAH), is a devastating disorder characterized by increased pressure in the pulmonary circulation associated with pulmonary vascular endothelial dysfunction. Currently, the therapeutic options are rather limited. Bosentan, a non-peptide orally active agent that blocks the actions of both the endothelin-receptors, is very promising. The increase of peripheral vascular resistance is due to vasoconstriction, obstructive remodeling of the pulmonary vessel wall, inflammation and thrombosis. Although the cellular and molecular processes are not known but endothelin-1 and nitric oxide not only seem to be major players in the pathophysiology but also therapeutic targets in PAH. Betaine, an endogenous metabolite of choline, has been shown to induce increased levels of nitric oxide (NO) and tissue factor pathway inhibitor (TFPI) after oral administration in healthy volunteers.

**METHODS:** A group of 8 patients with severe PAH due to collagen vascular disease treated with bosentan, were daily administered with 6 grams of Betaine for 2 weeks. After a wash out period of 2 weeks, they received a placebo for a further period of 2 weeks. We evaluated, before and after treatment, Echocardiogram, six minute walking test and NO level.

**RESULTS:** After betaine administration, PAH decreased in 5 patients and in 3 patients it remained unchanged in contrast to the placebo group where no variation was noted. Moreover, the percentage of fractional shortening of RV decreased in 5 patients after Betaine. The six-minute walking test was slightly improved in six patients and not after placebo. NO level remained similar either after betaine or placebo.

**CONCLUSION:** Betaine in conjunction with other drugs could be a useful and novel treatment option in patients with pulmonary arterial hypertension. Further large-scale clinical studies are warranted to confirm these preliminary results.

### OP-792-IS IT POSSIBLE TO QUANTIFY MYOCARDIAL PERFUSION DURING NON-FLOW LIMITING STENOSES BY FLUORESCENT CARDIAC IMAGING?

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**BACKGROUND:** Previously we could show that quantitative assessment of myocardial perfusion (MP) during high-grade flow-limiting stenoses is feasible by fluorescent cardiac imaging (FCI). The purpose of this validation study was to analyze the ability of FCI to quantify MP during non-flow-limiting stenoses (NFLS) as compared to gold standard fluorescent microspheres (FM).

**METHODS:** After baseline, hyperemia LAD flow was induced by pharmacological vasodilatation using selective adenosine A2A receptor antagonist in 13 pigs. Thereafter, NFLS were graded by reduction of hyperemia LAD flow by 30%, 60% and 90%, measured using transit-time flowmeter. FCI images were analyzed using a digital image processing system (LLS, Ulm, Germany). The impairment of myocardial perfusion was quantified by background subtracted peak fluorescence intensity (BSFI) and slope of fluorescence intensity (SFI) obtained with FCI and compared to myocardial blood flow (MBF) assessed by FM. These results were compared to a normal perfused reference area in the CX region.

**RESULTS:** During NFLS normalized BSFI ( $r=0.81$ ,  $p<0.05$ ) as well as SFI ( $r=0.86$ ,  $p<0.05$ ) decreased and demonstrated linear correlation with FM-derived MBF. Even a low impairment can be quantified by FCI.

**CONCLUSIONS:** FCI is a highly sensitive technology to quantify myocardial perfusion even during non-flow limiting stenoses and correlates well with results obtained by FM.

### OP-793-COMPARISON OF GRAFT WAVEFORM IN CABG BETWEEN ON-IABP AND OFF-IABP

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**BACKGROUND:** Recently, transit time flow measurement (TTFM) has been the most common method of intraoperative coronary artery bypass grafting (CABG) patency assessment, because TTFM is a noninvasive and easy method. TTFM provides a mean graft flow (MGF) and a flow waveform. We previously reported that a waveform of TTFM had a close relationship to graft patency in CABG. We thus indicated that graft patency could be assessed using a fast Fourier transformation (FFT) analysis of the TTFM waveform. We investigated the relationship of targeted, between a graft waveform and intra aortic balloon pump (IABP).

**METHODS:** The present study included 11 patients, all of whom underwent CABG, including with cardiopulmonary bypass (CPB) or without CPB. The patients received 12 internal mammary artery grafts (IMA), all of which were in-situ grafts, including 10 left IMAs and 2 right IMAs. All of the anastomoses were performed by two surgeons in the same fashion. Graft flow tracing was obtained intraoperatively using a TTFM when on-IABP or off-IABP. A flow probe to fit each IMA, which was chosen among from 2 mm to 4 mm, was placed around the graft when the hemodynamic condition became stable after CPB was weaned or after the anastomosis was finished without CPB. Based on the obtained flow profile, the following variables were calculated: MGF and FFT analysis of the waveform. Harmonics of FFT analysis by the flowmeter existed at frequencies that were multiples of the frequency of the original waveform and were described in terms of an amplitude and phase. In the present study, we defined F0 as a power of the fundamental frequency, H1 as a power of the first harmonic, H2 as a power of the second harmonic, and as the same as H3, H4, H5, H6, H7, H8, H9, H10. H0 (=F0+H1) and Ha (=H5+H6+H7+H8+H9+H10) was calculated.

**RESULTS:** Significant stability of Ha was observed between the group of on-IABP and the group of off-IABP ( $p<0.01$ ). MGF and H0 in the group of on-IABP was significantly higher than those in the group of off-IABP ( $p<0.01$ ).

**CONCLUSIONS:** Our finding indicates that Ha could be related to the graft quality. The graft quality, including anastomotic quality, was stable regardless of IABP. Some reported that MGF and H0 had the relationship to the anastomotic quality of CABG. MGF and H0 were affected by hemodynamic condition, because MGF and H0 increased in on-IABP or decreased in off-IABP. We demonstrate that Ha could have an important relationship to the graft quality and that Ha might be an index to present the graft quality.

### OP-794-ANOMALOUS LEFT CORONARY ARTERY FROM PULMONARY ARTERY (ALCAPA): THE ROLE OF 64-MULTISLICE COMPUTED TOMOGRAPHY

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**BACKGROUND:** A 38-year-old woman discovered to have a systolic murmur during physical examination for an unrelated complaint at internal medicine department.

**METHODS:** Then, she was evaluated by a cardiologist using electrocardiography (ECG), chest x-ray (CXR) and echocardiography.

**RESULTS AND CONCLUSIONS:** ECG was completely normal and CXR revealed mild cardiomegaly. Transthoracic echocardiography showed a moderately reduced systolic function (EF=35%), no mitral regurgitation, and multiple muscular ventricular septal defects (Swiss cheese VSD). Transesophageal echocardiography was performed by an echocardiologist and revealed no atrial and ventricular septal defects but multiple large collateral vessels in inter-ventricular septum. The origin of left coronary artery was not seen at the expected site on the aortic root. Suspecting left coronary artery anomaly and so as to noninvasive illustration of coronary arteries, 64-multislice computed tomography (64-MSCT) was performed and beautifully confirmed the diagnosis of Anomalous

Origin of Left Coronary Artery from Pulmonary Artery (ALCAPA). At the operation it was not feasible to translocate the orifice of left coronary artery to aorta and so the orifice was obliterated with separate stitches and the left coronary artery bypassed with a saphenous vein graft anastomosed proximally to aortic root. The post-operative course was uneventful.

### OP-795-EFFICACY OF PREOPERATIVE SCREENING WITH COMPUTED TOMOGRAPHIC ANGIOGRAPHY BEFORE CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** Many of the patients who require coronary artery bypass grafting (CABG) may have degenerative disease in various arterial systems in addition to the coronary arteries, and often have concomitant diseases such as a hidden malignancy. This study was undertaken to evaluate the efficacy of whole body angiography with 64-slice multidetector computed tomography (CT) as a preoperative screening test before CABG.

**MATERIAL AND METHOD:** We retrospectively reviewed the medical records and CT images of 300 patients (mean age: 64.7) who were examined with whole body CT angiography before CABG from July 2003 through August 2007. CT findings were reviewed focusing on the presence of coexisting diseases in the thoracoabdominal cavity and abnormality of aorta and major arteries such as aneurysm, steno-occlusive disease, and atherosclerotic plaque.

**RESULTS:** In overall, significant abnormality was found by CT in 156 patients (52.2%). The prevalence of concomitant diseases was as follows; obstructive diseases in the carotid or peripheral arteries in 83 patients (27.7%), abdominal aortic aneurysm in 24 patients (8.0%), and a mass lesion in the kidney, lung, liver, or thyroid in 24 patients (8.0%). For these diseases, forty two patients (14.0%) needed early treatment; bypass surgery or percutaneous intervention for vascular diseases in 23 (6.7%), aneurysm resection in 9 (3.0%), and resection or biopsy of a mass in 10 (3.3%). Pathologies in the ascending aorta or the aortic arch such as atherosclerotic plaque, calcification, or aneurysm that needed modification of operative technique or grafting strategy were found in 64 patients (21.3%). Severe atherosclerotic diseases or tortuosity of the iliofemoral arteries that would increase the risk of blind insertion an intraaortic balloon catheter or femoral arterial perfusion cannula were detected in 129 patients (43.0%).

**CONCLUSION:** In a significant number of patients undergoing CABG, CT angiography revealed concomitant vascular diseases or malignancy that affected the operative technique or the entire management plan. Because CT angiography enables screening of these diseases in one step, we consider it one of the most important preoperative test, especially in elderly patients.

### OP-796-QUANTITATIVE CT-ANGIOGRAPHIC EVALUATION OF AORTO-CORONARY BYPASS GRAFTS USING SYNGO VESSEL VIEW SOFTWARE APPLICATION - INITIAL CLINICAL EXPERIENCE

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**OBJECTIVE:** For 64-MSCT, a high diagnostic accuracy was reported for the evaluation of bypass graft patency and stenosis by numerous investigators. In CT-coronary angiography, stenosis assessment is normally performed by manually measuring the vessel diameter in axial layers. We wanted to show with this study the possibility of performing quantitative CT-angiography of aorto-coronary bypass grafts with SYNGO Vessel View Software.

**MATERIAL AND METHODS:** Twenty-four patients with previous CABG underwent 64-MSCT examination using a Siemens SOMATOM Sensations Cardiac 64, evaluating a total of 44 venous and 10 arterial (left internal thoracic) grafts. Graft patency has been analyzed on CT images in volume rendered and multi-intensity-projection technique. The SYNGO Vessel View Software (Siemens) was used for absolute quantification of the degree of area and diameter of stenosis. Subsequently, the analyzed vessels were classified according to the Fitzgibbon criterias (Fitzgibbon grade A stenosis < 50%, B 50 - 99%). All bypass graft stenosis assessments were performed in cooperation of heart surgeons and a radiologist who was extensively experienced in CT-coronary angiography of both native coronary vessels and bypass grafts. For each patent bypass graft, the curved multiplanar reformat was reviewed for possible stenosis. In the case



of lumen narrowing in the bypass, the integrated quantification algorithm was applied, which is based on the detection of the contrast opacified lumen at stenotic site (d). As reference value, an unaffected area of the bypass had to be indicated in which the SYNGO Vessel View Software also determines the opacified lumen area. The stenosis quantification (S) was then calculated by division of the lumen area within the stenotic site (d) by the lumen area of the reference (patent) bypass segment (D) according to the formula:  $S = (D - d) / d \times 100$ .

**RESULTS:** The visualization was 100 %, the degree of stenosis could be calculated in seventeen of 20 venous and all arterial grafts with SYNGO Vessel View Software. In three cases of vein grafts, stenosis graduation could not be measured objectively with SYNGO Vessel View application because of poor opacification, but multi-planar reconstruction and visual assessment of stenosis quantification was possible in either case. Forty-one percent of patent grafts showed grade B stenosis, none of the conduits showed a significant stenosis higher than 75 percent. All arterial grafts were widely patent (grade A).

**CONCLUSIONS:** The bypass graft stenosis assessment on the conventional way had been reported by several investigators. On our knowledge, there is no published data available at this point about the use of SYNGO Vessel View (or comparable software applications provided by other companies) in the analysis of bypass graft stenosis. We could show with our results that the use of SYNGO Vessel View Software is well accomplishable in routine clinical use. To gain data about the diagnostic accuracy of this method, it has to be compared to current techniques of quantitative coronary angiography such as intravascular ultrasound and pressure-wire measurement.

#### OP-797-INITIAL EXPERIENCE OF REAL-TIME 3D TRANSESOPHAGEAL ECHO PRIOR TO MITRAL VALVE REPAIR

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**BACKGROUND:** Accurate visualization of the Mitral valve is essential prior to Mitral valve repair surgery. The gold-standard method thus far has been 2D-Transesophageal Echo (2D-TEE) due to the superior high-resolution images when compared to transthoracic echo. Recently the method of real-time 3D TEE (RT3D-TEE) was developed, allowing rapid acquisition of live high-resolution 3-dimensional images of the MV apparatus. We explored the feasibility of this new method relative to standard imaging.

**METHODS:** 15 consecutive patients (age  $57 \pm 12$ , 10 male) underwent Mitral valve repair (MVR) due to Mitral leaflet prolapse with severe Mitral regurgitation (MR). All underwent TEE (Philips iE 33, X7-2t probe) prior to surgery. The study was divided into two parts and was performed by an experienced operator: part 1 was standard detailed 2D-TEE study and part 2 was RT3D-TEE by switching the probe function to the 3D 'zoom' and 'full-volume' modes. Images were stored electronically and were reviewed by independent operators off-line. The reports were compared to the surgical findings.

**RESULTS:** A total of 90 segments were analyzed. Visualization of all the segments of the MV was possible for all the patients. 11 patients had posterior leaflet (PL) prolapse, 7 had anterior leaflet (AL) and 3 had bi-leaflet (BL) prolapse. MVR was successful (<1/4 MR) in all patients. Sensitivity, specificity and accuracy (%) were analyzed for 2D-TEE and RT3D-TEE respectively compared to surgical findings and are as follows: P1 prolapse 85 vs. 95, 100 vs. 100, 95 vs. 99 ( $p=0.5$ ), P2 100 vs. 100, 100 vs. 100, 100 vs. 100 ( $p=1.0$ ), P3 77 vs. 95, 95 vs. 100, 92 vs. 99 ( $p=0.017, p<0.05$ ), A1 85 vs. 95, 95 vs. 95, 93 vs. 95 ( $p=0.43$ ), A2 100 vs. 100, 95 vs. 100, 97 vs. 100 ( $p=1.0$ ), A3 56 vs. 95, 85 vs. 90, 73 vs. 93 ( $p=0.023, p<0.05$ ). Testing the overall performance of the two methods for the PL and AL respectively, there were the following agreement values when compared to surgery: For PL, 88% 2D-TEE AND 98% RT3D-TEE,  $P=0.024$  ( $P<0.05$ ), for AL 77% 2D-TEE AND 96% RT3D-TEE,  $P=0.002$  ( $P<0.05$ ).

**CONCLUSIONS:** RT3D-TEE is both feasible and probably superior to conventional 2D-TEE in identifying MV anatomy prior to MVR. It allows rapid dynamic high-resolution 3-dimensional visualization of the MV in real-time, allowing views and anatomic orientation similar to the surgical views obtained during MVR. It may prove helpful to further optimize surgical planning. Further studies will be required to test this initial experience

#### OP-798-AN ECHOCARDIOGRAPHIC STUDY OF HEART IN A GROUP OF ADULT ELITE ATHLETES

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**BACKGROUND:** Severe and prolong physical training is associated with morphologic and physiologic cardiac changes often termed as the athletes heart. Echocardiographic features peculiar to elite Iranian athletes have not been described. We examined the echocardiographic characteristics of highly trained Iranian athletes exercising different types of sport.

**METHODS:** We studied cardiac morphology and function as assessed by rest echocardiography in 50 adult male elite athletes attending one of the educational hospitals in Tehran between February 2001 and March 2006. Resting ejection fraction, inter ventricular septal wall thickness, left ventricular posterior wall diameter, left ventricular internal end diastolic dimension, Left ventricular mass, and relative wall thickness were measured. Control group consisted of 50 age and weight matched healthy sedentary healthy men.

**RESULTS:** The overall mean left ventricular internal end diastolic dimension ( $51.06 \pm 5.49$ ) and interventricular septal wall thickness ( $10.24 \pm 1.43$ ) were increased in athletes over normal subjects. Of athletes, 38 engage in predominantly dynamic (running and soccer) sports and 12 in predominantly static (weight lifting) sports. The mean interventricular septal wall thickness in 38 endurance trained athletes was significantly more than that of 12 strength trained athletes ( $11.1$  mm vs  $10.3$  mm,  $p<0.05$ ). Left ventricular internal end diastolic dimension was also greater in endurance trained athletes, but the difference does not reach the statistical significance ( $51.2$  mm vs  $50.6$  mm,  $p=NS$ ). There was no significant statistical association between left ventricular internal end diastolic dimension with the age or length of practice of the athletes.

**CONCLUSION:** Our results of increasing left ventricular internal end diastolic dimension and interventricular septal wall thickness in Iranian athletes are in line with previous reports. To generalize the results, more studies with larger sample size (with female athletes included) are required.

#### OP-799-NON-INVASIVE DETECTION OF MYOCARDIAL FIBROSIS IN PATIENTS AFTER SURGERY FOR CONGENITAL HEART DISEASE

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**BACKGROUND:** The assessment of myocardial viability is important in the management of patients with unrepaired, repaired and palliated congenital heart defects. Cardiac magnetic resonance imaging is a valuable tool for detection of myocardial fibrosis via late gadolinium enhancement. The aim of this study to investigate the clinical usefulness of delayed-enhancement cardiovascular magnetic resonance for non-invasive detection of fibrous tissue associated with surgery for congenital heart disease.

**METHODS:** In total, 52 patients with congenital heart disease underwent gadolinium-enhanced viability imaging. Patients were divided in two groups. Group A patients ( $n=27$ ) underwent correction or palliation of a congenital heart defect. Group B patients ( $n=25$ ) had never undergone cardiovascular surgery. Magnetic resonance imaging studies were performed on 1.5 T scanner (Siemens Magnetom Avanto). Fisher's exact test was used to compare variables. **RESULTS:** In group A ( $n=27$ ), late gadolinium enhancement was observed in 14 (51.9%) of 27 patients, compared with 0 of 25 group B patients ( $P<.001$ ).

**CONCLUSIONS:** Delayed-enhancement cardiovascular magnetic resonance imaging is a valuable tool for non-invasive detection of fibrous tissue associated with surgery for congenital heart disease.

## MINI PRESENTATIONS V

### OP-800-AMPLATZER OCCLUSION OF PARAVALVULAR LEAK OF MECHANICAL PROSTHESIS FOLLOWING A REOPERATION FOR MITRAL MECHANICAL PROSTHESIS DEHISCENCE

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We are describing a case of a 46-year-old woman following a mitral valve replacement for severe mitral stenosis, complicated 2 years later with acute mitral regurgitation and pulmonary oedema, due to dehiscence of the implanted mitral mechanical prosthesis following a bacterial endocarditis. She received urgent replacement of the mechanical prosthesis on the mitral position with another mechanical prosthesis. Following an uneventful reoperation and recovery, her condition deteriorated, requiring readmission in the intensive care unit and transthoracic echocardiography diagnosis of severe mitral regurgitation due to paravalvular leak with dehiscence of the newly implanted mitral mechanical valve. After the stabilization of her clinical condition and following a 6 weeks treatment with antibiotics, and due to high risk of another reoperation, our interventional cardiologists successfully treated her with Amplatzer occlusion of her paravalvular leak. Her mitral regurgitation was downgraded to mild, and she was able to return home on minimal diuretics. Three and 6 months follow up was normal, with only mild mitral regurgitation.

### OP-801-FIFTH YEAR RESULTS OF MAURITIUS - INDIAN OCEAN ISLANDS HUMANITARIAN MEDICINE PROJECT

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**BACKGROUND:** The goal of all humanitarian aids is to decrease the social, cultural, economic and medical gaps between the developed and developing countries. The role of humanitarian, non-governmental organizations in the medical field is considerable. "Coeurs pour Tous- Hearts for All" is a non-governmental, humanitarian association which was founded at 1998 in Geneva, Switzerland to help developing countries treat their population, teach the local teams, as well as build and develop new institutions for the treatment of cardiovascular diseases. Mauritius- Indian Ocean Islands (MIOIs) Project was founded in 2002 in order to help the local team in the surgical treatment of pediatric cardiac diseases and to decrease the waiting time for adult cardiac operations. Our aim is share the results of this project in its 5th anniversary.

**METHODS:** MIOIs project was founded with three related aims: 1- Organization of short visits to treat patients and teach the local team in their center, 2- Organization of long term rotations abroad for selected professionals from the local team in order to improve their knowledge in specific fields (pediatric cardiology, perfusion and anaesthesia-intensive care), 3- Improving the local infrastructures for better diagnosis and patient care. Mauritius Cardiac Center was selected because of its central position in the Indian Ocean Islands territory (Madagascar, Comoros and Seychelles islands), which may serve a population of 20 million.

**RESULTS:** A total of 468 patients were operated on by surgeons rotating from abroad in Mauritius Cardiac Center. There were 183 pediatric and 285 adult operations. One cardiologist, one anaesthesiologist and one perfusionist did rotations in our center with funding from Hearts for All. One echocardiography device has donated by our association. Additionally, a collaboration was founded between the University of Geneva and the University of Mauritius in order to develop new biodegradable polymers and polymer based equipments.

**CONCLUSIONS:** Humanitarian activity and missions are a tradition at the University Hospital of Geneva. Since the 1970s, approximately 6500 children were operated in our hospital with the collaboration of another humanitarian association, named "Terre des Hommes". Although the concept is the same for all humanitarian medical associations, i.e. the treatment of people in developing countries, "Coeurs pour Tous- Hearts for All" was conceived for in-situ treat-

ment, which means organization of short visits to the local units in order to treat patients locally and at the same time teach local teams. One of the most important issues for success is professional manpower, especially surgeons. They are chosen among staff surgeons in our department and in other "developed countries" departments according to their interest to share in our activities. Another important aspect is the funding of these activities, which is based mostly on personal and corporate charitable contributions, as well as through the organization of social and sports activities to elicit donations. Although there is still a big need for improving the conditions and treatments in developing countries, the current efforts in humanitarian medicine are important. In our opinion, humanitarian medicine likes to fire a candle instead of screaming on the darkness.

### OP-802-ACUTE DESCENDING NECROTISING MEDIASTITIS, BILATERAL EMPYEMA OF PLEURAE, PURULENT PERICARDITIS WITH HEART'S TAMPONADE AND RETROPERITONEAL INFECTION IN A COURSE OF PERITONSILLAR ABSCESS

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**OBJECTIVE:** The aim of this study is to present particular case of acute descending necrotising mediastinitis developed after perforation of the posterior wall of pharynx in the course of peritonsillar abscess, treated surgically with good early and late results.

**METHODS:** In 20-years old woman in course of peritonsillar abscess perforation of the posterior wall of pharynx with consequence of rapid development of the acute descending necrotising mediastinitis, purulent pericarditis, bilateral empyema of pleurae and infection of retroperitoneal space had occurred. In the first 24 hours: numerous drainages of pus collection were performed along interfascial spaces of the neck, simultaneously numerous drainages of the anterior and posterior mediastinum were performed by the right thoracotomy with evacuation of pus and necrotic tissue and with the relief of rapidly increasing tamponade. In the next 24 hours: after control CT numerous drainages of the anterior and posterior mediastinum were performed by the left thoracotomy together with pericardiotomy and with simultaneous opening and drainage of retroperitoneal space. The postoperative course was heavy but uncomplicated. The patient was discharged on 39th day and observed above 5 years with no complains.

**RESULTS:** Very good early and late result was achieved after complex surgical treatment.

**CONCLUSION:** Correct aggressive surgical treatment may bring good results in curing the acute descending necrotising mediastinitis.

### OP-803-NEW INSIGHTS INTO THE FORM AND FUNCTION OF THE SUBAORTIC CURTAIN

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**OBJECTIVE:** To understand the form and function of subaortic Curtain (SAC) by correlating anatomy with echocardiography.

**METHODS:** SAC was studied visually in seventy five normal human autopsy hearts. In five hearts, the left atrium was dissected up to its attachment to the junction between the SAC and aortic leaflet of the mitral valve (AML). Function of SAC was observed in 2-dimensional conventional echocardiograms of 100 normal hearts and in five transthoracic echocardiograms.

**OBSERVATIONS:** The SAC, generally bounded by the left coronary cusp (LCC), noncoronary cusp (NCC) and LCC-NCC commissure, varied in size and morphology. Echocardiography revealed binged movement at the cranial SAC-aorta and caudal SAC-AML junctions. SAC facilitates atrio-genic and ventriculo-genic narrowing of the mitral orifice with concurrent enlargement of the aortic orifice. It aids concurrent descent of mitral and aortic annuli in early ventricular systole.

**CONCLUSIONS:** SAC should be considered as a component of the membranous anchorage of the aorta, along with the membranous septum and their membranous extensions into the aortic sinuses, allowing flexibility to the aortic root and offering anchorage for aortic cusps. SAC is strategically located to: 1. Diffuse stress on the aortic and mitral valves. 2. Link the atrio-genic and ventriculo-genic closure of the mitral valve concurrently with the opening of the aor-

tic orifice. 3. Aid concurrent descent of the mitral and aortic annuli facilitating simultaneous filling of the left atrium and emptying of the left ventricle, and pre-ejection opening of the aortic valve. Clinical application: Identification of SAC and AML as separate but complementary entities helps in understanding the complex cross talk between the left ventricular inflow and outflow. It also helps to understand findings during imaging. Appreciation of the form and function of SAC enhances our understanding of pathological states, including rheumatic heart disease, infective endocarditis, aneurysm or diverticulum of SAC, absence of SAC, rupture of SAC, subaortic obstructions and congenital valvular heart disease. Surgical interventions may be planned better. Rigid rings in the mitral and aortic location can interfere with functional aortic-mitral coupling. However a forgiving heart tolerates intrusions into its complex mechanisms and dysfunction may not be overtly evident. Appreciation of the normal anatomical variations is helpful in surgery involving left ventricular outflow including aortic valve replacement and excision of obstructive tissue in hypertrophic obstructive cardiomyopathy. If the SAC is big an extracardiac approach to left ventricular outflow is possible as an alternative to trans-left atrial, trans-AML approach.

#### **OP-804-PROCALCITONIN (PCT) VERSUS C-REACTIVE PROTEIN (CRP) AS SYSTEMIC INFLAMMATORY RESPONSE MARKER AFTER CARDIOPULMONARY BYPASS (CPB)**

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**BACKGROUND:** Procalcitonin (PCT) is the precursor protein of calcitonin and has been identified 1992 as a new diagnostic marker for various inflammatory processes. It is normally produced in the C-cells of the thyroid gland. Normally, in healthy individuals, PCT plasma concentrations are very low and often even below the detection limit of the presently used assay (normal range of PCT, 0.1 ng/ml). In comparison C-reactive protein, PCT is generally not induced by infections, autoimmune disorders and allograft rejections, etc. It was the aim of this study to investigate the influence of CPB on the PCT secretion in comparison with CRP.

**METHODS:** 40 consecutive patients were scheduled for CABG and randomized in two groups: group A on pump, group B off pump. Plasma concentration of PCT and CRP were detected in all patients the day before the operation (T0), 24h after the operation (T1), 6 days after the operation (T2). All data were registered and compared.

**RESULTS:** In first postoperative day CRP increased significantly in both groups whether PCT increased significantly only in group A. In the sixth postoperative day CRP remained significantly elevated in both groups but significantly higher in group B than in group A. Differently PCT decreased near to the preoperative plasma concentration in both groups.

**CONCLUSION:** Our data show that PCT is a more specific marker of systemic inflammatory response after CPB than CRP.

#### **OP-805-REOPERATION IN THE INTENSIVE CARE UNIT FOLLOWING CARDIAC SURGERY: 10 YEAR REVIEW**

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**BACKGROUND:** Some patients require reoperation in the intensive care unit after cardiac surgery. This study was conducted to assess the impact of reoperation in intensive care unit (ICU) on early and long term survival after cardiac surgery.

**METHODS:** Prospectively collected data on 10,324 consecutive patients who underwent cardiac surgery from April 1997 to March 2007 was analysed. Reoperations for cardiac arrest, bleeding/tamponade and graft/valvular problems were included in the study. Reoperations for other reasons were excluded. 634 (5.8%) patients underwent reoperation in theatre and 51(0.5%) patients required reoperation in the ICU. Late survival data was obtained from the UK Central Cardiac Audit Database (CCAD). Follow-up was 96% complete. Mean follow-up was 5.1 years (Range 1.2 -9.4 years)

**RESULTS:** In a majority of cases, the primary indication for ICU reoperation was either bleeding /tamponade (33.3%) or cardiac arrest (35.3%). Cardiopulmonary bypass was used in 19 cases (37.3%). Overall survival to hospital discharge was 41.1% (21 patients). Cause of death was cardiac in 23 patients (76.6%), neurological and septicaemia in 2 patients each (6.7%). Three patients died of other causes. At follow-up, 19 of 21 (90.5%) hospital survivors were alive with two late deaths.

**CONCLUSION:** Although reoperation in ICU is associated with a high mortality and morbidity, the long term outcome in hospital survivors is encouraging.

#### **OP-806-CAROTID STENOSIS IN CORONARY PATIENTS WITH PERIPHERAL VASCULAR DISEASE: APPROACH FOR BETTER OUTCOME**

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**BACKGROUND:** The prevalence of severe carotid stenosis in patients who undergo coronary bypass grafting (CABG) ranges from 2 to 27% and it is more common in patients with peripheral vascular disease (PVD). The purpose of this study is to examine the prevalence and the consequences of carotid stenosis in a group of patients undergoing CABG in whom PVD coexisted.

**METHODS:** Our study population is 88 CABG patients with history of PVD, compared to 877 without PVD. All had a carotid color duplex examination. CABG technique included single aortic occlusion and the myocardial protection was accomplished with cold blood cardioplegia. During the procedure the monitoring included Swan Ganz, SVO2, TEEcho and Cerebral oxymetry.

**RESULTS:** From the 88 patients, 22 had stenosis greater than  $\geq 50\%$ . Carotid endarterectomy (CEA) was performed in 6 of them. Without cardiopulmonary bypass (OPCAB) were selected to be operated 12 (one of them underwent simultaneously CEA). One patient (1,4%) who was operated on cardiopulmonary bypass (CBP) without significant carotid stenosis suffered postoperative stroke (CVA). In the rest of the 877 patients without PVD, 6 patients (0,68%) suffered CVA .

**CONCLUSIONS:** In our group of CABG patients with PVD, 25% have significant carotid stenosis. These patients are in higher risk for CVA and we preferred to operate them OPCAB when it was possible, but when the CBP method was selected, CEA was mandatory. The low rate of CVA (1,4%) in these patients supports our methodology of therapeutic approach

#### **OP-807-PRIMARY CARDIAC TUMOURS: A 13 YEARS EXPERIENCE OF SURGICAL TREATMENT**

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**OBJECTIVES:** To Analyze Surgical treatment of Cardiac Tumours

**METHODS:** 32 Patients with Primary Cardiac Tumours were operated in our Department from January 1993 to June 2006. The most frequent location was left atrium (90.6%) while in 9.4% the tumours were located in right atrium. Age ranged from 8 years to 55 years. 20 patients (62.5 %) were female while 12 patients (37.5 %) were male. 1 Patient (3.12 %) had history of cerebrovascular accident. Majority of the patients were complaining of palpitation (84.37 %). Most of the patients were in NYHA class II. (90 % Only 3 patients in the Left Atrium group were in congestive heart failure. All operations were performed with cardiopulmonary bypass, Moderate hypothermia and antegrade cold blood cardioplegia. Only the involved site was opened for the removal of the tumour.

**RESULTS:** Postop course was uneventful. 3 patients (9.4 %) had new onset Atrial fibrillation. 2 patients developed superficial wound infection, 1 patient had lower limb embolism with successful embolectomy. 1 patient (3.4 %) developed post op Jaundice leading to hepatic coma and death. All the cases were benign myxomas histologically.

**CONCLUSIONS:** Constitutional Symptoms with heart murmur must be investigated and referred for surgery in time. Surgical excision of Myxomas results in almost complete cure of the condition.



### OP-808-MASSIVE PERICARDIAL EFFUSION IN THE PHILIPPINE GENERAL HOSPITAL: CLINICAL PROFILE OF PATIENTS OVER FIVE-YEARS

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**BACKGROUND:** In the Philippine General Hospital (PGH), patients diagnosed to have massive pericardial effusion causing tamponade are normally referred to the Division of Thoracocardiovascular Surgery (TCVS) of the Department of Surgery for drainage via subxiphoid tube pericardiostomy. In this institutional setting, the cause and prognostic significance of cardiac tamponade secondary to massive pericardial effusion have not yet been reviewed. To review the etiologies, clinical profile of patients with massive pericardial effusion and present most common signs, symptoms and results of diagnostics and to describe characteristics of pericardial fluid and pericardium.

**METHODS:** A cross-sectional descriptive study was performed on patients with massive pericardial effusion who underwent tube pericardiostomy. The age, sex, results of ECG, chest x-ray, 2D-echo, volume and character of pericardial fluid, character of pericardium, pericardial fluid analysis, and pericardial biopsy were noted.

**RESULTS:** There was a 1:1.4 female to male ratio. The mean age is 36 years. The common presenting symptoms were dyspnea (29%), fever (23%), cough (12%), easy fatigability (8%) and chest pain (8%). The common signs were tachypnea (27%), bipedal edema (22%), neck vein engorgement (19%), cervical lymph adenopathy (10%) and tachycardia (6%). The common ECG findings were low voltage complexes (36%) and sinus tachycardia (20%). The common chest x-ray findings were cardiomegaly (61%) and pleural effusion (16%). Forty-five percent had echocardiographic evidence of tamponade at the time of surgery. The average volume drained was 540cc. The character of drainage was described as sanguinous (45%), serous (24%) and purulent (13%) with pericardium described as thickened (29%) and normal (67%). Pericardial fluid cytology showed chronic inflammation (55%), malignant cells (11%), fibrinous (8%) and negative (7%). Pericardial biopsy results showed malignancy (19%) miscellaneous (27%) and negative (23%).

**CONCLUSION:** The most common symptom and sign are dyspnea and tachypnea. Chest x-rays and ECG have no single common specific finding for massive pericardial effusion. Pericardial effusion cytology and biopsy may aid in diagnosing the etiology for the pericardial effusion. The most common etiology in our setting is chronic inflammation probably TB. The most common etiology for bloody effusion is non-malignant.

### OP-809-ERDHEIM-CHESTER'S DISEASE OF THE HEART: A MEDICAL RARITY

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Erdheim-Chester's disease is a rare multi-system histiocytic lipid granulomatosis of the bones and various inner organs. We delineate an unusual case of a cardiac variant of Erdheim-Chester's disease presenting with pericardial effusion and as a collision with a synchronous orbital manifestation. We describe our diagnostic pathway and propose a novel treatment option involving non-steroidal anti-inflammatory drugs.

### OP-810-STRENGTH OF WIRED STERNOTOMY CLOSURES: EFFECT OF NUMBER OF WIRE TWISTS

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**BACKGROUND:** The median sternotomy is the most commonly used incision for surgical access to the heart, lungs and great vessels. After surgery the incision, made by cutting the sternum in half along its length is usually closed by placing stainless steel wires through the sternum. The wire ends are then twisted together to close the incision. This study was done to investigate the effect of the number of wire twists on the strength of wired sternotomy closures.

**METHODS:** A custom-built test rig, fitted to a materials testing machine, was used to apply an increasing tension to wire closures, until they failed. The num-

ber of twists in the wire closure was varied between 1 and 10. Stainless steel wires of diameter 0.7 mm and 0.9 mm were tested.

**RESULTS:** Initially, there is an increase in the maximum strength of the wire closure with increasing number of wire twists. After 3 wire twists greater strength is not achieved with increasing the number of wire twists. The highest mean force taken by the 0.7 mm diameter wire was 613 N, at 9 wire twists, whereas the highest force taken by the 0.9 mm diameter wire was 887 N, at 8 wire twists. However, by 3 wire twists, 80% and 88% of the maximum force has been achieved for the 0.7 mm and 0.9 mm diameter wire, respectively.

**CONCLUSION:** Twisting wires many times in a sternotomy closure does not result in increased strength

### OP-811-PULMONARY-THORACIC RATIO - A NOVEL MEASUREMENT FOR EVALUATING INFANTS WITH PENTALOGY OF CANTRELL

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**BACKGROUND:** Pentalogy of Cantrell (POC) is a rare syndrome comprising congenital defects which commonly include an anterior diaphragmatic hernia, an omphalocele, and variations of Tetralogy of Fallot. These patients usually have respiratory failure and are ventilator-dependant. It seemed clinically that the chest wall cavity is unusually small, and as a result, the lungs occupy a significant portion of the abdominal cavity, with the abdominal viscera contained outside the abdominal cavity in an omphalocele. To determine whether this impression was accurate, we developed a radiological ratio which we applied to the infants with Pentalogy of Cantrell whom we managed over the past 10 years.

**METHODS:** We reviewed our experience with 9 infants with Pentalogy of Cantrell who underwent cardiac surgical repair between 1997 and 2007. As a control, we randomly selected 25 young infants without POC or cardiac defects. The antero-posterior chest roentograms of these patients were reviewed and the distance from the apex of the lung fields to mid-portion of the diaphragm was measured and divided by the maximum width of the chest cavity at the level of the heart (level of the tenth thoracic vertebra). We termed the resulting ratio the "pulmonary-thoracic ratio" (PTR), and compared the results between the control group (n=25), the survivors in the POC group (n=6), and the non-survivors within POC group (n=3).

**RESULTS:** The pulmonary-thoracic ratio for the control group was 0.54 +/-0.05. For the 6 hospital survivors with Pentalogy of Cantrell, the pulmonary-thoracic ratio ranged from 0.68-0.86 (median 8.2), and for the 3 non-survivors with Pentalogy of Cantrell, the pulmonary-thoracic ratio was 0.68, 0.92, and 1.25 respectively.

**CONCLUSIONS:** The pulmonary-thoracic ratio in infants with Pentalogy of Cantrell tended to be larger than that of the normal infants. In those patients with Pentalogy of Cantrell who did not survive, this difference seemed more pronounced. Although this preliminary data needs to be verified, it suggests that the pulmonary-thoracic ratio may be of practical importance when evaluating patients with Pentalogy of Cantrell.

### OP-812-STROKE AFTER CORONARY ARTERY SURGERY WITH AND WITHOUT CARDIOPULMONARY BYPASS

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**BACKGROUND:** Stroke is a major complication of coronary surgery, with reported rates of 0.4% to 6%. Avoiding cardiopulmonary bypass in coronary artery bypass grafting is thought to reduce early mortality and morbidity. The aim of this study was to compare incidence and outcome of stroke after on-pump and off-pump coronary artery bypass grafting.

**METHODS:** From January 1999 through June 2005, 703 consecutive patients underwent isolated coronary artery bypass grafting in our institution. Before 2002 year myocardial revascularization was performed off pump at the discretion of the operating surgeon. After this period our strategy was to plan starting the operation without cardiopulmonary bypass in patients over 60 years. In accordance of our off-pump coronary surgery policy our inclusion criterion was the age over 60 years. On-pump surgery was performed in 289 patients and



off-pump coronary surgery in 414 patients. On- and off pump patients were not sequential groups; however, the number of off-pump coronary artery bypass operations increased during this period. Off-pump patients were older, more likely to be hypertensive and to have previous strokes or transient ischemic attacks, whereas incidence of unstable angina and previous myocardial infarction were higher in on-pump group.

**RESULTS:** The incidence of stroke was significantly higher in on-pump group compared with off-pump patients (5.9% and 0.25%, respectively,  $p = 0.001$ ). The in-hospital mortality (4.8% and 1.2%, respectively,  $p=0.004$ ), renal failure (4.5% and 1.9%, respectively,  $p = 0.039$ ), wound infection (11.8% and 7%, respectively,  $p = 0.022$ ), acute heart failure (3.5% and 0.5%, respectively,  $p = 0.005$ ), need for intraaortic balloon pump (2.8% and 0%, respectively,  $p = 0.001$ ) and hospital stay ( $13.9 \pm 8.2$  and  $12.3 \pm 8.1$  days, respectively,  $p=0.015$ ) were all significantly greater in the on-pump population.

**CONCLUSIONS:** Stroke is a devastating complication of coronary surgery. In this study off-pump coronary surgery, compared with on-pump surgery reduced neurologic and clinical morbidity, mortality as well as hospital stay.

### OP-813-PREVENTION OF STERNAL DEHISCENCE USING THERMOREACTIVE CLIPS (FLEXIGRIP®) IN HIGH-RISK PATIENTS

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**BACKGROUND:** Postoperative sternal dehiscence is a serious complication extending hospital stay and requiring extra interventions. We evaluate the use of thermoreactive clips in patients at high risk for sternal dehiscence in an attempt to reduce this complication.

**METHODS:** Retrospective and descriptive study of 61 patients operated on between December 2006 and December 2007 in whom sternum was closed using thermoreactive clips associated to standard stainless steel wires. In 2 patients thermoreactive clips were used to treat a dehiscence in patients closed with stainless steel wires previously. Data were prospectively collected and the incidence of sternal instability was determined.

**RESULTS:** Patients were 49 male (80%), mean age  $61.8 \pm 11.5$  (40-82). Mean Euroscore was  $4.5 \pm 3.3$  (0-12). Mean logistic Euroscore was  $5.7 \pm 6.3$  (0.8-25.7). Mean body mass index was  $24.7 \pm 4.6$  (16.1-41.1), in 6 over 30 (9.8%). Mean ejection fraction was  $50 \pm 12.4$ . Eighteen patients were diabetic (29.5%) and 16 (26.2%) had a COPD. In 49 patients a CABG procedure was performed (80.3%) and in 29 out of them (59%) both thoracic arteries were harvested. Heart valve disease surgery was performed in 24 patients (39.3%) and a combined procedure in 12 patients (19.6%). The mean number of clips used was  $3.6 \pm 0.6$  (between 2 and 5). A superficial sternotomy infection occurred only in 4 patients (6.5%). No sternal dehiscence was noted. Progression to mediastinitis could not be avoided in 2 patients in whom clips were used to treat a previous dehiscence. Among the 4 patients with superficial sternotomy infection, all were male, mean age was  $59.2 \pm 20.1$  (40-80), mean Euroscore was  $3.5 \pm 6.3$  (0-9), mean body mass index was  $22.1 \pm 3.8$  (16.7-26.8) and in 3 cases both thoracic arteries were harvested (75%) being the factor more related to the presence of infection apart from gender. Only 1 patient was diabetic, 1 patient had a COPD and another one was operated on for heart valve disease. The number of clips used in the 4 patients with superficial infection was as follows: 3, 4, 4 and 5, suggesting that using a large number of clips does not prevent from the occurrence of infection.

**CONCLUSIONS:** Using thermoreactive clips (Flexigrip®) prevents from sternal dehiscence and related complications in high-risk patients. They could be specially indicated in male patients in whom both thoracic arteries have to be harvested. A word of caution has to be raised when using clips in order to treat a previous instable sternum, moreover when there is an associated infection.

### OP-814-CORONARY ARTERY BYPASS GRAFTING IN DIALYSIS PATIENTS

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**BACKGROUND:** To evaluate the outcome after isolated coronary artery bypass grafting (CABG) in patients requiring preoperative chronic dialysis for end stage renal failure (ESRF).

**METHODS:** We retrospectively analyzed data from 112 patients (pts) (88 male, 24 female) who were operated in our institution between April 1994 and May 2007 and were on maintenance dialysis for at least 1 month preoperatively.

**RESULTS:** The patients had a mean age of 63.4 years (range 37.3-82.6) and had been on dialysis for a mean of 56.5 months (range 1-275) preoperatively. During the Operative procedure a mean of 2.7 grafts (range 1-6) were performed, with all patients receiving at least one arterial graft. Mean ICU stay was 11.2 days (range 1-80), and patients were discharged after a mean of 24.5 days (range 6-133). 30 day mortality was 5.4% (6 pts.) and in hospital mortality was 5.4% (6 pts.). Mean follow-up was 36.4 months (range 3-136.3). Actuarial overall survival after 1, 2, and 5 years is 81, 73 and 53%, respectively. Subjective quality of life was improved in 69.5% (41 pts), not changed in 27.1 % (16 pts.) and decreased in 3.4% (2 pts.) of the survivors. Kidney transplantation was planned in 17 pts. and successfully performed in 6 pts.

**CONCLUSIONS:** Coronary artery bypass grafting can be performed on dialysis patients with acceptable higher perioperative morbidity and mortality, compared to the normal population. Long term survival of ESRF-patients is considerably increased compared to patients with normal renal function. However, improved postoperative quality of life in the majority of patients, justifies this strategy.

## MINIMALLY INVASIVE SURGERY I

### OP-815-HYBRID PROCEDURES FOR COMPLEX THORACIC AORTIC DISEASE

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**BACKGROUND:** Antegrade open stent grafting of the descending aorta with simultaneous surgical repair of the proximal aorta is gaining popularity as a single-stage approach for complex aortic disease. The aim of this study was to evaluate our initial experience with this combined surgical treatment, in patients with disease of the aortic arch and descending aorta.

**METHODS:** A total of 16 patients (8 males, mean age  $66.3 \pm 11.1$  years) underwent hybrid aortic procedures for different aortic pathologies (11 aneurysms and 5 dissections) using a Jomed stent graft between December 2005 and August 2007. Four patients underwent emergency surgery. The exposure of the aortic arch was gained through a mid-sternotomy with antegrade implantation of the stent graft during hypothermic circulatory arrest and bilateral antegrade cerebral perfusion. All patients underwent aortic CT-scan postoperatively and during follow-up thereafter. Follow-up was available for all discharged patients.

**RESULTS:** The median Jomed prosthesis size used was 33 mm. The mean lower-body arrest time was  $42 \pm 21$  minutes with mean cardiopulmonary bypass time of  $213 \pm 64$  minutes. Two patients died postoperatively because of low cardiac output (in-hospital mortality- 12,5 %). Perioperative complications included stroke (3 patients), temporary paraplegia (3 patients), and reexploration for bleeding (3 patients). Postoperative CT-scan showed thrombus formation in the excluded descending aorta lesions in all patients (complete thrombosis in 13 cases and partial in 3). Thirteen (81.3 %) patients were alive after a mean follow-up of  $6.4 \pm 4.1$  months (range 1 to 14 months). No secondary aortic interventions were required.

**CONCLUSIONS:** Our initial experience with hybrid aortic procedures showed encouraging early results. Although long-term results are not yet available, this new single-stage technique might provide better outcomes for patients with combined aortic arch and descending aorta pathology.

### OP-816-HYBRID TREATMENT OF TYPE-B AORTIC DISSECTION INVOLVING THE ARCH

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**BACKGROUND:** Conventional surgery of type-B aortic dissection (B-AD) involving the arch is still hampered by consistent risk of mortality and neurologic complications. Thoracic endovascular stent-graft repair (TEVAR) required a preventive revascularization of epiaortic vessels to allow the aortic arch coverage. Here we report our experience with 2 patients in the hybrid treatment for B-AD involving the arch.

**METHODS AND RESULTS:** Patient n.1: a 56-year-old man was admitted for chest pain and hypertension because of an acute B-AD involving the distal arch, left subclavian artery (LSA), visceral vessels, and the abdominal aorta up to both common iliac arteries, with a small ascending aortic aneurysm. An emergency surgical option was considered because of the substantial risk of impending rupture of the false lumen, highlighted by the persistence of chest pain and unresponsive hypertension. Our strategy consisted of a simultaneous hybrid treatment: to achieve an adequate proximal landing zone, under local anesthesia, a prosthetic bypass graft between the right and left common carotid arteries was accomplished and TEVAR from origin of brachiocephalic artery, with oversteenting of the left carotid and subclavian arteries, to the celiac axis was thereafter performed by 3 cone-shaped stent grafts. No steal phenomena, left arm ischemia, or cerebrovascular accident occurred. The patient was discharged on the fifth postoperative day. At 9 months follow-up, the patient did well; a computed tomographic scan confirmed patency of the prosthetic bypass

graft and complete thromboexclusion of the false lumen. Close monitoring of the dissected abdominal aorta and the ascending aortic aneurysm was planned. Patient 2: a 51-year-old man, previously treated for B-AD with TEVAR elsewhere, was admitted because of a presence of a proximal type-I endoleak with retrograde dissection of aortic arch. Simultaneous hybrid treatment was planned: under general anesthesia, the preventive revascularization of the epiaortic vessels were performed by a bifurcated prosthetic bypass from the ascending aorta to the both common carotid arteries and to left subclavian artery. TEVAR was thereafter performed by 3 cone-shaped stent grafts from the ascending aorta, distally to the origin of the prosthetic graft, to the descending aorta, covering brachiocephalic, left common carotid and subclavian arteries. No cerebrovascular accident, steal phenomena, or left arm ischemia occurred. The patient was discharged on the seventh postoperative day. At 6 months follow-up, the patient did well; a computed tomographic scan confirmed patency of the prosthetic bypass grafts and a near-complete thromboexclusion of the false lumen.

**DISCUSSION:** This technique offers the option of less invasive treatment to a greater number of patients with severe thoracic aortic disease who would otherwise be exposed to the high risk of conventional surgery and cardiopulmonary bypass. Major challenges associated with endovascular procedures are related to the conformability and to durability of the current generation of endografts: both short- and mid-term outcomes after endografting B-AD are encouraging, compared with open surgery. However, this hybrid approach does not preclude the possibility of a secondary TEVAR or of a conventional surgery of the aortic pathologies if and when required.

### OP-817-A HYBRID ENDOVASCULAR APPROACH TO ASCENDING AORTIC PSEUDOANEURYSM

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**BACKGROUND:** A 66 year old male presented to a regional E.R. with a chief complaint of chest pain. He was 6 months out from aortic valve replacement for aortic stenosis and ascending aortic replacement with a 28mm Dacron graft for ascending aortic aneurysm. He had done well since his operation with the exception of this acute chest pain presentation. A CT scan ordered in the ER revealed a large, leaking aortic pseudoaneurysm with a large anterior mediastinal hematoma. He was transferred to our institution for emergent surgery. The pseudoaneurysm arose from the right anterior aspect of distal anastomosis of the previously placed graft. It was felt that fem-fem bypass with probable circulatory arrest would be necessary to repair this problem. It was felt that this procedure would have excessive risk for this re-operative procedure due to the patient's co-morbid conditions of cardiomyopathy, cirrhosis, ongoing alcohol use, pulmonary hypertension, and obstructive pulmonary disease.

**METHODS:** An alternate strategy of endovascular placement of an ascending aortic cuff to seal this leak was proposed. A 23mm Gore Excluder cuff was selected for placement. Since the available cuffs are on a 60 cm shaft, this was placed via a left subclavian approach. Completion angiography showed resolution of the leak. A review of the intra-operative TEE after the procedure suggested a persistent, but much smaller, leak. Subsequent angiographic imaging confirmed a second, smaller pseudoaneurysm with a small neck. An attempt at catheter embolization was carried out. This was unsuccessful secondary to inability to access the neck. An alternative approach to access the pseudoaneurysm via a transthoracic, right parasternal approach was employed. Multiple nester and tornado coils were placed with no identifiable flow in the pseudoaneurysm at the completion of the procedure.

**RESULTS:** The patient has been followed for over a year. He has remained free of symptoms and with no apparent issues secondary to the pseudoaneurysm. On subsequent imaging, there has been no flow identified in the pseudoaneurysms and they are decreasing in size.

**CONCLUSIONS:** This hybrid endovascular approach for the repair of a complicated pseudoaneurysm of the ascending aorta was successfully utilized in a patient with prohibitive surgical risks. This technology may have increasing utility for treatment of complex aortic pathology. Further refinements of the delivery systems and devices will aid in the application of this type of technology for treatment of aortic pathology.

### OP-818-MANUBRIUM SPARIN STERNOTOMY IN PATIENTS WITH TRACHEOSTOMY UNDERGOING CARDIAC SURGERY PROCEDURES

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**BACKGROUND:** The patients (pts), previously totally laryngectomized with a tracheostoma who require cardiac operations, are exposed to an increased risk of sternal wound complications, sternal dehiscence, infection and tracheal injuries when full sternotomy is used. We describe our experience using manubrium-sparing sternotomy for these pts in need of cardiac surgery.

**METHODS:** After the tracheostoma was adequately secured, a midline skin incision was made starting 5-6 cm below the sternal notch and ending 1-2 cm below xyphoid process. A small muscular flap was created bilaterally 3 cm laterally the condrosternal junction to facilitate sternal divarication. The second intercostal space was isolated and the sternum was transversally transected with a regular sternal saw. The lower part of the sternum was divided in the midline. A long 3 cm large umbilical tape was sutured to the manubrium and passed outside the surgical field, and stretched to the operating table in order to elevate the manubrium and gain better view of the ascending aorta and completely isolate both mammary pedicles. Furthermore the left radial artery was harvested in a standard fashion. To elevate the heart and expose the targets coronary arteries for grafting on the beating heart, we used a single suture in the oblique sinus attached to a umbilical tape. The coronary anastomoses were performed off-pump with standard stabilizing technique using, when necessary, the radial artery previously anastomosed to left internal mammary artery end-to-side. No proximal anastomoses on the ascending aorta were carried out. In case of Aortic Valve Replacement was important to isolate the mid portion of the right and left mammary artery pedicles in order to easily divaricate the lower part of the sternum without stretching the mammary arteries. A standard cannulation for cardiopulmonary by-pass was used, and the aortic valve replacement was performed in a standard fashion.

**RESULTS:** 5 pts with tracheostoma underwent cardiac surgery procedures, 4 pts for Myocardial Revascularization and 1 for Aortic Valve Replacement. All pts were male and former smokers with severe COPD, 3 pts were insulin dependent diabetics. All pts underwent the planned complete myocardial revascularization (3.4 grafts/pts). The post-operative course was uneventful and all pts were discharged home within five days.

**CONCLUSIONS:** The manubrium-sparing sternotomy technique is easily performed; elevating the manubrium gives a good exposure of the ascending aorta and allows the complete isolation of both internal mammary pedicles. Although it has been used only in a small number of pts undergoing coronary artery by-pass grafting with tracheostomy, pts with high risk of sternal wound complications, or younger pts who perform heavy manual duties, may benefit from this technique, as preservation of the sternal manubrium may considerably enhance the stability of the thorax and upper girdle in the early post-operative period and erases the hazards and potential complication of a full sternotomy. Moreover this technique allows an adequate exposition of all coronary targets, including those located on the lateral and inferior wall of the heart, and can be easily used in aortic and mitral surgery.

### OP-819-THE USE OF VIDEOPERICARDIOSCOPY IN INDETERMINATE PERICARDIAL EFFUSIONS

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**BACKGROUND:** The pericardial biopsy has opened a new perspective for the etiologic diagnosis of pericardial effusions; the use of video camera can provide more accurate results by adequate pericardial visualization. To assess the usefulness of videopericardioscopy for diagnosis and treatment of indeterminate origin pericardial effusion.

**METHODS:** Retrospective study based on clinical data of patients who underwent videopericardioscopy for pericardial effusions without established diagnosis. The video-assisted pericardioscopy was performed through a small incision on the xiphoid area.

**RESULTS:** From January 1998 to January 2007, 101 consecutive patients under-

went to videopericardioscopy for pericardial effusion. Ten patients were excluded by lack of data. Fifty men and forty one women were included; mean age was 50 years ranged from 14 to 76 years. All cases had moderate or significant pericardial effusion demonstrated by Echocardiography or Computed Tomography. The diagnosis of pericardial effusion was established as follows: nonspecific inflammation in 50 (54,94%) cases, neoplastic disorders in 22 (24,17%) cases, tuberculous in 11 (12,08%) bacterial inflammatory process in 3 (3,29%) cases, chylopericardial in 2 (2,19%) cases, fungal infection in 2 (2,19%) cases and viral infection in 1 (1,09%) cases. The pericardioscopy define the definitive diagnosis by pericardial biopsy in 36,26%, by the fluid analyses in 13,18% and the association of both methods guaranteed 45,05% of definitive diagnosis. Overall morbidity was 4,3% and the most common complication was the occurrence of arrhythmias due to intra-operative manipulation, that ceases with the removal of the instruments from the pericardial cavity. We had 1 death in the perioperative period by cardiac tamponade.

**CONCLUSION:** Videopericardioscopy is a safe and efficient method to obtain better diagnosis and satisfactory therapeutic results in indeterminate pericardial effusions, by a better exploration of the pericardial cavity.

### OP-820-ROUTINE USE OF BILATERAL INTERNAL MAMMARY ARTERIES:RELEVANCE TO STERNAL WOUND COMPLICATIONS

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**BACKGROUND:** Routine use of pedicled bilateral internal mammary arteries (BIMA) together with the use of radial arteries has been established in our Department in order to achieve total arterial revascularization in our patients. The aim of this study is the assessment of the relative risk of sternal wound complications in patients undergoing BIMA harvesting.

**METHODS:** We reviewed retrospectively 1825 consecutive patients who have undergone coronary artery bypass grafting using pedicled BIMA, combined or not with other procedures, at our Department for the last 7 years. The IMAs were always harvested in a 1 cm pedicled fashion with titanium clips and minimal use of electrocautery. The radial artery was harvested only as a third choice graft, when necessary. Continuous insulin infusion was used in all diabetic patients. Sternum was closed using a technique with five, "figure of eight", knitted stainless steel wires. Intravenous as well as local antibiotics were always administered.

**RESULTS:** Total arterial revascularization was achieved in 1817 out of 1825 patients (99.5%). Radial arteries were used in 1119 patients (61.3%). In situ pedicled BIMAs were used in 1820 cases (99.7%). Patients received two to six arterial grafts (mean: 3.2). Thirty nine percent of the patients were diabetics, 12.6% had chronic obstructive pulmonary disease (COPD) and 3.5% were reoperations. Emergency operations were included (4.5% of the cases), whereas an impaired left ventricular ejection fraction (<50%) was noticed in 47.5% of the patients. Recent myocardial infarction (less than 3 months) was noticed in 27.6% of the cases. Peripheral vascular occlusive disease and chronic renal failure was observed in 20.9% and 8.9% respectively. Combined procedures (valve repair or replacement, Dor ventriculoplasty, ascending aortic aneurysm) were performed in 18.9% of the cases. In 4.6% an intraaortic balloon pump was used perioperatively. The average age was 66.3 years, whereas 28.8% of the patients were above the age of 70 years. Preoperative mean additive Euroscore was 7.4 and the early mortality was 2.6%. The wound complications included: superficial sternal wound infection (n=60, 3.2%), deep sternal wound infection (n=6, 0.3%) and late dehiscence (n= 1, 0.05%). Resternotomy was required in two cases with mediastinitis (0.1%). Severe sternal complication was the cause of death in two cases (0.1%). Univariate analysis demonstrated that diabetes was associated with an increased risk of superficial sternal wound infection (p<0.05). On the contrary, this study failed to reveal any independent risk factor for deep sternal infection or dehiscence.

**CONCLUSION:** Total arterial revascularization with routine use of pedicled bilateral internal mammary arteries is an effective technique with low postoperative morbidity and mortality rates for all subgroups of patients. Therefore, regular use of BIMA as a gold standard technique in all patients requiring myocardial revascularization is highly recommended.



## OP-821-XIPHOID APPROACH LONG TERM RESULTS

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**BACKGROUND:** Thoracoscopy was used for the first time to dissect the LIMA without opening the pleural cavity. The LIMA was then anastomosed to the LAD through a small left anterior thoracotomy in 1994, marking the era of the minimal access cardiac surgery, and the eponym MIDCAB minimally invasive direct coronary artery bypass was coined. In 1997 we began to examine the possibility of ambulatory coronary surgery. The approach was based on access via a xiphoid or lower sternotomy. Using three dimensional visualization, the LIMA or RIMA was harvested and anastomosed to the coronary arteries. Important advantages of this approach include reduced postoperative pain and preservation of intact pleural cavities in most of the cases, increasing the possibility of early discharge. The aim of this study was to evaluate the long term results of the first group of patients operated on with this technique.

**METHODS:** We retrospectively analyzed prospectively collected data of 31 patients operated on from October 1997 to December 1998 through the xiphoid approach (mean age  $67 \pm 17$  years), 4 (15%) female. 18 patients (58%) had hypertension. 11 (35%) had a previous myocardial infarction. 8 (26%) diabetes. 9 (26%) chronic lung disease and 2 (6%) peripheral vascular disease. 1 (3%) previous CABG. 1 (3%) previous PTCA stent. 18 (58%) had one vessel proximal LAD. 8 (26%) two vessels disease, in 5 the other artery was in previous necrotic area. 4 (13%) triple vessels, all had previous myocardial infarction. 1 (3%) left main disease. The STS risk stratification expected mortality for this group was (3.64%). In 29 (94%) patients we performed a LIMA to LAD, 1 (3%) LIMA to LAD and RIMA to RCA, 1 (3%) LIMA TO LAD and vein from the LIMA to RCA. 1 (3%) received a PTCA stent to the circumflex artery at the same time.

**RESULTS:** At 110 months 3 patients died 1 from pancreatic cancer at 45 months. 1 cerebrovascular accident at 59 months and the other from heart failure at 86 months. One patient received a PTCA Stent in the RCA at 48 months. Five (16%) had angina class I-III (NYHA), 3 (10%) class III (NYHA), the rest are asymptomatic. The angina free survival at 110 months was 68,23 % (KM), and the survival rate at 110 months was 90 % (KM).

**CONCLUSION:** The long term results of the initial series, confirm these operation like another option; in the trend to expand these technique with arterial conduits in multiple vessels, to try to discharge the patients ambulatory or at list in the same time as the PTCA - stenting with a potential more effective treatment in the long term.

## OP-822-MINIMALLY INVASIVE DOUBLE VALVE SURGERY USING THREE DIFFERENT APPROACHES

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**BACKGROUND:** We analyzed in-hospital results of 162 patients undergoing minimally invasive double valve operations in three different techniques (partial upper sternotomy [PUS], right anterior small thoracotomy [RAST] and "bikini" approach.

**METHODS:** Between January 1997 and November 2007, 82 (50%) consecutive unselected patients underwent RAST, 76 (46%) patients PUS and 4 (4%) patients bikini approach. Mitral and tricuspid valve was repaired in 60 (37%) cases. Aortic valve replacement in combination with mitral valve surgery was performed in 78 (48%). In 44 (27%) cases a radiofrequency ablation and in 4 (2.4%) ASD closure was performed.

**RESULTS:** In-hospital mortality was 4.3% (7 patients). Five patients underwent second pump run and mitral valve replacement after failed complex repair. Operating, bypass and cross-clamp times averaged  $211 \pm 42$ ,  $114 \pm 30$ , and  $76 \pm 16$  minutes, respectively. Seven patients (4.3%) had conversion to sternotomy. Eight patients (4.9%) underwent reexploration for bleeding. Postoperative stay was  $7.5 \pm 4$  days.

**CONCLUSIONS:** These minimally invasive approaches are useful alternative techniques for even more complex double valve procedures. Results are similar to those associated with full sternotomy approach. The smaller incision is appreciated by patients. Especially PUS is a safe alternative to other incisions, results in good exposure, does not require division of the mammary arteries, minimizes postoperative pain medication requirements, and, with experience, can be performed with acceptable aortic cross-clamp times.

## OP-823-MINIMAL ACCESS MITRAL VALVE SURGERY

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**INTRODUCTION:** Minimal access surgery is a marriage of modern technology and surgical innovation which aims to accomplish surgical therapeutic goals with minimal somatic and psychological trauma. We present forty consecutive patients who had cardiac surgery through a mini - anterolateral thoracotomy.

**OBJECTIVE:** To assess the outcome of mitral valve surgery for a low risk group of patients through a mini-thoracotomy approach in the period from October 2004 to October 2007.

**PATIENTS AND METHODS:** All patients with surgical mitral valve disease with or without tricuspid valve involvement and with a body mass index less than 27 were offered surgery through a 6cm long anterolateral thoracotomy. The surgical technique involved a right anterolateral thoracotomy of 6 cm long incision and femoro - femoral bypass. Patient's satisfaction was assessed using a scale from on to ten.

**RESULTS:** Forty consecutive patients were included in this study. The mean age was 39 years (range 17 - 78). The male female ratio was 1:1. thirty one patients had an isolated mitral valve disease. Nine patients had mitral and tricuspid valve disease. Rheumatic heart disease was the pathology in 57% of mitral valve disease group, and 4 % had a myxomatous mitral valve. The average preoperative LVEF was  $55.7 \% (\pm 7)$  and the average body weight was  $64.7 \text{ kg} (\pm 12)$ . The pre-morbid conditions included DM in one patient, epilepsy in one patient and pulmonary hypertension in 3 patients. The bypass time was 170.8 min ( $\pm 40$ ) and the cross clamp time was 108min (range 45 - 168). Patients were ventilated for 3 - 72 hours. The average blood loss in the first 24 hours was 284 mls ( $\pm 43$ ). One patient needed PRBC transfusion. One patient needed conversion to full sternotomy due to ischemia resulting from circumflex artery occlusion that needed bypass grafting. Two patients developed superficial pseudomonas groin wound infection. There was no operative mortality. Patients satisfaction was nine in 90% of cases.

**CONCLUSION:** Minithoracotomy is a useful approach for a large number of surgical mitral valve diseases. It is associated with reduced hospital stay and great patient satisfaction.

## OP-824-THE DIRECT FLOW VALVE - A NEW REPOSITIONABLE AND RETRIEVABLE BOVINE PERICARDIAL VALVE FOR PERCUTANEOUS AORTIC VALVE REPLACEMENT

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**BACKGROUND:** Percutaneous aortic valve replacement is a considerable alternative for patients carrying a high risk for operation. The Direct Flow percutaneous aortic valve is the first that is not based on stent technology. The stentless tissue valve with bovine pericardial leaflets is connected to two inflatable rings showing a high flexibility and deliverability. It is immediately competent upon initial inflation. Implantation does not require rapid pacing or cardiac support. The valve is repositionable, retrievable and available in multiple sizes.

**METHODS:** Four patients underwent percutaneous valve replacement using the Direct Flow valve. All patients had a high risk for operation (Log. Euroscore > 20). The Device was placed in the left ventricle by a flexible sheath under fluoroscopic control. The lower ring was inflated and the valve was positioned in the LV outflow tract against the aortic annulus using control wires. After inflation of the upper ring valve performance was controlled and eventual repositioning performed. Polymer media were infused in the rings once correct position was confirmed.

**RESULTS:** Procedure was successful in three of four patients. In one patient the valve could not be correctly positioned due to extreme calcifications of the native aortic valve. The valve was removed and the patient underwent successful operation a week later without complications. Implanted valves showed a good postprocedural performance with a mean peak gradient of 26 mmHg and a mean orifice area of 1.8 cm<sup>2</sup>. In one patient a small paravalvular leak of < 1° was seen. Patients showed no peri- or postprocedural complications and were discharged from hospital with five days.

**CONCLUSIONS:** Percutaneous aortic valve replacement using the Direct Flow Valve is safe and effective in patients with a high operative risk. In contrast to other devices the valve is repositionable and retrievable. The neurologic risk of the procedure is low due to the high flexibility of the valve and the delivery system.



### OP-825-HYBRID CORONARY REVASCLARIZATION USING ROBOTIC TECHNOLOGY - AN APPEALING CONCEPT FOR MINIMALLY INVASIVE TREATMENT OF MULTIVESSEL DISEASE

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**BACKGROUND:** Hybrid coronary revascularization is a combination of minimally invasive coronary surgery and percutaneous coronary intervention (PCI). It allows sternal preserving treatment of multivessel coronary artery disease and includes the longterm benefits of the internal mammary artery (IMA). In its classical version internal mammary artery bypass grafts were placed through minithoracotomy (MIDCAB). Most recently robotic technology has allowed completely endoscopic procedures (TECAB = totally endoscopic coronary artery bypass). We report on our experience with robotic techniques in hybrid coronary intervention. Patients and

**METHODS:** From 2001 to 2007 47 patients (41 male/ 6 female, age 58 (41-75) received hybrid coronary revascularization on an intention to treat basis. The daVinciTM telemanipulation system was used for performance of the following procedures: MIDCAB (endoscopic IMA harvesting) n=2, TECAB single vessel arrested heart n= 35, TECAB single vessel beating heart n=4, TECAB double vessel arrested heart n=6. In 32 patients (68%) robotic surgery was performed first, in 3 patients (6%) PCI was performed first, in 12 patients (26%) a simultaneous intervention was carried out.

**RESULTS:** Six conversions to larger thoracic incisions were necessary (13%). In these cases the PCI target received an aortocoronary bypass graft. There was no hospital mortality, one patient required revision for bleeding. Ventilation time was 8 (1-132) h, ICU stay was 20 (16-240) d, hospital stay was 6 (4-20) d. In 16 patients who were asymptomatic during the early postoperative period after robotic surgery PCI was not carried out. There was no mortality on follow up. Overall freedom from angina was 97% at two years; freedom from major adverse cardiac and cerebral events (MACCE) was 91 % at two years. No reinterventions were necessary on the internal mammary artery bypass grafts, two PCI targets required percutaneous reintervention.

**CONCLUSION:** We conclude that robotic technology allows completely endoscopic placement of internal mammary artery bypass grafts in hybrid coronary revascularization. Single and double bypass grafts are feasible and simultaneous interventions can be performed. Conversion remains a challenge. Overall safety of the procedure seems to be adequate and perioperative clinical results are satisfactory. Intermediate term survival and freedom from angina are excellent.

### OP-826-ROBOTIC ASSISTED OFF PUMP CORONARY ARTERY BYPASS SURGERY. THE FIRST 100 DA VINCI PROCEDURES IN THE UK

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**BACKGROUND:** Since 2002 the Da Vinci robot (Intuitive Surgical, Mountainview, CA), have been used to perform Totally Endoscopic Coronary Artery Bypass off pump (TECAB) or Robotic assisted A-traumatic Coronary Artery Bypass (RaACAB). The later consists of a robotic LIMA harvest and preparation, robotic pericardiotomy and a 4-5 cm. non-rib spreading anterior thoracotomy to perform a direct vision LIMA to LAD anastomosis with an LAD stabiliser inserted via a thoracoport.

**METHODS:** Part prospective study of the first 100 robotic assisted procedures at St Mary's Hospital, London (2002-07). Selected patients underwent either a TECAB (n = 12) or Robotic assisted ACAB (n = 88) mainly due to instrumentation availability. A fifth of all cases were performed as part of a hybrid procedure.

**RESULTS:** The majority of patients were overweight men (Mean BMI = 27.0, SD = 3.3 Kg/m<sup>2</sup> and mean age = 62, SD = 11 years). The mean additive Euro score (SD) for all patients was 1.72 (1.99). The mean internal mammary artery harvesting time (SD) was 63 (25) minutes. There was a small positive statistical correlation between BMI and time to harvest LIMA (r = 0.19). The conversion rate to a MIDCAB procedure was 3% mainly related to chest wall abnormality. All patients were fast tracked with a time to discharge ranging from 2-10 days. The mean (SD) time to discharge home was 4 (1) days. There was no significant difference in the length of hospital stay between the first and the second

half of the series (p = 0.148). Bleeding complication occurred in only one patient with factor XI deficiency, however no re-exploration was required. The incidence of atrial fibrillation was 2%, minor respiratory complications occurred in 4% and the incidence of postoperative pleural effusion was 5%. Graft patency was assessed in 6 patients for clinical reasons. One showed obstruction at implantation site and one minor post insertion stenosis of the LAD (<50%). In the majority of hybrid cases the endovascular procedure was performed some time after surgery. There were no reports of anastomotic defects in this hybrid group. All patients survived to discharge and to 6 weeks follow-up. There was no mortality recorded at 1- and 3-year follow up.

**CONCLUSIONS:** Excellent clinical results can be achieved with both techniques. The shorter operating times achieved with the ACAB technique and the absence of an ideal endostabilization system has made us choose the robotic assisted ACAB as the preferred option of surgical revascularisation of the LAD in our unit.

### OP-827-ENDOVASCULAR TREATMENT OF COARCTATION OF THE AORTA IN ADOLESCENTS AND ADULTS WITH COVERED STENTS: EXPERIENCE WITH A NEW APPROACH

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**BACKGROUND:** Surgery is the preferred treatment in infants and children with aortic coarctation. The endovascular treatment with balloon angioplasty has been introduced as an alternative treatment. Although less invasive, the presence of associated weakness of the arterial wall represents a risk of acute rupture, dissection and late pseudoaneurysm formation, especially in adults. Our hypothesis is that primary treatment with covered stent can reduce these complications.

**METHODS:** Between may 2004 and July 2006 six patients with severe hypertension were treated with covered stents for aortic coarctation in a single University Hospital. Four were males and two females. The age ranged from 18 to 55 years. The endovascular treatment was proposed to be done in two steps: first the coarctation was gently dilated with a 6mm balloon just to pass the endoprosthesis (18 to 20 French). The self-expandable covered stent (Braile Biomedica-nitinol and polyester) was deployed by retrograde approach via femoral artery from the left subclavian artery to the post coarctation level (size 18 to 22mm diameter X 5cm extension). Four to six months later when fibrosis developed and the aortic wall was stronger the plan was to definitely dilate the stent-graft. Surprisingly, four of the six patients treated in the first step had almost no gradient when returned to do the second step. No additional procedure was necessary in these four patients.

**RESULTS:** There were no complications related to the procedure. The gradient fell from a mean of 46 +/- 16 mmHg to 9 +/- 6 mmHg in the group that had a single procedure (four patients). This was not different from the two patients that were submitted to the second step (gradient 49 +/- 11 mmHg before the first procedure and 10 +/- 4 mmHg after the second) p=NS. The mean hospital stay was 2 days. There were no dissection, aneurysm or pseudoaneurysm in this small series.

**CONCLUSION:** Our preliminary experience with treatment of aortic coarctation with covered stents showed that this new approach had a short hospital stay, no complications and a good gradient reduction. There is evidence that a single dilatation with a 6 or 8 mm balloon followed by self-expandable stent-graft is all that is required to treat coarctation in adolescents and young adults. This is a promising approach and hopefully will reduce the incidence of late pseudoaneurysm formation. Long term follow-up is required in larger series to confirm this initial results.

## SURGICAL TECHNIQUES IN LUNG CANCER

### OP-828-IS PRIOR STERNOTOMY FOR CARDIAC SURGERY AFFECTING THE SAFETY AND EFFICACY OF MEDIASTINOSCOPY AND MEDIASTINOTOMY?

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**OBJECTIVE:** The diagnostic and staging value of cervical mediastinoscopy (CM) is well established. Left anterior mediastinotomy (LAM) is of further value in assessing left upper lobe tumours. However the efficacy and safety of these procedures after median sternotomy for cardiac surgery, especially if LIMA has been used, is unknown.

**METHODS:** We reviewed our experience of mediastinal exploration by CM+/-LAM between 1998-2007.

**RESULTS:** In this period we undertook mediastinal exploration in 9 males and 2 females (mean age 58, range: 45-80 years), all with prior sternotomy for cardiac surgery (9 had LIMA graft). The time interval between sternotomy and mediastinal exploration was 5 + 7.4 years. CM was performed in all 11 patients and additionally LAM was undertaken in 2/11 patients (both of them with LIMA graft). Indications for exploration were: staging of lung cancer in 8 patients (8 CM & 2LAM) and diagnostic biopsy of mediastinal mass in 3 patients (3 CM). Thorough mediastinal assessment was possible in all 11 patients. A specific diagnosis was obtained in 8 patients [metastatic lung cancer (5), lymphoma (2), sarcoidosis (1)]. The other 4 patients with negative findings underwent pulmonary resection by lobectomy. There were no operative complications and morbidity.

**CONCLUSION:** Prior sternotomy for cardiac surgery does not compromise the efficacy and the safety of mediastinoscopy and mediastinotomy.

### OP-829-EARLY RESULTS OF BIOLOGIC LUNG VOLUME REDUCTION (BLVR) USING A FIBRIN-BASED HYDROGEL FOR ADVANCED EMPHYSEMA

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**BACKGROUND:** Lung volume reduction surgery (LVRS) is an established therapy for selected patients with advanced emphysema. However significant morbidity and mortality offset its benefits. Bronchoscopic subsegmental application of a fibrin based hydrogel containing biodegradable materials that remodel damaged lung has the potential to reduce lung volume without surgery by converting hyperinflated lung into contracted scar tissue. This abstract summarizes 3-month safety and efficacy responses to BLVR in a cohort of patients with advanced emphysema.

**METHODS:** 13 patients received BLVR treatment at the Rabin Medical Center between 7/2007 and 12/2007. Group A patients (n=4, all heterogeneous disease) received split-dose therapy at 4 subsegments in each lung during 2 sessions 6 weeks apart. Group B patients (n=9, 2 with heterogeneous disease, 7 with homogeneous disease) received treatment at 8 subsegments (4 in each lung) during a single session. Dosing was performed through a flexible bronchoscope under general anesthesia. Treatment sites were chosen based upon review of CT and lung perfusion scans.

**RESULTS:** 12 male and 1 female patient (age 48 to 68 years) were treated. Mean preoperative FEV1 was 0.85L (21- 44% predicted) and 6min walk distance was 339 m (166 to 560 m). Treatment times (for 8 subsegments) ranged from 13 to 28 min (median 15 min). Inpatient stay was 1-3 days (median 1 day). There were no major complications or mortality. Minor complications included fever, pleuritic pain and dyspnea that resolved either spontaneously or with antipyretics and bronchodilators. Three patients required treatment with steroids for several days. Chest CT evidence of scarring at treatment sites was observed in all patients. Twelve weeks efficacy data for Group 1 (n=4)

demonstrated an increase in: FEV1 (+15.5 ± 17.9%), FVC (+31.25 ±20%),  $\Delta$ DLCO (+5.6± 12.14%),  $\Delta$ 6MWD (+ 65.4 ± 18.9m), and a decrease in MRCD (-1.3±0.5) and RV/TLC (-5.9 ± 15.7%). Twelve weeks efficacy data for Group 2 is available in 4 patients: FEV1 -0.2±5.3%, FVC +7.5 ±3.7%,  $\Delta$ DLCO -1.2± 8.1%,  $\Delta$ 6MWD + 18.5 ± 27.4m, MRCD -0.25±0.5 and RV/TLC -11 ± 9.6%.

**CONCLUSIONS:** In this small cohort, BLVR administered at 8 subsegmental sites in divided doses or during a single session was safe. Reductions in lung volume, improvements in spirometry and exercise capacity were observed. Improvements at 12 weeks were greater in patients with heterogeneous disease than homogeneous disease, although both groups experienced improvements in gas trapping, vital capacity and exercise capacity. Future trials are needed confirm the safety and efficacy of BLVR, and refine patient selection criteria. Aeris Therapeutics, Inc. Woburn, MA 01801; provide the funding for the clinical trial. The data presented here was collected by the authors and transmitted to the shared data base maintained by Aeris. The Product/procedure/technique is considered research and is NOT yet approved for any purpose.

### OP-830-SLEEVE RESECTIONS

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**BACKGROUND:** Sleeve resections are important surgical techniques in which protection of normal lung parenchyma distal to the pathological lesion is aimed. We are presenting results of patients who underwent sleeve resection.

**METHODS:** Thirty three bronchial, 5 bronchovascular and 3 vascular sleeve resections were performed in a 5 years period in our clinic. Age, sex, operations, postoperative diagnosis and staging, postoperative morbidity and mortality were evaluated prospectively.

**RESULTS:** Sleeve resections were performed in 41 patients (3 female, 38 male) whose ages ranged between 24 and 74 (mean: 56.4). Operations were 18 right upper, 17 left upper, 2 left lower sleeve lobectomies, 3 sleeve bilobectomy superior and 1 sleeve resection of right main bronchus. Postoperative pathological diagnosis were 36 lung cancer (34 squamous, 1 pleomorphic, 1 combined large and small cell carcinoma), 2 carcinoid tumor, 1 leiomyosarcoma, 1 mesenchymal tumor, 1 posttuberculosis bronchostenosis. Pathological staging of lung cancers were; 3 stage 1A, 10 stage 1B, 2 stage 2A, 13 stage 2B, 8 stage 3A. Postoperative morbidity including 6 persistent atelectasis, 5 prolonged air leak-empyema, 1 prolonged air leak, 1 infection of incision, 1 postoperative bleeding needed revision and 1 formation of severe granulation and fibrosis on bronchial anastomosis line, was 22 % (n=9). Thirty day mortality was 4.8% (n=2). Median follow up period and 5 year survival are 21 months and 47% respectively.

**CONCLUSION:** Sleeve resections should be preferred in suitable cases because they have lower morbidity and mortality than standard pneumonectomies and result in better lung function and life quality.

### OP-831-PULMONARY ARTERIAL RECONSTRUCTIONS IN SURGERY FOR LUNG CANCER

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**BACKGROUND:** The aim of this study was to evaluate the results of pulmonary arterial reconstructions in surgery for lung cancer.

**METHODS:** Between January 2002 and July 2007, we performed pulmonary arterial reconstruction in 27 patients out of 613 operations for primary lung cancer. We analyzed the age of patients, histology, type of reconstruction, complications, morbidity and mortality. Data were recorded from our databank unit.

**RESULTS:** Twentyfive of the patients were male and mean age was 62.3 years. Twenty one patients had a sleeve resection for invasion of the primary tumor to the artery and six for the invasion of lymph nodes. Twelve patients had a double sleeve resection where as five patients had a bronchial sleeve resection and an angioplasty. Six patients had a pulmonary patch plasty with a bronchial sleeve resection. Four patients had an isolated patch plasty of the pulmonary artery. Seven patients had N2 disease, another seven patients had N1 disease and the rest of the patients had N0 disease. The morbidity rate was 18.5 % (5/27 patients), in one patient dehiscence of bronchus was detected. No mor-

tality was seen in our series. The median follow up period was 21.8 months (3-63). The mean survival was 45.7 months. Three patients developed local recurrence in follow up and all died within 14 months after surgery.

**CONCLUSION:** Pulmonary arterioplasties carried similar morbidity and mortality rates with conventional lung resections. Local recurrence and survival rates after N1 and N2 disease showed that arterioplasties were good alternatives for pneumonectomy operations.

#### **OP-832-VERTICAL THORACOTOMY - EXPERIENCE WITH 369 OPERATED PATIENTS**

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**BACKGROUND:** How to perform a thoracotomy is constant subject of debates among thoracic surgeons. This debate was intensified with the sprouting and advances of minimum invasive techniques in surgery. The thoracic surgery video (VATS) and thoracotomy with muscular preservation are surgical options fully established for the accomplishment of pulmonary resection. The use of the technique for vertical thoracotomy with muscular preservation for treatment of the diseases is arising in recent years, as way of preferential access.

**OBJECTIVE:** We have as objective to show the use of only one pleural drain (28 fr) on the post operator of 369 patients.

**OBJECTIVE:** We have as objective to analyze 369 patients operated by a vertical thoracotomy.

**METHOD:** The charts of 369 operated patients with vertical thoracotomy up to 10 cm, between 2000 and 2005, had been analyzed. We evaluated the patients about the sex, age, diagnostic, type of operation, time of drainage, time of hospital stay and complications.

**RESULTS:** The results had shown 64% male patients and 36% of female, the age varied from two months to 91 years, with median of 48,9 years, the average time of stay was 6,25 days, varying from 1 to 30 days. The average of the drain time was four days, varying from one to 26 days. We had six deaths - mortality of 1,63% and a morbidity of 11,92%, being the most frequent pneumonia, in eight patients (2.44%).

**CONCLUSIONS:** Vertical thoracotomy is safe and also represents a fast strategy for pulmonary resection and others diseases. The direct visualization of the pulmonary hilum (vessels and bronchus) for dissection and suture had been performed, even without any kind of staplers. This strategy is a good option, providing an excellent access to the thoracic pleural space. We believe that the ample posterolateral thoracotomy represents an additional morbidity to the treatment.

#### **OP-833-ANTERO AXILLARY MUSCLE SPARING MINI THORACOTOMY OFFERS GOOD ACCESS AND MINIMAL MORBIDITY**

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**BACKGROUND:** The conventional postero-lateral thoracotomy is carried out with a long incision, therefore postoperative complications are high, and length of recovery is prolonged. The antero-axillary approach allows lesser pain, good cosmesis and shorter hospital stay.

**METHOD:** From April 2005 to April 2007, we performed 550 Antero-axillary muscle sparing mini-thoracotomies. Intended procedures ranged from lung resections, oesophagectomy, posterior mediastinal tumours to scoliosis corrections. In our unit 99% of thoracotomies were performed using above method. A curved vertical incision is placed in mid-axillary line. Posterior flap is raised with the Lat dorsi muscle, sparing it and the Thoraco-dorsal nerve. Anterior flap is raised with the Pectoralis major sparing it. Serratus anterior muscle is split posteriorly up to the Long Thoracic nerve. Thorax is entered incising Inter-costal muscles, and incision extended beneath Serratus-anterior and Lat-dorsi.

**RESULTS:** Patients were mobilized on the next day. Drains were removed by 3rd to 5th day. Analgesic requirement was minimal and cosmesis was good. Wound related complications were less than 1%. Hospital stay was 6 to 7 days.

**CONCLUSIONS:** This technique gives a good access for intra-thoracic organs. Vertical incision gives option of making 2nd or 3rd entry points through the same incision. Blood loss was minimal and closure was simple and quick. It facilitates lung resections even with low lung function capacities. Long instruments, good operative skill and understanding of anatomical landmarks are

vital. We believe this technique gives good access for intra-thoracic procedures with reduced morbidity and mortality.

#### **OP-834-AWAKE ANAESTHESIA FOR MAJOR THORACIC SURGICAL PROCEDURES: AN OBSERVATIONAL STUDY**

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**ABSTRACT/BACKGROUND:** Major thoracic surgical procedures are rarely performed under awake anaesthesia. The purpose of this study is to review the experience of a tertiary center in major thoracic surgical procedures done under awake anaesthesia.

**METHODS:** This single center, single operator, retrospective review of cases of thoracic surgery done under awake anaesthesia included all patients operated on from September 2002 to September 2006. Thoracic epidural anaesthesia was done either between T1-T3 or T4-T6 depending on the type of procedure. The block level was verified using warm-cold discrimination. In addition, stellate ganglion block was performed in some patients to achieve cough control. The following data were documented: patients' demographics, the type and approach of procedure, operative time, intra-operative complications, conversion to general anaesthesia, mortality, the need for intensive care unit (ICU) admission and post-operative hospital length of stay.

**RESULTS:** A total of 79 cases were performed over the study period. The mean age was 37 years (59% Male). Twenty five (32%) of patients underwent thymectomy, 11 patients (13%) lung resection and 8 patients (11%) sympathectomy. The most common approach was thoracoscopy in 61 patients (77%), followed by thoracotomy in 11 patients (14%) and median sternotomy in 3 patients (4%). The median postoperative hospital stay was 1.5 days, with 33% of cases discharged on the same day of operation (day surgery). Only five patients (6%) required ICU admission; 3 of these patients in 2002 did not need ICU, but epidural policy at that time mandated ICU admission (only 2/79 (2.5% required ICU). One patient died as a result of his underlying metastatic hepatocellular carcinoma 9 days postoperatively. One other patient was converted early to general anaesthesia prior to pneumonectomy after discovery of left upper lobe involvement and he died 3 months later. There was no anaesthesia related mortality.

**CONCLUSIONS:** We conclude that major thoracic procedure can be safely performed under awake anaesthesia. The technique avoids general anaesthesia and endotracheal intubation, reduces post-operative hospital stay and minimizes intensive care unit admission. This study strongly suggests awake anaesthesia can improve outcomes and reduce cost. A proper multi-center trial to further evaluate this technique is needed.

#### **OP-835-SAFETY OF INDIVIDUAL AND SIMULTANEOUS STAPLING HILUM STRUCTURES CLOSURE IN PULMONARY LOBECTOMY**

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**BACKGROUND:** Hilum mass ligation was the most important technique performed in the beginning of the twentieth-century for lobectomy with serious postoperative complications due to wound healing severely jeopardized in infected, inflamed, fibrotic, edematous or desvascularized tuberculosis and bronchiectasis hilum tissues. On the other hand, during the last decades most of patients have healthy, well-vascularized bronchi from lung cancer and the incidence of postoperative complications decreased enormously. At the same time, the development of modern surgical staplers has been remarkable and has allowed for sutures of many tissues of the human body including safety for the closure of the artery, vein and bronchus of a pliable and elastic hilum, free from diseases and enlarged lymph nodes. The objective is to evaluate safety and operative outcomes for patients submitted to individual stapling and simultaneous stapling of hilum structures.

**METHODS:** Sixty patients suffering from either benign or malignant lung diseases were submitted to pulmonary lobectomy. 35 patients underwent lobectomy by videothoracoscopy and 25 by muscle sparing limited thoracotomy. In 24 patients the closure of the hilum structures was performed by individual stapling technique (Group I) and in 36 patients the closure of the hilum bronchus



and vessels was carried out by simultaneous stapling technique (Group II).

**RESULTS:** There was one intraoperative vascular accident in Group I and no accident in Group II patients. The mean operative time was 174.4  $\pm$  60.2 minutes for Group I and 111.1  $\pm$  70.9 minutes for Group II, with a significant difference. The chest tube stay was 6.0  $\pm$  3.2 days in Group I patients and 5.9  $\pm$  4.0 days in Group II patients. The length of hospital stay was 7.0  $\pm$  2.8 days and 6.2  $\pm$  3.8 days for Group I and Group II, respectively, with a significant difference. In the postoperative period there were no technically-related complications as bronchopleural, arteriovenous or bronchovascular fistulas in both, Group I and Group II, during the follow-up time of about 14 years and 9 years, respectively. The operatory mortality was zero in both groups.

**CONCLUSION:** Individual and simultaneous stapling seem to be safe alternative for the closure of hilum structures when performing pulmonary lobectomy.

### OP-836-A NOVEL AND SAFE TECHNIQUE FOR PREVENTION OF DRAIN MALPOSITION IN TUBE THORACOSTOMY

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**BACKGROUND:** Tube thoracostomy (TT) is the most commonly performed surgical procedure in thoracic surgery clinics. The procedure might have to be repeated due to ineffective drainage in patients with tube malposition (TM), in whom the drain is not directed to the apex or located in the fissure. Trochar technique, which is used to prevent TM, is not recommended because of its potential for severe complications.

**METHODS:** The study involved 180 patients who required TT application for any etiology within one year. The patients were divided into two groups as Group A, who had undergone classical surgical technique (n=90) and Group B, who had undergone a combination of surgery and trochar techniques (n=90). The groups were compared for tube malposition (TM), the effect of TM on the drain removal, and other insertional complications.

**RESULTS:** Group A comprised 87 male (96.7%) and 3 female patients with a mean age of 34.59 $\pm$ 15.92 years. Group B comprised 81 male (90%) and 9 female patients with a mean age of 35.86 $\pm$ 16.02 years. The most common etiology in both groups was stab wound injury. In Group A, 23 (25.5%) patients had TM, 4 (4.4%) of whom developed associated ineffective drainage, while the patients in Group B had no insertional complications (p=0.001). The mean drain removal time of the patients with TM was 5 $\pm$ 2.25 days. In the patients who did not develop TM, it was 3.39 $\pm$ 1.18 days (p=0.001).

**CONCLUSIONS:** The modified combination technique is a reliable method in preventing TM and its potential complications.

### OP-837-USE OF TRANSSTERNAL TRANSPERICARDIAL APPROACH FOR BRONCHIAL STUMP FISTULA AFTER PNEUMONECTOMY

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**OBJECTIVE:** To show the importance of transternal transpericardial approach of bronchial stump fistula after pneumonectomy, as an exceptional therapeutic solution.

**MATERIAL AND METHODS:** Between March 2001 October 2007 in our clinic were operated 18 patients (2F/16M) with postpneumonectomy bronchial stump fistula. The pneumonectomies were performed in different thoracic surgery departments. 11 (78.6%) of them were TB destroyed lung patients, rest of 7 (21.4%) - lung cancer. There were 10 (55.5%) right bronchial stump fistula and 8 (44.5) left sided. All patients had open thoracic window Eloesser flap. In all patients we have made transternal transpericardial resection of the bronchial stump tangential to the carina and pericardial or thymic flap apposition.

**RESULTS:** No postoperative deaths. Recurrence of the fistula with spontaneous healing in one case, and covering thoracoplasty in another one. Follow up of the patients was made for a period between 3 and 56 months.

**CONCLUSIONS:** Transternal transpericardial approach of bronchial stump fistula represents an effective therapeutic option in treatment of bronchial fistulas. This treatment must be preceded by cavity "sterilization" with an Eloesser flap. The optimal procedure is preventing the fistula by a very accurate surgical act, preservation of the bronchial arteries and pleural, pericardial, intercostal muscle

flap apposition.

### OP-838-5-YEAR REVIEW OF THE USE OF POCKET SIZED HEIMLICH VALVE IN POST BULLECTOMY PATIENTS: INITIAL EXPERIENCE WITH PNEUMOSTAT TM

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**BACKGROUND:** Prolonged air leak after bullae resection is a common problem. This is due to a dead space within the pleural space after part of the lung being removed which will take some times for the remaining lung to be fully expanded and to allow seal between the two pleural layers. Excessive and prolonged air leak has been treated with the conventional underwater seal drainage system and this is technically troublesome to manage, restrict patient ambulation and will definitely lead to increase length of hospital stay with significant health-care costs and possible patient dissatisfaction. To evaluate the practicability, effectiveness and the complications of the PneumostatTM use following bullectomy for spontaneous recurrent pneumothorax.

**METHODS:** This is a retrospective review of 98 patients underwent bullectomy following recurrent spontaneous pneumothorax via either Video Assisted Thoracoscopic (VATS) or thoracotomy at our department from January 2002 until June 2007. Data from patients' files were collected and analysed.

**RESULTS:** Mean age of 28.5 years (range 17-52). 80.6% were smokers and 5.1% were diabetes. Pneumostat was inserted from the second post operative day in all patients. Patients started to ambulate from day 1 after surgery. The mean of hospital stay was 3.08 days range (3-5). Patient was discharged home with Pneumostat and followed up in clinic. The duration of lung to fully expand and drain to be removed was 5 - 14 days with mean of 7.5 days. It took longer for the lung to be fully expanded in smokers as compared to non-smokers but no significant difference with p value of 0.052. No other complications apart from drain infection in 4.1% of the patients which only required oral antibiotics.

**CONCLUSIONS:** This study proved that this pocket sized Pneumostat to be safe and practical in this group of patients. It accelerates the patients recovery in terms of mobilization which helps lungs expansion and reduce length of hospital stay with no significant complications.

### OP-839-POSTOPERATIVE RESIDUAL PLEURAL SPACES WITHOUT AIRLEAK

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**BACKGROUND:** The authors conducted this study in order to redefine the incidence, the natural history and the management of postresectional spaces without airleak.

**MATERIAL AND METHOD:** From January 1997 to December 2003, 966 patients, who were subjected to less than entire lung resections, were followed and the cases of any postresectional residual pleural spaces (PRS) were recorded. The records of these patients were retrospectively analyzed for several clinicopathologic factors. Furthermore, cases with PRS were analyzed for the type of resection performed, the PRS location, the size (large or small), the PRS wall thickness (normal or increased) and the space's prognosis (good or poor). According to two selected criteria (i.e. size and sepsis) the patients were grouped in 8 distinct categories. PRS management was studied between these subclassifications. The PRS outcome was classified into favorable and unfavorable one. The correlation of these categories with space characteristics was performed.

**RESULTS:** 46 cases (4.8%) with postresectional residual air spaces were documented. PRS were more frequently (p<0.001) documented after upper lobectomies, malignant disease, at apical location and at right side. Pleura characteristics were within normal limits in the majority of cases (p<0.001). No additional treatment was the main type of management for apical PRS of small size. Basal spaces were more frequently (p=0.05) managed with prolonged CTT. Unfavorable outcome was strongly correlated to age>72 years (p<0.001), to air leak (p<0.001), to empyema (p<0.001) and to thickened pleura (p<0.001).

**CONCLUSION:** Prevention is the best approach for PRS. PRS characterized by two or more of the following criteria were associated with a dismal outcome:



(a) large size; (b) increased space wall pleural thickness; (c) pleural empyema; (d) apical location.

#### OP-840-SURGICAL TREATMENT OF SUPERIOR SULCUS (PANCOAST) TUMORS; RESULTS AND PROGNOSTIC FACTORS

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**BACKGROUND:** Treatment modalities of the superior sulcus tumours remain controversial. This study aims to investigate treatment modalities and factors influencing survival in surgically treated superior sulcus tumours.

**PATIENTS AND METHOD:** Between 1994 and 2007, 65 cases of surgically treated non-small cell carcinoma of lung as superior sulcus tumors retrospectively reviewed. All patients were male with a mean age of  $51.5 \pm 8$  (range 32-73). Adenocarcinoma, the most encountered histopathological tumor type was seen in 36 (55%) of the patients. 35 patients received neoadjuvant therapy as radiotherapy in 25 (38.5%) and chemoradiotherapy in 10 (15.4%). Remaining 30 (46.2%) patients were underwent surgery alone without neoadjuvant therapy. Lobectomy in 54 (83.1%) and wedge resection in 11 (16.9%) of the cases was performed. The morbidity and mortality rates were 26.2% (n=17) and 6.2% (n=4) respectively. Pathological stage was T3 in 55, T4 in 10, N0 in 52, and N1 in 5 and N2 in 8 patients. Survival rates of the patients were calculated and compared by univariate and multivariate analysis methods.

**RESULTS:** Overall complete resection rate was 81.5% (53 patients). This rate was 90% for patients received neoadjuvant chemoradiotherapy and 80% for either patients received neoadjuvant radiotherapy alone or patients performed surgery directly. Overall median survival time was 24 months; 5-year and 10-year survival rates were 31% and 28% respectively. Median survival time, 5-year and 10-year survival rates of the patients performed a complete resection were 30 months, 38% and 34% respectively. Median survival time of the patients with tumors incompletely resected was 8 months. 5-year survival rate of these patients was zero and 2 year survival rate was 9%. This difference of survival rates between patients with tumor resected completely and incompletely was statistically significant ( $p=0.0001$ ). Among the patients performed complete resection, 10 year survival rate of the patients staged as N0 was 46%, 5-year survival rate of the patients staged as N1 was 25%. There was no any patient survived longer than 2 year who staged as N2. Survival rate differences between N0 or N1 and N2 patient groups were statistically significant ( $p=0.004$ ). In patients who received neoadjuvant therapy and tumor resected completely, median survival time was 33 months (28 months for patients received radiotherapy alone and 36 months for patients received chemoradiotherapy) and 5-year survival rate was 41%. Median survival time and 5-year survival rate of the patients treated surgically alone with a complete resection was 24 months and 37% respectively. There was no statistical significant difference between survival rates of the patients treated surgically alone and surgery performed after neoadjuvant therapy. In multivariate analysis, only N2 disease ( $p=0.04$ ) and completeness of resection ( $p=0.03$ ) was found prognostically.

**CONCLUSION:** Preoperative chemoradiotherapy increases the rate of complete resection. The highest survival rates obtain in patients with tumor resected completely and no mediastinal lymph node involvement was found.

#### OP-841-FAST-TRACK REHABILITATION FOR LUNG CANCER LOBECTOMY: A FIVE YEARS EXPERIENCE

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**INTRODUCTION:** Fast-Track-Rehabilitation is a group of measures that accelerate postoperative rehabilitation and reduce morbidity. It can be applied to Lung Cancer lobectomy. Video-assisted muscle sparing incisions, normovolemia, normothermia, good oxygenation, no unnecessary antibiotics, epidural Patient-Controlled-Analgesia, free systemic opioid analgesia, early ambulation and oral feeding are cornerstone measures to achieve early rehabilitation and reduces morbidity. The purpose of this study is to describe a five years experience with Fast-Track-Rehabilitation for Lung Cancer lobectomy.

**METHODS:** A prospective non-controlled study involving 104 patients submit-

ted to Fast-Track-Rehabilitation and lung cancer lobectomy was performed. Only patients who could receive double-lumen intubation, epidural catheters with Patient-controlled-analgesia, who had Karnofsky index of 100, previous normal feeding and ambulation, absence of morbid obesity, diabetes or asthma, were included in the study. Postoperative oral feeding and aggressive ambulation started as soon as possible.

**RESULTS:** Immediate postoperative extubation was possible in 102 patients and oral feeding and ambulation were possible before the first hour in 96 patients. Six patients could not receive early oral feeding or ambulate due to hypnosis secondary to preoperative long effect benzodiazepines. Two patients could not ambulate immediately due to epidural catheter misplacement with important postoperative pain. Ninety-six discharges occurred at the second postoperative day, 4 of them with a chest tube connected to a Heimlich valve due to air leak. No complication of early feeding and ambulation was observed. Postoperative hypnosis due to long duration benzodiazepines or pain does not allow early oral feeding or ambulation.

**CONCLUSION:** Fast-Track-Rehabilitation for Lung Cancer lobectomies can be safely performed in a selected group of patients.

#### OP-842-THE ROLE OF MUSCLE FLAP IN PREVENTING BRONCHUS STUMP INSUFFICIENCY AFTER PNEUMONECTOMY FOR MALIGNANT PLEURAL MESOTHELIOMA IN HIGH RISK PATIENTS

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**BACKGROUND:** Bronchus stump insufficiency (BSI) is one of the major complications after pneumonectomy; we analyzed all patients who underwent extra pleural pneumonectomy (EPP) for malignant pleural mesothelioma (MPM) in order to detect the role of muscle flap (MF) on preventing early and late stump insufficiency.

**METHODS:** From January 2000 till December 2005, there were 42 patients admitted with MPM for further intervention at our institution. 30 patients were suitable for surgery thus received a combined treatment modality approach with neo adjuvant chemotherapy using Cisplatin® and Gemcitabin (Gemzar®), EPP followed by 54 Gray (Gy) adjuvant radiotherapy. Data were collected from the surgical and oncological records. Age, sex, concomitant diseases, risk factors, staging, operative procedures, tumor histology, time of hospital stay, early and late complications, and overall survival were analyzed.

**RESULTS:** There were 37 male patients (88%), the median age was 65 years (range 40-83 years). 7 (17%) patients had concomitant diseases. Nicotine abuse was found in 22 (52%) patients, 40 (95%) patients had asbestos exposure. The histological findings in all patients were: 1) epithelial (n=32), 2) papillary (n=2), 3) biphasic (n=2), and 4) sarcomatoid type (n=4). The operative procedures were EPP with muscle flap through an anterolateral thoracotomy. One patient (3%) died on the 2nd postoperative day due to lung embolism. Mild complications were noticed in the early postoperative phase in 8 (25%) patients. There was no early or late stump insufficiency during the 15 month follow up. One patient had local recurrence within 3 months post operative (3%), and after 12 months in 8 (25%) patients. The overall survival after 15 months is 60%.

**CONCLUSIONS:** Surgical techniques using muscle flap are feasible and seem to play a major role in the prevention of bronchus stump insufficiency especially after neo adjuvant chemotherapy.

#### OP-843-MEDIAN STERNOTOMY FOR SYNCHRONOUS BILATERAL LUNG CANCERS

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**BACKGROUND:** Patients presenting with synchronous primary lung cancers have a variety of surgical options. The role of median sternotomy for this situation has been alluded to in the literature but specific results have not been detailed.

**METHODS:** Since 1999, 9 patients (6 females, 3 males, ages 51-84 mean 68) with synchronous lung cancers have had median sternotomy with resection of presumed bilateral lung cancers. All patients had PET scanning revealing no evidence of extrathoracic disease or mediastinal adenopathy. 20 lung cancers (3 squamous, 4 adenoBAC, 6 BAC, and 5 adeno) were resected. No patient was found to have pathologically involved mediastinal lymph nodes. Average

tumor size was one patient had M1 disease in the pericardial fat. Resections included wedge (11), lobectomy (6), and segmentectomy (1) with a wedge/lobe (6) being the most common combination.

**RESULTS:** There were no deaths. Two patients had postoperative atrial fibrillation, and one had an unstable sternum. Mean time in ICU and to discharge was 2 and 5 days, respectively. Of the 8 patients with a complete resection, three have recurred (new nodules, 54 months, brain 31 months, pleura 27 months). Five year survival for all patients was 51% and median time to progression was 54 months.

**CONCLUSION:** Median sternotomy is a reasonable and safe alternative approach for patients with bilateral synchronous lung cancers. Total mediastinal lymph node dissection along with the ability perform all necessary resections at one sitting are obvious advantages to an "staged" approach.

## OP-844-FAILED DECORTICATION AETIOLOGY, TREATMENT OPTIONS AND OUTCOME

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**OBJECTIVE:** To find out different factors which lead to failed Decortication and to evaluate their management and outcome.

**STUDY DESIGN:** Retrospective observational descriptive study.

**PLACE AND DURATION:** Department of Cardiothoracic Surgery, Postgraduate Medical Institute, Lady Reading Hospital Peshawar from January 2003 to June 2006.

**SUBJECTS AND METHOD:** Clinical record of 260 patients who underwent Decortication for chronic Empyema during the last 3.5 years was retrospectively analyzed and their results evaluated. Detailed scrutiny of the computerized clinical record was carried out to analyze the aetiology of failure of the operation. The variables studied were persistent broncho- pleural fistula, poor post-operative efforts by the patients, wound infection, old chest drain site infection, technical failure and nutritional state of the patient.

**RESULTS:** Of the 260 decortications performed over the period of 3.5 years, 230 patients had a successful outcome in terms of lung expansion and improved pulmonary functions. In thirty patients (19 males, 11 females with age range of 12 to 70 years) Decortication failed to achieve the desired results. These patients had to undergo space obliterate procedures for persistent infected space. Twenty three patients had history of tuberculosis and seven patients had non-tuberculous Empyema. All patients had chronic Empyema with duration of more than 12 weeks before the first operation. All patients were nutritionally compromised. Thoracoplasty (complete or partial) was performed in 25 patients to obliterate the persistent infected space. Five patients with recurrent broncho-pleural fistula had an additional procedure of intercostal muscle reinforcement over the fistulae, in addition to thoracoplasty. All patients had successful obliteration of the persistent space with no mortality and minor wound infection in only three patients.

**CONCLUSION:** Thoracoplasty is a useful procedure following failed Decortication as a space obliteration procedure in patients with nutritional impairment and poor respiratory efforts.

## OP-845-LONG-TERM RESULTS OF LUNG DECORTICATION IN PATIENTS WITH RESTRICTIVE PLEURISY AND TRAPPED LUNG SECONDARY TO CORONARY ARTERY BY PASS GRAFTING

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**BACKGROUND:** Persistent pleural effusion after coronary artery by pass grafting can occur. Most of these effusions are small and self-limiting and usually can control with one to three therapeutic thoracenteses. Minority of these can persist and, with times result in restrictive pleurisy and trapped lung requiring decortication. The aim of the study is to investigate the efficiency of lung decortication at long-term period for symptomatic restrictive pleurisy and trapped lung secondary to coronary artery by pass grafting (CABG).

**METHODS:** 23 patients performed decortication for restrictive pleurisy and trapped lung between March 2001 and January 2007 were evaluated in a prospective manner. All patients were referred to our thoracic surgery clinic from other wards or other hospitals. The diagnosis of restrictive pleurisy and

trapped lung was based on the typical clinical course, chest radiograph and computer tomography evaluation. Cases with post-CABG empyema, post-CABG hematoma and cardiac insufficiency were particularly excluded from this study. Chest radiography, computed tomography, echocardiography, pulmonary function test were routinely done in all patients before and after surgery. FOB was applied to all patients in order to exclude other pathology before the decortication. Objective preoperative assessment consisted of forced vital capacity and forced expiratory volume in 1 second in spirometry. Subjective dyspnea was evaluated by the Medical Research Council (MRC) dyspnea scale. Decortication was performed through a standart posterolateral thoracotomy using controlateral single lung ventilation. In the operation, restrictive fibrous layer was peeled away from the lung with blunt and sharp dissection in correct plane and adhesions were dissected by electrocauterization with gentle manual ventilation of the lung operated on. Patient's pleural spaces were drained using two chest tubes. Statistical significance between the preoperative and long term follow-up spirometric values were evaluated by the paired samples test. Statistical significance was accepted as p less than 0.01. Dyspnea score was evaluated by Wilcoxon signed rank test.

**RESULTS:** There was 3 female and 20 male aged 41-78 (mean 61). The median interval from CABG to the decortication was 13.2 months (range, 2 to 84 months). They were followed for an average of 34 months (range, 12-73 months) after decortication. The median LVEF was 55% (range, 45-70). 4 right, 18 left and 1 bilateral decortication were performed. Dyspnea score were 2 points in 2 patients, 3 points in 14 patients, four points in 7 patients. Preoperative spirometry results showed a clear restrictive pattern. Mean preoperative FVC was 51.3% predicted (range, 37.5-67.4 %), mean preoperative FEV1 60.79 % predicted (range, 38 to 73 %). 4 patients (8.69 %) experienced a superficial wound infection. 7 patients (30.4%) prolonged air leakage, two of them necessitated additional surgical intervention. There was one (4.3%) postoperative death due to empyema and sepsis. Atelectasis of the compressed lung was improved in all patients on CT scan. Dyspnea score at long-term period improved 3 points in 18 patients, 2 points in 4 patients. FVC and FEV1 improved by 30.79%, 22.25% at late follow up. There was significant improvements in FVC and FEV1 %'s after decortication. All patients showed both subjective and objective improvement.

**CONCLUSION:** Lung decortication in patients with restrictive pleurisy and trapped lung after CABG reexpands the affected lung so, ensures remission of symptoms and improves quality of life in long-term period.

## OP-846-COLD COAGULATION OF BLEBS IN SPONTANEOUS PNEUMOTHORAX: A NEW ALTERNATIVE TECHNIQUE TO ENDOSTAPLER RESECTION

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**BACKGROUND:** Further improvements in the thorascopic treatment of spontaneous pneumothorax may reduce the already low invasiveness of the procedure. We recently experienced a new device, to coagulate blebs in opposition to endostapler resection.

**METHODS:** Patients with recurrent or persistent spontaneous pneumothorax underwent thorascopic treatment. Those with blebs or small bullae (Stage III and IV according with Vanderschueren's classification) were treated with a new device, based on coupling saline solution perfusion with radiofrequency energy (Floating Ball). Combination of fluid with radiofrequency allows to coagulate the tissue avoiding charring or burning. Most operations were performed through only two 1-centimetre incisions.

**RESULTS:** From 2004 to 2006, 25 patients were treated. They were 22 males and 3 females with a mean age of 27.7 years (range of 16 - 56). Eighteen patients underwent general anaesthesia with selective intubation, in 7 cases we utilized thoracic epidural anaesthesia with the patients awake and spontaneously breathing. Mean operation time was 23 minutes (range of 11 - 50). Post-operative drainage period and hospital stay were on average 2.5 days (range of 1-11) and 3.1 days (range of 2-11) respectively. Prolonged air leak occurred in 2 patients, one requiring re-operation after 8 days. On a mean follow-up period of 17 months (range of 6 - 37) 1 recurrence was reported.

**CONCLUSIONS:** Cold coagulation of blebs seems to be effective in the treatment of primary spontaneous pneumothorax. Due to its clear advantages (i.e., less invasiveness, easiness, quickness) it appears to be particularly suitable to be associated with awake epidural anaesthesia.

### **OP-847-COMPARATIVE STUDY OF NEW DRAINAGE DEVICE (DRAINAGE BAG) AND CHEST BOTTLE FOR PLEURAL CAVITY DRAINAGE**

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**BACKGROUND:** Chest tube have been used as a close drainage system for evacuation of pleural cavity after thoracic surgery and traumatic patients. To day, the chest bottles are making from hard and fragile material that may break easily, and so for proper function chest bottle need to sterile saline solution that should be adding. Further more, heaviness of bottle with pressure effect on the chest wall, can produce severe pleuritic chest pain which interfere to early ambulation and post operative ventilation. We used a new drainage device which made from soft and paliable material (like to the urine bag) for pleural cavity drainage that has not other disadvantage of routine chest bottle.

**PATIENT & METHOD:** This clinical trial have been designed to compare efficacy of new drainage device (Drainage bag) and chest bottle for pleural cavity evacuation. Among of this study 50 selected patients with explanation for procedure and settled in two subject groups incidentally. For one group (25 patients) routine chest bottle have been utilized and for another them (25 patients) drainage bag were used as close drainage system of pleural cavity. Then two patients group compared for severity of chest pain (according to Visual Analog Score), satisfaction and duration of admission. All data were analyzed statistically.

**RESULTS:** Distribution of mean pain score was 4.2 score for drainage bag in versus to 5.5 score for routine chest bottle, as well as in the aspect of patient's satisfaction for ambulation and fungibility of device was 81% for drainage bag and 43% for routine chest bottle. Duration of admission is the other item which was evaluated and data showed 5.3 days mean duration for drainage bag and 8.7 days for chest bottle group.

**CONCLUSION:** According to these data it seems that use of "drainage bag" for evacuation of pleural cavity, can be as effective as routine chest bottle with less pain and more satisfaction of patients and shorten of hospital admission.

### **OP-848-SMALL-BORE CATHETER USING FOR THE TREATMENT OF IATROGENIC PNEUMOTHORAX**

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**BACKGROUND:** The aim of the study was to evaluate the utility of small-bore catheters for the treatment of iatrogenic pneumothorax.

**METHODS:** Between May 2004 and June 2007, 45 patients (17 women and 28 men; mean age, 46, years; age range 17-86 years) were treated with chest tube and/or pleural catheter for iatrogenic pneumothorax. Small-bore catheters (8-14 size) were used in randomized 20 of them and standard chest tubes (20-28F size) were inserted in 25 patients.

**RESULTS:** Thoracentesis was the most frequent cause of pneumothorax following by trans-thoracic fine-needle biopsy (18-11 patients). Prolonged hospitalization caused by IP was observed in 20 (46%) patients. After small-bore catheter insertion, a standard chest tube insertion was required in 7 of 20 patients (35%) because of insufficient drainage. The causes of standard chest tube insertion were subcutaneous emphysema, not fully expanded lung or prolonged air leak. Advantages of small bore catheters were mostly observed in patients who had no primary pulmonary or pleural disorders. Small-bore catheters were unsuccessful after trans-thoracic needle biopsy. Also, obstruction of small-bore catheters was commonly seen in case of hydro-pneumothoraces when pneumothorax occurred during thoracentesis.

**CONCLUSION:** Achievement of a chest drain type was depending on etiology of pneumothorax. Small-bore catheters are not recommended in case of iatrogenic pneumothorax during thoracentesis and trans-thoracic needle biopsy. However it may be used safely in remaining causes of iatrogenic pneumothorax.

### **OP-849-ANALYSIS OF 369 PATIENTS WITH ONLY ONE PLEURAL DRAIN (28 FR) ON THE THORACIC SURGERY POSTOPERATIVE**

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**BACKGROUND:** The pleural drainage was described more than 2500 years,

since the time of Hipocrates. The procedure evolved with the treatment of empiema pleural and Charles Hunter described what we consider first thoracocentesis by needle, in 1859. Playfair, in 1872, was the first one to develop the system with water stamp in bottle, however closed. Our current system with an exit for air in the bottle was created by James Kenyon (1917) and Lilienthal (1922) spread out the use of the system on the postoperative of a thoracotomy (1). Munnell (1975) after a research with more than 300 thoracic surgeons, concluded that the collecting bottle would have to be graduated, with capacity of 2 liters and it could be emptied and used again. The extension must have 180 cm and the connector would have to be serrated (2). They are esteem that more than a million of collecting bottle is used per year in the United States, with a cost that surpasses 60 million dollar (2).

**OBJECTIVE:** We have as objective to show the use of only one pleural drain (28 fr) on the post operatory of 369 patients.

**MATERIAL AND METHOD:** The charts of 369 operated patients with only one pleural drain, between 2000 and 2005, had been analyzed. We evaluated the patients about the sex, age, diagnostic, type of operation, time of drainage, time of hospital stay and complications.

**RESULTS:** the results had shown 64% male patients and 36% of female, the age varied from two months to 91 years, with median of 48,9 years, the average time of stay was 6,25 days, varying from 1 to 30 days. The average of the drain time was four days, varying from one to 26 days. We had six deaths - mortality of 1,63% and a morbidity of 11,92%, being the most frequent pneumonia, in eight patients (2.44%).

**CONCLUSION:** We conclude that the use of only one pleural drain with 28 Fr was enough and efficient for the post operatory, not being necessary two drains even 38 fr or 36 fr.



## CARDIAC III

### OP-850-THE EFFECT OF REMOTE EARLY ISCHEMIC PRECONDITIONING ON SPINAL CORD INJURY AFTER DESCENDING THORACIC AORTIC OCCLUSION

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**BACKGROUND:** We have previously shown that early and late ischemic preconditioning reduces ischemia/reperfusion-induced spinal cord injury after descending thoracic aortic occlusion in the porcine experimental model. We sought to determine the effect of remote early ischemic preconditioning on spinal cord injury in the same experimental setting.

**METHODS:** Twenty-four pigs (weight 30-35 kg) were used in this study. The animals were randomly divided into 4 groups. In group I (n=6, sham group) we followed the experimental protocol without performing occlusion of the descending thoracic aorta. In group II (n=6, abdominal aortic occlusion) the infrarenal aorta was occluded for 35 minutes. In group III (n=6, descending thoracic aortic occlusion) the descending thoracic aorta was occluded after the origin of the left subclavian artery for 35 minutes. In group IV (n=6, remote ischemic preconditioning) the infrarenal aorta was occluded for 35 minutes and after 80 minutes of reperfusion the descending thoracic aorta was occluded for 35 minutes. In all cases the occlusion of the aorta was performed under fluoroscopic guidance using aortic balloon occlusion catheters. The clinical neurologic evaluation of the animals was performed according to the Tarlov score (0-4, 0: complete paraplegia, 4: normal) by an independent observer. The animals were sacrificed on postoperative day 7 and lower thoracic and lumbar spinal cord segments were harvested for histologic evaluation by an independent pathologist. Histologic lesions were graded from 0 to 4 (0: represented the higher grade of neurologic injury in terms of the number of motor neurons and the grade of inflammation and 4: normal histologic appearance of the spinal cord).

**RESULTS:** The animals in groups I and II had normal clinical neurologic score (Tarlov score=4) and normal histologic appearance of the lower thoracic and lumbar spinal cord (histologic score=4). The animals in groups III and IV developed paraplegia. The mean Tarlov score in group III was  $1.8 \pm 0.2$  and in group IV  $2.0 \pm 0.2$ . Similarly, the mean histologic score in group III was  $1.6 \pm 0.2$  and in group IV  $1.8 \pm 0.2$ . The comparison of Tarlov scores of groups III and IV with groups I and II was statistically significant ( $P < 0.001$ ) as was the histologic score ( $P < 0.001$ ). The comparison of Tarlov score and histologic score between groups III and IV was not statistically significant ( $P = NS$ ) suggesting the inability of remote ischemic preconditioning in reducing the spinal cord injury after descending thoracic aortic occlusion.

**CONCLUSIONS:** Remote ischemic preconditioning as used in this study (35 minutes of infrarenal aortic occlusion followed by 80 minutes of reperfusion) after 35 minutes of descending thoracic aortic occlusion showed no beneficial effect on spinal cord in contrast to the early and late ischemic preconditioning in the same experimental setting. Further studies evaluating different time intervals of infrarenal aortic occlusion and reperfusion will be needed in order to determine the effect of remote ischemic preconditioning on ischemic spinal cord injury.

### OP-851-THE EFFECT OF SIMVASTATIN ON ANEURYSM FORMATION IN A RABBIT EXPERIMENTAL MODEL

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**OBJECTIVE:** To determine whether treatment with simvastatin can influence the development of experimental aortic aneurysms in a rabbit model.

**METHODS:** A total of 18 rabbits were randomized in group I (n=3) where the abdominal aortas were exposed to 0.9% NaCl and in group II (n=7) and III (n=8) where the aortas were exposed to CaCl<sub>2</sub> 0.5 mol/L for 15 minutes after

laparotomy. Groups I and II received placebo whereas group III received 2mg/kg simvastatin daily starting 7 days prior to laparotomy. Aortic diameters were measured at baseline and 4 weeks after aneurysm induction. In addition, aortas were harvested and studied for inflammation (grade 0-3) and calcification (1-3) by an independent pathologist.

**RESULTS:** Group I had normal aortas with 5% increase in aortic diameter without inflammation (mean score 0) and calcification (mean score 1.00). The mean increase in the diameter of the abdominal aortas was 58% in group II compared to 10% in group III ( $P = 0.009$ ). Group III showed reduced inflammation compared to group II (1.25 vs. 2.57,  $P = 0.002$ ). There was no difference in the degree of calcification between group III and II (2.25 vs. 2.43,  $P = 0.613$ ).

**CONCLUSIONS:** Simvastatin significantly reduced the aortic aneurysm formation as well as the grade of inflammation in a rabbit experimental model. Simvastatin may be useful as an adjuvant therapy to suppress the growth of small aortic aneurysms.

### OP-852-IS THE EUROSCORE MODEL ACCURATE ENOUGH TO PREDICT MORTALITY AFTER CARDIAC SURGERY?

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**BACKGROUND:** EuroScore is a common risk assessment method in cardiac surgery that uses 18 standard variables. Serum creatinine (Cr) is one of the variables used for prediction in the EuroScore model. Estimated Creatinine clearance (CrCl), calculated from 4 standard variables, has been suggested to be a better predictor of mortality than Cr in cardiac surgery. The aim of this study was to compare the performance of the original EuroScore model to a modified one, where CrCl replaces Cr, and finally to compare it to a prediction made solely by estimated CrCl.

**METHODS:** A total of 408 consecutive cardiac surgical patients who underwent CABG with or without AVR performed the study population. We calculated EuroScore for each patient. In addition, we used the original EuroScore variables, in our database, to build a local model and predict mortality. We used this methodology once with Cr and once with CrCl. Receiver operating characteristic (ROC) curves were used to compare the ability to predict mortality with the three above methods, in addition to CrCl as an isolated variable.

**RESULTS:** The area under the ROC curve for the local developed model with the original EuroScore variables was 0.96. The area was 0.98 when CrCl was used instead of Cr. The calculated additive EuroScore achieved an area under the curve of 0.8 while the calculated logistic EuroScore area under the curve was 0.76. CrCl as a single predictor of mortality achieved an area under the curve of 0.82.

**CONCLUSION:** The EuroScore variables were able to discriminate perioperative survival, in a local developed model, in almost all patients whether Cr was used or CrCl. The power to discriminate mortality with the calculated EuroScore was inferior to the local model, and performed equally to CrCl as a single predictor of mortality. In this cohort of patients, a 4 variables prediction model (estimated CrCl) is as accurate as an 18 variables prediction model (EuroScore). Development of an alternate prediction model is suggested.

### OP-853-OESOPHAGOGASTRECTOMY FOR CARCINOMA VIA A LEFT THORACOPHRENOTOMY

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**OBJECTIVE:** We present our results of oesophagogastrectomy via a left thoracophrenotomy and radical two field lymph node clearance.

**METHODS:** A retrospective review of all 458 patients who underwent surgery for carcinoma of the oesophagus between January 1991 and July 2007 was carried out in the above two centers. Actuarial survival was calculated using the Kaplan-Meier method.

**RESULTS:** The male to female ratio was 1.5:1 (344 males, mean age 68.3 years, range 39 to 85 years). 25 patients (5.4%) were deemed inoperable at surgery. Of the 433 patients who underwent resection, the cell type was adenocarcinoma (AC) in 273 patients (63%) and squamous cell carcinoma (SCC) in 160 patients (37%). An anastomotic leak at the oesophagogastric staple line occurred in 11 patients (2.5%). The mean in hospital stay was 13.5 days. The



mortality rate was 2.3% (10 patients). Follow-up was complete in all patients (range 0 to 95 months). Overall one-year survival was 69.5%, 3-years survival was 44.6% and five-year survival 35%.

**CONCLUSION:** Oesophagogastrrectomy via a left thoracophrenotomy with radical two field lymph node clearance can be performed with a low operative mortality and good overall 5 year survival. Surgery remains the standard against which other therapeutic modalities should be compared.

#### OP-854-EARLY AND LATE RESULTS OF CONCOMITANT LUNG CANCER RESECTION AND OFF-PUMP CABG

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**BACKGROUND:** The aim of this study was to present the early and late results of lung resection for cancer with simultaneous myocardial revascularization on beating heart [OPCAB].

**METHODS:** From 2001 to 2006, 42 patients (33 men and 9 women, mean age 62 yrs) with resectable lung cancer and unstable angina were operated on. The majority of patients were classified as stage II of lung cancer (AJCC) and stage II of ischemic heart disease (CCS). Twenty four lobectomies, eleven pneumonectomies, six wedge resections and one bilobectomy were carried out together with aortocoronary graft implantation (mean: 1.9 graft per patient). OPCAB preceded the lung resections.

**RESULTS:** There were no postoperative deaths and perioperative myocardial infarctions. The most frequent complications were as follows: atrial fibrillation (15%), atelectasis and residual pneumothorax. Patients were followed up for 8 to 60 months. Within this period of time 17 patients died mostly due to cancer relapse. Local recurrence of lung cancer and distant metastases were the only factors statistically influenced late survival of patients. Probability of survival in patients without metastases was nearly 90%. Five-year follow-up did not reveal any patients with acute myocardial infarction. In 7 patients symptoms of recurrent angina occurred and in 3 of them coronary stents were placed on.

**CONCLUSIONS:** Lung resection carried out simultaneously with OPCAB is a safe and effective method for the treatment of both diseases- lung cancer and myocardial ischemia. Concomitant lung resection and myocardial revascularization can be a good alternative for two-stage treatment in which cardiologic interventions or cardiac surgery preceded lung cancer resection. The late results in this group of patients are mostly affected by lung cancer recurrence.

#### OP-855-INTRACRANIAL ANEURYSMS IN PATIENTS WITH THORACIC AORTIC ANEURYSMS

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**BACKGROUND:** The prevalence of cerebral aneurysm in patients with thoracic aortic aneurysm is not known. This investigation is directed at this question: Should patients with thoracic aortic aneurysm have concurrent intracranial imaging?

**METHODS:** Records of 106 patients with thoracic aortic aneurysms and concurrent brain images (CT or MR scans) were analyzed. The Fisher exact probability test was used to compare incidence among different subgroups.

**RESULTS:** We found a rate of intracranial aneurysms in our patient population with thoracic aneurysms of 10%-higher than expected in the general population. We have also found a higher probability of intracranial aneurysm in patients with descending thoracic aortic aneurysms than in those with ascending aneurysms ( $p = 0.04$ ). Race, age, smoking, hypertension, and gender did not have significant impact on prevalence of intracranial aneurysms, although hypertension, smoking, and African-American race showed trends toward higher rates.

**CONCLUSION:** There is a cross-over between thoracic and intracranial aneurysm disease. We suggest that patients with ascending or descending thoracic aortic aneurysms be screened for intracranial aneurysm. This is important not only for long-term protection of the patient from cerebral consequences, but also for peri-operative awareness at the time of thoracic aneurysm resection.

#### OP-856-IMPACT OF CORONARY ARTERY DISEASE IN AORTIC VALVE SURGERY

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**BACKGROUND:** With the increase of the verified life expectancy in the last few decades, the concomitant increase of the prevalence of aortic stenosis degenerative, the coronary artery disease and the association between them has been evidenced. The present study it aims at to evaluate the influence of the critical artery coronary disease in patients with aortic stenosis and that they had been submitted to isolated aortic valve replacement or associated to the coronary artery bypass grafting.

**METHODS:** In the period of January of 2001 the January of 2006 (five years), in the Institute of the Heart of the Hospital of the Clinics of the College of Medicine of the University of Sao Paulo, 628 patients with aortic stenosis had been followed prospectively and divided in two groups: Group I with 460 (73.2%) patients submitted to isolated aortic valve replacement and Group II with 168 (26.8%) patients submitted to valvar replacement associated to coronary artery bypass grafting. The characteristics of the study population included: sex, age, index of corporal mass, cerebral vascular accident, diabetes mellitus, chronic obstructive pulmonary disease, rheumatic fever, hypertension, previous acute endocarditis, previous myocardial infarction, smoking, left ventricular ejection fraction, coronary artery disease, chronic atrial fibrillation, previous cardiac surgery, functional class - NYHA, serum creatinine concentration and total cholesterol, combination of coronary artery bypass grafting with aortic valve replacement, ampliation of the aortic ring, aortic prosthesis size, complete or incomplete coronary artery bypass grafting, number of grafts, cardiopulmonary bypass time and aortic cross clamp time. In the statistical study univariate analysis (Qui-Square test and test t of Student) and multivaried logistic regression)for evaluation of the influence of the coronary artery disease in hospital mortality in the studied groups was used.

**RESULTS:** The general mortality of this series was 15.1% (95 deaths), being 14.4% (66 deaths) in Group I and 17.3% (29 deaths) in Group II. Mortality in Group I was 14.4% (66 deaths), being 14.5% (60 deaths) in the patients without associated coronary artery disease (Grupo IB) and 12.8% (6 deaths) in the ones with this association (Group G). General mortality in Group II was 17.3% (29 deaths), being 16% (20 deaths) in the patients with complete coronary artery bypass grafting (Grupo IIA) and 20.9% (09 deaths) in the with incomplete coronary artery bypass grafting (Grupo IIB). In Group I the coronary artery disease was considered risk factor of hospital mortality ( $p = 0, 002$ ).

**CONCLUSIONS:** In the general analysis of the series, the combination of coronary artery bypass grafting with aortic valve replacement was not considered as risk factor ( $p = 0,37$ ) and in Group II the extension of the coronary artery disease ( $p = 0,04$ ) and the type of revascularizanyo of the myocardium (complete or incomplete) also had not influenced hospital mortality. The presence of the coronary artery disease associated to stenosis aortic consists in factor of risk of hospital death in the substitution to isolated valvar, on the other hand, when the coronary artery bypass grafting to the operation associated to valvar did not observe interference in mortality.

#### OP-857-MECHANICAL VALVE PERFORMANCE OVER 15 YEARS AS ASSESSED BY MICROSIMULATION: OPPORTUNITIES FOR IMPROVEMENT WITH THE ON-X MECHANICAL PROSTHESIS

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**BACKGROUND:** Mechanical prostheses in aortic and mitral valve replacements (AVR & MVR) have considerable morbidity and mortality related to major thromboembolic (TE) events, inclusive of thrombosis, and major hemorrhagic events due to anticoagulation management. The purpose of the study is to document the extent of morbidity and mortality with contemporary mechanical prostheses and to provide preliminary evaluation of control of morbidity and mortality with the On-X mechanical prosthesis (MP).

**METHODS:** Microsimulation statistical analysis was used to evaluate hemorrhagic and reoperation risk between MP and bioprostheses (BP) in AVR and MVR. The preliminary experience with the On-X MP was evaluated in near 300 patients. Preliminary results with the On-X is documented in the regulatory approval. The microsimulation patient population incorporates 1,074 of

patients (mean age 57.6 years) with MP and 2,860 of patients (mean age 70.0 years) with BP implanted between 1982 and 2000.

**RESULTS:** Actual lifetime risk of reoperation for AVR MP ranged between 10%-3% while for AVR BP ranged between 55%-3%, depending upon the age at implantation. Corresponding lifetime risk of reoperation for MVR MP ranged between 10% and 5% and for MVR BP 55% and 18%. Lifetime risk of bleed for AVR MP ranged between 25%-44% and for AVR BP 14%-12%, depending upon the age at implantation. Lifetime risk of bleeding for MVR MP was approximately 30% and for MVR BP 15% both regardless of age at implantation. Reoperation as a cause of death was less in AVR than MVR by prosthesis type. Bleeding as a cause of death was substantially greater for MP than BP for both AVR and MVR.

Regulatory results with the AVR On-X revealed a late major TE rate of 0.2%/patient-year and for MVR 1.0%/patient-year. Post-regulatory clinical experience reveals the opportunity for On-X management with low-dose anticoagulation to reduce major morbidity from TE and hemorrhage.

**CONCLUSIONS:** The use of MP for AVR and MVR requires the opportunity for low-dose anticoagulation (preferably patient-controlled) for the reduction of major hemorrhagic and thromboembolic complications.

#### OP-858-PREOPERATIVE PRO-BNP: PROGNOSTIC FACTOR IN CARDIAC SURGERY.

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**BACKGROUND:** Natriuretic peptides emerged during recent years as good biomarkers of cardiovascular disease. The plasma level of pro-brain natriuretic peptide is a strong predictor of mortality among patients with acute coronary syndromes, as well as in patients with chronic coronary artery disease. The heart secretes pro-brain natriuretic peptide in response to myocardial stretch. We assessed the role of pre-operative plasma level of pro-brain natriuretic peptide as a prognostic factor in a cohort of patients undergoing cardiac surgery procedure.

**METHODS:** One-hundred and seventy-five consecutive patients (mean age 67,2±9,8 years), 78% male (138/175), undergoing various cardiac surgery, were prospectively enrolled. Inclusion criteria were open heart surgery, EF>40%, creatinine clearance >40 ml/min, plasma creatinine level >1.0 mg/ml. Exclusion criteria were preoperative renal dialysis, preoperative IABP, cardiogenic shock. Pro-BNP concentrations were measured at hospital admission (T1), fifteen minutes after weaning from CPB (T2), on post-operative day one (T3), three (T4) and seven (T5). A multivariate analysis was used to assess prognostic role of pro-BNP, and its influence on the short term outcome.

**RESULTS:** Hospital mortality was 2.2% (4/175). Pre operative Pro-BNP plasma level (median:355pg/mL, range 126-884) was directly correlated with age ( $p<0,0001$ ;  $r=0.40$ ), and negative with preoperative EF% ( $p<0,0001$ ,  $r=-0.44$ ), preoperative Clearance creatinine ( $p<0,0001$ ;  $r=-0,42$ ), Mechanical ventilation ( $p=0,002$ ;  $r=0,23$ ) and ICU stay ( $p=0,003$ ;  $r=0,22$ ). Incidence of postoperative major adverse (death and low cardiac output syndrome) events were about 12,6% and they were correlated with pro-BNP plasma. Pre-operative pro-BNP prognostic value was 700 pg/mL (AUC 0,68;  $p=0,04$ ).

**CONCLUSIONS:** We found that preoperative pro-BNP level is a good predictor of adverse events after cardiac surgery procedure. Our suggestion is that the use of a simple blood test for pro-BNP level may help to try to adopt manoeuvre able to reduce early and late complications after open heart surgery.

#### OP-859-FEASIBILITY OF MITRAL VALVE REPAIR FOR DEGENERATIVE INSUFFICIENCY INVOLVING BOTH LEAFLETS

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**BACKGROUND:** Feasibility and reliability of mitral valve repair in patients with degenerative mitral insufficiency secondary to involvement of both mitral leaflets have been evaluated.

**METHODS:** From January 1, 1996 to January 1, 2007 four-hundred and fifty-three consecutive patients with degenerative mitral incompetence due to prolapse of both leaflets underwent surgical correction. In 439 patients (97%)

repair was accomplished by reconstruction of the chordae tendineae with polytetrafluorethylene (PTFE) sutures (mean 3.7 chordae per patient). The involvement of the posterior leaflet prolapse was generally corrected by performing a resection and a sliding plasty. A complete annuloplasty ring was almost universally implanted. In 16 patients (3.5%) the repair was accomplished (9 cases) or completed (7 cases) utilizing an "edge to edge" stitch. In 4 patients (0.9%) a prosthetic valve replacement was performed. All patients who underwent repair had either no regurgitation or trivial to mild incompetence at the end of the procedure.

**RESULTS:** Hospital mortality was 0.7%. Follow-up (6 months to 11 years, average of 6.1 years) was performed in 444 cases (98%). No cardiac-related late mortality was recorded; six patients (1.3%) presented a late failure of the repair which required a second procedure. In four patients (0.9%) repeated echocardiograms showed a stable moderate recurrent mitral insufficiency that, at present, does not require a correction. Echocardiographic controls demonstrate in 339 patients trivial to mild mitral incompetence.

**CONCLUSION:** In the majority of patients (95%) with pure mitral insufficiency with involvement of both leaflets of the mitral valve, a physiological single-orifice repair is feasible with low mortality and low medium-term recurrency rate. Repair utilizing an "edge to edge" stitch may find an occasional indication in a few patients. Valve replacement is seldom necessary.

## CORONARIES V

### OP-860-TIMING AND DURATION OF HYPOTENSIVE EPISODES DURING CARDIAC SURGERY

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**BACKGROUND:** The association between hypotension during cardiac surgery and postoperative neurologic sequelae has been established. However, beyond the choice of perfusion pressure during cardiopulmonary bypass, the relationship between specific procedural practices and hypotension has not been fully studied. We identified the frequency and duration of hypotension during cardiac surgery and related hypotensive episodes to procedural processes.

**METHODS:** We studied 117 patients undergoing coronary procedures at a single institution. Monitoring of mean arterial blood pressure began at sternotomy, ended at sternal closure, and was captured every 20 secs through a computerized interface. Hypotension, defined as > 1 minute of mean arterial pressure <50mmHg in duration, was identified during the following four phases: pre-cardiopulmonary bypass (CPB) onset, CPB onset to distal construction, proximal construction, and post-CPB.

**RESULTS:** There were a total of 565 hypotensive episodes. Hypotension occurred among 24% of patients pre-CPB, 69% during CPB onset, 74% during distal construction, 61% during proximal construction, and 21% during post-CPB. Maximum duration of episodes across phases ranged from 4 to 18 minutes. As a percentage, episodes were most common during distal construction (124, 74%), followed by proximal construction (85, 25%), CPB onset (52, 16%), post-CPB (42, 13%), and pre-CPB (32, 10%). When indexed per 30 minutes of each phase, episodes were most common during CPB onset (0.91 episodes/min). Minutes per episode were greatest during the distal construction (13.5min/episode).

**CONCLUSION:** Short and extended episodes of hypotension occur commonly during cardiac surgery. Incidence and duration of hypotensive episodes were greatest during the onset of CPB. Identifying the timing of these episodes affords the clinical team the ability to determine where to redesign their care to reduce the patient's exposure to hypotension (See Figure).

### OP-861-EARLY AND MID-TERM RESULTS OF MYOCARDIAL REVASCULARISATION USING BILATERAL INTERNAL THORACIC ARTERIES. SINGLE UNIT'S 13 YEAR EXPERIENCE.

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**OBJECTIVE:** We assessed the balance of the peri-operative risk against the potential long-term benefits of increased life expectancy in 1.419 consecutive patients who underwent CABG with the use of bilateral internal thoracic arteries (BITA) by the same surgical team.

**METHODS:** Between July 1993 and December 2006, all patients undergoing coronary artery bypass grafting receiving both internal thoracic arteries in our unit were included in the study. All demographic, peri-operative and post-operative data were prospectively recorded in a spreadsheet. All patients were followed up clinically, echocardiographically, with 12 min ECG stress test (Bruce protocol), Thallium myocardial scintigraphy and some with coronary angiography when required. Cumulative and event-free actuarial survival were calculated and risk stratified subgroups of the cohort.

**RESULTS:** A total of 1419 consecutive patients with mean age of 56.3 years, of which 1357 (95.6%) male received BITA (mean 2.3 arterial grafts /patient) during the study period. A pre-operative LVEF <45% was noted in 439 (31%) of the patients. Standard cardiopulmonary bypass with cold blood cardioplegic arrest was used. Near all right thoracic arteries were anastomosed as free grafts.

Saphenous vein and/or radial artery was utilised when more than 2 grafts were required. The LITA was used for the LAD and the RITA for the larger intermediate or marginal branch of the circumflex artery. There were 38 combined procedures (valve surgery, resection of aortic aneurysm, arterioplasty of the LMCA) and 40 re-operations. 30-day mortality was 0.56% (8 patients). Major complications were recorded at 1.3%, including 6 (0.4%) patients with deep sternal wound complications and mediastinitis. Complete follow-up is currently available in 1285 (90.55%) of these patients. At mean f-u of 7.2 years 89% of them remain in NYHA class II and cumulative survival is 94.2% while major event-free survival is 91.1%. At mean f-u of 8.4 years 102 patients underwent coronary angiography which demonstrated 94 of 96 LITAs to LAD (97.9%) and 90 of 95 RITAs to CX territory (94.7%) to be patent.

**CONCLUSION:** We demonstrate in a large cohort of patients who received BITA grafting of the left coronary territory low early morbidity and mortality. Early and mid-term results are excellent. Probability for re-hospitalisation, re-operation and unexpected death is extremely low.

### OP-862-EFFECT OF TRAINING ON LONG TERM OUTCOME IN CORONARY ARTERY BYPASS GRAFTING.

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**BACKGROUND:** There is a growing difficulty to balance the quality of the services provided with the need for surgical training. Aim of the study was to assess the effect of training on outcome in coronary artery bypass grafting (CABG).

**METHOD:** Between January 2000 and December 2003 1862 consecutive patients underwent isolated CABG. 1364 (73.3%) were operated by consultant surgeons (group A) and 498 (26.7%) by trainee (group B). Comparison of clinical characteristics, in hospital mortality and morbidity as well as mid-term mortality was made between both groups. All data were prospectively entered into a database. Mean follow up was 2120.2 days (SD 422.9).

**RESULTS:** Patients operated by consultant surgeons had higher Parsonnet score 7.3 (SD 6.1) vs. 6.8 (SD 5.5) (p=0.044), additive EuroSCORE 4.0 (SD 3.2) vs. 3.7 (SD 2.8) (p=0.026) and logistic EuroSCORE 5.2 (SD 8.1) vs. 4.1 (SD 6.6) (p=0.005). However their patients were younger 63.6 (SD 9.2) vs. 64.5 (SD 8.9) (p=0.029) and more likely to be male 1132 (83%) vs. 396 (79.5%) (p=0.042). Trainee surgeons were less likely to operate on patients with previous cardiac surgery 61 (4.5%) vs. 13 (2.6%) (p=0.034), poor EF 115 (8.4%) vs. 29 (5.4%) (p=0.03) or with preoperative IABP 78 (5.7%) vs. 7 (1.4%) (p<0.001). Patients in group A had more grafts per patient 3.3 (SD 0.9) vs. 3.0 (SD 0.7) (p<0.001), shorter bypass time 89.1 (SD 34.9) vs. 95.6 (SD 27.7) (p<0.001) and longer ITU stay 2.3 days (SD 3.1) vs. 1.7 (SD 0.9) (p=0.002). There were no other differences in postoperative period. In hospital 36 (2.6%) vs. 9 (1.8%) (p=0.15) and mid term mortality 89 (6.5%) vs. 29 (5.9%) (p=0.29) were also comparable.

**CONCLUSIONS:** Training does not adversely affect the early and mid-term outcomes of CABG.

### OP-863-"TAILOR-MADE" REOPERATIVE OFF-PUMP CORONARY SURGERY

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**BACKGROUND:** Off-pump CABG (OPCABG) has several proven advantages for multi-vessel myocardial revascularization in high risk patients. A subgroup of these high risk patients are the reoperative CABGs. Conventional redo coronary surgery has been associated with a relatively high early mortality (3.4-12.5%) in comparison with the first procedure.

**METHODS:** Between September 2004 and September 2007, 37 patients underwent reoperative OPCABG in our department. Surgical access was tailored according to patient's individual needs and was median sternotomy in 67.6% of the patients, left thoracotomy in 21.6%, laparotomy in 10.8%. Mean age was 66.47 years old, mean logistic Euroscore was 8.70. Preoperative EF was below 50% in 30.5% of the patients.

**RESULTS:** Each patient received a mean of 2 grafts, of which 88.20% received 1 or more arterial grafts. Y grafts were performed in 10 patients. Perioperative only 4 patients required blood products. During the first 30 postoperative days we recorded no mortality, renal failure, wound infection or cerebrovascu-



lar accident. In three patients perioperative myocardial infarction occurred (8.1%). Two patients developed cardiac tamponade that required surgical re-exploration. Mean hospital stay was 7.2 days. The observed mortality at thirty days was zero percent. In the 38 months follow-up Kaplan-Meier curve, the mean survival was 94.4%, with a mean survival time to date of 36.91 months. **CONCLUSION:** The standard use of OPCABG and extensive arterial revascularization as well as a "tailor-made" surgical approach has resulted in a significant reduction of mortality and morbidity, compared with the current results in the literature. Even in a small patient cohort, the observed mortality was significantly lower than the expected, according to the Log Euroscore. Observed mortality was also significantly lower than that generally reported in the literature. We conclude that a "tailor -made" off-pump approach is a safe procedure for patients undergoing reoperative coronary surgery.

## OP-864-THE ARTERIAL BYPASS: A GRAFT FOR ALL REASONS

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**BACKGROUND:** Total arterial grafting (TAG) is usually reserved for young, non-urgent patients, and misses many beneficiaries. Can TAG be used for the majority of Coronary Artery Bypass Graft (CABG) patients?

**METHODS:** In 500 consecutive patients over 4 1/4 years, TAG was intended regardless of age, co-morbidities, or urgency. In 22 patients, prudence required use of some venous conduits for disintegrating internal thoracic arteries (ITA) (2), presence of arterio-venous fistula for hemo-dialysis (2), positive Allen's test for lack of sufficient collateral support for the hand (5), shock/emergency (6), re-operation for failed arterial grafts (4), arm infection (1), and complex patients (2).

**RESULTS:** TAG was possible in 96% (478/500) of patients and 98% (1495/1528) of bypasses. The patient population consisted of: 48 emergencies (10%), 240 urgent-in-patients (48%), 146 septuagenarians (29%), 35 octogenarians (7%), 118 women (24%), 173 diabetics (35%), 30 patients with an ejection fraction <30% (6%), 116 patients with an ejection fraction of 30-50% (23%), 26 re-operative surgeries (5.2%) and 30 off-pump surgeries (6%). Mean age was 65 years (Range 29-89 years) with an average of 3.1 grafts/patient: BITA (Bilateral Internal Thoracic Arteries): 68% (342/500), Radials: 70% (350/500), and 2 inferior epigastric arteries. Sequential/composite ITA's comprised 42% (172+30/483); sequential radials comprised 31% (110/350). (Sequential grafts were single conduits with multiple anastomoses, composite grafts were "T" or "Y" grafts). Average cross-clamp time for TAG patients including redo surgery patients was: 2 CABG: 44 minutes (110 patients), 3 CABG: 67 minutes (193 patients), 4 CABG: 86 minutes (123 patients) and 5 CABG: 106 minutes (22 patients). Total operative time for on-pump TAG excluding re-operative surgeries was: 2 CABG: 3 hours (103 patients), 3 CABG: 3 3/4 hours (184 patients), 4 CABG: 4 hours (118 patients), and 5 CABG: 5 hours (22 patients). For all patients the average length of stay was 10 days, peri-operative myocardial infarction occurred in 11/500 (2.2%), post-operative intra-aortic balloon pump was required in 13/500 (2.6%), sternal infection occurred in 15/500 (3%) and stroke occurred in 5/500 (1%). Total operative mortality was 4.4% (22/500); and for non-emergent TAG was 2.3% (10/441). (This includes three deaths of four patients re-operated for failed arterial grafts). Operative mortality for non-emergent TAG in women vs. men was 1% (1/98) for women and 2.6% (9/343) for men (p=NS). EuroSCOREs for the TAG patients were: Low risk (0-2): 33% (165/500), Medium risk (3-5): 38% (190/500), High risk (6+): 29% (145/500). At a mean follow-up of 33 months, 3 late deaths have occurred (2 due to infection, 1 due to congestive heart failure). There was one late re-operation at 3.2 yrs, and 7 angioplasties were needed for failed grafts (0.5% of arterial grafts, 1.4% of patients).

**CONCLUSIONS:** Results of TAG in majority of patients are no worse than for saphenous vein. Early re-operation for failed arterial grafts carries high mortality. Prudent in selected cases, TAG can give the arterial advantage to so many more.

## OP-865-INFLUENCE OF SIMVASTATIN ON INFLAMMATORY AND METABOLIC RESPONSE TO CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** Recent studies have demonstrated that statins improve out-

come after percutaneous coronary interventions. The influence of statins on coronary artery bypass grafting (CABG) outcomes is not yet known. The aim of the study was to determine whether statins therapy continued until the day of surgery diminishes inflammatory response, influences metabolic status of the myocardium and hence, improves outcome of elective isolated CABG with cardiopulmonary bypass (CBP).

**METHODS:** The study was performed in 96 patients with coronary artery disease with stable angina - mean age 59.8±6 years, 75% males, average EuroSCORE 2.1±1.6, mean number of diseased vessels 2.6±0.5. The study was designed as a randomized double blind placebo-controlled. Patients were randomized into two groups 7 days before the surgery: 48 subjects received placebo and 48 - 40 mg simvastatin. Incidence of complications was noted during postoperative course. Cardiac markers: troponin T and CK-MB were determined preoperatively and 6, 12, 24 hours after the surgery. The inflammatory response was evaluated by level of CRP, IL-6, IL-2, IL-10, TNF-α, IFN-α determined before the surgery, 3, 24 and 72 hours after the procedure. Cardiac nucleotide metabolites such as: ATP, hypoxanthine, uric acid were evaluated in venous and arterial blood before and 6, 12, 24 hours after the surgery, in coronary sinus blood just before aortic cross-clamping, 1 and 10 minutes after declamping. Moreover the myocardium biopsy was performed to determine cardiac nucleotide metabolites before aortic cross-clamping and 10 minutes after declamping.

**RESULTS:** There was no death, myocardial infarction, ventricular arrhythmias, respiratory failure, renal failure in postoperative period noted in the studied group. Incidence of other postoperative complications and length of stay on ICU or hospitalization did not differ between simvastatin and placebo groups. Concentration of troponin, CK-MB, CRP, cytokines, hypoxanthine, uric acid and ATP in myocytes were not different between groups. ATP concentration in arterial blood sample was higher in simvastatin group only before the surgery.

**CONCLUSIONS:** Preoperative simvastatin therapy has no effect on inflammatory response, metabolic status of the myocardium during or after CABG with CPB and on clinical outcome during postoperative period. It can be hypothesized that good clinical outcome in this cohort, lack of differences of inflammatory and metabolic parameters between simvastatin and placebo group results from good clinical status of the patients enrolled for the study.

## OP-866-AUTOTRANSFUSION AFTER URGENT CORONARY ARTERY BYPASS SURGERY. SAFETY AND EFFICIACY OF POST OPERATIVE CELL SALVAGE. A RANDOMISED CONTROLLED TRIAL.

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**BACKGROUND:** A minority of patients having cardiac procedures (15% to 20%) consume more than 80% of the blood products transfused at operation. Emergency operation has been confirmed as a risk factor for blood transfusion. The aim of this study was to ascertain whether cell salvage and autotransfusion after urgent coronary artery bypass grafting is associated with a significant reduction in the use of homologous blood, a clinically significant derangement of postoperative clotting profiles, or an increased risk of postoperative bleeding. Transfusion reactions, infection risk and cost should stimulate us to decrease transfusion rates. We test the efficacy of autotransfusion following surgery in a prospective randomized trial.

**METHODS:** A prospective, randomised controlled study with ethics committee approval enrolled 100 patients undergoing in house urgent first-time coronary artery bypass grafting surgery. In group A (n=50) shed blood was collected, processed and retransfused by using the CardioPat system. The collecting period started at the end of surgery and was stopped after 6 hours. During this period we switched from conventional suctioning to the postoperative saving procedure by connecting the machine to the chest drains. In group B (control group, n=50) standard treatment without retransfusion of autologous blood was performed. Primary outcome variable was the safety and feasibility of the device, second outcome variables were postoperative haemoglobin levels and transfusion requirements. Mann Whitney U test was used for statistics. p<0.05 was accepted as significant.

**RESULTS:** All operations were performed without any mortality. There was no significant difference in preoperative and operative variables between the groups. Two patients required reopening for haemorrhage in the group A whilst four were re-explored in group B. Autotransfusion of washed red blood cells was not associated with any derangement of laboratory measures of clotting pathway function (prothrombin time, activated partial thromboplastin



time, and fibrinogen levels), increased postoperative bleeding, fluid requirements, or adverse clinical events. Transfusion requirements were higher in the control group with 11 patients receiving transfusion. The mean requirement for blood transfusion was reduced in the treatment group A. The treatment group received significantly less homologous blood than the control group ( $0.48 \pm 1$  vs  $0.28 \pm 0.7$ , respectively,  $P < 0.05$ ) with a total of 24 units transfused vs 11 units. There were no significant differences in post operative haemoglobin. The treatment group received  $69.34 \pm 134$  mls of blood as autotransfusion.

**CONCLUSIONS:** Autotransfusion is a safe and effective method of reducing the use of homologous bank blood after urgent first time coronary artery bypass grafting with a statistically significant reduction in the mean number of units transfused. This represents a potential benefit to the patient and a decrease in cost to the health service.

#### **OP-867-RANDOMIZED CLINICAL AND ANGIOGRAPHIC EVALUATION OF DIFFERENT BILATERAL ITA REVASCULARIZATION**

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**BACKGROUND:** Bilateral internal thoracic arteries (BITA) demonstrated superiority over other grafts to the left coronary system in terms of patency and survival benefit. Several BITA configurations are proposed for left-sided myocardial revascularization, but the ideal BITA assemblage is still unidentified.

**METHODS:** From 03/2003 to 08/2006, 1297 consecutive patients underwent isolated bypass surgery in our institution. 481 patients met the inclusion criteria for randomization and 304 (64%) were randomized. Patients were allocated to BITA in situ grafting ( $n=147$ ) or Y configuration ( $n=152$ ) then evaluated for clinical, functional, and angiographic outcome after 6 months and 3 years. Patient telephone interviews were conducted every 3 months and a stress test performed twice yearly under the referring cardiologist's supervision. Angiographic follow-up was performed 6 months after surgery. The primary and secondary end points were, respectively, major adverse cerebro-cardiovascular events (MACCE) and the proportion of ITA grafts that were completely occluded at follow-up angiography.

**RESULTS:** More arterial anastomoses were performed in patients randomized to the Y than in the in situ configuration (3.2 versus 2.4;  $p < 0.001$ ). No significant difference between the 2 groups in terms of hospital mortality or morbidity was found. At follow-up, there was no significant difference in any MACCE rate between the 2 groups. 450 out of 464 anastomosis (97%) in the BITA Y group and 287 of 295 (97%) in the BITA in situ group were controlled patent ( $p=0.53$ ).

**CONCLUSION:** Excellent patency rates were achieved using both BITA configurations with no significant differences in terms of MACCE up to 19 months postoperatively, but longer-term results remain to be established.

#### **OP-868-"NO-TOUCH" SAPHENOUS VEIN GRAFT HARVESTING WITH HARMONIC SCALPEL: MID-TERM RESULTS**

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**BACKGROUND:** The saphenous vein (SV) is the most commonly used conduit for coronary artery bypass surgery. However, using traditional techniques, the occlusion rate for the SV is high, with over 50% of grafts failing within 10 years. Recently, an increased graft patency has been described using a "no-touch" technique, whereby the vein is prepared with minimal vascular trauma. The aim of this study was to compare the vessel morphology and graft patency of SV grafts harvested conventionally and grafts prepared using an atraumatic "no-touch" harvesting technique.

**METHODS:** Patients undergoing bypass surgery from September 2006 through December 2007. Group A ("no-touch" technique with harmonic scalpel) consisted of 350 patients. Group B (conventional technique) consisted of 150 patients. We have examined the effects of conventional or "no-touch" technique SV harvesting on vessel morphology and graft patency. The patients were followed up at equal intervals in the outpatient clinic or were sent questionnaires. Follow-up angiography was performed in 20 patients (group A) and 30 patients (group B) at a mean of 18 months. Postoperative morphometry was

performed on 70% vein grafts both groups.

**RESULTS:** The average number of grafts was 3.15. The patency rate of the SV in group A was better than group B (98% vs 82.6%,  $P = 0.01$ ). All vein grafts from group A have not endothelial damage, however 95% of vein grafts from group B have endothelial damage (desquamation) ( $P = 0.001$ ).

**CONCLUSIONS:** The results of this study showed a better mid-term patency rate and less endothelial damage in "no-touch" versus conventional grafts.

## MULTIDISCIPLINARY IV

### OP-870-EPICARDIAL 3D ECHOCARDIOGRAPHY DURING MITRAL VALVE REPAIR: COMPARISON WITH TRANSESOPHAGEAL ECHO

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**BACKGROUND:** Mitral valve repair (MVR) is a technically demanding operation requiring detailed description of the functional anatomy of the Mitral valve. This is done conventionally with Transesophageal Echocardiography (TEE). Real-time three dimensional Echocardiography (RT3DE) is a recently developed modality that allows high-resolution dynamic visualization of the Mitral valve in real-time. We sought to compare TEE with epicardial RT3DE during MVR.

**METHODS:** 65 consecutive patients (age 62±14, 18 women) underwent MVR for previously diagnosed Mitral valve prolapse with severe Mitral Regurgitation (MR). A standard detailed TEE exam was performed in the operating room by an experienced operator. Prior to cardiopulmonary by-pass a second independent operator performed an epicardial RT3DE (Philips Sonos 7500, X3 probe), by inserting the probe into a sterile sheath. Both studies were recorded independently and were compared to the surgical findings, looking at the sensitivity, specificity and accuracy of both methods.

**RESULTS:** 51 patients had Posterior leaflet (PL) prolapse, 31 had anterior leaflet (AL) prolapse and 24 had bi-leaflet (BL) prolapse. There was successful repair (less than O MR) in all patients. Additional procedures were: CABG in 15 patients, Aortic valve replacement in 5, Tricuspid repair in 3 patients. 62 patients received an annuloplasty ring (29±5 mm), and three patients had trans-aortic Alfieri repair. A total of 390 segments were analyzed by both techniques and compared to the surgical findings. The sensitivity, specificity and accuracy (%) for TEE and RT3DE respectively are as follows: for P1 prolapse, 80 vs. 93, 100 vs 100, 95 vs. 98 (p=0.5). For P2: 100 vs. 100, 92, 9 vs. 100, 98 vs. 100 (p=1.0). For P3: 78 vs. 94, 100 vs. 100, 93.7 vs. 98.4 (p=0.25). For A1: 87.5 vs. 100, 100 vs. 100, 96.9 vs. 100 (p=0.5). For A2: 96.8 vs 100, 100 vs 100, 96.9 vs. 100 (p=1.0). For A3: 59.1 vs. 86.4, 97.6 vs. 100, 84.4 vs. 95.3, p=0.021 (significant p<0.05). Testing the overall performance of the two methods for the PL and AL respectively, there were the following agreement values when compared to surgery: For PL, 89.06% of TEE and 96.88% of RT3DE, p= 0.034 (p<0.05) and for the AL, 79.69% of TEE and 95.31% of RT3DE, p=0.002 (p<0.05).

**CONCLUSIONS:** Epicardial RT3DE is a fast and reliable method of describing Mitral valve anatomy during MVR. When compared to TEE it at least as accurate in describing isolated scallop morphology and superior to TEE for overall description of valve leaflet functional anatomy.

### OP-871-IMPACT OF CARDIOPULMONARY BYPASS ON FIBRINOLYSIS IN CORONARY SURGERY

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**BACKGROUND:** Off-pump coronary artery bypass grafting (OFFCAB) leads to an activation of the haemostatic-inflammatory system similarly as on-pump coronary artery bypass grafting (ONCAB), but fibrinolysis in ONCAB seems to be slightly greater (1, 2). The aim of this study was to search for fibrinolysis (by the method of rotation thromboelastography, and D-dimer levels) and to evaluate blood loss plus transfusion requirements in three different settings of coronary artery surgery.

**METHODS:** Sixty-five patients undergoing coronary surgery were in the prospective, randomized study enrolled. Patients were randomized into three groups: A - conventional ONCAB (open extracorporeal circulation system), B - OFFCAB, C - modified ONCAB (open rheoparin coated cardiopulmonary bypass system with the avoidance of re-infusion of cardiectomy blood into the circuit). The sampling time points for thromboelastographic evaluations were

as follows: pre-operatively, fifteen minutes after sternotomy, on the completion of peripheral bypass anastomoses, at the end of the procedures, and 24 hours after the end of surgery. D-dimer levels were evaluated before surgery, at the end of procedures and 24 hours after surgery.

**RESULTS:** No inter-group differences in the basic demographic data and pre-operative hematological characteristics were found. Thromboelastographic signs of fibrinolysis (evaluated by Lysis on Set Time - inter-group differences at 60 and 150 minutes of assessment: P = 0.003 and P < 0.001, respectively) were detectable during cardiopulmonary bypass in group A only, but not at any time in groups B and C. At the other sampling times all thromboelastographic parameters were similar in all groups. Bleeding tendency (during 24 hours after operation) was no exceptional in group A, as compared to groups B and C (P = 0.157). No significant correlations between signs of fibrinolysis in group A, post-operative blood loss and D-dimer levels were found.

**CONCLUSION:** In certain patients undergoing coronary surgery operated on with the use of conventional ONCAB were thromboelastographic signs of increased fibrinolysis clearly detectable, but they were not in the OFFCAB and modified ONCAB group. Signs of fibrinolysis were not associated with increased post-operative bleeding and D-dimer levels. REFERENCES: 1. Vedin J, Antovic A, Ericsson A, Vaage J. Hemostasis in off-pump compared to on-pump coronary artery bypass grafting: a prospective, randomized study. Ann Thorac Surg 2005; 2: 586-93 2. Jares M, Vanek T, Bednar F, Maly M, Snircova J, Straka Z. Off-pump versus on-pump coronary artery surgery. Identification of fibrinolysis using rotation thromboelastography; A preliminary, prospective, randomized study. Int Heart J 2007; 1: 57-67

### OP-872-MYOCARDIAL REVASCULARIZATION IN DIABETIC PATIENTS, BETTER THE SURGICAL OR THE PERCUTANEOUS TECHNIQUE?

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**BACKGROUND:** Cardiovascular disease in diabetes is one of the main causes of death. In Italy the prevalence of diabetes is 5-8 %, up to 26% of patients needing myocardial revascularization have diabetes. In these patients it is still not clear whether to prefer the surgical technique (CABG) or percutaneous revascularization (PCI). The Agenzia Sanitaria Regionale di Emilia-Romagna (RER) centralizes and keep available two clinical registries, one of cardiosurgical interventions (RRCC) and one of percutaneous coronary interventions (REAL). Aim of the study is the follow-up evaluation of a group of 1280 consecutive diabetic patients with multivessel coronary disease who underwent myocardial revascularization from July 1st 2002 to December 2004 either with PCI with drug eluting stents, or with CABG. We analyzed the frequency of major cardiovascular events, death, heart attack, stroke, and of repeated interventions of revascularization in the middle period and compared these data with those of non diabetic population in the registries.

**METHODS:** From a population of 4824 patients who underwent CABG and from 4254 patients treated with PCI we selected respectively 801 and 479 patients with diabetes. To obtain all the informations about the clinical features and the events of interest the registries have been integrated with record linkage to other informative flows, namely that of hospital discharge forms (SDO) and the regional registry of mortality. Besides standard descriptive techniques, statistical analysis implied univariate analysis by log-rank test and multivariate analysis with Cox models.

**RESULTS:** The two groups were similar for age and comorbidities (prevalence of EF < 0.35, heart failure, chronic renal failure, cerebrovascular disease, peripheral arterial disease) while they slightly differed for gender (women>men in PCI group), clinical presentation and distribution of coronary lesions at the time of revascularization. There was significant difference in the number of treated vessels with a more complete treatment with CABG. Mean follow-up has been 1075 days ranging from 0 to 1644 including intraoperative deaths. No significant difference was observed in postprocedural mortality nor in the rate of stroke occurrence in the two groups of diabetic patients, while PCI patients experienced more episodes of acute myocardial infarction and of target vessel restenosis. Factors influencing the occurrence of major adverse cardiac and coronary events, as shown by multivariate analysis, where the presence of PCI, age > 75 years, chronic renal disease and peripheral vascular disease.

**CONCLUSIONS:** Although the use of registries implies some limitations, for instance lack of randomization and of complete description of some interesting feature, we found useful to study this population of consecutive, non selected "real life" patients. Diabetic subjects have a greater incidence of adverse events with drug eluting stents. For this reason in these subjects we should not only know the presence of diabetes and, hopefully, its duration and degree of control but also we need to share with the patient himself and all the caring physicians the choice of the type of revascularization most suitable for each individual patient.

### **OP-873-IMPACT OF CLOPIDOGREL USE ON MORBIDITY, MORTALITY AND ON MAJOR BLEEDING IN PATIENTS UNDERGOING URGENT CORONARY ARTERY BYPASS SURGERY**

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**OBJECTIVE:** Clopidogrel is widely used in acute and chronic coronary syndromes and often administered prior to angiography. These patients are often candidates for coronary artery bypass grafting (CABG) surgery, where a potential increase in bleeding risk must be balanced with the risk of ongoing ischemia if CABG is delayed. This study aimed to evaluate the impact of clopidogrel on mortality and major bleeding in patients undergoing urgent CABG.

**METHODS:** We reviewed 451 consecutive patients (04/2005-12/2006) who underwent urgent CABG at our institution: 262 never received clopidogrel pre-CABG, whereas 189 received clopidogrel <5 days prior to the operation. The primary endpoint was in-hospital death, massive transfusion (>10U PRBC) or massive blood loss (>2L chest-tube loss/24 hrs).

**RESULTS:** Patient characteristics were similar between groups, except the incidence of prior MI (71% vs 46%), NYHA class 3-4 (94% vs 81%) and prior PCI (22% vs 13%), which were higher in patients receiving clopidogrel. Cardiopulmonary bypass and total operative times were similar between groups, although, cross-clamp time was statistically higher in the clopidogrel group (97±30 vs 90±28 min, p=0.02). There was no difference in the primary endpoint of in-hospital death or massive bleeding indices between groups (clopidogrel: 7% vs no clopidogrel: 6%, p=0.9). Furthermore; death, bleeding indices, renal failure, post-op MI and stroke, were not different even after adjusting for the date of stopping clopidogrel pre-CABG. Multivariate regression analysis showed that clopidogrel or the duration it was stopped pre-CABG, did not predict adverse outcomes. Significant independent predictors of the primary endpoint included preoperative renal dysfunction, hemoglobin level as well as the presence of peripheral vascular disease.

**CONCLUSIONS:** We report the largest evaluation of clopidogrel use as a function of perioperative outcomes in patients undergoing urgent CABG surgery. Our results demonstrate that clopidogrel, or the time it was stopped prior to CABG, was not a risk factor for in-hospital death, massive bleeding, or other poor early outcomes in patients undergoing urgent CABG.

### **OP-874-ALZHEIMER'S DISEASE-LIKE BIOMARKER CHANGES AFTER CORONARY ARTERY BYPASS GRAFTING**

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Cognitive decline after coronary artery bypass grafting is recognized and well-documented. The purpose of this study was to evaluate whether the level of cognitive biomarkers after heart surgery correlate with the development of cognitive dysfunction. Concentrations of  $\beta$ -amyloid peptide, tau and S100 $\beta$  in the cerebrospinal fluid were assessed before and after coronary artery bypass grafting, utilizing immuno-assays. A drastic rise in the level of S100 $\beta$  was observed 1 week after the surgery, the mark of a severe cerebral injury. The level of  $\beta$ -amyloid peptide significantly decreased, whereas the concentration of tau markedly increased 6 months postoperatively. These findings clearly demonstrate that changes in biomarkers after heart surgery are similar to that seen in Alzheimer's disease, confirming the cognitive decline after cardiac interventions at the molecular level.

### **OP-875-IS THERE ANY EVIDENCE FOR USING THE PREOPERATIVE INTRA-AORTIC BALLOON PUMP IN CORONARY ARTERY SURGERY: AN UPDATED META-ANALYSIS WITH MORTALITY OUTCOMES.**

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**OBJECTIVE:** A body of randomised and non-randomised evidence is mounting in favour of deploying the intra-aortic balloon pump in certain high risk patients undergoing coronary artery surgery. However, patient inclusion criteria in most studies has allowed the data to be diluted with unstable patients. Thus it has been difficult to determine whether the preoperative intra-aortic balloon pump is an efficacious prophylactic measure in truly elective patients, or is simply a treatment measure in in-house urgent unstable patients. The objective of this work was to update our previous meta-analysis in an attempt to clarify this issue.

**METHODS:** Searches were performed of Cochrane Central Register, MEDLINE (2000-2007) and EMBASE (1998-2007). All randomised controlled trials (RCTs) were included. Meta-analysis of RCTs was performed using RevMan 4.1. One randomised controlled trial was identified from the abstracts of WSCS 2007 (Ottawa, Canada) but has not yet appeared as a full paper (Oberhoffer et al.).

**RESULTS:** Six RCTs were identified. A total of 255 patients were included in this study, of which 132 had a preoperative IABP, and 123 were treated routinely without this intervention. Generally, patients were designated as high risk but definitions were variable between studies. There were 4 deaths in the control arm and 23 deaths in the treatment arm (odds ratio 0.18; 95% CI, 0.08-0.41; P<0.0001). A large proportion of the control arm (61) had an IABP inserted post-operatively for low cardiac index further complicating the data. Evidence still suggests one hour of preoperative IABP augmentation is optimal. An analysis of off-pump surgery was not possible due to the limited number of studies.

**CONCLUSIONS:** Although randomised evidence is mounting for use of a pre-operative intra-aortic balloon pump in coronary artery surgery, there remains controversy whether the studies suggest this is a treatment strategy in unstable patients, or an efficacious prophylactic measure in high risk elective patients.

### **OP-876-REDO SURGERY IN END-STAGE ISCHEMIC HEART DISEASE 15 YEARS AFTER MULTIPLE CORONARY ENDARTERECTOMY (CASE REPORT)**

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**BACKGROUND:** Coronary endarterectomy is the most controversial method in cardiac surgery. High perioperative morbidity and mortality are arguments that discourage the use of coronary endarterectomy. However, unlimited coronary stenting and no available donors for heart transplantation forced us to re-evaluate this method.

**METHODS:** We present a 65 y/o male with unstable angina, low ejection fraction (<30%) and severe functional mitral and tricuspid regurgitation 15 years after multiple coronary endarterectomy.

**RESULTS:** The patient was successfully treated with REDO coronary bypass surgery combined with reductive annuloplasty of mitral and tricuspid orifices (RADO procedure). Postoperative course of the patient was uneventful. He was discharged on postoperative day #10, and was remaining stable twelve month after surgery.

**CONCLUSIONS:** REDO surgery after multiple coronary endarterectomy is still a challenge. However, it could be successfully performed even in patients with End-stage Ischemic Dilated Cardiomyopathy. Results indicate that RADO procedure in addition to bypass surgery should not be recognized as a simple valve repair, but ventricular repair procedure as well.

### OP-877-IS CAROTID SCREENING OBLIGATORY IN YOUNG PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING?

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**BACKGROUND:** High-risk patients for postoperative stroke (CVA), have history of stroke or peripheral vascular disease (PVD) or age  $\geq 65$ . They have to undergo carotid artery duplex before coronary artery bypass grafting (CABG). Aim of this study is to identify the utility of routine carotid duplex screening before CABG in patients without the above risk factors, as CVA constitutes a serious complication in CABG.

**METHODS:** The subjects of this study were 330 patients < 65 years old without any risk factors, compared to 635 patients with the above-mentioned risk factors for CVA, who underwent CABG. All patients had a carotid color duplex examination. The common carotid, internal and external carotid arteries, and the vertebral arteries were scanned bilaterally for the presence of occlusion or stenosis; furthermore some underwent CT angiography when the duplex was inconclusive.

**RESULTS:** From the 330 patients with age <65 years old - without risk factors - 33 (10%) had stenosis  $\geq 50\%$  and 4 of them underwent combined CEA-CABG. None of them suffered from postoperative stroke. Patients with increased age ( $\geq 65$  years) and without history of CVA or PVD had rate 17,1%.

**CONCLUSIONS:** In today's era of economic constraint, it becomes necessary to demonstrate cost-effectiveness screening tests for asymptomatic disease. In patients <65 years old, the rate of carotid stenosis was important and carotid artery screening should definitely be performed in all CABG patients. That it would help to modify the operative strategy to reduce the dreadful incidence of postoperative stroke.

### OP-878-FAST TRACK CARDIAC ANESTHESIA FOR CORONARY ARTERY BYPASS GRAFTING: EFFECTS ON HEMODYNAMICS AND EXTUBATION TIME

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**BACKGROUND AND AIM OF THE WORK:** The incidence of ischemic heart disease (IHD) is gradually increasing During last decades.CABG operations have been the most effective surgical method in the treatment of IHD.One of the most important factors that affect the morbidity and \_or mortality during CABG operation is the anesthetic technique that used, and its direct or indirect effects on cardiac function. Fast-track approach uses modified anesthetic management that facilitates early extubation after surgery - has proved to be safe and cost beneficial by reducing ICU stay.

**METHODS:** Sixty patients undergoing CABG surgery at National heart Institute (NHI) - were studied. Patients were classified into tow groups: Group I: (include 30 patients) received Fentanyl-sevoflurane and picecuronium, Group II: (include 30 patients) received Remifentanyl - propofol and cisatracurium. Monitoring is done using the usual monitors for ECG, Invasive BP, SPO<sub>2</sub>, Etco<sub>2</sub>, HR, CVP & urine output . In addition, cardiac output (COP), cardiac index (CI) and systemic vascular resistance (SVR) are monitored using trans-esophageal Doppler technique. The following criteria were considered: 1- Time from skin closure to return of spontaneous breathing. 2- The eligibility for start of extubation. 3- Time of actual extubation to compare between the tow protocols for fast-track anesthesia. Our study aimed to measure the hemodynamic changes at special events intraoperatively that considered major stress points, these are: intubation, sternal skin incision, sternotomy, maximal sternal spread (MSS), and sternal wire placement.

**RESULTS:** As regard MAP, patients in group (I) had a fluctuation in MAP: significant decrease after: induction (\_19.6%), intubation (\_8.5%), skin incision (\_3.5%), on-by pass (\_11.6%), SWP(\_7.4%), end of surgery (\_8.6%), ICU admission (\_7.3%),from pre-operative value . While in group (II) there was no fluctuation in MAP, but there was significant decrease in all major stress events during operation. As regards cardiac index (CI): there was also fluctuation in group (I) between significant decrease (e.g.: 1.95 after induction = 20%decrease from preoperative Value), and significant increase after sternotomy and MSS (12.4% and 22% from the preoperative values). While in group II, cardiac index (CI), showed much less fluctuations throughout the surgery and

also after the surgery. As regards SVRI: group I: insignificant changes as compared to preoperative values. Group II: statistically significant decrease in SVRI in most of times intraoperatively and post-operatively as compared to preoperative values. \_ When both groups compared together, the decrease in group II in SVRI, was statistically significant compared to group I. As regard the time needed for return of spontaneous breathing, (37 min GI&14 min GII), time to eligibility to start extubation, (114 min G I and 93 min G II) And the actual time of extubation, (217.7 min G I & 181.4 min G II), : All were shorter in group II than in group I, but the difference was statistically insignificant.

**CONCLUSION:** both regimens were tolerated and can provide fast-track anesthesia in CABG surgeries. The second regimen (Remifentanyl, propofol and cisatracurium) was better tolerated and provide better control over major anesthetic and surgical stress events without prolongation of recovery time, than the second regimen .So, we recommend the use of this anesthetic regimen for anaesthesia for CABG

### OP-879-PREDICTORS OF POST-OPERATIVE ACUTE RENAL FAILURE REQUIRING RENAL DIALYSIS AFTER CARDIAC SURGERY

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**BACKGROUND:** Renal dysfunction occurring in the immediate post-operative period is known to significantly increase morbidity and mortality after cardiac surgery. The aim of this study was to evaluate the predictors of renal dysfunction requiring renal dialysis after cardiac surgery.

**METHODS:** We analysed 7851 consecutive patients who underwent cardiac surgery at our institution between 1997 to 2005. All patients with pre-existing renal disease on dialysis were excluded from the study. Multiple logistic regression analysis was done to ascertain the predictors of post-operative renal dysfunction requiring dialysis. Risk-adjusted odds ratios (OR) and their 96% confidence intervals (CI) were calculated for each outcome.

**RESULTS:** We identified 129 (1.6 %) patients who required renal dialysis after cardiac surgery. Preoperative predictors of renal dialysis after cardiac surgery included Dyspnoea status (p<0.001, OR 1.6, 95% CI 1.3-2.0), Diabetes (p<0.032, OR 1.7, 95% CI 1.1-2.8), Euroscore (p<0.001, OR 1.2, 95% CI 1.1-1.3) and Angina status (p<0.05, OR 0.8, 95% CI 0.7-1.0). Intra-operative predictor of renal dysfunction requiring renal dialysis was Total bypass time (p<0.03, OR 1.0, 95% CI 1.0-1.1). Post-operative variables giving rise to a high incidence of renal dialysis included Low cardiac output syndrome (p<0.024, OR 2.2, 95% CI 1.2-4.7), use of Intra Aortic Balloon Pump (p<0.018, OR 2.3, 95% CI 1.2-4.3), Atrial Fibrillation (p<0.05, OR 1.5, 95% CI 1.3-2.3), Tracheotomy (p<0.02, OR 2.0, 95% CI 1.1-3.8), Sepsis (p<0.03, OR 2.4, 95% CI 1.3-5.3), Gastrointestinal bleeding (p<0.015, OR 4.2, 95% CI 1.3-13.0), Ventilation time (p<0.001, OR 2.7, 95% CI 2.0-3.6), Readmission to intensive care unit (p<0.03, OR 2.0, 95% CI 1.1-3.8) and total hospital stay (p<0.02, OR 1.6, 95% CI 1.3-2.0). Mortality was exceptionally high in this group of patients (p<0.001, OR 6.8, 95% CI 4.0-12.0)

**CONCLUSION:** This study reveals that patients requiring renal dialysis after cardiac surgery indeed carry a very high mortality and morbidity. Recognizing risk factors permits the timely institution of proper treatment, which is the key to reducing untoward outcomes. Optimizing diabetes control and cardiac output, reducing cardiopulmonary bypass time, gastro-intestinal bleeding and sepsis may improve the outcome of patients at high risk of acute renal failure requiring dialysis.

### OP-880-RADICAL EXCISIONAL THERAPY FOR A HUGE RECURRENT MYXOMA THROUGH COMPLETE TRANSECTION OF AORTIC ROOT

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**BACKGROUND:** Recurrence of left atrial myxoma into a huge adhesive mass occupying nearly the whole atrium many years after first operation is rather uncommon. Here we present radical excision of a large recurrent myxoma through complete transection of aortic root.

**METHOD:** A 65 years old man was referred to our hospital due to repeated syn-copal attacks and a 9X8X5 Cm left atrial mass detected on echocardiography



with involvement of nearly whole septum and roof of the left atrium and suspicious penetration to the aortic root. The operation was radical excision of this tumor alongwith septum and left atrial roof after complete transection of aortic root for better access to the atrial wall and examination of aorta for any involvement.

**RESULT:** the patient had an uneventfull hospital stay and was discharged from hospital two weeks after operation and insertion of Permanent Pace maker and no evidence of recurrence 12 months postoperatively by echocardiography.

**CONCLUSION:** Radical excisional therapy through aortic root transection is a practical solution for challenging huge recurrent myxoma.

#### **OP-881-MULTIDISCIPLINARY APPROACH FOR REDUCED INCIDENCE OF STROKE AFTER CORONARY ARTERY BYPASS**

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**BACKGROUND:** Postoperative stroke (CVA) constitutes a serious complication in coronary artery bypass grafting (CABG) rated between 2-3,6%. In this study we present a multifactorial approach of CVA prevention.

**METHODS:** We used a protective strategy in 894 patients who underwent CABG with aim to reduce the incidence of CVA: a) patients had a carotid color duplex, b) patients with CVA history had neurological consultation and CT, c) we preferred to operate them off-pump, d) patients with carotid stenosis  $\geq 75\%$  underwent simultaneous carotid endarterectomy (CEA-CABG), e) CABG technique included single aortic occlusion, f) myocardial protection was accomplished with cold blood cardioplegia, g) during the procedure, in patients with history of CVA, the MAP was 70-75 mm Hg, h) the monitoring included Swan Ganz, SVO<sub>2</sub>, TEEcho and Cerebral oxymetry.

**RESULTS:** Risk factors for CVA were, age  $\geq 65$  years (54,3%), carotid stenosis  $\geq 50\%$  (21,9%) and history of CVA (4,25%). CVA occurred in 6 patients (0,78%) operated on-pump. We preferred to operate high-risk patients off-pump and in this group the incidence of stroke was nil. Also nil was the incidence of CVA in 27 patients who underwent combined CEA-CABG.

**CONCLUSIONS:** In our group of patients the observed incidence of perioperative CVA was low as the result of our multidisciplinary approach. The use of carotid ultrasonography should be considered in all patients before CABG and neurological consultation in patients with history of CVA in order to select the best surgical technique and ensure the perioperative and postoperative safety and prognosis.

## MINI PRESENTATIONS VI

### OP-882-URGENT CAROTID SURGERY FOR MULTIPLE TRANSIENT ISCHEMIC ATTACKS.

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**BACKGROUND:** To evaluate the postoperative outcomes of urgent carotid surgery in patients admitted for multiple transient ischemic attacks (TIAs) in our stroke unit.

**METHODS:** Between January 2002 and December 2007, patients operated on urgently for multiple TIAs were identified in our prospectively collected database. Multiple TIAs were defined as > 2 TIAs within the preceding 15 days, despite optimal medical treatment. Patients were examined by neurologists via the stroke unit: ABCD 2 predictive stroke risk score was determined at admission, and neurological impairment was assessed pre-, postoperatively and at follow-up using the Rankin scale. Duplex sonography was mandatory for the diagnosis of an ipsilateral patent internal carotid artery (ICA) with a stenosis > 70 %. Assessment of intracerebral damage followed computed tomography (CT) or magnetic resonance (MR) imaging procedures. Perioperative and surgical management was standardized. Post-operative stroke, death, and any major cardiac events were analysed.

**RESULTS:** Thirty eight multiple TIAs patients had sustained a median of 3 TIAs (range, 2 to 15) in the 15 days before surgery. The mean of ABCD2 score was 5 (score II: 1 patient, III: 3, IV: 8, V: 11, VI: 12, VII: 3), and the mean preoperative Rankin score was 1.4 (range, 1 to 4). The mean degree of ICA stenosis was 88 % (range 70 to 99), assessed by an additional CT or MR arteriography of the supra aortic vessels in 31 patients (82%). Ipsilateral cerebral infarctions were diagnosed in 24 patients (63 %), with an additional image of recent haemorrhage in one patient. All patients underwent conventional endarterectomy with PTFE patch angioplasty, within a median of 7 days after the first TIA (range, 1 to 15). Local anaesthesia could be used in 30 patients (79 %), and the other 8 patients were performed under general anaesthesia with systematic shunting. The median in-hospital postoperative stay was 4 days (range, 2 to 9). At one month, the Rankin score was improved in all patients, with no restenosis on duplex scan. No post-operative stroke, death or major cardiac events were recorded at 90 days, whereas the rate of stroke predicted from ABCD2 scores was 8.9 %. This compares with a < 1 % stroke and death rate in 430 patients undergoing elective carotid endarterectomy during the same time period.

**CONCLUSIONS:** In our experience, urgent carotid surgery is highly beneficial for patients presenting multiple TIAs with > 70 % stenosis, especially considering the natural history of such unstable neurologic symptoms.

### OP-883-RELATIONSHIP BETWEEN BMI AND POST-OPERATIVE STROKE IN PATIENTS UNDERGOING ISOLATED CABG

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**BACKGROUND:** Factors associated with morbidity and mortality following isolated coronary artery bypass graft surgery (CABG) have been extensively investigated, yet uncertainty regarding the risk associated with obesity (or cachexia) and a number of postoperative adverse outcomes remains. The inconsistent findings regarding the association between body mass index (BMI) and adverse outcomes following coronary artery bypass graft surgery (CABG) may be attributable to grouping BMI into weight classes.

**METHODS:** We evaluated the effect of BMI categorization using a cohort of 5,762 patients receiving isolated CABG at Baylor University Medical Center, Dallas, TX. A propensity-adjusted model was used to investigate the relationship between post-CABG stroke and BMI using: 1) a BMI categorization selected from relevant literature; and 2) a smoothing flexible technique which avoided forcing BMI into categories.

**RESULTS:** The propensity-adjusted model for the smoothed association between BMI and postoperative stroke revealed a moderate effect of BMI on

the risk of stroke ( $p = 0.056$ ). Based on the model using the categorization scheme, patients within the 25-29.9 kg/m<sup>2</sup> (Odds Ratio [OR] = 0.54; 95% Confidence Interval [95%CI]: 0.34, 0.85) and 30-34.9 kg/m<sup>2</sup> (OR = 0.53; 95%CI: 0.30, 0.95) ranges were less likely to experience postoperative stroke compared to patients with BMI within the 20-24.9 kg/m<sup>2</sup> range. The elevated risk associated with cachexia was not significant, likely due to the small number of cachectic patients. Categorization provided a poor fit to the smoothed risk as the estimated hazard for certain BMI categories (BMI 30-34.9 kg/m<sup>2</sup>), deviating from the curve representing the BMI-stroke association while forcing entire ranges of BMI to receive the same risk estimate. As a result of the poor fit, inferences regarding risk differences between patients in these BMI groupings will be inaccurate.

**CONCLUSION:** Categorization markedly biased the estimated risk of stroke and the resulting inference regarding risk differences across the range of BMI. We conclude that categorizations can mis-specify the relationship between BMI and the risk of stroke. Future research should consider flexible approaches instead of grouping BMI into categories.

### OP-884-DOES ARCH REPLACEMENT IMPROVE OUTCOMES AFTER ACUTE TYPE A AORTIC DISSECTION?

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**BACKGROUND:** To evaluate outcomes after arch replacement in acute type A aortic dissection (TAAD).

**METHODS:** From 1982 to 2006, 373 patients underwent emergency surgery for TAAD. Among these, 252 patients (mean age 62 ± 11 years) underwent arch replacement (203 proximal and 49 total arch). Indication for total arch replacement was Marfan syndrome in 2/49 patients and intimal tears in the transverse arch in 47/49 patients. Total arch replacement was performed with antegrade cerebral perfusion in 16 patients (32%).

**RESULTS:** Mortality was higher after arch replacement (39%,  $p=0.0105$ ). Risk factors for operative death were arch surgery ( $p=0.0074$ ; OR 2.66) and intimal repair ( $p=0.0038$ ; OR 0.40). Risk factors for late death were repair of intimal tear ( $p<0.0001$ ; RR 2.31) and aortic cross-clamp technique without deep circulatory arrest ( $p=0.0001$ ; RR 0.44). Long-term survival after arch replacement was lower ( $p=0.1323$ ). Freedom from reoperation after arch replacement was higher ( $p=0.2935$ ).

**CONCLUSIONS:** In our experience the arch replacement increases operative mortality and doesn't improve long-term survival. A tear-oriented essential approach should be considered to improve outcomes in TAAD.

### OP-885-TYPE A AORTIC DISSECTION: LONG TERM OUTCOMES IN AN ACADEMIA HOSPITAL IN ARGENTINA

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**BACKGROUND:** Aortic dissection type A is a serious disease and its consequences could appear long after the initial admission. Data on long term outcome of patients with aortic dissection type A in Argentina are scarce. Thus, we sought to assess the long term outcome in a cohort of patients treated in an academic hospital.

**MATERIALS AND METHODS:** This is a descriptive study that included 155 patients treated for aortic dissection type A in Hospital Italiano de Buenos Aires between 1972 and 2006. Clinical outcome was defined as the occurrence death, development of new aneurisms or dissections, re operation, or major vascular events (MI and stroke).

**RESULTS:** Median age was 55 years ± 14.5. Most of the patients were male (71%), 68.4 % (n) had history of hypertension, and 68.4% (24) of the patients suffered from Marfan syndrome. Survival (Kaplan Meier) was 91% (IC 95:84 - 95%) at 5 years, 65% (IC 95: 52-75%) at 10 years, and 54% (37 - 70%) at 15 years. Survival free from events (Kaplan Meier) was 86.5% (IC 95:79 - 91%) at 5 years, 55% (IC 95: 43-65%) at 10 years, and 31% (20 - 44%) at 15 years. Presence of aneurism ( $x^2 = 9.59$ ,  $p=0.002$ ), re operations ( $x^2 = 6.35$ ,  $p=0.01$ ), and rupture (test de fisher 0.0000....) were associated with mortality during long term follow up. In a multivariate analysis (Cox regression), rupture (HR 14.25),

and re operation (HR 2.36) were found as independent predictors of death.

**CONCLUSION:** In Argentina, long term survival and occurrence of events in patients treated for aortic dissection type A are acceptable and similar to the rates reported in the literature. The follow up should include imaging of the remaining aorta and the aortic valve to detect at an early stage the appearance of predictor of mortality.

#### OP-886-AORTIC ROOT SURGERY: TEN YEAR EXPERIENCE AT THE FAVALORO FOUNDATION

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**INTRODUCTION:** Aortic root surgery has become a common place in cardiovascular surgery. Different surgical options are to be considered according to individual patient's characteristics.

**OBJECTIVE:** to evaluate the patient's profile, disease process, and early and late outcomes of the population requiring surgical treatment for aortic root disease.

**METHODS:** from January 1997 to January 2007, 880 surgical procedures involving the aortic root, were performed at our institution. Preoperative patient's characteristics, type of surgical procedure performed, and postoperative outcome were considered. Valve-associated events (death, endocarditis, thromboembolism, reoperation, valvular dysfunction) were analyzed with Kaplan Meier curves. Log-rank test, chi-square and the Cox model were used for variable analysis.

**RESULTS:** the surgical procedures performed were: Bentall De Bono 340 (38%), Homografts 182 (21%), Ross procedure 165 (19%), ascending aortic replacement 92 (10%), Cabrol surgery 23 (3%), Freestyle prosthesis 31 (4%), and valve sparing procedure 45 (5%). Bentall De Bono was performed as an isolated procedure in 166 p (49%), it was elective in 257 p (76%) and was indicated in the setting of acute aortic dissection in 83 p (24%). Global hospital mortality was 12% (Parsonnet score 13), 3% when Bentall was an elective isolated procedure, and 20.5% vs 9.5% ( $p < 0.001$ ) when comparing dissection vs non dissection. Nine p required reoperation during follow-up. For the Ross procedure, hospital mortality was 2.4%; and freedom from valve related events and from reoperation at ten years were 91% (CI 95%,86-96) and 97% (CI 95%,94-99), respectively. Of the 182 homografts implanted, 81 (45%) were used for the treatment of infective endocarditis with aortic root compromise. Surgery was performed as an urgent or emergent procedure in 91 p (49%). Global hospital mortality was 17% (Parsonnet score 19), and 32% when surgery was indicated in the setting of severe acute aortic regurgitation due to active infective endocarditis. The valve sparing procedure (VSP) most frequently chosen was remodelling (40 of the 45 VSP patients). Nine patients were Marfan, and surgery was performed for the treatment of acute aortic dissection in 11 p. In 24 p (53%) the VSP was an isolated surgical procedure. Global hospital mortality for VSP was 4.4% (2p). During the same time period, aortic root surgery was performed in 54 Marfan patients; in 36 of them (66%) on elective basis, and in 21 p (39%) for the treatment of aortic dissection. The type of surgery performed in the Marfan group was: Bentall in 39 p (71%), reimplantation in 9 (17%), Cabrol in 3 (6%), and homograft in 3 (6%). Global hospital mortality was 3.7% (2p) and 2.8% when surgery was elective. During follow-up 13 p required reoperation, mainly for distal redissection (9 p). Survival at 2, 5 and 10 years was 94%, 83%, and 75%, respectively.

**CONCLUSIONS:** several pathological conditions require aortic root surgery. The type of surgical procedure to be performed needs to be tailored considering the individual patient's characteristics.

#### OP-887-EMERGENCY ENDOVASCULAR REPAIR OF ACUTE THORACIC AORTIC PATHOLOGY

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**BACKGROUND:** Preliminary results suggest that stent grafting is an attractive alternative to conventional open surgery for treatment of acute thoracic aortic pathology. The aim of this study was to report single-center prospective results of emergency endovascular treatment of acute thoracic aortic disease ruling out degenerative/atherosclerotic aneurysms.

**METHODS:** From April 2005 to June 2007 data from patients with acute tho-

racic aortic pathology treated in our department with an endovascular procedure were prospectively collected. Diagnosis and localization of the aortic lesions were confirmed by contrast-enhanced CT scan. Stent-grafts (Talent, Valiant, Medtronic) were placed via a femoral or iliac access route. The procedure was considered to have succeeded in case of complete aortic wall tear occlusion. CT scan follow up was obtained before discharge and every 6 months after the procedure.

**RESULTS:** During the 2-year study period 24 patients (male 15, female 9, mean age 42 years) were treated. Pathology of aortic lesions included traumatic aortic transections ( $n=10$ ), symptomatic penetrating ulcers ( $n=10$ ), traumatic intramural hematomas ( $n=2$ ) and acute Type B dissections ( $n=2$ ). Two patients died before treatment could be initiated. In four patients a combined prior bypass of the left supra-aortic arteries was performed. The stent graft was successfully delivered in all 22 patients. There were no procedure related deaths. One patient (4.5%) admitted for aortic transection died of other co-existing injuries. One patient presented deterioration of a preexisting renal failure. There were no cases of paresis or paraplegia. Mean follow up was 12.4 months (6-30). CT scan follow-up did not reveal evidence of endoleak, stent migration, collapse or pseudoaneurysm formation.

**CONCLUSION:** Stent grafting with commercially available devices for the treatment of acute thoracic aortic pathology (ruling out degenerative/atherosclerotic aneurysms) is technically feasible and can be performed in emergency with low rates of morbidity and mortality.

#### OP-888-NOVEL METHOD FOR BIO GLUE USE IN SURGERY FOR ACUTE AORTIC DISSECTION

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**INTRODUCTION:** This report will summarize our experience using new hemostatic technique using suction-assisted bioglue application for aortic suture line reinforcement during surgery on acute aortic dissection (AAD).

**MATERIAL AND METHODS:** 20 consecutive patients were treated in our center for AAD using this technique. Moderate hypothermia ( $30^{\circ}\text{C}$ ) with antegrade selective cerebral perfusion via the right subclavian artery was used during ascending aorta and hemiarch reconstruction in 17 and complete arch in 3 patients. Bioglue reconstruction of the dissected layers and proximal and distal aortic anastomosis is performed, reinforcing the suture line with previously cut strips from the prosthesis, followed by bioglue application on the outside of the anastomosis while applying suction from the inside of the prosthesis using catheters from the house suction, thus forcing the bioglue to impregnate the suture line, reinforcing it and closing the needle holes.

**RESULTS:** There were no bleeding complications during surgery and there were no re-explorations or early deaths as result of bleeding. Average daily chest tube drainage was  $582 \pm 150$  ml/day, with the duration of drainage of  $2 \pm 0.9$  days.

**CONCLUSION:** Our method is simple and safe to use, with excellent operative results and reduced chest tube drainage and need for transfusion.

#### OP-889-USE OF CEREBRAL OXIMETRY TO FACILITATE ADULT AORTIC ARCH SURGERY AT MODERATE HYPOTHERMIA

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**BACKGROUND:** A Cerebral Oximetry system (INVOS<sup>®</sup>) has been recently introduced to measure adequacy of cerebral perfusion. We describe the use of this system in a series of adults undergoing aortic arch surgery at moderate hypothermia.

**METHODS:** 5 patients (4 males and 1 female, age range 49-69) with type A aortic dissection in 2, aortopathy associated with a bicuspid aortic valve in 2 and with Ehlers-Danlos in 1 underwent partial replacement of the aortic arch with unilateral antegrade cerebral perfusion at moderate hypothermia ( $30-32^{\circ}\text{C}$ ) without circulatory standstill. In 2 patients with Stanford type A aortic dissection, antegrade cerebral perfusion via the right axillary artery was combined with corporeal perfusion via the right femoral artery. This allowed the whole of the aortic arch to be isolated, inspected and partially replaced. In the rest, both cerebral (left sided) and corporeal perfusion was provided through a cannula in the distal aortic arch which was clamped between the innominate and the left common carotid. This allowed distal anastomoses to be carried out

at the level of the proximal arch. Additional procedures carried out included aortic root replacement with a composite prosthesis in 2, CABG in 2 and mitral valve repair for endocarditis in 1.

**RESULTS:** Bilateral cerebral perfusion as measured by the INVOS system was maintained throughout the procedure. Mean bypass time was 254 minutes (129-301) and cross clamp time 184 minutes (68-254). Mean number of transfused blood products were 4.8 (RBC), 2 (platelets), 6.4 (FFP) 0.8 (cryo). Mean chest drainage was 958mls (350-1600). All patients but one were extubated within 15 hours. All survived without any neurological damage.

**CONCLUSION:** Measurement of Cerebral Oximetry allows the use of unilateral cerebral perfusion in aortic arch surgery with confidence. Hypothermic circulatory arrest and associated problems of coagulopathy, neurological damage and long operating times can thus be avoided in many cases.

## OP-890-AORTIC VALVE REPLACEMENT IN PATIENTS OLDER THAN 60 YEARS

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**OBJECTIVE:** The aim of our study was to evaluate clinical outcomes and changes in hemodynamic parameters including left ventricular mass index at 1 year follow-up in patients undergoing either isolated or concomitant aortic valve replacement procedures with stentless aortic valves versus mechanical prostheses.

**METHODS:** Between January 2002 and August 2005, a total of 88 consecutive patients older than 60 years with the diagnosis of aortic stenosis and/or aortic regurgitation, who undergone aortic valve replacement were analysed. 44 patients had aortic valve replacement with mechanical bileaflet aortic valves in group-I (m-AVR, mean age 69,3 years). In group-II, 44 patients received stentless aortic bioprosthesis (s-AVR, mean age 72,3 years). For both groups mean follow up time was 24 months, total follow up time was 1584 months.

**RESULTS:** There was no difference between two groups in their preoperative clinical profile. Cross clamp and total cardiopulmonary bypass times were longer in s-AVR group compared with m-AVR group. The regression of left ventricular hypertrophy and residual aortic valve gradients were significantly more pronounced in the s-AVR group in comparison to mechanical valve replacement group. The maximal regression in left ventricular mass at one year was 23% in s-AVR, but 18% in m-AVR. For both groups the regression of left ventricular mass index was maximal at postoperative six months. We have found no difference in operative and 30-day mortality rates for both groups. Although we haven't found any statistical difference in early and late complication rates, complications because of bleeding, thromboemboli and endocarditis were lower in s-AVR group.

**CONCLUSION:** AVR operations with stentless biological valves in patients older than 60 years can be performed with an acceptable mortality and morbidity rate. AVR with stentless bioprosthesis gives the advantage of low rate of thromboemboli, bleeding and endocarditis events without the need for anticoagulation. Stentless biological valves should be considered for AVR in patients older than 60 years of age.

## OP-891-THE USE OF SURGICAL SPONGES TO TREAT SEVERE BLEEDING IN PATIENTS OPERATED ON FOR ACUTE AORTIC DISSECTION

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**BACKGROUND:** Aortic dissection is one of the most demanding problems in surgical practice in terms of severe bleeding. The pathology of aortic dissection leads to destruction of medial layer of the aorta as a result of intimal tear. The purpose of the operation is to remove whole diseased aortic wall and replace it with an aortic graft. Unfortunately in many cases it can not be achieved and the graft must be sutured into fragile tissue. That graft-patient's tissue anastomosis is a major source of surgical bleeding. Problems with hemostasis are not only caused by surgical bleeding but also coagulopathy as a result of specific conditions during operation such as prolonged cardiopulmonary bypass (CPB) and deep hypothermia (DH). We would like to present our approach to refractory

bleeding encountered in patients operated on for acute aortic dissection in our department.

**METHODS:** There are about 2400 operations performed on CPB in our department annually. From 2002 to 2006, 548 patients underwent operation for ascending aortic aneurysm and 182 patients had an acute aortic dissection. From those 182 patients in 28 (23M, 5F, age range 31-72) with intractable bleeding during operation, surgical sponges had been applied to stop blood loss. All 28 patients were operated on CPB, 14 pts required DH circulatory arrest. In 18 cases there was De Bakey I and in 10 De Bakey II type of aortic dissection. Over half of pts (15) were in cardiogenic shock and 10 suffered from cardiac tamponade. Surgical sponges were left about spots responsible for blood leakage, mainly where aorto-graft connections were done. Sponges, in number from 2 to 5, were left for maximum of 2 days after initial operation.

**RESULTS:** In all patients, in whom surgical sponges were left, the bleeding was stopped. However in 7 pts there were signs of cardiac tamponade which resolved after sponges had been removed with no subsequent bleeding. 14 pts suffered from low cardiac output syndrome and 11 died in early postoperative period. The hospital stay ranged between 9 and 44 days.

**CONCLUSIONS:** Surgical sponges can be used effectively in the setting of refractory bleeding to other available hemostatic agents. What one must keep in mind that left sponges, alone or while soaked with blood, may cause cardiac tamponade. Comparing to patients in whom sponges had not been left we did not notice any increase in number of mediastinal or sternal wound infection.

## OP-892-ENDOVASCULAR REPAIR OF DESCENDING THORACIC AORTIC DISEASE

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**BACKGROUND:** Endovascular repair has been established as a valid, minimally invasive therapeutic approach for several aortic pathologies. We present our experience with endovascular treatment of the diseases of the descending thoracic aorta.

**METHODS:** Between 2003 and 2007, 41 patients suffering from various pathologies of the descending thoracic aorta were treated in our Hospital by endovascular means. 23 patients were treated electively and 18 emergently. The aortic diseases were 24 aneurysms, 10 dissections, 2 penetrating ulcers and 5 traumatic aortic ruptures.

**RESULTS:** Technical success was 90% (37/41). One patient (2,5%) died early post-operatively due to inability of the device to reach and cover the aneurysm rupture. Two patients (4,8%) developed delayed paraparesis post-operatively. In four patients (10%) coverage of the orifice of the left subclavian artery by the endograft was required, however none of them developed subclavian steal syndrome and thus no revascularization was required. Two early, type III (4,8%) and one late, type II (2,5%) endoleaks occurred, which were resolved spontaneously. The mean hospital stay was 6 days (from 1 to 13). During follow-up time (from 1 to 53 months) one patient died from acute myocardial infarction. The rest of the patients are well without any endograft related complication.

**CONCLUSIONS:** Endovascular repair represents a feasible and safe therapeutic approach for the treatment of descending thoracic aortic disease offering encouraging early and mid-term results. It reduces treatment related mortality, morbidity and hospital stay, while expands the number of patients to whom a safe treatment can be offered.

## OP-893-HYBRID TREATMENT OF THORACOABDOMINAL AORTIC ANEURYSMS WITH THE USE OF A NEW PROSTHESIS

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**BACKGROUND:** Surgical repair of thoraco-abdominal aortic aneurysms (TAAA) is still a complex and high risk procedure that often causes multiple postoperative organ dysfunction. We propose an effective and safe hybrid two-stage strategy in management of this extremely complex disease using a new multi-branch vascular prosthesis, followed by endovascular stent grafting of the aneurysm.

**METHODS:** Between November 2005 and September 2007, 18 patients (12



males, 6 females; mean age 71.4<sub>b6</sub>, 5 years; range 56 to 81 years) underwent surgical and endovascular treatment of thoracoabdominal aortic aneurysm in our institution. Indications included thoracoabdominal aortic aneurysm in 13 patients (72.2%), Type A aortic dissection in 2 patients (11.1%) and type B aortic dissection in 3 patients (16.7%). All operations were performed using a two stage strategy; performing first debranching of the aortic arch and implantation of a new multibranched prosthesis with trans-diaphragmatic celiac artery and superior mesenteric artery revascularization and completing the procedure after two weeks with aneurysmal exclusion by deployment of multiple stent grafts. Mean crossclamp and cardiopulmonary bypass times were 47.8<sub>b11</sub>, 21 and 106.2<sub>b17</sub>, 03 minutes, respectively. All patients underwent clinical end CT scan follow-up, the mean follow-up was 8 months (range 2 to 24 months) and it was 100% complete.

**RESULTS:** Overall hospital mortality was 16.6% (n=3). Only two patients (11.1%) had stroke while no cases of medullary injuries or peripheral ischemic damage were detected. At latest follow-up all patients were alive and in good conditions. CT scan control confirmed good post-procedural result with no evidence of endoleak or hypoperfusion of reimplanted vessels.

**CONCLUSIONS:** Two-staged hybrid surgical and endovascular approach with the use of a new prosthesis reduces morbidity and mortality minimizing the risk of endoluminal graft endoleak and thus might constitute an attractive alternative to conventional surgery in management of high risk thoracoabdominal aortic aneurysms.

#### OP-894-IN SINUS AORTIC VALVE REPLACEMENT

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**BACKGROUND:** Aortic valve replacement in the face of narrow and calcified aortic root is a formidable challenge. The standard techniques of root enlargement are difficult in these usually sick and old patients. An alternative technique which allows implantation of one to two size larger valve without the need for patch enlargement is designed and used initially for narrow and calcified and later in narrow and defective roots.

**METHOD:** The proximal 1/3 of the infra coronary sinus expansion is the site of valve implantation and horizontal mattress sutures from the valve are tied outside the circumferentially dissected aortic root over Teflon pledgets sandwiching the aortic wall with the calcium between the valve and the outside pledget. The primary indication in 20 patients treated by this method has been calcification in 8, mismatch in 9 and defective annulus in 3. Both biologic and mechanical valves are used. Five year follow up available in 85% of the cases.

**RESULTS:** There was one operative mortality. This 84 years old woman underwent AVR CABG died from bleeding complication of IABP. There were two reoperations for bleeding. One was bleeding from the aortotomy and the second from an RV epicardial coronary. One late wound drainage related to bone wax. One post op. embolic stroke in a triple valve replacement with full recovery. One right ventricular failure from deformed right coronary by the outside pledget, resolved by moving the pledget and releasing the coronary artery. One, two years mortality from Alzheimer, one 4 years mortality from cancer and the rest are doing well. Echocardiography has shown no systolic gradient across the valve except in one of the two children whose dramatic growth has been associated with a gradient of 20. In 4 patient echo follows up at 4 years showed improvement in diastolic filling parameters and significant LV mass reduction. None of the patients developed mismatch.

**CONCLUSION:** In sinus AVR is an acceptable alternative to root enlargement when the left ventricular out flow tract is not narrow and only a larger valve is needed. Also it is a good solution to the problem of calcified or deformed aortic root.

#### OP-895-TEACHING VALVE-SPARING AORTIC ROOT REPLACEMENTS - SUCCESSFUL OUTCOMES WITHIN A TRAINING PROGRAM

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**INTRODUCTION:** Many surgeons, especially in academic centers, remain reluctant to use valve-sparing root replacements because of concern over longer

bypass times, durable results, and the difficulty of performing the procedure in a teaching environment. We present our recent experience in an academic center.

**METHODS:** Retrospective chart review was conducted of 164 patients undergoing ascending aortic repairs with valve repair or reconstruction 2004-2007: 51 (27.4%) valve-sparing roots, 135 (72.6%) combined root/valve replacement.

**RESULTS:** Patients undergoing valve-sparing roots were younger (52.8 vs. 63.2 yrs, p=0.0001), but had a similar incidence of moderate or severe AI (58.8% vs. 65.9%) than those whose valves were replaced. Total cardiopulmonary bypass time was similar (151 vs 153 min), but the valve-sparing group had slightly longer cross-clamp times (119 vs. 105 min, p<0.0001). The incidence of post-operative insufficiency greater than 1+ was slightly higher in the valve-sparing group: 4.0% vs. 0.0% (p=0.0195). Postop and ICU length of stay did not differ. No patients have required a reoperation for valvular dysfunction. There were no postoperative deaths in either group.

**CONCLUSIONS:** Operative times and outcomes following valve-sparing aortic root replacement are similar to non-valve sparing procedures. Valve-sparing root replacements can be performed safely and expeditiously within a thoracic surgery residency program.

#### OP-896-AORTIC VALVE REIMPLANTATION: RESULTS IN 82 CONSECUTIVE PATIENTS WITH MID-TERM FOLLOW-UP

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**OBJECTIVE:** we review the results of aortic valve sparing operation in a cohort of 82 patients with ascending aorta and aortic root aneurism to determine early and late outcome.

**METHODS:** From January 2000 to July 2007, 82 consecutive patients underwent replacement of ascending aorta with reimplantation of the aortic valve in a straight tubular Dacron (first 11 cases) or a "Valsalva" conduit (Valsalva-Sulzer VascutekTM). 63 were male, mean age was 60 ± 11 (24 to 79). 4 patients had Marfan syndrome, 6 (7.3%) acute aortic dissection. 8 patients (9.7%) presented with a bicuspid aortic valve. 9 patients (10.9%) received an associate CABG procedure, 4 (4.8%) a mitral procedure and 8 (9.7%) underwent repair of aortic cusp prolapse.

**RESULTS:** There were 5 operative deaths (6%), 4 multiorgan failure following aortic dissection repair and 1 respiratory insufficiency. Surviving patients were followed for a mean of 29 months and follow-up was 100% complete. There were 2 late deaths from non cardiac causes. 7 patients underwent reoperation for severe aortic insufficiency. Of remaining 68 patients Doppler echocardiography revealed moderate to severe aortic incompetence in 5 (7.3%), 1 in bicuspid valve, where 63 presented absent, trivial or mild aortic insufficiency. None of the resuspended aortic valve showed more than trivial aortic incompetence.

**CONCLUSIONS:** Aortic valve reimplantation is safe and feasible in most patients with aortic root aneurism. Operative and mid term results are satisfactory. Bicuspid valve and prolapse of valve leaflets do not contraindicate the operation.

## CARDIAC OTHER IV

### OP-897-GENISTEIN INCREASES CORONARY BLOOD FLOW THROUGH $\beta_2$ -ADRENERGIC MEDIATED NO RELEASE AND ESTROGENIC RECEPTORS

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**BACKGROUND:** Various studies have suggested that the phytoestrogen genistein has beneficial cardioprotective and vascular effects. However, there has been scarce information regarding the primary effect of genistein on coronary blood flow and its mechanisms including estrogenic receptors, autonomic nervous system and nitric oxide (NO). The present study was planned to determine the primary effect of genistein on coronary blood flow and the mechanisms involved. This was achieved by infusing the isoflavone locally into the coronary circulation whilst preventing changes in heart rate and arterial blood pressure to avoid interferences by reflex, local metabolic and physical effects. In addition the intracellular pathway related to NO mechanisms involved in the vascular effects elicited by genistein was examined in porcine aortic endothelial cells (PAE).

**METHODS:** In anesthetized pigs, changes in left anterior descending coronary artery caused by intra-coronary infusion of genistein at constant heart rate and arterial pressure were assessed using ultrasound flowmeters. In vitro the experiments were performed in PAE maintained in Dulbecco Modified Eagle's Medium. In these cells the effects of genistein on NO production, detached through the Griess method, were tested in absence or presence of the NO synthase (NOS) inhibitor (L-NAME), the  $\beta_2$ -adrenergic agonist (salbutamol) and antagonist (butoxamine) and of estrogenic receptors blocker (fulvestrant). The role of intracellular signalling pathways leading to NOS phosphorylation has been examined as well by repeating the experiments in presence of ERK 1/2, Akt and p38 MAPK inhibitors and through Western blot analysis.

**RESULTS:** In 25 pigs, genistein infused at 0.075 mg/min increased coronary blood flow by about 16.3%. This response was graded in a further five pigs by increasing the infused dose of the genistein between 0.007 and 0.147 mg/min. In the 25 pigs blockade of cholinergic receptors (intravenous atropine; 5 pigs) and of  $\alpha$ -adrenergic receptors (intravenous phentolamine; 5 pigs) did not abolish the coronary response to genistein, whose effects were prevented by blockade of  $\beta_2$ -adrenergic receptors (intravenous butoxamine; 5 pigs), nitric oxide synthase (intracoronary L-NAME; 5 pigs) and estrogenic receptors (intracoronary fulvestrant; 5 pigs). In PAE genistein 10  $\mu$ M acutely increased NO production by about 93.7% of control values. This effect was found to be related to cAMP production. When the phytoestrogen was given in co-stimulation with salbutamol the NO production amounted to 166.7%. The effects of genistein were abolished in presence of butoxamine, L-NAME, fulvestrant and after the blockade of ERK 1/2, Akt and p38 MAPK pathways. The involvement of the above intracellular signalling proteins has been confirmed through Western blot analysis of the level of phosphorylation of ERK 1/2, Akt and p38 MAPK.

**CONCLUSION:** Genistein primarily caused coronary vasodilation the mechanism of which involved estrogenic receptors and the release of NO through vasodilatory  $\beta_2$ -adrenoreceptor effects. Genistein could initiate cytoplasmic signalling events upon binding to the estrogenic receptor, leading to cAMP production and phosphorylation of factors such as ERK 1/2, p38 and Akt which ultimately induce activation of NOS. The induction of factors involved in the  $\beta_2$ -adrenergic signalling pathway, could represent the link among genistein,  $\beta$ -adrenergic system and estrogenic receptors.

### OP-898-THE NEW HTK-N46 CARDIOPLEGIC SOLUTION PROVIDES SUPERIOR POSTISCHEMIC HEMODYNAMIC RECOVERY IN THE FAILING RAT HEART

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**BACKGROUND:** Aim of this investigation is the evaluation of HTK-N46, a new cardioplegic solution, in comparison to its precursor Custodiol (HTK) in failing rat hearts. The main difference between these two solutions is the enrichment of HTK-N46 with several specific amino acids.

**METHODS:** In male Sprague Dawley rats myocardial infarction (MI) was induced by LAD ligation. Six weeks after MI 16 animals were randomly assigned to two groups, HTK (n=8) and HTK-N46 (n=8), respectively, and evaluated on a red cell perfused isolated working heart, during 45 minutes of baseline measurements, 60 minutes of subsequent ischemia and 45 minutes of reperfusion. The cardioplegic solution was induced once at the beginning of ischemia (2.5ml/g heart weight). Study protocol was closed up with final pump function curve, recording cardiac output (CO) and systolic left ventricular developed pressure (LVPSys) at rising afterload. Hemodynamic parameters (e.g. stroke work index, SWI; stroke volume, SV; diastolic left atrial pressure, LAPdia; coronary flow, Cflow) were recorded, biochemical (high energy phosphates, HEP) and histological evaluation performed. After 5 minutes of preischemic and 10 minutes of postischemic Working Heart evaluation blood gas samples were taken. Mean $\pm$ SD.

**RESULTS:** At similar fractional shortening (HTK,  $14.91 \pm 5.44$ ; HTK-N46,  $16.7 \pm 8.05$ ; ns) postischemic recovery of SWI and LVPSys were significantly improved in the HTK-N46 rats compared to HTK. Due to HTK-N46 treatment, recovery of SV and Cardiac Output were significantly improved as well throughout the whole reperfusion period. LAPdia tended to be lower in the HTK-N46 protected group, even though there were no statistically significant differences. There was no difference between the treatment groups according to recovery of Cflow. Despite the fact that HTK-N46 significantly improves hemodynamic outcome, there was no difference in heart rate and HEP content (ATP, ADP, AMP, CrP).

**CONCLUSION:** In failing rat hearts, HTK-N46 shows superior cardioprotective properties according to postischemic hemodynamic recovery and biochemical markers compared to its precursor HTK. As the number of patients with reduced left ventricular function undergoing cardiac surgery is increasing, HTK-N46 may be an interesting alternative to currently used cardioplegic solutions in this high risk group of patients.

### OP-899-BONE WAX INFLUENCES STERNAL WOUND INFECTION RATE? RESULTS OF A PROSPECTIVE AUDIT

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**BACKGROUND:** Bone wax is routinely employed in cardiac surgery to reduce bleeding from sternal edges despite animal studies showing strong concerns over its usage<sup>1</sup>. Moreover, there are no human cohort studies to date that investigate any link. We previously evaluated our sternal wound infection rate between 1997-2002 over 1426 patients. Multi-variate logistic regression analysis demonstrated those wired using the multi-twist method with bone wax use had the highest sternal infection rates - superficial 4.3%; deep 1.0%. Hypothesis As the multi-twist method has been demonstrated in biomechanical studies to provide in the most rigid closure<sup>2</sup>, we hypothesised that bone wax was responsible for our high infection rates. Since Jan 2004 we have abandoned the routine use of bone wax but continued to use the multi-twist method for sternal closure. In this study, we re-audited our infection rates.

**METHODS:** We undertook a prospective study during which all patients who underwent median sternotomy closure using the multi-twist method from January 2004 were evaluated for sternal wound infections. These were classified as deep or superficial using the same definitions as our original study.

**RESULTS:** Between January 2004 and November 2007, 654 patients underwent multi-twist closure of their sternums. Analysis of risk factors showed that there was no difference in profiles between the original study and the current cohort. There were 15 (2.3%) sternal wound infections recorded - 11 superficial (1.7%) and 4 deep (0.6%). Mortality was 0%. This represented an overall 40% reduction in deep infection rate and 47% reduction in superficial infection rate.

**CONCLUSIONS:** Our study has shown that abandoning bone wax usage resulted in the reduction in sternal wound infection rate. We believe that a larger prospective randomised controlled trial should be undertaken to further evaluate these findings that support animal studies 1. Nelson DR, Buxton TB, Luu QN, Rissing JP. The promotional effect of bone wax on experimental *Staphylococcus aureus* osteomyelitis. *J Thorac Cardiovasc Surg.* 1990;99:977-980 2. Casha AR, Yang L, Kay PH, Saleh M, Cooper GJ. A biomechanical study of median sternotomy closure techniques. *Eur J Cardiothorac Surg.* 1999;15:365-9

#### **OP-900-COMPARISON OF LOGISTIC EUROSORE AND CARE SCORE IN HEART SURGERY: A TERTIARY CENTRE EXPERIENCE**

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**BACKGROUND:** The aim of this single-center study was to compare 2 risk stratification models [Cardiac Anesthesia Risk Evaluation score (CARE) and Logistic European System for Cardiac Operative Risk Evaluation (EUROSCORE)] in cardiac surgery in our unit and to investigate their possibility of application in a Greek population.

**METHODS:** The study group consisted of 301 consecutive adult patients who underwent elective or emergency cardiac surgery in our unit over the period from March 2005 to December 2006. In the immediate preoperative period each patient was simultaneously assessed using the two models by an anaesthesiologist. Calibration was determined by Hosmer-Lemeshow goodness of fit statistics (HL) while discrimination was assessed by using receiver operating characteristic (ROC) curve. As mortality is reported the death 30 days afterwards the surgery.

**RESULTS:** Actual mortality was 5,6%. The 74% was isolated coronary artery bypass graft surgery, the mean of age 66,1 (sd±10,1). The area under receiver operating characteristic (ROC) curves was 0,72 (95% C.I. 0,61-0,80) for the logistic Euroscore and 0,77 (95% C.I. 0,63-0,89) for the CARE. The calibration analysis showed agreement between the observed and expected number of deaths by both models.

**CONCLUSIONS:** CARE and logistic EuroSCORE are equally applicable as mortality predictors in Greek population. Despite geographic differences between European and Canadian population the CARE is a simple, objective classification system for the risk assessment of cardiac surgery and prediction mortality.

#### **OP-901-THE EFFECT OF MATRIX METALLOPROTEINASE INHIBITOR IN VENTRICULAR REMODELING AFTER MYOCARDIAL INFARCTION**

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**BACKGROUND:** Matrix Metalloproteinase (MMP) inhibition has emerged as a potential therapeutic strategy for left ventricular dilatation after myocardial infarction. This study is designed to evaluate which is better for attenuation of left ventricular remodeling by MMP inhibition for early short highly MMP producing period of the initial phase or most period of the initial phase after myocardial infarction.

**METHODS:** Myocardial infarction was induced by ligation of left anterior descending coronary artery in rabbit. Experimental groups were divided into 3 groups. Myocardial infarction only (MI only) group was consisted of 7 cases. MMP inhibitor 5 days(MMPI 5d) group had 6 cases, which was given MMP inhibitor for 5 days after myocardial infarction, beginning with postoperative first day. MMP inhibitor 9 days (MMPI 9d) group was consisted of 5 cases and was given MMPI for 9 days as the same manner. As a selective MMPI, CG2300 was used that is a potent MMP-2 and -9 inhibitor. Two-D echocardiogram was performed on every group at the time of preoperative period, postoperative 1 week, postoperative 2 weeks, and postoperative 3 weeks, and measured end-diastolic dimension(EDD), end-systolic dimension(ESD), and ejection fraction(EF).

**RESULTS:** Echocardiogram showed postoperative left ventricular dilatation generally in the MI only group. EDD was increased significantly higher in the postoperative 1 week than preoperative value ( $p<0.05$ ). ESD was also increased significantly higher in the postoperative 1 week, postoperative 2 weeks, postoperative 3 weeks than preoperative value( $p<0.05$ ). Left ventricular dilatation was noted less in the MMPI 9d group than in the MI only and MMPI 5d groups. In the MMPI 9d group there was no significant change of EF postoperatively com-

paring to the preoperative period. MMP-2 and MMP-9 were measured from infarcted myocardial tissue at post-MI 4 weeks by western blotting and zymography. The changes of protein expression and activity of MMP-2 and MMP-9 were not appreciated in three MI groups and normal heart group. Histopathologic examination revealed severe collagen deposition in MI only group. Collagen accumulation was reduced in both MMPI groups. MMPI 9d group revealed increased number of capillaries.

**CONCLUSIONS:** Left ventricular dilatation had developed rapidly after MI by ligation of coronary artery and MMPI attenuated ventricular dilatation. The effect of MMPI seemed to have better result from its usage during most period of the initial phase after myocardial infarction. It is suggested that increase of neovascularization by MMPI may also contribute to the attenuation of left ventricular remodeling.

#### **OP-902-HEART TUMORS: PRESENTING SYMPTOMS, DIAGNOSIS AND SURGICAL TREATMENT. 11 YEARS CLINICAL EXPERIENCE OF ONE SINGLE CENTRE**

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**BACKGROUND:** Primary tumors, both benign and malignant, of the heart are extremely rare. In this study we report on our eleven years clinical experience with primary cardiac tumors describing their incidence, symptoms, diagnosis, surgical management and late clinical outcome.

**METHODS:** A retrospective review of our archival material at our institution between January 1996 and December 2007 revealed 23 patients (pts.) with primary heart tumors; 18 intracardiac myxomas, 4 papillary fibroelastomas (PFE) of the heart valves and 1 single high malignant tumor (sarcom). There were 9 males and 14 females with age range between 21 and 73 years. Diagnosis was done through echocardiography. The intracardiac myxomas originated in the left atrium (16 pts.), in the right atrium (1 patient) and in the left ventricle (1 patient). The 4 PFE of the heart valves were located on the tricuspid valve (1), mitral valve (1) and aortic valve (2) respectively. The one single malignant tumor (sarcom) originated in left atrium. The clinical features of myxomas were determined by their location, size and mobility. One patient with myxoma was asymptomatic. The other patients with myxomas presented one or more symptoms of the following triade: embolism, intracardiac obstruction and constitutional symptoms. Three PFE of the heart valves presented with aphasia (mitral valve), with two myocardial infarctions (aortic valve) and one PFE of the tricuspid valve was asymptomatic. The huge malignant tumor of the left atrium (sarcom) presented with symptoms of mitral valve stenosis. All 23 heart tumors were removed surgically under cardiopulmonary bypass on urgency basis. Particular care was done to enucleate the origin of the tumors in attempt to avoid future recurrences. Exposures of the intracardiac myxomas were done through transeptal (15 patients), right atrial (1 patient), biatrial 1 (patient) and transmitral (for left ventricle myxoma) approaches respectively. The radical removal of unusual left ventricle myxoma required complexed mitral valve repair procedure. All PFE were completely enucleated with preservation of the heart valves. Particular attempt was done to excise completely the left atrial sarcom. Combined surgical procedures like coronary artery bypass grafting and aortic valve replacement and others were also performed.

**RESULTS:** No operative deaths occurred. The postoperative courses were in 21 pts. uneventful. The removal of PFE of the tricuspid valve complicated with severe aortic valve insufficiency, which required urgent replacement. The patient with left atrial sarcom had early recurrence and died 2 months later after the primary operation due to global heart insufficiency. Clinical follow-up was complete. Postoperative echocardiographical exams done 1-10 years later demonstrated no recurrences. All other 22 patients are doing clinically very well.

**CONCLUSIONS:** Surgical removal of intracardiac benign neoplasms is, even in asymptomatic patients, mandatory; their removal is safe and curable. The intracardiac tumors must be included in the differential diagnosis of other heart diseases like valvular heart disease, heart insufficiency, bacterial endocarditis, and pulmonary embolism. The echocardiography is a reliable method to make clinical diagnosis and can also predict their size, morphology and likelihood to embolise. Complete excision of high grade aggressive malignant heart tumor (sarcoma) may alleviate symptoms but not improve prognosis.



### OP-903-PREVENTION OF RETROSTERNAL PERICARDIAL ADHESIONS AFTER PRIMARY CARDIAC OPERATIONS BY MITOMYCIN C (EXPERIMENTAL STUDY)

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**BACKGROUND:** Retrosternal pericardial adhesions may cause significant injuries to the heart and great vessels in cases that require reoperation. Fibroblast proliferation is one of the mechanisms for adhesion formation. Inhibition of fibroblast proliferation is important in the reduction of retrosternal adhesions. MMC is able to reduce fibroblast proliferation. We aimed to determine the effect of MMC on the prevention of retrosternal pericardial adhesions after primary cardiac operations.

**MATERIAL AND METHODS:** Thirty Sprague-Dawley female rats were used in the study. The rats were divided into two groups. First group was control (N=10), second group was MMC study group (N=20). All the groups were applied xiphoid cartilage resection and retrosternal abrasion via subxiphoidal incision. In study group, MMC (1 mg/kg) was topically applied to the retrosternal space. After 15 days, reoperation was taken and formation of adhesions was graded. Tissue and blood samples were taken before sacrifice procedure. Tissue samples were applied standard staining procedures and fibroblast growth factor receptor 3 antibody staining, immunohistochemically.

**RESULTS:** The average adhesion scores of the control (N=10) and study (N=20) (MMC; 1 mg/kg) groups were  $2.50 \pm 1.27$  and  $0.70 \pm 0.86$ , respectively. Adhesion score of study group was lower than control group ( $p < 0.05$ ). No side effect of MMC was observed. Immunohistochemical samples were revealed that tissue fibroblast intensity was significantly higher in control group than study group ( $p < 0.05$ ). There was no statistically significance between two groups in case of hydroxyproline levels ( $p > 0.05$ ).

**CONCLUSION:** In conclusion without any delay in normal tissue regeneration MMC was found to be effective in the prevention of retrosternal pericardial adhesions.

### OP-904-QUALITY MANAGEMENT IN CARDIAC SURGERY IMPROVES OUTCOMES

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**BACKGROUND:** This study investigates Quality Management and goal-oriented, multidisciplinary protocols on outcomes after cardiac surgery.

**METHODS:** Patients were divided into two groups: those who had surgery (coronary artery bypass-CABG-, isolated valve or CABG and valve) after the establishment of the quality management program (QM, 2005-2006, n=922) and those prior to the institution of the multi-disciplinary quality management program (non-QM, 2002-2003, n=1289). Patients from 2004, where the system and processes were re-engineered, were not included in the analysis. The protocols included standardized communication tools and goal sheets, sedation monitoring, respiratory protocols for early extubation and best pulmonary practices bundles, computerized euglycemia management, blood management and infection control programs, and multidisciplinary ICU rounds. Logistic regression and propensity score analysis were used to adjust for imbalances in the patients' preoperative characteristics.

**RESULTS:** Operative mortality was lower in the QM group compared to the non-QM group (2.6 vs. 5.0 %, respectively,  $p < 0.01$ ). The unadjusted odds ratios was 0.5 (95% CI 0.3-0.8,  $p < 0.01$ ) and the propensity score-adjusted odds ratio was 0.6 (95% CI 0.4-0.99,  $p = 0.04$ ). In the multivariable analysis QM ( $p < 0.01$ ) was associated with lower mortality after cardiac surgery (mortality in non-diabetics improved more than diabetics). Univariate analysis of the effect of QM demonstrated a 50% reduction in postoperative sepsis (2% QM vs. 4% non-QM,  $p = 0.04$ ). Moreover, QM patients had a lower incidence of acute renal failure than non-QM patients (6% vs. 8%, respectively,  $p = 0.02$ ) and a significant decrease in the risk of cardiac tamponade (0.2% QM vs. 1.6% non-QM,  $p = 0.01$ ).

**CONCLUSIONS:** Application of goal-directed, multi-disciplinary protocols and QM are associated with lower mortality and morbidity after cardiac surgery. The mortality decline with QM was less pronounced in diabetics and future improvement processes should focus on this particular subset of patients.

### OP-905-ESTIMATION OF GLOMERULAR FILTRATION RATE IN CARDIAC SURGERY: COCKCROFT-GAULT FORMULA VS MDRD

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**BACKGROUND:** The preoperative reduction of renal function in cardiac surgery, is an important risk factor; usually this reduction is expressed with plasma creatinine level. Today is recommended for the evaluation of renal function the calculated glomerular filtration rates, using the Cockcroft and Gault formula and/or the Modification of Diet in Renal Disease (MDRD). The more recent (MDRD) study equation seems more accurate, but it has not been well evaluated in cardiac surgery patients. The aim of the study was to evaluate the correlation between calculated creatinine clearance, obtained using the Cockcroft and Gault (CG) formula and MDRD with two parameters of short term outcome, post cardiac surgery procedure: mechanical ventilation time and Intensive Care Unit length of stay.

**METHODS:** 200 consecutive patients with mean age  $67 \pm 10.7$ , preoperative creatinine  $1.17 \pm 0.60$  mg/dL, CLCG  $67 \pm 24$  ml/min and CLMDRD  $64 \pm 21$  ml/min, underwent to coronary artery bypass grafting n=145 (72%), or mitral/aortic replacement n=55 (27.5%) with cardiopulmonary bypass (CPB), were prospective enrolled and analyzed. Renal function was measured on the admittance in Hospital.

**STATISTICAL ANALYSIS:** We evaluated the kind of correlation between the dependent variables (ICU STAY and VAM) with independent, CLCG and CLMDRD considering the coefficient of linear correlation (r). For each couple of variables, significance was tested with two tails t-test.

**RESULTS:** We observed a significant negative correlation between CLCG and ICU STAY ( $r = -0.23$   $p = 0.0009$ ), and between CLMDRD and ICU STAY ( $r = -0.21$   $p = 0.002$ ); significant negative correlation between CLCG and VAM ( $r = -0.23$   $p = 0.0008$ ) as well as CLMDRD and VAM ( $r = -0.21$   $p = 0.0023$ ).

**CONCLUSIONS:** In our experience, GFR calculated with Cockcroft and Gault formula seems to be a good predictor of short term outcome in cardiac surgery as well as MDRD.

### OP-906-EVALUATION OF A BIOABSORABLE OXIDIZED REGENERATED CELLULOSE IN A RABBIT MODEL FOR THE REDUCTION OF PERICARDIAL ADHESIONS

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**BACKGROUND:** Pericardial adhesions complicates reoperative cardiac surgery. Several attempts made to reduce adhesion formation after cardiac surgery. The purpose of this study was to evaluate the efficacy of bioabsorbable oxidized regenerated cellulose for preventing postoperative pericardial adhesions.

**MATERIALS AND METHODS:** Forty rabbit were divided into 4 groups of 10. In group 1 and 2 (control groups), 1x1 cm pericard was excised and left opened. In group 3 and 4 pericardial defects were replaced with of bioabsorbable oxidized regenerated cellulose. Group 1 and 3 were sacrificed three weeks, group 2 and 4 were sacrificed six weeks, after surgery.

**RESULTS:** All animals demonstrated adhesions between the posterior and lateral surfaces of the heart and pericardium. In group 1 and 2 were observed severe adhesions and more prominent inflammatory and fibrous reaction as compared with bioabsorbable oxidized regenerated cellulose groups. Although in control groups coronary anatomy was completely obscured, in group 3 and 4 coronary vessels were clearly identifiable. Light microscopy showed mesothelium-like cell layer in oxidized regenerated cellulose groups.

**CONCLUSIONS:** Bioabsorbable oxidized regenerated cellulose reduces effectively adhesion formation, supports scaffold for regeneration of the pericardium and preserves coronary anatomy. In conclusion, bioabsorbable oxidized regenerated cellulose may be used for staged congenital surgery and also in patient with high probability of reoperation.



## OP-907-METASTATIC TUMORS OF THE HEART

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**BACKGROUND:** Tumors of the heart can be primary, benign (72%) or malignant (28%), and secondary or metastatic tumors, which are malignant and affect the pericardium in 10% of the cases. The 96-97% of the heart tumors, which undergo resection, are primary tumors and only the 3-4% are metastatic tumors, although these are more frequent (more than 40%). Metastasis may occur through both the hematogenous and the lymphatic routes, or by tumors, which are arising by structures near the heart (as esophagus, thymus, lungs) and are invading it. Subdiaphragmatic renal, hepatic, suprarenal tumors are invading the IVC and spread metastasis in the heart as also do ovarian and uterus tumors and rarely stomach, prostates and colon tumors. The most common metastasis are originated from melanomas, lung tumors, sarcomas, esophagus and breast tumors.

**PATIENTS:** 2 women with metastatic cardiac tumor underwent resection of the primary tumor with subsequent chemotherapy and/or radiations. Both had a preoperative cardiac U/S which showed a mass of 4-5cm in the right atrium with obstructive right atrium symptoms. Intraoperatively we found a mass in the right atrium in both patients. The first patient had as primary tumor a rachis malignant melanoma, which underwent resection 8 months ago. This had been diagnosed as a right atrial mass. From the intraoperative fast biopsy we found a malignant cardiac tumor and a metastatic pericardial lymph node so we did not proceed to resection of the mass. The second patient had as primary tumor a cervix malignant tumor with metastasis in the pelvis, which she underwent resection and radiations one year ago, and metastasis in the right atrium of the heart, which obstructed the outflow track of the right ventricle. From the fast biopsy we found a malignant tumor and we proceeded to complete surgical resection of the tumor. Both patients went home and are still alive.

**CONCLUSION:** Most of the malignant heart tumors are asymptomatic or have obstructive symptoms from cardiac chambers (dyspnoea, arrhythmias, etc) or cardiac pulmonary embolisms. If the pericardial is affected then the analysis of the pericardial fluid may be diagnostic. The symptoms are compared with the general situation of the patient (loss of weight, weakness, fatigue). Diagnosis of cardiac tumors is usual a necrotomic finding and only the 30% can be diagnostic in vivo. The number of patients who undergo resection of metastatic cardiac tumor is very limited, approximately 0.3% of the total open-heart operations because of the poor clinical condition of the patient at the moment of diagnosis and of the presence of other metastasis which make impossible a resection. A wrong diagnosis of a benign tumor of the heart (for example, myxomas), wrongfully lead to an operation of a malignant metastatic tumor of the heart. The best diagnostic procedure of an endocardial tumor is the trans-esophagus cardiac U/S, however CT and MRI can be a useful and reliable tool for finding the primary tumor and other metastasis.

## ONCOLOGY IN LUNG CANCER

### OP-909-DETECTION OF CIRCULATING TUMOUR CELLS DURING PULMONARY RESECTION FOR NON-SMALL CELL LUNG CARCINOMA

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**BACKGROUND:** Lung cancer is the leading cause of cancer mortality worldwide. Despite complete resection, a large proportion of tumours metastasize due to circulating tumour cells. A flow cytometry assay has been developed at our institution to detect circulating epithelial tumour cells. A study was undertaken to determine if viable tumour cells could be detected in the bloodstream of patients undergoing lobectomy for non-small cell lung carcinoma (NSCLC) using this assay, and if intra-operative tumour mobilization promotes tumour cell release into the circulation.

**METHODS:** Patients undergoing pulmonary resection for NSCLC (Stages IA, IB, or IIA) were eligible for inclusion. Three blood samples (5mL) were drawn from each subject: 1) pre-tumour mobilization radial arterial, 2) post-tumour mobilization ipsilateral pulmonary venous, and 3) post-tumour mobilization radial arterial samples. Samples were stained using a DNA dye (DRAQ5 or propidium iodide) and fluorescent antibodies against cytokeratins and CD45. Samples were analyzed using flow cytometric analysis. Positive tumour events were identified as CK+/CD45-/DNA+. Cell viability was assessed based on light scatter and only viable cells were included in the analysis. Sensitivity of the assay is 1 tumour cell in 100,000 normal leukocytes. Positive controls (blood spiked with epithelial tumour cells) and negative controls (healthy donors) were tested alongside each sample.

**RESULTS:** Ten patients (8 males, 2 females, average age 66 yrs) were studied. Pathological tumour stages were: 5 stage IB (T2N0M0); 4 stage IIB (T2N1M0); and, 1 stage IIIA (T2N2M0). Viable tumour cells were detected in 3 (30%) patients. Both the pre-tumour mobilization radial arterial and the post-tumour mobilization ipsilateral pulmonary venous samples were positive in these 3 patients. All 10 post-tumour mobilization radial arterial samples were negative. Two of 3 (67%) patients with positive tumour events were stage IB, and one (33%) was IIB. Vascular invasion was found in 2 of 3 (67%) positive patients, compared to 2 of 7 (29%) negative patients. Average duration of follow-up was 13.6 months (range 6 to 25). No local recurrences were identified in follow-up. To date, only one patient was found to have metastatic disease (brain metastasis). This patient was negative for tumour events at operation.

**CONCLUSIONS:** Flow cytometric analysis can be used to identify circulating tumour cells in patients undergoing pulmonary resection for NSCLC. Both radial arterial and ipsilateral pulmonary venous sampling techniques can be used. Intra-operative tumour manipulation did not promote tumour release into the bloodstream. Future studies are required to determine if circulating tumour cells, identified by flow cytometry, are a risk factor for metastasis.

### OP-910-DELAYS IN THE MANAGEMENT OF NON-SMALL CELL LUNG CANCER IN A PUBLICLY FUNDED HEALTH CARE SYSTEM

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**BACKGROUND:** Excessive wait times for treatment of malignant diseases are issues of concern in publicly funded health care systems as they may impact on patient outcomes. We attempted to evaluate the lengths of wait times and analyze the bottlenecks for management of non-small cell lung cancer (NSCLC) in a publicly funded Canadian urban community hospital.

**METHODS:** We performed a retrospective chart review of patients with NSCLC who underwent cervical mediastinoscopy between January 2004 and December 2006. Patient characteristics and wait times between multiple pre-treatment points were evaluated. The start of the time line was chosen as the time of onset of the patient's reported symptoms related to NSCLC which prompted visit

with the primary physician, or the initial visit with the primary physician prompted by an incidental radiological finding. The cTNM stage was determined after completion of all invasive and non-invasive staging modalities. Treatment was defined as definitive surgery, induction therapy, chemotherapy alone, radiation therapy alone, or definitive chemo-radiation therapy. Using regression analysis, time intervals were examined to identify whether patients with early stage NSCLC (stages I and II) had shorter delays than the ones with advance stage NSCLC (stages III and IV), and whether patients who ultimately received non-surgical therapy had significantly longer wait times than those who were treated with definitive surgery.

**RESULTS:** In the 102 patients identified, median age was 71 years; 57% were male. The distribution cTNM stage was as follows: stage I, 32.4%; stage II, 14.7%; stage III, 33.3%; and stage IV, 19.6%. Fourteen patients did not receive any therapy after staging and were excluded from further analysis. Mean and median time intervals between the time of initial visit with primary physician or the time of onset of symptoms related to NSCLC, and first visit with thoracic surgeon were 132.2 (standard deviation [SD] 147.5) days and 75.0 days, respectively. Mean and median time intervals between first visit with thoracic surgeon and any treatment, which includes staging completion, were 59.3 (SD 57.5) days and 44.0 days, respectively. No statistically significant differences were observed when wait times compared between early and advance stage NSCLC groups or surgical and non-surgical treatment groups.

**CONCLUSIONS:** The longest delays appear to exist prior to surgical referrals. However, these delays may not have significant effect on the outcomes as those patients with advance stage NSCLC or those who were treated non-surgically did not have statistically significant longer wait times than patients with early stage NSCLC or those who were treated surgically. Early detection of NSCLC by screening methods may be more important than the current delays in its management in a publicly funded health care system.

### OP-911-BRONCHOPULMONARY TYPICAL CARCINOID TUMOR: INCIDENCE OF LYMPH NODE MICRO METASTASES

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**BACKGROUND:** Bronchial-Typical-Carcinoids are low grade malignancies, but in a subgroup of patients, they can send haematogenic and/or lymph node metastases. Lymph node macrometastasis incidence is a well known phenomenon, but lymph node micrometastases are not routinely searched. Our objective is to describe the incidence of lymph node micrometastases in a retrospective cohort of 128 patients operated on by Bronchial-Typical-Carcinoid and followed-up for more than 10 years.

**METHODS:** A retrospective cohort of 128 patients operated in a university quaternary hospital followed-up during a period longer than 10 years was studied. Only patients who had 10 or more lymph nodes dissected were included. Resected lymph nodes were analyzed and searched for micrometastases using the following immunomarkers: synaptophysin, neuron-specific enolase and chromogranin.

**RESULTS:** Eleven patients had macrometastases. Three patients had both macro and micrometastasis. Eight patients without macrometastases had micrometastases and all of them were diagnosed in lymph nodes sampled at the moment of the parenchyma resection. There were two deaths related to haematogenic metastases in this group of patients. Although the prognostic role of micrometastases in Bronchial-Typical-Carcinoid is not well established, it is interesting to notice that even typical carcinoids can send malignant cells to these structures. Clinical and radiological surveillance of these patients during a long follow-up period will clarify the prognostic role of micrometastases. As 98% of these tumors and their metastases have somatostatin receptor, octreoscan can be used to identify metastases with a diameter compatible with the image resolution.

**CONCLUSION:** Bronchial-Typical-Carcinoid can send malignant cell to lymph nodes and establish micrometastasis.

## OP-912-PRECISE PREDICTION OF LUNG CANCER PATIENTS SURVIVAL WITHOUT LYMPH NODE METASTASIS AFTER COMPLETE LOBECTOMIES AND PNEUMONECTOMIES

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**BACKGROUND:** The influence of clinicomorphological data on 5-year survival (SYS) and life span (LS) of non-small lung cancer (LC) patients (LCP) without lymph node metastasis (N0) after surgery was investigated.

**METHODS:** In trial (1985-2007) the data of consecutive 276 LCP (age=56.4±8.1 years; male=241, female=35; tumor diameter: D=4.2±1.9 cm; pneumonectomy=93, upper lobectomy=106, lower lobectomy=55, middle lobectomy=6, bilobectomy=16, combined procedures with resection of pericardium, left atrium, aorta, v. cava superior, carina, diaphragm, ribs=34) with stage T1-4N0M0 (squamous cell=163, adenocarcinoma=92, large cell=21; T1=103, T2=110, T3=54, T4=9; G1=76, G2=78, G3=122) was reviewed. Variables selected for SYS study were input levels of 48 blood, biochemical and hemostatic factors, sex, age, TNMG, D. Survival curves were estimated by Kaplan-Meier method. Differences in curves between groups were evaluated using a log-rank test. Neural networks computing, Cox regression, clustering, discriminant analysis, structural equation modeling, Monte Carlo and bootstrap simulation were used to determine any significant regularity.

**RESULTS:** For total of 276 LCP overall LS was 2194±1291 days and cumulative SYS reached 77.9%, 10 year survival - 62%, 20 year survival - 55%. 215 LCP (LS=2634±1100 days) lived more than 5 years without LC progressing. 61 LCP (LS=643±430 days) died because of LC during first 5 years after surgery. Cox modeling displayed that SYS of LCP after radical procedures significantly depended on: D less/more 2 cm, age, G1-3, T1-4, blood cell subpopulations, cell ratio factors, ESS, prothrombin index, heparin tolerance, (P=0.000-0.046). Neural networks computing, genetic algorithm selection and bootstrap simulation revealed relationships between SYS of LCP and LC growth (rank=1), G1-3 (2), T1-4 (3), D less/more 2 cm (4), sex (5), heparin tolerance (6), histology (7), D (8), erythrocytes (9), bilirubin (10), ESS (11), Hb (12), prothrombin index (13), ratio of monocytes to LC cells (14), fibrinogen (15), thrombocytes (16), color index (17), stick neutrophils (18), age (19), ratio of eosinophils to LC cells (20), segmented neutrophils (21).

**CONCLUSION:** Correct prediction of LCP survival after surgery was 100% by neural networks computing (error=0.001; urea under ROC curve=1.0).

## OP-913-THE ANALYSIS OF THERAPEUTIC MODALITIES FOR pIIIB(T4) NON-SMALL CELL LUNG CANCER: SURGICAL OR NON-SURGICAL TREATMENT?

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**BACKGROUND:** Generally, surgical resection is not recommended for the patients with stage IIIB non-small cell lung cancer. Although, resectional surgery for the patients with limited T4 disease without mediastinal lymph node involvement is done in some institutions, no study showed advantageous effect of surgery comparing to non-surgical management.

**METHODS:** Between January 2003 and March 2007, 49 patients (46 male, 3 female) with stage IIIB non-small cell lung cancer were analyzed. Twenty-three patients underwent cervical mediastinoscopy followed by anatomical surgical resection, whereas 26 patients were referred to oncological treatment (chemo/radiotherapy). No statistical difference was found in terms of clinical parameters between two groups.

**RESULTS:** The overall 5-year survival of patients who had undergone surgical resection was found as 11% and median survival time was 12 months (95%CI: 8-16 months), whereas the 2 and 5-year survival were 9.3 and 0% respectively. The difference was found statistically significant (p=0.0267). However, the survival of the surgically treated pT4N2 patients and that of oncologically treated pIIIB patients was almost identical (p=0.97). The treatment-related mortality were not different in these groups.

**CONCLUSIONS:** Surgical resection in selected pIIIB non-small cell lung cancer without lymph node involvement (i.e., pT4N0) can be justifiable. However, the survival rate of T4 patients with mediastinal lymph node involvement (i.e., T4N2) was similar to that of oncologically treated cT4N2 patients. Surgical lymph node evaluation seemed to be crucial during operation and mediastinal involvement could indicate futile resection in these patients.

## OP-914-SHORT-TERM AND LONG-TERM RESULTS OF LUNG CANCER SURGERY IN THE OCTOGENARIANS

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**BACKGROUND:** To evaluate our short-term and long-term results in octogenarian patients submitted to surgical resection for lung cancer.

**METHODS:** Medical records of all octogenarian patients who had pulmonary resection for lung cancer at our Institution from January 1990 to October 2007 were reviewed.

**RESULTS:** There were 79 patients; males were 64 (81%) and females 15 (19%). Median age was 81 (range 80-86). Lobectomy was performed in 59 patients (74.7%), segmentectomy in 7 (9%), pneumonectomy in 5 (6.3%), atypical resection in 5 (6.3%) and explorative thoracotomy in 3 (3.7%); associated chest wall resection and bronchoplastic procedures were evaluated. Pathologic diagnosis was squamous carcinoma in 37 pts., adenocarcinoma in 20, bronchoalveolar cell carcinoma in 12, adenosquamous carcinoma in 5, small cell carcinoma in 3, large cell carcinoma in 2. Pathologic stage was IA in 8, IB in 34, IIA in 1, IIB in 13, IIIA in 18, IIIB in 2, IV in 3. Complications occurred in 40 patients (50.6%) and operative mortality in 1 (1.2%). Overall actuarial survival at 1, 3 and 5 years was 73%, 42% and 20.6%, respectively. 39 pts were dead at the time of the study, 21 (53.8%) of whom for cancer recurrence and 18 (46.2%) for not cancer-related causes: 12 for cardiovascular events, 4 for pulmonary embolism and 2 for respiratory failure.

**CONCLUSIONS:** Curative surgical resection for lung cancer should not be denied in octogenarian patients based on age, because their short and long-term results are acceptable and satisfactory. An appropriate preoperative selection is mandatory because an high rate of not-cancer related deaths may be expected.

## OP-915-TUMOR REGRESSION GRADE AND PROGNOSIS IN MULTIMODALITY-TREATED NON-SMALL CELL LUNG CANCER

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**BACKGROUND:** Aim of the study was to investigate the role of pathologic tumor regression grade on prognosis of locally advanced non-small cell lung cancer undergoing trimodality treatment.

**METHODS:** Selected patients with stage (N2)IIIA/(N3)IIIB-NSCLC received two cycles of platin-based induction chemotherapy followed by concurrent chemoradiation, based on hyperfractionated accelerated radiotherapy, and surgery. Responders were scheduled to complete the treatment protocol with two additional chemotherapy cycles. Non-responders were followed up until progression and then underwent second-line therapy. On surgical specimen, tumor regression grade was assessed on a semiquantitative basis using a novel scale: grade I, no viable tumor; grade II, isolated viable tumor cells into scarred or necrotic tissue; grade III, <10% viable tumor cells; grade IV, 10-50% viable tumor cells; grade V, 50-90% viable tumor cells; grade VI, no regression. A separate score was attributed either to primary tumor and lymph nodes.

**RESULTS:** From January 1999 to December 2005, 69 patients with a median age of 60 years (range: 33-74) were included in the trimodality treatment concept. After induction chemotherapy and radio-chemotherapy, 55 (79%) patients underwent lobectomy, 6 (9%) sleeve-lobectomy, and 6 (9%) pneumonectomy. Exploratory thoracotomy was performed in 2 (3%) cases. Operative mortality and major morbidity rates were 3% and 20%, respectively. On pathologic examination of primary tumor, grade I-II regression was observed in 26 (38%) patients, grade III+ in 43 (62%) patients. In lymph node tissue, grade I-II was detected in 35 (51%) of cases, grade III+ in 34 (49%). According to T-regression grade, 5-year survival rates were 35% for grade I-II, and 23% for grade III+ (P=.23). According to N-regression grade, these were 42% for grade I-II, and 13% for grade III+ (P=.01).

**CONCLUSIONS:** The grade of tumor regression only in the involved lymph nodes is able to predict the clinical outcome of patients with stage (N2)IIIA/(N3)IIIB-NSCLC treated by trimodality approach. The presence of microscopic residual disease (grade II) does not worsen significantly the prognosis as compared with a complete "clearance" of the lymph nodes.

#### OP-916-EFFECT OF SUBAORTIC-PARAAORTIC LYMPH NODE INVOLVEMENT IN RESECTED LUNG CANCER OF LEFT UPPER LOBE

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**BACKGROUND:** Mediastinal lymph node involvement (N2 disease) is the most important prognostic factor of non-small cell lung cancer (NSCLC) patients without distant metastasis. Some types N2 disease believed that not influence prognosis as others as. One of these types is involvement of subaortic or paraaortic lymph nodes (sAO/pAO) in NSCLC of left upper lobe.

**PATIENTS-METHOD:** Between 1993 and 2007, 307 patients with NSCLC located in left upper lobe were treated. Mean age of the patients was 55.8 (31-81). Male patients were constituted 94.4% of the group. Squamous cell carcinoma was the most encountered histopathological tumor type (73%). For mediastinal staging; standard cervical mediastinoscopy in 288 patients, extended cervical mediastinoscopy in 53 and anterior mediastinotomy or video assisted thoracoscopy in 15 patients who have enlarged subaortic or paraaortic lymph nodes in their computerized tomography of thorax, was done. After mediastinal staging, no mediastinal metastasis was found in 255 patients. Surgery was performed to 245 patients. Of these, a complete resection could be achieved in 240. N2 disease was diagnosed in 55 (23%) of them. Involvement of sAO/pAO lymph nodes were detected in 80,5% of the N2 patients. In 63% of the N2 patients, T stage was T2. Surgical procedures performed in these patients were lobectomy in 24 (58%) and pneumonectomy in 21 (42%). All the patients with N2 disease received adjuvant chemotherapy. Patients were followed up and survival rates were calculated.

**RESULTS:** Overall mean survival time of the N2 patients was 40 months; 5-year survival rate was 25%. Patients with only sAO/pAO lymph node involvement (58%) had better prognosis although not statistically significant as mean survival time of 43 months and 5-year survival rate of 33%. Mean survival times of T2 and T3 patients were 43 and 26 months respectively ( $p=0.015$ ). 5-year survival rates of patients performed lobectomy and pneumonectomy were 58% and 11%, respectively ( $p=0.035$ ).

**CONCLUSION:** In NSCLC patients with N2 disease emerged intraoperatively, an acceptable survival rate can be achieved with complete resection, if the tumor was staged as T2 and no pneumonectomy is needed.

#### OP-917-CAUSE SPECIFIC ANALYSIS OF RISK FACTORS FOR COMPLETELY RESECTED PATHOLOGIC STAGE IA NON-SMALL CELL LUNG CACNER: CANCER RELATED AND NON-CANCER RELATED

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**BACKGROUND:** Prognosis of pathologic stage Ia non small cell lung cancer (NSCLC) is reported to be good. But, about 15 to 40 % of patients succumb to death by surgical mortality, recurrent disease or any other causes, eventually. We sought to the pattern of treatment failure and cause specific risk factors in complete resected pathologic stage Ia NSCLC.

**METHODS:** 156 completely resected stage Ia NSCLC patients from 1992 to 2006 were retrospectively reviewed. Clinicopathologic data were obtained from prospectively built Lung cancer data system. Treatment failure was divided into 2 categories; 1. Recurrence and lung cancer related death, 2. Non-cancer related death.

**RESULTS:** Median follow up time was 38.9 months. 5 year overall survival rate were 85.1%. In-hospital mortality rate was 1.32%. 1. Recurrence and lung cancer related mortality. Recur was diagnosed in 19 patients (12.3%) and all were distant metastasis. 15 patient died of lung cancer. Microvascular invasion was significant risk factor for recurrence ( $HR=9.52$ ,  $p=0.00$ ) and lung cancer related death ( $HR=11.5$ ,  $p=0.00$ ). 2. Non-cancer related death. Among 11 deaths in this category, 3 were secondary cancer related deaths. 2 patients died of respiratory insufficiency. 2 patients died of renal and cardiac disease. 4 patients without data of causes of death had undergone pneumonectomy and two of them died within 6months after operation. In multivariate analysis, postoperative cardiopulmonary complication ( $HR=12.2$ ,  $p=0.036$ ) and pneumonectomy ( $HR=5.65$ ,  $p=0.012$ ) were significant risk factors for non-cancer related death.

**CONCLUSIONS:** In pathologic stage Ia NSCLC, microvascular invasion was a risk factor for the recurrence and the lung cancer related death. Pneumonectomy and cardiopulmonary complication were significant risk factor for the non-cancer related death.

#### OP-918-THE ACCURACY AND COST OF POSITRON EMISSION TOMOGRAPHY IN MEDIASTINAL STAGING OF NON-SMALL CELL LUNG CANCER

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**BACKGROUND:** Positron emission tomography (PET) is believed that has effectiveness comparable with mediastinoscopy and has acceptable cost in mediastinal staging of operable non-small cell lung cancer (NSCLC) patients

**METHODS:** PET and mediastinoscopy was performed to 197 patients with operable non-small cell lung cancer (NSCLC) between 2004 and 2007. Mediastinal lymphatic dissection via thoracotomy was performed to 149 patients found no mediastinal metastasis by mediastinoscopy. Mediastinal lymph nodes were examined histopathologically. Five mediastinal staging strategies including PET and mediastinoscopy were designed and results of these 197 patients were adapted into these strategies. In strategy A performing mediastinoscopy to all patients, in strategy B performing mediastinoscopy for all patients except with T1N0 cancer in computerized tomography of chest (CT), in strategy C performing mediastinoscopy for all patients except with peripheral squamous cell cancer staged T1N0 with CT, in strategy D performing PET for patients with cancer staged T1N0 by CT, performing mediastinoscopy if metastasis reported or cancer staged other than T1N0 by CT and in strategy E, performing PET for all patients and if positive, performing mediastinoscopy to these patients were evaluated. Accuracy rate and average costs of each strategy were calculated according to the prices established by Social Security Organization of Turkey.

**RESULTS:** The specificity, sensitivity and accuracy rates of PET in mediastinal staging of NSCLC were determined as 74% (95%CI: 67-81), 72% (95%CI: 61-84), and 74% respectively, while specificity, sensitivity and accuracy rates of mediastinoscopy were determined as 100% (95%CI: 96-100), 81% (95%CI: 71-91) and 94% respectively. Strategy C provided highest accuracy with lowest cost, and strategy E provided the highest cost with lowest accuracy.

**CONCLUSION:** In the mediastinal staging of NSCLC, routine using of PET does not provide sufficient accuracy and has an obvious financial disadvantage.

#### OP-919-POSITRON EMISSION TOMOGRAPHY FOR NODAL STAGING OF LUNG CANCER IN A TUBERCULOSIS-ENDEMIC REGION

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**BACKGROUND:** Integrated positron emission tomography/computed tomography (PET/CT) has emerged as a powerful tool for pre-operative staging of non-small cell lung cancer (NSCLC). One potential limitation may be false positive results due to granulomatous disease, yet most previous studies on PET/CT have come from countries where such diseases are uncommon. This study examines the accuracy of PET/CT for nodal staging of NSCLC in a region where tuberculosis (TB) remains endemic: Hong Kong.

**METHODS:** Consecutive patients who received PET/CT for staging of proven or suspected NSCLC followed by thoracotomy at a university cardiothoracic surgery unit in Hong Kong were included for study. Between January 2003 and December 2005, a total of 249 lymph node stations in 105 patients were evaluated. PET/CT findings were correlated with histological findings of these lymph nodes for all patients. A nodal station was regarded as positive for metastasis on PET/CT if the Standardized Uptake Value was 2.5 or greater and/or if the station was reported as metastatic by an experienced radiologist. The histologic nodal assessment results were used as reference standards.

**RESULTS:** Nodal metastases were identified on histology in 52 nodal stations (21%). Overall, the sensitivity, specificity, and accuracy of PET/CT for nodal staging on a per-nodal station basis were 35%, 84%, and 74% respectively. The overall positive predictive value (PPV) of PET/CT for nodal metastasis was 37% and the overall negative predictive value (NPV) 83%. PET/CT falsely identified 31 nodal stations (12%) as being positive for metastasis. A medical history or radiological evidence of previous or concurrent pulmonary TB was identified in



38 patients (36%). The rate of false positive nodal stations on PET/CT was 13 out of 98 in patients with clinical evidence of TB, compared to 18 out of 151 in patients without evidence of TB. The PPV for nodal metastasis in TB patients was 28%, compared to 42% in non-TB patients. The NPV of PET/CT was high in both TB and non-TB patients (92% and 86% respectively). The likelihood ratio for true positives with PET/CT nodal staging was 2.84 in TB patients ( $p = 0.92$ ), compared to 5.39 in non-TB patients ( $p = 0.02$ ).

**CONCLUSIONS:** In a TB endemic region, PET/CT remains an invaluable tool for nodal staging in NSCLC because of its high specificity, accuracy and NPV. However, its PPV in such regions is limited by a high rate of false positives probably due to TB and other granulomatous diseases. In patients with a history or radiological evidence of TB, histological confirmation should be mandatory for any lymph node suspicious for metastasis on PET/CT.

### OP-920-RISK OF RECURRENCE IN SURGICALLY RESECTED STAGE I ADENOCARCINOMA OF THE LUNG

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**BACKGROUND:** Stage I lung cancer, especially adenocarcinoma represents the fastest growing segment due to screening programs. However, stratification of patients — prognosis using solely the TNM staging system does not allow one to differentiate between the patients who are and who are not at risk of recurrence. Better knowledge of the molecular biology of lung cancer might improve the capability to predict the outcome for any individual patient, which in turn would be helpful to define subgroups of patients according to prognosis. The purpose of this study was to evaluate several histopathologic variables and a panel of molecular markers to assess their prognostic value in patients with resected stage I adenocarcinoma.

**METHODS:** Fifty-five patients with resected stage I adenocarcinoma at the Seoul National University Bundang Hospital were enrolled into the study. They comprised 28 cases of stage IA and 27 cases of stage IB. Histopathologic factors and molecular markers were selected including Glut1, Ki-67, p16, Rb, cyclin D1, p53, E-cadherin, EGFR which represent separate oncogenic pathways.

**RESULTS:** Univariate analysis showed that differentiation, lymphatic invasion, necrosis, T factor, p53, E-cadherin, EGFR overexpression were prognostic factors and multivariate analysis demonstrated that p53 ( $p=0.01$ ), Ki-67 ( $p=0.03$ ), E-cadherin ( $p=0.02$ ), vascular invasion ( $p=0.01$ ), lymphatic invasion ( $p=0.04$ ), and necrosis ( $p=0.01$ ) emerged as independent prognostic factors of recurrence. Patients were defined as low-, and high-risk group according to the number of factors involved (p53, E-cadherin, lymphatic invasion, necrosis) and the difference in disease free survival between these groups was statistically significant ( $p=0.001$ ).

**CONCLUSION:** In resected stage I adenocarcinoma, pathologic and molecular marker that independently predict disease-free survival have been identified. Through further investigation with large number of patients, validation of these results must be necessary.

### OP-921-IMMUNOHISTOCHEMICAL FACTORS PREDICTING RECURRENCE AFTER RESECTION OF STAGE I NON-SMALL CELL LUNG CANCER

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**BACKGROUND:** To identify the prognostic molecular markers using immunohistochemical study on surgically resected stage I non-small cell lung cancer.

**METHODS:** From June, 2003 to August, 2005, total 77 patients who underwent curative resection for pathologic stage I NSCLC were included in this study. 44 patients had T1N0M0, 33 patients T2N0M0 of stage. Adenocarcinoma was detected in 55 patients and squamous cell carcinoma in 22 patients. Pathologic parameters such as differentiation, vascular or lymphatic involvement, necrosis or visceral pleural invasion were evaluated. Immunohistochemical stains for Glut1, p53, p16, cyclin D, E-cadherin, Ki-67 and EGFR were performed. The statistical significances between disease-free survival rate and pathologic parameters or immunohistochemical results were evaluated.

**RESULTS:** During 28.9-month median follow-up period, cancer-related death was observed in 5 patients (6.4%), recurrence in 19 patients (24.7%) and 3-year disease-free survival rate was 74.5%. Over-expression of EGFR, loss of Rb and loss of E-cadherin were significantly correlated with recurrence rate. Hazard ratio was 4.3 for Rb loss, 4.4 for E-cadherin loss and 2.6 for EGFR over-expression. Patients with the two or three abnormal molecular expressions had significantly lower 3-year survival rate than the others (27% versus 80%,  $p=0.03$ ).

**CONCLUSION:** Over-expression of EGFR, loss of Rb and loss of E-cadherin were significantly correlated with recurrence rate. We can expect the disease-free survival rate of patients according to the abnormal molecular expressions.

### OP-922-EFFECT OF NEOADJUVANT THERAPY FOR MICROSCOPIC N2 NON-SMALL CELL LUNG CANCER DETECTED BY MEDIASTINOSCOPY

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**BACKGROUND:** Low prevalence of N2 disease in clinical stage I non-small cell lung cancer (NSCLC) favors that further staging such as mediastinoscopy is not necessary for T1N0 or T2N0 on preoperative CT scan. The questionable benefit of neoadjuvant therapy for occult N2 disease still needs to be answered for conclusion. The aim of this study was to evaluate the effect of neoadjuvant therapy for N2 patients detected by mediastinoscopy in T1-2N0 NSCLC on CT scan.

**METHODS:** When patients had N2 node on mediastinoscopy, they were referred for neoadjuvant therapy followed by pulmonary resection and adjuvant therapy by our protocol. We collected data of 116 consecutive patients who had T1-2N0 on CT but N2 on mediastinoscopy or thoracotomy from 1996 to 2004. Twenty seven patients completed pulmonary resection and adjuvant therapy following neoadjuvant therapy consisted of cisplatin-based chemotherapy and radiation of 40-45Gy for N2 disease detected on mediastinoscopy. Eighty nine patients were found to have N2 disease after pulmonary resection and lymph node dissection at thoracotomy and these patients also underwent adjuvant therapy afterwards for unforeseen N2 disease. Survival analysis was done by Kaplan-Meier curve and Log Rank test was performed for comparison of survival.

**RESULTS:** No difference was found between those who had neoadjuvant therapy and those who did not get neoadjuvant therapy in age, sex, cell type of lung cancer, primary T stage, type of operation, or postoperative morbidities. Mean follow-up period was 40 months. Five-year survival was 44% for overall 116 patients with stage I on CT scan but pathological N2 disease. Survival comparison by Log Rank test showed no statistical difference between those with neoadjuvant therapy and without neoadjuvant therapy ( $p=0.647$ ).

**CONCLUSIONS:** We conclude that neoadjuvant therapy by cisplatin-based chemotherapy and radiotherapy does not provide survival benefit for microscopic N2 disease detected by mediastinoscopy in non-small cell lung cancer patients with T1N0 or T2N0 on preoperative CT scan.

### OP-923-RESULTS OF 99mTc DEPREOTIDE SCINTIGRAPHY IN SOLITARY PULMONARY NODULE

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**OBJECTIVES AND BACKGROUND:** To evaluate the diagnostic yield of 99mTc depreotide scintigraphy in patients with solitary pulmonary nodule. The affinity of various malignant neoplasms including small cell and non-small cell lung cancer for peptide analogs of somatostatin has been well documented. Depreotide is such an analog and can be complexed with technetium-99m (99mTc depreotide) for optimal imaging properties. The result of using 99mTc DEPREOTIDE to differentiate malignant and benign SPN. Of the 28 individuals studied, 22 had a histological result compatible with malignant neoplasm 99mTc depreotide scintigraphy correctly identified 25 of this group.

**METHODS:** Patients with SPNs  $\leq 6$  cm on chest radiograph were evaluated. Twenty-eight individuals who had an absence of a benign pattern of calcification on CT scan, age  $\geq 30$  years, and no demonstrable radiographic stability for the prior 2 years. All went study with 99mTc - depreotide scintigraphy and subsequent histologic examination.

**RESULTS:** The mean age was ( 38.7  $\pm$  4.9 ) years ( range Of 32 : 65 years ) of the 28 individuals studied , 24 had a histological result compatible with malignant neoplasm , 99mTc - depreotide scintigraphy correctly identified 22 patients , with 2 false +ve demonstrations . Sensitivity was 92.8 %.

**CONCLUSION:** The currently reported multicenter study confirms the initial experience with 99mTc-depreotide in the scintigraphic differentiation of benign and malignant SPNs. This method should be readily available, safe, and more cost -effective in comparing with others.

#### **OP-924-PROGNOSTIC SIGNIFICANCE OF MAIN BRONCHIAL INVASION WITH LUNG CANCER LOCALIZED IN RIGHT UPPER LOBE**

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**BACKGROUND:** Non-small cell lung cancer (NSCLC) extending to the main bronchus is staged as pT3. In this study we investigated the survival of patients with NSCLC localized in right upper lobe extending to the main bronchus.

**METHODS:** Between January 1998 and January 2007, results of surgery in 302 patients with NSCLC localized in right upper lobe underwent resection. Their results were evaluated retrospectively. 169 patients with completely resected cancer and staged as T2 or T3 (superior sulcus tumors were not included) without mediastinal lymph node metastasis were formed the study group. The patients were divided into three groups; patients with NSCLC staged pT3 due to invasion of the main bronchus (pT3-MB) (n=41), pT2 (n=82), and pT3 without main bronchus invasion (n=46). Their 5-year survival rates were compared univariately and prognostic factors were investigated using multivariate analysis.

**RESULTS:** Pneumonectomy was needed in 56.1% of the patients with pT3-MB cancer whereas in 16.7% for the rest of the patients (p<0.001). Histopathological tumor type was squamous cell carcinoma in 78% of the pT3-MB cases and 39.7% of the other cases (p<0.001). Frequency of interlobar and/or hilar lymph node metastasis (N1-HI) was 51% in pT3-MB patients and 17% in the rest of the patients (p<0.001). The 5-year survival rate of patients with pT3-MB was 36.7%, whereas 55.1% for patients with pT2 and 50.7% for patients with other pT3 NSCLC (p=0.28). Survival of the patients who had pneumonectomy was poorer than others' (p<0.01). Detection of N1-HI was found to be predictive for poor prognosis (p<0.001). Multivariate analysis showed that T status, histopathological tumor type and resection type had no effect on survival but existence of N1-HI was found to be a poor prognostic factor (p=0.01).

**CONCLUSION:** Survival of patients with resected right upper lobe NSCLC with main bronchus invasion is poor and this is probably due to high incidence of hilar and/or interlobar lymph node metastasis.

#### **OP-925-ACCURACY OF THE PET ACCORDING TO MEDIASTINAL LYMPH NODE STATIONS IN MEDIASTINAL STAGING OF LUNG CANCER**

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**BACKGROUND:** The role of positron emission tomography (PET) in mediastinal staging of non small cell lung cancer (NSCLC) is not clear. We studied effectiveness of PET in mediastinal staging of NSCLC according to mediastinal lymph node stations.

**PATIENTS AND METHOD:** PET-CT was carried out to 181 operable NSCLC patients between 2004 and 2006. Maximum standard uptake (SUVmax) levels of right paratracheal (numbered 2R and 4R), left paratracheal (numbered 2L and 4L), inferior mediastinal (numbered 7,8 and 9) and aortopulmonary (numbered 5 and 6) areas lymph nodes were evaluated separately. Stations where PET reported metastasis (SUVmax>2,5) were recorded. Later, cervical mediastinoscopy was done to all the patients and mediastinal lymphatic dissection via thoracotomy was performed to patients who were not detected mediastinal metastasis at mediastinoscopy. Mediastinal lymph nodes examined histopathologically and, sensitivity, specificity and accuracy of PET were calculated for each mediastinal lymph node stations.

**RESULTS:** Cancer was at right lung in 88 and at left in 93 patients. Mediastinal

lymphatic metastasis was detected in 55 patients (30%). Sensitivity, specificity, positive and negative predictive values (PPV and NPV) of PET in mediastinal lymph node area basis were calculated as 69.8%, 85.7%, 40% and 96% respectively. Accuracy rate of PET was 84% for right paratracheal area, 87% for left paratracheal area, 82% for inferior mediastinal area and 75% for aortopulmonary area.

**CONCLUSION:** The most effective areas of PET in mediastinal staging of NSCLC patients are right and left paratracheal areas. The power of PET decreases at inferior mediastinal and aortopulmonary areas which the power of mediastinoscopy is low.

#### **OP-926-THE EFFECT OF NEOADJUVANT CHEMOTHERAPY ON STAGE IA TO IIIA NON-SMALL CELL LUNG CANCER: A CASE CONTROL STUDY**

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**BACKGROUND:** Although surgery offers the best chance of cure for patients with non-small cell lung cancer the overall 5-year survival rate is modest, and improvements are needed. On the other hand, optimal management of stage IIIA-N2 non-small cell lung cancer remains controversial. The current study was set up to compare, in patients with resectable non-small cell lung cancer, surgery alone versus platinum-based chemotherapy followed by surgery in terms of overall survival, pathological staging, resectability rates, surgical morbidity.

**METHODS:** This is a retrospective study of consecutive patients with biopsy-proved T1-3 N0-2 M0 lung cancer who underwent induction chemotherapy before surgery (n=74) or surgery alone from January 2004 through June 2007 (n=371). Lung resection was performed within 4 weeks of completion of chemotherapy in induction chemotherapy group.

**RESULTS:** Only one patient died postoperatively in neoadjuvant group (1.3%). Postoperative morbidity rate were 25.5% and 19% in patients who underwent surgical induction following chemotherapy and surgical resection alone groups respectively. The difference was not significantly different. Overall five-year survival rates were 68.6% and 52.4% respectively. In pIIIA patients, 3-year survival rates were 64.5% and 58.8% respectively. The difference was not statistically significant (p=0.18). In the induction chemotherapy group, 3-year survival rates were 67%, 62.5% and 52% in patients with stage IB, IIB and IIIA tumor respectively. Although, these rates were slightly higher than those of stage-matched surgery-alone groups, statistically significant survival benefit was not noted provided by induction chemotherapy.

**CONCLUSIONS:** Although there was no evidence of a difference in overall survival, chemotherapy before surgery in selected patients can lead to improved survival in patients with pIB, pIIB and pIIIA tumor. In addition, Induction chemotherapy did not cause increased morbidity. Early stage lung cancer patients had limited survival benefit provided by preoperative chemotherapy

#### **OP-927-PLEURODESIS WITH SILVER NITRATE 1%, DOES A BETTER AGENT EXIST? ANALYZE OF 36 PATIENTS**

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**BACKGROUND:** The malignant pleural effusion occurs generally in patients with advanced cancer illness and for blockage of the pleural lymphatic circulation. The more frequent clinical manifestation is the dyspnea, followed by chest pain and symptoms related to the tumor, as lose of weight and anorexy. It can be present in up to 50% of the cancer. The primary tumor sites that more frequent originates metastasis are the lungs (35%) and the breast (23%). The treatment of the malignant pleural effusion is the chemotherapy and pleurodesis. It must be proven by therapeutic thoracentesis the total pulmonary expansion, generally performed in the previous investigation of the pleural disease. The most know agent used for pleurodesis is the talc. The silver nitrate came back to be used in a lesser concentration (1%) with promising results.

**OBJECTIVE:** To analyze the use of silver nitrate 1% as sclerosant agent in 36 patients submitted to pleurodesis.

**METHODS:** We selected 36 patients with malignant pleural effusion, confirmed

by cytology or biopsy and with total pulmonary expansion confirmed by a x-ray after thoracentesis. We did pleurodesis by chest drain with silver nitrate 1% - 10 ml. When the volume was minor than 200ml/24hs, the drain was removed. In case of a bigger amount persists, repeated pleurodesis were done daily until reduction of the drainage. The patient was reevaluated in 7 days and 30 days after discharged. The effectiveness of pleurodesis was considered when the patient did not have pleural effusion or have a small pleural effusion without clinical reperussion. If these situations occur, the pleurodesis was considered unsuccessful.

**RESULTS:** We had 22 female patients and 14 male, with average of 60,7 years, with variation from 27 to 88 years old. The primary tumor sites that more frequent originated the pleural metastasis was breast cancer in 29,4% and lung cancer in 26,5%. The average of silver nitrate application per patient was 2,7 times, with variation from 1 to 12 pleurodesis. We did not have malignant pleural effusion recurrence. The complications were chest pain in one patient and empyema in another - morbidity of 6%. No deaths.

**CONCLUSION:** We conclude that the silver nitrate 1% is an excellent agent for pleurodesis with this method and similar to talc effectiveness.

### **OP-928-ROLE OF CHEMOTHERAPY in COMBINED TREATMENT OF NON-SMALL CELL LUNG CANCER**

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**BACKGROUND:** Adjuvant therapy (chemotherapy, radiotherapy) improved the follow-up results of non-small cell lung cancer. The aim of the study was to evaluate the role of chemotherapy in combined treatment of non-small cell lung cancer.

**METHODS and MATERIALS:** At Thoracic Surgery Department of the Institute of Oncology Vilnius University from 1994 till 2006 years 1324 patients (pts) with non-small lung cancer were operated. This is a randomized treatment (surgery+chemotherapy,radiotherapy) of 150 pts with non-small cell carcinoma. 120 pts were in control groups. These pts before and after surgery did not received any adjuvant therapy. Four groups of pts were investigated: 54 pts of group I after complete resection received Cisplatin 80mg/m<sup>2</sup> in four cycles days and Vinblastin 4mg/m<sup>2</sup> adjuvant therapy.48 pts of II group received induction chemotherapy with Taxol (175mg/m<sup>2</sup>) and Carboplatina AUC-due to Calvert formula+surgical treatment, 22pts of III group received neoadjuvant and adjuvant chemotherapy: Mitomycin 6mg/m<sup>2</sup> and Ifosfamide 3000mg/m<sup>2</sup>+mesna and Cisplatin 100mg/m<sup>2</sup> 2 day two cycles. After resection the pts received three cycles of chemotherapy. All pts of this group were treated in stage IIIA of disease. After randomization the pts received radiotherapy. 26 pts of IV group after surgery received adjuvant chemotherapy: Gemcitabine 1250mg/m<sup>2</sup> 2 days 1+8 and Cisplatin 30mg/m<sup>2</sup>.

**RESULTS:** The follow-up results of treatment of pts who received neoadjuvant and adjuvant therapy were better than in controls groups. Median survival of pts who received neoadjuvant chemotherapy was 22+2.0 months. The pts did not have such treatment lived shorter -17.0+2,0 months. The pts who received adjuvant chemotherapy after radical operation lived 23.1(18.7-27.2) months.Median survival of pts who were treated only surgically was 13.0(10.1-15.9) months.

**CONCLUSIONS:** 1.Neoadjuvant and adjuvant chemotherapy of non-small cell lung cancer improved the follow-up results of treatment.2.The pts in stage IIIA disease before surgery must treated with induction chemotherapy.

## CONGENITAL III

### OP-930-TEN-YEAR EXPERIENCE IN THE USE OF AORTIC HOMOGRAFT CONDUITS TO CONSTRUCT AN EXTRACARDIAC TOTAL CAVOPULMONARY CONNECTION

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**BACKGROUND:** Arrhythmias, pleural effusions, and thromboembolism remain major reasons for morbidity and mortality following the Fontan-Kreutzer operation. Use of an homograft conduit to construct an extracardiac total cavopulmonary connection may have advantages over intracardiac palliations by eliminating intra-atrial suture lines, frequently avoiding the use of pump-oxygenators, and minimizing the use of long-term warfarin anticoagulants.

**METHODS:** Over a ten-year period ending in 2007, 128 consecutive patients (mean age of  $4.4 \pm 3.2$  yrs) underwent an extracardiac total cavopulmonary connection using an aortic homograft for the inferior cava-to-pulmonary artery conduit. Cardiopulmonary bypass with a pump-oxygenator was used in 84 patients (66%), veno-venous bypass without an oxygenator in 9 (7%), and no extracorporeal support was used in 35 (27%). 117 patients (91%) were discharged on aspirin and 4 (5%) on warfarin, the latter for supraventricular arrhythmias (N=2), heparin-induced thrombocytopenia (N=1), or use of a mechanical atrioventricular valve (N=1). For data analysis, atrioventricular valvular regurgitation was graded qualitatively from 0 to 4+. Arrhythmias during the postoperative period were either supraventricular tachyarrhythmias or bradyarrhythmias. Prolonged pleural effusions were those that lasted > 10 days. The pulmonary artery index (in mm<sup>2</sup>/m<sup>2</sup>) was calculated as the cross-sectional area of the branch pulmonary arteries at the hilum divided by the body surface area. Multiple regression analysis (SAS Institute, Cary, N.C., U.S.A.) was used to test for statistical independence, and a probability value of  $\leq 0.05$  was considered to be significant.

**RESULTS:** Over time, there was a clear trend towards less use of mechanical circulatory support to perform the operation. 124 patients (97%) survived to hospital discharge. Statistically significant independent risk factors for prolonged pleural effusions were the lack of a patent fenestration (36/102 vs. 2/26 with a fenestration,  $p < 0.001$ ) and a low pulmonary artery index ( $187 \pm 25$  vs.  $218 \pm 24$  mm<sup>2</sup>/m<sup>2</sup>,  $p = 0.03$ ). Independent risk factors for arrhythmias were a right (vs. left) univentricular morphology (18/40 vs. 2/68,  $p < 0.0001$ ), a low pulmonary artery index ( $176 \pm 16$  vs.  $213 \pm 26$  mm<sup>2</sup>/m<sup>2</sup>,  $p = 0.0002$ ), and increased atrioventricular valvular regurgitation ( $1.50 \pm 0.75$  vs.  $0.29 \pm 0.53$ ,  $p < 0.0001$ ). Independent risk factors for death included increased atrioventricular valvular regurgitation ( $2.50 \pm 0.58$  vs.  $0.55 \pm 0.36$ ,  $p < 0.0001$ ) and a low pulmonary artery index ( $159 \pm 10$  vs.  $210 \pm 27$  mm<sup>2</sup>/m<sup>2</sup>,  $p = 0.0004$ ). At  $4.9 \pm 2.1$  years follow-up, there have been no documented thromboembolic events, circuit revisions, conduit replacements, or late deaths.

**CONCLUSIONS:** Use of a homograft conduit to construct an extracardiac total cavopulmonary connection is a safe and effective procedure - applicable to most forms of univentricular morphologies. The operation can frequently be performed without a pump-oxygenator and eliminates the need for long-term anticoagulation with warfarin in most patients. Whereas a fenestration can decrease the duration of pleural effusions, risk factors for morbidity and mortality include  $\geq 2+$  atrioventricular valvular regurgitation, right (vs. left) univentricular morphology, and a pulmonary artery index  $< 180$  mm<sup>2</sup>/m<sup>2</sup>.

### OP-931-THE APPLICABILITY OF THE "RISK ADJUSTMENT FOR CONGENITAL HEART SURGERY (RACHS-1)" SCORING SYSTEM FOR STRATIFICATION OF PROBABILITY OF MORTALITY FOLLOWING CONGENITAL HEART SURGERY

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**BACKGROUND:** Congenital heart surgery is associated with significant risks. Identification of pre-operative factors that may contribute to morbidity and mortality in this young patient population is an ever persistent challenge to pediatric cardiac surgeons. The purpose of this study was to verify the applicability of the "Risk Adjustment for Congenital Heart Surgery (RACHS-1)" scoring system for stratification of probability of mortality of congenital heart surgery in an international heart institute.

**METHODS:** All patients (3311) under the age of 18 years who underwent congenital heart surgery between 2002 and 2006 were reviewed and analyzed. Data was collected retrospectively and validated for accuracy from the Operative Log Book, the Departmental Mortality and Morbidity Records, the Hospital Medical Records and the Hospital Integrated Clinical Information System (ICIS).

**RESULTS:** The data analysis revealed a positive and progressive relationship between the "Risk Adjustment for Congenital Heart Surgery (RACHS-1)" scoring system and surgery outcome of in-hospital mortality in the patient population treated at a single heart institute.

**CONCLUSIONS:** The "Risk Adjustment for Congenital Heart Surgery (RACHS-1)" scoring system has excellent power to reasonably predict mortality in a non-North American nor-European heart institute and it can discriminate between different categories of congenital heart surgery based on that predicted risk. This was confirmed using c-statistics.

### OP-932-TRANSPPOSITION OF THE GREAT ARTERIES WITH INTACT VENTRICULAR SEPTUM. ARTERIAL SWITCH OPERATION IN PATIENTS 21 DAYS OF AGE OR OLDER

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**BACKGROUND:** Neonatal arterial switch operation (ASO) is the procedure of choice for the repair of transposition of the great arteries and intact ventricular septum (TGA-IVS). Classically, after 21 days old the ability of the Left ventricular (LV) to sustain a systemic output remains uncertain and LV retraining could be necessary. The aim of this study was to review our experience with patients with TGA-IVS and late referral to surgery.

**METHODS:** Between 1993 and 2007, 79 patients with TGA-IVS older than 3 weeks old were referred to our institution for an ASO. The median age was 44 days (21 to 1070 days). Decision to perform a primary ASO was roughly based on the values of LV mass  $> 35$  g/m<sup>2</sup> and when between 25 and 35g/m<sup>2</sup> on the value of LV mass/volume ratio  $> 1.2$ . Below these levels, a rapid two stage approach was favoured. Primary ASO was performed in 44 (Group I) (median age 29, 21 to 143 days) while 35 (Group II) (median age 83, 23 to 1070 days) underwent a rapid 2-stage management (median delay 9 days) with initial pulmonary artery banding associated or not a systemic to pulmonary artery shunt.

**RESULTS:** Overall mortality was 5% (4/79). It was 2.27% in group I versus 8.5% in group II (2 of them prior to the ASO). Mechanical LV support was required in 1 patient of Group I (LV mass/ Volume ratio = 1) versus 3 in group II. Patients in group II were older than in group I (83 versus 29 days,  $p = 0.0001$ ). Mortality and post operative morbidity were not influenced by age, LV geometry, LV mass index, LV posterior wall thickness index, LV volume index, LV mass/volume ratio, patent arterial duct or patterns of coronary anatomy. There was a trend for shorter hospital stay in group I ( $7.4$  vs  $11.6$  days,  $p =$  not significant).

**CONCLUSIONS:** Despite late referral, and initially inadequate left ventricular quality, patients 21 days of age or older with TGA/IVS can successfully be treated with the arterial switch procedure, provided that the left ventricle is adequately prepared. Either primary ASO followed by mechanical LV support or rapid two stage approach are adequate managements which provide good results.



### OP-933-MAKING A SIMPLE AUTOLOGUS MONOCUSP PERICARDIAL TRANS ANULAR PATCH FOR RIGHT VENTRICULAR OUTFLOW TRACT RECONSTRUCTION IN TETRALOGY OF FALLOT

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**OBJECTIVE:** Late right ventricular failure and its re-operation due to free pulmonary regurgitation after trans-annular patch correction of tetralogy of Fallot and DORV VSD PS is a current issue of discussion in the Pediatric cardiac society. Various options are presently being practiced to make a competent RVOT but none is free of pit-falls. Valved homograft is suffering from calcification and stenosis regurgitation followed by re-operation. Monocusp prepared from bovine pericardium also calcify progressively. Pocket like monocusp prepared in the under surface of trans annular pericardial patch also become incompetent even at the time of its insertion. To make a more competent RVOT we had modified our autologous monocusp pericardial patch. Here we are presenting our experience with new autologous monocusp pericardial patch.

**METHOD:** From January 2005 to July 2007 we had operated on 428 cases of tetralogy of Fallot and DORV VSD with variable degrees of pulmonary stenosis. History, clinical data, laboratory investigations, radiological imaging and Echocardiography was evaluated for the diagnosis and operative indications for the selected cases. Only 15% (64) cases were requested to do a cardiac catheterization for evaluation of branch PA's, MAPCA and doubtful coronary patterns. Approximate Z value for the cases was calculated and plotted for trans-annular pericardial patch.

**OPERATIVE PROCEDURE:** With all aseptic precaution in supine position mid-line sternotomy done. Pericardium harvested and treated with 0.6% glutaraldehyde for 6 minutes. CPB started with Aortic and bicaval cannulation. After cross clamp and cold blood cardioplegia atriotomy done. Infundibular bands resected as far possible from the atriotomy. According to the need of the case pulmonary annulus and valve is tested to size. Desired Hegar's dilator placed to measure the ring size. Passed smoothly we do close the VSD with PTFE patch and wean from CPB. As pre-operative evaluation if the patient is in need of trans annular patch we open the proximal PA, see the valve morphology and open the annulus and RVOT to the desired Z value of zero to 1. A piece of untreated pericardium is used to make the leaflet of the monocusp pulmonary valve. At least twice we measure the length and breadth of monocusp before we cut it to fit properly without stenosis. Starting from the apex of ventriculotomy we stitch the monocusp up to annulus. From the annulus the suture continue to the leaflet tip in both sides. TAP is then sutured as usual. RV/LV pressure measured to make it <7 in all cases.

**RESULTS:** Severe pulmonary stenosis requiring trans-annular patch to relieve RVOT obstruction was 236 (55%) and 192 patient does not need any trans annular patch. Age ranges from 3 years to 28 years (median  $5.5 \pm 3.2$  years). Sex: male 278(64%), female 150(36%). Body weight ranges from 4.5 kg to 46 kg (mean  $12.4 \pm 4.8$  kg). All the cases included in this study were in situs solitus, levocardia, and concordant connections. No cases of coarctation of aorta, multiple MAPCA, absent pulmonary valve were included. Isolated RPA or LPA stenosis was not excluded. There were no significant differences between groups regarding operating time, ICU stay, inotropic support, post-operative morbidity and mortality. No patient required re-exploration for bleeding or re-operation for failure to wean from CPB. Mortality from post perfusion injury induced multi organ failure were 3.4% (8) in monocusp group and 3.1% (6) in non patch group (not significant). Post operative echocardiography done on seventh day shows very encouraging findings of pulmonary regurgitations. More than 60% (140) of monocusp patch have no or trivial PR, 25% have grade I to II PR and 15 % have grade II + PR but asymptomatic.

**CONCLUSION:** Autologous untreated monocusp pericardial patch is easy to prepare, in-expensive, not associated with any extra complications. It makes competent RVOT in a very good numbers of patients those require trans-annular patch to relieve RVOT obstruction in TOF /DORV cases. Midterm follow-up results are encouraging. Key words: monocusp, autologous TOF.

### OP-934-SELF-EXPANDABLE PULMONARY VALVE IMPLANT TROUGH ENDOVASCULAR APPROACH

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**BACKGROUND:** Pulmonary insufficiency is a common condition after Tetralogy of Fallot surgical correction. Expectant follow-up can lead to permanent right ventricular dysfunction. Standard surgical treatment is accomplished under cardiopulmonary bypass implanting a prosthesis with significant morbidities and mortality. Recent reports suggest the feasibility of endovascular approach in order to implant a pulmonary valve. We report the development, immediate and intermediate follow-up of a self-expandable pulmonary valve implant through an endovascular approach without cardiopulmonary bypass in pigs.

**METHODS:** After approval of our institutional ethical board committee, twelve pigs underwent endovascular pulmonary valve implant. Pulmonary ring diameter was assessed through echocardiography images. A purse string suture was made in the right ventricle out-flow tract. A guide wire, under fluoroscopic guidance was advanced in pulmonary trunk. Pulmonary artery angiographic images were performed in order to identify native valve's position. After that a self-expandable pulmonary valve mounted in a catheter was advanced over the guide-wire and released in pulmonary trunk, covering the native valve. Control angiograms and echocardiography analysis were performed. The animals were then kept alive for 3 months. Serial clinical and echocardiography evaluation were done. At 3 months animals were sacrificed and pulmonary prosthesis, right ventricle and trunk underwent histological analysis.

**RESULTS:** Pulmonary valve implant was successfully performed in 12 pigs. Acute hemodynamic and echocardiography analysis confirmed a corrected deployment, no paravalvular leaks and insignificant gradient. Follow-up could demonstrate the maintenance of the initial hemodynamic profile without paravalvular or valvular leak. The mean gradient at three months was 18 mmHg (peak). Macro and microscopic valve analysis showed preserved structure. No right ventricular hypertrophy was present.

**CONCLUSIONS:** Endovascular Self-expandable pulmonary valve implant is technically feasible, reproducible and safe. The prosthesis demonstrated an acceptable hemodynamic performance. Future research could possibly lead to clinical application of the described device.

### OP-935-ANATOMICAL REPAIR -PANACEA FOR CONGENITALLY CORRECTED TRANSPOSITION OF THE GREAT ARTERIES?

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**BACKGROUND:** Anatomical repair is being actively evaluated by several centers round the world as the preferred option for Congenitally corrected transposition of the great arteries(CCTGA).We present a retrospective analysis of our patient population operated by a single surgeon in three centers over a time span of thirteen years.

**METHODS:** Between May 1994 and Sept 2007, a total of 68 patients with double discordance underwent anatomical repair. Thirtyone had associated severe valvar pulmonic stenosis or pulmonary atresia (Gp 1) and therefore underwent a Rastelli with atrial switch. Mean age was 6 years (range 3-18 years). The remaining 37 patients had a pulmonary valve that was usable in the aortic position (Gp 2) and underwent an arterial(ASO) and atrial switch procedure. Mean age was 38 months (range 3 months-14 years) Seven of the ASO gp had intact ventricular septum. Three had pulmonary hypertension either due to a large patent ductus(1) or severe tricuspid valve incompetence(2) which had ensured that the left ventricle was still prepared. The remaining four underwent preliminary pulmonary artery banding for left ventricular preparation.

**RESULTS:** There was an early mortality of 5 in the Rastelli group (17%). There has been no late death. Three patients have undergone conduit revision at a mean follow up of 48 months. In the arterial switch group(Gp 2), there was an early mortality of 5 (13.5 %). There were 4 re-operations (2 pulmonary baffle revisions, 1 mitral valve replacement, and 1 permanent pacemaker implantation for delayed complete heart block). There were 3 late deaths (1 secondary to severe progressive left ventricular(LV) dysfunction and 2 secondary to uncontrolled atrial tachyarrhythmias). Four survivors in the ASO group(Gp2) have a left ventricular ejection fraction (LVEF) < 40%, five have moderate aortic incompetence(AI), five have symptomatic tricuspid incompetence(TR) and 1 tricuspid stenosis, while 3 need to be on antiarrhythmic therapy for control of atrial flutter.

**CONCLUSION:** The occurrence of late LV dysfunction, aortic incompetence, tricuspid incompetence and atrial arrhythmia, leads to the conclusion that anatomical repair in the ASO group is still fraught with imperfections. The Rastelli group suffers from the expected need for conduit revision, but has otherwise performed well to date.

### **OP-936-SERUM CYSTATIN C: A SENSITIVE MARKER OF EARLY RENAL INJURY AFTER PAEDIATRIC CARDIAC SURGERY**

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**BACKGROUND:** Cardiopulmonary bypass (CPB) and post-operative low cardiac output are important factors in acute renal injury following cardiac surgery. In patients with renal disease cystatin C has emerged as a new biomarker that is sensitive to changes in glomerular filtration rate (GFR) and may provide a better estimate of renal function than creatinine alone. In this study we wished to: 1. Evaluate cystatin C as a means of quantifying renal performance after cardiac surgery in children. 2. Utilize cystatin C to investigate acute changes in renal function following cardiac surgery in children and its association with cardiopulmonary bypass factors and peri-operative myocardial injury.

**METHODS:** Twenty children, aged 4-70 months (median 5.5, 10 M: 10 F), undergoing surgery (AVSD n=7, VSD n=9, ASD n=4) were prospectively studied. Blood samples were collected pre-operatively and on days 0, 1, 2 and 3 post-operatively to measure serum cystatin C (cysC) and creatinine (Cr). GFR was quantified by creatinine clearance during the first and second 12hr post-operative periods; CrCl(0-12) and CrCl(12-24) respectively. Recorded CPB parameters included bypass duration, the lowest pump flow (Qmin), the lowest hematocrit (Hctmin) and the corresponding lowest oxygen delivery (DO2min). Myocardial injury was quantified post-operatively by Troponin-I release.

**RESULTS:** Serum cystatin C and creatinine increased post-operatively to peak on days 3 and 2 respectively (cysC(Day0) 0.83+/-0.27 vs. cysC(Day3) 1.45+/-0.53; p=0.02) (Cr(PreOp) 31+/-6.9 vs. Cr(Day2) 36.9+/-12.2; p=0.03). During the first 24hrs after surgery GFR remained unchanged (CrCl(0-12) 63.6+/-37.0 vs. CrCl(12-24) 65.1+/-27.5; p=n.s.). In comparison to creatinine, cystatin C demonstrated a superior correlation with GFR (cysC(Day0) r=0.58 p=0.018; Cr(Day0) r=0.09 p=0.735). Receiver-operator cut-off level for cystatin C >1.044mg/l exhibited a 100% sensitivity and 67% specificity for detecting renal dysfunction, defined as a GFR <55ml/min/1.73m<sup>2</sup>, compared to 85% sensitivity and 88% specificity for creatinine >340µmol/l. Serum cystatin C significantly increased during the first 24hr post-operative period (cysC(Day0) 0.83+/-0.27 vs. cysC(Day1) 1.09+/-0.39; p=0.003) and was strongly associated with CPB duration (cysC(Day1) r=0.67, p=0.001), Qmin (cysC(Day1) r=0.61, p=0.005) and greater Troponin-I release (cysC(Day1) r=0.73, p<0.001). Lowest DO2min and Hctmin did not correlate with cystatin C.

**CONCLUSIONS:** This study has shown that in comparison to creatinine, cystatin C provides a better estimate of GFR and is more sensitive in detecting significant renal dysfunction in children following cardiac surgery. Cystatin C identified a transient post-operative renal impairment, the magnitude of which was associated with duration of bypass, low pump flows and the degree of myocardial injury.

## CORONARIES VI

### OP-937-COMPARISON BETWEEN ARTERIAL REVASCU-LARIZATION AND DRUG ELUTING STENTS IN MULTIVESSEL DIABETIC PATIENTS.

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**BACKGROUND:** Reduction of re-stenosis and re-intervention was recently reported with the introduction of drug-eluting stents (DES). This study compares mid-term outcome of surgical arterial revascularization in patients with diabetes mellitus to that of percutaneous interventions (PCI) incorporating DES (Cypher).

**METHODS:** Two hundred and two diabetic patients with multi-vessel disease who underwent left-sided arterial revascularization between May 2002 and December 2005 were compared with 187 diabetics who underwent Cypher stenting. Multi-vessel patients in the surgical group were treated with two ITAs. After performing propensity score with patients' characteristics, COX regression was used in order to evaluate predictors of outcome events.

**RESULTS:** Follow-up ranged between 6-52 months. Four-year survival (Kaplan-Meier) of the two groups was similar (91.3% and 87% for the surgical and Cypher groups, respectively,  $p=0.87$ ). However, angina-free survival (72% vs 47%, respectively, Log Rank  $p<0.001$ ) and re-intervention-free survival (91% vs 76%,  $p=0.000$ ) were better in the surgical group. After adjustment to propensity score, assignment to the Cypher group was associated with increased risk of angina return (OR 4.0, 95% CI 2.6-6.21,  $p=0.000$ ), re-interventions (OR 3.36, 95% CI 1.7-6.62,  $p=0.000$ ) and MACE (OR 3.47, 95% CI 1.85-6.49,  $p=0.000$ ).

**CONCLUSIONS:** Outcome of diabetic patients who underwent surgical arterial revascularization is better than that of PCI patients treated with DES.

### OP-938-EXPANDING EXPERIENCE OF THE MINI-EXTRACOR-POREAL CIRCULATION SYSTEM (MECC) VS. OFF-PUMP CABG

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**BACKGROUND:** We aimed to evaluate the biochemical effects, the clinical results and the outcome of coronary grafts after coronary bypass surgery either off-pump (OPCABG) or with the use of the mini-extracorporeal circulation system (MECC).

**METHODS:** Three-hundred fifty consecutive patients were randomized to undergo CABG either OPCABG or with the use of the MECC. Circulating markers of inflammation and organ injury were assayed. The operative results and the outcome of coronary grafts at a 1-year follow-up were compared between groups. All patients underwent control myocardial perfusion nuclear scan.

**RESULTS:** Preoperative characteristics were similar between groups. There were no statistically significant intergroup differences in operative mortality and major/minor morbidity. The inflammatory reaction elicited by MECC was comparable to that seen after OPCABG (peak interleukin-6  $171.1\pm14.1$  versus  $186\pm7.8$  pg/mL,  $p=0.19$ , OPCABG versus MECC group, respectively). Peak creatine kinase was  $426.3\pm112.9$  versus  $329\pm86.0$  mg/dL ( $p=0.27$ ), and peak S-100 protein was  $0.13\pm0.07$  versus  $0.27\pm0.2$  pg/mL ( $p=0.055$ , OPCABG versus MECC group, respectively). Length of hospital stay and use of blood products were comparable among groups. At 1-year follow-up, we observed two cases of angina recurrence in the MECC group vs. 7 cases in the OPCABG group ( $p=0.10$ ). Residual perfusion defect at myocardial nuclear scan was significantly less frequent following operation with MECC (4 versus 13 cases,  $p=0.44$ ). Nine (OPCABG group) vs. 3 (MECC group) coronary grafts were occluded or severely stenotic at 1 year ( $p=0.13$ , odds ratio 0.32, 95% confidence interval 0.07 to 1.31).

**CONCLUSIONS:** Postoperative mortality and morbidity are comparable among patients operated on with the MECC or off-pump. Pump-related systemic and organ injury is little irrespective to the technique employed. The reduced inci-

dence of residual perfusion defect (statistically significant difference) and of failed coronary grafts at one year (although not statistically) suggest that the MECC may facilitate complete and easier revascularization in the case of complex lesions unsuitable for OPCABG at the price of less operative morbidity than standard on-pump operations.

### OP-939-LATE OUTCOMES OF ALL-ARTERIAL REVASCU-LARIZATION IN MULTIVESSEL CORONARY DISEASE

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**BACKGROUND:** The left internal thoracic artery (ITA) to the left anterior descending graft has become the standard of care for coronary bypass surgery (CABG) based on a large body of converging evidence showing a realizable early and late survival benefit of this graft. Other studies have also shown an incremental late survival advantage when a second arterial conduit (ITA or radial) is used rather than saphenous vein. This effect of arterial grafting has been linked to their superior graft patency compared to vein, and has increased efforts to achieve all-arterial grafting in multivessel coronary artery disease. Yet, to our knowledge, no late survival data for all-arterial CABG has been published to date.

**METHODS:** We obtained complete all-cause mortality survival data in 544 consecutive primary isolated CABG patients (1994-2006;  $60\pm11$  years; 71% male; 31% diabetic) that underwent total arterial revascularization ( $\geq 2$  grafts,  $\geq 1$  ITA). Survival was assessed using Kaplan-Meier analysis.

**RESULTS:** This patient series included 266 two-vessel and 278 three-vessel disease patients receiving an average of  $2.25\pm0.50$  and  $3.02\pm0.80$  grafts per patient, respectively. Bilateral ITA grafts were used in 70 patients (12.9%) while 501 patients (92.1%) received 1 or more radial grafts. In-hospital or 30-day mortality occurred in 7 patients (1.29%) and a total of 80 deaths (14.7%) have been documented thus far with a mean time to death of  $1720\pm1096$  days. Follow-up in survivors was  $2760\pm1065$  days. Kaplan-Meier survival was essentially identical ( $P=0.65$ ; Log-Rank) for the two-vessel (38 deaths) versus the three-vessel (42 deaths) sub-cohorts: 95.4% vs. 96.7% (1000 days); 90.6% vs. 90.8% (2000 days); 85.2% vs. 83.1% (3000 days); and 79.3% vs. 76.7% (4000 days). Importantly, three-vessel survival was significantly better in 204 patients with  $\geq 3$  completed grafts (Complete Revascularization) compared to 74 patients with two grafts only: 98.0% vs. 93.1% (1000 days); 94.5% vs. 81.0% (2000 days); 88.9% vs. 67.5% (3000 days); and 84.6% vs. 54.2% (4000 days). The corresponding Complete Revascularization risk ratio by multivariate cox regression was 0.38 (0.20-0.69; 95% confidence interval,  $P=0.002$ ).

**CONCLUSIONS:** All-arterial CABG in multivessel coronary disease patients - that is predominantly attained through the frequent use of 1 or more radial grafts - is associated with excellent long-term outcomes especially if complete revascularization is attained.

### OP-940-THE USE OF $\Pi$ -CIRCUIT IN ACUTE CORONARY SYNDROMES

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**STUDY:** To evaluate the effectiveness of OPCAB aorta non-touch technique as method of choice for patients with acute coronary syndromes requiring emergency surgical revascularization.

**METHODS:** From 2/2001 to 11/2005, 1359 patients (pts) underwent OPCAB with aorta non-touch technique (mammaries mobilization and  $\Pi$ -circuit). 212 pts (15.6%) were operated emergently. Data were collected prospectively and reviewed retrospectively. Elective vs emergency cases, are compared for pre-, intra- and postoperative variables by using Fisher's exact test, Chi-Square test, Kaplan Mayer method and Cox Regression analysis.

**RESULTS:** Emergencies were in a greater proportion males ( $p=0.027$ ) and octogenarians ( $p=0.031$ ). Elective cases had better LV performance ( $p=0.0005$ ) and were more obese ( $p=0.004$ ) and hyperlipidemic ( $p<0.0005$ ). Preoperatively use of IABP was more common for the emergency group ( $p<0.0005$ ). Other preoperative risk factors were similar. The use of IMAs, the mean number of distal anastomoses ( $2.7\pm0.9$  vs  $2.7\pm0.9$ ), the number of sequential anastomoses and the completeness of revascularization were similar. No difference for

morbidity rates was detected (sternal wound infection, TIA, renal failure, pulmonary complications, prolonged ventilation, atrial fibrillation, postoperative MI, postoperative IABP insertion, urinary retention, GI and psycho complications). In-hospital mortality was greater for the emergency group (0.9 % vs 5.2%,  $p<0.0005$ ), but the 5 days mortality was similar. Follow up was for 7-64 months. Survival and cardiac-event free period favored elective cases ( $p=0.0005$ ).

**CONCLUSIONS:** OPCAB with aorta non-touch technique can be the method of choice for patients with acute coronary syndromes requiring emergency surgical revascularization and is accomplished with acceptable morbidity and mortality rates.

### OP-941-THE IMPACT OF MALIGNANT VENTRICULAR ARRHYTHMIAS ON EARLY AND LONG-TERM SURVIVAL FOLLOWING CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** We sought to determine the impact of malignant ventricular arrhythmias (MVA) on in-hospital and long-term mortality after CABG.

**METHODS:** We studied 4,140 consecutive patients with isolated CABG. Long-term survival data (mean follow-up 7.0 years) were obtained from the National Death Index. Groups were compared by Cox proportional hazard models and risk-adjusted Kaplan-Meier survival plots. The propensity for MVA was determined by multivariate logistic regression analysis.

**RESULTS:** There were 105 patients (2.5%) with MVA prior to CABG. Their mean EuroSCORE was  $11.1 \pm 2.8$  and they had 10 (9.5%) in-hospital deaths. Multivariate logistic regression analysis found that patients with MVA had higher percentages of urgent operations (OR 1.84, 95%CI 1.16-1.91;  $P=0.009$ ), recent myocardial infarctions (OR 2.48, 95%CI 1.55-3.96;  $P<0.001$ ), left ventricular hypertrophy (OR 1.53, 95%CI 1.00-2.34;  $P=0.048$ ), current congestive heart failure (OR 1.66, 95%CI 1.05-2.63;  $P=0.030$ ), intra-aortic balloon pump (OR 2.19, 95%CI 1.24-3.85;  $P=0.007$ ) and lower ejection fraction (OR 1.86, 95%CI 1.31-2.65;  $P=0.001$ ). After adjustment for all pre, intra and postoperative variables MVA was associated with higher in-hospital mortality (OR 3.29, 95%CI 1.37-7.91;  $P=0.008$ ), however it was not an independent predictor for any major postoperative complication. Risk-adjusted Kaplan-Meier curves showed no difference between the two groups and MVA was not associated with long-term mortality (HR 1.18, 95%CI 0.84-1.64;  $P=0.345$ ).

**CONCLUSIONS:** Patients with MVA showed increased in-hospital mortality when compared with patients without MVA. However, MVA was not an independent predictor for any major postoperative complication or long-term mortality after CABG.

### OP-942-IMPACT OF PREOPERATIVE STATIN THERAPY ON ADVERSE POSTOPERATIVE OUTCOMES IN PATIENTS UNDERGOING CARDIAC SURGERY: A META-ANALYSIS OF OVER 30.000 PATIENTS

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**BACKGROUND:** Preoperative statin therapy reduces adverse postoperative outcomes in patients undergoing non-cardiac surgery through lipid-dependent and independent (pleiotropic) actions, but no conclusive data exist from cardiac surgery trials. We sought to determine the strength of evidence for preoperative statin use on adverse postoperative outcomes in cardiac surgery patients.

**METHODS:** A meta-analysis of randomized (RCT) and observational trials reporting the effects of preoperative statin therapy on major clinical outcomes after cardiac surgery was performed. Analyzed outcomes included short-term mortality (in-hospital or 30-day mortality), myocardial infarction, atrial fibrillation, stroke and renal failure. Odds ratio (OR) and weighted mean differences (WMD) with 95% confidence intervals (CI) were reported using fixed- or random-effect models and publication bias was assessed.

**RESULTS:** After literature search in major databases, 1196 studies were retrieved and screened, and 18 studies identified (3 RCT, 15 observational) that report-

ed outcomes of 30915 cardiac surgery patients with ( $n=16746$ ; 54%) or without ( $n=14169$ ; 46%) preoperative statin therapy. Preoperative statin use resulted in a 1.5% absolute risk (2.2% vs. 3.7%;  $p<0.0001$ ) and 43% odds reduction for short-term mortality (OR 0.57; 95% CI 0.49-0.67). A significant reduction ( $p<0.01$ ) was also observed for atrial fibrillation (24.9% vs. 29.3%; OR 0.67, 95% CI 0.51-0.88) and stroke (2.2% vs. 2.9%, OR 0.77, 95% CI 0.62-0.95) in patients receiving statins, but not for myocardial infarction (4.0% vs. 3.8%;  $p=0.475$ ; OR 1.12, 95% CI 0.94-1.35) or renal failure (3.9% vs. 4.5%;  $p=0.275$ ; OR 0.78, 95% CI 0.46-1.31). Funnel plot and Egger's regression analysis ( $p=0.60$ ) excluded relevant publication bias. However, comparison of pooled preoperative characteristics revealed that patients receiving preoperatively statins were more likely to be younger, of male gender, to have a previous myocardial infarction, diabetes or hyperlipemia and receive  $\beta$ -blocker or aspirin therapy before surgery ( $p<0.001$ ). In contrast, more patients without statins received non-elective surgery and surgery with CPB ( $p<0.01$ ), while no differences were observed in CPB and aortic cross-clamp durations.

**CONCLUSION:** Our meta-analysis provides evidence that preoperative statin therapy may exert significant clinical benefit on postoperative outcomes in cardiac surgery patients, but differences in preoperative variables of patient groups underline the need for larger RCT trials.

### OP-943-COST COMPARISON OF RADIAL ARTERY HARVESTING TECHNIQUES: VESSEL CLIPPING, HARMONIC SCALPEL AND THERMAL WELDING

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**BACKGROUND:** We have been harvesting the radial artery as a conduit for coronary bypass grafting since its resurgence in 2002. With evolving technology, we have modified our harvesting technique. In our initial experience we used titanium vessel clips with diathermy. With the introduction of ultrasonic scalpels we altered our practice. Our current method of harvesting employs Thermal Welding™ technology. We undertook a cost comparison between the 3 techniques especially in current times of financial constraints.

**METHODS:** A retrospective analysis was undertaken to evaluate the cost per radial artery harvested. The analysis accounted for capital expenditure for equipment, disposable and sterilisation costs as well as equipment maintenance contract costs. Other ancillary equipment necessary for the harvesting were also included in the analysis.

**RESULTS:** From August 2002 to November 2007, 531 radial arteries were harvested (vessel clipping = 225, Ultrasonic Scalpel = 69, Thermal Welding = 234). For each technique the disposable costs, capital expenditure, sterilisation costs, maintenance costs (per year) and ancillary costs are given respectively. Vessel clipping: £45.50, £0.00, £0.00, £0.00, £7000 (diathermy). Harmonic Scalpel: £145.00, £28000, £42.00, £420.00, £0.00. Thermal Welding™: £178.50, £0.00, £0.00, £0.00, £0. The cost per radial artery harvested in our experience was £76.60 for vessel clipping, £595.00 for Harmonic Scalpel and £178.50 for Thermal Welding™.

**CONCLUSIONS:** In our experience, the most cost effective method for radial artery harvesting is diathermy with vessel clipping at £76.60 per artery harvested followed by Thermal Welding™ at £178.50. Harmonic Scalpel remains the most expensive technique, with an almost 8-fold increase in cost per conduit. There is no capital cost incurred with Thermal Welding™, so the cost per conduit harvested will remain at £178.50. However, with the other techniques described, additional capital costs will have to be met as machinery such as diathermy and generators need replacement. For this reason and given its documented benefits we have continued with Thermal Welding™ in our unit. The benefits include less collateral damage by heat and electrical energy, simultaneous sealing and division of tissues leading to quicker harvest times and a steeper learning curve.



#### **OP-944-ROLE OF OFF-PUMP CORONARY SURGERY IN OCTOGENARIANS.**

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**BACKGROUND:** Safety and efficacy of off-pump coronary artery bypass (OPCAB) has been demonstrated in the general population as well as in high-risk patients. This retrospective study was aimed to evaluate if OPCAB can confirm its role in a particular high-risk subset of patients: the octogenarians.

**METHODS:** From November 1994 to December 2002, 138 patients older than 80 years underwent coronary artery bypass grafting (CABG), 52 (37.7%) on-pump (ONCAB) and 86 (62.3%) off-upmp (OPCAB). The two groups were similar for all investigated preoperative and operative characteristics but emergencies (25.6% OPCAB vs 48.1% ONCAB,  $p=0.007$ ), diabetes (22.4% vs 7.7%,  $p=0.028$ ); moreover OPCAB patients showed lower number of diseased vessels ( $p<0.001$ ). Actuarial survival curves were obtained by means of Kaplan-Meier method.

**RESULTS:** Early mortality and morbidity were 4.3% (3.5% OPCAB vs 5.8% ONCAB,  $p$  ns) and 11.6% (11.6% OPCAB vs 11.5% ONCAB,  $p$  ns), respectively. Mean follow up time of  $7.5\pm1.9$  years. Seven-year freedom from death any cause ( $60.9\pm5.5$  OPCAB vs  $57.9\pm7.0$  ONCAB,  $p$  ns), from cardiac death ( $84.1\pm4.3$  vs  $84.2\pm5.7$ ,  $p$  ns), from cardiac events ( $81.0\pm4.7$  vs  $82.3\pm5.7$ ,  $p$  ns) and from any event ( $57.8\pm5.7$  vs  $56.3\pm7.1$ ,  $p$  ns) were not statistically different between the two groups.

**CONCLUSIONS:** In octogenarians OPCAB seems not to have any protective effect in the early postoperative time. In long-term period, OPCAB provides outcome, due to any or cardiac causes, similar to the one achieved by more conventional ONCAB.

#### **OP-945-IS CARDIAC REOPERATION AN INDEPENDENT PREDICTOR FOR HOSPITAL OR LONG-TERM MORTALITY?**

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**BACKGROUND:** Previous cardiac surgery is an independent predictor for hospital mortality in various risk stratification models, whereas its impact on long-term survival is unclear. We sought to determine the impact of a second or third cardiac operation on hospital and long-term mortality in the whole context of cardiac surgery.

**STUDY DESIGN:** Between 1992 and 2003, 5,889 consecutive patients underwent cardiac surgery (isolated CABG (70%), other than isolated CABG (28%) and thoracic aortic surgery (2%)). Long-term survival data (mean follow-up  $6.4\pm4.1$  years) were obtained from the National Death Index. Multivariate logistic and Cox regression analysis were used to assess independent predictors for hospital and long-term mortality, respectively.

**RESULTS:** Patients with first cardiac operation ( $n=5,374$ ) had lower EuroSCORE compared to patients with second ( $n=462$ ) or third ( $n=53$ ) cardiac operation ( $5.97$  vs.  $9.06$  vs.  $9.26$  respectively,  $P<0.001$ ) and lower observed hospital mortality ( $4.1\%$  vs.  $5.4\%$  vs.  $9.4\%$ ,  $P=0.028$ ). However, second (OR 1.36, 95%CI 0.81-2.27,  $P=0.247$ ) and third cardiac operation (OR 1.48, 95%CI 0.44-4.94,  $P=0.524$ ) were not independent predictors for hospital mortality. On the other hand, second cardiac operation was an independent predictor for long-term mortality (HR 1.30, 95%CI 1.12-1.52,  $P=0.001$ ), as was third cardiac operation (HR 1.50, 95%CI 1.01-2.23,  $P=0.043$ ).

**CONCLUSIONS:** Second and third cardiac operations were independent predictors for long-term but not for hospital mortality. Current risk stratification models may necessitate revision as they apparently overestimate the risk associated with repeat procedures.

## VALVES IV

### OP-946-TRICUSPID VALVE SURGERY IN THE ELDERLY : IS IT DIFFERENT ?

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**OBJECTIVE:** We compared the outcomes of tricuspid valve [TV] surgery in the elderly and younger cohorts.

**METHODS:** In a prospective observational study, all 130 consecutive patients undergoing TV surgery between October 2004 and July 2007 were considered in 2 groups: group 1 included patients aged below 70 years (mean  $55.76 \pm 10.6$  yrs) and group 2 - patients aged 70 years or more (mean  $77 \pm 5.3$  yrs). Preoperative, operative and all outcome parameters were compared. TV surgery was indicated due to significant tricuspid regurgitation or disease. Followup extended upto 3 years.

**RESULTS:** Ring annuloplasty was done in 120 patients, while TV replacement was needed in 10 patients. The primary procedure was mitral valve replacement/ surgery in both groups - due to rheumatic disease in group 1 and degenerative disease in group 2. Elderly patients had significantly more hypertension, diabetes, higher Euroscore, postoperative atrial fibrillation and behavioral confusion. Mortality was similar in both groups (12.9% in group 1 vs 13.3% in group 2,  $P=0.5$ ). Elderly patients had no TS, IE but had more functional TR and did not undergo any valve replacement. They were more likely to have associated coronary revascularization. Incidence of aortic valve surgery was similar in both groups. Impact of associated of TV surgery had significant additive mortality risk in the younger cohorts but not in the elderly.

**CONCLUSIONS:** Although elderly age reflected a sicker group of patients in our study, impact of associated of TV surgery had additive mortality risk in the younger patients. However the quality of life in the survivors remained equivocal in the older cohorts in intermediate term followup.

### OP-947-EVOLUTION OF NON-SEVERE MITRAL REGURGITATION AFTER AORTIC VALVE REPLACEMENT FOR AORTIC STENOSIS

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**BACKGROUND:** Degenerative aortic stenosis is often coexistent with moderate mitral regurgitation and this poses a clinical dilemma in many patients. Our objective was to analyze the changes in mitral insufficiency after isolated aortic valve replacement and identify potential predictors for mitral regurgitation improvement

**METHODS:** Patients with severe aortic stenosis and significant mitral regurgitation were collected from our surgical database between May 2003-June 2007. Those with significant aortic regurgitation (grade 2+) were excluded. Preoperative and postoperative echo studies were analyzed for mitral regurgitation and morphologic study of the mitral and aortic valves, and the results compared and analyzed. MR was classified as 0-none I-trace II-mild III-moderate IV-severe

**RESULTS:** In the time frame of the study 43 patients fulfilled the criteria, and in these patients the morphological analysis of the mitral indicates that etiology was 58.1% degenerative, 6.9% rheumatic, 35% functional. Preoperative MR was grade II in 38 (88.4%) cases and grade III in 5 (11.6%). All grades IV MR were treated at surgery, and were excluded from any further analysis. After AVR 18 (41.8%) had MR degree improvement and 15 (34.9%) had none or trace MR ( $p<0.001$ ). Univariate analysis demonstrated non-rheumatic etiology was associated with non significant postoperative MR (OR 0.9-12.9). There were not any other variable associated with the outcome. In the multivariate analysis a statistically significant association was found between functional MR, low LVEF and smaller end-diastolic left ventricular diameter and the absence of significant postoperative MR as with improvement of persistent MR.

**CONCLUSIONS:** The non-organic grade II+ mitral insufficiency significantly

improves after isolated aortic valve replacement. Normal appearance in the echo studies, low LVEF and small EDLV diameter could identify MR prone to improve after AVR although prospective studies are required to confirm our initial findings.

### OP-948-MID-TERM CLINICAL AND HEMODYNAMIC PERFORMANCE OF STENTLESS AORTIC BIOPROSTHESIS

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**BACKGROUND:** We present mid-term clinical and echocardiographical data comparing two types of stentless aortic bioprostheses.

**METHODS:** From 10/2000 to 10/2007, 100 patients underwent aortic valve replacement using stentless bioprosthesis. Forty-one patients underwent AVR using Toronto SPV valve (group A) and in 59 patients Shelhigh NR-2000Plus valve was implanted (group B). Concomitant CABG was preformed in 10 (24%) of patients in group A and in 22 (45%) in group B. Mean EuroScore was 5.1 (groupA) and 6.4 (groupB) ( $p=0.004$ ).

**RESULTS:** Mean follow-up time was 37.5 months in group A vs 24.1 months in group B. Freedom from endocarditis and structural valve deterioration at 1, 3 and 5 years was 100% for both groups, respectively. Mean size of implanted prostheses was 26.1 mm (groupA) and 23.9 mm (groupB) ( $p<0.001$ ), respectively. Mean transaortic gradient at follow-up was 7.3 mmHg (groupA) vs 15.5 mmHg (groupB) ( $p=0.003$ ). Mean regression of LV mass was 14 grams in group A and 16 grams in group B ( $p=0.116$ ). Functional status improved in both groups over time from median class III to class I. No significant difference was noted between groups during mid-term follow up.

**CONCLUSION:** Both types of stentless bioprostheses have good hemodynamic properties, durability and clinical improvement at mid-term follow-up.

### OP-949-CONGENITAL BICUSPID AND QUADRICUSPID SEMILUNAR VALVES: ASSESSMENT OF 3.861 DONOR HEARTS IN THE EUROPEAN HOMOGRAFT BANK (EHB)

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**BACKGROUND:** This study reports the incidence of the bicuspidity and quadricuspidity of semilunar valves in 3.861 donor hearts for allograft valve preparation.

**METHODS:** The morphologically unacceptable valves for clinical use as allograft are retrospectively analysed for congenital cusp malformation.

**RESULTS:** 39 hearts contained congenital cusp malformation of one or both semilunar valves (1.01%): 28 bicuspid aortic valves (0.69%), four bicuspid pulmonary valves (0.1%) and 8 quadricuspid pulmonary valve (0.2%). Only in one case both the aortic and the pulmonary valves were bicuspid (2.5% of all congenitally malformed valves or 0.026% of all dissected hearts). As far as the morphological features concerns, the bicuspid valves were recognized with the equal right and left coronary cusp in 8 cases or 29.63% (type 1), non-coronary (posterior) cusp of normal size and large coronary cusp with two coronary ostia included in the corresponding sinus in 7 cases or 25.92% (type 2), right coronary cusp of normal size and large left coronary cusp in 5 cases or 14.81% (type 3), left coronary cusp of normal size and large right coronary cusp in 4 cases or 14.81% (type 4) and equal coronary and non coronary cusp in 3 cases or 11.11% (type 5). Among the quadricuspid pulmonary valves, 3 (37.5%) were of type G, 2 (25%) of type B and one case (12.5%) of A, C and F, respectively, following Hurwitz and Roberts classification.

**CONCLUSION:** Congenital malformations of the semilunar valves are often asymptomatic, being found only as post-mortem findings or during routine echocardiography. The most frequent among those malformations are the bicuspid aortic and the quadricuspid pulmonary valves. Neither quadricuspid nor monocuspid aortic valves were observed in this group of the hearts. These valves have tendency of accelerated degeneration, becoming symptomatic early during the life.

#### OP-950-ABSORBABLE ANNULOPLASTY RING IN THE TRICUSPID POSITION: INITIAL CLINICAL EXPERIENCE

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**BACKGROUND:** We present our initial clinical experience with an absorbable annuloplasty ring in the tricuspid position.

**METHODS:** Patients undergoing tricuspid annuloplasty alone or combined with other cardiac operations were prospectively included between September 2004 and December 2006 and followed with transthoracic echocardiography. Primary endpoints were death and severe tricuspid regurgitation (TR) requiring reoperation for valve replacement. Secondary endpoints were perioperative complications and relapse of severe TR.

**RESULTS:** 32 patients (17 males) with a median age of 44 years old (range 16-81) underwent tricuspid valve annuloplasty, 22 for functional tricuspid regurgitation, 7 for post-rheumatic TR, 1 for tricuspid endocarditis, 1 for Barlow TR and 1 for congenital TR. Median CPB and aortic cross-clamping was 81 (range 25-250) and 41 (range 0-180) min respectively. There were three early deaths, not related to the tricuspid valve repair. Two patients required reoperation for tricuspid valve replacement. On discharge, 26 patients had no or mild TR (grade  $\leq$  I) and 1 had moderate TR (grade II) with no tricuspid stenosis. Median follow-up was 13 months (range 4-30 months). One patient was lost to follow-up. One patient developed asymptomatic moderate TR. The remaining 25 patients had no or discrete TR.

**CONCLUSIONS:** Tricuspid valve surgery remains challenging and the optimal surgical strategy is controversial. Early results with a biodegradable ring in the tricuspid position seem acceptable and safe. Implantation is simplified, possibly reducing cardiopulmonary bypass. Mid term results appear adequate, but further investigation in a prospective randomized study comparing biodegradable ring, de Vega, and non-absorbable ring annuloplasty, is required.

#### OP-951-CLINICAL OUTCOME OF AORTIC VALVE REPLACEMENT IN PATIENTS WITH LOW BODY MASS INDEX

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**BACKGROUND:** Asian people have lower body mass index (BMI) than Western people. Low or high BMI have been discussed to be predictive of an increased risk of mortality after aortic valve replacement (AVR). A retrospective study was conducted to evaluate the clinical outcome of AVR in patients with low BMI.

**METHODS:** From June 2001 to October 2007, 41 adult patients with low BMI ( $<20.0$ ) underwent AVR with or without concomitant cardiac surgery in our institute. The patients with acute aortic dissection or aortic root disease were excluded from this study. There were 14 men and 27 women, with an average age of  $71.1 \pm 11.0$  years (range, 35 to 87). Average BMI was  $18.1 \pm 1.4$ . Average body surface area (BSA) was  $1.40 \pm 0.15$  m<sup>2</sup>. Simultaneous procedures were performed: Mitral valve replacement in 12, Coronary artery bypass grafting (CABG) in 9, Tricuspid annuloplasty in 3, Mitral annuloplasty in 2, Maze procedure in 1, Replacement of the ascending aorta in 4, Total arch replacement in 2 patients. Twenty-one mechanical valves and 20 bioprostheses were implanted. Prosthetic valve below 20mm-size were implanted for 20 patients.

**RESULTS:** There were 2 (4.8%) operative deaths caused by ventricular tachycardia. Both patients had a previous history of cardiac surgery (CABG in 1, Decortication for constrictive pericarditis in 1) and chronic renal failure on hemodialysis. Other patients were discharged without any complication. When prosthesis-patient mismatch (PPM) is defined as prosthetic effective orifice area / BSA less than  $0.85 \text{ cm}^2/\text{m}^2$ , 2 patients developed PPM ( $0.81$  and  $0.82$ ) without any symptoms. There were 2 late deaths (cerebral hemorrhage and sudden death) during the average follow up of 27.1 months.

**CONCLUSION:** Clinical results of AVR in patients with low BMI is acceptable in this study. Without the co-morbidity with dialysis-dependent renal failure, low BMI is not a predictive factor of mortality after AVR. Achievement of appropriate EOA might contribute to obtain an acceptable result of the patients with low BMI after AVR.

#### OP-952-OUR EXPERIENCE WITH EDWARDS MIRA BILEAFLET MECHANICAL VALVE

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**BACKGROUND:** Edwards MIRA bileaflet mechanical prosthesis, a heart valve, is designed with a unique hinge mechanism, curved leaflets, and thin titanium housing. It is designed to optimize hemodynamics, reduce thrombogenicity, and avoid mechanical failure. We performed a prospective study to investigate its clinical performance and the postoperative hemodynamic results of this prosthesis.

**METHODS:** We implanted 310 Edwards MIRA prostheses in 265 patients in the 65 aortic, 156 mitral, and 44 aortic and mitral positions. Patients' ages ranged from 18 to 56 years, mean age  $38.7 \pm 10.4$  years. Patients were followed up by physical examination, ECG, blood tests, and Doppler studies prior to discharge, at six months, at one year, and at two years postoperatively.

**RESULTS:** Operative mortality was 1.5% ( $n=4$ ), and late mortality was 2.26% ( $n=8$ ). Thromboembolic events were observed in 3 patients (valve thrombosis in one and a cerebrovascular event in two patients). Two patients had bleeding complication due to anticoagulation. No signs of valvular dysfunction or paravalvular leak were observed. Peak transvalvular gradient of the aortic prostheses ranged from 21 to 24 mmHg for the 21-mm valve, 14 to 16 mmHg for the 23-mm prosthesis and from 8 to 11 mmHg for the 25-mm valve. The effective orifice area ranged from 1.88 to 1.99 cm<sup>2</sup> for the 21-mm valve, from 2.1 to 2.2 cm<sup>2</sup> for the 23-mm valve and from 2.32 to 2.52 cm<sup>2</sup> for the 25-mm valve. The transvalvular gradient of the mitral prostheses ranged from 6 to 8 mmHg for the 25-mm valve, from 5 to 7 mmHg for the 27-mm valve and from 3 to 5 mmHg for 29-mm valve. The effective orifice area ranged from 2.1 to 2.3 cm<sup>2</sup> for 25-mm valve, 2.6 to 2.8 cm<sup>2</sup> for the 27-mm valve and 2.9 to 3.1 cm<sup>2</sup> for the 29-mm valve. All patients were in NYHA class I and II at the six month and two year follow-up.

**CONCLUSION:** These preliminary data suggest good hemodynamic function and a low rate of valve-related complications in the use of the Edwards MIRA mechanical prosthesis.

#### OP-953-RECIDIVATE TRICUSPID AND MITRAL INSUFFICIENCY AFTER SURGERY FOR ISCHAEMIC MITRAL REGURGITATION

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**OBJECTIVE:** The tricuspid and mitral regurgitation (TR and MR) are an inevitable complications in the terminal stage of ischaemic mitral regurgitation (IMR) significantly contributing to development of heart failure with bad prognosis and high mortality despite the optimal drug therapy. The aim of the study was to analyze the grade of TR and MR after the operation.

**METHODS:** In a retrospective study, a recidive free rate of TR and MR (grades over III°) after surgery for IMR, was evaluated in 188 patients, during a two-year period. There were 80.3% (151/188) male and 19.7% (37/188) female patients with an average age of  $59.2 \pm 8.3$  (31-76 y). All patients were in NYHA class III or IV. The mean ejection fraction (EF) was  $35.3 \pm 10.9\%$ , while  $EF < 30\%$  was found in 49% of pts (92/188). Preoperatively the mean grade of MR was  $3.4 \pm 0.6$ . Sixty three percent (119/188) had MR grade over III°. The mean grade of TR was  $2.3 \pm 1.2$ . Forty three pts (23%) had TR grade over III°. Myocardial revascularization was done in all cases (2.4 grafts/pt) as well as posterior semicircular mitral annuloplasty and modified De Vega's tricuspid annuloplasty.

**RESULTS:** The postoperative recidive free rate for TR was 98%, 93%, 87.8%, 82.9% at 3, 6, 12 and 24 months respectively. Recidive free rate for TR regarding preoperative MR (grade over III° vs. grade I° to III°) was statistically significant ( $p=0.028$ ). The postoperative recidive free rate for MR was 93.9%, 87.8%, 69.6%, 55.2% at 3, 6, 12 and 24 months respectively. Recidive free rate for MR regarding preoperative MR was also statistically significant ( $p=0.06$ ).

**CONCLUSION:** Only severe preoperative MR predicts a lower recidive free rate of TR. The preoperative grade of MR determinates the recidive free rate of MR.

## OP-954-THE SOURCE OF ELEVATED BLOOD LACTATE DURING MITRAL VALVE SURGERY

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**BACKGROUND:** Elevated blood lactate concentration during cardiac surgery is an indicator of hypoxia and anaerobic glycolysis in cardiac and skeletal muscle. The cardiac source of lactate is likely to occur following the release of cross clamp (early reperfusion). Subsequent postoperative changes in blood lactate are likely to be due to increased aerobic glycolysis in skeletal muscle possibly due to systemic hypoperfusion. If this is the case then the profile of lactate release should reflect these two sources.

**METHODS:** The data was collected from seventeen patients undergoing valve surgery using Custodiol (based on Bretschneider's HTK-solution) cardioplegia. Blood The durations of cross-clamp and cardiopulmonary bypass were  $111 \pm 5$  min and  $124 \pm 6$  min, respectively. Lactate and pH levels were measured before institution of cardiopulmonary bypass, immediately, 30 min and 1hr after releasing the cross-clamp, and 6hr, 12hr, 24hr and 48 hr postoperatively. Myocardial injury was determined by measuring CK-MB postoperatively.

**RESULTS:** Following the release of the cross-clamp, there was a significant and marked rise in serum lactate concentration which remained at this level for 1hr. This was followed by a second phase of an increase in blood lactate where the increase continued up to 12hr before it starts to slowly decrease. After 48hr postoperatively, the lactate levels fell back to the levels seen after releasing the cross-clamp but were still significantly higher than basal levels. A decrease in blood pH within 1hr of reperfusion was coincidental with the increase in lactate. However, beyond that pH remained relatively constant and started to rise after 12hr postoperatively. Myocardial injury (CK-MB release) reached a maximum 1hr after releasing the cross-clamp and remained at this maximal level for 12 hours before decreasing back to basal levels 48hr later.

**CONCLUSIONS:** In this study we show that lactate appearance in the blood during valve surgery follow a biphasic profile. The first is a fast one that occurs within minutes of releasing the cross-clamp and lasts for 1hr. This release is consistent reperfusion-induced release of myocardial anaerobic lactate synthesized during ischaemic cardioplegic arrest and is confirmed by a simultaneous drop in pH. The second slow phase of lactate release is likely to be of skeletal source and during this phase other factors are likely to contribute of pH regulation.

## OP-955-PATIENT PROSTHESIS MISMATCH AFTER AORTIC VALVE REPLACEMENT IN RHEUMATIC PATIENTS

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**BACKGROUND:** Mismatch is a severe problem because patient may be hemodynamically and symptomatically worse after aortic valve replacement. It still represents a common issue in routine surgical procedures on aortic valve.

**METHODS:** This work entailed the study of thirty aortic valve replacement surgeries in rheumatic patients. Choice of prosthesis was dependant on annulus diameter measured by the sizers irrespective of body surface area but aiming to provide the largest fitting prosthesis.

**RESULTS:** Results as regard patient's demographic data, operative data, effective prosthetic orifice area, calculated indexed effective orifice area, preoperative and postoperative NYHA classification, end systolic and diastolic dimensions and ejection fraction of the left ventricle, pressure gradient across the prosthetic aortic valve were discussed. Their was a reciprocal relation between index effective orifice area and pressure gradient across the prosthetic aortic valve. Also with large aortic index effective orifice area their was a higher left ventricular mass regression. These relations are statistically significant.

**CONCLUSION:** In our experience an aortic index effective orifice area of  $0.6 \text{ cm}^2/\text{m}^2$  is the cut off point below which hemodynamic deterioration should be expected. Aortic root enlargement should be considered especially in severe mismatch.

## OP-956-THE IMPACT OF PARAVALVULAR ABSCESS IN THE MANAGEMENT AND OUTCOME OF INFECTIVE ENDOCARDITIS. A SINGLE CENTER EXPERIENCE

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**BACKGROUND:** Evaluation of the outcome after surgical intervention in patients with paravalvular abscess due to infective endocarditis.

**METHODS:** We retrospectively reviewed 35 patients with paravalvular abscess out of 112 pts. with active endocarditis who underwent surgery at our institution from 9/1996-8/2007. Patient's mean age was  $58.2 \pm 14.1$  yrs; 80% were men. 32 pts. suffered from native valve endocarditis, in 3 cases was found an infected prosthesis. The abscess affected the aortic annulus in 23 cases, in 7 cases the mitral annulus, in 2 cases both and in one patient the tricuspid annulus; no abscess presence was noticed by pulmonic annuluses. Surgical procedures included the radical lesion-resection as well as the reconstruction of the annulus with pericardial patches. According to the lesion- morphology 4 groups were classified: vegetations (group A), paravalvular abscess (group B), destruction/ perforation (group C) and mixed (abscess + other lesion: group D). The majority of the pts. were preoperatively in NYHA-class III-IV. Follow up was 98.5% complete with a maximum of 11.25yrs.

**RESULTS:** Early mortality (30d) was 11.4% (n:4). 2 pts. died due to heart failure, one due to sepsis and one because of intracerebral bleeding. The 11-yr overall survival rate was  $68.7 \pm 9\%$ ; 73.1% for AVR-pts. and 26.9% for MVR-pts (p:0.4). With regard to the lesion-morphology the survival rates of the 4 groups at 11 years were: A 35.8%, B 86.7%, C 56.6%, D 42.5%. There were no episodes of recurrent endocarditis; hence freedom of recurrent endocarditis at 11 years was 100%. Causative microorganisms were in approximately 30% Staphylococci, while MRSA seems to induce more frequent destructive lesions like paravalvular abscess.

**CONCLUSIONS:** Despite the increased rate of abscess formations, a radical surgical treatment delivers acceptable long term results by low operative mortality. In this study we observed an increased rate of infections caused by MRSA.

## OP-957-LONG TERM RESULT OF PREDOMINANT RHEUMATIC MITRAL VALVE REPAIR AT NATIONAL HEART INSTITUTE, MALAYSIA

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**OBJECTIVE:** To analyse the long-term result of mitral repair performed at Institut Jantung Negara (IJN), with emphasis on durability of the procedure.

**METHODS:** All patients who underwent mitral repair at IJN from 1992 to 2006 were reviewed retrospectively. A total of 843 patients were analysed. The mean age was  $22 \pm 20$  years old (range; 1.5 month to 77 years) and 51% were males. More than 80% were in NYHA functional class II to IV, 22% had atrial fibrillation and 92% had moderate to severe mitral regurgitation (MR). Most patients were rheumatic in origin (60%), whilst others included congenital (19%), degenerative (10%), and ischemic (9%) etiology.

**RESULTS:** Forty two percent underwent isolated mitral repair and 58% had combined procedures done. The repair techniques include leaflet procedures (33%), chordal procedures (47%), commissural procedures (7%), papillary muscle procedures (1%), and annuloplasty (100%). Mean ICU stay was  $1.6 \pm 1.7$  day, and the mean hospital stay was  $9.1 \pm 5.5$  days. Mean duration of follow up was  $41.6 \pm 38$  months (range; 1 to 156 months). On follow up, 90% of patients had mild or no mitral regurgitation, 94% were in NYHA functional class I, and 90% were in sinus rhythm. Freedom from reoperation at 5 and 10 years were 91% and 80% respectively. The survival rate was 96% at 60 months and 94% at 150 months. The operative mortality rate was 3.6%, whilst the late mortality rate was 1%. Subgroup multivariate analysis was performed to determine predictors of long-term outcome. Presence of commissural fusion, calcification and performance of chordal shortening were significant predictors of reoperation. Importantly, rheumatic etiology was not associated with decreased durability of repair. Introduction of newer repair techniques like artificial chordal replacement and leaflet augmentation extended the feasibility and durability of valve repair particularly in the rheumatic population.

**CONCLUSION:** Mitral valve repair is safe with low operative risk. It also demonstrates excellent long-term outcome, survival and freedom from reoperation. It is the procedure of choice for MR whenever feasible, even in the rheumatic population.



## CONGENITAL IV

### OP-958-ICU OUTCOME OF DOWN SYNDROME CHILDREN UNDERGOING SURGICAL REPAIR OF CONGENITAL HEART DISEASES

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**INTRODUCTION:** Congenital heart diseases (CHD) are present in 30 to 50% of children with Down syndrome (DS). The decision to repair CHD in these patients can be difficult and challenging. These patients are occasionally labeled as high risk and therefore denied surgical correction. The purpose of our study is to determine ICU course and early outcome of DS patients undergoing surgical repair of CHD

**METHODS:** A retrospective analysis of ICU course and early outcome of all children with DS underwent surgical repair of CHD from January/2000 to December/2002.

**RESULTS:** During the study period 51 patients (17m/34f) with DS had surgical repair of CHD. Their average weight and age were 6.3 kg and 13.3 months respectively. Their primary surgical interventions were: AVSD repair (26), VSD closure (15), PDA ligation (6), ASD closure (2), TOF repair (1) and B-T shunt (1). Postoperative complications occurred in 11 patients. They were as follow: 5 patients (10%) had sepsis, 3 patient (6%) required permanent pacemaker, 2 patients (4%) had chylothorax, 1 patient (2%) had cardio-respiratory arrest from severe PHT crisis and was successfully resuscitated, 4 patients (8%) needed prolong intubations more than 7 days and one patient (2%) required tracheostomy. All patients survived and were discharged home except one (2%) expired 8 weeks after surgery from sepsis and multi-organ failure.

**CONCLUSION:** We conclude that the patients with DS undergoing CHD repair had acceptable postoperative morbidity and mortality. Their results are comparable to Non-Down cardiac patients. From ICU prospective, the majority of these patients do well postoperatively with good ICU outcome.

### OP-959-USE OF STENTS FOR THE TREATMENT OF CERTAIN CONGENITAL HEART DEFECTS

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**BACKGROUND:** to show the possibilities of the use of stents for the treatment of patients with congenital heart defects (CHD).

**MATERIAL AND METHODS:** From 1994 till February 2007 we have implanted 238 stents in 204 patients with different congenital heart defects (CHD) aged from 6 hours to 27 years. In 87 patients 118 stents were implanted in pulmonary arterial position (PA) for the treatment of 106 stenotic segments. One patient received a "CP"-coated stent following Fontan operation for simultaneous treatment of PA stenosis and recanalized antegrade blood flow in the pulmonary trunk. In 43 patients with aortic coarctation (AC) and recoarctation (ARc) we have stented the aortic isthmus; 45 stents were implanted. Two of these patients received "CP"-coated stents, and one - the "Valiant" stent-graft (Medtronic) for the closure of para-coarctation aneurysm developed 18 months after aortic stenting. The stenting of patent ductus arteriosus (PDA) was performed in 38 neonates with ductus-dependent CHD. In 3 cases PDA stenting was done simultaneously with pulmonary arteries restriction in the settings of hybrid operating room. Nine patients (3- with primary pulmonary hypertension and 6 with complex CHD and mitral valve stenosis) underwent stenting of the atrial septum aimed at the creation of adequate interatrial communication. Stents were also used for the stenoses of: conduits between the RV and the PA (7 patients); major aorto-pulmonary collateral arteries (MAPCA) in pulmonary arterial atresia (7 patients); intraatrial tunnel after Fontan operation (3 patients); right and left ventricular outflow tract (3 patients); systemic-pulmonary and cavapulmonary anastomoses (4 patients); supravalvular aortic stenosis (1 patient); subclavian artery (1 patient).

**RESULTS:** Good immediate results of PA stenting were obtained in 96,1% of

cases. Late stent restenosis occurred in 4,1% of cases. In one patient following Fontan operation stent fracture was revealed 8 months after stenting of the pulmonary artery; a new stent was implanted. Stenting of AC gave good and satisfactory results in all cases. Paracoarctation aneurysm revealed in the long-term follow-up in one patient necessitated the implantation of "Valiant" stent-graft (Medtronic). Technical success of PDA stenting procedure was obtained in 93,9% of cases. Blood saturation with oxygen in patients with ductus-dependent pulmonary blood flow (12 patients) increased after the procedure from 43,4±15,6 to 75,6±9,7%. Acute stent thrombosis was seen in one case. After PDA stenting the patients with ductus-dependent systemic circulation underwent bilateral restriction of the PA. Two critically ill patients with left heart hypoplasia syndrome died during PDA stenting. The procedures of the stenting of conduits, MAPCA, stenotic systemic-pulmonary and cavapulmonary anastomoses, intraatrial tunnel, subclavian artery were successful in all cases.

**CONCLUSIONS:** the stents can be successfully used in patients with different congenital cardiovascular pathology. Stenting of the aorta and the pulmonary arteries is widely used in the clinical practice.

### OP-960-NEONATAL BRAIN PROTECTION USING INNOMINATE ARTERY CANNULATION FOR CONTINUOUS BRAIN PERFUSION IN COMPLEX ARCH REPAIRS

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**BACKGROUND:** Traditionally, deep hypothermic circulatory arrest has been used when complex neonatal arch surgery was performed. Recently, the use of antegrade cerebral perfusion (ACP) has been advocated as means of brain protection. Two basic techniques have been used; either suturing a gortex shunt to the innominate artery, or direct cannulation of the ascending aorta with sliding of the cannula to the innominate artery when ACP is performed. Both techniques require additional surgical maneuvers to complete. For the last year we have been using direct innominate artery cannulation when ACP is performed.

**METHODS:** During 2007, 6 neonates [Norwood (3), IAA VSD (2), severe coarctation (1)], and 1 child [intracardiac Wilms tumor] underwent complex arch surgery using innominate artery cannulation and ACP. Median age was 1 week (range- 1week-3.5yrs), median weight was 3 kg (range 2.4-12kg). Innominate artery cannulation was accomplished using 8 french modified cannula inserted 3 mm into the innominate artery and directed into the ascending aorta enabling 200cc/kg flow. CPB times were: mean 176 min, median 221 and ranges were 104-268 minutes. ACP times: mean 49 minutes, median 40min, range 26-84 minutes.

**RESULTS:** All patients survived the operation without neurologic damage, there were no clinical seizures. Innominate artery cannulation accommodated appropriate flows and de-cannulation was performed without complications.

**CONCLUSION:** Innominate artery cannulation and ACP is a safe and effective technique for brain protection in neonates and infants undergoing complex arch surgery.

### OP-961-BEATING HEART REPLACEMENT OF THE PULMONARY VALVE USING OVERSIZED BIOPROSTHETIC VALVE IN OPERATED PATIENTS WITH TETRALOGY OF FALLOT

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**BACKGROUND:** Development of severe pulmonary valve (PV) regurgitation in patients with surgically corrected Tetralogy of Fallot (TOF) may finally lead to right heart failure with significant mortality rates due to lethal arrhythmias. We present our early results regarding the timely PV replacement with the beating heart technique using oversized bioprosthetic valves.

**METHODS:** From September 2005 to September 2007, 21 patients (mean age 38 years, 14 males and 7 females) with surgically corrected TOF underwent PV replacement after a mean time of 26 years (22-35 years) from the initial surgical correction. Our choice of prosthesis was the stented bioprosthetic Aortic Magna (Edwards, Lifesciences) valve. Twenty valves were size 27mm and one 25mm. In every case the operation was performed with the beating heart tech-

nique under extracorporeal circulation. Concomitant surgical procedures included tricuspid valve annuloplasty (n=14), resection of aneurysmal outflow tract patches (n=9), augmentation of stenotic pulmonary arteries (n=5) and right ventricular remodeling (n=4).

**RESULTS:** There was no perioperative mortality and only one patient (n=1, 4.8%) developed atrial flutter (medically managed) and partial sternal dehiscence that required rewiring. Mean ICU stay was 1 day and mean hospital stay was 7 days. Postoperative cardiac ultrasonography (12 months after the operation) revealed good function of bioprosthetic PV (without stenosis / regurgitation) (n=21) and trivial to mild tricuspid regurgitation (n=14). Significant decrease of the right cardiac chambers were also observed in comparison with the preoperative echo (n=21). All patients are in a good cardiac status without symptoms up to day and no need for reoperation.

**CONCLUSION:** The possibility of reoperation in patients with surgical corrected Tetralogy of Fallot is concrete. Timely PV replacement is considered necessary in order to prevent the development of right heart failure symptoms, severe arrhythmias and sudden death. The use of new bioprosthetics valves combined with the beating heart technique provide excellent immediate and short-term outcome. Further follow-up is necessary to evaluate the durability of this valve in the pulmonary position.

### OP-962-SURGICAL APPROACH FOR DIFFERENT TYPES OF SUBAORTIC STENOSIS

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**BACKGROUND:** Heterogenous presentation of subaortic stenosis in congenital heart disease mandates a flexible and carefully selected surgical approach in order to achieve successful results in terms of low morbidity and low mortality.

**METHODS:** Between February 2000 and October 2007, 45 patients with congenital subaortic stenosis underwent subaortic resection utilizing various surgical techniques. 26 patients were male and mean age was 12.5 years. Ten reoperative procedures were undertaken (22.2%). 16 patients (35.5%) had combined procedures including subaortic resection, ventricular septal defect closure and relief of right ventricular outflow tract obstruction. 14 patients (31.1%) underwent isolated subaortic resection. 13 patients (28.8%) had either complex reoperative procedures or complex combined procedures including Ross-Konno operation in 2, Konno operation in 1, modified Konno operation in 1 patient and coarctation repair with subaortic resection in 2 patients.

**RESULTS:** One patient died of major stroke early after the operation (mortality 2.2%) and 3 patients needed a permanent pacemaker due to permanent atrioventricular block (6.6%). Mean follow-up is 3.5 years and there are 6 patients (13.3%) with more than 25 mmHg gradient on echocardiographic follow-up. Only 1 patient have more than mild degree of aortic regurgitation. All surviving patients continue to enjoy unlimited daily activities with NYHA class I or II.

**CONCLUSION:** Various surgical techniques for the relief of subaortic stenosis is utilized, especially in complex forms of subaortic obstruction. Despite the difficulty of operations, mortality is low but incidence for permanent pacemaker implantation is still high. Efforts should be focused on reducing the incidence of permanent heart block and residual subaortic stenosis. Although Konno, modified Konno and Ross-Konno procedures are technically demanding operations, they are safe and effective procedures for complex left ventricular outflow obstruction.

### OP-963-OUR EXPERIENCE IN CORONARY ARTERY SURGERY IN PEDIATRIC POPULATION

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**BACKGROUND:** Coronary circulatory problem in pediatric patients is a rare condition that might be congenital or acquired. It represent a large spectrum of pathology and its surgical treatment consist of various procedures.

**METHODS:** We operated 9 pediatric patient for different coronary problems. Mean age was 62,6±64,9 months. Bypass grafting of coronary artery with IMA to LAD or RCA was done in 4 patients with coronary ostial obstruction. One of

them was a 6 month old baby with TGA,VSD who had unusual coronary pattern (single coronary artery from sinus 1) and the bypass grafting was performed during Arterial Switch Operation (ASO) due to RCA malperfusion. The second was an old ASO patient with LCA occlusion diagnosed during control angiography at 12th years postoperatively. The other patients who had LIMA to RCA grafts were bypassed because of RCA ostial occlusion during the Ross procedure. Four patients had fresh autologous pericardial tube interposition to facilitate coronary translocation. Their pathologies were TGA with inverted coronary artery pattern in two and ALCAPA in the others. We performed LMCA roofplasty with pericardial patch in a patient with anomalous origin LCA from the right aortic sinus with intramural and interarterial course.

**RESULTS:** There is no operative and late mortality. Mean followup time is 63,8±37,8 months. All patients had an uneventfull postoperative course and no wall motion abnormality was detected on their control echocardiographic studies. Postoperative exercise stress test was normal in all patients. Catheter or CT coronary angiography realised in 4 patients operated with different procedures (2 patients with tube interposition, 1 patient with roofplasty, 1 patient with LIMA graft) showed patent coronary circulation between one and 10 years postoperatively.

**CONCLUSION:** Although it is a challenging procedure coronary artery surgery can be performed with very low mortality and morbidity in pediatric patients. Different surgical technics can be preferred according to various anatomical situation. Obviously longterm followup is mandatory with periodic myocardial ischemic tests.

### OP-964-ROUTINE LEAFLET AUGMENTATION OF LEFT ATRIOVENTRICULAR VALVE IN THE REPAIR OF ATRIOVENTRICULAR SEPTAL DEFECT

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**OBJECTIVES:** A better understanding of the morphology of complete atrioventricular septal defects (CAVSD) has impacted on surgical techniques and results. On some occasions the leaflet tissue is deficient and repair becomes difficult

**METHODS:** The technique was performed on 85 infants with CAVSD at a mean age of 5±1.3 month. Five were associated with Tetralogy of Fallot. Both superior and inferior bridging leaflets are divided routinely to expose the VSD. An autologous pericardial patch, sized precisely, is sutured to the ventricular septum. A 3-4 mm of extra patch is fashioned beyond the plane of the annulus and sutured to the divided leaflet of the left atrioventricular valve (AVV). A second autologous pericardial atrial patch is attached to the body of the VSD patch at the plane of the annulus allowing 3-4 mm of the VSD patch to augment the left AV valve.

**RESULTS:** There were no early deaths among these infants. At early postoperative echo all infants had no significant residual lesions. The contribution of the patch-augmented left AV valve to competency is clearly seen by 2D echocardiography. At a mean follow up of 45±10 months there was two late deaths with normal last echocardiography. There were only two children who progressed to severe left AV valve regurgitation needing reoperation

**CONCLUSIONS:** This modified technique yields good anatomical repair. Allowing reconstruction of both AV valves independent of the other and is in particular helpful in cases of deficient left AVV tissue.

### OP-965-ENDOVASCULAR CLOSURE OF SEPTAL HEART DEFECTS AND PATENT DUCTUS ARTERIOSUS WITH MECHANICAL AMPLATZER OCCLUDERS.

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**BACKGROUND:** To show the possibilities of endovascular method for the closure of septal heart defects and patent ductus arteriosus with Amplatzer occluders.

**METHODS:** 404 patients underwent closure of septal heart defects and patent ductus arteriosus with Amplatzer occluders (232 patients with ASD, 125 - with PDA and 47 - with VSD). According to transthoracic EchoCG ASD was centrally located in 117 patients; 83 had a defect with anterior rim deficit; in 7 patients the defect was located within the aneurysm and 18 patients had 2 defects, recanalization of the defect was revealed in 7 patients. Closure of patent ductus arteriosus was performed in 125 cases (primary PDA in 112

cases, recanalized PDA in 13 cases). In all cases we used Amplatzer Duct Occluder, in two cases (patient with high pulmonary hypertension) Amplatzer Muscular Septal Ventricular Occluder was used. In 9 cases of VSD the defect was recanalized after previous correction of an isolated VSD (7 cases) and tetralogy of Fallot (1 case), and in one patient - after radical correction of double-outlet right ventricle and mitral valve replacement. One patient was after previous palliative Mustard operation for transposition of the great arteries. In 38 patients VSD was closed with Amplatzer Perimembranous Septal Ventricular Occluder, in 6 patients - with Amplatzer Muscular Septal Ventricular Occluder. **RESULTS:** Occluders were successfully implanted in 229 of 232 patients with ASD, in 6 patients with two ASD two Amplatzer septal occluders were used. Immediately after ASO implantation small residual shunt (less than 4 mm) was revealed in 3 patients. Control EchoCG performed at 3 months revealed the absence of residual shunt in 2 patients, in one patient it disappeared after 12 months. Complete closure of PDA was achieved immediately after the procedure in 75% patients, in 25% cases there was a shunt through occluder frame; 24 hours later EchoCG revealed absence of this shunt. Successful occluder implantation was performed in 43 of 47 patients with VSD. In three cases the defect could not be closed, because its small diameter did not allow to pass the deliver system through the defect. In one case the defect could not be closed, because after occluder implantation EchoCG 2nd degree aortic valve insufficiency. In one case 24 hours after the closure of the defect located in the septal aneurysm occluder migrated into the pulmonary artery; it was necessary to retrieve it with the trap, after that the second occluder was implanted. In 7 cases there was a residual shunt through the occluder. In one case it led to the development of hemolysis, which was eliminated with medical treatment within 48 hours. The examination in the late follow-up revealed total resolution of the shunt in 3 patients.

**CONCLUSIONS:** With the respect of definite indications it is possible to perform successful endovascular closure of septal heart defects and PDA.

#### **OP-966-SINGLE CENTER TRANSCATHETER PATENT FORAMEN OVALE CLOSURE EXPERIENCE USING THE STARFLEX DEVICE IN 75 CONSECUTIVE PATIENTS**

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**BACKGROUND:** Percutaneous transcatheter closure of patent foramen ovale (PFO) is used as an alternative to surgery and medical therapy for the treatment of patients with paradoxical embolism and PFO. The aim is to evaluate the safety and long term results of the STARFlex device which was used in our centre.

**METHODS:** We report on 75 consecutive adult patients who underwent closure of Results: PFO using STARFlex after cryptogenic stroke in between 1999 and 2005. Procedural success, defined as successful deployment of the device and effective occlusion (no or trivial shunt after device placement) was achieved in all patients. There was no in hospital mortality. Periprocedural complications include 2 episodes of cardiac tamponade of which 1 requiring pericardiocentesis and 1 patient needing surgical venous access site repair complicated later by venous thrombosis and pulmonary embolism. All events occurred during the first half of the observation period indicating the presence of a learning curve. There was no need for reintervention. During follow-up 2 patients experienced recurrent neurological events (2 transient ischemic attacks).

**CONCLUSIONS:** Transcatheter closure of PFO using the STARFlex device is a safe and effective therapy for patients with paradoxical embolism and PFO. There is a high success rate, and low incidence of in-hospital complications and low frequency of recurrent events. Our results suggest the presence of a learning curve with the technique of percutaneous closure of PFO. Complication rate for the STARFlex device is not different from other devices reported by other authors.

#### **OP-967-TRANS ESOPHAGEAL ECHOCARDIOGRAPHY A PRICE-LESS TOOL IN ACHIEVING SURGICAL EXCELLENCE**

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**BACKGROUND:** Post operative evaluation of the adequacy of surgical repair of congenital heart defects is of utmost importance Trans Esophageal Echocardiog-

raphy (TEE) has become the standard of care in providing real time information and in assessing the operative success, and has great influence on cardiac surgical decision making. For the last decade TEE is routinely performed at our institution following congenital heart surgery. We herein present our experience and clinical impact of the use of TEE in the operating room.

**METHODS:** Retrospective review of all intra-operative TEE studies performed in the operating room in the years 2004 to 2007.

**RESULTS:** 1000 TEE studies were performed in the operating room following congenital heart surgery in the years 2004 to 2007. In 5.5% of the cases (55 Pts) a second bypass run was needed in order to achieve optimal results due to residual RVOTO (51%, mostly TOF), residual LVOTO (7%), Valve dysfunction (18%), Ventricular dysfunction (5%) and Unexpected surgical errors (5%). In all 55 patients residual lesions were corrected.

**CONCLUSION:** TEE is a priceless tool in providing surgical excellence. Close collaboration between the cardiologist and the cardiac surgeon leads to a team approach, enabling the surgeon to safely walk the thin ice by precisely tailoring his surgical repair, knowing that TEE will guide him through in achieving the optimal result for the benefit of the patient.

#### **OP-968-THE PEDIPUMP: A NEW PEDIATRIC VENTRICULAR ASSIST DEVICE**

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**BACKGROUND:** Mechanical circulatory support has revolutionized the treatment of cardiac disease in adults with end-stage heart failure who would otherwise die from their disease. The same cannot be said for mechanical circulatory support for children; due to limitations imposed by patient size and the nature of pediatric cardiac disease. In fact, extracorporeal membrane oxygenation (ECMO) remains the most commonly used form of pediatric circulatory support. Because it is suitable only for short-term usage, small children with life-threatening heart failure on ECMO are limited to support periods of days to weeks. Clearly, the need remains for the development of new pediatric mechanical circulatory support devices that addresses the following issues: 1) support for the entire range of patient sizes encountered in pediatrics by a single pump 2) preserved hemodynamic performance despite reduced size of system components 3) minimal host impact and 4) possibility of system implantation even in the smallest patients.

**METHODS:** The PediPump is a new ventricular assist device designed specifically for children. The design is based on a mixed-flow rotary dynamic pump; the rotating assembly consists of an impeller in the front, front and rear radial magnetic bearings and a motor magnet in its center. The initial pump design measured approximately 7 mm X 75 mm with a priming volume of 0.6 ml; however, work has begun on newer pumps that are substantially smaller. This basic pump design may be used in acute or chronic clinical settings to provide right ventricular, left ventricular or biventricular support. The current development program for the PediPump includes three objectives: 1) determination of the basic engineering requirements for hardware and control logic including design analysis for system sizing, evaluation of control concepts and bench testing of prototypes 2) performance of pre-clinical anatomic fitting studies using CT-based 3D modeling and 3) animal studies to provide characterization and reliability testing of the device. The present report provides an update on the development of the PediPump in each of these areas.

**RESULTS:** The device provides pressure and flows capable of supporting adults, far exceeding the requirements for support of children. It could be used to support children in the 2 to 25 kg weight range. It is suitable for right ventricular support (RVAD), left ventricular support (LVAD) and biventricular support (BVAD). Hemolysis is comparable to cardiopulmonary by pass machine.

**CONCLUSIONS:** Mini-mixed flow technology in the present pediatric application has been used to develop a VAD that is much smaller than currently available devices (7 mm diameter), allowing use for even newborn circulatory support, while retaining excellent hemodynamic performance. The design of the PediPump in intravascular and extravascular versions will hopefully allow use in a variety of clinical settings from acute support to chronic implantation and in a variety of configurations to provide right ventricular, left ventricular or biventricular support (RVAD, LVAD, BVAD). Performance and durability testing provided by animal studies will hopefully lead to a device that is ready to commence clinical testing at the completion of the funding period.



## MINI PRESENTATIONS VII

### OP-970-VALVE SPARING SURGERY OF THE AORTIC ROOT

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**BACKGROUND:** Patients with symptomatic disease of the aortic root and non-symptomatic aortic valve regurgitation represent a major clinical challenge. Valve sparing surgery has historically yielded unreliable results and valve prosthesis are endowed with risks due to design and durability along with the necessity for anti-thrombotic therapy. Two principally different methods to radically excise the aortic root while preserving the aortic valve have been developed by David and Yacoub. This is a presentation of our experience of aortic valve sparing surgery at Rikshospitalet, Oslo, Norway. Patients were followed up with echocardiography, angiocardiology and computer tomography.

**METHODS:** Between 1999 and 2007, 58 patients (30 men, 29 women) mean age 49 years were operated due to ascending aortic aneurysm or aortic dissection with valve sparing surgery. Twelve patients had no aortic valve regurgitation, 21 had slight, 18 had moderate and 7 had severe. Twenty-two patients had other concomitant surgeries. Four patients had previously aortic surgery. Twelve patients were operated ad modum Yacoub without annuloplasty. Forty-six patients were operated with reimplantation of the valve in a 'Valsalvagraft' ad modum David. In most patients, the ascending aorta was resected. In 15 patients additional surgery of the aortic arch was performed under circulatory arrest. Eleven patients had other concomitant surgery. Four patients underwent other procedures because of B-dissection/aneurysm and one for renal artery stenosis. Operative result was controlled on-table by echocardiography. All patients were studied postoperatively with echocardiography, computer tomography or angiography.

**RESULTS:** Cardiopulmonary bypass-time was 147 (101-301) minutes, cardiac ischemia time 117 (82-237) minutes. One patient died early due to left main stem occlusion. There was no late mortality. Eighteen patients had detectable aortic valve regurgitation which was significant in three at the completion of surgery. One patient had a serious cerebrovascular event, one was reoperated for bleeding, one had therapy-demanding arrhythmia, three had pericardial and two pleural effusion needing treatment, one had pneumonia, one had early percutaneous coronary intervention because of coronary ischemia and one was reoperated with coronary artery bypass grafting for right coronary artery occlusion. Two patients had later surgery with valved conduits during the observation period. At the last postoperative follow-up, five patients had moderate to severe, nine moderate, 19 slight and 19 no aortic valve regurgitation. One patient had late percutaneous coronary intervention of a stenosed left anterior descending artery. Patients operated ad modum Yacoub had a shorter ischemia time (102 minutes) compared to patients operated ad modum David (121 minutes), but the frequency of residual aortic valve regurgitation was greater (8/12 versus 25/40).

**CONCLUSIONS:** Elective reconstruction of the aortic root with valve sparing surgery can be performed with acceptable results. Surgery ad modum David is more complex and time-consuming but seems to yield better long-term results. These methods may allow treatment of patients at risk of dissection/rupture without need for aortic valve prosthesis.

### OP-971-OUR EXPERIENCE OF VISCERAL ORGANS' PROTECTION BY PERFUSION OF COLD CRYSTALLOID SOLUTION DURING THORACOABDOMINAL AORTAS' REPAIR

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**BACKGROUND:** The mortality due to multi-organ failure (MF) after operations on thoracic aorta can reach 80% in spite of application the various methods of organs' protection at reconstruction of thoracoabdominal aortic aneurysms

( $\text{III}$ ). The selective warm blood visceral perfusion (SBVP) and selective cold crystalloid kidneys perfusion (SCKP) have been introduced in clinical practice rather recently and yet have deserved the justified popularity. The aim of SBVP is to minimize the visceral ischemia, which decrease the MF rate up to 8-29%. SCKP is aimed to create local hypothermia with corresponding reduction of kidneys' metabolic needs (oxygen consumption by kidneys decreases up to 5% and their temperature - up to  $+10^{\circ}\text{P}$ ), which leads to MF rate of 3-11 %.

**METHODS:** Since 2007 we have proposed and introduced in our practice the original method of visceral organs' protection. The method consists of cold ( $+4^{\circ}\text{P}$ ) non-selective or selective perfusion of all aortic visceral branches by "Custodiol" solution (Bretschneider, Germany) without using heparin. The reconstructive surgery is performed in conditions of simple clamping of aorta. The proposed method of protection was applied in 8 patients (for the first time in Russia on 21 of February 2007). Four patients suffered from  $\text{III}$  of 3-4 type and the other four - from dissecting aortic aneurysm of 3 B type (mean age was  $57.6 \pm 3.7$  years) as well as from connective tissue dysplasia and atherosclerosis (one patient in second group had Marfan's syndrome). Grafting of thoracoabdominal aorta including all visceral arteries by various technique was performed in all patients (average duration of operation was  $350 \pm 27.6$  minutes) using non-selective perfusion by  $950 \pm 22.4$  ml of "Custodiol" and selective - by  $1250 \pm 250$  ml. Heparin was not used in half of patients.

**RESULTS:** The optimal protection of all visceral organs, smaller bleeding volume with comparative duration of aorta clamping was noted in comparison with isolated left heart bypass and circulatory arrest. The postoperative MF rate was found to be 12.5% in patients operated in conditions of "Custodiol" perfusion in comparison with 17.4% in patients with  $\text{III}$  who were operated with application of various protection methods. In total 7 patients had the smooth postoperative period and the minimal period of recovery after operation.

**CONCLUSION:** The method of cold perfusion of all aortic visceral branches can be recommended to practical application. However, this method has restrictions at extended  $\text{III}$  of II type as the time of reconstruction is significant and thus the necessity of only pharmacological prevention of proximal hypertension is unreasonable. We have revealed a certain tendency of more smooth and uncomplicated postoperative course in patients whose visceral organs were protected by cold perfusion during operation. These first results seem to be very promising and need the further clinical studying.

### OP-972-BENTALL SURGERY USING A BIOLOGICAL VALVE

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**BACKGROUND:** In cardiac surgery, the decision to replace a valve with a mechanical or a biological prosthesis basically depends on the age of the patient and on the contraindications for the anticoagulant - with mechanical prostheses, the anticoagulant is for life. The risks and complications of the situation are well known. Bentall surgery is usually carried out with a graft consisting of Dacron and a mechanical aortic valve, so the patient has to take anticoagulants. We will describe our experience in Bentall surgery using biological valves.

**METHOD:** Between September, 2003 and September, 2006, 8 Bentall surgical procedures were carried out with biological valves, with an average age of  $72 \pm 4.9$ , euroSCORE  $8.9 \pm 2.6$  and females 25%. During surgery, a graft was made out of a Dacron tube to which a biological valve was sewn, selected in accordance with the diameter of the aortic ring, and then proceeding as usual as for the technique described by Bentall.

**RESULTS:** The average EC was  $195' \pm 45'$ , clamping  $195' \pm 45'$ . In three cases (37.5%), interrupted blood flow was carried out with cerebral perfusion through the right subclavian artery  $15' \pm 5'$ . The average UCI stay was  $2.8 \text{ days} \pm 1.9$ , the post-operative intubation time was  $4 \pm 5$  hours. Surgical complications were low output (12.5%), auricular fibrillation (12.5%), acute renal insufficiency (12.5%), respiratory infection (12.5%), re-operation due to bleeding (12.5%). Hospital mortality was 25% (2 patients), one of whom died as a result of respiratory arrest secondary to epileptic seizure and the other of low output. The patients were in follow up for  $34 \pm 11$  months, they are all in functional grade I-II.

**CONCLUSION:** Bentall surgery using a biological valve is a useful technique that prevents anticoagulant complications in patients over 70, and in patients under 70 where anticoagulants are contraindicated.



## OP-973-SURGERY FOR ACUTE TYPE A AORTIC DISSECTION

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**BACKGROUND:** The aim of this study was retrospective analysis of 6 years surgical experience in treatment of patients with acute type A aortic dissection.

**METHODS:** Between 2000 and 2006, a total of 73 patients were operated on for an acute type A aortic dissection. Operations were carried out as an emergency. Moderate hypothermic (30-32°C) extracorporeal circulation with right subclavian artery as an arterial line and the right atrium cannulation was performed. Cerebral protection during circulatory arrest was obtained by antegrade perfusion through the same arterial line. Various kinds of operations were carried out depending on an arrangement and prevalence of proximal fenestration and conditions of a root of an aorta. The preference was given to valve-preserving surgical procedures. We reviewed retrospectively preoperative and intraoperative records to conduct an analysis of risk factors associated with surgery. Multivariate analysis was used to predict operative mortality and to provide a preoperative risk profile of each individual patient that could be used for future patients. The survived patients were followed up clinically and echocardiographically up to 70 months. Endpoints were death, cardiovascular reoperation, and neurologic events. Median follow-up was 10,7 months. Follow-up was 89,4% complete.

**RESULTS:** Operative mortality was 15% (n = 11). A logistic regression model with five explanatory variables to predict operative death showed a good fit: the risk factors associated with operative mortality were coma, abdominal pain, extension of operation, AMI, Ao rupture. Location of the intimal tear, type of the aortic root repair, and duration of circulatory arrest did not emerge as predictors of mortality. Late mortality was 4(6,4%). Cause of death was cardiac failure in 2(3,2%) cases and 2(3,2%) due to brain stroke. 6 years survival exclude hospital mortality was 93,6%. The lethal outcomes connected to the main disease have not been registered at that period of time. Only 3 (4,8%) patient in follow up period had an aortic insufficiency of more than grade 1.

**CONCLUSIONS:** Surgery for acute type A aortic dissection using moderate hypothermia (30°C) and antegrade selective cerebral perfusion via the right subclavian artery represents an acceptable operative risks and good mid-term survival.

## OP-974-ANEURYSMS AFTER COARCTATION OF THE AORTA REPAIR

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**BACKGROUND:** Aneurysms forming - grave complication after coarctation of the aorta (CA) correction. AIM. To attract attention to the risk of aneurysms forming after CA repair and to the tactic of aneurysms surgical treatment.

**METHOD:** 4186 patients after CA correction were studied during 1 to 45 years postoperatively. Patients age range 3 days - 55 years. Methods used for CA repair: coarctation resection with end-to-end anastomosis - 2513(59,8%), patch aortoplasty - 1161(27,7%), aorta grafting - 238(5,7%), Waldhausen operation - 66(1,6%), bypass grafting - 61(1,4%), Blalock operation - 11(0,3%), balloon dilatation - 146(3,5%). Aneurysms developed at the site of CA correction in 118(2,8%) patients during 1 month to 34 years postoperatively after end-to-end anastomosis in 0,2% of patients, in 8,9% - after patch aortoplasty, in 1,7% - after aorta grafting, no after Waldhausen and Blalock operations in 4,9% - after aorta bypass grafting, in 1,4% - after balloon dilatation. Frequency of aneurysms forming increased with duration of follow up. During the first 5 years aneurysms were found in 10(8,5%) cases, most during 6 to 16 years after operation - in 79(66,9%) cases. Disease symptoms were absent in 56(47,5%) patients, blood-spitting or lung bleedings were noted in 46(39,0%) cases, chest pain - in 11(9,3%), sepsis - in 5(4,2%). Aneurysm diagnosis was established mainly during X-ray study. Diagnosis verification was done by aortography. A round shadow in the region isthmus was found in 113(95,8%) cases, in 3(2,5%) patients with repeated haemophthysis chest X-ray was normal, in 2(1,7%) patients aneurysms could not be detected even during aortography. 93(78,8%) patients were operated on, 25(21,2%) patients refused operation. Distal blood circulation support was accomplished with a passive ascending to descending aorta bypass in 86(92,4%) patients, in 5(5,4%) - cardiopulmonary bypass was used, in 1(1,1%) - aorta was cross clamped, in and 1(1,1%) aorta was not clamped. After aneurysm resection in 81(87,2%) patients the diseased

part of aorta was replaced with synthetic graft, in 6(6,4%) cases patch aortoplasty was performed, in 3 (3,2%) - aortorrhaphy and in another 3 (3,2%) - bypass grafting.

**RESULTS:** Hospital mortality - 8(8,6%). There were no spinal cord or kidneys injuries. All 25 patients, which refused operation, died during 7 years after diagnosis of aneurysm was established. Surgical CA correction is considered at present time as the only possible, sufficiently safe and effective method of treatment. However remote postoperative studies showed that such a threatening complication as an aneurysm of the aorta at the site of repair appeared in 2 - 34% of operated on patients according to the literature reports and in 0,5% - according to our data. Aneurysm a presence of an is the direct indication for operation. Redo operations on the thoracic aorta demand the use of a distal circulation support.

**CONCLUSIONS:** Aneurysms of the aorta are the complication of a remote post-operative period of CA repair. This necessitates the life long dispensary supervision of the operated on patients for the timely diagnostics and treatment of the aneurysms. Big role in the prophylaxis of on aneurysms development plays the restriction of a patch isthmoplasty.

## OP-975-SAFETY OF UNILATERAL ANTEGRADE CEREBRAL PERFUSION at 22 DEGREES °C SYSTEMIC HYPOTHERMIA

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**BACKGROUND:** Even superiority of antegrade cerebral perfusion in aortic operations is accepted widely, there is still debate on perfusion properties such as sufficiency of unilateral perfusion and optimal systemic temperature.

**METHODS:** Between January 2005 and September 2007, 30 patients operated with unilateral antegrade cerebral perfusion at 22 °C systemic temperature are included to the study. Their mean age was 58±11 with male predominance (n=21). Operation indication was acute type A aortic dissection in 14 patients (47%), degenerative aneurysm in 9 patients (30%), dissecting aneurysm in 6 patients (20%) and intramural hematoma in 1 patient (3%). In 13 patients (%43) supracoronary ascending aorta replacement, in 8 patients (27%) hemi-arcus replacement, in 3 patients (10%) Bentall procedure+hemiarcus replacement, in 3 patients (10%) total arcus replacement, in 2 patients (7%) just Bentall procedure and finally in 1 patient (3%) ascending, total arcus and descending aorta replacement was performed.

**RESULTS:** Hospital mortality observed in just one patient (3.3%). Permanent or transient neurological deficit did not observed in any of alive patients. Average cardiopulmonary bypass, myocardial cross clamp and antegrade cerebral perfusion times were 144±40, 82±28, 30±11 minutes respectively. Average mechanical ventilation, intensive care and hospital stay duration were 18±9 hours, 2.3±1.1 and 12±6 days, respectively.

**CONCLUSIONS:** Our experience with unilateral antegrade cerebral perfusion at 22 °C systemic hypothermia is a safe method and has satisfactory clinical results. Establishment of antegrade cerebral perfusion via right axillary artery cannulation is fast and simple. Absence of cannulas in operation field provides an excellent surgical comfort nearly total circulatory arrest.

## OP-976-HEART INJURIES: A SCANDINAVIA PERSPECTIVE

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**BACKGROUND:** The nature of cardiac injuries in Scandinavian countries is not well characterized.

**METHODS:** We evaluated our experience of cardiac injuries treated at one of the largest University Hospitals in Sweden and at Denmark's busiest medical center during a 10 and 6-year-period respectively.

**RESULTS:** We found 23 patients with cardiac injuries, of whom 11 were penetrating, 9 blunt, and 3 iatrogenic. The penetrating wounds involved the right ventricle in 4, left ventricle in 5 and pericardium in 2. Blunt rupture of the right atrium was found in 2 and myocardial contusion in 7. Patients with cardiac penetration or rupture presented in shock and underwent urgent surgery. Three patients died: two due to exsanguinations and one due to mas-

sive cerebral lesions.

**CONCLUSIONS:** Our data reflect the Swedish and Danish experiences of cardiac injuries: there are relatively few cases, alcohol and drug misuse is the principal risk factor, and there were no gunshot wounds. The outcome was excellent using an aggressive way of management.

### OP-977-THE ROLE OF VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS) ON THE MANAGEMENT OF PATIENTS SUSPECTED TO HAVE A DIAPHRAGMATIC INJURY AFTER A PENETRATING THORACIC TRAUMA: A SYSTEMATIC REVIEW OF THE LITERATURE

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**BACKGROUND:** The diagnostic of a diaphragmatic injury in patients after a penetrating thoracic trauma always involve difficult decisions and usually these patients undergone a laparotomy or thoracotomy. Nowadays video-assisted thoracoscopic surgery (VATS) has been shown to be an important tool on the diagnostic and treatment of these patients. Our objectives were to determine the VATS accuracy and safety on the diagnostic of patients with a suspected diaphragmatic injury after a penetrating thoracic trauma and determine the VATS effectiveness and safety on the treatment of patients who have a diaphragmatic injury.

**METHODS:** Systematic review of the literature, the data based searched were: MEDLINE, EMBASE, LILACS and Cochrane Library. All studies that have reported VATS on the management of patients after a penetrating thoracic trauma were included.

**RESULTS:** Initially, 184 studies were identified by the electronic research. We had done a first appraisal of these studies reading the title and the abstract, after that, report of one case, letters to editors, studies with animals, who have included other diseases, whose VATS wasn't the first option, that didn't do mention to diaphragmatic injury, who had included chronic diaphragmatic injuries, were excluded. After that we considered 58 studies for a full text appraisal. Finally we selected 9 studies to do the data extraction. These studies were selected because they have included only patients suspected to have a diaphragmatic injury after a penetrating thoracic trauma. Design of the selected studies: 4 studies were retrospective case series and totalizing 250 patients, 3 studies were prospective case series totalizing 69 patients and 2 studies were prospective cohort, these two studies were included only patients who had a penetrating thoracic trauma on the left side.

**CONCLUSION:** The data presented until now do not permit the recommendation of VATS as a standard on the management of patients after a penetrating thoracic trauma.

### OP-978-PROXIMAL AORTIC ARCH SURGERY WITH INTERRUPTED BLOOD FLOW IN MILD HYPOTHERMIA

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**BACKGROUND:** Surgery on aneurysms and ascendant aortal dissections affecting the proximal aortic arch are associated with a high rate of morbidity and death, it is usual to carry out distal anastomosis with interrupted blood flow in deep hypothermia and selective cerebral perfusion. We describe our surgical experience in this pathology with interrupted blood flow in mild hypothermia and cerebral protection with antegrade perfusion at 19°C.

**METHOD:** Between September 2006 and October 2007, 12 patients were submitted to proximal aortic arch surgery, with interrupted blood flow in moderate hypothermia at 27°C, average age 63.3 ± 15.4 years, female 41.6%, euroSCORE 8.5 ± 1.6. They were compared with 12 patients operated on in 2005 and 2006 for the same pathology, with interrupted blood flow at 19°C, average age 55.9 ± 12.5 years, female 0%, euroSCORE 7.3 ± 2.8.

**RESULTS:** No significant differences were found in relation to age, risk factors, diameter of the aneurysm, degree of urgency or euroSCORE. However, there was a difference with respect to gender P: 0.01. The patients operated on mild hypothermia had less EC time (156.8' vs 210.6', P: 0.003), similar clamping time (88.7' vs 90') and interrupted blood flow (22.9' vs 19') P: ns. The aortic

valve was substituted (66% vs 41.6%, P: ns). Complications were similar in both groups, P: ns. Shorter ICU stays (2.7 ± 3.4 vs 22.3 ± 44.4 d. P: 0.16), fewer intubation hours (5.2 vs 13.6), and the lower death rate (0% vs 41.6%, P: 0.02) also stand out.

**CONCLUSIONS:** Proximal aortic arch surgery with interrupted blood flow in moderate hypothermia, prevents the complications caused by deep hypothermia, reduces EC time and shows a lower death rate.

### OP-979-ABDOMINAL PATHOLOGY IN THE CHEST AN EXPERIENCE OF 50 CASES

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**AIMS:** This study seeks to define the clinical presentation, the usefulness of diagnostic tests, surgical management approach and outcome of treatment of abdominal pathology in the chest, following trauma.

**DESIGN:** An observational descriptive study.

**PLACE AND DURATION OF STUDY:** Department of Cardiothoracic Surgery, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar from March 2002 to April 2005.

**SUBJECTS AND METHODS:** In this retrospective study, 50 patients admitted to our department with diaphragmatic injury were evaluated according to the type of injury, diagnostic methods, associated organ injury, treatment, modality, morbidity and mortality.

**RESULTS:** The average age of patients was 32 years. There were 35 (70%) male and 15 (30%) female patients, 38 (76%) of these patients sustained blunt and 12 (24%) had penetrating chest injury. The diaphragmatic injury was right sided in 4 and left sided in 46 patients. Thirty nine (78%) patients presented in respiratory distress within 48 hours of injury while 11 (22%) presented with bowel obstructive symptoms months and years after injury. A chest x-ray on admission suggested the diagnosis in 70% of the cases while chest ultrasonography and contrast studies were required in others. Surgery was emergent in 35 (70%), semi-emergent in 9 (18%) and effective in 6 (12%) cases. Surgical approaches were left thoracotomy (40 patients), left thoracotomy (6 patients) and right thoracotomy (4 patients). The diaphragmatic repair was achieved by direct suture in 45 cases while prolene Mesh was required in 5 cases. The mortality rate was 6% (n = 3). Recurrence occurred in one (2%), wound infection in 3 (6%), pleural space, problem in 1 and chest infection in 2 (4%) patients.

**CONCLUSION:** A high index of suspicion and early surgical treatment determine the successful management of traumatic diaphragmatic injury with or without the herniation of abdominal organs. The surgical approach is individualized. We prefer the thoracic approach adding laparotomy when necessary. Acute right sided injuries and chronic injuries should be approached through right thoracotomy.

### OP-980-INCIDENCE AND PATTERNS OF PERMANENT PACING FOLLOWING BICAVAL AND BIATRIAL ORTHOTOPIC HEART TRANSPLANTATION

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**BACKGROUND:** The etiology of postoperative heart block in cardiac transplant patients remains uncertain. Over 600 heart transplants have been performed at our institution since 1978. Before 2001, the standard biatrial technique was employed almost exclusively for all cases. After 2001, the bicaval technique was introduced. Differences in postoperative pacing requirements were studied between both groups of transplant patients. We studied the incidence and patterns of permanent pacemaker (PM) insertion in 217 consecutive cardiac transplant recipients beyond 2001.

**METHODS:** Prospective systematic review of all orthotopic heart transplant cases from January 1, 2001 to October 31, 2007 was done. Data was collected from 217 consecutive patients, and the incidence of postoperative need for permanent pacing devices was determined.

**RESULTS:** The standard biatrial technique (Group I) was used in 144 patients, and the bicaval technique (Group II) was used in 73 patients. In Group I, 18 of 144, (12.5%), required permanent pacing within the first postoperative

month, while in Group II 5 of 73, (6.8%), required permanent pacing, ( $p=0.20$ ). The incidence of permanent pacing was also studied beyond the first postoperative month. In Group I, 3.4% required permanent pacing beyond the first month up to the 5th postoperative year, vs. only 1.3% in Group II, ( $p=0.33$ ). Data was analyzed using the chi-square test with Yates' correction.

**CONCLUSIONS:** The standard biatrial technique was associated with a higher incidence of atrioventricular conduction abnormalities with consequent need for permanent pacing compared with the bicaval group. In both groups, it was observed that the need for permanent pacing was highest within the first postoperative month. The bicaval technique may be superior to the biatrial technique to decrease the incidence of atrioventricular conduction dysfunction and in preventing the need for short term and long term permanent pacing in orthotopic heart transplantation.

### **OP-981-THE PRESERVATION OF DONOR'S HEART AND LUNG AND THE POSTOPERATIVE IMMUNOTHERAPY FOR THE HEART-LUNG TRANSPLANTED PATIENTS --THE CLINIC EXPERIENCES OF DISCRIMINATION FOR GRAFT REJECTION WITH TWO CASES**

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**BACKGROUND:** To summarize the preservative measures of the donor's heart and lung, and the postoperative immunotherapy, as well as the clinic experiences of discrimination and management for graft rejection.

**METHODS:** To review the 2 heart-lung transplantation cases in our department during last 2 years, to summarize and sum up the experiences of the preservative measures for donor's heart and lung and the discrimination and management for graft rejection as well as the postoperative immunotherapy.

**RESULTS:** Perfiox and Euro-Collin solutions may play very good preservative roles for donor's lungs. UW solution may play very good preservative role for donor's heart. There are good relationships between the thicker of ventricular septum and back wall of left ventricle in UCG and the events of rejection after operation. The 2 patients are rehabilitative and discharged with satisfactory quality of life, and follow-up visit for 8~12 months without any serious graft rejection event.

**CONCLUSIONS:** The preservative measures we used are convenient and effective. To discriminate the clinic graft rejection and infection in time and administer correct management will have large benefits for the patients' rehabilitation, shortening the hospital stay and reduce the medical cost.

### **OP-982-TOTAL INFLOW OCCLUSION OF THE RIGHT DONOR HEART IMPROVES THE OUTCOME OF HETEROTOPIC HEART TRANSPLANTATION**

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**BACKGROUND:** The outcome of heterotopic heart transplantation has been poor since the description of the original technique. The competition of the hypertensive right native heart over the new transplanted heart was the main cause of failure of the original operation. Nevertheless the new technical approach spares the transplanted right ventricle from the recipient pulmonary hypertension. The scarcity of donors is a factor limiting heart transplantation. Pulmonary hypertension secondary to long lasting chronic left heart failure is a fact that risks the transplanted heart due to the distension of the right ventricle that many times requires a Right Ventricular Assist Device increasing the perioperative risk and diminishes the possibilities of a proper outcome. Heterotopic heart transplantation with this technique is a relative new surgical option for certain patients who otherwise would require heart and lung blocks reducing the availability of organs for patients needing lung transplantation. Strongly built patients having great body surface area may accede to heterotopic heart transplantation with slightly built donors

**METHODS:** Since September 2001 six patients have undergone heterotopic heart transplantation with total inflow occlusion of the right donor's ventricle. Five cases were men and big recipients around 100 Kilograms each and an extended body surface area and the other one was a woman. Mean pulmonary Pressure was high in all cases over 75 mmHg and Tran's pulmonary gradient over 14 mmHg. Both hearts were electrically synchronized with pace-

makers. The synchronization of the two hearts was made initially with external pacemakers and then switched to internal pacemakers three days after surgery. Two levels of pacing were established. First at the atrium level if the patient had sinus rhythm and a second level at the ventricles in case any arrhythmias occurred thereafter.

**RESULTS:** Four of the six cases are alive and well. The first case has 6 years after transplantation. Two deaths occurred one due to severe liver dysfunction and the other due to recurrent vascular rejection.

**CONCLUSION:** Heterotopic heart transplantation with the described technique is a valid surgical option for patients with pulmonary hypertension and or big recipients and small donors.

### **OP-983-TRANSLARYNGEAL TRACHEOTOMY (TLT). AN ALTERNATIVE IN EARLY TRACHEOTOMY AFTER CARDIAC OPERATION**

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**BACKGROUND:** Tracheotomy after cardiac operation through a median sternotomy is believed to increase the risk of mediastinitis, leading to debate as to whether early tracheotomy (within 14 days) is safe in these patients. Only limited data are available to date regarding the translaryngeal percutaneous approach (Fantoni method) in this patient population.

**MATERIAL-METHODS:** We reviewed charts from patients underwent cardiac operation with median sternotomy between March 2004 and June 2007, at our institution. Translaryngeal tracheotomy was performed in 18 patients undergoing cardiac operation through median sternotomy. Complications of the method on the day of tracheotomy (subcutaneous emphysema, haemorrhage, hypoxemia) and patients developed mediastinitis during the first 14 days after the procedure were recorded.

**RESULTS:** All tracheostomies were performed on or before the 7th day after median sternotomy. Out of the tracheostomies performed, only one (1) was turned to percutaneous tracheotomy due to misplacement of the tracheostoma. Relative hypoxemia ( $SpO_2 = 90\%$ ) during the procedure was developed in 2 cases, however without any clinical significance. None of these patients developed mediastinitis. Overall mortality of the cases undergoing translaryngeal tracheotomy was 28%, while the predicted mortality according to the Euroscore was  $30, 2 \pm 22, 1\%$ . The ICU days were  $25, 5 \pm 16$ .

**CONCLUSIONS:** Early post cardiac operation translaryngeal tracheotomy seems to be a safe tracheotomy method in patients with median sternotomy. It offers a very low periprocedural complication rate without increasing the incidence of mediastinitis due to: a) a small skin incision, and b) a retrograde internal gradual dilatation of the trachea. More studies are needed to confirm these results in this patient population.



## CORONARIES VII

### OP-984-WHO WILL BE THE CANDIDATE FOR SURGICAL CORONARY REVASCLARIZATION IN THE NEAR FUTURE?

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**BACKGROUND:** Although CABG is the gold standard treatment for certain types of CAD, PCI and DES has become the most popular nonmedical treatment approach for CAD. PCI with DES were introduced at our hospital in May 2002. The aim of our study was to investigate the initial and late impact of the PCI-DES on the surgical treatment of CAD.

**METHODS:** Using the in-house database (Cardex), we investigated the characteristics of the patients who underwent CABG during the year before the introduction of DES (A=2001-2002) (n=924, CABG & Valve 91-9.8%), the first year of their introduction (B=2002-2003) and the last year (C=2005-2006)(n=578, CABG & Valve 114-19.7%). During the same periods, 0 (4), 84 (269) and 841 (102) patients underwent PCI and Drug-Eluting Stenting (Non-coated), respectively.

**RESULTS:** We noticed strong difference between the CABG cases and the combined CABG and Valves cases when we compared the C year with A and B (p=0.0001). The comparison between the years A and C showed strong difference as for LVEF<50% (p=0.045), age>75y (p=0.033), LMS lesions (p=0.0001), redo cases (p=0.017), gender (p=0.011), OPCAB vs CABG cases (p=0.0001), prolonged ITU and Hospital stay (p=0.002 and 0.011), number of grafts (p=0.031) and higher Parsonnet score but not Euroscore (p=0.001 and p=0.135). The comparison between years B and C showed significance difference as for LVEF<50% (p=0.002), LMS lesions (p=0.001), redo cases (p=0.003), OPCAB vs CABG cases (p=0.0001), diabetes (p=0.038) and higher Parsonnet score and Euroscore (p=0.001 and p=0.011). There was no difference among the three years as for mortality rate (p>0.05).

**CONCLUSIONS:** It seems that the candidate for surgical coronary revascularization in the near future will be a diabetic elderly with fair LV function and LMS lesion and possibly with valve replacement, with other comorbidities and high Euroscore. Furthermore, this patient will undergo an on-pump cardiac procedure, with excellent results, low mortality and without prolonged ITU or Hospital stay.

### OP-985-RESPIRATORY FAILURE AFTER CORONARY ARTERY BYPASS SURGERY: INTRAOPERATIVE AND POSTOPERATIVE RISK FACTORS

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**BACKGROUND:** Unlike preoperative events, the influence of intraoperative or postoperative events on respiratory failure after coronary artery bypass grafting (CABG) remains unclear. The purpose of this study was to identify intraoperative and postoperative risk factors that predispose respiratory impairment after CABG.

**METHODS:** A total of 2095 consecutive patients who underwent primary CABG without a concomitant cardiac operation from January 2005 until July 2007 were included. Respiratory failure was defined as the need for postoperative mechanical ventilatory support longer than 72 hours. Univariate and multivariate logistic regression model was used in the analysis.

**RESULTS:** Of 2095 consecutive patients who underwent CABG without a concomitant operation, 122 patients (5.8%) suffered from postoperative respiratory failure. Multivariate analysis identified six intraoperative and postoperative risk factors for post-CABG respiratory failure. CPB time (in 30 minutes increments) was the only validated intraoperative variable that increased the risk of postrespiratory failure (odds ratio [OR], 1.4; p less than 0.01). Postoperative

events contributing significantly to an increased risk of post-CABG respiratory failure were (1) sepsis and infection (OR, 66.4; p<0.001), (2) renal failure (OR, 28.7; p<0.001), (3) deep sternal wound infection (OR, 12.3; p<0.001), (4) new stroke, intraoperative at 24 hours (OR, 8.3; p<0.001), and (5) bleeding that required reoperation (OR, 5.5; p<0.001).

**CONCLUSIONS:** Respiratory function after CABG is readily influenced by postoperative occurrence of extracardiac organ or system complications.

### OP-986-USE OF THE CARDICA PAS-PORT AORTIC CONNECTOR SYSTEM: EARLY RESULTS IN CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** The PAS-port device eliminates the need for aortic clamping during coronary artery bypass grafting (CABG) for the proximal anastomoses between vein grafts and aorta, and may reduce the incidence of stroke or intraoperative aortic dissection in patients with severe atherosclerotic or calcified aorta.

**METHODS:** Forty PAS-Port devices were used in 37 patients (mean age 67 ± 9.8 years, six females) with logistic EuroSCORE 5.1 ± 5.5 submitted to CABG between October 2006 and December 2007. Outcome variables studied were intraoperative device performance and 30-day mortality, 6-12-month (earlier implants, n=10) CT-scan angiographic graft patency, and clinical follow-up.

**RESULTS:** Off-pump CABG was performed in 24 patients (65%), mean number of grafts per patient was 2.5 ± 0.5; bilateral internal thoracic artery was used in 5 patients (14.7%); in 7 patients (19%) was performed a Y-graft between PAS-Port anastomosis and other vein graft for other territories, in order to avoid aortic clamping; PAS-Port-dependent veno-coronary distal anastomoses were 47/51 (92%). Deployment of PAS-Port device was successful in all patients. No bleeding was recorded. One patient died during hospitalization for pulmonary sepsis, with graft patency evaluated with angio-CT scan and another patient during rehabilitation, for AV block. CT-scan angiographic graft patency for PAS-Port device proximal anastomoses and for PAS-Port-dependent distal anastomoses was observed in all patients studied, but one (12/13 with follow-up>8 mo.s; 93%). No cardiac related death or myocardial infarction were observed in all survivors during 12-month follow-up period.

**CONCLUSIONS:** In-hospital results, 6-12-month patency rate and clinical follow-up data using PAS-Port device are very good; patency and 12-month clinical follow-up results compare favorably with data from hand-sewn controls. PAS-port system safely allows the clampsless creation of proximal aorta anastomoses in CABG surgery.

### OP-987-PREDICTORS OF PROLONGED (>48 HRS) MECHANICAL VENTILATION AFTER OPCAB AORTA NON-TOUCH (n-CIRCUIT TECHNIQUE)

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**OBJECTIVE:** To identify parameters associated with prolonged (>48 hrs) mechanical ventilation after OPCAB in our patient population.

**MATERIALS AND METHODS:** From 02/2001 to 11/2005, we operated on 1359 patients and performed isolated coronary revascularization with the n-circuit technique, consisting of: 1) beating heart, 2) OPCAB 3) aorta non-touch 4) use of composite grafts 5) arterial revascularization. Patients needing prolonged mechanical ventilation (39 patients, Group A) were compared to patients extubated early post-op (1320 patients, Group B). Data were analyzed using chi-square, Fisher's exact test and Cox's regression model.

**RESULTS:** Group A patients were older (68.43±10.03 vs 64.74±9.85, p<0.02). There were more octogenarians among them (6.5% vs 2.7%, p=0.09). Patients with transient ischemic attacks (TIAs) pre-op were likelier to belong to Group A (13.0% vs 2.7%, p<0.02, OR 5.41, 95% CI 1.54-19.05) as were patients with frank stroke (9.8% vs 2.7%, p<0.02, OR:3.96, 95% CI 1.33-11.72). Most strongly associated with prolonged ventilation was pre-operative intra-aortic balloon pump insertion (22.6% vs 2.5%, p<0.0005, OR: 11. 95% CI 4.20-29.69). Unexpectedly COPD was not associated with post-op prolonged ventilation (4.4% vs 2.8%, p=NS), neither was obesity (3.1% vs 2.8%, p=NS).



**CONCLUSION:** After OPCAB aorta non-touch technique most patients are extubated in the first 48 hrs after the operation. A small subgroup (2.9%) remains, with patients necessitating prolonged mechanical ventilation. Multivariate analysis shows the best predictors for this to be: Age (probability increasing by 4% with each year of advancing age), pre-op IABP, pre-op TIA and frank stroke.

#### OP-988-ACCELERATED IDIOVENTRICULAR RHYTHM FOLLOWING CORONARY BYPASS SURGERY: A CONFUSING ARRHYTHMIA

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**OBJECTIVE:** Accelerated Idioventricular Rythm (AIVR) is one type of Ventricular Tachicardia (VT), which is sometimes termed slow VT since the ventricular rate is between 60-110 beats per minute. The onset of AIVR is typically nonparoxysmal (gradual) and it results when the ventricular rate exceeds the sinus rate secondary to sinus rate slowing or sinoatrial (SA) or AV block. AIVR may occur following successful treatment of acute MI (primary PCI, or thrombolytics) once reperfusion is restored in the infarct-related artery. AIVR occurrence following aorto-coronary bypass surgery is rare and also confusing for the cardiac surgeon. We herein report an AIVR in a patient with coronary artery disease which was surgically treated.

**CASE:** A fifty-four year old man was admitted to our emergency service with chest pain and non-ST elevation myocardial infarctus diagnosis was made. Clopidogrel, acetylsalicylic acid, low molecular weight heparin, nitroglycerine, ramipril and metoprolol treatment was initiated. Elective coronary angiography revealed critical lesions on the left main coronary artery and right coronary artery. Ejection fraction was calculated as 45% with transthoracic echocardiography. The patient was referred to our cardiac surgery department for urgent coronary artery surgery. Left internal thoracic artery was anastomosed to the left anterior descending artery and two saphenous grafts were anastomosed to the right coronary artery and the first obtuse marginal under cardiopulmonary bypass. Patient was transferred to the cardiac surgery intensive care unit under 6 mcg/kg/min dopamine and was followed on sinus rhythm 80 beat/min and 110/70 mmHg arterial pressure. Postoperative initial electrocardiogram was normal. Except rare ventricular extrasystoles and without any ischemic changes. In the sixth postoperative hour an accelerated idioventricular rhythm appeared with a frequency of 92 beat/min leading to almost 20 mmHg reduction in the arterial pressures. After 45 minutes patient was back to the sinus rhythm without any medical or electrical treatment. AIVR repeated two more times and again resolved spontaneously. Patient was discharged on the sixth postoperative day without any complaint.

**DISCUSSION:** AIVR is found to be the most common reperfusion arrhythmia and usually is very well tolerated. No specific antiarrhythmic treatment is recommended. Such reperfusion arrhythmias following coronary angioplasty or thrombolytic therapy may indicate successful reperfusion. Previous studies considered the absence of AIVR after reperfusion interventions as a risk factor for in-hospital morbidity. In our case coronary bypass grafts can be postulated to reperfuse ischemic areas completely and thus induce an AIVR. Although ventricular arrhythmias frighten the surgeons at the first sight, AIVR is a benign arrhythmia and moreover may be considered as an indicator of successful surgical revascularisation.

#### OP-989-THE SYSTEMIC INFLAMMATORY RESPONSE IN CABG: WHAT IS THE ROLE OF THE VERY LOW EJECTION FRACTION (EF ≤ 30%)?

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**BACKGROUND:** Heart operations with cardiopulmonary bypass (CPB) are associated with a transient inflammatory response involving the release of proinflammatory and antiinflammatory cytokines. CPB, extracorporeal membrane oxygenation, ischemia-reperfusion injury and hypothermia induce systemic inflammatory response (SIR). The impaired left ventricular function in patients undergoing elective CABG is associated with a more pronounced release of proinflammatory cytokines and these patients are more susceptible to

develop postoperative complications after cardiac surgery. The aim of our study is to examine the effect of severe left ventricular dysfunction (Ejection Fraction -EF ≤ 30%) on the activation of systemic inflammatory reaction (SIR) during and after CABG.

**METHODS:** Clinical prospective study. 32 selected patients underwent CABG. 16 patients had depressed left ventricular function before the operation (Low EF, ≤30%) - Low EF group (study group). 16 patients had normal left ventricular function (Normal EF, >50%) - Normal EF group (control group). To assess the LVEF, (1) transthoracic echocardiography, (2) left ventriculography during coronary angiography and (3) transesophageal echocardiography were performed in all patients of the study before the operation. The used criterion for a patient being included into low EF group was a LVEF < 30% having been measured by all the three methods. If a patient had a LVEF > 50%, he would be included in the normal EF group. The levels of inflammatory mediators TNF-α, IL-6, IL-8 and IL-10 were measured preoperatively, 30 minutes after the beginning of Extracorporeal Circulation (ECC), in the end of ECC, after the administration of Protamine and 24 hours postoperatively.

**RESULTS:** Higher levels of almost all of inflammatory mediators were detected in patients with depressed left ventricular function compared with patients of normal EF group. IL-6 levels were found statistically significant higher in Low EF group before the induction of anesthesia (p=0.039) and after the administration of Protamine (p=0.02). IL-8 levels were found statistically significant higher in Low EF group before the induction of anesthesia (p=0.05), 30 min after the start of CPB (p=0.02), after the administration of Protamine (p=0.015) and 24 hours after the end of the operation (p=0.05). No statistically significant differences were demonstrated between the 2 groups of study relative to TNF-α and IL-10.

**CONCLUSIONS:** In our study we clearly demonstrated that the impairment of left ventricular function is a significant factor which strongly affects the mobilization of SIR in coronary surgery. A greater activation of SIR occurred in patients with depressed left ventricular function than in patients with normal cardiac function when they underwent CABG with extracorporeal circulation. It is obvious that the intraoperative factors are the main cause of elevated levels of cytokines during and after CABG, but it remains unclear the degree of their influence in this specific category of patients.

#### OP-990-PREOPERATIVE MYELOPEROXIDASE SERUM LEVELS AS A PROGNOSTIC FACTOR OF SHORT TERM OUTCOME IN OFF-PUMP CORONARY ARTERY REVASCLARIZATION

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**BACKGROUND:** In recent years the widely accepted hypothesis that a single unstable plaque is responsible for development of coronary instability has been challenged. Instead, widespread inflammation of coronary bed has been suggested. In patients with unstable angina transcoronary activation of monocytes and neutrophils has been demonstrated with increased levels of enzyme myeloperoxidase (MPO) used as a marker of inflammation. Increased MPO levels have been shown to predict risk for adverse events in patients with acute coronary syndrome. We ascertained the prognostic value of MPO regarding postoperative course in troponin negative patients undergoing off-pump coronary artery bypass grafting.

**METHODS:** MPO, troponin and C-reactive protein serum levels were measured in 40 consecutive patients undergoing elective off-pump coronary artery bypass grafting. Patients with acute myocardial infarction within 24 hours prior surgery were excluded from the study. Adverse cardiac events (death, myocardial infarction, recurrence of angina) and patients' exercise tolerance were evaluated at 1 and 6 months follow up.

**RESULTS:** Upon 1 and 6 months follow up, no adverse cardiac events were recorded (no deaths or myocardial infarctions). Preoperative MPO levels did not correlate with preoperative troponin or C-reactive protein levels. We established, however, that at 1 month follow up patients with lower preoperative MPO values (MPO < 100 ng/ml) had better exercise tolerance (double product  $21643,9 \pm 5433,5$ ) than patients with higher preoperative MPO values (MPO > 100 ng/ml) (double product  $18436,2 \pm 3616,6$ , P=0,05). These two groups did not differ regarding gender (80 % males vs. 69 %, P=0,42) or age (63,7 vs 61,5 years, P=0,48).

**CONCLUSIONS:** Increased MPO levels have been reported as a predictor for adverse cardiac events in troponin negative patients that are currently considered to be at low risk. We were not able to establish increased MPO levels as

reliable predictor of the short-term postoperative course in patients undergoing elective off-pump coronary artery bypass grafting. The reason for that is probably a small sample of patients and short follow up period. Currently, long-term follow-up of described patients is being conducted. However we established a correlation between MPO levels and exercise tolerance at 1 month follow up: patients with MPO levels < 100 ng/ml had significantly higher exercise tolerance than patients with MPO levels > 100 ng/ml. From this we infer that lower preoperative serum levels of MPO predict better and quicker postoperative rehabilitation after elective off-pump coronary revascularization.

### OP-991-IMPACT OF METABOLIC SYNDROME IN POSTOPERATIVE OUTCOME FOLLOWING ISOLATED CORONARY ARTERY BYPASS GRAFT

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**BACKGROUND:** Metabolic Syndrome (MS), defined as the combination of Obesity, Hyperlipidemia, Hypertension and Diabetes, has been recently shown to negatively influence epidemiology and severity of coronary diseases. Furthermore MS has been correlated to impaired early patency of saphenous vein grafts following coronary artery bypass graft (CABG). In this study we sought to elucidate the role of MS in early postoperative outcome following isolated CABG.

**MATERIALS AND METHODS:** Data prospectively collected from 3600 patients undergoing isolated CABG were analyzed. patients presenting MS were identified according WHO definition and MS severity was scored from 1 to 4 according the presence of risk factors. Presence and severity of MS were then correlated with early postoperative outcomes in terms of mortality and morbidity.

**RESULTS:** Out of the overall cohort of 3600 patients, 3468 (85 %) presented MS. Among them, however, the majority presented a MS score 1-2 (2272 pts, 63% of total) while 797 (22% of total) presented a MS score 3-4. Presence of MS, regardless MS score, was correlated to a significant difference in early postoperative morbidity (increased incidence of prolonged intubation and ICU stay, increased incidence of pulmonary and infective complications) but not in early postoperative mortality. Analysis of MS score revealed that incidence of postoperative pulmonary and infective complications were further correlated to the severity of MS with a respective odd ratio of 5.2 and 9.4 in patients with a MS score=4. ROC curve confirmed the correlation between increased MS score and postoperative pulmonary and infective complications.

**CONCLUSION:** Presence of MF itself significantly effects postoperative outcome following isolated CABG. Combination of risk factors expressed by an elevated MS score further influences postoperative outcome increasing the risk of postoperative pulmonary and infective complications.

### OP-992-ULTRASONOGRAPHIC AND 64-MSCT ANALYSIS OF SINGLE LIMA VERSUS ARTERIAL Y GRAFTS 12 YEARS AFTER SURGERY

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**BACKGROUND:** We investigated the long term outcome of coronary artery bypass grafting (CABG) in patients with single left internal mammary artery (LIMA) to left anterior descending (LAD) arteries versus arterial Y grafts by transthoracic ultrasonography and 64-multislice computed tomography (MSCT) scans.

**METHODS:** From September until December 2007, thirty-two patients (28 male, mean age of  $50.8 \pm 8.8$  years at the time of operation), were entered in a retrospective study. Fifteen patients with LIMA to the LAD with additional vein grafts (group I) and seventeen patients with LIMA-right internal mammary artery (RIMA)-Y-grafts (group II) were studied. Transthoracic ultrasonography of the LIMA and left ventricle and 64-MSCT scans were performed at  $11.8 \pm 0.7$  (group I) and  $11.6 \pm 1.0$  years (group II) postoperatively,  $P=0.47$ . Ultrasonographic LIMA parameters analysed through the third intercostal space were systolic and diastolic peak velocity (SPV, DPV), systolic and diastolic velocity integral (SVI, DVI), diastolic/systolic and diastolic/total velocity integral ratio (DSVIR, DTVIR) and diastolic/systolic peak velocity ratio (DSPVR). Differences between groups were tested with unpaired t-tests.

**RESULTS:** In group I, fifteen single anastomoses with the LIMA and forty-eight anastomoses with vein grafts were performed. MSCT-scans showed three string sign LIMA grafts (20 %), six occluded venous anastomoses (12.5 %) and seven severely stenotic regions in venous jump grafts (14.6 %). In group II, thirty anastomoses with the LIMA, thirty-nine anastomoses with the RIMA and six anastomoses with the gastroepiploic artery (GEA) were performed. MSCT-scans showed three string sign LIMA grafts (17.6 %), seven occluded LIMA anastomoses (23.3 %), nine occluded RIMA anastomoses (23.1 %), one RIMA anastomoses could not be judged (2.6 %), one string sign GEA graft (16.7 %) and one occluded GEA graft (16.7 %). Differences in age were significant between the groups:  $66 \pm 10$  (group I) versus  $60 \pm 6$  years (group II),  $P=0.04$ . No significant differences were measured between the groups for systolic blood pressure, diastolic blood pressure, heart rate and SPV, DPV, SVI, DVI, DSVIR, DTVIR and DSPVR. The combined six patients with a string sign LIMA from both groups showed ultrasonographic diastolic parameters significantly different compared to all patent LIMA grafts: DPV  $26.6 \pm 9.2$  versus  $19 \pm 7.1$  cm/s,  $P=0.036$ , DVI  $10.5 \pm 4.3$  versus  $7.2 \pm 3.3$  cm<sup>2</sup>,  $P=0.047$  and DSPVR  $0.45 \pm 0.13$  versus  $0.32 \pm 0.1$ ,  $P=0.01$ . Ultrasonographic parameters did not differ significantly between patients with normal left ventricular function compared to ventricles with impaired function.

**CONCLUSIONS:** In group I was 9.5 % and in group II 22.7 % of the anastomoses occluded. No ultrasonographic LIMA differences between normal and impaired ventricles and between single LIMA and arterial Y grafts could be measured despite the probably larger perfusion area of the Y grafts twelve years after CABG. String sign LIMA grafts showed higher diastolic velocities compared to patent LIMA grafts twelve years after CABG.

### OP-993-UNPROTECTED BEATING HEART SURGERY FOR COMPLETE MYOCARDIAL REVASCULARISATION

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**BACKGROUND:** Performing the LAD anastomosis at the end of the procedure may expose the patient to more haemodynamic instability and higher morbidity. However it may give the surgeon more freedom to perform the other distal anastomosis.

**METHODS:** In a retrospective with prospective collected data study conducted from february 2002 to september 2007, 328 consecutive 3 vessels diseased patients operated by 2 surgeon from 2 institution were reviewed (102 had a significant left main stenosis). Patients with 1-2 vessel disease were excluded. A no touch procedure with a "T" graft construction was performed in 193 patients. Intra luminal shunting was not routinely used.

**RESULTS:** A mean of 3,48 anastomosis per patient were performed. A conversion to CPB was needed in 8 patient (2,4%). The operative mortality and myocardial infarction was respectively 0,6% (2pts) and 1,8% (6pts). Inotropes were needed in 8 pts (2,4%) and epinephrine in 39 pts (12%).

**CONCLUSIONS:** Beating heart myocardial revascularisation is a safe procedure. The unprotected procedure allows us to perform a complete myocardial revascularisation with a low mortality and morbidity, with a low conversion rate. It may give the surgeon more freedom to perform distal anastomosis before being limited by the pedicled LIMA to LAD anastomosis.

### OP-994-TOTAL ARTERIAL REVASCULARIZATION IN PATIENTS WITH END STAGE RENAL DISEASE AWAITING RENAL TRANSPLANT

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**BACKGROUND:** Achieving Total Arterial Revascularization in patients with End Stage Renal Disease awaiting transplant is challenging, considering that most have had AV fistulae for dialysis access. This study looks at the feasibility of achieving TAR in these patients. Methodology 29 patients with ESRD awaiting renal transplant presented for CABG between January 2004 and December 2007. All underwent OPCAB TAR using both internal mammary arteries as a composite Y graft.

**RESULTS:** TAR was achieved in all the 27 patients. 11 patients underwent Peritoneal dialysis in the immediate post op period in addition to the haemodialysis that all underwent 48 hours after surgery. 2 patient had superficial wound infection. There were no sternal infections. 3 patients developed lung infection

which responded to appropriate antibiotics. There was no mortality and all patients underwent renal transplant as scheduled within 6 - 8 weeks of surgery.  
**CONCLUSION:** With better immunosuppression to prolong the function of the transplanted kidney, survival has increased. Achieving Total Arterial Revascularization to this group of patients in order to pass the long term benefits of TAR is safe and effective.

**OP-995-HEARTSTING DEVICE IN OFF-PUMP CORONARY ARTERY BYPASS OPERATIONS: MINIMIZING AORTIC MANIPULATION MINIMIZES RISKS OF PERIOPERATIVE NEUROLOGICAL EVENTS**

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**BACKGROUND:** There is a growing body of evidence supporting OPCAB over traditional CABG procedures with respect to perioperative neurological outcomes. However aortic manipulation, even during OPCAB, has been linked to adverse neurological outcomes. Though the "aortic no-touch" technique does have merit, most cardiac surgeons are reluctant to base the entire myocardial revascularization exclusively on the mammary pedicles. Can minimizing aortic manipulation rather than completely avoiding it be a valid alternative strategy?

**METHODS:** A Heartstring device was utilized to perform a single, clampless, proximal aortic anastomosis in the last 258 patients undergoing OPCAB at our institution. In addition, all patients had either one or two mammary arteries harvested. Sequential bypasses were utilized liberally.

**RESULTS:** The mean age was 76.6 years. The incidence of DM, HTN, and dyslipidemia was of 66%, 77%, and 64% respectively. Preexisting cerebrovascular disease and peripheral arterial disease were present in 19% and 33% respectively. No patient developed clinically detectable neurological events.

**CONCLUSIONS:** This series demonstrates that a single, clampless, proximal aortic anastomosis, performed with a Heartstring device, during OPCAB appears to minimize the incidence of perioperative neurological sequelae.

## MINI PRESENTATIONS VIII

### OP-996-PULMONARY THROMBOENDARTERECTOMY: THERAPY OF CHOICE IN CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION

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**BACKGROUND:** Patients with pulmonary hypertension secondary to chronic pulmonary thromboembolism (CPTE) have a 90% mortality rate at 5 years when the mean pressure in the pulmonary artery is over 50 mm Hg. Either lung transplant or pulmonary thromboendarterectomy (PT) are the only therapeutic options available for these patients. The objective of this paper is to disclose the experience with PT in only one center.

**METHODS:** 28 consecutive patients who underwent surgery between 11/1992 and 7/2007 were included. Mean age was  $47 \pm 14$  years. Eighteen patients were male (64%). The patients were in functional class (NYHA)  $2.5 \pm 0.5$ . Eleven patients (39%) exhibited ascites; another eight patients (28%), anasarca. Eighteen patients (64%) had a history of deep venous thrombosis (DVT). The mean pressure of the pulmonary artery (MPPA) was  $55 \pm 13$  mmHg; pulmonary vascular resistance (PVR) was  $922 \pm 440$  dyn s cm<sup>-5</sup>, total pulmonary resistance (TPR) was  $1131 \pm 439$ , and the cardiac index (CI) was  $2.1 \pm 0.7$  l/min/m<sup>2</sup>. PT was performed under deep hypothermic (17°C) circulatory arrest ( $59 \pm 16$  min). The time of ECC was  $205 \pm 36$  min, and the clamping time was  $115 \pm 25$  min. All the patients received anticoagulation therapy during follow up. In order to compare the baseline values with the follow up values, the sign test for functional class and the Wilcoxon-Mann-Whitney test for CI and MPPA were used. The long term survival was estimated by means of the Kaplan Meier curve.

**RESULTS:** The hemodynamic parameters improved significantly after PT: MPPA was  $30 \pm 10$  mmHg ( $p < 0.0001$ ), PVR was  $251 \pm 176$  dyn s cm<sup>-5</sup> ( $p < 0.0001$ ), TPR was  $427 \pm 220$  ( $p < 0.0001$ ), and the CI was  $3.4 \pm 0.9$  l/min/m<sup>2</sup> ( $p < 0.0001$ ). After one year follow up, the FC (NYHA) had improved to  $1.2 \pm 0.5$  ( $p < 0.0001$ ). The mean follow up period was  $4.6 \pm 4.4$  years (0.1-14.7). Five patients (17.8%) died while in hospital. During follow up, one patient died at 21 months due to right heart failure. Excluding the in-hospital mortality, the estimated probability of survival at five years was 92%.

**CONCLUSION:** In our experience, PT improved both functional and clinical parameters significantly; both survival and functional class were satisfactory in the long term.

### OP-997-OFF-PUMP OR ON-PUMP, IS THE QUESTION

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**BACKGROUND:** Available literature suggests that only 27% of the coronary artery bypass cases are performed by OPCAB method. Further more it seems that these are selected cases and even the hard core proponents of OPCAB admit to their inability to Predict the need for cardiopulmonary by pass and the fact that in the emergently converted cases the mortality and morbidity is increased. We have used a new concept, reading the heart, as a tool for myocardial management and have a different experience.

**METHODS:** Visible physiologic changes that follow coronary occlusion and reverse with release of occlusion include myocardial and coronary color changes and contractility changes that if absent there is no global functional significance to the occlusion and the hemodynamics will be stable. When present depending on the severity and the speed of their appearance they affect the global function and hemodynamic deterioration will follow. Use of Dobutamine can improve the condition and intracoronary shunt will prevent the hemodynamic deterioration. If use of shunt seems difficult elective use of cardiopulmonary by pass is recommended. The events in 100 consecutive cases are presented.

**RESULTS:** There are 65 men and 35 women. Ages range between 35-84 years.

Average numbers of grafting per patient in 3. The Left Ventricular Ejection fraction (LVEF) is  $< 50\%$  in 49% of the patients and not reported in 5%. 32% of the patients are diabetic, 12% on insulin. Coronary occlusion caused no changes in 14 patients. Myocardial and coronary changes that resolved spontaneous were noted in 38 patients. Mild Hypotension (BP $>80$ ) in 26 patients either improved spontaneously in 16 or with IPC 5. Dobutamine is used in 4 and shunt in 1. Significant hypotension (BP  $< 80$ ) with evidence of global dysfunction occurred in 15 patients in 24 coronary occlusions. In 17 instance dobutamin alone and in 7 dobutamin plus shunt improved the BP. Cardiopulmonary bypass (CPB) was used electively in one emergency patient for resuscitation and in one elective patient for anatomic reasons. In a third patient with intra operative aortic dissection was repaired on CPB. The only mortality occurred two weeks post op. from unrelated cause.

**CONCLUSION:** Reading the heart provides a physiologic but subjective means to direct the myocardial management during OPCAB. This tool can play the same role as cardioplegia plays in CABG, and provides a safe and stress free environment.

### OP-998-MITRAL VALVE REPAIR FOR MITRAL REGURGITATION - IN THE CURRENT ERA

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**BACKGROUND:** Valve repair is preferred over valve replacement for mitral regurgitation (MR). Operative techniques have been standardized recently, based on the mechanism of MR. To determine the results in the current era, we reviewed all the patients who underwent mitral valve repair (MV rep) for MR, between June 2003 and July 2005.

**METHODS:** A total of 67 patients underwent valve repair for severe MR during a 3 year period. The etiology was myxomatous degeneration in 47, rheumatic in 14, ischemic in 4 and infective endocarditis in 2. The predominant mechanism of MR was prolapse or flail anterior mitral leaflet (AML) in 17, of the posterior mitral leaflet (PML) in 25 and of both leaflets in 15. The techniques used for repair were plication or resection of PML in 17, replacement or reinforcement of chordae using expanded polytetrafluoroethylene (ePTFE) sutures in 25, direct closure of leaflet perforation in two and pericardial patch augmentation of the PML in one. All repairs were reinforced with a posterior annuloplasty using prosthetic material and evaluated by intraoperative transoesophageal echocardiography (intrapop TEE). The remaining had isolated posterior annuloplasty. Associated procedures included CABG in 10, aortic valve replacement in 6 and ASD closure in 3.

**RESULTS:** There were no early or late deaths on followup. All were extubated within 24 hours after surgery. Four patients who had plication or segmental resection of the PML developed systolic anterior motion (SAM), as detected by intraop TEE. SAM resolved in all cases with conservative therapy. There was no reoperation for recurrent MR. All except one patient had less than mild MR on followup echo. All patients were anticoagulated for 6 weeks. There were no thromboembolic or hemorrhagic complications.

**CONCLUSIONS:** Mitral valve repair techniques for severe MR due to degenerative heart disease are now standardized and can achieve excellent and predictable results in almost all patients. Replacement of ruptured chordae with ePTFE has eliminated the problem of SAM sometimes seen with the older technique of plication or resection of the PML and enabled successful repair of the flail AML. MV repair is especially useful for improving survival in patients with severe MR and associated coronary artery or aortic valve disease and dilated and dysfunctional left ventricles.

### OP-999-SIMULTANEOUS OPERATIONS FOR OPEN HEART SURGERY AND LUNG RESECTIONS

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**BACKGROUND:** In last decades increasing number of patients with simultaneous lung neoplasm and either acquired or congenital heart disease are seen. Determination of the therapeutic method for these complex patients is more



difficult than for the patients who only have one of these diseases. Although surgery is accepted as the actual best treatment modality for nonsmall cell lung cancers up to stage IIIa, in cardiac diseases surgery indications are outlined according to the guidelines. Therefore medical or oncological therapy with or without staged surgery are traditionally preferred in patients with combined lung cancer and cardiac diseases especially in countries where thoracic and cardiovascular surgery disciplines are separated from each other. Unfortunately some of the patients are treated sub optimally due to inability or lack of experience to perform both thoracic surgery and cardiovascular surgery simultaneously which needs an additional expertise, effort and organization. As it is known delayed or suboptimal treatment is unacceptable. It is possible and safe to combine these two surgeries at the same session.

**METHODS:** Twenty-two simultaneously operated patients due to various cardiovascular and lung diseases, including urgent cardiac and lung resections, since 1997 are included. All patients were evaluated in terms of gender, age, cardiac disease, lung disease, operation techniques, hospital stay and postoperative short and long term follow-up.

**RESULTS:** All patients were male but one was female. The youngest one was 5 years old and the oldest one was 81 years old (mean age  $55 \pm 3$  years). Coronary artery disease was accompanied in 4 patients with T4 vascular tumor and in 16 with lung neoplasm. One patient had left lower lobe bronchiectasis with VSD and the other one had left lower lobe tumor and mitral valve disease. Operations were done via median sternotomy(12), midsternotomy+anterior thoracotomy(3) and left thoracotomy(7). In all patients, except one, thoracic surgery performed prior to the cardiovascular surgery. Lung resections were including right pneumonectomy(7), right upper lobectomy(5), right lower lobectomy(1), left pneumonectomy(4), left upper lobectomy(2), left lower lobectomy(2), wedge resection(1). Cardiac procedures were including aorta coronary by-pass grafting(ACBG) (on-pump in 8 patients and off-pump in 8 patients), VSD repair(1), vena cava superior resection(VCSR)(1), AVR+VCSR+2ACBG(1), MVR+Tricuspid repair(1), aortic wall resection and repair(1), left atrium wall resection+repair(1). One patient died perioperatively due to excess bleeding and the other one died postoperative second day due to cardiac failure. Mean hospital stay was  $13.4 \pm 2$  days. During follow-up period 4 recurrences and 1 sudden death at home occurred. Our results were concordant with similar patients in the literature in terms of clinical follow up and life expectancies.

**CONCLUSION:** In patients who have both cardiac and lung diseases, performing cardiovascular and thoracic surgery simultaneously may be safely possible due to physiologic localization relationship of the heart, great vessels and the lung. In conclusion in order to obtain optimal treatment results we recommend combining both thoracic and cardiovascular surgery at the same session in these complex groups of patients. We believe that sharing the experiences will improve success and make us and our colleagues more eager and courageous.

#### **OP-1000-IMPLANT OF LEFT VENTRICULAR ASSIST DEVICES: TEN YEARS EXPERIENCE IN A SINGLE CENTER.**

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**BACKGROUND:** To investigate about clinic outcome of implant of left ventricular assist devices (LVAD) in pts. not eligible for heart transplantation (HTX), our experience was reviewed.

**METHODS:** Between May 1998 and November 2007 75 patients (pts.) were referred for HTX. All pts. were on inotropic drugs infusions. Indications for HTX were borderline. However, 49 of them were enrolled on the HTX waiting list. Thirty eight had their transplant done. Among remaining 11 pts., 3 died while awaiting, and 8 are still HTX candidates. Twenty five pts. were did not undergo HTX. Decision made on their treatment was either to implant a LVAD (12 pts. Group 1, G1) or to leave them on medical therapy (Group 2, G2). Devices used in G1 were both World Heart Novacor (12 pts.) and Thoratec Heart Mate II in 2. Remaining eleven pts. either refused LVAD implant or were on terminal clinical conditions. They were left on medical therapy.

**RESULTS:** Twelve months actuarial survival was 50% in G1 vs. 1% in G2 (p.v.<0.005). Remaining eleven pts. either refused LVAD implant or were on terminal clinical conditions and were left on medical therapy. Twelve months actuarial survival was 50% in G1 vs. 1% in G2 (p.v.<0.005).

**CONCLUSIONS:** Our limited experience indicates that emergency use of LVAD ensures a satisfactory outcome and allows a better actuarial survival.

#### **OP-1001-LUNG PERFUSION : A REVOLUTIONARY CONCEPT IN HEART SURGERY WITH CARDIOPULMONARY BYPASS**

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**BACKGROUND:** The reduction of bronchial flow during cardiopulmonary bypass makes pulmonary ischemia and reperfusion injury more likely to occur substantially. This study aims to propose an experimental model for pulmonary artery perfusion during cardiopulmonary bypass and to evaluate the benefits from this new approach in terms of hemodynamic performance and inflammatory tissue response.

**METHODS:** Thirty-two male pigs were randomly divided into groups I (aortic cross clamping, antegrade cardioplegia and moderate hypothermia) and II (normothermia, beating empty heart), both containing 16 animals. Each main group was divided into 3 subgroups A(n=4), B(n=6) and C(n=6), respectively, no pulmonary artery perfusion (control group), perfusion with arterial blood and perfusion with venous blood. Swan-Ganz catheter was inserted after induction of anesthesia and a midline thoracotomy and pericardiotomy were performed subsequently. After taking preoperative pulmonary tissue samples from inferior right lobe, cardiopulmonary bypass was established (aorta plus double cavae), mechanic ventilation was discontinued and pulmonary artery perfusion was carried out for 30 minutes. After this time, weaning from cardiopulmonary bypass was done and postoperative pulmonary tissue samples were taken. Tissue samples were analyzed through hematoxylin-eosin technique, immunohistochemistry (heat shock protein 27) and Real-Time Polymerase Chain Reaction (tumor necrosis factor alpha, interleukin-4, intercellular adhesion molecule). It was considered as index of significance 5%.

**RESULTS:** Postoperative pulmonary artery pressure was lower in subgroup IB than IA (p = 0,038). Postoperative pulmonary vascular resistance was lower in subgroup IC than IA (p = 0,010). These two variables did not present significant difference between IB and IC. Postoperative pulmonary vascular resistance was lower in subgroup IIB (p = 0,032) and IIC (p = 0,005) than IIA; no difference between IIB and IIC. Pulmonary histoarchitecture presented significant modifications in IA in relation to IB (p = 0,003) and IC (p = 0,003); the same findings for IIA in relation to IIB (p = 0,003) and IIC (p = 0,003); no differences between IB and IC and between IIB and IIC. The intensity of heat shock protein 27 expression was lesser in IC comparing to IA (p = 0,001) and IB (p = 0,001). In group II, there was more prominent heat shock protein 27 expression in IIB in comparison to IIA (p = 0,009). There was decrease of tumor necrosis factor expression in IB postoperatively (p = 0,041). Comparing IB and IC, it was noted lesser molecular adhesion molecule expression in IC postoperatively (p = 0,039).

**CONCLUSION:** Pulmonary artery perfusion consists of a relevant approach that is able to promote better hemodynamic performance and to reduce the intensity of inflammatory pulmonary response in heart surgery with cardiopulmonary bypass. Therefore, pulmonary artery perfusion is a revolutionary concept in terms of minimizing of pulmonary ischemia and reperfusion injury during cardiopulmonary bypass.

#### **OP-1002-SURGICAL TREATMENT OF ONCOLOGY PATIENTS WITH CONCURRENT CARDIOVASCULAR DISEASE**

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**BACKGROUND:** Combination of malignant tumor with heavier cardiovascular disease not infrequently creates contraindications for radical surgical treatment in such patients.

**METHODS:** In the period 1991 till 2007 88 patients have been operated in connection with cancer located at stomach (29 persons), lung (24), colon (15), kidney (9), esophagus (3), trachea, liver, pancreas, urinary bladder, breast, glossa, mediastinum tumor, and primary heart tumor. In most cases the malignant tumor shall be considered as Stage I-II. To treat concurrent cardiovascular disease coronary artery bypass grafting (CABG) (44); coronary angioplasty with stenting (21); prosthetic repair and plasty of cardiac valves (7); endarterectomy

from carotid artery (3) with prosthetic repair (1); prosthetic repair of abdominal (3) and thoracic aorta (1); CABG in association with prosthetic repair of cardiac valves (3), with resection of left ventricle aneurism (2), aorta-femoral bypass (1); coronary angioplasty with stenting in combination with prosthetic repair of abdominal aorta (2). These operations were simultaneous in 28 cases and sequential in 60 cases. In case of sequential technique the first step mostly consisted in cardiovascular surgical treatment.

**RESULTS:** Radical operations have been performed in 80 (91%) patients. Operative mortality was 4%. Survival rate reflected the stage of malignant tumor at the moment of surgery treatment. Tumor progressive has been observed in 8 patients in the time interval from 3 months to 3 years. Other patients have no signs of oncologic disease and associated cardiovascular conditions during the ongoing follow-up.

**CONCLUSIONS:** Simultaneous and sequential surgical technique used in patients with concurrent oncologic and cardiovascular disease make it possible to perform radical operation in wider range of patients who otherwise are fated to palliative and/or symptomatic treatment.

### OP-1003-SIMULTANEOUSLY PERFORMED OPEN HEART SURGERY AND CORRECTION OF PECTUS DEFORMITY

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**BACKGROUND:** Pectus deformities and some cardiac problems necessitating surgery may occur simultaneously in some patients. The aim of this study is to share our experiences and review the literature.

**METHODS:** We performed 6 pectus deformity repair and open-heart surgery simultaneously between 1999-2006 years in our hospital. One patient had pectus carinatum and 5 had pectus excavatum. Cardiac problems were coronary artery disease in one patient, ASD+VSD in one patient, VSD in one patient, mitral valve insufficiency and left atrial dilatation in one patient, ascending aortic aneurysm and aortic valve insufficiency due to the Marfan's syndrome in 2 patients. In all patients modified Ravitch's sternoplasty was preferred in order to correct pectus deformities. In supine position costal cartilages were resected first. After the completion of cardiac operation sternum was corrected, additional time for pectus operation was calculated for each patient. The patients were monitored in 1st month, 4th month and 6th month postoperatively.

**RESULTS:** In all patients no major complication was seen. Average operation time prolonged was 101,8 minutes. The bars were removed in 4-6th months of operation. All patients were followed up for 5 years with good cardiac and cosmetic results.

**CONCLUSIONS:** Pectus deformity correction and open-heart surgery can be performed concomitantly and safely. Compared with staged operation, concomitant surgery may lessen the risks of a second operation.

### OP-1004-EXTRA-CORPOREAL MEMBRANE OXYGENATION IN ADULTS UNFIT FOR TRANSFER TO A SPECIALISED CENTRE IS WORTHWHILE

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**BACKGROUND:** Extracorporeal membrane oxygenation has an established place in the treatment of severe pulmonary dysfunction in neonates, but controversy still surrounds its role in adult respiratory distress syndrome (ARDS). Outside of specialised centres it is usually only considered when every other possible form of ventilatory support has failed and the patient faces imminent death. In such cases there may not be time to consider transfer to a specialised ECMO centre. We reviewed our experience with four such cases over the last five years in order to highlight the successful results that may be obtained in a centre with minimal ECMO experience when there is support from the Regional specialist centre.

**METHODS:** Retrospective analysis over a 5-year period of 4 patients with severe pulmonary dysfunction who received continuous veno-venous ECMO. Two venous drainage cannulas were employed typically a 21F gauge superior vena cava cannula (inserted via the right internal jugular vein) and a 31mm inferior vena cava cannula (inserted via the left femoral vein). The arterialised blood

was returned via a 28F cannula to the right atrium via the right femoral vein. A centrifugal pump was used in all cases with a target flow rate of four litres per minute. Patients were considered to have no chance of survival with continued conventional intensive care treatment. Cardiothoracic referral was made after all other therapeutic approaches had failed. All patients were discussed with the National Adult ECMO Centre in Leicester who agreed that due to the presence of severe multiple organ failure the patients were not fit for inter-hospital transfer. Consent was obtained by next of kin after making clear that we rarely undertake this form of treatment.

**RESULTS:** Three of the four patients who received ECMO survived. Two had *Streptococcus pyogenes* pneumonia with purpura fulminans, one had poly-trauma including overwhelming bilateral pulmonary contusions and one patient developed post-lobectomy ARDS (which proved fatal). The patients with purpura fulminans received renal replacement therapy and plasma exchange. Invasive procedures carried out during ECMO included chest drain insertion, central line insertion and mini-laparotomy. Post ECMO hospital stay was 1, 6, and 9 months, the longer periods being on account of partial lower limb amputation consequent to severe pre-ECMO disseminated intravascular coagulation. Technical problems encountered in the unsuccessful case included poor venous drainage due to probable previous pelvic vein thrombosis and centrifugal pump failure.

**CONCLUSIONS:** All 3 survivors have returned to active and productive lives. These patients are not unique to our hospital and similar cases are regularly seen in intensive care units worldwide. Our experience indicates that, where there is a will to get involved, these patients can be salvaged using technology that is available in all cardiac surgical units with the support and guidance of a specialised ECMO centre.

### OP-1005-ULTRASTRUCTURAL INVESTIGATION OF INTERNAL THORACIC ARTERY AND AORTIC WALL PATHOLOGY BY TRANSMISSION ELECTRON MICROSCOPE IN CORONARY ARTERY BYPASS GRAFTING PATIENTS

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**BACKGROUND:** Internal thoracic artery (ITA) is known to be more resistant to atherosclerosis than the other arterial tissues. However, ITA graft occlusion due to atherosclerosis and conduit spasm is still the major problem after coronary artery bypass grafting (CABG). Therefore, for investigation of ITAs' atherosclerosis rate we examined histopathologic findings of internal thoracic arteries in patients undergoing coronary artery bypass grafting by the use of transmission electron microscope (TEM). In those patients, we also researched the correlation between aortic walls' pathologies and ITAs' histopathologic changes.

**METHODS:** To investigate the histopathologic ITA and aortic wall pathology, 60 patients undergoing elective CABG operations were randomly selected. The ITA was harvested in a standard fashion with the use of low voltage electrocoagulation and its distal end was cut prior to bifurcation. During the aortic cross clamping, 1mm length of ITA ring was cut and saved in 2,5% Glutaraldehyde solution for fixation and examination of TEM. The aortic walls were provided by aortic punching during proximal anastomosis. One blinded anatomopathologist examined all specimens and described the endothelial integrity and pathologic condition according to the score system proposed by Fischlein et al. using the following criteria:(a) completely confluent endothelium;(b) partially confluent endothelium;(c) loosely netted endothelium;(d) islands of endothelium;and (e) no endothelium.

**RESULTS:** In 10 cases (17%) different degree of histopathologic findings (endothelial cells, intercellular space or adventitial) were recorded in ITA samples. Also, in 12 patients, aortic wall pathology was noted. The most important histopathologic findings were as follows:endothelial vacuolisation, intimal thickening and/or intimal separation, subendothelial edema, swelling of cytoplasm and mitochondria.

**CONCLUSION:** In previous studies, the rate of histopathologic changes of ITA have been shown to be between 1-1,8%. The number of studies have been reported with the use of light microscopic examination. Ultrastructural changes of ITA has been reported with the use of electron microscope in a limited number of studies. Our study results indicate that there are nearly ten fold more histopathologic changes of ITA than the percentage of previously reported cases.

## CORONARIES VIII

### OP-1006-POSTOPERATIVE MORTALITY AND MORBIDITY OF OCTAGENARIAN UNDERGOING CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** The purpose of the present study was to examine the time of extubation, packed red blood cell transfusions, intensive care unit (ICU) length of stay (LOS), and preoperative and postoperative LOS in octogenarians undergoing coronary artery bypass grafting (CABG) and compare it with younger patients. The study also examined differences in postoperative morbidity and mortality.

**METHODS:** Demographic, mortality, morbidity, and resource utilization data were collected from the records of patients undergoing CABG at our institution from January 2005 until July 2007. There were 2095 patients: 132 octogenarians and 1963 nonoctogenarians.

**RESULTS:** Octogenarians had a significantly higher incidence of peripheral vascular disease, chronic obstructive lung disease, congestive heart failure, and left main disease. They weighed significantly less, and had lower preoperative hematocrit. Mean time from the end of surgery to endotracheal extubation was 9.3 hours for octogenarians and 6.3 hours for their younger cohorts ( $p < 0.01$ ). Blood transfusion was required in 87.8% of octogenarians compared with 58.5% of nonoctogenarians ( $p < 0.01$ ). Mean ICU LOS was 2.1 days for octogenarians and 1.4 days for nonoctogenarians ( $p < 0.001$ ). Mean postoperative LOS was 9.8 days for octogenarians and 5.8 days for nonoctogenarians ( $p < 0.01$ ). Clinical and demographic variables were correlated with age 75 years or older. Multivariate linear and logistic regression models were constructed to show the combined effects of age and comorbid conditions on outcomes. Octogenarians had a significantly higher incidence of postoperative renal failure and neurologic complications. The 30-day mortality rate was 9.0% for the octogenarian group v 2.8% for the younger group ( $p < 0.001$ ). Age 75 years or older was significantly associated with outcome, and was an independent predictor of increased postoperative mortality and morbidity.

**CONCLUSIONS:** The results demonstrated that octogenarians undergoing CABG had significantly higher morbidity, with increased incidence of postoperative renal failure, neurologic complications, and 30-day mortality. Age 75 years or older was an independent predictor of increased postoperative morbidity, and mortality.

### OP-1007-CORONARY ARTERY SURGERY WITH MINI C.E.C. VS OFF PUMP TECHNIQUE

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**INTRODUCTION:** There are some alternative techniques to minimize the adverse effects of extracorporeal circulation (CPB) in coronary artery bypass graft surgery (CABG): Off-pump surgery<sup>1</sup> and, more recently, Mini Extracorporeal Circulation Circuit (MECC)<sup>2</sup>. We have performed a prospective randomized study to compare both techniques in terms of surgical results, need of blood transfusion and postoperative morbidity.

**MATERIAL AND METHODS:** 140 patients were prospectively randomly assigned to undergo CABG with off-pump (OP group = 70 patients) or MECC technique (M group = 70 patients) during a 18 month period. Variables collected were: demographic data, preoperative variables (hypertension, diabetes mellitus, left ventricular ejection fraction and eucor score), number and type of grafts, intra and postoperative data: baseline and minimal hemoglobin, blood chest drainage, total blood transfusions, requirement of inotropic support, atrial fibrillation (AF), myocardial lesion markers, myocardial infarction, neurological, gastrointestinal and respiratory complications, renal function impairment, CPK and troponine T (TT) maximal levels, and length of hospital stay (LOS). The

SPSS 14.0 statistical package was used to compile descriptive statistics and compare qualitative variables with a  $\chi^2$  test and quantitative variables with a t-test.

**RESULTS:** No significant differences were noted in demographic nor preoperative data between groups. There was only one hospital death. Number of grafts / patient was 2.76 in OP group and 2.71 in M group (NS). There were no differences in chest drainage bleeding between groups but there was a trend in the OP group to be less transfused (1.6 vs 2.07 red cell pack / patient) ( $p=0.16$ ). The incidence of cardiac, neurologic, gastrointestinal, respiratory and renal complications were similar in both groups. LOS was also similar (8.6 days in OP group and 7.6 days in M group). CPK levels were higher in M group (766 U/l vs 527 U/l) ( $p=0.009$ ) but TT levels were similar (0.415 vs 0.358) ( $p=0.5$ ). There was a trend towards an increased leucocyte count in the first 24 h in M group. Also in this group the patients had more postoperative hyperglycemia than in OP group (131mg/dl vs 125mg/dl) ( $p=0.04$ ).

**CONCLUSIONS:** In our study, both techniques were similar in terms of surgical results (number of grafts and cardiac complications) and postoperative morbidity. M group showed a higher levels of indirect markers of inflammatory response suggesting that off-pump avoids the adverse effects of inflammatory reaction.

### OP-1008-LONG TERM FOLLOW-UP FOR PATIENTS WITH TOTAL ARTERIAL GRAFT REVASCULARIZATION OF MYOCARDIUM

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**BACKGROUND:** Coronary artery bypass surgery has been the gold standard in the treatment of coronary disease in the last 40 years, mainly in patients with triple vessel disease. However, in the long time follow-up, recurrence of symptoms were frequently observed due to progression of coronary disease and deterioration of grafts. Many publications reported excellent patency rates for left Internal Thoracic Artery in 10 years (more than 90%) whereas the patency rates for Saphenous Vein graft was among 50 to 70% in the same period. Additional benefit has been reported with the utilization of the two Internal Thoracic Arteries, therefore, it was expected that total arterial graft revascularization could improve more these results, an information that is supported by some few publications. So, we aimed to evaluate the long-term results of the total arterial graft revascularization of myocardium in patients with triple vessel disease.

**METHODS:** We evaluated 136 patients who underwent isolated coronary artery bypass grafting between January 1995 and December 1997 in the Heart Institute (INCOR) - University of Sao Paulo - Brazil. Patients who underwent emergency surgery, reoperation or associated procedures, with mechanical support or severe ventricular dysfunction were excluded. All the patients were operated on extracorporeal circulation. 353 grafts were used for revascularization of 449 arteries (average: 3.30 anastomoses per patient). Grafts used were Left Internal Thoracic Artery (99.2%), Right Internal Thoracic Artery (56.6%), Radial Artery (88.2%), Right Gastroepiploic Artery (20.5%) and one Epigastric Artery. In 76 patients (55.8%) were constructed composite arterial conduits ("Y" shape) and 66 patients (48.5%) received sequential anastomoses for two or three arteries. Complete follow-up was obtained in 86.7% of this cohort and Kaplan-Meier method was used for statistical analysis.

**RESULTS:** In hospital mortality was 4.4%. In the long-term follow-up (9.5 to 12.8 years), 82.1% of the patients were free from cardiac events. 20 patients (17.9%) had hospital re-admission due to cardiac events: 15 presented with angina, five had acute myocardial infarction, and three of them presented with associated heart failure. Eight patients (7.2%) needed reintervention for coronary disease: One of them underwent coronary bypass reoperation and the others underwent coronary angioplasty with stent. Time from the surgery to the onset of symptoms was from 6 to 147 months (average: 84) and time from surgery and reintervention was from 8 to 150 months (average 92). Estimated probability freedom from cardiac events was 98.2%, 95.4% e 84.2% at 1, 5 and 10 years and freedom from coronary reintervention was 99.1%, 99.1% e 92.8% at 1, 5 and 10 years follow-up. There were 16 late deaths (14.2%) and four of them (3.6%) were cardiac related. Actuarial 12.8-years-survival of all deaths was 85% in this group.

**CONCLUSION:** Total arterial graft revascularization is a safe procedure for patients with triple vessel coronary disease and good long-term results<sup>®</sup> can be achieved with this technique.



## OP-1009-INCIDENCE OF REACTIVE THROMBOCYTOSIS AFTER CABG OPERATIONS

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**BACKGROUND:** Platelet disturbance following cardiopulmonary bypass can result in an increase in platelet number (a rebound phenomenon called reactive thrombocytosis) and causes a potential risk of thromboembolic complications. The aim of the study was to determine the incidence of reactive thrombocytosis and the risk factors related to it.

**METHOD:** The 1350 consecutive patients who underwent CABG during 2006 were included in the study. The demographic, pre and postoperative data and one month follow up results of the patients were recorded. Platelet levels were recorded preoperatively, during the cardiopulmonary bypass period, postoperative 1st, 3rd, 5th, 7th, 14th and 30th days.

**RESULTS:** In 229 (17%) of the patients, reactive thrombocytosis (Plt  $>400 \times 10^3/\text{mm}^3$ ) was found during the postoperative second week. In 9 % of the patients the Platelet count was over  $700 \times 10^3/\text{mm}^3$ . The comparative analysis of the patients with reactive thrombocytosis and patients with normal platelet levels showed that mean platelet volume was significantly lower in patients with reactive thrombocytosis. Similarly, pre and postoperative statin use was significantly lower in patients with reactive thrombocytosis.

**CONCLUSION:** Reactive thrombocytosis is not a rare finding during postoperative period after CABG operations. Mean platelet volume, if lower than normal, may predict reactive thrombocytosis. Statin use may also prevent increase in thrombocyte levels. Follow up of thrombocyte levels can be important in preventing early graft occlusion.

## OP-1010-II-CIRCUIT IN OPCAB SURGERY: EARLY OUTCOME AND MID-TERM RESULTS

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**STUDY:** To assess early and midterm results in patients undergoing OPCAB, using the "II circuit technique".

**METHODS:** Between 2/2001 and 11/2005, 1359pts (85.3 % male, 14.7 female, mean  $\pm$  SD age  $64.85 \pm 9.87$ y.) underwent isolated CAB with the use of ES-circuit, which is based on the following principles: i).Beating heart, ii).OPCAB, iii). Aorta non-touch, iv).composite grafts. Comorbidities, and coronary risk factors were recorded preoperatively.

**RESULTS:** Preoperatively IABP was inserted to 27 unstable pts (2.0%). 212pts (15.6%) were operated on an emergently. In 821pts (60.4%) we bypassed more than two coronaries (3-6 distal anastomoses). Mean number of distal anastomoses was  $2.75 \pm 0.92/\text{pt}$ . In 1192 pts (87.7%), bilateral mammaries were used. Composite grafts on LIMA were performed in 824 cases (60.6%), with a mean of  $1.78 \pm 0.76$  grafts on LIMA. Early postoperative complications were analyzed: acute renal failure 2.2%, pulmonary complications 6.0%, prolonged ventilation 2.9%, SWI 1.0%, atrial fibrillation 20.1%. Postoperative use of IABP: 21 cases (1.5%). Overall hospital mortality 21pts (1.5%). The follow up lasts 7-64 months. 32pts underwent coronary angiography due to recurrence of the angina (2.3%). 15pts (1.1%) required additional PTCA in a mean time of  $24 \pm 4$  months after the procedure. 2pts reoperated at 18 and 21 months respectively, after the OPCAB, due to graft failure.

**CONCLUSIONS:** The low rate of postoperative complications, the ability to perform the method in all subgroups of the population, even in the high risk and the excellent results, indicate that the II-circuit procedure can be the method of choice for myocardial revascularization.

## OP-1011-PREOPERATIVE THROMBOLYSIS IMPROVES LONG-TERM SURVIVAL AFTER CORONARY ARTERY BYPASS GRAFTING: ARE MEN DIFFERENT FROM WOMEN?

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**OBJECTIVE:** CABG is frequently used after thrombolytic therapy. We have

shown that 5-year survival was improved in CABG patients subjected to thrombolytic therapy within 7 days before surgery compared to those without thrombolysis. We aimed to determine these findings at 10 years of follow-up and to compare men and women because current reports have shown that different independent predictors affect long-term survival in each sex.

**METHODS:** We studied 4,140 consecutive patients (2,843 men and 1,297 women) who underwent isolated CABG between 1992 and 2003. Long-term survival data were obtained from the National Death Index. Multivariable Cox regression analysis was performed to determine independent predictors for long-term mortality in the entire database and in men and women separately. All available preoperative, intraoperative and postoperative risk factors were considered as possible independent predictors.

**RESULTS:** There were 20 preoperative, 1 intraoperative and 7 postoperative independent predictors for long-term mortality. Thrombolytic therapy within 7 days before CABG was an independent predictor for long-term mortality in the entire database (HR 0.57, 95%CI 0.41-0.77;  $P < 0.001$ ) and 10-year risk-adjusted survival rates were 79% and 68% in patients with and without thrombolysis respectively. This finding was also confirmed in men (HR 0.55, 95%CI 0.38-0.79;  $P = 0.001$ ) where 10-year risk-adjusted survival rates were 80% and 71%. However, these results were not confirmed in women (HR 0.51, 95%CI 0.26-1.01;  $P = 0.054$ ).

**CONCLUSIONS:** Patients undergoing CABG subjected to thrombolytic therapy within 7 days prior to surgery demonstrated increased 10-year survival. However, this was statistically significant only in men. Further studies are needed to shed light in the potential mechanism of this beneficial effect of thrombolysis which occurs selectively in men.

## OP-1012-COMPARISON WITH ENDOSCOPIC AND OPEN SAPHENOUS VEIN HARVESTING IN CORONARY ARTERY BYPASS GRAFTING

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**OBJECTIVE:** to evaluate the clinical outcomes, histologic characteristics and effects on endothelial and smooth muscle function of Endoscopic saphenous vein harvesting (EVH).

**METHODS:** Sixty patients were randomized into EVH group ( $n=30$ ) and OVH (open saphenous vein harvesting,  $n=30$ ). The clinical results were assessed. Harvested vein specimens were stained for hematoxylin-eosin, Mason's trichrome, and elastin, respectively. The numeric grading system estimated the percentage disruption of each histologic structure was then scored: 1° ( $\leq 10\%$ ), 2° (11% to 25%), 3° (26% to 50%) and 4° ( $> 50\%$ ). The SVG endothelial and smooth muscle function test was performed in isolated organ baths. Contractile function was measured in maximum tension induced by potassium chloride (KCL) (60mmol/L) and Phenylephrine (PE) (1\_10-6/L); Diastolic function was measured in response to two concentrations of Acetylcholine (Ach) (1\_10-6mol/L, 1\_10-5mol/L) and two concentrations Sodium nitroprusside (SNP) (1\_10-7mol/L, 1\_10-6mol/L).

**RESULTS:** 1. The postoperative wound complications were significantly reduced in EVH compared with those of OVH (10.7% versus 40.0%,  $P=0.02$ ); The postoperative pain assessed by a Visual Analog Scale was significantly decreased in EVH group (EVH 2.4\_1\_70.6 versus OVH 3.2\_1\_70.8,  $P=0.01$ ) in the 4th post-op day, but similar in the 4th post-op week; The mean harvested length was not significant differences between the two groups (EVH 29.3\_1\_72cm versus OVH 27.3\_1\_76.4cm,  $P=0.25$ ); The harvesting time was significantly longer in EVH group (EVH 36.3\_1\_73.9min versus OVH 29.0\_1\_71min,  $P=0.01$ ). 2. Comparing EVH with OVH, there was no significant differences in histologic structures impairment scale of vascular endothelial layer (EVH 2.0\_1\_70.8 versus OVH 1.8\_1\_70.7,  $P=0.71$ ), vascular elastic lamina (EVH 2.1\_0.8 versus OVH 1.9\_1\_77,  $P=0.78$ ), vascular smooth muscle (EVH 2.2\_1\_78 versus OVH 2.2\_1\_70,  $P=0.37$ ) and adventitial connective tissue (EVH 2.9\_1\_70.9 versus OVH 2.6\_1\_78,  $P=0.26$ ) between the two groups, respectively. 3. There were no significant differences between the two groups in vasoconstriction tension induced by KCL (60mmol/L, EVH 5.0\_1\_76g versus OVH 5.4\_1\_772g  $P=0.07$ ), and PE (1\_10-6mol/L, EVH 4.7\_1\_757g versus OVH 4.9\_1\_70.62g  $P=0.18$ ). No significant differences in vasodilator responses induced by two concentrations of Ach (1\_10-6mol/L) (EVH 72.1\_1\_79.7 versus OVH 68.2\_1\_74,  $P=0.35$ ), Ach (1\_10-5mol/L) (EVH 57.9\_1\_73 versus OVH 52.4\_1\_70,  $P=0.15$ ) and two concentrations of SNP (1\_10-7mol/L) (EVH 67.3\_1\_70 versus OVH 61.8\_1\_79.8,  $P=0.18$ ), SNP (1\_10-6mol/L) (EVH



52.9\_1\_713.3 versus OVH 44.5\_1\_79,  $P=0.19$ ), respectively.

**CONCLUSIONS:** It was found that the EVH can significantly reduces post-operative leg pain and wound complications compared with OVH. EVH did not induce significant greater histologic trauma, smooth muscle and endothelial function alterations compared with OVH. Our results suggest that EVH offers many advantages over OVH technique and can be performed safely.

### OP-1013-DOES LASER TYPE IMPACT MYOCARDIAL FUNCTION FOLLOWING TRANSMYOCARDIAL LASER REVASCULARIZATION?

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**BACKGROUND:** Transmyocardial revascularization (TMR) is performed with either CO<sub>2</sub> or Ho:YAG lasers for the treatment of severe angina. While both lasers provide symptomatic relief, there are significant differences in laser-tissue interactions specific to each device that may impact the contractile function of the heart.

**METHODS:** A porcine model of chronic myocardial ischemia was employed. After collecting baseline functional data with cine magnetic resonance imaging (MRI) and dobutamine stress echo (DSE), 14 animals underwent TMR with either a CO<sub>2</sub> or Ho:YAG laser. Transmural channels were created with each laser in a distribution of 1/cm<sup>2</sup> in the ischemic zone. 6 weeks post treatment repeat MRI as well as DSE were obtained. Histology was also performed to characterize the laser-tissue interaction.

**RESULTS:** CO<sub>2</sub> TMR led to an improvement in wall thickening in the ischemic area as seen with cine MRI (40.3% vs. baseline,  $p<0.05$ ) and DSE (20.2% increase vs. baseline,  $p<0.05$ ). Ho:YAG treated animals had no improvement in wall thickening by both MRI (-11.6% vs. baseline,  $p=0.67$ ) and DSE (-16.7% vs. baseline,  $p=0.08$ ). Correlative semi-quantitative histology revealed a significantly higher fibrosis index in Ho:YAG treated myocardium vs. CO<sub>2</sub> (1.81 v. 0.83,  $p<0.05$ ).

**CONCLUSIONS:** In a side-by-side comparison, CO<sub>2</sub> TMR resulted in improved function of ischemic myocardium as assessed by MRI and echocardiography. Ho:YAG TMR led to no improvement in regional function likely due to a concomitant increase in fibrosis in the lasered area.

### OP-1014-RELATIONSHIP OF BLOOD TRANSFUSION AND INCREASED RISK OF ATRIAL FIBRILLATION AFTER CORONARY BYPASS GRAFT SURGERY

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**BACKGROUND:** Atrial fibrillation (AF) is a common complication after cardiac surgery and is associated with increased resource utilization. Recent evidence supports a role of inflammation in the development of AF. It is also known that blood transfusion modulates inflammation by increasing plasma levels of inflammatory markers. Therefore, we tested the hypothesis that blood transfusion increases the risk of postoperative AF for patients undergoing cardiac surgery.

**METHODS:** Between January 2005 and July 2007, 2095 patients underwent isolated coronary artery bypass grafting with or without valve replacement. Patient and procedural variables associated with development of new-onset AF were identified by logistic regression.

**RESULTS:** In addition to older age, prior history of AF, beta-blocker withdrawal, longer aortic clamp time, and intensive care unit inotropic usage, intensive care unit blood transfusion increased risk for AF (odds ratio per unit transfused, 1.16; 95% confidence limits, 1.14, 1.24;  $p<0.001$ ). Intensive care unit blood cell transfusion was done in 487 patients that was associated with a significant increase in new onset of AF (45.9% versus 37.9%;  $p<0.01$ ).

**CONCLUSIONS:** Intensive care unit blood transfusion is associated with increased occurrence of postoperative AF after cardiac surgery. This factor should be considered in identifying patients who might benefit from prophylaxis to prevent this common postoperative complication.

### OP-1015-PAPAVERINE AND NITROGLYCERIN WORK ON BLOOD FLOW AND ENDOTHELIUM OF LIMA

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**OBJECTIVE:** To evaluate the effect of Papaverine (PP) and Nitroglycerin (NG) on flow augmentation in pedicle IMA preparation.

**METHODS:** Fifty patients who underwent OPCAB with IMA to LAD were divided into two treated groups according to PP or NG used for preparation of LAD with each composed of 25 pts. The LIMA was treated with 3mg/3ml heparinized autologous blood PP or NG that were intraluminally injected. The basal blood flows and the increased blood flows were measured before and after the treatment. After treatment with PP or NG, the LIMA endothelial function was assessed in isolated organ baths in the two groups; by using potassium (KCL 80mmol/L) and three different concentration (10-7, 10-6, 10-5mol/L) of norepinephrine (NE), 10-7, 10-6, 10-5mol/L of acetylcholine (Ach) in the two groups. The Nitric Oxide (NO) and Endothelin (ET) concentration were recorded before and after treating in the two groups. LIMA segments were immersed with heparinized autologous blood PP or NG in 15, 30 and 60 min, respectively; then scanned by electron microscopy in 10 pts.

**RESULTS:** Both PP and NG showed a significant effect on flow augmentation before and after treatment (PP, 60.05±14.23mL/min versus 111.89±15.20 mL/min,  $P=0.000$ ; NG, 66.54±17.76 mL/min versus 107.31±19.86 mL/min,  $P=0.000$ , respectively). PP increased more IMA flow than that of NG (51.85±15.97 versus 40.77±15.00,  $p=0.03$ ). No significant differences between the PP group and NG group with the maximum contraction to KCL (6.46±0.77g versus 6.44±0.74g,  $P=0.957$ ). There were no significant differences between PP group and NG group on the relative vasoconstriction tension rates in three concentration NE of 10-7mol/L, 10-6mol/L and 10-5mol/L (22.49±3.01% versus 21.57±2.13%,  $P=0.276$ ; 36.97±4.02% versus 38.10±4.27%,  $P=0.396$ ; 71.92±2.15% versus 71.47±2.85%,  $P=0.554$ ), respectively. No significant differences between the PP group and NG group on endothelium dependent relaxation percentage with cumulative relaxation concentration Ach of 10-7 mol/L, 10-6mol/L and 10-5 mol/L (12.31±2.21% versus 11.49±2.66%,  $P=0.299$ ; 25.61±4.74% versus 23.74±3.46%,  $P=0.163$ ; 48.37±4.31% versus 45.69±5.36%,  $P=0.089$ ), respectively. No significant differences between PP group and NG group in NO concentration of either before and after treatment (85.58±19.97 μmol/L versus 93.00±17.37 μmol/L,  $P=0.387$ ; 78.14±14.12 μmol/L versus 72.92±13.61 μmol/L,  $P=0.411$ ), respectively, and so did for ET in both groups before and after treatment (37.75±18.19pg/mL versus 40.67±20.68pg/mL,  $P=0.741$ ; 45.14±17.24 pg/mL versus 46.29±16.95 pg/mL,  $P=0.882$ ). No endothelium and morphology damaging evidence was noted by scanning electron microscope after treatment of 15, 30 and 60 min with PP or NG, respectively.

**CONCLUSIONS:** The results suggest that the 1mg/mL heparinized autologous blood PP or NG that did not induce morphologic and functional change of the artery, can be safely used in preparation of IMA. PP may be more powerful in increasing the blood flow of IMA.

## VALVES V

### OP-1016-KYMOGRAM - A NEW TOOL FOR THE ASSESSMENT OF HEART VALVE PERFORMANCE

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**BACKGROUND:** The aim of this study was to examine the potency of heart valve Kymograms generated from digital high speed camera data. We conducted these investigations in an ex vivo beating pig-heart model

**METHODS:** After cardioplegic arrest the heart was explanted and then reperfused with the donor-blood. When the heart started beating again, it was rinsed thoroughly with warm physiological sodium chlorid. Physiological blood pressures were reached by reducing the aortic diameter. The recording of the mitral valve was performed due to a rigid 0o endoscope attached to a high-speed camera inserted into the left atrium with a recording rate of 2000 frames per second. After recording, the image sequences were analysed and several digital kymograms were calculated. Creating digital Kymograms is a technique of data reduction and simplified visualisation for time related image sequences. In each single image of the sequence, all pixels along a manually selected line are automatically extracted in a first step, and then recombined to form a new image by transferring all extracted lines along the time axis.

**RESULTS:** This investigation showed that in reconstructive surgery of the mitral valve, the coaptation phase had to be preserved by all means, because the relationship between closing (180 ms) and coaptation (167 ms) is nearly equal and therefore essential for the efficient function.

**CONCLUSION:** This exemplary investigation shows the potency of the Kymogram as a new tool for heart valve investigations especially for the mitral and aortic valve.

### OP-1017-THE EFFECT OF TRAINING IN TRICUSPID VALVE REPAIR SURGERY ON EARLY AND LATE OPERATIVE OUTCOME

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**BACKGROUND:** Correction of moderate-severe tricuspid regurgitation (TR) positively influences outcome. Competence in tricuspid valve (TV) repair techniques is important but higher operative risk may limit trainee exposure to this type of surgery. Our aim was to evaluate the effect of training for TV repair on postoperative morbidity and mortality, recurrence of TR, need for re-operation and survival.

**METHODS:** Between 2002 and 2006, 197 patients with functional moderate-severe TR underwent TV repair with a flexible annuloplasty ring in a single institution (91% also having concomitant mitral valve (MV) surgery). Of these cases, 108 (54%) were performed by consultants (consultant group) and 89 (46%) by cardiothoracic trainees (trainee group). The preoperative clinical features and postoperative outcome in these two cohorts of patients were compared.

**RESULTS:** There were no significant differences in the demographics, aetiology of TR, need for MV surgery and other organ comorbidity between the two groups ( $p < 0.05$ ). However, consultants performed a higher proportion of concomitant CABG ( $p = 0.04$ ), and non-elective cases ( $p = 0.03$ ) with shorter ischaemic times ( $p = 0.03$ ). The consultant and trainee groups had similar rates of operative mortality (8.3% vs 4.5%,  $p = 0.4$ ) and morbidity (28% vs 25%,  $p = 0.7$ ). At latest follow-up, the rate of recurrent moderate/severe TR (11% vs 9%,  $p = 0.8$ ) and Kaplan-Meier five-year survival ( $82 \pm 4\%$  vs  $88 \pm 4\%$ ,  $p = 0.2$ ) did not differ significantly between groups. No patient required a TV re-operation.

**CONCLUSIONS:** With appropriate patient selection, cardiothoracic trainees can be taught TV repair surgery without a negative effect on the early or late outcome.

### OP-1018-SHORT AND LONG-TERM OUTCOMES OF AORTIC VALVE SURGERY IN PATIENTS WITH IMPAIRED LEFT VENTRICULAR FUNCTION

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**BACKGROUND:** Although aortic valve replacement (AVR) is the definitive treatment of patients with aortic stenosis or regurgitation, data regarding the clinical outcome of AVR in patients with poor left ventricular (LV) function is not only scarce but conflicting. We therefore reviewed our experience to determine outcomes of patients with poor ventricular function undergoing AVR.

**METHODS:** Over an eight-year period, 1555 patients underwent aortic valve replacement at our institution (Isolated AVR=749, AVR+MVR=180, AVR+CABG=504 and AVR+Others=122). Patients were stratified into groups based on left ventricular ejection fraction:  $EF > 40$  and  $EF \leq 40$ . Long-term survival was obtained from the Social Security Death Index, and both short and long-term outcomes were analyzed using SPSS v 10.0.

**RESULTS:** Within the isolated AVR group ( $n = 749$ ), patients with  $EF \leq 40$  had a higher incidence of concomitant mitral valve disease (45.7 vs. 34.0%), previous heart surgery (27.1 vs. 16.6%), recent MI (within 21 days, 16.3 vs. 8.3%), past CHF (44.7 vs. 30.2%), CHF at presentation (19.7 vs. 9.5%) and increased preoperative systolic pulmonary artery pressure (30.7 vs. 25.4 mm Hg,  $p$  value = 0.005). However, except for a higher rate of malignant ventricular arrhythmia (11.1 vs. 1.3%  $p$  value = 0.034) in the  $EF \leq 40$  subgroup, preoperative EF did not influence the incidence of postoperative complications, hospital length of stay (LOS), 30-day mortality or long-term survival in isolated AVR patients (even, after further stratification, in the  $< 20\%$  subgroup [data not shown]). In the AVR with MVR group ( $n = 180$ ) there were no differences in preoperative findings, intra-operative findings and postoperative complication between the low  $EF (\leq 40)$  and normal ( $> 40$ ) subgroups. In the AVR with CABG group ( $n = 504$ ), patients with  $EF \leq 40$  had higher preoperative systolic pulmonary artery pressure (32.4 vs. 26.6 mm Hg,  $p$  value = 0.006), preoperative mean wedge pulmonary artery pressure (11.2 vs. 8.7 mm Hg,  $p$  value = 0.008) and cardiopulmonary bypass time (155.8 vs. 145.9 min,  $p$  value = 0.041). However, the incidence of postoperative respiratory failure (21.8 vs. 8.4,  $p$  value = 0.000), LOS (16.5 vs. 11.9 days,  $p$  value = 0.003) and long-term survival (4.15 vs. 4.75 years,  $p$  value = 0.018) were poorer in low EF than in normal EF patients undergoing AVR+CABG.

**CONCLUSIONS:** Low ejection fraction negatively influences 30-day and long-term survival rates in patients undergoing aortic valve replacement and coronary artery bypass grafting. However, there is no difference in clinical outcome, post-operative complications, 30-day mortality and long-term survival between patients with low and normal preoperative ejection fraction undergoing isolated aortic valve replacement or aortic valve replacement with concomitant mitral valve surgery.

### OP-1019-IN HOSPITAL AND LONG TERM PROGNOSIS OF MISMATCH IN PATIENTS WITH FIRST AORTIC VALVE SURGICAL REPLACEMENT.

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**OBJECTIVE:** To determine In-Hospital and Long Term prognosis of the post-surgical incompetence of the aortic valve.

**MATERIAL AND METHOD:** We design a nested cohort study we included older than 18 years old patients who went to first aortic valve replacement surgery. Clinical, hemodynamics and echocardiography parameters were obtained in pre-surgical and post-surgical periods. The effective aortic orifices (EAO) were obtained in all patients (effective aortic valve area / body mass index). Patients were grouped in the 3 classes: A Class EAO  $< 0.65 \text{ cm}^2/\text{m}^2$ , B Class EAO:  $0.66 - 0.85 \text{ cm}^2/\text{m}^2$  and C Class EAO:  $> 0.86 \text{ cm}^2/\text{m}^2$ . The perfusion, surgical and anesthesiology protocols were standardized. The treatment in the cardiological intensive care unit was in accord to the risk for each patient. We calculate Morbidity and Mortality, In hospital, 90 days and 6 years the follow up. The statistical analysis was made with SPSS 13 program, we declare  $p$  value  $< 0.05$ .

**RESULTS:** Since January 1998 to December 2000, 185 patients were consecutively included with first aortic valve surgical replacement. Previous to surgical proceedings: 60% were males with mean age 63.1±11.1 years old, the Mean Body Surface Index was 1.68±0.17m<sup>2</sup>. Patients had history of: Angor pectoris in 26%, 49% with dyspnea, 19% had syncope, 60% was in NYHA functional class II. 38% with systemic arterial hypertension, 17% has Diabetes; the 5.4% had history of Myocardial Infarction. 89% of the patients were undergoing elective surgery. Tran-surgical variables were: In 97 patients (52%) were placed mechanical prostheses. The average size of the prosthesis was 21.9±2.32mm. The extracorporeal circulation time was in 97.1±27 minutes and the aortic clamp time in 69.7±21 minutes. In 23 patients (12%) were made CABG plus aortic valve replacement. In the bivariate analysis, when we compared the 3 groups, there is no statistical difference: in hospital mortality (17% vs. 13% vs. 16% p=ns) Bleeding (8% vs. 12% vs. 11% p=ns). During the evolution in cardiologic intensive care unit, 21 patients (11.4%) had significant bleeding, 2 patients presented ventricular arrhythmias, and 25 patients (13.5%) had Cardiogenic Shock.

**CONCLUSIONS:** The overall hospital mortality was 14%. There was no significant difference in mortality and medical complications when comparing the group of patients with EAO / BMI under 0.85. In long term evolution, to 6 years, no significant difference was encountered when survival and NYHA functional class was compared in the 3 studied groups.

#### OP-1020-PARTICULATE EMBOLI CAPTURE BY INTRA-AORTIC FILTER DEVICE DURING AORTIC VALVE REPLACEMENT

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**BACKGROUND:** The neurological events in heart surgery are associated with a substantial increase in the hospital mortality, hospital stay and costs. Therefore, efforts have been done to reduce the risks of these complications. This study aims to analyze the embolic activity in patients with calcified aortic stenosis who underwent aortic valve replacement using intra-aortic filtration EMBOL-X System device (Edwards Lifesciences Inc., Mountain View, CA, USA).

**METHODS:** From January 2007 to July 2007, were operated 13 consecutive patients with calcified aortic stenosis who underwent isolated aortic valve replacement using intra-aortic filtration with EMBOL-X System device. Mean patient age was 63.7 years (range 34 to 79) and 62.5% were female. The mean bypass time was 60 minutes (range 45 to 72) and the mean crossclamp time was 50 minutes (range 35 to 63). The device was inserted during 5 minutes after the aortic clamp release and following removal, each filter was fixed in formalin, analyzed macroscopically and the captured fragments were quantified. Histological exam of the captured material was accomplished.

**RESULTS:** There were no strokes or gross neurological events. There were no deaths during hospital stay. Particulate emboli were found in 5 (38.5%) of the filters. On the histological analysis of the particulate emboli captured, 2 (40%) contained fibrin, 2 (40%) presented conjunctive tissue, 1 (20%) contained red blood cells and in 1 (20%) it was not possible to determine the nature of the particulate.

**CONCLUSIONS:** The EMBOL-X System device was effective in particulate emboli reception during aortic valve replacement surgery of patients with calcified aortic stenosis in a large portion of patients. Thus it may be useful in the reduction of postoperative morbidity.

#### OP-1021-A COMPARISON BETWEEN CUSTODIOL AND ST THOMAS COLD BLOOD CARDIOPLEGIA DURING MITRAL VALVE SURGERY

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**BACKGROUND:** Cold blood St Thomas II and Custodiol (based on Bretschneider's HTK-solution) are two cardioplegic techniques used to protect hearts of patients undergoing valvular surgery. There are no studies comparing the benefits of the two preparations. This study investigates the effects of Custodiol versus cold blood St Thomas II cardioplegia on myocardial reperfusion injury and clinical outcomes in patients undergoing mitral valve replacement/repair sur-

gery.

**METHODS:** Patients were randomly assigned to receive antegrade cold blood cardioplegia (n=12) or Custodiol (n=12). To monitor metabolic stress, blood lactate levels were measured before and after releasing the cross clamp. Myocardial injury was determined by monitoring the postoperative release of CK-MB. Clinical outcome was determined by measuring an array of clinical parameters including ventilation time, ICU stay and inotropic support.

**RESULTS:** Patient characteristics (age, cross clamp time and cardiopulmonary bypass) were similar in the two groups and there was no mortality. After 1 hour cardioplegic arrest there was a significant rise in blood lactate and remained higher than pre operative level for 48 hours. This increase in lactate was significantly higher for the Custodiol group at 12 and 24hours postoperatively. There was a significant release of CK-MB that remained high for 24 hours before dropping back to normal levels. However, the extent of CK-MB release was significantly higher in the Custodiol compared to St Thomas blood group. There were no differences in the duration of inotropic support, ventilation time, intensive care unit, or hospital stay in the two groups.

**CONCLUSIONS:** Both Custodiol and cold blood St Thomas II cardioplegic techniques are associated with significant metabolic stress and myocardial injury. However, the use of St Thomas cardioplegia accounts for less metabolic stress and reperfusion injury when compared with Custodiol cardioplegia in patients undergoing mitral valve surgery.

#### OP-1022-STENTLESS HEART VALVE FLOW PROFILE

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**BACKGROUND:** Abnormal flow across aortic heart valves may result in aortic wall and aortic valve calcification. It is thus important to use artificial heart valves with a physiologic flow profile. Blood velocity profiles downstream of stentless valve prostheses implanted in pigs were therefore investigated with Magnetic Resonance Imaging (MRI) and compared with stented and native aortic valves.

**METHODS:** Twenty-six pigs were operated using cardiopulmonary bypass and cold crystalloid cardioplegia. The animals were subjected to implantation of either a stented valve prosthesis (Mitroflow, Sorin), a stentless valve prosthesis (Solo, Sorin; Toronto SPV, St. Jude) or they kept their native valve. After weaning from cardiopulmonary bypass 2D phase contrast MRI scans were performed one valve diameter downstream of the aortic valve to display blood velocity profiles. MRI scans were obtained on the day of operation.

**RESULTS:** The native valves had a significantly lower peak velocity (89.3 cm/sec) than the artificial valves (Solo: 226.6 cm/sec; Toronto: 253.5 cm/sec; Mitroflow: 229.2 cm/sec. P<0.05). We found no statistical significant difference in peak velocity between the artificial valves. The native valves exhibited a flat velocity profile during systole evenly distributed throughout the vessel. The Solo valve displayed a skewed velocity profile with the highest blood velocities located at the posterior aortic wall. Velocity profiles from the mitroflow valve varied from a flat to a parabolic shape with a central location. The Toronto SPV had a skewed velocity profile with the highest velocities at the posterior aortic wall.

**CONCLUSIONS:** In this acute setting all the artificial valves had a significantly higher peak velocity than the native valves. We found no statistically significant difference in peak velocity between the artificial valves. None of the artificial valves had velocity profiles similar to native valves. However, the Solo and Mitroflow valve displayed flow velocity profiles most alike native valves, whereas the Toronto valve had a markedly skewed velocity profile.

#### OP-1023-SEGMENTAL ANULOPLASTY OF THE POSTERIOR MITRAL VALVE -A FEASIBLE SURGICAL PROCEDURE

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**BACKGROUND:** In patients with poor left ventricular function and mitral valve incompetence (MVI) due to multiple MV pathology, MV reconstruction with ring alone is frequently not effective. If the anterior leaflet (AML) is intact, segmental anuloplasty (MVSAP) of the posterior mitral leaflet (PML) is a suitable



new option for reconstruction. MVSAP is a kind of de Vega plasty separately for any segment of PML.

**METHODS:** 31 patients with a MVI °III (n=16) or °IV (n=15) underwent MVSAP. Average age was 72.3 years (range 45-87;m:21/f:10). The pathology of the MVI was segmental dilatation of the posterior anulus in 14, ischemic process in 7, morphological alterations in 10 patients. MV reconstruction was required in 11 patients. 18 patients had additional tricuspid incompetence; 5 patients had prior coronary surgery.

**RESULTS:** Ischemia time was 61.6 (range 24-118) minutes. Intubation time was 18.7±6.1 hours. ICU stay was 3.2± 2.6 days. Intraoperative TEE showed MVI °I or less in 26 patients; 5 patients remaining MVI °I-°II. Survival was 93.5% (29/31). Two patients died due to right heart failure. Two patients required re-operation because of hemorrhage; one patient required a permanent pacemaker. One ischemic insult occurred and one patient underwent MV replacement 3 months after MVSAP.

**CONCLUSIONS:** This is the only procedure, that allows individual adjustment of each PML segment under beating heart conditions. Complex pathology of the MV can be effectively treated using this new technique. These early results are encouraging, however, long term follow up is necessary.

## OP-1024-PROCESSING OF BOVINE PERICARDIUM FOR APPLICATION IN CARDIAC VALVE PROSTHESES

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**BACKGROUND:** Cardiac valve replacement with prosthetic valves is an established treatment for valve-related diseases. One of the most widely used bioprostheses is manufactured with treated bovine pericardium (BP). Despite its widespread adoption, their use and durability are limited due to the occurrence of calcification, wear and the lack of growth. It is assumed that a tissue engineered valve may overcome these limitations. In this work we investigated a BP treatment which may improve its properties, making it more suitable for use as scaffold material for tissue engineered heart valves.

**METHODS:** BP samples fixed with Glutaraldehyde (GA) for 10 days were used as controls. BP samples, treated with GA for 5, 15, 30 and 60 minutes were impregnated with polymers polyhydroxybutyrate, polycaprolactone and polylactic acid. Changes occurring due to decellularization, Glutaraldehyde cross linking and polymer deposition were assessed by scanning electronic microscopy (SEM) and histological analysis. BP samples were implanted in the subcutaneous of anesthetized male Wistar rats, explanted after 21 days, fixed and stained with HE to assess cellular infiltration and neo-vascularization. Collagen elastic fibers presence and integrity were assessed with Verhoeff staining.

**RESULTS:** Decellularized GA treatment times of 5 minutes and higher resulted in adequate cross linking, increasing with treatment times. SEM visualization showed no structural changes in BP related to GA treatment time and confirmed the deposition of polymers. Samples treated for 15 minutes were chosen to be studied henceforth. BP samples explanted after 21 days showed sites with neo-vascularization and cellular repopulation.

**CONCLUSIONS:** These results suggest that the decellularized BP, partially treated with GA and impregnated with polymers may be useful as a scaffold in the construction of prosthesis using tissue engineering techniques.

## OP-1025-INR SELF MANAGEMENT DECREASES COMPLICATION RATES AFTER MECHANICAL VALVE IMPLANTATION

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**OBJECTIVE:** Thromboembolism and bleeding under anticoagulants continue to account for 75% of all complications following mechanical heart valve replacement. When bleeding or thromboembolism occurs, as many as 60% of the INR values were observed not to lie within the therapeutic range. The aim of this study is to assess the effects of low-dose self-controlled anticoagulation therapy.

**METHODS:** Since the year 1998, 598 patients received mechanical valves in our institute and were offered a coagulation monitor device (CoaguCheck S, Roche

Diagnostics, Mannheim, Germany). Each of these patients was taught how to use the device and adjust his own dose of the oral anticoagulant according to the results. They were instructed to measure the INR once weekly. The course took 3 to 6 hours for each patient. The patients were followed up and all complications were recorded.

**RESULTS:** The total observation time was 1050 patient years and the completeness of follow up was 96.4 %. During the observation period there were 2 thrombo-embolic complications and 3 bleeding complications requiring intervention or blood transfusion.

**CONCLUSIONS:** The quality of the anticoagulation can be increased through the introduction of INR self-management considerably. INR self-management under oral anticoagulation after mechanical heart valve replacement enables patients to keep within a lower and smaller INR target range and subsequently reduce the incidence of complications.

## OP-1026-MYOCARDIAL PROTECTION FOR ISOLATED MITRAL VALVE REPLACEMENT

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**OBJECTIVE:** To present analysis of different methods of myocardial protection during isolated mitral valve replacement (MVR).

**MATERIALS AND METHODS:** During 01.01.2000 - 01.01. 2007 yy 1574 patients (pts) with pathology of mitral valve (MV) were operated in Institute. There were 579 (36,8%) males, 995 (63,2%) females. Patients' age was 18 - 73 years (mean 54,8±12,6 yy). NYHA class in all group were followings: II class - 21 (1,3%), III class - 397 (25,2%), IVclass - 1156 (73,5%) pts. The reasons of MV were: rheumatism, lipoidoses, atherosclerosis and others. Following methods of surgical treatment were used: MVR (n = 1251), MVR + correction of tricuspid valve (n = 323). Concomitant CABG was performed in 57 (3,6%) pts. 245 (15,6%) operations were performed after previous closed mitral commissurotomy. Systemic hypothermia 27-34 C , CPB, St Thomas cardioplegic solution were occurred in all pts. In 1501 cases myocardial protection was achieved with the use of ante-retrograde St. Thomas cardioplegia cold blood cardioplegia (group A). In group B (n= 73 pts) at the St. Thomas cardioplegia was mixed with perfitoran for better myocardial protection in doses 200-300 ml. Perfitoran was added by 100 ml to 300 ml of St.Thomas cardioplegic solution. In all group (n=1574) CPB time was 108,4 ± 18,6 minutes and cross-clamping 72,4 ± 9,8. Ventilation support in ICU 6,2 ± 1.2 h.

**RESULTS:** At whole group hospital mortality was 4,1% (n=64/1574). Respectively group A - 4,1% (n=62/1501), group B - 2,7% (n=2/73). The reasons of deaths: heart failure (n = 43), brain damage (n = 7), bleeding (n = 5) pneumonia (n = 4), others (n = 5). Lethal heart failure wasn't marked in group B (0/73) only in group A (2,9% - n= 43/1501).

**CONCLUSION:** Improved myocardial protection by using perfitoran (group B) lead to better results and low risk of postoperative heart failure than in group A without using perfitoran in cardioplegia.

## OP-1027-RECOVERY OF SYSTOLIC AND DIASTOLIC LEFT VENTRICULAR FUNCTION AFTER AORTIC VALVE REPLACEMENT FOR SEVERE AORTIC STENOSIS : WOMEN VERSUS MEN

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**BACKGROUND:** Left ventricular (LV) dysfunction in patients(pts) with severe aortic stenosis (SAS) is an important predictor of mortality after aortic valve replacement (AVR). This is the reason for the cardiologist to identify and quantify before surgery the subclinical myocardial dysfunction in order to operate those pts earlier. AIM : To asses the changes of systolic and diastolic function of LV after AVR for SAS in women versus men.

**METHODS:** We evaluated 20 pts (10 women ; mean age 67 +/- 6 years ), with SAS ( aortic valve area : 0,6+/- 0,2 cm2; maximal pressure gradient: 102 +/- 23 mmHg; mean pressure gradient 68+/- 21 mmHg) and mean ejection fraction (EF) 50+/- 6 mmHg. All pts were symptomatic preoperatively ( NYHA class II and III). A trans-thoracic echocardiography and a tissue doppler study was performed in these pts analyzing EF, the diastolic function ( E/A, IVRT, tdE), the systolic and diastolic myocardial velocities at the level of the lateral and septal



mitral annulus (apical view) and at the basal posterior wall (parasternal view) before and after 6 months from surgery. All pts received metallic prosthesis.

**RESULTS:** The EF raised after 6 months at  $56 \pm 8\%$  (NS). LV peak systolic velocities improved for women from  $0,06 \pm 0,02$  m/s (lateral wall) and  $0,05 \pm 0,02$  (septum) to  $0,106 \pm 0,04$  m/s (lateral wall;  $p = 0,004$ ) and respectively  $0,101 \pm 0,01$  m/s (septum;  $p < 0,0001$ ). For men the improvement was not so significant: from  $0,07 \pm 0,01$  m/s (lateral wall and septum) to  $0,09 \pm 0,03$  m/s (lateral wall,  $p = 0,061$ ) and to  $0,08 \pm 0,03$  m/s (septum;  $p = 0,331$ ). The radial peak systolic velocities significantly improved in men (from  $0,08 \pm 0,03$  to  $0,106 \pm 0,01$  m/s;  $p = 0,018$ ) and also in women (from  $0,09 \pm 0,02$  to  $0,125 \pm 0,03$  m/s,  $p = 0,007$ ). All pts had diastolic dysfunction before surgery (12 pts: abnormal relaxation and 8 pts: pseudonormal pattern). After 6 months, 18 pts had abnormal relaxation and 2 pts - pseudonormal pattern. Longitudinal peak diastolic velocities improved in women from  $0,106 \pm 0,04$  m/s to  $0,154 \pm 0,01$  m/s (for free wall,  $p = 0,002$ ) and from  $0,110 \pm 0,02$  m/s to  $0,150 \pm 0,01$  m/s (septum,  $p < 0,0001$ ). In men, longitudinal diastolic velocities didn't improved significantly. Before treatment, the ratio  $E/E'$  was more than 15 in 2 pts and between 8-15 in 18 pts; after 6 months,  $E/E'$  became smaller than 8 in 5 pts and between 8-15 in 15 pts.

**CONCLUSIONS:** 1. It is important to identify before surgery pts with regional myocardial dysfunction. 2. Systolic longitudinal LV function improved, after AVR for SAS only in women, but radial systolic function increased both in men and women. 3. The diastolic function had a slower recovery, more significant in women.

## CARDIOTHORACIC II

### OP-1028-WRAPPING OPERATION IN SURGERY OF ASCENDING AORTA'S ANEURYSM

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**PURPOSE:** To determine possibilities of correction of ascending aorta's aneurysm (AAA) by using wrapping procedure at aorta.

**MATERIAL:** During 1999-1.10.2007 yy 151 patients (pts) with aortic valve diseases (AVD) and AAA were operated in Institute. The average age was  $53,4 \pm 7,2$  (21 - 73) yy. At all group 53 (35,0%) pts were in III NYHA class and 98 (65,0%) pts - in IV. There were following lesions on the AV: aortic stenoses (n=112 - 74,1%), aortic incompetence (n=24 - 15,9%), combine AVD (n=15-10,0%). There were not any pts with Marfan's syndrome, cystomedioneckroses in etiologic reasons of pathology. The following operations were performed: aortic valve replacement (AVR) + wrapping of AA - 94 (62,3%) pts (group A), AVR + resection of AA + wrapping of AA 21 (13,9%) pts (group B), AVR + resection of AA + plasty of sinotubular junction (STJ) in zone of noncoronary cusp + wrapping of AA 23 (15,2%) pts (group C), AVR + plasty of STJ + wrapping of AA 13 (8,6%) pts (group D). In all cases group A-D after AVR nylon tape (diamener 1 cm) was wrapping AA by 5-7 tours and fixation between them and in proximal and distal part of AA. Control group E is 37 pts with AAA but performed only with AVR. All operations were performed with CPB, moderate hypothermia (28-36 C), retrograde St. Thomas crystalloid cardioplegia.

**RESULTS:** No hospital deaths among all groups in hospital period and during remote period (average  $4,2 \pm 0,9$  yy). No any specific complications during hospital and remote period. Echo examination of diameter of AA for group A: preoperative  $4,8 \pm 0,6$  cm, postoperative (6-7 dd)  $4,3 \pm 0,4$  cm, remote period  $4,4 \pm 0,3$  cm; for group B: preoperative  $5,1 \pm 0,4$  cm, postoperative -  $3,8 \pm 0,3$  cm, remote period  $3,9 \pm 0,4$  cm; for group C: preoperative  $5,5 \pm 0,6$  cm, postoperative -  $3,7 \pm 0,4$  cm, remote period  $3,8 \pm 0,3$  cm; for group D: preoperative  $5,3 \pm 0,6$  cm, postoperative -  $3,5 \pm 0,3$  cm, remote period  $3,6 \pm 0,2$  cm; for group E: preoperative  $5,7 \pm 0,4$  cm, postoperative -  $5,5 \pm 0,6$  cm, remote period  $6,1 \pm 0,8$  cm ( $p < 0,05$ ). Two reoperations in group D because of AAA.

**CONCLUSION:** We recommend the safe effective method of wrapping AA + complex reconstruction of AAA during AVR without prostheses of AA. Wrapping of AA during AVR is quite necessary procedure in pts with diameter of AA  $5,0-6,0$  cm but only in pts without Marfan's syndrome, cystomedioneckroses.

### OP-1029-ACUTE TYPE-A DISSECTION AND CHRONIC DILATATION: TENASCIN-C AS A KEY FACTOR IN DESTABILIZATION OF THE AORTIC WALL

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**BACKGROUND:** The extracellular matrix molecule tenascin-C (TN-C) plays an important role in embryonic development, wound-healing, cancer invasive fronts and myocardial remodeling by loosening the linkage between connective tissue and cells lying within. As there is clear evidence for an involvement in vascular remodeling as well, we hypothesized TN-C being a mediator in the pathogenesis of chronic dilatation of the ascending aorta and acute aortic dissection.

**MATERIALS AND METHODS:** Ascending aortic wall specimens were obtained from patients undergoing aortic reconstruction due to chronic dilatation of the ascending aorta (n=12) and acute aortic dissection Stanford Type A (n=10). Specimens of patients (n=5) undergoing aortic valve replacement with a macroscopically normal aorta served as controls. Formalin-fixed paraffin-embedded specimens were morphologically evaluated by hematoxylin-eosin staining and immunostaining for TN-C expression.

**RESULTS:** There were no differences in clinical characteristics concerning age and gender between patients with acute dissection, chronic dilatation and control. Patients with a known connective tissue disorder or bicuspid aortic valve were excluded from the study. Histologic examination showed a clear difference between chronic dilatation and acute dissection. In chronic dilatation TN-C staining was homogenously distributed throughout the media parallel to the orientation of vascular smooth muscle cells. In contrast specimens in acute aortic dissection showed a focal strong positive staining especially surrounding vasa vasorum and sites of intramedial hemorrhage and subsequent dissection throughout the whole vessel wall with TN-C negative areas in between. Computer-aided quantification of TN-C staining showed a significant higher TN-C expression in Type-A dissection compared to chronic dilatation. Whereas in control aorta TN-C expression was almost absent.

**CONCLUSION:** These data suggest a role for TN-C in the remodeling of the ascending aorta leading to chronic dilatation and Type A dissection. Keeping in mind the differences in TN-C expression between chronic dilatation and acute dissection one may speculate that changes of the vascular wall leading to aortic dissection are mediated or at least accompanied by a change in TN-C distribution.

### OP-1030-EXTENDING INDICATIONS FOR REIMPLANTATION VALVE-SPARING AORTIC ROOT REPLACEMENT TO OLDER PATIENTS: OUR EXPERIENCE

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**BACKGROUND:** Reimplantation valve-sparing aortic root replacement has been increasingly performed with improving peri-operative and midterm results. However, many surgeons remain reluctant in performing this operation in older patients even if appropriate anatomical criteria are met. On the contrary we believe that the advantages provided by sparing the native valve, such as freedom from anticoagulation and low rate of thromboembolic events and endocarditis are extremely appealing for the elderly. We reviewed our experience with aortic valve reimplantation by means of a modified Dacron graft that incorporates sinuses of Valsalva, in a series of 98 consecutive patients including 43 patients older than 65 years of age.

**METHODS:** During a 59-month period, 98 patients with aortic root aneurysm underwent aortic valve reimplantation using the Gelweave Valsalva™ prosthesis. They were predominantly male and the mean age was  $60 \pm 12$  years (range 28-83 years). Forty-three patients (44%) were older than 65 years of age. Five patients had the Marfan's syndrome, 13 had a bicuspid aortic valve. Cusp repair was carried out in 4 patients. The mean follow-up time was 27.4 months (range 1-59).

**RESULTS:** There was one hospital death and 2 late deaths. Overall survival at 59 months was  $91.3 \pm 5.3\%$ . Five patients developed severe aortic incompetence (AI) during follow up requiring aortic valve replacement (AVR). The 59-month freedom from reoperation due to AI was  $90.2 \pm 4.7\%$ . One patient had moderate AI at latest echocardiographic study. The 59-month freedom from AI>2+ was  $92.8 \pm 6.8\%$ . Cox regression identified cusp's repair as independent risk factor ( $p=0,001$ ) for late reimplantation failure (AVR or AI>2+). There were no episodes of endocarditis and the majority of the patients (87%) were in New York Heart Association functional class I. According to the univariable analysis, age greater than 65 years had no significant impact either on overall mortality ( $p=0.5$ ) or on reimplantation failure ( $p=0.7$ ).

**CONCLUSIONS:** The aortic valve reimplantation with the Gelweave Valsalva prosthesis™ provided satisfactory results. Age greater than 65 years failed to show any negative effect on the results in terms of mortality and reoperation rate, thus encouraging the use of this procedure also in this subgroup of patients. However long-term results are needed in order to define the durability of this technique.

### OP-1031-UNILATERAL ANTEGRADE SELECTIVE CEREBRAL PERFUSION IN AORTIC SURGERY - EFFECT OF BODY TEMPERATURE

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**BACKGROUND:** Although unilateral antegrade selective cerebral perfusion (UASCP) has been shown to be a one of the safe methods of the brain protection during aortic surgery, a consensus regarding the optimal temperature for UASCP remains to be defined. The objective of this study is to find the optimal temperature by assessing the postoperative neurologic outcomes as well as other variables following aortic surgery with UASCP under two different systemic temperatures.

**METHODS:** Between March 2000 and November 2007, 104 consecutive patients underwent aortic surgery using UASCP. Patients were divided into two groups according to systemic temperatures: group A, 64 patients with deep hypothermia ( $<24^{\circ}\text{I}$ ), mean temperature  $18.4^{\circ}\text{I}$  and group B, 40 patients with moderate hypothermia ( $\sim 24^{\circ}\text{I}$ ), mean temperature of  $25.2^{\circ}\text{I}$ .

**RESULTS:** There were no significant differences in the extent of aortic replacement between the two groups apart from a greater tendency to do hemiarch replacement in group B (62.5% group A, 82.5% group B;  $p=0.046$ ). Although the average UASCP times were similar ( $56.3^{\circ}\text{I}$  group A,  $46.9^{\circ}\text{I}$  group B;  $p=0.239$ ), the total cardiopulmonary bypass time ( $274.7^{\circ}\text{I}$  group A,  $190.2^{\circ}\text{I}$  group B;  $p<0.001$ ) and aortic cross clamp time ( $157.5^{\circ}\text{I}$  group A,  $118.3^{\circ}\text{I}$  group B;  $p=0.002$ ) were longer in group A. No significant difference in 30-day mortality rate was seen between the two groups (9.4% group A, 10.0% group B). Mental recovery, ventilator, and ICU stay times were also not significantly different between the two groups. Also no significant differences in the incidence of temporary and permanent neurologic deficits were seen between the two groups (temporary; 6.7% group A, 7.7% group B, permanent; 11.3% group A, 2.6% group B). On multivariate analysis, preoperative shock status was a risk factor for in-hospital mortality (odds ratio 7.07, 95% confidence interval: 1.3 to 38.2) and a preoperative history of cerebral accident was a risk factor for permanent neurologic deficit (odds ratio 8.99, 95% confidence interval: 1.6 to 50.2).

**CONCLUSION:** We conclude that UASCP is a comparably safe and effective cerebral protective strategy during aortic surgery in terms of hospital mortality and neurologic outcomes. Moderate systemic hypothermia appears to be safe and also beneficial for reducing cardiopulmonary bypass time and hypothermia-related side effects.

### OP-1032-NOVEL TECHNIQUE FOR AORTIC ARCH SURGERY UNDER MILD HYPOTHERMIA

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**OBJECTIVES:** Aortic arch replacement surgery often requires a deep hypothermic circulatory arrest (DHCA), which prolongs CPB, induces an inflammatory response and increases bleeding, with a negative impact on outcome. We present our initial experience with a simple technique allowing antegrade cerebral, upper and lower body perfusion under mild hypothermia, avoiding DHCA.

**METHODS:** Under continuous antegrade cerebral perfusion and a brief mild hypothermic ( $30^{\circ}\text{C}$ ) systemic circulatory arrest, a Medtronic single stage venous DLP cannula with an inflatable cuff on its extremity was connected to the CPB arterial line with a Y connector, passed through a Dacron graft and then within the descending aorta for arterial perfusion of the lower body. The balloon was inflated in order to create an aortic tape while CPB flow was increased to the normal systemic rate. This allowed open distal and arch branches anastomosis of the graft under continuous cerebral and systemic perfusion.

**RESULTS:** Five patients (4 men) were included from March 2005 to September 2006. Mean age at operation was  $55.6\pm 17$  years. Three patients had previously undergone ascending aorta replacement for type A aortic dissection. All patients underwent total aortic arch replacement; in one the replacement was extended to the thoracic descending aorta. The lower body circulatory arrest time was of  $7.2\pm 1.1$  min. Mean duration of CPB and aortic cross-clamp were  $138\pm 9.1$  and  $62\pm 5.7$  min respectively. The postoperative course was uneventful and all patients were discharged from the hospital.

**CONCLUSIONS:** The perfusion mode presented herein allows safe open repair of the aortic arch, short aortic cross clamp and CPB times associated to all the known advantages of the mild hypothermia and could have the potential to be applicable generally aortic arch surgery after further evaluation.

### OP-1033-RETROGRADE TYPE-A DISSECTION ASSOCIATED WITH STENT-GRAFT IMPLANATION IN THE THORACIC AORTA- INCIDENCE, MECHANISMS AND MANAGEMENT

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**OBJECTIVE:** Retrograde Type-A aortic dissection is a dreaded complication of thoracic stent-grafting. We analyzed seven cases with consecutive ascending aortic repair.

**METHODS:** In 236 patients thoracic endografts were implanted. Primary indications were Type-B dissections in 90 cases (38 %) and aneurysms or traumatic ruptures in 146 (62 %). Retrograde type-A dissection was noted in 6 cases (overall 3.0 %) with 5 cases in the dissection group (5.5 %) and in 2 cases in the non-dissection group (1.4 %). The Type-A-dissection occurred within the first week in 3 cases, after 3-4 weeks in 3 and late (after 2 years) in one case. In 5 cases the stentgraft had been placed inside the aortic arch covering the left subclavian artery (LSA), in 2 cases distal of the LSA. The dissection had involved the LSA in 3 cases.

**RESULTS:** In all six patients the ascending aorta was replaced by a supracoronary tube graft with the distal anastomosis performed in circulatory arrest. Intraoperative evidence of previous unrecognized dissection of the ascending aorta was found in 4 cases (57%). Four patients recovered well. One patient died, one acquired severe brain damage and one paraplegia.

**CONCLUSIONS:** Retrograde type-A-dissection associated with stentgrafts was rare and related mainly to type-B-dissection as the primary indication. Risk seemed increased with involvement of the LSA into the dissection and with stentgrafts placed in the distal aortic arch. The configuration of the proximal end of the stent-graft obviously played a minor role. Institutions performing thoracic aortic stent-grafting should be able to handle this serious complication.

### OP-1034-SURVIVAL AND REOPERATION RISK FOLLOWING BICUSPID AORTIC VALVE SPARING ROOT REPLACEMENT

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**BACKGROUND:** The mid-term outcome of aortic valve sparing root replacement reimplanting native bicuspid versus tricuspid aortic valves is unclear.

**METHODS:** The records of 84 consecutive patients undergoing aortic valve sparing root replacement using the reimplantation technique between January 21, 1997 and July 3, 2006, were reviewed. The mean age was 46.6 yr and there were 66 (78.6%) men. Twenty six patients (30.9%) had Marfan's Syndrome and 14 (16.7 %) had a bicuspid aortic valve. The mean follow-up was 4.1 yr.

**RESULTS:** There were 3 (3.6%) early and 5 (6.0 %) late deaths. Late survival ( $>30\text{d}$ ) at 5 and 8 yr was 94.9 % and 88.2 % respectively. Older age ( $p=0.04$ ) and lower preoperative ejection fraction ( $p=0.03$ ) were the only univariate predictors of death. Freedom from moderate-severe or severe (grade 3 or 4) aortic valve regurgitation at 1 and 5 yr was 90.7% and 77.4 % respectively. Ten (11.9 %) patients required aortic valve reoperation at a mean of 3.4 yr following surgery (3/14 bicuspid, 7/70 tricuspid). Freedom from aortic valve reoperation at 1 and 5 yr was 95.1% and 83.2 % respectively. PredischARGE degree of aortic valve regurgitation was the only univariate factor associated with aortic valve reoperation ( $p=0.002$ ). Bicuspid valve morphology was not a predictor of either recurrent aortic valve regurgitation or aortic valve reoperation.

**CONCLUSIONS:** Bicuspid aortic valves may be safely spared by reimplantation during replacement of the aortic root, with similar mid-term durability as tricuspid aortic valves.

### OP-1035-STENT-GRAFTING OF THE DESCENDING THORACIC AORTA: THE IMPORTANCE OF OPERATOR EXPERIENCE ON OUTCOME

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**BACKGROUND:** Thoracic aortic stent-grafting (TASG) has decreased early mortality and morbidity linked to the treatment of pathologies of the descending aorta. However the durability of the TASG remains a concern. To assess the late outcome of TASG, we reviewed our institutional experience in 73 pts (63,0±16,5years; 68,5% male) since May 2001.

**RESULTS:** Pathologies treated were an aneurysm in 25 pts, a complicated penetrating ulcer in 18 pts, a traumatic rupture in 18 pts, a complicated type B dissection in 9 pts and a miscellaneous indication in 2 pts. An acute aortic syndrome was present in 64,3% of pts. Primary or secondary procedure success rate was 100%. Hospital mortality was 8,2%; 2 pts (2,7%) suffered from partial or total paraplegia. Mean follow-up was 22,1±17,9 months; 98,6% complete; 3,9±2,6 CT/pt. Patients were followed in a dedicated aortic clinic. At 48 months, actuarial freedom from all death causes, freedom from stent-graft or aortic related death and freedom from type 1 endoleak were respectively 56,7%, 91,3% and 85,8%. To evaluate the prognostic factors of a bad outcome (early or late TASG or aortic related death, type 1 endoleak, major vascular access complication or paraplegia) a multivariate analysis was performed. Patients with severe COPD (OR: 4.5) and surgeries performed by operators with exposure to less than 5 procedures (OR: 17.2) were significantly linked to a bad outcome.

**CONCLUSION:** In patients with significant co-morbidities and carrier of an acute disease of the thoracic aorta, use of TASG, when anatomy is favourable, demonstrates an acceptable freedom from TASG or aortic related death at mid-term. Experience of the operator is significantly linked to outcome. Implanting well structured training and proctorship programs are mandatory to minimize the complications related to the learning curve.

### OP-1036-EARLY AND MID-TERM RESULTS OF ARCH SURGERY USING THE AXILLARY CANNULATION AND THE ARCH FIRST TECHNIQUE

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**BACKGROUND:** Axillary cannulation (AC) and the arch first technique (AFT) have been proposed to decrease complications related to arch surgery. Reports assessing results of this combined approach remain limited.

**METHODS:** We herein report our results of arch surgery using the AC and the AFT in 52 consecutive patients; mean age 65,3±15,4 years; 65,4% male. Including the arch procedure, 6 AVR, 25 Bentall procedures, 3 valve sparing procedures and 17 CABG procedures were performed. Patients were operated in an emergent or urgent setting in 33,3% of cases and in an elective setting in 66,7% of cases.

**RESULTS:** Mean duration of antegrade cerebral perfusion, cross-clamp time and cardiopulmonary bypass time were respectively: 20,9±18,2 min, 80,1±32,6 min and 133,4±36,7 min. Hospital mortality was 3,9% (2 pts); observed morbidity was as follow: CVA 3,9%, septicaemia 1,9%, atrial fibrillation 57,7%, renal failure 7,7%, reoperation for bleeding 15,4% and intubation > 48H 15,4%. Follow-up was performed in a dedicated aortic clinic. Mean follow-up was 1,7±1,1 years; 100% complete. Actuarial 3-year freedom from all death causes was 61,7% while freedom from aortic related death was 86,4% which include 2 sudden unexplained deaths. Freedom from reoperation owing to postoperative complications was 97,9% (one infected AC stump). Freedom from infection was 94,6% (one case of AC stump infection and one medically treated prosthetic valve endocarditis). Freedom from thromboembolic complications was 100%. During the follow-up period, six patients required a reintervention on another aortic segment.

**CONCLUSION:** Arch surgery using an AFT and AC is associated to a low mortality and an acceptable morbidity. Mid-term outcome is good. Early identification of postoperative related complications or progression of the aortic disease on other aortic segments mandates regular follow-up in a dedicated aortic clinic.

### OP-1037-SINGLE SHOT ATG INDUCTION FOLLOWED BY POSTOPERATIVE CNI HOLIDAY: A RENAL SPARING AND SAFE STRATEGY AFTER HEART TRANSPLANTATION!

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**OBJECTIVE:** To evaluate safety and efficacy of significant delay of postoperative CNI administration after single shot ATG induction.

**METHODS:** 63 patients (ICM 23, DCM 36, other 4, age 54±14yrs) underwent orthotopic heart transplantation between Jan. 2004 and Aug. 2007. Preop. creatinine was 2,1 ±0,8mg/dl. Immunosuppression was induced by a single dose ATG (Thymoglobulin 1,5mg/kg) with concomitant MMF (fixed dose of 2g/day) and steroids (taper from 1 to 0,1mg/kg/day) starting day one. Oral CyA or Tac was started only at 48-72 hours post HTx to reach target through levels only at postop. day 7-10. Postoperative monitoring included daily echocardiography, endomyocardial biopsy when indicated or before discharge.

**RESULTS:** Perioperative mortality was 7/63 (11,1%) due to primary graft failure unrelated to rejection (n=3), sepsis/MOF (n=3) and mediastinitis (n=1). CO level (HPLC) of CyA or Tac was 147±64 / 6,8±1,4 at day 7 and 189±23 / 8,9±1,9 at day 10 respectively. During the first postop. month only 1 patient required treatment for moderate acute rejection (ISHLT II) at day 10. Postop. creatinine peaked at 2,9±1,5, and decreased to 1,5±0,3 mg/dl at discharge (day 28±25); only 3 patients (4,8%) required temporary hemofiltration. Incidence of viremia requiring preemptive therapy was 39,3% (22/56) during first year follow-up. No patient developed malignoma. Actuarial survival at 1 and 3 years is 83,6% and 81,8% respectively.

**CONCLUSION:** Single shot induction with ATG is potent enough to safely delay CNI administration translating into excellent perioperative renal function with <5% use of hemofiltration and avoids increased incidence of viral infection and malignoma.

### OP-1038-EFFICACY AND SAFETY OF APROTININ IN HEART TRANSPLANTATION: COMPARISON BETWEEN LOW DOSE VS HIGH DOSE

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**BACKGROUND:** The benefits of aprotinin in cardiovascular surgery have been established in many publications. Recently, the systematic use of aprotinin has been related to serious side effects (Mangano, N Engl J Med 2006), indicating that continued use is not recommended. There is no evidence concerning the usefulness of aprotinin in heart transplantation. We aim to analyze the safety and efficacy of two different doses of aprotinin in heart transplant recipients.

**METHODS:** Two hundred and forty five consecutive heart transplant recipients were analyzed retrospectively between 01/1993 and 11/2006 at a single center. Recipients who received aprotinin during the transplant were identified and divided into two groups, according to the administered dose. Group 1 patients (G1) received a high dose (Hammersmith Protocol); and Group 2 (G2) received a low dose, adjusted to the patients' weight (loading bolus at 3.5 mg/kg followed by 3.5mg/kg during the next hour and maintenance at 1mg/kg/hour). Safety and efficacy were analyzed in terms of pre- intra and post operative variables.

**RESULTS:** Out of 245 patients, 201 (82%) received a loading and maintenance dose of aprotinin during the operative procedure. G 1 included 91 recipients (45.3%) and G 2 included 110 recipients (54.7%). Pretransplant renal insufficiency (creatinine level >1.5 mg/dl) was greater in G 2 (12.1% vs. 21.7%; p=0.05). All others preoperative characteristics were similar in both groups. Operative and cardiopulmonary bypass time were similar. The cardiac ischemic time was longer in G 2 (180±58 vs. 217±53 min.; p<0.0001) and the first 24 hour chest tube drainage was similar (603±480 vs. 713±687 ml; p= NS). The requirement of packed red blood cells and platelets was lower in G 2 (6.4±6.3 U vs. 4.5±4.1 U; p<0.01 and 11±16 U vs. 4.9±7 U; p<0.0001). The incidence of renal insufficiency 24-hour postoperatively was higher in G 1 (38% vs. 22.4%, p=0.01). In hospital mortality was similar between groups (17.3% vs. 17.6%).



**CONCLUSIONS:** The efficacy of aprotinin in heart transplanted patients was similar despite the administered dose. Low dose aprotinin was associated to less incidence of 24-hour postoperative renal insufficiency, showing to be safer than high dose aprotinin.

**OP-1039-INTRA-THORACIC ORGAN TRANSPLANTATION FROM DONORS WITH MENINGITIS: A SINGLE CENTRE 20 YEAR EXPERIENCE.**

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**BACKGROUND:** The universal shortage of suitable donors for transplantation has prompted redefining of donor selection criteria. We aimed to review the outcome of intra-thoracic organ transplantation at our institution, from donors who died as a result of bacterial meningitis, over a 20 year period.

**METHOD:** Between July 1986 and July 2006, 40 adult patients who underwent heart and/or lung transplantation performed with organs from cadaveric donors with bacterial meningitis were studied. There were 16 heart, 12 lung (4 bilateral) and 12 heart-lung transplants. The mean age was  $35.7 \pm 16.1$  years. There were five children (12.5%). Twenty seven patients (67.5%) were males.

**RESULTS:** The pathogens were: *Neisseria meningitidis* (n=21, 52.2%), *Streptococcus pneumoniae* (n=16, 40%), *Haemophilus influenzae* (n=2, 5%) and *Herpes simplex virus* (n=1, 2.5%). Adequate antimicrobial therapy before organ retrieval and after transplant was administered. The hospital mortality was 10% (n=4). Apart from one early death as a result of sepsis (*staphylococcus*), there were no infectious complications caused by meningeal pathogens. Other causes of hospital mortality were rejection (n=2) and intracranial bleeding (n=1). The mean post-transplant follow-up was  $5.35 \pm 5.54$  years (range: 1 month-18.9 years). Actuarial patient survival at 1, 5, 10 and 15 years for heart transplantation was  $73.3 \pm 11.4\%$ ,  $65.2 \pm 12.7\%$ ,  $43.5 \pm 15.1\%$  and  $21.7 \pm 17.1\%$ , respectively, for lung transplantation was  $70.0 \pm 15.5\%$ ,  $48.0 \pm 16.4\%$ ,  $48.0 \pm 16.4\%$  and  $48.0 \pm 16.4\%$ , respectively, and for heart-lung transplantation was  $81.8 \pm 11.6\%$ ,  $54.5 \pm 15.0\%$ ,  $36.4 \pm 14.5\%$ , and  $36.4 \pm 14.5\%$ , respectively.

**CONCLUSIONS:** Orthotopic intra-thoracic organ transplantation from donors with meningitis is a viable option with acceptable short and long term outcome.

## MINI PRESENTATIONS IX

### OP-1040-THORACIC AND CARDIOVASCULAR TRAUMA SURGERY IN A THIRD WORLD TERTIARY HOSPITAL - CHALLENGES AND IMPROVISATIONS

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With the many advances occurring in research and technology in developed countries, it is interesting to get a contrast picture of patient care in a tertiary hospital in a developing country. The Philippines, one of the developing countries in Southeast Asia, continues to strive for improved national health care. A limited national health care budget, migration of health professionals and increasing population are all contributing to the slow progress of the national health care program. The University of the Philippines - Philippine General Hospital (UP-PGH), the biggest tertiary hospital of the country, offers the cheapest rates and is generally known as the hospital for indigent patients. Because of the low national budget for health care, UP-PGH has limited resources in terms of supplies and equipment and manpower. The demand of providing prompt adequate care to these acutely injured patients requiring specialized thoracic and cardiovascular trauma care has given rise to improvised techniques which have proven useful and beneficial. A description of the patient load, cases, procedures, improvisations, and outcome are presented in this paper.

### OP-1041-ATRIAL FIBRILLATION TRENDS IN CARDIAC SURGERY AN INSIGHT INTO THREE DIFFERENT TECHNIQUES CONVENTIONAL CABG, OFF PUMP CABG AND MINIEXTRACORPOREAL CIRCULATION CABG

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Atrial Fibrillation Trends In Cardiac Surgery An Insight Into Three Different Techniques Conventional CABG, Off Pump CABG and Mini Extracorporeal Circulation CABG Hardip Singh, CN Lee, Uwe Klima, Christie Tan, M Caleb, Theo Kofidis Dept Of Cardiac, Thoracic & Vascular Surgery, The Heart Institute, National University Hospital, Singapore Introduction The reported incidence of postoperative atrial fibrillation (AF) varies between 10% and 40% during the first postoperative week. These variations in the incidence of AF depend on the patient populations studied, type of cardiac surgery, the definition of the arrhythmia and the duration of observation period. In recent years, the performance of coronary artery bypass grafting (OPCAB) has emerged in alternative methods ranging from conventional coronary artery bypass grafting (CCABG), the advent of OPCAB and now mini extracorporeal circulation aided CABG (MECC CABG). This brought with it the hope and the expectation that there would be a strikingly lower incidence of postoperative AF, because many of the hypothesized causes of AF could be eliminated. Methods Six hundred and sixty five patients had surgical revascularisation by utilising three different techniques namely CCABG, OPCAB and MECC CABG. In Group I two hundred and fifty patients underwent CCABG, Group II three hundred patients underwent OPCAB and Group III one hundred fifteen patients underwent MECC CABG. The trend of atrial fibrillation in terms of onset, pharmacological convertibility, duration of atrial fibrillation and effects of atrial fibrillation were analysed. Then, the incidence and predictive perioperative factors of AF in three groups were determined and compared with each other. Results There were no significant differences between three groups with respect to the preoperative demographic characteristics of the patients. The onset of AF was earliest in CCABG at 6 % ( $p < 0.05$ ), the pharmacological convertibility was easiest in the OPCAB group at 48 hours. The incidence of postoperative AF was determined as 16.1% after on-pump, 8.6% after off-pump revascularization and 9.4 % in the MECC CABG group. Age over 65 years, left ventricular dysfunction, NYHA status and HbA1C  $> 7.5\text{gm}$  ( $p < 0.05$ ) were independent predictive factors

Conclusion In summary, postoperative AF remains a challenging problem that has not been resolved or even consistently reduced. So much attention should still be focused on prevention of AF by the prophylactic drug regimens such as preoperative  $\beta$ -blocker prophylaxis, and/or prophylactic administration of other antiarrhythmic agents. Hence we need a large scale randomised controlled trial to assess the different modes of operation for the surgical treatment of Coronary Artery Disease.

### OP-1042-SHOULD QUALITY OF LIFE MATTER WHEN DECIDING ON OPEN HEART SURGERY

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**BACKGROUND:** When deciding on open heart procedures, surgeons are trained to utilize hard indicators, relief of chest pain or shortness of breath, for example. A good outcome is based on survival and eradication of physical symptoms. However, there are a multitude of factors, such as, quality of life or depression, that play a significant role in the outcome independent of a technically good operation. A patient's symptoms may be relieved but their life continues to deteriorate after surgery. This study prospectively analyzed quality of life and depression measures in 90 patients prior to surgery and then at 2 and 6 month intervals post-operatively in order to determine whether a clinically successful procedure guaranteed an improvement in the patient's quality of life.

**METHODS:** 90 patients were interviewed before heart surgery, a mix of coronary artery bypass and valve procedures, and then at 2 and 6 months after surgery. There were 71 men and 19 women, mean age of 66; there were 66 isolated CABG patients and 24 valve patients. T test and X analysis compared the 90 patients with regard to demographics, biomedical factors, baseline depressive symptoms, quality of life, hospital length of stay, and complications. Depressive symptoms were assessed using the Beck Depression Inventory and quality of life was assessed using the Medical Outcomes Study.

**RESULTS:** Higher levels of pre-surgical depressive symptoms predicted poorer physical functioning after cardiac surgery. An increase in depressive symptoms 2 months after surgery was significantly predictive of poorer physical and psycho-social function at 6 months. The effect of increased depressive symptoms on psycho-social function was significantly stronger in patients with pre-surgical Beck Depression Inventory scores. Both pre-operative depressive symptoms and post-operative increases in depressive symptoms were associated with poorer quality of life 6 months after surgery independent of relief of angina or shortness of breath. This demonstrates that in addition to effects on cardiac morbidity and mortality, increases in depressive symptoms have an adverse impact on quality of life following open heart surgery.

**CONCLUSION:** Open heart surgery was successful in a high percentage of patients, as determined by a low cardiac morbidity and mortality, but in a subset of patients the quality of life did not improve, and, in some cases, resulted in a mortality. Further examination of these associations and the mechanisms they reflect may provide a basis for guiding treatment decisions before and after open heart surgery.

### OP-1043-SURGICAL REPAIR OF POST INFARCTION VENTRICULAR SEPTAL DEFECT: A SINGLE CENTRE EXPERIENCE

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**BACKGROUND:** Post-infarction ventricular septal rupture (VSR) remains an infrequent but dreaded complication of an acute myocardial infarction. Surgical repair remains a difficult challenge and is associated with significant early mortality. The aim of our study is to review our own institutional experience with surgical repair of post-infarction VSR.

**METHODS:** All patients who underwent surgical repair of a post-infarction VSR at our institution from 2000 to 2007 were included in the study. Pre- and peri-operative variables were identified from our department database and individual patient charts. We also reviewed the early mortality and morbidity rates in these patients.

**RESULTS:** A total of 18 patients underwent surgical repair of post-infarction VSR. The mean age was 67.4 years (range 43 - 83 years). The infarct location was anterior (apical) in 15 patients (83.3%) and posterior (basal) in 3 patients

(16.7%). The median time from diagnosis of MI to VSR development was 9 hours (range 1 - 120 hours), and mean time from diagnosis of VSR to surgery was 5.3 hours (range 1 - 18 hours). Six patients (33.3%) received pre-operative thrombolysis and 1 patient received a stent pre-operatively. All patients had pre-operative intra-aortic balloon pumps. Eleven patients (61.1%) received concomitant coronary bypass grafting. Ten patients developed acute renal failure requiring post-operative hemodialysis. Two of the patients who developed post-operative renal failure had underlying pre-operative renal impairment (creatinine levels > 2mg/dL). Two patients developed a cerebrovascular accident. There were six early deaths in the group of patients presenting with an anterior apical VSR (n=15) compared to 2 early deaths in the group of patients presenting with a posterior basal VSR (n=3). The overall early mortality rate (deaths <30 days) was 44.4% (n=8).

**CONCLUSION:** The findings from our study are consistent with case series published to date and demonstrates that the surgical management of post-infarction VSR remains associated with significant morbidity and mortality.

#### **OP-1044-VENA CAVAL SYNDROMES IN BEHHET DISEASE. DIAGNOSTIC AND THERAPEUTIC MODALITIES**

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**BACKGROUND:** Behnet disease (BD) is a heterogenous, multisystem, inflammatory disorder; vascular involvement, which mainly affects veins, occurs in 25-50 % of the patients, whereas caval involvement is rare. We present the patients with BD, which affects vena cavae, resulting in vascular syndromes.

**METHODS:** In our department, 14 patients, one of them was a female, with BD resulting in caval occlusion were followed-up and treated in last 1.5 decade. The patients' median age was 31 years (range, 18 to 60 years). These patients accounted for one-fourth of the patients with vasculo-Behnet disease managed during the same period. Our cases with caval thrombosis reported previously excluded from this study [1]. The patients were either following with diagnosis of BD or had been admitted initially to hospital with symptoms and signs of venous disease. Diagnosis of BD was verified by duplex ultrasound, MRA, CTA and/or contrast angiography. Inferior vena caval involvement often associated with chronic venous insufficiency affecting bilateral lower limbs. In addition, the rate of concomitancy between systemic or pulmonary arterial aneurysms and caval occlusions was important (42.8%).

**RESULTS:** Two cases with superior vena caval syndrome were treated by jugulo-atrial bypass grafting. One patient who had multi-organ failure was exitus.

**CONCLUSIONS:** Surgical management with long-term results is an effective therapeutic modality. Although spiral saphenous vein graft remains the conduit of choice for surgical reconstruction, its obtaining is always not possible, and therefore expanded externally supported polytetrafluoroethylene is a good alternative. Although endovascular treatment for superior vena caval obstructions of other nonmalignant etiology is effective in the short term, with frequent need for repeat interventions, it is not always possible in Behnet disease. [1]Y.Akcali, et al. Venous lesions in vasculo-Behnet's syndrome. Erciyes Medical Journal; 13:412-415, 1991.

#### **OP-1045-BRIDGE TO CANDIDACY FOR TRANSPLANTATION IN DESTINATION THERAPY PATIENTS**

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**BACKGROUND:** Patients ineligible for heart transplantation at initial screening are evaluated for mechanical circulatory (MCS) support either for destination therapy or as bridge to recovery. However, a subset of patients may benefit from reevaluating their candidacy for heart transplantation following a period of MCS.

**METHODS:** We retrospectively reviewed our experience over 3 years to identify patients who underwent MCS for destination therapy due to their ineligibility for heart transplantation. The criteria for exclusion from transplantation were identified. Patients with correctable risk factors were monitored for future candidacy for transplantation.

**RESULTS:** Between 4/2005 and 8/2007 38 patients with end-stage heart dis-

ease underwent placement of left ventricular assist device (LVAD) for destination therapy at our institution. At initial screening, 10 of these were excluded from heart transplantation due to nicotine dependence (4), body mass index >32 (4), recent history of colon cancer (1) or lack of interest for transplantation (1). The mean age was 50.8yrs (23-61yrs). In this subgroup, following smoking cessation for at least 6 months, weight reduction, or clearance from cancer, 3 (30%) eventually underwent successful heart transplantation. Mean time to transplantation was 14 months (range 7-23months). In the remaining 7 patients, 2 (20%) are currently listed for heart transplantation following successful cessation of smoking. Two other patients have had significant weight reduction though have yet to reach target weight.

**CONCLUSION:** In this series of patients, smoking and obesity were major reasons for destination therapy. However, with successful smoking cessation, aggressive weight reduction, periodic monitoring and surveillance, a subset of these patients with refractory heart failure could be bridged with MCS for future candidacy to heart transplantation

#### **OP-1046-HEARTMATE II AND QUALITY OF LIFE: ELECTROSTATIC DISCHARGE AND PRECAUTIONS AT WORK**

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**BACKGROUND:** The HeartMate II (HMII) is a small axial flow pump designed for long term circulatory support. The inflow is connected to the apex of the left ventricle and the outflow to the ascending aorta. The HMII is driven by a System Driver through a percutaneous lead and powered by batteries or main power supply. A 36 years old male HMII patient, with end-stage heart failure, works as a porter in a youth detention center. His working environment, a lodge, is a closed area with air-conditioning and a nylon fitted carpet. All the chairs have a synthetic seat and back, and are equipped with plastic wheels. These are circumstances where high levels of Electrostatic Charges might be developed. In case of touching the metal door-latch or metal counter, his colleagues and he experienced a very unpleasant shock caused by Electrostatic Discharge (ESD).

**METHODS:** Since the patient works on a regular basis, there was a necessity to prevent the electronics of the HMII of possible slow and sneaky damage caused by regular ESD. After consulting a company specialized in ESD, the nylon fitted carpet was covered with ESD conducting paving-tiles with underneath strips of conducting foil. At two opposite sides of the lodge, the strips and paving-tiles were connected to an electrical ground. Over and above this, the patient was equipped with special ESD conducting shoes.

**RESULTS:** These measures provide the patient of an environment where electrostatic charges will be discharged in such a manner that the electronics of the HMII will not be damaged.

**CONCLUSION:** In the last decade, more patients suffering of end-stage heart failure are supported by an implantable Ventricular Assist Device. The progress in Assist Device technology makes it possible that patients return to their regular job while awaiting for a donor heart. Hospital staff has to be aware of the well-being of the patient and is aware of the characteristics of the implanted assist device. That makes them responsible to advise patient and employer on safe surroundings at work.

#### **OP-1047-AORTIC ROOT SURGERY WITH THE MODIFIED BENTALL PROCEDURE. 13 YEAR SINGLE UNIT'S EXPERIENCE WITH 235 CONSECUTIVE CASES.**

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**BACKGROUND:** Replacement of the aortic valve and aortic root in a variety of pathological conditions performed by the modified Bentall procedure remains an ideal durable surgical option.

**METHODS:** From September 1993 to December 2005, 235 consecutive patients were operated on in our unit with the modified Bentall procedure that entails aortic root and valve replacement with composite valved graft and re-implantation of the coronary ostia as "buttons". The aortic pathology requiring aortic root replacement was chronic aneurysms in 174 patients, chronic dissection in 10 patients, acute aortic dissection in 27 patients. 31 patients underwent

emergency operations whereas 204 had elective surgery. Concomitant bypass grafting was performed in 44 patients, MVR in 6 patients and left main arterio-plasty in 4 patients. 33 patients had undergone previous cardiac surgery.

**RESULTS:** Male to female ratio was (184/51). The mean age was 60,46 months at the time of the operation. Deep hypothermic circulatory arrest was utilised in 32 patients for replacement of the distal ascending aorta and aortic arch. 30 day survival was 94.5% (96,4% for elective cases and 79% for emergencies). Risk factors for 30 day mortality were emergency surgery, increased patient age, At mean follow up of 83 months actuarial survival was 89 % while major event free survival was 84%.

**CONCLUSION:** Aortic valve and root replacement with composite valved graft and ostial re-implantation is a safe technique for a variety of pathological conditions with good post-operative and long-term results.

### OP-1048-TYPE A AORTIC DISSECTION: THE SALERNO PROVINCE EXPERIENCE

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**BACKGROUND:** Acute Type A aortic dissection (TA-AAD) remains a highly lethal entity for which emergent surgical correction is a standard care. We report the "real-life" clinical practice in a defined geographical area in Southern Italy.

**METHODS:** From January 1996 to December 2006, 116 TA-AAD consecutive patients (pts) [mean  $\pm$  SD age  $59 \pm 12$ , 24-81 years (range), 81% male] were referred to the "Salerno Heart Tower". A standardized data form was utilized to collect information about patient clinical characteristics, management and outcomes.

**RESULTS:** All underwent surgery. Hospital stay (days) was  $16 \pm 22$ , 1-186 (mean  $\pm$  SD, range). Patient history included hypertension (70%), atherosclerosis (33%), known aortic aneurysm (13%), iatrogenic (10%), bicuspid aortic valve (6%), diabetes mellitus (5%), prior aortic dissection (3%), Marfan syndrome (2%). Most pts had two imaging tests performed (test/pt = 1.5). Transesophageal echocardiography was more often the initial study tool (64%), followed by computed tomography (33%). Time (minutes) from clinical suspicion to operating room was  $778 \pm 1515$ , 30-8640 (mean  $\pm$  SD, range). Major in-hospital complications were acute renal failure (38%), neurological deficits (26%), mesenteric ischemia (8%), cardiac tamponade (8%), myocardial infarction (6%) and limb ischemia (3%). Overall in hospital mortality was 30%, 37% in pts  $>$ Greater or equal 70 years (30/143, 21%) and 17% in pts.

### OP-1049-IMPALEMENT INJURIES OF THE CHEST: UNUSUAL MECHANISMS AND PRINCIPLES OF MANAGEMENT

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Impalement injuries of the chest are uncommon in civilian practice with few reports in the literature. We report three cases of thoracic impalement seen over a 5 year period with unusual underlying mechanisms. In two of the cases, the impalement was obvious; in the third, the impalement was concealed having occurred 5 months earlier. In case 1, the underlying mechanism was a high-speed road traffic accident. The patient was impaled by a metallic square pipe used by local mechanics to fashion additional seats on the commercial mini-van in which the patient was travelling. In case 2, the gun-housing of a locally-made rifle gave way as it was fired and allowed a reverse ejection of the barrel during recoil that impaled the hunter's chest. In case 3, a domestic assault with an old umbrella caused an impalement injury as one of the umbrella spokes broke off, penetrated and lodged in the left chest going unnoticed for 5 months. Persistent chest pain led to a request for chest radiographic examination upon which the foreign body was discovered. Massive haemoptysis brought the patient to emergency thoracotomy. All three patients underwent thoracotomy with a successful outcome. A brief review of the literature on thoracic impalement injuries and principles of management is given.

### OP-1050-WHEN TO TRANSPLANT HEART FAILURE PATIENTS WITH HEART ALONE (OHT) OR WITH COMBINED HEART AND KIDNEY (HKT)? - AN ANALYSIS OF THE UNOS DATA BASE

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**BACKGROUND:** In the past, patients with concurrent end-stage heart failure and renal disease were not considered candidates for either heart or renal transplantation. As the number of heart transplant candidates with end stage renal failure continues to grow, their need for combined heart/kidney transplantation (HKT) has continued to grow. The aim of this study is to define pre-transplant patient characteristics predictive of improved post-transplant patient survival following HKT.

**METHODS:** UNOS provided de-identified patient-level data. Analysis included 19,373 heart transplant recipients from 1/1/95 to 12/31/06. Multivariable Cox proportional hazards regression analysis was performed to identify pre-transplant recipient characteristics associated with better long-term survival following HKT, including demographics (recipient age, male sex, African-American race), past medical history (hypertension, diabetes mellitus, peripheral vascular disease, non-ischemic etiology of heart failure, previous heart transplant), bridge-to-transplant with a ventricular assist device, and UNOS Status 1/1A/1B at transplant. Kaplan-Meier survival functions and Cox regression were used for time-to-event analysis. Using the relative risks (RR) calculated in regression analysis, weights were assigned for each risk factor, allowing for the construction of a risk score.

**RESULTS:** Analysis included 78,447.5 patient-years. Among recipients, 264 (1.4%) underwent HKT and 19,373 (98.6%) received only orthotopic heart transplant (OHT). Factors associated with worse survival following HKT included: history of peripheral vascular disease, recipient age greater 65 years old, non-ischemic etiology of heart failure, bridged-to-transplant with a ventricular assist device, and dialysis dependence at the time of transplant. After stratifying the results based on risk score, one-year survival was 93.2% in the lowest-risk HKT group and only 61.9% in the highest-risk HKT group. Further stratification by estimated glomerular filtration rate (eGFR)  $<$ 33 was performed and showed that candidates with eGFR  $<$ 33 in the low risk group who received HKT had significantly ( $p=0.006$ ) better survival when compared to the OHT group with eGFR and risk score in the same range.

**CONCLUSIONS:** When heart transplant candidates were stratified by risk score and diminished eGFR ( $<$ 33), low risk HKT recipients with a diminished eGFR had improved survival over that of patients treated with OHT alone. This suggests that only low risk patients with combined kidney (eGFR  $<$ 33) and heart failure gain a survival benefit from a combined HKT.

### OP-1052-HOSPITAL AND LONG-TERM OUTCOME OF TRACHEOSTOMY IN INTENSIVE CARE UNIT AFTER CARDIOVASCULAR SURGERY

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**BACKGROUNDS:** Little has been published regarding outcomes subsequent to tracheostomy after cardiovascular surgery. The present study investigated outcomes and risk factors associated with mortality in patients with tracheostomy. The objective of this study is to determine the patient characteristics, hospital course, hospital cost, posthospital survival, and functional outcome in a group of patients with tracheostomy after cardiovascular surgery.

**METHODS:** Between August, 1998, and September, 2006, 4,581 adult patients underwent cardiovascular surgery. Of those, seventy (1.6%) patients required tracheostomy in intensive care unit after cardiovascular surgery (median, post-operative 15th day), and were the subject of the present retrospective review.

**RESULTS:** The patient group included 43 males (61.4%), of mean age 66 years. Patients were classified as either survivors ( $n=26$ , 37%) or non-survivors ( $n=44$ , 63%). The most common mode of death was multisystem organ failure and sepsis ( $n=26$ , 59%). Twenty-six patients (37.1%) required renal replacement therapy. Multivariate analysis showed that the acute physiological assessment and chronic health evaluation (APACHE) III score, renal replacement therapy at the time of tracheostomy, and diabetes mellitus were risk factors for in-hospital mortality. The hospital stay was 115 days and 74 days for nonsurvivors and survivors, respectively ( $p=0.006$ ). Total intensive care unit cost was 50,600 \$ and 32,100 \$ for nonsurvivors and survivors, respectively ( $p=0.005$ ). The overall survivals were 60%, 36%, and 12% at 30 days, 1 year, and 10 years after tra-



cheostomy. Cox analysis showed that survivors who underwent tracheostomy with higher APACHE III score had a poor prognosis ( $p = 0.001$ ). Follow-up of survivors identified 19 survivors, and they are all in NYHA functional class I or II, except 2 patients who are in dependent with mechanical ventilator. There are 2 (8%) voice complaints, and 1 (4%) mild tracheal stenosis.

**CONCLUSION:** Only one third of patients undergoing tracheostomy after cardiovascular surgery survive, possibly because it is used primarily in those with deteriorating function of multiple organ systems. Although tracheostomy may enhance patient comfort and simplify nursing care, some algorithms regarding patient selection and appropriate timing need to be developed if survival is the goal of the intervention.

#### **OP-1053-SHORT-TERM PATHOPHYSIOLOGICAL CHANGES IN CONTROL OF BREATHING, AIRWAY RESISTANCE AND DIFFUSION CAPACITY AFTER OFF-PUMP CORONARY ARTERY BYPASS GRAFTING**

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**PURPOSE:** The aim of the present study is to deepen into the pathophysiology of the respiratory system of patients undergoing OPCABG, focusing on control of breathing, respiratory pump effectiveness, airway resistance and diffusing capacity.

**METHODS:** We measured FEV1, FVC, FEV1/FVC, FRC, FEF, ERV, IC, Breathing Frequency (BF), Occlusion Resistance (ROcc), RV using He (RV(He)), TLC using He (TLC(He)), RV(He)/TLC(He), Diffusing Capacity (DLCO), P0.1, PIMAX, PEMAX, TI, VT/TI, TI/TTOT, and P0.1/VT/TI in 40 successive patients who had OPCABG. The measurements were made preoperatively and the fifth postoperative day. Statistical analysis was performed with the aid of the student-t test ( $p=0.05$ ).

**RESULTS:** A statistically significant decrease of all dynamic lung volumes was found postoperatively [FEV1 ( $2.80 \pm 0.650$  vs.  $1.71 \pm 0.062$ ,  $p < 0.0001$ ), FVC ( $3.42 \pm 0.735$  vs.  $2.09 \pm 0.466$ ,  $p < 0.0001$ ), FEF ( $2.84 \pm 1.223$  vs.  $1.55 \pm 0.632$ ,  $p < 0.0001$ )]. FEV1/FVC was not influenced significantly ( $81.77 \pm 7.324$  vs.  $81.58 \pm 5.973$ ,  $p = 0.806$ ). Several static volumes [FRC ( $3.67 \pm 0.809$  vs.  $2.78 \pm 0.100$ ,  $p < 0.0001$ ), ERV ( $1.44 \pm 0.693$  vs.  $1.10 \pm 0.493$ ,  $p = 0.007$ ), RV ( $2.21 \pm 0.384$  vs.  $1.68 \pm 0.370$ ,  $p < 0.0001$ ), TLC ( $5.40 \pm 0.876$  vs.  $3.66 \pm 0.710$ ,  $p < 0.0001$ )], DLCO ( $7.04 \pm 1.756$  vs.  $4.07 \pm 1.147$ ,  $p < 0.0001$ ), KCOC ( $1.33 \pm 0.236$  vs.  $1.16 \pm 0.250$ ,  $p < 0.0001$ ), PIMAX ( $6.37 \pm 2.292$  vs.  $4.61 \pm 1.795$ ,  $p < 0.0001$ ) and PEMAX ( $8.56 \pm 2.952$  vs.  $5.62 \pm 2.092$ ,  $p < 0.0001$ ) were significantly decreased postoperatively. A significant increase was observed postoperatively in several control of breathing indices [P0.1 ( $0.17 \pm 0.121$  vs.  $0.25 \pm 0.126$ ,  $p < 0.001$ ), P0.1/VT/TI ( $0.30 \pm 0.135$  vs.  $0.39 \pm 0.156$ ,  $p = 0.002$ )]. No significant changes were recorded in VT ( $1.06 \pm 1.275$  vs.  $0.84 \pm 0.309$ ,  $p = 0.303$ ), VT/TI ( $0.69 \pm 0.729$  vs.  $0.64 \pm 0.198$ ,  $p = 0.687$ ), TI/TTOT ( $0.43 \pm 0.053$  vs.  $0.43 \pm 0.041$ ,  $p = 0.508$ ) and Raw ( $0.53 \pm 0.470$  vs.  $0.47 \pm 0.174$ ,  $p = 0.388$ ).

**CONCLUSIONS:** The postoperative restrictive pattern in patients who underwent OPCABG seems to be related to respiratory muscles impairment, accompanied by increased respiratory drive. Airway resistance remained unchanged, while DLCO was reduced, mainly due to the diminished alveolar volume.

**CLINICAL IMPLICATIONS:** The present study not only reconfirms previous findings concerning respiratory function after OPCABG but it also deepens into the pathophysiological sequences of the disturbance.

#### **OP-1054-PAIN LOCATION, DISTRIBUTION, AND INTENSITY AFTER CARDIAC SURGERY**

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**BACKGROUND:** Acute pain is common after cardiac surgery and can keep patients from participating in activities that prevent postoperative complications. Accurate assessment and understanding of pain are vital for providing satisfactory pain control and optimizing recovery.

**STUDY OBJECTIVES:** To study the location, distribution, and intensity of pain in a sample of adult cardiac surgery patients during their postoperative hospital stay and to describe pain levels for 5 activities expected of patients after cardiac surgery on postoperative days 1 to 6 and changes in pain levels after chest tube removal and extubation.

**DESIGN:** In a prospective study, pain location, distribution (number of pain areas per patient), and intensity (0 to 10 numerical rating scale) were documented on the first, second, third, and seventh postoperative day (POD). Patient characteristics (age, sex, size, and body mass index) were analyzed for their impact on pain intensity. Adults who underwent cardiac surgery were asked to rate the pain associated with various types of activities on postoperative days 1 to 6. Pain levels were compared by postoperative day, activity, and type of cardiac surgery. Pain scores before and after chest tube removal and extubation also were analyzed. Setting: TABRIZ MADANI HEART CENTER Patients: Two hundred consecutive adult patients who underwent median sternotomy for open heart surgery. There were 121 male and 79 female patients, with a mean ( $\pm$  SD) age of  $60.9 \pm 19.2$  years. Measurement and results: The maximal pain intensity was significantly higher on POD 1 and 2 ( $3.7 \pm 2$  and  $3.9 \pm 1.9$ , respectively) and lower on POD 3 and 7 ( $3.2 \pm 1.5$  and  $2.6 \pm 1.8$ , respectively). The pain distribution did not vary significantly throughout the hospital stay. Only age was found to have an impact on pain intensity, with patients  $< 60$  years having a higher pain intensity than older patients on POD 2 ( $4.3 \pm 2.2$  vs  $3.6 \pm 2.4$ ;  $p = 0.02$ ). Pain scores were higher on earlier postoperative days. The order of overall pain scores among activities ( $P < .01$ ) from highest to lowest was coughing, moving or turning in bed, getting up, deep breathing or using the incentive spirometer, and resting. Changes in pain reported with coughing ( $P = .03$ ) and deep breathing or using the incentive spirometer ( $P = .005$ ) differed significantly over time between surgery groups. After chest tubes were discontinued, patients had lower pain levels at rest ( $P = .01$ ), with coughing ( $P = .05$ ), and when getting up ( $P = .03$ ). Advertisement Conclusions: In this patient population, the pain intensity diminished from POD 3 onward, although its distribution did not vary significantly during the first postoperative week. Moreover, pain location changed with time, with more osteoarticular type pain at the end of the first postoperative week. Among the patients' characteristics, only younger age had an impact on pain intensity, with a higher value on POD 2. Pain relief is an important outcome of care. A comprehensive, individualized assessment of pain that incorporates activity levels is necessary to promote satisfactory management of pain.

## VALVES VI

### OP-1055-CHANGES IN MYOCARDIAL AMINO ACIDS DURING MITRAL VALVE SURGERY USING TWO CARDIOPLEGIC TECHNIQUES

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**BACKGROUND:** Taurine and the principal amino acids glutamine, glutamate and alanine are the most abundant intracellular free amino acids in mammalian hearts. Changes in their intracellular concentrations are likely to influence a number of cellular activities including energy metabolism and protein turnover. In this study we investigated the effects of ischaemia and reperfusion on the intracellular concentrations of these amino acids in the right and left ventricles of hearts of patients undergoing mitral valve surgery using Custodial (n=14) or cold blood St Thomas (n=12) cardioplegic solutions.

**METHODS:** Myocardial biopsy specimens were collected immediately after institution of cardiopulmonary bypass and 10 min after releasing the cross-clamp (reperfusion). Tissues were snap frozen until processed for amino acids extraction. Amino acids in the extracts were determined using HPLC.

**RESULTS:** There was a significant fall in glutamate concentration in both left and right ventricles irrespective of the cardioplegic technique. This was associated with a significant rise in alanine. There were no changes in glutamine or taurine in the left ventricle. However there was a strong trend for a fall in the right ventricle but only reached statistical significance with taurine when using St Thomas solution.

**CONCLUSIONS:** This work demonstrates that irrespective of the cardioplegic solution used to arrest the heart, there is a marked fall in tissue glutamate associated with a rise in alanine in both right and left ventricles. This indicates that the metabolic ischaemic stress is similar for both cardioplegic techniques. The changes (or trends) in taurine and glutamine in the right ventricle, indicate that the right ventricle is likely to be more vulnerable than the left ventricle during mitral valve surgery using antegrade Custodial or St Thomas cardioplegic techniques.

### OP-1056-IMMEDIATE AND LATE EFFECT OF MITRAL VALVE REPAIR ON BNP (B-TYPE NATRIURETIC PEPTIDE) VALUES

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**BACKGROUND:** To evaluate immediate and late hormonal (BNP) variations after Mitral Valve Repair (MVR).

**METHODS:** Twenty two consecutive eligible patients with severe Mitral Insufficiency (MI) (10 Degenerative, 8 Ischemic, 4 Dilated Cardiomyopathy) undergoing elective Surgical Mitral Valve Repair (14 Edge-to-edge and mitral annuloplasty, 6 isolated mitral annuloplasty, 2 Quadrangular Resection and mitral annuloplasty) were enrolled prospectively between June 2005 and October 2005. BNP was tested before, 15 minutes after induction of anesthesia (T0), and after (30 minutes after the end of the weaning of CPB (T1), in first (T2), in VII (T3) postoperative days and after 1 year (TF)) MVR. Pre and postoperative echocardiographic, clinical (NYHA, CCS) and intraoperative parameters as Length of CPB and CC times were correlated with postoperative BNP values.

**RESULTS:** No case of mortality was observed. In 10 cases we used undersize mitral annuloplasty (mean size  $28.8 \pm 0.8$  mm) while in 8 cases myocardial revascularization was associated. In all cases we observed the increase of BNP values (T0 BNP =  $577.8 \pm 364.24$  pg/mL; T2 BNP  $755.4 \pm 461.46$  pg/mL; T3 BNP  $990.4 \pm 915.35$  pg/mL; TF BNP  $858.4 \pm 788.29$  pg/mL). Post CPB (T1) BNP values were statistically lower ( $415.1 \pm 298.71$  pg/mL). Patients with preoperative low ejection fraction (LVEF < 30%) showed during follow-up higher BNP values ( $1715.0 \pm 758.34$  pg/mL vs  $287.33 \pm 140.93$  pg/mL) ( $p=0.003$ ). Only 1 pt (4.5%)

showed at the follow-up moderate MI. In no case normal (<100pg/mL) values of BNP at the Follow-up was observed in spite of echocardiographic normal mitral valve competence. No statistical correlations between preoperative echocardiographic parameters, as LVEDD, EF, CPB and CC time and Postoperative levels of BNP were observed. No correlation between NYHA (Mean  $2.1 \pm 0.8$ ) and BNP values was observed at the follow-up ( $p=n.s.$ ).

**CONCLUSIONS:** MVR do not assure normalization of BNP values at the follow-up also in pts with normal preoperative LVEF. Patients with preoperative low ejection fraction (LVEF < 30%) showed during follow-up higher BNP values. BNP evaluation can be the best test for tailored therapy after MVR.

### OP-1057-MEASURED POSTERIOR ANNULOPLASTY FOR REPAIR OF NON-ISCHEMIC MITRAL REGURGITATION. A SINGLE UNIT FOLLOW-UP

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**BACKGROUND:** All current annuloplasty methods make the posterior mitral leaflet (PML) practically immobile in open position and the result of the repair is dependent on the area and function of anterior leaflet (AML). All sizers to determine the size of the ring/posterior band/ring give a fair approximation of the AML at the best. By measuring the length of the free edge of AML and using that measure for the length of the posterior band will give an exact measure and when using this unnecessary overreduction of the orifice is also eliminated. The objective of this study is to assess the short and mid-term results of the measured posterior annuloplasty (MPA) for repair of non-ischemic mitral regurgitation (NIMR) with or without concomitant procedures.

**METHODS:** During a five-year period from 1998 to 2002 103 pts were diagnosed with NIMR and repaired by MPA. MPA is a piece of cut Duran ring measured to match the length of free edge of AML and sewn with closely placed pledgeted U-sutures into the posterior annulus from trigone to trigone. All but one patient had a successful MPA. Preoperative MR grade was  $3.8 \pm 0.5$  and decreased to  $0.1 \pm 0.3$  postrepair ( $p < 0.0001$ ). 3 patients had instant rerepair for SAM or stenosis. Hospital mortality was 4 pts (3.9%) and the follow-up was  $62.3 \pm 15.7$  months. Three patients had a reoperation: one for failure of P2 resection at 3 months and two at 4 and 5 years for new MR due to calcification of AML. MPA was intact in all cases. There was no hemodynamically significant MR or MS noted at the end of follow-up and no reoperations for such.

**CONCLUSIONS:** MPA is a safe and durable option for repair of NIMR. It does not leave the patient with unnecessary MS and seems not to deteriorate during the time due to accurate measurement of the needed length of the posterior flexible band and adhering to sound surgical principles by using multiple (12-16) pledgeted sutures for anchoring the band for extra stability and durability.

### OP-1058-MIDTERM OUTCOMES OF TRICUSPID VALVE REPAIR FOR ORGANIC VERSUS FUNCTIONAL LESIONS

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**BACKGROUND:** Tricuspid Valve Repair (TVR) is the treatment of choice of tricuspid valve dysfunction and should be performed whenever possible and preferred to tricuspid valve replacement. Organic tricuspid valve disease is uncommon, and requires complex surgery compared with surgery for tricuspid valvular functional lesion. The current study compared midterm outcomes of TVR for organic versus functional lesions in order to define the best indications of each surgical technique used for TVR.

**METHODS:** We report a retrospective study of consecutive patients operated on from 2000 to 2006 (single unit experience) for valvular tricuspid dysfunction non related to congenital heart disease. Four hundred and fourteen patients underwent surgery and were divided in two groups: group A (n=97) with organic lesions and group B with functional lesions (n=317). The mean age was respectively 31 years  $\pm 9.1$  years (range: 11 - 56) and 34.6 years  $\pm 12.2$  years (range: 10 - 69 years) for A and B groups. The etiology was rheumatic in 97%. Clinical and echocardiographic follow-up were obtained, were 89% complete, and were 47.3 months  $\pm 39.4$  months (mean  $\pm$  standard deviation).

**RESULTS:** In group A, 97% requires tricuspid annuloplasty of whose 88.5% Incomplete Ring with Modulated Flexibility (IRMF), 10.5% DeVega Annulo-

plasty, 1% Flexible Annuloplasty. Commissurotomy was performed in 73% (n=71), extension valvuloplasty (using pericardium) in 10% (n=10), papillary muscle fenestration in 4% (n=4), chordal fenestration in 3% (n=3). In group B, all patients underwent tricuspid annuloplasty of whose 47.2% IRMF, 32.1% DeVega Annuloplasty, 19.2% Flexible Annuloplasty and 1.5% others. Concomitant procedures included, respectively for A and B groups, mitral 64% and 78.2%, mitral and aortic 36% and 25.5% and others 2% and 5.4%. The mean aortic cross clamp time was similar in both groups : 106min  $\pm$  30.5min for group A and 100min  $\pm$  37.7min for group B. Hospital death was respectively 1% and 3.2% for A and B groups. Cumulated rate of reintervention for tricuspid valve dysfunction was 0% and 0.6% respectively for A and B groups. Clinical follow-up revealed that 97.5% of alive patients were in NYHA functional class I or II. Follow-up echocardiography noted that 86.9% presented less than Tricuspid Insufficiency grad I in group A, while 83% in group B presented negligible or no Tricuspid Insufficiency.

**CONCLUSIONS:** TVR provides, at low risk, excellent surgical midterm outcomes. These outcomes are similar in organic and functional groups. However, for the organic group it is absolutely necessary to use the combination of all available surgical techniques of TVR and treat all associated valvular dysfunctions to reach good results.

#### OP-1059-BEATING HEART MITRAL VALVE REPLACEMENT VIA SUPERIOR SEPTAL APPROACH USING ANTEGRADE NORMOTHERMIC OXYGENATED BLOOD PERFUSION : AN EMERGING CONCEPT IN MYOCARDIAL PROTECTION

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**INTRODUCTION:** The emerging trend in cardiac surgery is to perform operative procedures on the beating heart with the myocardium being continuously perfused.

**BACKGROUND:** The study covers last 10 patients done using this technique in the Division of Cardiac Surgery at KIMS once this technique was introduced, in Sept 2007. All patients undergoing MVR using the above technique was included in the study. Patients with severe AR were excluded.

**METHODS:** We routinely approach via a median sternotomy and superior septal approach to the mitral valve is preferred. This technique is ideal in patients with poor LV and diminished cardiac reserves. Technical difficulties can be overcome by modification of surgical techniques. TEE was used to confirm the adequacy of deairing while coming off CPB.

**RESULTS:** Weaning from CPB is easier and lesser incidence of ventricular arrhythmias were noted. Combined mitral and aortic procedures were undertaken in 2 patients.

**CONCLUSIONS:** This new method of myocardial protection relies upon continuous, simultaneous, antegrade/retrograde perfusion of empty beating heart with normothermic blood avoiding the period of mandatory ischemia. Our results are excellent and shall be discussed in detail.

#### OP-1060-1000 PERICARDIAL VALVES IN AORTIC POSITION: RISK FACTORS FOR EARLY MORTALITY

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**BACKGROUND:** The mortality after aortic valve replacement (AVR) can still be reduced if risk factors can be identified and avoided.

**METHODS:** In a retrospective study of 1000 consecutive patients undergoing AVR with a pericardial valve, between 1986 and 2006, 30d-mortality was recorded. With a chi-square/Fisher exact and logistic regression analysis, the effect of 20 preoperative and 5 peroperative (cardiac and non-cardiac) factors was studied.

**RESULTS:** Preoperative factors with an effect in an univariate analysis were - need for urgent AVR (7/25, p=0.0001) - age>80 (17/186, p=0.001) - digitalis ((12/152, p=0.002) - congestive heart failure (16/216, p=0.002) - coronary artery disease (28/632, p=0.002) - myocardial infarction (12/151, p=0.004) - renal dysfunction (9/109, p=0.010) - EF<0.50 (10/155, p=0.021) - atrial fibrillation (12/197, p=0.023) - diabetes mellitus (10/149, p=0.030) Preoperative factors with an effect in a multivariate analysis were - need for urgent operation (odds ratio 9.0, 95% Conf Interval 2.8-28.8, p=0.0001) - digitalis (OR 3.3,

95%CI 1.6-7.7, p=0.002) - age>80 (OR 3.1, 95%CI 1.4-6.6, p=0.005)

**CONCLUSIONS:** Need for urgent AVR points to an exhaustion of all mechanisms to sustain an adequate circulation and leads to an increased risk of 30-day mortality. Therefore, once aortic valve disease becomes symptomatic, AVR should not be postponed. High age is less important. In these patients, poor results become a self fulfilling prophecy if surgery is delayed due to hesitation.

#### OP-1061-MID-TERM OUTCOME OF MANOUGUIAN PROCEDURE IN PATIENTS WITH SMALL AORTIC ROOT

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**BACKGROUND:** Aortic valve replacement (AVR) in patients with a small aortic annulus may represent a surgical challenge. Although new generation heart valves especially stentless bioprosthesis minimize the need for aortic annulus enlargement procedures but there were some conditions that necessitate the aortic root enlarging method to implant a suitable size of prosthesis. We evaluated the midterm results of the Manouguian procedure as a simple method to aortic root enlargement.

**METHODS & MATERIAL:** We performed a retrospective review of 70 patients (38 Female, 32 Male; Mean age 29.3  $\pm$  19 years) underwent aortic root enlargement during AVR. The Mean follow-up period was 36.7 months. Primary aortic valve disease included rheumatic heart disease (75.7%), congenital aortic valve disease (14.3%) and active endocarditis (10%). The predominant aortic valve pathology was aortic stenosis (AS) in the majority of cases (75.7%). All patients underwent AVR with a prosthetic valve one or more size larger than patients annulus diameter.

**RESULTS:** Improvement of functional status was seen in all survivors and all of them were in NYHA class I or II. After use of this procedure the mean indexed effective orifice area of patients' annulus had enhanced from 0.71  $\pm$  0.19 to 1.46  $\pm$  0.38 based on label size of prosthesis. There was 10 operative mortality (14.3%) and two late deaths (2.8%). The rate of surgically induced mitral regurgitation was 4.2% but only one of these patients need for mitral valve replacement. There was no case of other procedure-related morbidities including peri-prosthetic leak, severe hemolysis, prosthetic valve endocarditis or residual patient prosthetic mismatch (PPM).

**CONCLUSION:** This procedure seems a simple and effective method to enlargement of aortic annulus and provide excellent hemodynamic results with a low incidence of operation related morbidities. Although the in-hospital mortality rate of our series was high but we should consider that the primary causes of deaths were not related to the enlarging aortic annulus procedure directly. Keywords: Patient Prosthesis Mismatch, Small Aortic Root, Manouguian Procedure

#### OP-1062-BRAIN'S PROTECTION IN SURGICAL TREATMENT OF MITRAL VALVE DISEASES WITH NEUROLOGICAL DEFICITS

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**OBJECTIVE:** To present analysis of different methods of brain's protection during mitral valve's correction in patients (pts) with neurological deficits.

**MATERIALS AND METHODS:** During 01.01.2000 - 01.10. 2007 yy 1674 pts with pathology of mitral valve (MV) were operated with CPB. The reasons of MV were: rheumatism, lipoidoses, atherosclerosis and others. Following methods of surgical treatment were used: MVR (n = 1331), MVR + correction of tricuspidal valve (n = 343). 245 (14,6%) operations were performed after previous closed mitral commissurotomy. In the most cases myocardial protection was achieved with the use of ante-retrograde St. Thomas cardioplegia with addition of the blood (homemade) or in using only cooling blood cardioplegia. Previous brain damage with neurological deficits (cysts) were marked in 225 (13,4%) pts. There were 91 (40,4%) males, 134 (59,6%) females. Patients' age was 29 - 69 years (mean 54,8  $\pm$  12,6 yy). NYHA class in all group were followings: II class - 1 (0,4%), III class - 37 (16,4%), IV class - 187 (83,2%) pts. This cohort we had divided on 3 groups: (group A) 51 pts were operated with using perfluorocarbon (perfortan) for brain protection only after cross-clamping of aorta in doses 200-300 ml, (group B) 13 pts operated with using perfortan for brain protection after beginning of operation during 30 minutes and always before CPB in the same doses, (group C) 51 pts with using nimo-

top at the beginning of operation in doses 0,015 mg/h/kg, (group D) 151 pts were operated without using nimotop or perfitoran. In all group (n=225) CPB time was  $104,4 \pm 18,6$  minutes and cross-clamping  $63,4 \pm 5,6$ . Ventilation support in ICU  $6,4 \pm 1,4$  h.

**RESULTS:** Hospital mortality was 3,1% (n=7/225). Respectively group A -1,9% (n=1/51), group B - 0% (n=0/13), group C -0% (n= 0/51) group D - 5,4% (n=6/111) (p <0,05). The reasons of deaths: heart failure (3), brain damage (2), pneumonia (2). Brain damage was marked only in group D (1,8% - 2/111). There were 7 temporary neurological events at the hospital period in all group (n=7/225) and all of them only in group D - 6,3% (n = 7/111).

**CONCLUSION:** Improved brain protection in pts with neurological deficits by using perfitoran, nimotop for better oxygenation (group A,B,C) we had obtain better results and low risk in hospital period than in group D. The same results were marked for using perfitoran at the beginning operation and after cross-clamping.

### OP-1063-ISCHEMIC MITRAL VALVE REGURGITATION: MORPHO-FUNCTIONAL AND MYOCARDIAL VITALITY EVALUATION WITH CARDIAC MRI

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**BACKGROUND:** Ischemic mitral valve regurgitation (IMVR) refers to mitral regurgitation in patients with coronary artery disease (CAD) in the presence of a structurally normal mitral valve (MV). The thresholds for clinical management, surgical intervention, and the choice of surgical procedure in patients with IMVR continue to evolve and new technologies such as magnetic resonance imaging (MRI) are useful to investigate variables that may play a role in the development of this complex pathology.

**METHODS:** A consecutive series of patients with 3 vessel CAD underwent cardiac MRI to investigate MV and left ventricular (LV) geometrical and functional variables. Myocardial perfusion (gadolinium) was investigated as well through delayed enhancement. Patients were divided in two groups: CAD without or with mild IMVR (Group CAD), and with moderate to severe IMVR (Group CAD+IMVR). Degree and mechanism of MV regurgitation were confirmed by echocardiography. MRI data were prospectively collected and analyzed.

**RESULTS:** A total of 8 patients were enrolled in the CAD group and 14 in the CAD+IMVR group. Gender, age, and major comorbidities were similar in the 2 groups. MRI data included: MV regurgitation volume, MV anterior leaflet length, MV annular septo-lateral diameter (systole/diastole), MV annular inter-commissural diameter (systole/diastole), MV papillary muscles distance (systole/diastole), MV coaptation depth (2 and 4 chambers view), MV tenting area (2 and 4 chambers view), LV end systolic and end-diastolic volumes, and LVEF%. Furthermore, myocardial regional perfusion was recorded following a 17 segments schema. MV regurgitation volume was significantly higher in the CAD+IMVR group ( $22.3 \pm 13.2$  vs.  $4.2 \pm 5.2$ ;  $p < 0.005$ ). LVEF% was comparable between the two groups (CAD+IMVR  $35 \pm 12.6$  vs. CAD  $34 \pm 16.0$ ;  $p = ns$ ) as well as all the other LV and MV geometrical variables ( $p = ns$ ). The average number of myocardial segments with delayed enhancement (necrosis) was comparable in the two groups (CAD+IMVR  $6.8 \pm 4.2$  vs. CAD  $6.5 \pm 3.8$ ;  $p = ns$ ). Necrosis in the inferior ventricular segments was significantly higher in the IMVR group (CAD+IMVR  $0.7 \pm 0.7$  vs. CAD  $0.1 \pm 0.3$ ;  $p = 0.04$ ). No further differences in myocardial perfusion were noticed between the two groups.

**CONCLUSIONS:** From our initial MRI findings, patients with IMVR do not present any difference in geometrical and functional MV and LV parameters when compared to patients with sole CAD. Furthermore, location of myocardial necrosis seems to play a stronger impact in the development of IMVR. In this context, the presence of inferior necrosis, as detected at MRI delayed enhancement, is more often associated with IMVR and should be kept in stronger consideration to stratify patients for adequate preoperative evaluation, to guide tailored treatment, and to plan adequate follow-up.

### OP-1064-ISCHEMIC MITRAL REGURGITATION AND THE EFFECTS OF LEFT VENTRICULAR REMODELING ON SURGICAL OUTCOME

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**BACKGROUND:** Ischemic mitral regurgitation is a feared complication of myocardial infarction, most commonly treated with coronary artery bypass grafting and mitral valve repair or replacement. The aim of our study is to document the early and late survival of mitral valve repair versus replacement in patients with ischemic mitral valve, and to evaluate the effects of adverse left ventricular remodeling on surgical outcome after mitral valve repair or replacement.

**METHODS:** We reviewed the medical charts from 93 consecutive patients with isolated ischemic mitral regurgitation. Of these patients, 52 underwent coronary artery bypass grafting with mitral valve repair, and 41 underwent coronary artery bypass grafting and mitral valve replacement.

**RESULTS:** Patients after mitral valve repair had a 5.8% (3/52) in-hospital mortality when compared to 9.8% (4/41) of patients undergoing mitral valve replacement. When all patients were adjusted for various risk factors, the long-term survival of patients undergoing mitral valve repair was significantly better than the patients after mitral valve replacement (73% vs. 29% at 4 years). Overall survival at four years was 57%. When the patients were adjusted for the type of surgery, there was a significant survival benefit for patients with left ventricular end-diastolic diameter  $\sim 55$  mm.

**CONCLUSIONS:** Operative correction of ischemic mitral valve can be accomplished with acceptable in-hospital mortality. However, ischemic mitral valve confers a poor long-term survival in patients undergoing repair or replacement. The patients after repair of mitral valve seem to have an improved survival compared to the patients having a valve replacement. An enlarged preoperative left ventricular end-diastolic dimension is an important risk factor for long-term mortality.



## CORONARIES IX

### OP-1065-EFFECTS OF OBESITY IN DIABETIC PATIENTS WHO UNDERGOING CORONARY ARTERY BYPASS GRAFT SURGERY

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**BACKGROUND:** Despite the fact that obesity is a known risk factor for cardiovascular disease, many studies have failed to demonstrate that obesity is independently associated with an increased risk of cardiovascular morbidity and mortality in nondiabetic patients undergoing coronary artery bypass graft surgery. The authors investigated the influence of obesity on adverse postoperative outcomes in diabetic and nondiabetic patients after primary coronary artery bypass surgery.

**METHODS:** A retrospective study of patients undergoing primary coronary artery bypass surgery (n = 2095) between January 2005 and July 2007 at our institute was performed. Diabetic (n = 712) and nondiabetic patients (n = 1383) were classified into three groups, according to their body mass index: normal weight (n = 440), overweight (n = 900), and obesity (n = 755). Multivariate, stepwise logistic regression was performed controlling for patient demographics, medical history, and preoperative medications to determine whether obesity was independently associated with an increased risk of adverse postoperative outcomes.

**RESULTS:** Obesity in nondiabetic patients was not independently associated with an increased risk of adverse postoperative outcomes. In contrast, obesity in diabetic patients was independently associated with a significantly increased risk of postoperative respiratory failure (odds ratio [OR], 2.28; 95% confidence interval [CI], 1.44-3.60; P < 0.01), atrial fibrillation (OR, 1.50; 95% CI, 1.03-2.46; P < 0.04), renal insufficiency (OR, 1.68; 95% CI, 1.18-3.40; P < 0.03), and sternal wound infection (OR, 1.66; 95% CI, 1.18-3.41; P < 0.05). Obesity in diabetic patients was not independently associated with an increased risk of mortality, stroke, myocardial infarction and sepsis.

**CONCLUSION:** Obesity in diabetic patients is an independent predictor of worsened postoperative outcomes after primary coronary artery bypass graft surgery.

### OP-1066-RANDOMISED TRIAL COMPARING SURVIVAL FOLLOWING BILATERAL INTERNAL MAMMARY ARTERY GRAFTING VERSUS SINGLE INTERNAL MAMMARY ARTERY GRAFTING: THE ARTERIAL REVASCUARISATION TRIAL

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**BACKGROUND:** Standard CABG surgery uses a single internal mammary artery (SIMA) and supplemental vein or radial artery grafts. Several observational studies have suggested a survival benefit with two IMA grafts (BIMA) but this has not been tested in a randomized trial. The Arterial Revascularisation Trial (ART) is an MRC and BHF funded, multi-centre international trial comparing SIMA versus BIMA.

**METHODS:** 28 centres in Australia, Austria, Brazil, India, Italy, Poland and the UK are randomizing 3000 CABG patients to SIMA or BIMA grafting. Supplemental grafts may be either saphenous vein or radial artery. CABG can be performed as an on-pump or off-pump procedure. The primary outcome is survival at 10 years and secondary end-points include clinical events, quality of life and cost effectiveness. The effect of age, LV function, diabetes and off-pump surgery are pre-specified subgroups.

**RESULTS:** 3000 patients have been enrolled and group data are available so far on 2760 patients. Mean age was 65 years (range 36-87) with 86% males. 41% of the CABG procedures were performed off pump. Thirty-day mortality was 1% (n=27 patients). Twenty-six patients (1%) have had sternal wound reconstruction. There were 60 re-explorations for bleeding (2%); 51 strokes (2%); 62 myocardial infarctions (2%); 107 (4%) required renal support therapy and 44

patients further revascularisation (2%).

**CONCLUSIONS:** ART is one of the first randomised trials to report on survival and clinical outcomes using BIMA compared to SIMA and will help to establish the gold-standard for CABG surgery.

### OP-1067-COMPARING THE EFFECTS OF FREQUENTLY USED BETA BLOCKERS (NEBIVOLOL, METOPROLOL) ON THE VASCULAR NITRIC OXIDE LEVELS OF THE CORONARY BYPASS SURGERY PATIENTS

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**BACKGROUND:** Metoprolol and nebivolol are  $\beta_1$  adrenergic blockers. Nebivolol plays an important role in the modulation of nitric oxide(NO) secretion in arterial and venous endothelium. NO primarily inhibits the aggregation and adhesion of platelets and other blood cells and contributes to the dilatation of vessels.

**METHODS:** Fifty five patients undergoing CABG operation had been included to our study. Patients were separated to 3 groups. The effects of preoperative metoprolol and nebivolol administration on nitric oxide levels in vascular graft endothelium and vascular graft vasovasorum was compared with controls. LIMA preparation was made in patients with suitable sternums. In patients with more than one coronary artery stenosis, saphenous vein were added. Tissue samples were collected from these grafts and evaluated by immunohistochemical methods.

**RESULTS:** There were not statistically significant differences in the age, sex, diabetes mellitus, hypertension and hyperlipidemia parameters of the groups. The highest activity in both endothelium and vasovasorum levels in LIMA and saphenous graft was measured in the nebivolol group. Metoprolol did not increase NO activity in tissue level when compared with the controls.

**CONCLUSION:** These findings suggest that nebivolol administration before and after coronary by-pass surgery(unless contraindicated) may be useful in the maintenance of graft patency by its NO mediated vasodilating effects.

### OP-1068-SHORT PERIOD OF ISCHEMIC PRECONDITIONING REDUCES INOTROPIC SUPPORT REQUIREMENT AFTER ON-PUMP CABG

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**BACKGROUND:** It has been suggested that ischemic preconditioning (IP) reduces inotropic support requirement after Coronary artery bypass grafting (CABG). We hypothesized that this effect of IP is not necessarily associated with protection of myocardium. For testing our hypothesis we evaluated the effect of short period of IP on inotropic support after CABG.

**METHODS:** In a randomized control trial, we evaluated the effects of IP on patients undergoing on-pump CABG with cold blood cardioplegia. Patients (n=40) were randomly divided into IP and control groups. Patients who had left ventricular ejection fraction (LVEF) < 30%, diabetes, consumption of antioxidants and those with calcification of the ascending aorta were excluded. IP induced by 2 cycles of ascending aorta clamping (2 min for each) followed by two reperfusion phases (1 min for each). LVEF was measured by echocardiography before and after surgery. Creatine phosphokinase (CPK) and CK-MB were measured 5 min before aortic clamping and 18 hrs after CABG. Also, hemodynamic parameters duration of inotropic support, using intra aortic balloon pump (IABP) and evidence of myocardial infarction (MI) were recorded.

**RESULTS:** Mean age of the patients in IP and control groups were 49±7.8 and 35±5.8 years old respectively (P> 0.05). MI was detected in one and 3 patients in IP and control groups respectively (P> 0.05). No patient needed IABP. Respectively 8 and 13 patients in IP and control groups needed inotropic support (P<0.05). Moreover, duration of inotropic support was longer in control group (P<0.05). Ventricular arrhythmia developed in three patients in control group while it was not seen in another group (P>0.05). There were no significant differences between two groups regarding the values of CPK, CK-MB,

hemodynamic parameters and LVEF ( $P>0.05$ ). Duration of converting the cardiac rhythm to normal sinus rate (NSR) after removing the aortic clamp was shorter in IP group ( $P<0.05$ ).

**CONCLUSIONS:** Short period of IP in spite of no significant cardiac protection, can reduce post-CABG inotropic support requirement. It seems that this effect of IP is independent from duration of IP. Moreover, our study showed IP can shorten converting cardiac rhythm to NSR after removing aortic clamp.

#### **OP-1069-A SINGLE CENTER COMPARISON OF CORONARY ARTERY BYPASS GRAFTING VERSUS PERCUTANEOUS DRUG-ELUTING STENTING FOR UNPROTECTED LEFT MAIN DISEASE**

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**BACKGROUND:** Coronary artery bypass grafting (CABG) is the recommended treatment for unprotected left main coronary disease (ULM). Percutaneous coronary intervention (PCI) is employed with increasing prevalence in patients with ULM, yet comparisons between CABG and PCI in ULM have been to date inconclusive. We aimed to compare our single-center results of PCI vs CABG in subjects with ULM.

**METHODS:** We identified all patients undergoing CABG or PCI with drug-eluting stents (DES) between July 2005 and December 2006 at our Institution for unprotected left main disease, excluding subjects with severe valvular disease. The primary end-point was the rate of major adverse cerebro-cardiovascular events (MACCE) at follow-up, defined as cardiac death, myocardial infarction, repeat target vessel revascularization or stroke.

**RESULTS:** A total of 186 patients were identified, 101 treated with bypass and 85 with DES. Surgical high-risk features (EuroSCORE $>6$ ) were more common in CABG group (54%) than in DES group (21%,  $p<0.001$ ). Similarly, bifurcational ULM was more frequent in CABG group (70%) than in DES group (56%,  $p=0.07$ ). After a median follow-up of 11 months (range 25-75% 7-16), MACCE had occurred in 13% of CABG patients and 11% of DES patients ( $p=0.63$ ), with, respectively, cardiac death in 8% and 5% ( $p=0.37$ ), myocardial infarction in 1% and 6% ( $p=0.09$ ), stroke in 1% and 0 ( $p=0.35$ ), and target vessel revascularization in 3% and 4% ( $p=0.86$ ).

**CONCLUSIONS:** Coronary artery bypass surgery is still the chosen treatment for higher risk patients with ULM, it provides results that are at least equivalent to those of state of the art PCI. These findings support current recommendations favoring CABG in ULM patients, and caution, despite upcoming reports, against widespread adoption of PCI until long-term data from randomized trials are available.

#### **OP-1070-NEUROLOGICAL COMPLICATIONS FOLLOWING OFF PUMP REVASCLARIZATION: IS ROUTINE PRE-OPERATIVE CAROTID DOPPLER WORTHWHILE?**

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**BACKGROUND:** Risk of neurological complications in patients with asymptomatic carotid artery stenosis undergoing off pump revascularization (OPCAB) is low. However correlation between degree of carotid stenosis and post-operative neurological outcome is not established. We investigated rationale of pre-operative Doppler assessment of carotid disease in such patients.

**METHODS:** Between April 2005 to October 2006, 1139 consecutive patients undergoing OPCAB were studied. Pre-operative carotid doppler screening was done and patients assigned to following groups according to degree of carotid stenosis- Group-I n=913(80.22%) no stenosis; Group-II n=11(0.98%) intimal thickening to 9% stenosis; Group-III n=181 (15.89%) 10-49% stenosis; Group-IV n=25 (2.28%) 50-74% stenosis; Group-V n=9 (0.81%) 75-100% stenosis. Central venous cannulation was avoided on side having significant carotid stenosis to minimize the inadvertent manipulation. All patients were monitored for adverse neurological outcome in the post-operative period, till the time of discharge.

**RESULTS:** Overall incidence of post-operative stroke was 6 (0.52%), Group-I (4), Group-II (0), Group-III (1), Group-IV (1), Group-V (0). Left main coronary disease was seen in 20% of patients having some degree of carotid stenosis but only 4.13% had Grade-V disease. Mortality among those who had stroke was 2 and both had carotid disease but cause of death was multi-organ failure.

**CONCLUSIONS:** Risk of neurological complications is low in patients undergoing OPCAB. We did not find any correlation between adverse neurological sequelae and degree of carotid stenosis as assessed by pre-operative doppler study. Off pump CABG may be safely performed with asymptomatic carotid stenosis. The routine carotid Doppler study may further help in increasing safety margin by taking precautions to decrease the carotid artery manipulation in patients having any degree of carotid stenosis. Total Word: 269

#### **OP-1071-ANGIOGRAPHIC EVALUATION OF ARTERIAL COMPOSITE GRAFTS WITH SKELETONIZED BILATERAL MAMMARY ARTERIES**

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**BACKGROUND:** Application of arterial grafts, especially bilateral mammary arteries, is associated with decreased mortality and long-term complications of coronary artery surgeries. Skeletonization of mammary arteries decreases sternal complications of bilateral mammary artery harvesting. Composite grafts are hemodynamically preferred to sequential anastomoses. This study angiographically evaluates the short-term results of composite arterial grafts using skeletonized bilateral mammary arteries.

**METHODS:** twenty three patients were enrolled from April 2006 to May 2007 who was  $<55$  years old with EF $\geq 40\%$ . Both mammary arteries were harvested with Skeletonization technique. Right internal mammary artery (RIMA) was detached from its origin and anastomosed to left internal mammary artery (LIMA) which was left connected to its pedicle. Radial artery was used to form more branches if necessary. The patient underwent angiography after 8-12 weeks to evaluate the function and patency of composite grafts.

**RESULTS:** We performed 94 distal anastomoses in whole group, 66 of which (70.2%) were with mammary arteries. The most common patterns were K (kappa) (11 patients), Y (3 patients) and double mini-composite (3 patients). The angiographic results indicated string sign in 1 mammary graft (1.5%), graft obstruction in 1 mammary graft (1.5%) and competitive blood flow in 4 mammary grafts (6%). Blood flow abnormalities in all grafts were reported to be 6.3% (patency rate= 98, CI 96-100%  $P=0.05$ ). There were no cases of mammary-coronary steal or coronary-coronary steal in our study. In all cases with competitive blood flow, coronary artery stenosis was of moderate degree.

**CONCLUSIONS:** composite arterial grafts using skeletonized mammary arteries or radial artery are safe in young patients without systolic dysfunction who undergo coronary artery bypass grafting (CABG).

#### **OP-1072-EFFECTS OF USAGE MILRINONE AND PAPAVERINE SOLUTIONS IN STORING RADIAL ARTERY CONDUITS ON CLINICAL RESULTS IN PATIENTS WITH CORONARY ARTERY DISEASE**

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**BACKGROUND:** Radial artery (RA) used in coronary artery bypass grafting (CABG) provides clinical benefit in a large variety of patients. Type of vasodilator solution, best for pretreatment effect on radial artery (RA) conduits prior to coronary artery bypass grafting, is still controversial. Efficiency of papaverine usage in current literature data is controversial. The aim of this study was to compare effects of papaverine and milrinone as a pretreatment solution on clinical outcomes.

**METHODS:** We retrospectively studied 114 consecutive patients, who underwent RA harvesting in preparation for coronary artery bypass grafting between January 2005 and September 2007. Papaverine (35 patients) or milrinone (79 patients) during RA harvesting was administered intraluminally, before RA graft was performed. Clinical outcomes compared between both groups were analyzed.

**RESULTS:** There were no significant differences in the operative status of the two groups including age, cross-clamp time, operation time and usage of left internal thoracic artery (LITA). In both groups amount of man was significant (76% of man in papaverine group and 81% in milrinone group). All procedures were performed by one surgeon. Mean number of grafts was 2.3 and 2.5 in

the papaverine and milrinone groups, respectively. Low-output syndrome in post-operative period appeared in 2.8% patients in papaverine group and 2.5% in milrinone group. In 4 patients free RA graft was attached to the proximal side of the LITA in milrinone group compared to any RA to LITA free graft anastomoses in papaverine group. There were only two in-hospital death in papaverine group and no deaths in milrinone storing solution group of patients.

**CONCLUSIONS:** Treatment of arterial grafts with milrinone solutions during RA harvesting was associated with better clinical results and no mortality in peri-operative period.

### OP-1073-SOCIAL DEPRIVATION, NOSOCOMIAL INFECTIONS AND CORONARY ARTERY BYPASS GRAFTING.

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**BACKGROUND:** Nosocomial infections blight the success of all surgical procedures. The increasing incidence and cost of such infections places a huge burden on the finite healthcare resources available. The results of coronary artery bypass grafting (CABG) are already under tight scrutiny. Such surgery, if complicated by a nosocomial infection, may subject patients to higher morbidity and possibly higher mortality. The aim of this study was to assess whether social deprivation influenced nosocomial infection rates and identify other factors which may predispose patients to nosocomial infection following CABG.

**METHODS:** 2535 patients (2024 male, 511 female (mean age 65±9)) underwent isolated first time CABG from 01/10/2002 to 30/09/2007. All data was recorded prospectively and analysed retrospectively. Patient deprivation was measured using the Carstairs Score and the Scottish Indices of Multiple Deprivation (SIMD). Patients were cross-matched on the microbiology database and documented on the basis of whether or not they acquired a nosocomial infection. A number of variables were examined as possible risk factors for nosocomial infections.

**RESULTS:** 432 of 2535 the studied patients (17%) acquired 17 microbiologically identified infective organisms from 9 different sites after CABG. Patients who acquired a nosocomial infection had a significantly higher mortality rate: 3.7% vs 1.3% ( $p < 0.01$ ). There was clear relationship between social deprivation and nosocomial infection. The deprivation scores between patients with and without nosocomial infections were: Carstairs score; -0.58 vs -1.13,  $p < 0.01$ , SIMD score; 17.13 vs 15.55,  $p < 0.01$ . Patients who had diabetes ( $p < 0.01$ ), were transfused of blood ( $p < 0.01$ ) or blood products ( $p < 0.05$ ) had more nosocomial infection. The hospital stay was significantly longer in patients with nosocomial infections: 11.4 vs 6.8 days,  $p < 0.01$ . The nosocomial infection rates were similar in patients undergoing CABG with or without cardiopulmonary bypass.

**CONCLUSION:** Patients who acquire a nosocomial infection following CABG have a significantly higher mortality rate than those who do not. Social deprivation has a significant relationship with the development of nosocomial infection following CABG.

### OP-1074-OFF-PUMP CORONARY ARTERY BYPASS GRAFTING: SINGLE-CENTER 10 YEARS EXPERIENCE

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**BACKGROUND:** With a widespread use of cardiopulmonary bypass (CPB) in cardiac surgery in 60's and 70's of the previous century, its weakness soon became apparent. The search for less invasive surgical methods in cardiac surgery was going on, and some pioneering techniques such as off-pump coronary artery bypass grafting (OPCAB) became popular again. Since then one of most hotly debated issues is whether OPCAB is superior to classical coronary artery bypass grafting (CCAB). With this retrospective study we evaluate a single center 10 years experience in University Clinical Center Ljubljana.

**METHODS:** Between 1997 and 2007, 755 patients underwent OPCAB surgery due to the ischemic heart disease in our center. We evaluated the cause of referral, left ventricular ejection fraction (LVEF) before surgery, the number of coronary artery bypass grafts performed, time to extubation after surgery, the length

of stay in the intensive care unit (ICU), the need for inotropic support and intra-aortic balloon pump (IABP) after surgery, postoperative need for red blood cell transfusion, postoperative morbidity and mortality and the cumulative cost of medical intervention.

**RESULTS:** The mean ( $\pm$ SD) age was 63.40 ( $\pm$ 11) years. 23.8% of the procedures were urgent, 32.8% were with high priority, and 56.6% were elective. 8.8% of the patients were referred because of acute myocardial infarction, 39.2% had unstable angina pectoris, and 52.7% had stable angina pectoris. LVEF more than 60% had 38.4% of the patients, LVEF between 60-40% had 48.5% and LVEF below 40% had 13.4% of the patients. The mean 2.7 grafts were performed per surgery. The average extubation time was 13 hours and the mean ICU stay was 3.7 days. 64.5% of the patients needed inotropic support and 8.5% of the patients needed IABP. 57% of patients were transfused. In the post-operative period 7.5% of patients had infection and 15.6% of patients had atrial fibrillation. Sternal dehiscence occurred in 3.5% of the patients and 0.2% of the patients had pneumothorax. 3.5% of patients were reoperated due to the postoperative bleeding. Postoperative mortality was 2.4% (18 patients).

**CONCLUSION:** We currently perform 33% of OPCAB surgeries in all patients referred for myocardial revascularization. The OPCAB surgery in our center is surgeon (not patient) specific. The results of OPCAB surgery are comparable with results of CCAB surgery. The patients after OPCAB surgery have shorter ICU stay, shorter intubation time, lower need for red blood cell transfusion, lower incidence of postoperative cardiac arrhythmia and lower cost of treatment.

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### OP-1075-SURGICAL TREATMENT OF DIFFUSE CORONARY ARTERY DISEASE WITH PLAQUE BRIDGING BYPASS GRAFTING. RESULTS OF SIX YEARS EXPERIENCE IN A SINGLE CENTER STUDY

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**BACKGROUND:** Diffuse multilocal coronary artery disease is a challenge for both interventional cardiologist and cardiac surgeon. In coronary surgery, good bypass runoff is associated with higher graft patency and complete revascularization improves outcome concerning life quality and freedom from reintervention. A surgical method of performing long arteriotomies through additional high grade distal coronary stenosis (plaque bridging) and results concerning patency rates compared to conventional bypass grafting are presented on 180 consecutive patients.

**METHODS:** Between April 2000 and December 2006, 180 patients (mean age 69,6 years) received complete coronary revascularization, performing distal plaque bridging bypass grafting on at least one coronary artery presenting with multiple high grade stenosis. A total of 208 anastomosis with either venous graft or left internal thoracic arteries were performed, whereas length of arteriotomy ranged from 15 to 50 mm. In all cases suturing was done with special reinforced needles for better penetration of calcified arterial wall. Pre-, intra- and postoperative data and follow up were retrospectively analysed.

**RESULTS:** Mean clamp time was 46 minutes for an average of 3, 6 grafts. 75 LAD, 72 RCA and 35 RCX plaque bridging grafts were performed. Bypass flow measurement was satisfactory in all cases. No acute complications occurred as a result of the procedures and all patients survived to hospital discharge. 15 control angiographies showed good graft patency. Freedom from angina was 94, 4% ( $n = 170/180$ ), freedom from myocardial infarction was 99, 4% ( $n = 179/180$ ), freedom from reintervention was 97, 2% ( $n = 175/180$ ) and freedom from reoperation was 100% ( $n = 180/180$ ).

**CONCLUSIONS:** Although angiographic evidence of graft patency for all patients is missing, intra-, perioperative and follow-up data demonstrate that surgical technique of plaque bridging is feasible, safe and effective.



## DEVICES - STEM CELLS - BIOENGINEERING

### OP-1076-THE EXTRACORPOREAL LIFE SUPPORT FOR ADULTS WITH IRREVERSIBLE CARDIOGENIC SHOCK: THE FLORENCE INITIAL EXPERIENCE

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**BACKGROUND:** Different cardiac assist options are necessary to meet the diverse indications for cardiac support in a comprehensive heart failure program. At our institution, a portable adult extracorporeal life support (ECLS) system is used in emergency for short-term and temporary cardiac assist for patients with irreversible cardiogenic shock and/or cardiac arrest. We report our initial data about feasibility, complications, and outcomes of patients underwent to emergency ECLS.

**METHODS:** Between August 2006 and January 2008, 4 adult cardiac patients were undergone to emergency ECLS. Indication for cardiac assist was irreversible cardiogenic shock due to postcardiotomy cardiac dysfunction (1 patient), Tako-tsubo cardiomyopathy (1 patient) and cardiac arrest (CA, 2 patients) unresponsive to cardiopulmonary resuscitation (CPR) and advanced cardiac life support, without return of spontaneous circulation. In all patients we have employed an A-V femoral implantation, eventually under continuous cardiac massage, and a centrifugal pump connected to a hollow-fiber membrane oxygenator and heat exchanger for achieving hypothermia if indicated. Data for analysis were collected by prospective completion of standardized ELSO report forms and retrospective review of hospital charts.

**RESULTS:** The employed ECLS system was inexpensive to operate, uncomplicated to implant, and adaptable for diverse indications. Stable support was achieved in all patients. No complications ECLS-related were registered. Associated treatments were: IABP and mechanical ventilation (in all patients), CVVH (2 patients), CABG (1 patient), PTCA-stenting (1 patients). The mean duration of ECLS was  $9 \pm 6.1$  days (5-18). Weaned to support with recovery of an adequate cardiac function was possible in three patients; in the other one the weaned was impossible for occurrence of a post-CA irreversible complication (intestinal ischemia). Hospital discharged without adjunctive treatments was possible in two patients: the other one dead for irreversible repeated CA at the 15th day after ECLS discontinuation.

**CONCLUSIONS:** In our initial experience the emergency ECLS is feasible, effective and provides good cardiopulmonary and end-organ support. Survival rates in patients with irreversible cardiogenic shock and/or cardiac arrest encouraging application in patients with an underlying cardiocirculatory disease reversible or amenable to immediate corrective intervention (angioplasty, surgery, transplantation/VAD implantation).

### OP-1077-LONG-TERM BIVENTRICULAR MECHANICAL SUPPORT IN A LOW ORGAN DONATION SETTING

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**BACKGROUND:** Greece has the second lowest rate of organ donation in Europe, hence the need for long-term mechanical circulatory support as a bridge to heart transplantation. We present our center's experience since the inception of the Berlin Heart Excor VAD program, in 2003.

**METHODS:** Fifteen biventricular assist devices (BiVAD) have been implanted at our institution for dilated ( $n=12$ ) or ischemic cardiomyopathy ( $n=3$ ). This cohort of patients required biventricular support due to the delayed referral, when both right and left ventricles were in irreversible failure. The Berlin Heart Excor Mobile Driving System enables adult patients to be discharged home while awaiting transplantation. Patients return for weekly clinic visits and outpatient laboratory check (anticoagulation along with general purpose tests).

Cannulae exit site dressings are changed and pumps are inspected for fibrin/thrombus formation. Pneumatic drives are exchanged every three months for maintenance. Anticoagulation consists of warfarin, aspirin, clopidogrel, and/or dipyridamole.

**RESULTS:** Mean patient age was  $31.6 \pm 16.5$  (range 12-56 years). Mean duration on BiVAD was  $384.8 \pm 167$  days (range 260-675 days). Seven patients have been successfully transplanted, 3 died while being supported (one due to catastrophic blood loss, the other 2 due to sepsis) and the rest (5) are awaiting transplantation. All patients enjoy good quality of life and even air travel was successfully accomplished in one of them. Complications included neurological events ( $n=12$ ), GI bleeding ( $n=3$ ), and infections ( $n=11$ ). Pump exchanges (31 pumps in 11 patients) for excessive fibrin or thrombus formation were easily carried out in the operating room. There have been no deaths due to mechanical failure and 7 patients have been supported on the device for more than a year. Two of these patients were each supported for 22 months, with one of them transplanted and the other still awaiting transplantation.

**CONCLUSION:** The Berlin Heart Excor BiVAD provides safe support in an outpatient setting, extending the lives of patients requiring biventricular support before transplantation, with relatively few complications.

### OP-1078-EXTRACORPOREAL MEMBRANE OXYGENATION IN ADULT PATIENTS WITH PERI-CARDIOTOMY CARDIOPULMONARY FAILURE

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**BACKGROUND:** Extracorporeal membrane oxygenation (ECMO) has been used as temporary, emergent, and initial biventricular circulatory support for patients with severe cardiopulmonary failure. Peri-cardiotomy cardiopulmonary failure occasionally develops in patients who received cardiac operations. Such patients are at very high risk for subsequent morbidity and mortality. We retrospectively reviewed the results of ECMO support in adult patients with peri-cardiotomy cardiopulmonary failure.

**METHODS:** From January 2003 to October 2007, 556 adult patients underwent cardiac surgery in our institution. 18 patients (3%), including 14 males and 4 females patients (mean age,  $55.7 \pm 15.0$  years, ranging from 32 to 87 years) with ECMO support for peri-cardiotomy cardiopulmonary failure were included in this study. The ECMO implantation were performed via the femoral vessels (by either percutaneous or open exploration method) or via the right atrium and ascending aorta (post-cardiotomy after cardiopulmonary bypass).

**RESULTS:** 18 adult cardiac operations with ECMO support for peri-cardiotomy cardiopulmonary failure, included coronary artery bypass grafting and mitral valve replacement ( $n=2$ ), coronary artery bypass grafting and mitral valve replacement ( $n=1$ ), aortic dissection ( $n=1$ ), cardiac tumor excision and tricuspid valve replacement ( $n=1$ ), tricuspid valve replacement and ventricular septum repair for infective endocarditis ( $n=1$ ). The ECMO were implanted pre-cardiotomy either in intensive care unit (ICU) or cardiac catheterization room ( $n=4$ ), post-cardiotomy in the operating room ( $n=9$ ), post-cardiotomy in the ICU ( $n=5$ ). Previous cardiac surgery history was noted in 4 patients. ECMO insertion during cardiopulmonary resuscitation was also noted in 4 patients. Acute myocardial infarction was diagnosed in 9 patients. Intra aortic balloon pump was employed in 13 patients. Venovenous mode ECMO was used for pulmonary support in one patient while others 17 patients were on venoarterial (VA) mode. The mean duration of ECMO support was  $6.2 \pm 5.5$  days (ranging from 1 to 23 days). 5 patients (28%) were successfully weaned off ECMO support and survived to hospital discharge. The survivors were in New York Heart Association Functional Class I or II except one case of late death. 13 (72%) patients died on ECMO support. The main cause of death was myocardial failure in 10 patients and multiple organ failure in 3 patients. ECMO support was complicated by renal failure in 7 patients, bleeding requiring mediastinal reexploration in 8 patients, ischemia of lower limbs in 2 patients and infection with sepsis in 4 patients.

**CONCLUSIONS:** The ECMO provides an acceptable short-term cardiopulmonary support, either in pre-cardiotomy patients for emergent life rescue, or in post-cardiotomy patients for cardiopulmonary failure. The use of ECMO not only saves the lives of a group of very high risk patients, but also allows time to make a better clinical assessment and appropriate treatments.



### OP-1079-MYOCARDIAL REVASCULARIZATION ALONE AND COMBINED WITH VENTRICULAR RECONSTRUCTION FOR ISCHEMIC HEART FAILURE

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**BACKGROUND:** To compare the results of the coronary artery bypass grafting (CABG) alone and combined with surgical ventricular reconstruction (SVR) in patients with ischemic heart failure.

**METHODS:** In this study we included 236 patients with ischemic heart failure who underwent surgical treatment. There were 217 men and 19 - women, with a mean age  $56 \pm 8$ , whom had prior one or more myocardium infarction, with 3-4 NYHA functional class, and EF less than 35%. Patients were blindly randomized in two groups. There were 116 patients who underwent CABG with SVR and in 120 patients was performed CABG alone. With echocardiography study we estimated left ventricular and mitral valve dysfunction before and after surgery. There was no difference in preoperative status in patients of both groups.

**RESULTS:** The hospital mortality rate was 5.8 % after isolated CABG and 3.5 % after CABG combined with SVR. All surviving patients had postoperative study from 1 month to 3 year. The mean NYHA functional class decreased from  $3.1 \pm 0.7$  to  $2.1 \pm 0.6$  after CABG and from  $3.2 \pm 0.5$  to  $2.0 \pm 0.4$  after CABG with SVR. We revealed that left ventricular reconstruction significantly decreased EDV from  $241 \pm 64$  to  $166 \pm 36$  and increased EF from  $30 \pm 6$  to  $38 \pm 4$  accordingly. However after isolated CABG EF did not increase significantly ( $31 \pm 5$  and  $33 \pm 7$  respectively). Three-year survival rate was 78 % after CABG with SVR and 73 % after CABG alone.

**CONCLUSIONS:** Despite on the more aggressive surgical strategy left ventricular reconstruction did not increase operative mortality and early results were significantly effective compare with coronary artery bypass grafting alone.

### OP-1080-STEM CELL THERAPY IN END-STAGE HEART DISEASE

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**BACKGROUND:** Heart failure is a growing problem in the world, with treatment being limited to anti-failure drugs, ventricular assist devices, and heart transplantation. Patients in gross heart failure have a poor quality of life, and poor long-term survival. Stem Cell Therapy represents a new therapeutic modality for patients with end - stage diseases. This is due to the ability of stem cells to differentiate & mature into functional cells. The aim of this study was to assess whether Stem Cell Therapy could help patients with heart failure, who were unsuitable for other standard forms of treatment.

**METHODS:** Between November 2006 and December 2007, 22 patients (18 males, 4 females), aged between 5 months and 84 years, with severe cardiac dysfunction, who were unsuitable for conventional revascularization procedures, were selected for Stem Cell Therapy. All patients gave detailed, fully - informed, written consent prior to commencement of therapy. This procedure was approved by the Institutional Review Board and Ethics Committee of the hospital. Granulocyte Colony Stimulating Factor was injected subcutaneously for 3 days in order to stimulate bone marrow derived progenitor stem cells. Apheresis was undertaken, autologous CD - 34 positive mononuclear stem cells were extracted, and injected into the myocardium.

**RESULTS:** There were no procedure related adverse affects, nor any immediate post - operative complications. None of the patients complained of aggravation in symptoms after Stem Cell Therapy. There were 4 deaths in the series, a survival rate of 82%. Follow-up was available in 66% of survivors. Follow-up ranged from 1 month to 9 months (average 4 months). Early follow-up demonstrated improvement in cardiac function and clinical symptom status in 10 out of the 18 survivors (56%).

**CONCLUSIONS:** Stem Cell Therapy may offer hope to patients with severe end-stage heart disease. Our current results & short-term follow-up are encouraging. However, long-term follow-up is required to confirm the benefits of Stem Cell Therapy.

### OP-1081-FETAL STEM CELLS THERAPY FOR HEART FAILURE IN PATIENT WITH IDIOPATHIC CARDIOMYOPATHY MIDTERM FOLLOW-UP

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**BACKGROUND:** Even though autologous cell therapy for heart failure demonstrated promising results, there still remains the issue that patient with chronic disease have suppressed bone marrow. This may result in cell that do not perform as well as young healthy cells. To address this issue, we performed a prospective safety to evaluate allogeneic fetal stem cells in patients with dilated cardiomyopathy.

**METHODS:** This was an open label, single-arm, prospective clinical safety study for Heart Failure in patient with Idiopathic cardiomyopathy which was approved by the Ethics Committee of the hospital, and informed consents fully explaining the potential risks of the surgical procedure and fetal cell transplantation were obtained from the patients. All patients were assessed at baseline for biochemistry profile CBC, coagulation profile, electrocardiogram, chest X-Ray, and transthoracic echocardiogram, cardiac catheterization with coronary angiogram to exclude ischemic heart disease, 6-minute walk test over a 30 meters flat surface, exercise tolerance test under Naughton protocol modified, NYHA classification and Minnesota CHF test. The fetal stem cells were provided by Institute for Regenerative Medicine (IRM), and processed and prepared by the Institute for Problems of Cryobiology and Cryomedicine (IPCC) in the Ukraine. The cells were injected under direct vision into the myocardium. Nine patients had midline sternotomy, and one had a left anterior minithoracotomy.

**RESULTS:** There were 10 patients enrolled in the study. Six patients were available for follow-up at 35 months, 4 patients died at 5, 8, 12, 18 months. The survival rate at 35 months was 63 % (KM). There was improvement in clinical and on imaging studies. With regard to imaging studies, increased wall thickness both eccentric and concentric was noted in association with and increased contractility in those regions. Compared to baseline easements, patients improved NYHA Class (Mean  $3.4 \pm 0.5$  to  $1.33 \pm 0.5$ ,  $P=0.001$ ); LVEDD by transthoracic echocardiography decrease of 10 mm ( $6.8 \text{ cm}$  to  $5.8 \text{ cm}$  a 15% decrease,  $P<0.001$ ) Minnesota CHF score decrease from  $71 \pm 27.3$  to  $6 \pm 5.9$  ( $P<0.001$ ), EF as assessed by transthoracic echocardiography increase at 31 % ( $26.64\% \pm 4.9$  to  $34.87\% \pm 7.2$   $p=0.005$ ); ETT increase from 4.25 mean to 16.63 ( $291.3\%$  increase,  $P<0.0001$ ) and 2.46 to 5.63 METS ( $128.9\%$  increase,  $P<0.0001$ ), six minutes Walk Test:  $251 \pm 113.2$  seconds to  $360.1 \pm 153.3$  seconds, a 43.42 % increase,  $P=0.01$  ; average distance:  $284.4 \pm 144.9 \text{ m}$  to  $468.89.8 \text{ m}$   $\pm 174.4 \text{ m}$  at 64.4 % increase,  $P=0.004$ .

**CONCLUSION:** Although these findings suggest direct myocardial implantation of allogeneic fetal Stem Cells is feasible and improved cardiac function in HF patients with Idiopathic cardiomyopathy at Midterm Follow-up, more clinical research is required to confirm these observations.

### OP-1082-IN VIVO FORCE MEASUREMENT ON MITRAL VALVE TRACTION SUTURE: INSIGHTS TO LEFT VENTRICULAR FORCE BALANCE

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**BACKGROUND:** Force measurements on the components of the mitral valve apparatus have been reported from in vivo and in vitro studies. However, the mitral valve and left ventricular force balance is not yet fully understood. Recent reparative techniques for ischemic mitral valve insufficiency calls for papillary muscle relocation. This study reports the forces generated on traction sutures utilized for this purpose.

**METHODS:** Eight animals were used in a porcine in vivo model of chronic functional ischemic mitral regurgitation. Cardiopulmonary bypass was established and during cold cardioplegic arrest, standard down-sized flat ring annuloplasty was performed. 2-0 GoreTex traction suture was extended from the anterior and posterior fibrous trigones through the anterior and posterior papillary muscles respectively, and exteriorized out through the left ventricle and attached to a dedicated device for papillary muscle relocation. Following termination of cardiopulmonary bypass, 5, 10 and 15 mm papillary muscle relocation was per-

formed with accompanying traction suture force measurements.

**RESULTS:** Peak force was seen at the onset of the systolic isovolumic contraction. 15 mm displacement of the posterior papillary muscle resulted in a force difference between diastole and systole of  $1.2 \pm 0.4$  Newton.

**CONCLUSION:** Forces in mitral valve papillary muscle relocation sutures are comparable to previously reported force magnitudes in the mitral valve valvular and subvalvular apparatus. These results provide insight into the biomechanical requirements of relocation traction sutures and other devices utilized for papillary muscle relocation.

### OP-1083-THE FIRST MECHANICAL PROSTHETIC HEART VALVE DESIGNED FOR FREE ANTICOAGULATION

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**BACKGROUND:** Design a mechanical prosthetic tri-leaflet valve with central flow closest to the flow of a native valve. Also, select the optimal material for building the designed valve with good mechanical resistance and good haemocompatibility, aiming to meet an optimum hemodynamic performance and low thrombogenesis.

**METHODS:** The effect of the morphological design on the blood flow across the valve is studied employing computational fluid dynamic modeling with the finite element method. The fluid is assumed to be in steady state, incompressible and with uniform viscosity; and the flow is analyzed for different blood flow rates. The results of the flow for a tri-leaflet valve are compared with the flows obtained for a standard prosthetic bi-leaflet valve.

**RESULTS:** The design of this tri-leaflet valve show that the effective surface area for flow across the valve is 83.6% of the total valve section, compared to a value of 78.6% for the standard bi-leaflet valve. In addition 98% of the flow is central and the remaining flow goes through the peripheral section. For a stable flow of 5,000 cm<sup>3</sup>/min the pressure drop across the tri-leaflet valve is of 0.055 mmHg, considerably lower than the pressure drop for the bi-leaflet valve which is of 0.080 mmHg. The shear stress for the tri-leaflet valve is 80% lower than for the bi-leaflet valve. With respect to the valve fabrication the material selected is a titanium alloy which is machined and coated with a layer of titanium dioxide. In this way the good mechanical properties of the titanium alloy is combined with an oxide layer with a good haemocompatibility.

**CONCLUSIONS:** It is concluded that an optimum hemodynamic performance was achieved in this design meeting the central flow, a lower pressure drop across the valve, and a smaller shear stress than a bi-leaflet design, with a good hemocompatible material, therefore removing the factors that generate thrombosis.

### OP-1084-MITRAL VALVE RELOCATION FOR ISCHEMIC MITRAL REGURGITATION: THE FIRST-IN-MAN SURGICAL EXPERIENCE

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**MITRAL VALVE RELOCATION FOR ISCHEMIC MITRAL REGURGITATION: THE FIRST-IN-MAN SURGICAL EXPERIENCE** Boris Orlov <sup>1</sup>H, Avinoam Shiran <sup>2</sup>, Alexander Karaskov <sup>4</sup>, Moshe Y. Flugelman <sup>2</sup>, Reuven Pizov <sup>3</sup>, Yuri Peisahovich<sup>1</sup>H and Dan Aravot <sup>1</sup>H <sup>1</sup>H Department of Cardiothoracic Surgery, <sup>2</sup> Department of Cardiovascular Medicine, <sup>3</sup>Department of Anesthesiology and Intensive Care, Carmel Medical Center, Haifa, Israel; <sup>4</sup>Institute of Circulation Pathology, Novosibirsk, Russia

**BACKGROUND:** Current surgical techniques for repair of ischemic mitral regurgitation (IMR) are sub-optimal, and recurrence rate is high. Most commonly, mitral valve (MV) annuloplasty with an undersized ring is performed, but this approach does not address the main problem of papillary muscle displacement and leaflet tethering. We have suggested that relocation the MV away from the dilated annulus to a geometrically optimal position may eliminate IMR and possibly reverse or stop ventricular remodeling. Initial animal studies demonstrated the feasibility of this novel approach. We report our first surgical experience in a human being.

**METHODS AND RESULTS:** A 59y old man was referred for coronary bypass surgery and mitral valve repair. He had anterior MI 10mo earlier, the proximal LAD was totally occluded, and he was in FC3 because of dyspnea. On echocardiography he had severely reduced LV contraction with severe IMR (Table). MV

repair with a pericardial sleeve and complete detachment of both MV leaflets relocation the MV apically was performed, resulting improved leaflet coaptation and hemodynamics (Table). He also had a LIMA to his LAD and Diagonal and ring annuloplasty for tricuspid regurgitation. Post-operative course was uneventful except for transient nodal bradycardia. At 3m follow-up he was in FC1-2 with EF=34% and mild residual MR.

**CONCLUSIONS:** Initial clinical experience with MV relocation for IMR is promising. Further refinement of surgical technique and more experience with long-term follow-up is needed to compare this novel technique with the current surgical approach. Table BP CO LVEDV LVESV EF ERO RV RF PAP Preop 94/70 1.8 164 106 37% 0.5 43 72% 55 Postop 95/61 3.9 159 104 35% 0.12 14 18% 45 BP=blood pressure (mmHg), CO=cardiac output (l/min), LVEDV=left ventricular end diastolic volume (cc), LVESD=LV end systolic volume (cc), EF=ejection fraction, ERO=effective regurgitant orifice area (cm<sup>2</sup>), RV=regurgitant volume (cc), RF=regurgitant fraction, PAP=systolic pulmonary artery pressure (mmHg)

### OP-1085-MODULATION OF VASCULAR CELL MOBILITY FOR TISSUE ENGINEERING OF CARDIOVASCULAR IMPLANTS

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**BACKGROUND:** Spontaneous healing of artificial cardiovascular implants in terms of a directed tissue ingrowth of vascular cells is a major goal in tissue engineering. Graft modification by cell interactive peptides might not only facilitate cell adhesion to the prosthesis, but could also direct cellular ingrowth towards a functional tissue substitute. Therefore motility of human microvascular endothelial cells (MVEC) and vascular smooth muscle cells (SMC) on bioactive peptides was studied.

**METHODS:** A 2-D in vitro single cell migration model was applied to examine cellular mobility on peptides such as YIGSR, RYVVLPR (both laminin derived) and DGEA (collagen derived) when combined with the cell adhesive peptide RGD (derived from fibronectin). These sequences have various activities ascribed to them such as pro-angiogenicity and adhesion. Peptides were custom synthesized and linked to an inert polyethylene glycol (PEG) matrix. Computer-aided time-lapse video-microscopy was used to quantify single cell migration.

**RESULTS:** MVEC migration speed was 21.2  $\mu$ m/h on RGD alone and was decreased on RGD combined with RYVVLPR or DGEA (-22.2% and -21.4% respectively,  $p < 0.05$ ) and increased on RGD combined with YIGSR (+25.8%,  $p < 0.05$ ). SMC (26.9  $\mu$ m/h on RGD) did show a similar decrease in mobility on RYVVLPR or DGEA+RGD but no increase in motility on YIGSR+RGD.

**CONCLUSIONS:** In vitro the mobility of vascular cell lines on a 2-D matrix can selectively be increased or decreased by peptide modification of this matrix. This raises the possibility of creating preferential ingrowth matrices for use in tissue engineering of cardiovascular implants.

## CORONARIES X

### OP-1086-EFFECTS OF CORONARY ARTERY BYPASS GRAFTING ON REGIONAL LEFT VENTRICLE WALL MOTION

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**BACKGROUND:** Coronary artery bypass grafting (CABG) is a viable and durable operation to preserve left ventricular function in patients with coronary artery disease. Revascularization often results in improvement of myocardial depression. Left ventricular regional wall motion analysis is usually based on grading of contractility of individual segments. These left ventricular segments or regions can be easily related to the coronary artery perfusion beds. With these facts in our mind, we planned this study in a population which has smaller size of coronary arteries and more severe form of disease.

**METHODS:** This is an on going prospective study. The study is being done at Department of Cardiac Surgery, National Institute of Cardiovascular Diseases (NICVD), Karachi Pakistan. We are presenting the early results. Data analysis is performed through SPSS version -10 on computer. Qualitative data including sex, left ventricular regional valve motion abnormality will be presented by frequency and percentage; chi-square test will be applied to compare the proportions of these variables at  $p < 0.05$  level of significance. Age is presented by mean  $\pm$  SD.

**RESULTS:** 150 patients ( $n=150$ ), were included in the analysis. These results showed that effect of CABG on anterior segmental wall motion abnormalities was insignificant ( $p=.609$ ), the effect on the anterior IVS showed deterioration of segmental wall motion and this effect was significant ( $p=.001$ ), effect is insignificant on anteriolateral segmental wall motion abnormalities ( $p=.078$ ), normal preoperative segments in posterior wall showed stability ( $p=.664$ ) while disappearance of dyskinetic, reduction in akinetic segments postoperatively and inferior wall motion have same effects as of posterior wall. Comparison of preoperative and postoperative echocardiographic data revealed early improvement in segmental wall motion of posterior and inferior wall, while alterations in segmental wall motion of anterior, anterior-lateral and septal wall.

**CONCLUSION:** When Saphenous venous graft is used as conduit for revascularization significant improvement occurs in early segmental wall motion as compared to segments revascularized by Left internal mammary artery (LIMA).

### OP-1087-FIRST DESCRIPTION OF NON-LINEAR HEART DYNAMICS AFTER BEATING HEART REVASCLARIZATION

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**BACKGROUND:** Advanced analysis of Heart Rate Variability using non-linear dynamics and chaos theory provide additional information about the behavior of the heart not evident from conventional linear analysis. Nonlinear parameters have been shown to be strong predictors of sudden cardiac death and malignant arrhythmias. New methods have already been applied to uncover nonlinear fluctuations in heart rate dynamics before and after on-pump coronary artery bypass grafting (CABG), however there were no patients on chronic beta-blocker prophylaxis having had undergone CABG without cardiopulmonary bypass studied so far.

**METHODS:** 67 consecutive patients with isolated stable multivessel coronary artery disease in normal sinus rhythm on chronic  $\beta$  blocker therapy scheduled for off-pump CABG were included in the study. Time and frequency domain heart rate (HR) variability measures, detrended fluctuation analysis (DFA) with short- ( $\leq 11$  beats, a1) and long-term ( $> 11$  beats, a2) correlation properties of R-R intervals and Fractal dimension (FD, High and Low) were determined from 24-hour Holter and 15-minute high-resolution ECG recordings to assess levels of sympathetic, parasympathetic and non-linear heart rate dynamics preoperatively, on the third and on the seventh postoperative day. DFA calculations were done by freely available software (www.physionet.org) and FD analysis was performed by software developed by Acharya et al. available from the

authors upon request. Mean differences over time were tested using paired-samples t-test. Mean differences between patients with and without post-operative arrhythmia were tested using independent samples t-test. Results were reported as mean  $\pm$  SE;  $p < 0.05$  was considered significant unless stated otherwise.

**RESULTS:** Three patients have died in early postoperative period, one due to massive perioperative myocardial infarction and two due to non-cardiac reasons. One patient had a transitory ischemic attack without any late consequences. There was one conversion to on-pump procedure due to hemodynamic instability. DFA analysis estimated either from 15-minute or 24-hour recordings, shows a significant decrease of a1 and increase of a2 after operation ( $p < 0.01$ ). a1 was  $1.187 \pm 0.0029$  preoperatively,  $1.007 \pm 0.053$  on the third and  $1.054 \pm 0.049$  on the seventh postoperative day whereas a2 was  $0.918 \pm 0.015$  preoperatively,  $0.978 \pm 0.020$  on the third and  $0.990 \pm 0.018$  on the seventh postoperative day. High FD as estimated either from 15-minute or 24-hour recordings decreased significantly after operation ( $p < 0.001$ ), whereby for 15-minute estimates this was verified already on the third postoperative day and then the values remained unchanged until the seventh postoperative day. High FD was  $1.928 \pm 0.000$  preoperatively,  $1.876 \pm 0.012$  on the third and  $1.873 \pm 0.011$  on the seventh postoperative day whereas low FD was  $1.702 \pm 0.014$  preoperatively,  $1.742 \pm 0.024$  on the third and  $1.718 \pm 0.024$  on the seventh postoperative day.

**CONCLUSIONS:** Our results on the selected nonlinear HRV analyzing methods after beating heart revascularization show consistent correlation between long- and short-term recordings. A marked reduction of a1 and high FD after the procedure is an indication that reduction in complexity comes along with a decrease in vagal tone, showing changes of cardiovascular dynamics toward a less adaptable direction.

### OP-1088-PERIOPERATIVE STRESS RESPONSE AND POSTOPERATIVE INFLAMMATORY COMPLICATIONS AFTER OFF-PUMP CORONARY ARTERY BYPASS SURGERY

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**BACKGROUNDS:** Little has been published regarding the association of perioperative stress response and clinical outcomes after off-pump coronary artery bypass surgery (OPCAB). The present study sought to assess the role of perioperative inflammation and coagulation system on postoperative complications in patients undergoing OPCAB.

**METHODS:** A one-hundred consecutive patients underwent isolated OPCAB over a 5-month period. Anesthetic management was standardized and arterial blood samples were collected before surgery, at the end of surgery, and 1, 2, 3, and 7 days after surgery. Plasma levels of inflammatory markers (white blood cell, neutrophil, erythrocyte sedimentation rate, C-reactive protein, fibrinogen, cortisol) and coagulation systems (platelet, prothrombin time, activated partial thrombin time, D-dimer, fibrin degradation product) were measured serially. We examined the association of these parameters with the postoperative inflammatory complications.

**RESULTS:** Major and minor postoperative complications occurred in 30 patients (acute myocardial infarction in 2, atrial fibrillation in 16, pulmonary complications in 11, wound problem in 4, low cardiac output in 2, delayed mediastinal bleeding in 1, and cerebral infarction in 1 case) at the median of 3rd postoperative day. Multivariate analysis revealed preoperative cortisol ( $p=0.024$ ), and cortisol at 1st postoperative day ( $30.3 \pm 15.3$  vs.  $19.2 \pm 8.5$   $\mu\text{g/dL}$ ,  $p=0.001$ ) were deeply associated with development of postoperative complications. Intraoperative cortisol release was well correlated with the intraoperative hemodynamic changes, including pulmonary artery pressure, central venous pressure, and cardiac index. Intraoperative and immediate postoperative cortisol release was significantly associated with postoperative complications. Cortisol level was peak at 1st postoperative day and recovered toward baseline value 7 days after surgery.

**CONCLUSIONS:** Patients with postoperative complication after OPCAB have significantly increased preoperative and 1st postoperative day cortisol. Also, intraoperative cortisol release was significantly correlated with the intraoperative hemodynamic changes. The neurohormonal environment and inflammatory response during and after beating-heart surgery should be further explored.



## OP-1089-CARDIAC SURGERY IN PATIENTS WITH DRUG ELUTING IN STENT RESTENOSIS- 'A NIGHTMARE'

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**BACKGROUND:** Complications following drug eluting stent (DES) implantation include thrombosis, rupture, sepsis, infected coronary artery aneurysm and coronary arteriovenous fistula. This study analyzes the various reported and some unreported complications encountered at our institution in patients who were referred to us for cardiac surgery following DES implantation.

**METHODS:** The records of all patients who underwent cardiac surgery following DES implantation at this institution between 2004 and 2007 were reviewed retrospectively.

**RESULTS:** Between January 2005 to September 2007 fourteen patients underwent cardiac surgery following DES implantation. Incidentally all the patients were men with median age of 58 years (Range 42 to 80years). Coronary artery aneurysms in the region of DES were present in 6 patients. Dense pericardial adhesions were found in 10 patients and all these patients had diabetes mellitus. In 2 patients localized abscess were found overlying DES site. Twelve patients underwent coronary bypass grafting (CABG) and 2 patients underwent mitral valve replacement. In one patient CABG was abandoned as the epicardial coronary arteries could not be localized because of distorted anatomy due to dense pericardial adhesions. Two patients required Intra aortic balloon pump to wean off cardiopulmonary bypass. Postoperatively the bleeding was more in patients with dense adhesions, as a result, the requirement for blood was more. There were two in hospital deaths. One of these patients was undergoing redo CABG and was given DES to right coronary graft which developed a large aneurysm. Second patient had large Left Ventricular (LV) aneurysm and severe ischemic mitral regurgitation. He underwent LV aneurysmorrhaphy, CABG and mitral valve replacement.

**CONCLUSIONS:** We report complications of dense pericardial adhesions, localized coronary artery aneurysms and abscess formation. Dense pericardial adhesions were more prevalent in diabetics. Implantation of DES in vein graft can lead to formation of large aneurysm. To best of our knowledge localized abscess formation and dense pericardial adhesions have not been reported so far.

## OP-1090-OFF-PUMP VERSUS ON-PUMP MYOCARDIAL REVAS- CULARIZATION IN LOW-RISK PATIENTS WITH MULTIVESSEL DISEASE

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**BACKGROUND:** This study reports one cardiac surgical center's experience with off-pump coronary artery bypass (OPCAB) and compares its clinical outcomes with that of a group of patients undergoing coronary artery bypass grafting (CABG) with cardiopulmonary bypass at the same institution.

**METHODS:** A prospective randomized study was performed. 184 selected low-risk patients were enrolled; 93 patients were operated on-pump (CABG, group II) and 91 patients were operated off-pump (OPCAB, group I). All were male and the ages ranged from 35 to 74 years old, mean  $50.2 \pm 1.8$ . Preoperative clinical characteristics were similar in both groups. Patients with severe left ventricular dysfunction ( $FE < 35\%$ ) and renal failure were excluded as well as patients with significant comorbidities that were inappropriate for randomization because we selected them for OPCAB procedures. The number of grafts per patients in group I was  $1.8 \pm 0.6$  and  $1.96 \pm 0.68$  in group II ( $p = 0.833$ ).

**RESULTS:** At the ambulatory stage of treatment in both discussed groups no fatal cases were noticed. In the early postoperative period the need for cardiac support therapy was significantly higher in the cardiopulmonary-bypass group than in the beating-heart group: (32% versus 7.7%;  $p < 0.05$ ). The extubation time ( $18.6 \pm 5/1$  hours versus  $14.3 \pm 2.8$  hours;  $p = 0.03$ ) was higher in the cardiopulmonary bypass group than in the beating heart group. Postoperative stroke (1.1% versus 2.2%;  $p > 0.05$ ), myocardial infarction (5.5% versus 8.6%;  $p < 0.05$ ), and re-entry for bleeding (2.2% versus 5.4%;  $p < 0.05$ ) occurred infrequently in the OPCAB group. There were reductions in the rates of transfusion (20.9% versus 49.5%;  $p < 0.001$ ) and deep sternal wound infection (3.3% versus 4.3%;  $p > 0.05$ ) in the OPCAB group compared with the CABG group. There were no differences in rates of atrial fibrillation. Actuarial survival for the beating-heart group was 98.9% at 1 year, 97.5% at 3 years, 96.1% at 5 years and

for the cardiopulmonary bypass group was 100% at 1 year, 98.7% at 3 years, 95.6% at 5 years ( $p > 0.05$ ).

**CONCLUSIONS:** CABG without the use of CPB is effective for complete revascularization in the majority of selected low-risk patients. We did not find any statistical difference in hospital mortality and morbidity using on-pump or off-pump techniques for low-risk patients.

## OP-1091-THE NO TOUCH HARVESTING TECHNIQUE FOR SAPHENOUS VEIN GRAFTS

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**BACKGROUND:** Vein grafts are, although their limited patency, still the most used conduits for coronary artery bypass grafting (CABG). Recently a prospective randomised study was published where vein grafts harvested with the new "no touch" technique showed the same patency as the Left Internal Mammary Artery, known to be the most superior conduit for CABG (1).

**METHODS:** Stills and video clips showing the "no touch" technique.

**RESULTS:** Vein grafts harvested with the "no touch" technique show a 90 % patency in 8.5 years.

**CONCLUSION:** Demonstration of the "no touch" harvesting technique for vein grafts that could improve long term results of CABG. 1. Souza DS, Johansson B, Bojo L, Karlsson R, Geijer H, Filbey D, et al. Harvesting the saphenous vein with surrounding tissue for CABG provides long-term graft patency comparable to the left internal thoracic artery: results of a randomized longitudinal trial. J Thorac Cardiovasc Surg 2006;132(2):373-8.

## OP-1092-ARE FEMALE PATIENTS OVER 70 YEARS A HIGH RISK IN CORONARY ARTERY BYPASS SURGERY?

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**BACKGROUND:** The European population is getting older and older and the expected lifetime of women is much higher than that of men. (82.1 years versus 76.6 years in Germany). Thus the percentage of female patients over 70 years in coronary heart surgery increases steadily. Many publications indicate, that female gender is a high risk factor in CABG surgery, others indicate that age over 70 years is an additional risk for adverse outcomes. This evaluation is aimed at examining in what extend female gender and age over 70 years really do influence adverse outcomes after CABG surgery in our institution

**METHODS:** All female patients over 70 years who underwent CABG-surgery between 2003 and 2007 were evaluated concerning their preoperative risk factors and scores, days of ICU stay, postoperative complications and their individual outcomes. All results were compared to the corresponding male group of CABG-patients over 70 years and differences have been worked out. All data were obtained via "HCH-Info", a database for cardiovascular departments. Statistical significance was calculated by Chi-Square-Test.

**RESULTS:** Between 2003 and 2007 190 female and 601 male patients over 70 years underwent CABG surgery in our clinic. Mean age was 75.8 years (female) and 74.9 years (male). Logistic Euro-Score predicted a high postoperative lethality (13.8% female, 12.3% male) whereas the actual KCH-Score indicated a risk of in hospital lethality of 6.5% (women) and 5.6% (men). In the female group only the amount of highly urgent operations was significantly higher ( $p = 0.01$ ) whereas concerning all other preoperative risk factors there were no significant differences between both groups. In 88.5% of all patients, at least 1 artery was used for complete revascularization. In 23% of our patients we performed a T-graft operation (BIMA). The average number of anastomoses was 3.6 (female) and 3.7 (male) per patient. Mean ICU-stay was 2.5 days (fem) versus 3.0 days (male). In comparison to both Score-predicted lethalties, the 30-day lethality of our patients was much lower in both groups (3.7 % female / 5.3% male), in relation to the Euro-Score even with high significance ( $p = 0.0005$  female and  $p = 0.0002$  male) By means of a systematic inquiry with a completeness of 97% half a year after the operation, 80% of all patients in both groups reported to feel "much better than before the operation".

**CONCLUSIONS:** Although the female group included significantly ( $p = 0.02$ ) more high-emergency operations, their postoperative outcomes were even better than those of the male group. We are convinced that these good results in



both groups are due to our concept of performing a complete revascularization and using arterial grafts in 88,5% (25 % BIMA) of all CABG-procedures despite high age of the patients. Thus in our institution female patients have no longer a gender specific risk in coronary bypass surgery, not even women over 70 years.

#### **OP-1093-PREEXISTING ATHEROSCLEROSIS OF RADIAL ARTERY AND INTERNAL THORACIC ARTERY USED AS CONDUITS FOR CABG**

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**BACKGROUND:** Despite the popularity of internal thoracic artery (ITA) and radial artery (RA) as the useful conduits for CABG, data about the prevalence of preexisting atherosclerosis in these vessels are lacking. The aim of this study was to compare the incidence of preexisting atherosclerotic changes in the RA and the ITA in patients who were undergoing CABG.

**METHODS:** A total of 143 consecutive patients undergoing myocardial revascularization (CABG) were enrolled to obtain specimens of RA and ITA during surgery. Seventy-four and 123 specimens from distal segments of RA and ITA were obtained respectively for histopathological analysis. The potential risk factors for coronary artery disease including age, sex, diabetes mellitus, smoking, hypertension, peripheral vascular disease (PVD), cerebrovascular disease (CVD), and hypercholesterolemia were also evaluated.

**RESULTS:** Fifty nine (79.7%) distal radial artery segments showed atherosclerosis of any type, while 76 (61.8%) of specimens obtained from ITA's were reported to have atherosclerosis ( $P=0.002$ ). The degree of atherosclerosis was significantly different between two groups ( $P<0.001$ ). There was an increasing trend of atherosclerosis frequency up to the age of 50 years and from that point it was reversed in both groups. Uni-variate analysis of risk factors in each group separately, revealed significant association only between hypercholesterolemia and atherosclerotic changes in radial artery.

**CONCLUSIONS:** The RA has a significantly greater prevalence of intimal hyperplasia, atherosclerosis, and medial calcification than the ITA. However, all severity indices were fairly low in both the RA and the ITA. Hypercholesterolemia correlated with atherosclerosis of the RA. Other potential risk factors did not seem to be suitable criteria to prefer RA over ITA as a better conduit for CABG.  
**KEYWORDS:** Radial artery, Internal Thoracic Artery, Atherosclerosis, CABG.

#### **OP-1094-ON-TABLE [OR] EXTUBATION FOLLOWING OFF-PUMP CORONARY ARTERY BYPASS**

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**BACKGROUND:** Sedation and overnight ventilation or early extubation, i.e., extubating patients few hours following off-pump coronary artery bypass (OPCAB) are commonly practiced. One of the most consistent benefits of OPCAB is reduction of the need for post-operative ventilation. This prospective study examines whether 1. On-table [OR] extubation is feasible and routinely practiced in the majority of patients undergoing OPCAB, 2. If this practice increases post-operative complications.

**METHODS:** Between November 2005 and August 2007, 218 consecutive unselected patients undergoing OPCAB through median sternotomy under general anesthesia (GA) were included in this study. 178 were males and 40 females, age range: 40-84 Years, ( mean 59 years); age 70 years and above were 21. Our GA protocol included induction doses of thiopentone sodium, rocuronium and fentanyl citrate, maintenance doses of pancuronium or vecuronium and fentanyl with reversal by glycopyrolate and neostigmine combination. Peri-operative variables included diabetes, hypertension, COPD, renal impairment, NYHA and CCS angina class, LV ejection fraction, serial blood gas analysis, post-operative complications such as bleeding, reoperations, re-intubation and ventilation, IABP use, stroke, deep sternal infection, and in-hospital mortality. Serial arterial blood gas analysis ( po2, pco2, and o2 saturation) were performed as preop, pre-extubation [OR], ITU on transfer and ITU 4 hours and the mean values of each variables were calculated and tabulated in graphic forms.

**RESULTS:** Of 218 patients, [OR] extubation was safely feasible in 211 patients;

in 7 patients [OR] extubation was not considered because of ineffective spontaneous breathing (no =4), need for emergency conversion to cardiopulmonary bypass (no =3). There were 2 in-hospital deaths (0.9%, perioperative stroke - 1, delayed respiratory insufficiency - 1); 2 required sternal re-entry for bleeding, none had deep sternal infection or required IABP use; number of grafts = 3.4 per patient. The analysis of arterial po2, pco2 and o2 saturation revealed no significant changes between pre and postoperative results. All hospital survivors were discharged between 6 and 8 postoperative days.

**CONCLUSIONS:** 1. On table [OR] extubation can be performed in the majority of patients undergoing OPCAB through median sternotomy, 2. the technique is safe, effective, cost savings and does not increase post operative complications.

#### **OP-1095-EARLY RESULTS OF CORONARY ARTERY BYPASS SURGERY IN DIALYSIS PATIENTS**

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**BACKGROUND:** Cardiac disease is the leading cause of death in patients with chronic renal failure and in the dialysis dependent patient population. The objective of this study is to examine the short term results of Coronary Artery Bypass Surgery in this group of patients.

**METHODS:** Twenty two patients on chronic dialysis underwent coronary artery bypass surgery from June 2004 to October 2007. The surgical technique employed was identical to that in non-dialysis patients. The Cardiopulmonary bypass was performed using the Rotaflow pump. Twenty patients were male and two patients female. The age of these patients ranged from 48 to 82 years. At the time of coronary bypass thirteen patients were on Hemodialysis and nine patients were on peritoneal dialysis. The left ventricular ejection fraction (LVEF) was less than 30% in six of the patients, three patients had left main stem disease and six patients had suffered an old myocardial infarct. All of the patients had unstable angina or angina class IV. Myocardial revascularization was completed with internal mammary artery and venous grafts. Two dialysis were performed preoperatively. Dialysis was also performed on the first or second post-operative days.

**RESULTS:** Mortality rates for both the immediate postoperative period and for the follow up period of forty months to date was zero. Functional state of the patients was greatly improved and their dialysis sessions are no longer interrupted due to hypotensive episodes or angina. None of these patients have required any other cardiac interventions during the follow up period.

**CONCLUSIONS:** Our excellent short term results of coronary artery bypass surgery in dialysis patients has led us to the conclusion that CABG can and should be performed in this patient group. Even though 30-50% of patients with chronic renal failure die of cardiac causes despite cardiac revascularization surgery, our results are encouraging us to continue operating this group of patients. Longer term follow up is needed for more conclusive evidence.

## VALVES VII

### OP-1096-MINIMALLY INVASIVE VERSUS CONVENTIONAL MITRAL VALVE RECONSTRUCTION

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**BACKGROUND:** Minimally invasive mitral valve repair offers certain advantages such as reduced postoperative pain, decreased hospital stay and excellent cosmetic results. However, it is technically demanding and not every patient is suitable for this approach. This study compares intermediate-term results of mitral valve repair after either the minimally invasive approach or the conventional sternotomy and underlines the differences of the patient groups.

**METHODS:** Retrospective analysis of 237 pts who underwent isolated mitral valve (MV) repair with annuloplasty using the Colvin-Galloway Future Band between 2001 and 2005. 131 (55%) patients were operated through a minimally invasive right anterior thoracotomy (group A) and 106 (45%) through a median sternotomy (group B). Patients in group B were significantly older ( $65.4 \pm 13$  vs.  $57 \pm 12$ ), with a lower LV ejection fraction and a higher NYHA functional classification. The follow up is 99% complete (mean follow up of 230 survivors  $2 \pm 1$  years).

**RESULTS:** Overall 30-day mortality was 0.0%. Seven patients died late after an average of  $1.9 \pm 1.0$  years. Actuarial survival at 4 years in group A and B was  $94 \pm 6\%$  and  $87 \pm 6\%$ , respectively ( $p=0.037$ ). Seven patients required a MV related reoperation after  $5.6 \pm 3.6$  months. Freedom from reoperation at 4 years was  $97 \pm 1.2\%$  in group A vs.  $97 \pm 1.8\%$  in group B, respectively ( $p=0.914$ ). At latest follow-up 93.5% of the patients showed trivial or mild MV regurgitation and 86.4% were in NYHA functional class I or II, with no difference between patient groups.

**CONCLUSION:** Mitral valve annuloplasty with the CG Future Band can be performed with a very low early and late mortality and an excellent functional outcome. Minimally invasive MV surgery can be performed with similar safety as compared to the conventional approach. Patient selection however is crucial.

### OP-1097-SURGICAL TREATMENT OF ENDOCARDITIS

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**BACKGROUND:** Endocarditis represents a cardiovascular disease with high mortality. Many studies have reported a range of outcomes and various determinants of early mortality.

**METHODS:** This retrospective study (2000 -2007) wants identify the variables for early mortality in our series (31 patients) and show the results in our experience.

**RESULTS:** The mean age was 55 years, male gender predominant. 75% had native and 25 % were prosthetic endocarditis. Fever (80%) was the most common presenting symptoms, congestive heart failure the most common indications for surgery. Low embolization rate ( 16%) is observed. Vegetations were observed in more than 2/3 of the patients and blood samples were positive in the 90 % of cases. Streptococcus was the most common microorganism, but staphylococcus was prevalent in the prosthetic group. In the 20% of cases multiple localizations were observed. In the 12% of cases the operation was emergent for hemodynamic instability or uncontrolled sepsis. In the aortic group the valve was always replaced with mechanical or biological prosthesis. In the mitral group replacement was prevalent but in 1/3 of the case repair was possible. The operative mortality was 6% (2/31), 3% if we consider the left side endocarditis. Emergent and impaired Right function were associated with early mortality.

**CONCLUSION:** In our series we have good results. The usual reported variables for early death, the low left ejection fraction and prosthetic endocarditis, were not associated with early mortality. The small number of patient is the big limit of this study

### OP-1098-UNDERSIZING IN MITRAL REPLACEMENT FOR CHRONIC MITRAL REGURGITATION ACCORDING TO INTERTRIGONAL SIZE

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**BACKGROUND:** The best results in surgery for chronic mitral regurgitation (CMR) are obtained by mitral repair vs mitral replacement (MR) through sub-valvular preservation and mitral annulus reduction. Most surgeons prefer to undersize the mitral ring device, but on the contrary, they choose the biggest prosthesis for mitral replacement.

**MATERIAL AND METHOD:** In the last 5 years, 38 MR for CMR were performed, 15 of those had a mitral prosthesis size according to the inter-trigonal size (measured by standard Carpentier ring seizer holders) minus 3 (ex.: for a theoretical Carpentier ring device size 28 we use a prosthesis size 25): GI, operated by 1st author and 23 for standard prosthesis measure, GII, operated by the remaining. An observational non randomized study comparing GI vs GII was performed. In all cases posterior leaflet was preserved. Fisher's exact test was applied.

**RESULTS:** Hospital mortality: One case in GI and 3 in GII,  $p=NS$ . Regarding the low cardiac output at ICU: non amines needed: five cases in GI and none in GII,  $p<0.006$ ; low dose amines needed: ten cases in GI and 17 in GII,  $p=NS$ ; high dose amines needed: none in GI and 6 in GII,  $p<0.036$ ; IABP needed: none in GI and 3 in GII,  $p=NS$ . ICU stay: 3.8 days in GI and 9.1 days in GII,  $p<0.01$ . At the follow up, a non stenotic prosthesis was found by echo.

**CONCLUSIONS:** Waiting for a randomized study, in MR for CMR, especially in aged women and low EF patients, it might be recommendable to use undersized mitral prosthesis according to inter-trigonal size, due to ventricular remodeling secondary to reduction of the mitral annulus.

### OP-1099-18 YEARS EXPERIENCE WITH MITRAL VALVE REPAIR

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**BACKGROUND:** Mitral valve repair (MVRp) for mitral regurgitation (MR) has many advantages over mitral valve replacement. However, durability and reoperations after MVRp still remain a major problem. The aim of the present retrospective study was to analyze the outcome of MVRp and to determine the significant risk factors for death and reoperation for the period of 18 years.

**METHODS:** From June 1989 to June 2007 - 322 patients underwent MVRp for MR. The average age of the patients was 58.1 years (from 11 to 82 years). There were 122 (37.89%) female patients. In 268 patients (83.22%) preoperative NYHA class was III or IV. The ejection fraction (EF) was low (under 35%) in 70 patients (21.74%). The operation was urgent in 35 patient (10.87%) and emergency in 8 patients (2.48%). The etiology of the MR was ischemic in 152 patients (47.2%), rheumatic in 66 patients (20.5%), degenerative in 94 patients (29.2%) and endocarditis in 10 patients (3.1%). The valve pathology was annular dilatation in 155 patients (48.1%), restricted leaflet motion in 117 patients (36.3%) and valve prolapse in 104 patients (32.3%). The following operative procedures were performed: implantation of anuloplasty ring in 220 patients (68.3%), resection of posterior mitral leaflet in 89 patients (27.6%), Key technique in 60 patients (18.6%), artificial chordae in 47 patients (14.6%), Alfieri technique in 22 patients (6.8%).

**RESULTS:** Hospital mortality was 4.97% (16 patients), while the follow-up mortality was 3.3% (10 patients). Mortality among patients who underwent an emergency or urgent operation was significantly higher (20.9%, 9 of 43 patients), compared to mortality among patients, who underwent a schedule operation (2.5%; 7 of 279 patients;  $p<0.05$ ). The mortality was significantly higher in ischemic patients (8.6%; 13 of 152 patients), compared to non-ischemic patients (1.8%; 3 of 170 patients;  $p<0.05$ ). The mortality among patients with low EF (under 35%) was significantly higher (8.6%; 6 of 70 patients), compared to mortality among patients with preserved EF (3.97%; 10 of 252 patients;  $p<0.05$ ). The postoperative results were excellent (MR up to I degree) in 273 patients (84.8%), good (MR up to II degree) in 40 patients (12.4%) and bad (III degree MR) in 1 patient (0.3%). Fifteen patients (4.8%) were reoperated from 1 to 62 months after the first operation. The reoperations were more common in patients, who did not receive an anuloplasty ring

(12.7%), compared to patients who received ring (2.2%;  $p<0.05\%$ ). We found also that Key technique is an independent risk factor for reoperation.

**CONCLUSIONS:** MVRp for MR should be considered as a procedure of choice, because it shows low mortality, few complications, good functional result and low rate of reoperations. Ischemic etiology, low preoperative EF and emergency operation was found to be independent predictors of mortality and suboptimal long-term results. Suboptimal correction, Key technique and omitting to implant an anuloplasty ring were all found to be independent risk factors for reoperation.

#### OP-1100-THE FREEDOM SOLO SORIN® STENTLESS AORTIC VALVE. A PROMISING EVOLUTIONARY IMPLANT

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**BACKGROUND:** The new Solo Freedom® Stentless aortic valve proves to be convenient and effective using simple suture line. It accommodates surgeons' needs for a fast and trouble-less aortic valve implantation especially in patients with severe aortic stenosis due to calcification. Our short-term results are presented.

**METHODS:** In this case-match study 23 patients underwent primary elective either isolated or combined aortic valve replacement using the aforementioned valve between September 2006 and September 2007. The implantation method was by a supra-annular subcoronary fashion using three commissural suture lines. Cross-clamp time and mean extra-corporeal circulation time were measured. Moreover, hemodynamics were investigated upon discharge and in one, three, six and twelve months postoperatively monitoring echocardiographic mean gradients and degree of regurgitation.

**RESULTS:** Mean extra-corporeal circulation time was  $54 \text{ mins} \pm 11 \text{ mins}$  whereas it is  $63 \text{ mins} \pm 19 \text{ mins}$  for conventional biological valve implants. Cross-clamp time was significantly shorter being  $42 \text{ mins} \pm 9 \text{ mins}$  for the Solo Freedom group whereas it was  $57 \text{ mins} \pm 14 \text{ mins}$  for the conventional implants. In addition, there were no transvalvular regurgitation or paravalvular leakage in our hemodynamic investigation. Mean gradient was  $7.2 \pm 4.8 \text{ mmHg}$  in the Solo Freedom group whereas it was  $10.1 \pm 5.3$  for the conventional implants. The Solo Freedom valve proved to be specifically effective in heavily calcified aortae since its flexible rim fits best.

**CONCLUSIONS:** The Solo Freedom Stentless aortic valve shows feasibility in implantation superiority in hemodynamic results and is less time-consuming. It seems to be an effective and promising method offering an attractive option in either combined or isolated aortic valve replacement.

#### OP-1101-RECONSTRUCTION OF LEFT PART OF THE HEART FOR ISOLATED MITRAL VALVE DISEASES

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**OBJECTIVE:** To determine possibilities of correction of the left parts of the heart by preservation of MV's apparatus and reduction of LA during MVR.

**METHODS:** During 1997 - 1.07. 2007 yy. 118 adult patients (pts) were operated with mitral valve diseases (MVD) and giant LA (diameter 60 mm and more) at Institute (group A). Average age was  $51.2 \pm 6.3 \text{ yy}$ . 81 (69,1%) pts were in IY NYHA class and 40 (30,1%) in III class. There were used bileaflet prostheses ( $n=83$ ), monodisc type ( $n=35$ ) with orientation of the large margin to the posterior leaflet. LA's plasty was performed by Kawazoe's method in all pts. Preservation of posterior leaflet (all pts) and translocation of anterior leaflet's papillary muscles ( $n=65$ ) was performed together with MVR. Concomitant plasty procedure were occurred on tricuspid valve ( $n=13$ ). Anterograde St. Thomas cardioplegia and moderate hypothermia ( $27-34^\circ\text{C}$ ) were used. Cross-clamping time of aorta was  $67.4 \pm 8.2 \text{ minutes}$ . Control group (mitral insufficiency) - only MVR without preservation of MV ( $n=73$ ) (group B).

**RESULTS:** There were 2 deaths at the hospital period (hospital mortality (HM) - 1,7%) (group A). The reasons of deaths were heart failure (1), brain damage (1). There aren't any episodes of bleeding, thromboembolic events or prostheses' failure at the hospital period. At the remote period (average was  $5.3 \pm 1.4 \text{ yy}$ ) 103 (87,3%) pts were followed-up. Sinus rhythm was preserved at 51 (49,5%) pts and there weren't any deaths or unsatisfactory results. Data of

echo for group A - end-systolic volume index (ESVI) ( $\text{ml/m}^2$ ) - preoperative  $67.4 \pm 9.3$ , postoperative (7-8 dd) -  $53.4 \pm 6.2$  and at the remote period  $47.4 \pm 5.1$  and diameter of LA (mm) preoperative -  $63.2 \pm 5.4$ , postoperative -  $45.6 \pm 4.4$ , remote period -  $46.2 \pm 4.6$ . Hospital mortality in group B - 2,7% (heart failure). Data of echo for group B was occurred: ESVI - preoperative  $79.8 \pm 8.2$ , postoperative -  $72.5 \pm 8.1$  and remote period  $75.2 \pm 9.4$  and diameter of LA was preoperative -  $71.4 \pm 5.2$ , postoperative -  $66.2 \pm 6.8$ , remote period -  $72.7 \pm 8.2$ . At the remote period in group B ( $n=67$ ) there were episodes of thromboembolic events ( $n=3$ ), heart failure (HF) ( $n=7$ ). Sinus rhythm wasn't marked in any pts and there were two deaths (progressive HF), unsatisfactory results ( $n=4$  - progressive HF).

**CONCLUSION:** Reconstruction of the left part of the heart for MVD by preservation of MV and LA's plasty during MVR was allowing to improve indexes of LV's and LA's morphometry, contractility during early and at the remote period comparing with group B. There weren't any specific complications at the postoperative period in group A.

#### OP-1102-AORTIC VALVE REPLACEMENT WITH "FREEDOM SOLO" PROSTHESIS: SHORT AND MID-TERM CLINICAL AND HEMODYNAMIC RESULTS

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**BACKGROUND:** Using The Freedom Solo aortic Stentless bioprosthesis with one single-suture line simplifies implantation technique and minimizes surgical time. Its supra-annular seating results in a 100% orifice-to-annulus ratio guaranteeing excellent haemodynamic performance.

**METHODS:** Between January 2005 and December 2007, the Freedom Solo prosthesis was implanted in 173 patients (mean age  $74 \pm 8 \text{ years}$ ). Patients were followed up at 6 months and 1 year after surgery by clinical and echocardiographic examination.

**RESULTS:** Isolated aortic valve replacement was performed in 123 patients, 50 patients underwent concomitant procedure included coronary artery bypass grafting (25), mitral procedures (12), subvalvular myectomy (7) and atrial ablation (6). The logistic EuroSCORE was  $12.4 \pm 8.6\%$  and in-hospital mortality was 3.6% ( $p<0.01$ ). The valve size ranged from 19 mm to 27 mm (mean:  $24.7 \pm 2.1 \text{ mm}$ ). Mean pump time was  $61 \pm 10 \text{ min}$ , the aortic cross-clamp time was  $38 \pm 7 \text{ min}$ . Mean follow-up time was 18 months. There was no valve-related mortality. All patients were asymptomatic. Mean and peak transprosthetic gradient were  $8.7 \pm 3.2 \text{ mmHg}$  and  $17.5 \pm 6.5 \text{ mmHg}$  at 6-month follow-up ( $p$ : NS) and  $8.2 \pm 3.4 \text{ mmHg}$  and  $17.3 \pm 5.2 \text{ mmHg}$  at 1-year follow-up ( $p$ : NS). Mean EOA was  $2.0 \pm 0.6$  and EOAI was  $1.11 \pm 0.29$ . No patients had paravalvular leakage and a minimal regurgitation (central jet) was detected in 5 patients. Neither structural valve failure nor endocarditis were observed.

**CONCLUSION:** Supra-annular implantation of the Freedom Solo Stentless valve is safe and reliable with good short and mid-term clinical results and offers excellent haemodynamics.

#### OP-1103-LONG-TERM RESULTS OF THE MULTICENTRE INVESTIGATIONS PROSTHETIC HEART VALVE "CARDIAMED"

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**BACKGROUND:** "CardiaMed" goal of this study is the estimation of the prostheses mechanical valves long-term results.

**METHODS:** The retrospectively estimated clinical data of 420 patients, getting implanted a prosthetic heart valve "CardiaMed" (211 getting an aortic and 209 getting a mitral prosthetic valve). The age of the patients was from 12,3 to 78,4 y.o. ( $52.2 \pm 10.2$ ); 221 (52,6%) patients were male and 199 (47,4%) - female.

**RESULTS:** Twelve patients (2,9%) were re-explored for bleeding. Peak aortic gradient was  $25.9 \pm 9.3 \text{ mmHg}$  post operation and  $23.2 \pm 7.9$  follow-up. Mean mitral prosthetic gradient was  $4.5 \pm 1.8 \text{ mmHg}$  post operation and  $4.6 \pm 1.7$  follow-up. Level of aortic regurgitation was  $0.94 \pm 0.42$  after operation and  $1.07 \pm 0.40$  follow-up; level of mitral prosthetic regurgitation was  $0.89 \pm 0.36$  and  $1.02 \pm 0.45$  accordingly. Total actuarial survival (without 30-day mortality) was

96,3% during 5 years. Four cases of non-structural dysfunction have been reported: a perivalvular leak was found in two patients (at the day of implantation, and also a 17 month after implantation); two cases of mitral valve thrombosis (first year after implantation) - actuarial freedom from prostheses thrombosis was 99,2% (49,4±8,7 month). Freedom from thromboembolic complications was 91,2%, in two cases were central neurological events. Of these 10 occurred within the first 30 days, 8 additional within the first year after implantation. There were two cases of operated paraprothetic endocarditis during the 30-day period, total actuarial freedom from reoperation was 98,7%. Freedom from significant bleeding (connecting with anticoagulation therapy) - 99,4% during 49,4±8,7 month follow-up. Dynamics of FC (NYHA) were from 3,00±0,49 pre-operation to 1,64±0,58 - follow-up for aortic patients and from 3,19±0,50 to 2,00±0,63 accordingly for mitral patients.

**CONCLUSIONS:** The objective of this clinical investigation is to demonstrate the safety and effectiveness of the CardiaMed heart valve prosthesis as compared to currently marketed devices in Europe.

#### **OP-1104-COEXISTENT, COVERT MITRAL DISEASE IN HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY: TRAP FOR THE UNWARY DURING TRANSAORTIC SEPTAL MYECTOMY**

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**BACKGROUND:** Left ventricular outflow obstruction and mitral regurgitation in hypertrophic obstructive cardiomyopathy (HOCM) are usually attributed to systolic anterior motion (SAM) of the mitral valve (MV). Conventional wisdom warrants that effective relief of obstruction by transaortic septal myectomy (TSM) will subsequently result in resolution of mitral regurgitation(MR), even if significant.

**MATERIAL AND METHODS:** Between January 2004 and November 2007, 20 consecutive patients with HOCM and preoperative significant MR underwent TSM. We describe five patients in whom MR remained significant despite effective TSM. In all 5 patients a reparable cause of the residual MR was identified by intraoperative TEE and the MR was abolished in a second pump-run for MV repair / replacement. In 3 of them, the additional reparable lesion could have been detected by the preoperative study, in 1 patient it became apparent on the preoperative TEE only in hindsight, and in 1 patient the significance of MR became apparent only after TSM. In 2 patients mitral valve replacement had to be performed in the absence of a detectable reparable cause, or due to intraoperative evidence of organic mitral valve disease unrelated to HOCM.

**CONCLUSION:** In up to 25% of the patients with HOCM and significant MR it may be difficult to predict whether abolishing SAM by TSM may also effectively abolish MR, because of: 1) intrinsic MV abnormalities typical for HOCM - particularly leaflet redundancy; 2) changes in MV configuration following TSM and 3) the potential presence of coincidental organic MV disease. Therefore, the MV of the HOCM candidates for TSM should not only be carefully examined by preoperative TEE, but also by off-pump intraoperative TEE following TSM.

#### **OP-1105-THE FREEDOM SOLO AORTIC VALVE BIOPROSTHESIS CAUSES SEVERE POSTOPERATIVE THROMBOCYTOPENIA**

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**BACKGROUND:** Stentless bioprostheses have been considered to achieve superior hemodynamics over stented bioprostheses for aortic valve replacement and to have improved long-term performance. However, we observed significant thrombocytopenia in patients who received the Sorin Freedom Solo aortic stentless pericardial bioprosthesis within the first days after implantation. The aim of this study was to statistically prove our clinical observations.

**METHODS:** Absolute and relative platelet counts within two weeks after implantation of either a stentless (Sorin Freedom Solo) or a stented (Sorin Mitroflow) bovine pericardial bioprosthesis were compared in a matched-pairs analysis in 40 patients.

**RESULTS:** Groups were comparable regarding demographics, medication, perioperative data, and preoperative platelet count. In the Mitroflow group the mean platelet count moderately dropped to a minimum of 60% of the initial value on POD 3 and fully recovered by POD 8. In the Freedom Solo group

platelet loss was significantly more severe (minimum relative value 25% on POD 4) with no recovery during follow-up (60% on POD 13). Except the initial values absolute platelet count was higher at all time points in the Mitroflow group. This difference was statistically significant on POD 1-6, POD 8, and POD 12-13. Despite this, no bleeding complications or other morbidity occurred.

**CONCLUSIONS:** Attention has to be paid to the platelet count after implantation of the Freedom Solo bioprosthesis, especially in patients who are supposed to receive platelet inhibitors. However, the described phenomenon remains unexplained.



## CONGENITAL V

### OP-1106-ARTERIAL SWITCH FOR D-TGA, FIRST FIVE YEARS EXPERIENCE AT KACC

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**OBJECTIVE:** To review our initial experience with arterial Switch operation (ASO) in 52 patients with D-transposition of the great arteries (D-TGA).

**PATIENTS AND METHODS:** All patients with D-TGA presented to our center were managed by ASO, after initial medical stabilization. Follow up ranged from one month to five years.

**RESULTS:** The study included 115 patients over 5 years. 68% were males. Median age was 16 days. Median body weight was 3.4 kgs. Simple D-TGA was present in 59 patients. Complex D-TGA was present in the other 56. Abnormal (unusual) coronary pattern was present in 38% of patients. Sternum was left opened in three patients. Postoperative bleeding occurred in 5 patients. Concomitant coarctation repair was performed in three patient and resection of left ventricular outflow tract obstruction was performed in 4 patients. There was only one death in the simple D-TGA group. Three deaths occurred in the complex group. There was one late death because of severe sepsis. Redo for supraventricular pulmonary stenosis was performed in one patient.

**CONCLUSION:** ASO for D-TGA has very good results. Intramural coronary artery is a real surgical challenge. Left ventricular outflow tract obstruction can be addressed during ASO.

### OP-1107-FATE OF PULMONARY ARTERIES AFTER ARTERIAL SWITCH OPERATION FOR TRANSPOSITION OF GREAT ARTERIES WITH VENTRICULAR SEPTAL DEFECT

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**BACKGROUND:** Right ventricular outflow tract obstruction at the level of the pulmonary valve, pulmonary trunk or pulmonary bifurcation may occur with sufficient severity to require reintervention after arterial switch operation. We analyzed the fate of the pulmonary valve and arteries over time after arterial switch operation (ASO) in neonates with transposition of the great arteries (TGA) with ventricular septal defect (VSD).

**METHODS:** Over a period of 20 years, 150 neonates (98 males, mean age  $3.62 \pm 0.52$  days, range 1-27 days) with TGA and VSD underwent ASO using Lecompte procedure and patch closure of a hemodynamically significant VSD. Fifty-one (34%) patients had associated cardiac anomalies. Perioperative records including follow-up echo- and angio-cardiography reports were reviewed to determine the occurrence and development of pulmonary stenosis. With a pressure gradient of 20 mmHg or greater and thickening and doming, the pulmonary valve is considered stenotic.

**RESULTS:** Among 103 patients post-ASO, 42 (40.7%) developed pulmonary stenosis (28 at the pulmonary valve and 14 at the level of pulmonary bifurcation or at its branches) during a mean follow-up period of  $12.53 \pm 0.78$  years. Mean peak pressure gradients of 15 mmHg were the first sign to occur 2 months after ASO in 6 patients and became progressive, warranting intervention. The latest occurrence of pulmonary stenosis was seen in 4 patients 5 years postoperatively. Balloon dilatation was eventually done in 12 and stent implantation in another 2 patients, who developed stenosis at the pulmonary bifurcation or at the right and/or pulmonary artery. Mean pressure gradient at time of intervention was  $48 \pm 7$ , and was immediately reduced to a mean of 10-15 mmHg after the intervention. Four patients developed restenosis and eventually required surgery. Twenty-eight patients developed pulmonary valve stenosis in isolation or combined with stenosis of the pulmonary bifurcation over a mean post-ASO period of  $3.7 \pm 1.8$  years. Among these, 5 patients underwent pulmonary valve replacement with homograft, 21 had bovine jugular vein conduit and 2 had patch enlargement of the main pulmonary trunk. All did well

postoperatively. Kaplan-Meier estimate of freedom from development of pulmonary stenosis is 97% and 63% at 1 and 5 years, respectively.

**CONCLUSIONS:** This study showed that, after arterial switch operation for transposition of great arteries with ventricular septal defect, pulmonary arteries may become stenotic at the valve, trunk, bifurcation or branch level, over a period of time. The decision to use interventional dilatation or surgery is guided by the level and degree of stenosis.

### OP-1108-FREEDOM FROM REINTERVENTION AND LONG-TERM SURVIVAL IN PATIENTS WITH CONGENITAL AORTIC STENOSIS AFTER OPERATIVE COMMISSUROTOMY VERSUS BALLOON VALVULOPLASTY

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**BACKGROUND:** Congenital aortic stenosis in children is initially treated with operative commissurotomy or balloon valvuloplasty. We compared freedom from re-intervention and long-term survival after these treatments.

**METHODS:** We reviewed 180 patients with congenital aortic stenosis who received operative commissurotomy or balloon valvuloplasty at our institution between 1984 and 2006. Number of reinterventions, time to reintervention, and survival were compared (Kaplan-Meier).

**RESULTS:** Mean age was 4.67 (range 0-20.51) years at first intervention. First intervention was operative commissurotomy in 56 patients and balloon valvuloplasty in 124 patients at mean age of 6.80 (range 0-19.29) and 3.74 (range 0-20.51) years, respectively. In the operative commissurotomy group, 2 received a second operative commissurotomy, 9 received balloon valvuloplasty and 26 aortic valve replacement as a second intervention. In the balloon valvuloplasty group, 22 received a second balloon valvuloplasty, 6 received operative commissurotomy and 21 aortic valve replacement as a second intervention. There were 16 deaths, 5 in operative commissurotomy group and 11 in balloon valvuloplasty group during follow-up. After operative commissurotomy 1, 5 and 10-year freedom from second intervention was  $92.8 \pm 3.5\%$ ,  $54.5 \pm 7.0\%$  and  $42.1 \pm 7.0\%$ . After balloon valvuloplasty 1, 5 and 10-year freedom from second intervention was  $79.2 \pm 3.7\%$ ,  $56.2 \pm 5.0\%$  and  $50.5 \pm 5.3\%$ . One, 5 and 10-year survival after operative commissurotomy was  $89.7 \pm 4.0\%$ ,  $86.9 \pm 4.7\%$  and  $84.2 \pm 4.9\%$ . One, 5 and 10-year survival after balloon valvuloplasty was  $88.7 \pm 2.8\%$ ,  $88.7 \pm 2.8\%$  and  $84.6 \pm 3.5\%$ .

**CONCLUSION:** In the first year after intervention there is a higher rate of reinterventions in the balloon valvuloplasty group. However, there were no significant differences between the operative commissurotomy and balloon valvuloplasty group in survival time (log rank 0.63) or freedom from re-intervention (log rank 0.64), despite older age in the operative commissurotomy group.

### OP-1109-RECONSTRUCTION OF PULMONARY VALVE WITH CONTEGRA™ CONDUIT DURING RIGHT VENTRICULAR OUTFLOW TRACT REPAIR: EXCELLENT SHORT TERM OUTCOME

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**BACKGROUND:** Standard procedure for right ventricular outflow tract (RVOT) obstruction repair in the context of an existent, yet obstructive, pulmonary valve (PV) includes the division of the PV and the use of a transannular patch resulting in a variable degree of pulmonary insufficiency (PI). Artificial pericardial or synthetic monocusp "valves" are been constructed and implanted to protect the right ventricle from high degree of regurgitation at least for the early post-operative period in selected cases. Our strategy is to restore the integrity of the PV in all patients requiring a transannular patch utilising the biological conduit Contegra™. Herein we present our results.

**METHODS:** From April 2002 to September 2007, 31 consecutive patients aged 9 months to 14 years underwent implantation of part of a Contegra™ conduit containing one or two cusps of its valve in order to relieve RVOT obstruction and restore the integrity of the PV. Diagnoses/procedures included tetralogy of Fallot repair in 29 and double outlet right ventricle (DORV) with pulmonary

stenosis (PS) in 2 patients. All patients received aspirin prophylaxis postoperatively.

**RESULTS:** No death occurred. Early postoperative echocardiography did not reveal any evidence of thrombus formation in the conduit. Mean pressure gradient across the reconstructed PV was  $18 \pm 7$  mmHg and median regurgitation grade 0 (mean  $0.6 \pm 0.5$ ). All patients made an excellent postoperative recovery. Median ICU and hospital stay was 3 and 9 days respectively.

**CONCLUSIONS:** Restoring PV integrity with a Contegra™ conduit showed excellent early postoperative results. The long term benefit of this strategy remains to be determined.

## OP-1110-APPLICATION OF HTK SOLUTION FOR MYOCARDIAL PROTECTION IN INFANTS

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**BACKGROUND:** This study was undertaken to evaluate the myocardial protection with HTK-solution during complete repair of congenital heart diseases relying on clinical, biochemical and morphological data.

**METHODS:** Forty patients underwent complete repair in 2001 are included in this research work. The mean age was  $10 \pm 1.9$  months, mean weight was  $8 \pm 1.5$  kg. Twenty two patients (55%) had a tetralogy of Fallot; nine patients (22.5 %) had the complete form of atrioventricular communication; eight patients (20 %) had a double outlet right ventricle and one patient (2.5%) had a pulmonary artery atresia, I type. Clinical data, biochemical and morphological markers of hypoxia were used for evaluation of myocardial protection efficiency. The biochemical analysis was performed by express method. The samples of arterial blood, blood from coronary sinus and vein were obtained at the following stages: 1 - initial data; 2 - beginning CPB before cardioplegia; 3 - after aortic crossclamp removal; 4 - in 20-30 min of reperfusion; 5 - in 50-60 min after aortic crossclamp removal. Factor of oxygen extraction and consumption of oxygen were calculated according to following formulas: consumption of  $\Sigma = (\text{SaO}_2 - \text{SvO}_2) / \text{SaO}_2$ ; extraction of  $\Sigma = (\text{ml O}_2 / 100 \text{ g/min}) = (\text{Nb}_1 \cdot 1.34 \cdot ((\text{SaO}_2 - \text{SvO}_2) / 100) + (\text{PaO}_2 - \text{PvO}_2) \cdot 0.3 / 100$ ; The specimens for electron microscopic examination were obtained from a right ventricle by a special needle (Dispomed, USA) at the following stages of procedure: 1- initiation of CPB before cardioplegia; 2 - through 20-30 min of reperfusion. A 5-mark scale were used to evaluate a visual parameter of a mitochondrial status - mitochondrial index, which defines density of mitochondrial cristae packing and status of mitochondrial matrix (5 - closely laying cristae, dense matrix, 4 - closely laying cristae, lucent matrix, 3 - loosely laying cristae, lucent matrix, 2 - a furnace divergence of cristae, lucent matrix, 1- separately laying cristae, lucent matrix). The glycogen particles quantity in cardiomyocytes were evaluated on a 6-mark scale (5, 4, 3, 2- accordingly high, significant, moderate and low quantity, 1 and 0 - accordingly solitary glycogen particles and its absence).

**RESULTS:** Carried out the analysis of biochemical and morphological hypoxia markers dynamics, we have not found out features of expressed myocardial hypoxic metabolism in the majority of cases. The clinical data conformed to it. There was spontaneous recovery of heart activity in 90%, these patients required only in moderate inotropic support. We observed the satisfactory ejection fraction and acceptable mortality. The initial glycogen particles quantity in cardiomyocytes was  $2.85 \pm 0.12$  and a mitochondrial index was  $4.27 \pm 0.26$ . The glycogen particles quantity ( $2.87 \pm 0.24$ ) and mitochondrial index ( $4.22 \pm 0.26$ ) didn't significantly differ after reperfusion compared to initial data. At the same time, the personal analysis of ultrastructural changes in cardiomyocytes during operation demonstrated, that significant decreasing of glycogen particles quantity and mitochondrial index was marked only in one case, when the aortic crossclamping time was most long (76 min). The ultrastructural data according to intraoperative biopsies analysis demonstrate the absence of ischemic injury during reperfusion in comparison with initial data. These parameters as well as the biochemical data demonstrate the absence of ischemic injury during complete repair.

**CONCLUSIONS:** Thus, the introduced protocol of a myocardial protection efficiency evaluation allows not only according to indirect parameters of postoperative period to judge about probable perioperative myocardial injury, but also to evaluate myocardial metabolism and ultrastructure at the most important stages of operative intervention.

## OP-1111-ATRIOVENTRICULAR SEPTAL DEFECT REPAIR WITH TWO PATCH TECHNIQUE AND MITRAL CLEFT CLOSURE

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**BACKGROUND:** Controversy continues to surround determining which is the most beneficial method of complete atrioventricular septal defect repair, eg, one- versus two-patch repair, closure of mitral cleft, and the necessity of annuloplasty.

**METHODS:** Between January 1995 and December 2007, 120 patients with complete atrioventricular septal defect underwent total correction at the Cardiac surgery department chest diseases hospital, Kuwait. Sixty-nine of the patients were infants and 51 were children or adolescents. Eleven patients had previously undergone pulmonary artery banding. One hundred three patients had Down's syndrome. In all 120 patients complete atrioventricular septal defect repair was performed using the two-patch technique. The mitral cleft was closed with interrupted sutures in 119 cases.

**RESULTS:** Thirty-four patients required aggressive treatment of postoperative pulmonary hypertensive crises (including nitric oxide inhalation). There were 2 hospital deaths (2.4%). Mortality was highest in patients with persistently high postoperative pulmonary arterial pressure (pulmonary artery pressure/systemic artery pressure  $> 0.6$ ) (2 of 17 patients died; 41%). Associated atrioventricular valve anomalies, especially dysplastic valve tissue and severe preoperative cardiopulmonary instability necessitating catecholamine support and artificial ventilation, represented other risk factors. There were no late deaths. Four patients suffered a complete heart block and sick sinus node syndrome necessitating pacemaker implantation 1 to 6 months after operation. During the follow-up period (3 to 80 months after operation), 7 patients (6.8% of survivors) were successfully reoperated on after significant mitral valve incompetence due to an open "cleft" (suture failure) developed.

**CONCLUSIONS:** Correcting complete atrioventricular septal defect using the two-patch technique, routine cleft closure, and atrial septal incision led to a low incidence of residual mitral valve incompetence. Mortality was primarily influenced by severe cardiopulmonary instability and additional atrioventricular valve anomalies preoperatively and the persistence of high pulmonary arterial hypertension postoperatively.

## OP-1112-EARLY AND MID-TERM RESULTS OF EBSTEIN ANOMALY REPAIR

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**BACKGROUND:** Ebstein anomaly is the downward displacement and adherence of dysplastic septal and posterior tricuspid leaflets into the right ventricle, thereby dividing the ventricle into a so-called atrialized chamber and a functionally reduced right ventricle. We evaluated the early and mid-term results of primary repair of Ebstein anomaly in adult patients.

**METHODS:** Between January 1997 and July 2004, twelve consecutive patients who underwent repair of Ebstein anomaly with Danielson technique, were evaluated at Imam Khomeini Medical Center, Tehran, Iran. Functional and echocardiographic parameters were studied both preoperatively and postoperatively, as well as demographic status and adverse events.

**RESULTS:** Hospital mortality occurred in one patient because of right ventricular failure. The average follow-up period was  $5.3 \pm 3.4$  years (median: 3.8 years). The actuarial survival rate was  $85.7 \pm 4.8\%$  at 7 years. During the follow-up, nine patients were in New York Heart Association functional class I, and two patients were in class II. None of the patients required reoperation related to their Ebstein repair. One patient demonstrated atrioventricular dissociation perioperatively; however, only one patient required permanent pacemaker insertion later. Two patients had minimal (1+) tricuspid regurgitation, with the jet localized along the anterior part of the ventricular septum. Two patients had residual tricuspid valve insufficiency (2+) on echocardiography. Mild tricuspid stenosis was found in one of our patients. Valve replacement was performed in two patients.

**CONCLUSION:** Ebstein repair has a good functional and hemodynamic outcome in adult patients.

### OP-1113-REOPERATION FOR AN OCCLUDED LIMA-LAD BYPASS GRAFT FOLLOWING ARTERIAL SWITCH OPERATION IN A FIVE YEAR OLD BOY

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**INTRODUCTION:** CABG is an uncommon operation in the pediatric population. Previous case reports on this topic are mostly related to patients with kawasaki disease or iatrogenic coronary injuries during an arterial switch operation. The former group includes the vast majority of the cases. In patients with intramural coronary arteries, coronary button transfer and transection of the aorta are the most critical stages of the arterial switch operation in point of view of coronary artery injury. We herein report a reoperation of occluded LIMA-LAD bypass with RIMA graft to LAD in a child who had had an arterial switch operation 5 years before.

**CASE REPORT:** A five year old boy was admitted to our institution with complaint of chest pain following exercise. The patient had underwent arterial switch operation in the fourth day of life for transposition of the great arteries. Five years ago peroperatively patient's left anterior descending artery had been injured during transection of the aorta because of its intramural course. After than LIMA-LAD anastomosis had been performed. Postoperative course was uneventful. During his second admission, a coronary angiography was performed and the LIMA-LAD graft was found to be occluded. Patient's blood count, platelet function tests, coagulation tests, Protein C and S levels were all within the normal ranges. Patient underwent a reoperation and this time RIMA was anastomosed to LAD in the usual fashion. Anginal symptoms ceased and the myocard perfusion scintigraphy demonstrated no ischemic area 3 months postoperatively.

**CONCLUSION:** Patency of coronary artery bypass grafts is a major pitfall for CABG. For the pediatric patient surgeons should evaluate all details to achieve the best outcomes. IMA is the most reliable graft with proved excellent patency rates. In our case we also preferred IMA graft for its long term patency. But five years later graft was occluded. The diameter of left anterior descending artery in the neonatal period, native arteries run-off, patients heart rate and antithrombotic therapy may all play major roles in graft patency. We considered the RIMA graft as the best option and anastomosed it to the LAD which was enlarged with the patient naturally. We added clopidogrel to our therapy regimen together with ASA, sotalol and digoxin. In conclusion although IMA's are the best vessels with excellent long term patency rates, graft occlusion possibility should never be forgotten. Exercise test, multi-slice CT angiography, conventional coronary angiography and myocardial scintigraphy are effective modalities for the follow-up of myocardial perfusion after pediatric aorto-coronary bypass and arterial switch operations.

### OP-1114-CHANGES IN HISTOLOGY OF NEONATAL KIDNEYS AFTER CARDIOPULMONARY BYPASS

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**BACKGROUND:** Renal failure after open-heart surgery is a serious complication increasing postoperative mortality and morbidity. The aim of the study was to find out if use of cardiopulmonary bypass results in histologic differences of kidneys in a neonatal animal model.

**METHODS:** Kidneys of newborn piglets were histologic examined after use of mild hypothermic cardiopulmonary bypass (CPB group; n=10) and after surgery without cardiopulmonary bypass (sham; n=3). The findings were compared with normal neonatal kidneys (control; n=6). Severity of tissue damage was scored by a 4-grade system (0: normal morphology, 3: severe damage) regarding tubular dilation, vacuoles, leucocyte infiltration, epithelial destruction, and interstitial edema. Additionally, apoptotic cells and granulocytes were counted.

**RESULTS:** Histologic score was higher in CPB and sham group compared with control ( $p<0.05$ ). More apoptotic cells were found in CPB group compared with control ( $7.9\pm6.5$  vs.  $0.8\pm1.2$ ,  $p<0.05$ ) and also the granulocytes count was higher in CPB group compared with control ( $30.6\pm20.4$  vs.  $6.7\pm3.3$ ,  $p<0.05$ ).

**CONCLUSIONS:** Our study revealed that although changes in renal tissue of

newborn piglets are detected after any cardiac procedure, this changes are more profound after use of cardiopulmonary bypass.

### OP-1115-MINISUBMAMMARY APPROACH FOR ATRIAL SEPTAL DEFECT CLOSURE ON FIBRILLATING PERFUSED HEART

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**BACKGROUND:** In females impaired breast development after an anterolateral thoracotomy is reported, and for both the posterolateral and the anterolateral approach, partial transection of large muscle groups is required. The midaxillary approach may help to avoid these side effects and improve the cosmetic result in prepubertal group. We had all our patients over 18 years of age for Submammary approach.

**METHODS:** Between September, 1997 and December, 2007, thirty-nine female patients age ranging 18 to 44, (mean 23) underwent ASD closure on fibrillating, perfused heart, through nine cms long right submammary incision. Aortic cannulation was done by placing cannula through third right intercostals space through the same incision. Bicaaval cannulation was routine in all. Femoral cannulation was avoided in all with good exposure of Atrial Septal defect. In 32 cases it was Secundum type, five had Sinus Venosus type, and 2 had Septum Primum type of defect. Closed using Autologous Pericardial Patch not treated with Gluteraldehyde in Thirty patients, while Direct suture closure was possible in nine patients. Two patients required Mitral Valve repair. Only one multiperforated drain was left draining both right pleural and pericardial cavity.

**RESULTS:** No early or late deaths. All the patients were extubated on table or in first four hours. Average blood loss was 185 ML. No patient received any Bank blood transfusion. One to two units of autologous blood collected in operating room, was transfused back. They were delined in next 24 hours and shifted to ward or room thereafter. Mean ICU stay was 25.5 hours. Hospital stay varied from 4 to 7 days. Postoperative pain was more than sternotomy patients in (first 6 cases). All had been injected local anaesthesia in intercostals spaces, given choice of epidural or PCA. No patient developed cardiac arrhythmia or heart block. Follow-up ranged 1 year to 10 years, mean 5.2, total of 249 patient years. All females were happy to have small bikini hidden scar and they all and husbands of married females, were satisfied 9 out of 10 scale. No patient developed any scar complication such as infection or keloid formation. Followup Echocardiography shown no residual defect or mitral valve leak.

**CONCLUSIONS:** Mini Right Submammary trans axillary approach in females gives excellent exposure to close ASD, with satisfactory cosmetic results.

### OP-1116-OFF-PUMP FONTAN IN COMPLEX SINGLE VENTRICLE

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**BACKGROUND:** Fontan operation is usually performed with cardiopulmonary bypass. Extra-cardiac Fontan operation has advantages when compared to the conventional Fontan procedure. Also it can be performed off-pump. Off-pump Fontan is challenging in patients requiring pulmonary arterioplasty especially due to previous central shunt operations performed by median sternotomy and to the right pulmonary artery.

**METHODS:** We present our 16-patient series with off-pump fontan procedure at our institution.

**RESULTS:** Our patients included 5 patients who required pulmonary arterioplasty. All the patients underwent successful extra-cardiac Fontan procedure without cardiopulmonary bypass.

**CONCLUSIONS:** Off-pump Fontan can be performed in patients who do not require intra-cardiac surgical interventions. Extensive pulmonary arterioplasty can also be executed with off-pump technique.

**OP-1117-CLEFT CLOSURE AND UNDERSIZING ANNULOPLASTY  
IMPROVE MITRAL REPAIR IN ATRIOVENTRICULAR CANAL  
DEFECTS**

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**BACKGROUND:** Reconstructing a competent left atrioventricular valve (Mitral) from the common orifice valve in complete atrioventricular canal defects is a challenging surgical procedure. More than 30% of these patients have regurgitation through the reconstructed mitral valve and reoperation rates to correct this recurrent regurgitation remain disconcertingly high. The causes of valvular regurgitation are likely multi-factorial and simple cleft closure is often insufficient to prevent recurrence.

**METHODS:** To elucidate the mechanisms leading to regurgitation after primary repair, we conducted hemodynamic studies using isolated native mitral valves. Anatomy of these valves was altered to mimic atrioventricular canal type valves and studied under pediatric hemodynamic conditions. The impact of sub-valvular geometry, cleft closure, annular dilatation and annular undersizing on regurgitation were investigated.

**RESULTS:** Papillary muscle position did not have a significant effect on regurgitation. Cleft closure had a significant impact on valvular competence, with reduced regurgitation volume with increased cleft closure. Regurgitation volume decreased from  $12.5 \pm 2.4$  ml/beat for an open cleft to  $4.9 \pm 1.9$  ml/beat for a partially closed cleft and to  $1.4 \pm 1.6$  ml/beat when the cleft was completely closed. Annular dilatation had a significant impact on regurgitation even after cleft closure. A 40% increase in annulus from its physiological size increased regurgitation by 59% for a partially closed cleft and by 84% for a fully closed cleft. Reducing the annular size by 20% from the physiological level decreased the regurgitation volume by 12% for a fully open cleft and by 58% for the partially closed cleft case.

**CONCLUSIONS:** Annular dilatation after primary repair has a potentially significant role in the recurrence of atrioventricular valve regurgitation. Reducing the annular size and restricting dilatation as an adjunct to cleft closure is a promising surgical approach in such valve anatomies.



## CONGESTIVE HEART FAILURE SURGERY I

### OP-1118-MITRAL VALVE REPAIR IN SEVERE HEART FAILURE PATIENTS: IS THERE A CUT OFF?

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**SUBJECTIVE:** To analyze outcome of mitral valve repair (MVR) for high grade mitral regurgitation (MR) in patients with left ventricular ejection fraction (LVEF) <35% and identify potential risk factors for surgery.

**METHODS:** In such a cohort 49 patients underwent MVR at our center between 01/02 and 12/06. In group I (Gr. I) 10 patients had a LVEF  $\leq$  20% (age 66.6  $\pm$  7 years; LVEDD 70  $\pm$  8 mm; NYHA 3.6  $\pm$  0.8), in group II (Gr. II) 39 patients had a LVEF 20-35% (age 65.3  $\pm$  10 years; LVEDD 65  $\pm$  12 mm; NYHA 3.3  $\pm$  1). Concomitant revascularization (ACB) due to ischemic cardiomyopathy was performed in 67% (n=33) (5 in Gr. I, 28 in Gr. II, p=n.s.) plus 4 additional Dor procedures (n=2 in each group).

**RESULTS:** Overall follow up was 38  $\pm$  16 months. Temporary IABP support required 4/10 patients in Gr. I vs. 5/39 in Gr. II (p<0.05). Perioperative and 3 year survival was 90% and 70% in Gr. I, 92% and 82% in Gr. II respectively. All perioperative deaths (n=4) occurred in patients with ACB. NYHA class improved in Gr. I to 2.4  $\pm$  1.4 and to 2.2  $\pm$  1.2 in Gr. II (p=n.s.). One patient in Gr. I (10%) and 2 patients in Gr. II (5.6%) deteriorated again after initial improvement and underwent successful heart transplant during follow up.

**CONCLUSION:** MVR is a successful treatment for patients in severe heart failure with MR. Low LVEF (< 20%) is not a limiting factor. Ischemic etiology increased perioperative risk.

### OP-1119-VOLUMETRIC AND FUNCTIONAL CHANGES OF RIGHT VENTRICLE AS A PREDICTOR OF OUTCOME IN POST SURGICAL VENTRICULAR RESTORATION IN DILATED CARDIOMYOPATHY -- STUDY OF 40 CASES

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**BACKGROUND:** Restoring the size and shape of left ventricle (SVR) has recently given new direction to the field of DCM along with the CABG, if associated with CAD. But still morbidity and mortality is very high. In SVR, geometry of the LV is modified and restored near normal. We rarely focus on the RV function and volume status. It is difficult to calculate the RV Function and Volume just by studying 2D Echo. In this study we have correlated the RV volume and functional changes post SVR with echocardiography finding and RV volumetric and functional relation & relevance to outcome. Measurement of right ventricle volume is available with CCO /CEDV (continuous CO and end diastolic volume measurement) Catheter, (Edwards Lifesciences Inc). Satisfactory inference of right ventricle volume has been proven by this catheter.

**METHOD:** After IRB approval, we studied 40 cases posted for SVR with or without CABG. EF was <35%, LV EDV >180 ml, LVESV >120 ml. 7 patients without CAD, required only SVR, 4 patients required Mitral valve replacement for MR. Rest required some form of mitral valve repair along with SVR and CABG. After endotracheal intubation, TEE probe was introduced and CCO/CEDV catheter was inserted. With TEE, we measured LVEDV, LVESV, mitral valve status, LV dyskinetic segments, ventricular septum motion, RV function and TR. Due to different geometry of the RV, RV volume measurement is not possible by ECHO. We measured RV EDV, RV ESV, RV Stroke volume, RVEF, RVCO, by CEDV Catheter on vigilance monitor (Edwards Lifesciences). After completion of SVR, we measured all parameters and compared data pre and post SVR and also in ICU. We used TTE in ICU. Inotropes were IV Dobutamine, infusion up to 10 mcg/kg/min, in adrenaline infusion when required. IABP was inserted if EF <20 or severe biventricular failure.

**RESULTS:** Pre SVR - RVCO & RVEF was correlating very well with TEE findings for LV, but LVEDV & LVESV was less than PRE-OP ECHO...this may be due to vasodilators and anesthetic agent effects to reduce vascular resistance. Immediate Post SVR - LVEDV and EF was much improved, but RVEDV, RVESV, RVCO, RVEF, was fluctuating. There were two groups of patients: Group (A) (RVEDV, PAP-S, PCWP), EF 20-30%, SV >40ml - RV diastolic dysfunction - 18 patients / 40 patients Group (B). (RVEDV, RVESV, PAP-D, PCWP), EF <20%, SV <30ml - RV SYSTOLIC & diastolic Dysfunction --- 4 patients. 40 patients Group (A) had long ICU stay and highly morbid condition. Up to 12 days stay. Group (B) had high mortality chances, all died. Rest 18 patients discharged from ICU and subsequently home as per routine.

**CONCLUSION:** There is a role of RV volumetric parameters in predicting outcome. SVR itself is high risk procedure but if RV function is fair then chances of survival is good but associated severe RV diastolic dysfunction carries high risk & along with systolic dysfunction also mortality is very high. Measuring the RV Parameters preoperatively should be done for better management and predicting the outcome.

### OP-1120-IMPACT OF GEOFORM RING ANNULOPLASTY FOR ISCHAEMIC MITRAL REGURGITATION ON LEFT VENTRICULAR PARAMETERS AND PATIENT OUTCOME

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**BACKGROUND:** For Ischaemic / functional Mitral regurgitation (IMR) various annuloplasty rings have been used with varying short term and long term benefit. As IMR is not just because of annular dilatation, a ring which can remodel the left ventricle along with reducing annuloplasty would be a better option. Geoform ring (Edward) which is a dog bone shaped ring is designed for above purpose. We intended to study which patient benefited the most and what was the changes in the LV anatomy after implanting this ring.

**METHODS:** After an IRB approval 37 patients were studied prospectively. One patient was of Idiopathic dilated cardiomyopathy and rest Ischaemic dilated cardiomyopathy. All patients had grade 3/4-4/4 Mitral regurgitation, with no valvular structural pathology, with EF 25  $\pm$  7, LVIDd of 60  $\pm$  8 mm, LVEDV were 180  $\pm$  54 ml. A 26/28 mm Geoform ring was used in all patients. After preparing medically according to standard protocol 2D TTE was done preoperatively and various parameters evaluated which were EF, PAH, MR Grading, EROA, regurgitant Volume ratio, annular diameter, coaptation length, coaptation area, interpapillary distance, vena contracta, leaflet movement, LV Volumes, LV Dimensions, segmental wall motion abnormality. Same parameters were observed postoperatively (TEE), at 8 days, 3, 6 months. CABG was done in all except one patient.

**RESULTS:** There was one, 30-day mortality and other 1 died in followup. We have follow up of 2 years. All surviving patients were in NYHA class 1-2, with increase in EF of 7-18% and no recurrence in MR. Patients who had significant benefit were having inferolateral MI, with spared antero-septal wall and there was gradual reduction in LV basal dimensions (5.6 mm), LV Volumes (46.4 ml), interpapillary distance (30%), and increase in coaptation distance, Coaptation area (58.8%), improvement in segmental wall motion, over a period of 6 months in these patients. No LVOT obstruction and mitral stenosis was seen, only high velocity at the orifice was observed. In few patients there was persistent leak from posterolateral commissural which was rectified by lateral Elferi stitch. No rehospitalization for dyspnoea or failure.

**CONCLUSION:** Our experience shows that Geoform ring improved overall clinical outcomes with echocardiographic finding in suitable and well selected ischaemic dilated cardiomyopathy patients.

### OP-1121-SURGICAL VENTRICULAR RESTORATION IN PATIENTS WITH ISCHEMIC CONGESTIVE HEART FAILURE - 5 YEAR RESULTS

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**BACKGROUND:** SVR is increasingly performed for ICHF. We report our five year results with different surgical reconstructions and two different methods of myocardial protection.

**METHODS:** Between February 2002 and May 2007, 170 consecutive patients underwent SVR, of whom 101 with ICHF, NYHA- class III- IV and EF< 35% were selected for this study. The patients are divided in two groups: Group I -55 pts with vented fibrillating heart, Group II - 46 pts with cardioplegic arrest (ante/retrograde cold blood cardioplegia). The patients in both groups have similar pre- and intra-operative parameters. Euroscore averaged 9,8 (6,8- 27,9). Two surgical techniques were used: Dor procedure in 65 patients and linear resection in 36 patients. Concomitant to SVR, mitral valve reconstructions, LV septoplasty, CABG and tromboectomy have been performed in 13 (12,8%), 13 (12,8%), 97 (96%) and 44 (43,5%) patients, respectively.

**RESULTS:** Mean follow-up was  $27 \pm 21$  months. The operative mortality was 7,9%. In both groups EF improved from 28% to 38%, NYHA-class was reduced from 3,3 to 1,5, LVEDV was reduced by  $62 \pm 43$  ml and LVESV- by  $55 \pm 47$  ml post-operatively. Significant differences between Group I and Group II were found in the use of inotropes 60% versus 84%, use of IABP 25,4% versus 43,4%, occurrence of POMI 7,2% versus 28%, duration of mechanical ventilation 23,6 versus 47,9 hours and length of hospital stay 8,8 versus 12,8 days. No difference was found between the Dor procedure and linear resection in terms of mortality, NYHA class and LV volume reduction. There were no neurological complications in both groups.

**CONCLUSIONS:** SVR shows good results for the treatment of patients with ICHF and EF< 35%. The method of vented fibrillating heart showed lower occurrence of LCO and POMI, and significantly shorter duration of mechanical ventilation and length of hospital stay in comparison to the method of cardioplegic arrest.

#### OP-1122-DOES THE APPLICATION OF ELECTRICAL MICRO-CURRENT HEAL HEART FAILURE? FIRST PRE-CLINICAL RESULTS

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**BACKGROUND:** It has been shown that unloading of hearts by mechanical cardiac assist devices leads to improvement of the heart's function to a variable extent. Improvement by mechanical unloading fails if the extracellular matrix (ECM) has been remodelled extensively. Thus, the limiting factors for improvement of cardiac function are not the recovery of the function of the myocytes but most probably the extracellular matrix. The goal of the in-vivo experiments described here is to investigate the effect of electrical microcurrent (MC) on the ECM and as a consequence on healing of heart failure. As previously published, MC is able to modify the myocardium (collagen, MMPs, TIMPs) of spontaneously hypertensive rats (SHR) under in-vitro conditions.

**MATERIALS AND METHODS:** Two patch electrodes were surgically placed around the heart of SHR covering the right and the left hearts epicardium. MC was applied over a period of 5 days. Thereafter, parameter of the ECM of the myocardium was analysed and compared to the myocardium from wild type rats (WKY) and SHR without previous MC application. Gene expression (quantitative PCR) was measured for MMP 2, 3, 8, 9, 13, 14, 16; TIMP 1, 2, 3, 4; connexin 40, 43, 45 and collagen I and III and eventually the level of IL-6.

**RESULTS:** Compared to the myocardium of WKY, the myocardium of SHR without previous MC application showed a significantly higher level of MMP 3, significant lower level of MMP 8, 14, 16 and an unchanged level of MMP 2 and 13. The TIMPs and connexins were only marginally altered. Collagen I showed an upregulation of 40 %. After MC application, MMP 2, 3, 9, 13, 14 and 16 were significantly up-regulated, MMP 8 remained unchanged, and most importantly, collagen I up-regulated by a factor of 2.5. All other analysed parameters were not altered significantly by MC application. The gene expression level of IL-6 was significantly downregulated.

**CONCLUSIONS:** MC application regulates MMPs as well as collagen I on the gene level and normalizes the ECM of hearts in a progressed state of failure. Interestingly, the proinflammatory IL-6 was significantly downregulated. MC application initializes a process towards healing of the diseased myocardium.

#### OP-1123-MANAGEMENT OF HIGH RISK ISCHEMIC PATIENTS REQUIRING THREE OR MORE CONCOMITANT OPEN HEART PROCEDURES

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**BACKGROUND:** In clinical practice of every cardiac surgeon there is a group of patients older than 66 years with high NYHA functional class, poor ejection fraction (EF) (under 35%) and three or more concomitant heart lesions. Since these patients are contraindicated for heart transplantation the major question is how to manage this group of high-risk patients?

**PATIENTS AND METHODS:** Between June 2000 and July 2007 we treat surgically 37 patients who require at least three concomitant heart procedures: coronary arterial bypass grafting (CABG), mitral valve repair (or replacement) and left ventricle restoration. The average age of the patient was 62.62 years (from 38 to 77 years). There were 26 male and 11 female individuals. All patients were with high NYHA class - 24 patients were NYHA class III and 13 patients were NYHA class IV. The mean EF was 34.78%. During the same period we have 17 patients who require the same surgical management, refusing operation. We followed up these patients in order to study their natural history.

**RESULTS:** The hospital mortality of operated patients was 13.5%. After a statistical analysis we were able to demonstrate that following factors increase the risk of hospital death: older age, emergency operation, unstable angina pectoris, preoperative renal failure, preoperative intra aortic balloon pump (IABP), longer operation, postoperative "open chest", postoperative shock, requiring considerable inotropic support and IABP, postoperative ventricular tachycardia/ventricular fibrillation (VT/VF) which require cardiopulmonary resuscitation (CPR), severe postoperative bleeding, prolonged mechanical ventilation, postoperative pneumonia, postoperative continuous veno-venous hemofiltration (CVVH). The 6 months follow up mortality was 28.1%. As a comparison the 6 months mortality in group of non operated patients was 88%. It was influenced by following factors: chronic obstructive pulmonary disease (COPD), peripheral vascular disease (PVD), perioperative myocardial infarction, postoperative shock, requiring considerable inotropic support and IABP, postoperative CVVH, postoperative VT/VF, severe postoperative bleeding. Our analysis shows also that myocardial management with heart fibrillation results in lower mortality and morbidity, compared to mortality and morbidity in patients operated on with cardioplegia. However the results did not reach statistical significance.

**CONCLUSIONS:** Our experience shows that cardiac surgery could be performed with acceptable risk in patients with ischemic heart disease, who require three or more concomitant procedures and who are contraindicated for heart transplantation. We also show that heart fibrillation is a suitable method for myocardial protection in such high-risk patients, because it reduces the postoperative mortality and morbidity.

#### OP-1124-IMPROVED RESULTS OF SURGERY FOR ISCHEMIC HEART FAILURE USING A NEW TECHNIQUE OF VENTRICULAR RESTORATION. PRELIMINARY RESULTS

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**BACKGROUND:** Surgical ventricular restoration (SVR) in cases of post-ischemic left ventricular dilatation is gaining popularity as the treatment of choice for selected categories of patients. The modified Dor operation is the basic technique adopted by the majority of surgeons to achieve the left ventricular volume reduction. With the aim of further improve the clinical results in this complex subset of patients, a substantial modification of the Dor procedure has been recently introduced in our practice.

**METHODS:** The technique varies from the original one because the endoventricular purse string is no longer circumferential. This modification should better preserve the diastolic function of the residual vital myocardium. Furthermore, by reducing the transverse diameter of the chamber by placing a second purse string at the equatorial zone, the risk of progressive dilatation should be partially eliminated. Between 2003 and Dec. 2006 45 patients (pts) affected by ischemic myocardiopathy received an operation of SVR at our unit, along with myocardial revascularization. The majority of pts were male (90%). We divided the pts in two groups: the first 26 pts (group A) underwent a classical SVR. The remaining 19 pts (group B) were treated according to the modified surgical protocol. Mitral reductive anuloplasty was associated in 68% of pts in

group A and in 58% of pts in group B. The mean age at operation was 67 yrs in group A, and 61 yrs in group B. Patients with ejection fraction less than 30% were 80% in group A and 90% in group B. There was no statistical difference between the groups as regard as ventricular end-diastolic diameters, end systolic volumes, and the presence of moderate to severe mitral incompetence.

**RESULTS:** Early mortality was 7,6% ( 3 pts ) in group A, 5,2% ( 1 pts ) in group B. Reduction in left ventricular end-diastolic diameters, along with improvement in ejection fraction and clinical status (NYHA) were more significant in group B (  $p < 0,05$  ). Residual mitral incompetence was more frequent in group A (  $p < 0,05$  ). Seven pts died late in group A ( 26,9% ), 3 of whom for non-cardiac events, while two pts died in group B ( 10,5% ) one for non cardiac causes. (  $p < 0,05$  ) Freedom for re-hospitalization because of heart failure at four years was 85% for group A, 95% for group B.

**CONCLUSIONS:** The reported surgical protocol developed for SVR seems to improve the early and medium-term results in the treatment of the patients candidate to reconstructive surgical intervention for ischemic left ventricular dilatation. Anyway, longer follow-up times and close observation of the progression of the myocardiopathy are needed before dropping reliable surgical advises.

### OP-1125-LEFT VENTRICLE ANEURISM PLASTY USING DUPLICATION METHOD

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**OBJECTIVE:** The purpose of this study is to present our experience in surgical treatment of the patients with left ventricle aneurism using duplication method.

**METHODS:** From 2005 till 2007 68 patients undergone coronary artery bypass grafting with resection and plasty of left ventricular aneurism. In 30 (44,1%) patients aneurism was resected with the following duplication formation when free lateral left ventricular wall sutured to interventricular septum and overlapping with another margin. In 38 (55,9%) patients Dor or linear plasty was performed. All patients had Q-wave myocardial infarction with formation of left ventricle aneurism. Mean age of the patients in first group was  $54,2 \pm 6,7$  years. 89,7% were male. Mean ejection fraction was  $37,2\% \pm 8,5\%$ . Mean left ventricle diastolic size was  $60,7 \pm 6,6$  mm, systolic -  $44,9 \pm 4,3$  mm. Mean left ventricle diastolic volume was  $232 \pm 36$  ml, systolic -  $120 \pm 18$  ml. Mean additive EuroSCORE was 8, logistic - 11,6%. Mean pulmonary artery pressure was 46 mm Hg.

**RESULTS:** Mean ejection fraction increased from  $37,2\% \pm 8,5\%$  to  $43,5\% \pm 5,4\%$  ( $p < 0,05$ ). Mean left ventricle diastolic size decreased from  $60,7 \pm 6,6$  mm to  $58,2 \pm 4,4$  mm ( $p < 0,05$ ), systolic - from  $44,3 \pm 4,3$  mm to  $40,2 \pm 3,8$  mm ( $p < 0,05$ ). Mean left ventricle diastolic volume decreased from  $232 \pm 36$  ml to  $166,3 \pm 28$  ml, systolic - from  $120 \pm 18$  ml to  $80 \pm 12$  ml ( $p < 0,05$ ). Pulmonary pressure decreased to 32 mm Hg ( $p < 0,05$ ) in postoperative period. Inotropic support took place in 9 (32,1%) of the patients. Hospital stay was  $16 \pm 2$  days. The hospital mortality in this group of patients was 1 (3,3%), while in group with Dor and linear plasty 4 (6,3%) patients died.

**CONCLUSIONS:** Coronary artery bypass grafting in patients with left ventricle aneurism plasty using duplication method could be successfully performed with good results.

### OP-1126-SURGICAL VENTRICULAR RESTORATION:THE EARLY EXPERIENCE IN SAUDI ARABIA: AN UPDATE

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**SURGICAL VENTRICULAR RESTORATION (SVR) The early experience in Saudi Arabia - (Update) Author. W. Abukhudair, MD, FRCS; Ahmed EO., MD, FRCS. W. Ahmed., MD, FACC; K. Shaibi. MD, FACC; A. Ajam., MD, MRCP; A. Ashmeg., MD, FRCS**

**OBJECTIVES:** To evaluate our experience, at two years follow up, with SVR as therapy for a subset of patients with ischemic cardiomyopathy. Background: Ischemic cardiomyopathy poses a challenging problem to the cardiologist and cardiac surgeons. Following myocardial infarction, 20% of patients develop

ventricular dilation and congestive heart failure (CHF) even with early reperfusion therapy. This is due to "ventricular remodeling" process that results in the loss of the normal elliptical shape of the ventricle and CHF. Ventricular volume reduction, and shape restoration surgery has recently become an available option for this subset of patients. We prospectively examined the early outcome of SVR in our institution.

**METHODS:** Fifty Two prospective post anterior myocardial infarction patients underwent SVR with concomitant CABG /or mitral valve repair are presented.

**RESULTS:** The mean age was  $50.6 \pm 5.1$  years. All patients were males. The mean left ventricular ejection fraction was  $23\% \pm 6.0$ . Thirty patients had SVR with concomitant CABG. Fifteen patients had mitral valve repair as well. Two patients had an isolated SVR and three patients had CABG, SVR, mitral valve repair and tricuspid valve repair. Two patients did not undergo the surgery due to the pre-op mortality of one and intra-operative change of decision to CABG alone for the other; these were excluded. The average number of grafts was  $2 \pm 0.63$ . At one year follow up, the NYHA class has improved from  $3.3 \pm 0.8$  to  $1.8 \pm 0.4$ , and. The left ventricular ejection fraction improved from  $23 \pm 6.16$  to  $41.08 \pm 6.8$ . The left ventricular end systolic volume index (LVESVI) has improved from  $85.8 \pm 20$  to  $38.6 \pm 9$  ml/m<sup>2</sup>. The post-op ventilation period was  $40 \pm 1.9$  hours and the mean length of stay was  $12.8 \pm 4.7$  days. Intra aortic balloon pump (IABP) was used in seven patients, and Levosimendan were used in all patients. The operative mortality was one patient (3.4%). No further mortality at two years follow up.

**CONCLUSION:** In our preliminary group, SVR may afford significant improvement of symptoms, ejection fraction and left ventricular volumes, and that the procedure can be performed safely. Further studies are needed to define the patients best served with the procedure.

### OP-1127-SHORT TERM FOLLOW-UP OF GEOFORM MITRAL VALVE REPAIR IN PATIENTS WITH SEVERE LV DYSFUNCTION.

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**BACKGROUND:** Various techniques are being used to correct the functional mitral regurgitation (MR) associated with severe LV dysfunction. This retrospective study examined the effect of Geoform ring mitral valve repair on the ejection fraction, LV function and End Diastolic dimensions of the left ventricle and the midterm success of the repair.

**METHODS:** Twenty four patients (mean age  $59.6 \pm 17$  yrs) with significant functional MR and LV dysfunction had mitral valve repair with the Geoform ring. Four patients were re-do's and 19 patients had associated procedures (CABG 10, TVR 5, Maze 3, PFO closure 3 and AVR 2). A 26 or 28 mm ring was used in the majority of the patients. Six patients were in NYHA class IV, fourteen in class III and four in class II.

**RESULTS:** There was no 30 day mortality. Follow-up ranged from 3 months to 1 year. One patient with cardiac sarcoidosis on high dose steroids developed endocarditis four month later and had mitral valve replacement. One patient died 3 months later with T cell lymphoma. Twenty two patients were available for follow-up. Nine patients were in NYHA class I and thirteen were in class II. On the follow up transthoracic echocardiography, the average preoperative EF changed from 26.5 to 33.6%. The LVEDD changed from a mean of 5.8 to 4.97. Sixteen patients had no MR and 6 patients had trivial MR. None of the patients had SAM or significant gradients.

**CONCLUSIONS:** Patients with functional MR from LV geometric distortion benefit from mitral valve repair. The geoform ring not only improves MR but also helps in LV remodeling.

### OP-1128-OUTCOME IN PATIENTS UNDERGOING COMBINED SURGICAL VENTRICULAR RESTORATION (SVR) AND GEOFORM RING MITRAL ANNULOPLASTY FOR DILATED CARDIOMYOPATHY

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**BACKGROUND:** Ischaemic dilated cardiomyopathy patients have dilated, large left ventricles with dyskinetic or akinetic LV wall and moderate to severe functional mitral regurgitation. Usually these patients are in NYHA class 'Y'. Apart from heart transplantation, the other option for these patients would be surgical ventricular restoration (SVR) and mitral annuloplasty, so as to bring the Left

ventricle geometry to normal and thus optimizing the Frank-Starling law. We have studied the outcomes of these sick patients undergoing SVR and Geoform Ring mitral annuloplasty.

**METHOD:** After IRB approval we prospectively observed the parameters and data's of the 17 patients undergoing SVR and Geoform ring Mitral annuloplasty. CABG was done in 16 patients. Pre-operative data's of NYHA Class, Ejection Fraction, previous hospitalization, MI duration, h/o arrhythmias, 2D Echocardiography parameters like LV volumes & dimensions, EF, MR grade, RWMA were compared with the data's postoperatively at 8 days, 3, 6 & 12 months. Intraoperative myocardial viability was correlated with that of the ECG and angiographic report. Postoperative inotropic support, ICU stay, IABP usage, PA pressure monitoring was recorded and analyzed. Procedures in SVR were DOR, Septal patch, Linear repair, lateral wall plication, and inferior wall placcation.

**RESULTS:** All the patients with optimum medications were preoperatively in NYHA class 3/4, with EF <30%, moderate to severe MR, with h/o MI of long duration. 3 patients had h/o of VT/VF. Average hospitalization was 2.5 times/year. We have followup of atleast 6 months postoperatively. In hospital /30 day mortality was 4 patients and cause of death was arrhythmia in 2 and myocardial failure in 2 patient. 4 patients died in followup, cause were myocardial failure in 2, arrhythmia in 1, and pneumonia in 1. IABP was used in 7 patients and average ICU stay was 7.3 days. Changes in 2D echo Parameters from pre-operative to postoperative were as follow: 1) EF 23.6 to 30.7% 2) LVEDV 173.2ml to 130.6 ml 3) LVESV 130.5ml to 94.6ml 4) LVDD 59.3 to 53.4mm. All patient had no or trivial MR. 10 patients had multi territory infarct (MTI) whereas 7 patients were of single territory infarct (STI). Of total 8 deaths 6 patients were of MTI. Rehospitalization in the surviving patient is 0.2%. All surviving patients are in NYHA class 1/2.

**CONCLUSION:** This combined procedure of SVR and Geoform Ring annuloplasty is definitely a good procedure in selected patients who have some viable myocardium present. High mortality in this group was because of multiterritory infarct with little viable myocardium left and very sick patients. Long term followup is awaited.

## OP-1129-COMBINED TREATMENT OF ISCHEMIC HEART FAILURE: CARDIAC RESYNCHRONIZATION THERAPY AND SURGERY

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**BACKGROUND:** To compare the results of the coronary artery bypass grafting (CABG) combined with biventricular device implantation and CABG alone in patients with ischemic heart failure.

**METHODS:** In this study we included 22 patients with ischemic heart failure. There were 18 men and 4 - women, with a mean age  $57 \pm 5$ , whom had prior one or more myocardium infarction, with 3-4 NYHA functional class, ejection fraction (EF) of the LV (LV) less than 35%, and signs of dyssynchrony measured by tissue tracking (TT) and tissue synchronization image (TSI). There was no difference in preoperative status in patients of both groups. All patients were blindly enrolled in two groups. The first group included patients (n=10) who underwent CABG alone and the second group included patients (n=12) who underwent CABG with biventricular device implantation. The epicardial leads were implanted to right atrium, right ventricle and left ventricle during the operation in patients of second group. At the end of operation the epicardial leads were connected with biventricular device and after that it was implanted to the left subclavian region. We evaluated the echocardiography and Doppler data before discharge in both group.

**RESULTS:** There were no complications during operation and the hospital mortality was 0 % in both groups. The EF, end diastolic volume (EDV) were  $29.2 \pm 4.1\%$  and  $244 \pm 62$  ml in patients of the first group after operation and did not significantly improve compare with preoperative data. Also there was no difference between TT and TSI data before and after procedure in first group of patients. In second group we revealed that EF increased from  $28.9 \pm 4.2\%$  to  $39.2 \pm 4.0\%$  after operation and decreased from  $239 \pm 65$  to  $210 \pm 52$ . We found significant improvement in TT and TSI data after operation in second group. The quantity of segments with systolic delay in TSI and TT methods was  $1.2 \pm 0.5$  after operation compare with  $5.2 \pm 2.7$  before operation in second group. Also, the time of systolic delay in these segments significantly decreased from  $452 \pm 69$  ms to  $212 \pm 59$  ms after operation.

**CONCLUSIONS:** Coronary artery bypass grafting combined with biventricular device implantation improves ejection fraction of the LV, decreases end dias-

stolic volume and dyssynchrony signs compare with coronary artery bypass grafting alone in patients with ischemic heart failure, who have dyssynchrony before operation.



## MINI PRESENTATIONS X

### OP-1130-APPLICATION OF EUROSORE IN CORONARY ARTERY BYPASS SURGERY FOR PATIENTS 60 YEARS AND OLDER

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**BACKGROUND:** The EuroSCORE has been largely demonstrated in patients undergoing on-pump and off-pump coronary artery bypass surgery to predict overall mortality reasonably well in many studies. The purpose of the present study was to evaluate and compare the performance of logistic EuroSCORE for on-pump and off-pump patients.

**METHODS:** According to the policy admitted in our institution, off-pump coronary surgery is the preferred procedure for patients over age of 60 years. So, only patients of this age category were included in our study. From 1999 to 2006, 766 consecutive patients underwent isolated coronary artery bypass grafting in our institution. On-pump coronary surgery were performed in 38,4% (n = 294) of patients and off-pump surgery in 61,6% (n = 472). After validation with our database we retrospectively calculated the EuroSCORE for all patients.

**RESULTS:** The annual rate of off-pump surgeries showed a tendency towards increase over time. The rates were 2.8% (n=2), 6.9% (n=6), 39.6% (n=44), 73.6% (n=89), 80.3% (n=102), 89.8% (n=115), to 95% (n=114) from 1999 to 2006 years, respectively. The predicted mortality was comparable in two groups during study period ( $4.7 \pm 5.3$  for on-pump and  $4.6 \pm 5.5$  for off-pump,  $p=0.918$ ). The observed in-hospital mortality was significantly higher in on-pump group compared with off-pump patients (4,8%, n=14 and 1,3%, n=6, respectively,  $p=0.002$ ). Therefore the observed to predicted mortality (O/E) ratios were 1,02 and 0,28, respectively.

**CONCLUSIONS:** During seven years in our institution the off-pump patients had significantly lower actual mortality compared with on-pump patients over 60 years at similar risk of predicted mortality.

### OP-1131-IS HBA1C AN INDEPENDENT RISK FACTOR FOR PREDICTING OUTCOME AFTER CORONARY ARTERY BYPASS GRAFTING?

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**BACKGROUND:** Diabetes mellitus is associated with coronary artery disease, and diabetic patients are frequently referred for coronary bypass graft surgery. It is well known that HbA1c, which reflects long-term glycemic control, is related to diabetic morbidity and mortality. Plasma Hemoglobin A1c (HbA1c) shows mean blood glucose over a 3 months period. We wanted to determine whether elevated plasma HbA1c level was associated with increased postoperative morbidity and mortality in patients undergoing CABG.

**METHODS:** Plasma HbA1c was measured prospectively in 135 consecutive patients undergoing emergency and elective CABG in two cardiac surgery departments in north of Iran, Mazandaran Heart Center and Shafa Hospital in 6 months. Patients were categorized into four groups depending on whether their plasma HbA1c was equal or less than 6%, 6.1-7%, 7.1-8% or greater than 8. Patients were also classified by diabetic status with suboptimal HbA1c in a patient without diabetes being  $>6$  to  $<7\%$  and suboptimal HbA1c in a patient with diabetes being  $>7\%$ . Patients with plasma HbA1c  $>7\%$  were reclassified as having undiagnosed diabetes mellitus. We assessed the patients for 6 months and checked them for mortality and morbidity (and overall 30 days morbidity) including low cardiac output state, need for IABP, infection, CVA, and mean length of hospital stay.

**RESULTS:** Of the 135 patients studied, 35% had diabetes and the remaining 65% did not. The mean age was 52 years and 60% were male. Suboptimal HbA1c levels were found in 60% patients without diabetes and in 49% patients with diabetes. In patients without diabetes those with suboptimal HbA1c lev-

els (6-7%) had a significantly higher incidence of overall 30-day morbidity compared to patients with HbA1c levels  $<7\%$ . Similarly, for patients with diabetes those with suboptimal HbA1c levels (HbA1c  $>7\%$ ) had a significantly higher incidence of 30-day morbidity compared to those with HbA1c levels  $<7\%$ . Multivariate analysis revealed that a plasma HbA1c level of  $>6$  to  $<7\%$  was a significant independent predictor of overall 30-day morbidity in patients without diabetes undergoing CABG.

**CONCLUSION:** Suboptimal HbA1c levels may have prognostic significance in patients without diabetes undergoing CABG.

### OP-1132-A RETROSPECTIVE EVALUATION OF MINIMAL EXTRACORPOREAL CIRCULATION (JOSTRA MECC SYSTEM) VERSUS STANDARD CARDIOPULMONARY BYPASS

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**BACKGROUND:** We retrospectively evaluated a minimal extracorporeal circulation system (Jostra MECC System; Jostra AG, Hirrlingen, Germany) for CABG and aortic valve surgery compared with a standard CPB.

**METHODS:** During the period Jan 2005-Dec 2007, 122 patients (86 M, 36 F; mean age  $70 \pm 8.5$  yrs) underwent CABG (n=106) or aortic valve replacement (n=17) with the MECC System (group M). In these cases we only used the cell salvage device to reduce the air-blood contact area. In the last 25 cases we also used a bubble trap and a pulmonary artery vent. We matched 122 patients (91 M, 31 F; mean age  $69 \pm 9$  yrs) operated in the same period using standard CPB (group C). The two groups were similar for preoperative data and surgical procedure.

**RESULTS:** We observed in 3 cases (1 CABG and 2 AVR) problems related with air-impairment (2 cases) and massive bleeding (1 case). Operative mortality (within 30 days) was similar for both groups as the OT intubation ( $M=22 \pm 48$  h vs.  $C=16.7 \pm 16.4$  h), IC stay ( $M=2.3 \pm 3$  days vs.  $C=2.1 \pm 2.5$  days) and bleeding ( $M=698 \pm 410$  ml vs.  $C=639 \pm 347$  ml) (difference not significant).

**CONCLUSION:** As literature has demonstrated MECC system seem to be more biocompatible than standard CPB. In our experience, in case of CABG and AVR, there are not statistical differences about clinical outcome between MECC and standard CPB; in case of AVR we suggest that first cases must be reserved to expert surgeons hand in order to avoid major complications that could discourage a routinely use. It is necessary to resolve two relevant problems in particular again in AVR: the air-impairment resolved with bubble trap and the massive bleeding that could be resolved with a particular reservoir bag in order to convert, in case of emergency, to a standard CPB. In any case MECC system, also in our experience, seems to reduce the use of blood products.

### OP-1133-TOPICAL APPLICATION OF AUTOLOGOUS BLOOD PRODUCTS DURING SURGICAL CLOSURE FOLLOWING A CORONARY ARTERY BYPASS GRAFT

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**BACKGROUND:** Surgical site wound complications are associated with increased cost, morbidity, and mortality following cardiothoracic surgery. Recent publications have advocated the application of autologous blood components, in particular platelet rich plasma, as adjunctive tools for surgical closure. The theoretical benefit of these products is the reduction of postoperative infectious and non-infectious wound healing disturbances. These disturbances are associated with significant patient morbidity and cost expenditure. The following analysis retrospectively examined the effect of autologous blood application at the surgical closure sites following a coronary artery bypass graft (CABG) procedure.

**METHODS:** The study involved a retrospective analysis of 1446 consecutive coronary artery bypass grafting procedures from two surgeons. A patient group receiving topical application of platelet rich and platelet poor plasma during closure of their chest and leg surgical incisions was compared to a patient population receiving standard of care treatment. Statistical analyses, including propensity scoring methods, were performed to gauge the effect of autologous blood application on infection and drainage of the sternal and leg wounds.

**RESULTS:** 1128 patients had sufficient data to be included in the final analysis,

with 571 of these patients receiving the treatment compared to 557 control patients. No treatment related adverse events were noted and the application process did not significantly affect the operative time. The ABP group had one incidence of sternal infection (0.18%) compared to 11 cases (1.98%) in the control group. There were 3 cases (0.53%) of notable drainage from the sternum in the ABP compared to 30 cases (5.39%) in the control group. For the leg vein harvest site, the ABP group had no reported infections and 61 (10.89%) incidences of excessive drainage compared to 3 (0.66%) surgical site infections and 212 (48.4%) cases of excessive leg drainage in the control group. Following propensity scoring, which successfully resolved differences observed between the two patient populations, it was concluded that application of platelet-rich and platelet poor plasma reduced the odds of chest wound infection by 93%, chest drainage by 96%, and leg wound drainage by 88%.

**CONCLUSION:** Prospective, randomized trials are necessary to confirm the findings of the current work, however this analysis demonstrated a potential benefit for the topical application of autologous blood components during surgical closure following a CABG.

### OP-1134-SUCCESSFUL USE OF VAC THERAPY FOR THE TREATMENT OF STERNAL AND LEG WOUND INFECTION AFTER CARDIAC

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**BACKGROUND:** Wound infections in cardiac surgery especially post-sternotomy mediastinitis, is a potentially life-threatening complication that has significant morbidity and mortality despite aggressive therapy. Recently, the general application of negative pressure to wounds by vacuum-assisted closure (VAC) therapy has shown enhanced granulation and wound contraction. The aim of this study was to review our treatment strategy using VAC therapy on patients who developed post-operative wound infection after cardiac surgery.

**METHODS:** We analyzed VAC performance data and outcomes with a prospective review on a consecutive cohort of 105 patients within 6230 patients who were treated with VAC therapy for post-cardiac surgery wound complications between 2001 and 2007.

**RESULTS:** Among the 105 patients (male 64; female 41; age  $66 \pm 10$  years), 87 (83%) had sternal wound infection and 18 (17%) had leg wound infection. Among the patients with sternal wound infection, 71 (82%) developed mediastinitis. Wound infections became evident on average at 30 days after surgery. Swab cultures most commonly identified *Staphylococcus aureus* (65%). Multi-regime antibiotics were started depending on swab cultures. The commonest antibiotic regimes include Vancomycin and Rifampicin. The VAC dressing was changed every 48 hours and VAC therapy was discontinued on average at 34 days after deployment. There were no immediate complications related to VAC therapy. However, one patient developed right ventricular tear possibly related to VAC therapy. 39 (45%) patients had definitive chest closure with pectoralis flap and/or omental flap. 21 (24%) patients had primary wound closure with sternal re-wiring and 27 (31%) were managed with closure by secondary intention. After discharge from the hospital all patients were reviewed in the out-patients department at two week intervals. At follow-up 2 patients developed sinus formation which was treated with local excision. Overall in hospital mortality was 2.1% and patients with mediastinitis had a mortality of 2.4%.

**CONCLUSIONS:** This is the largest study reported in literature. It is our opinion that VAC therapy reduces mortality after post-sternotomy mediastinitis and may be a safe and reproducible option to bridge patients with postoperative cardiac surgical wound infection to complete healing.

### OP-1135-EARLY RESULTS WITH THE USE OF BIODEGRADABLE RING FOR TRICUSPID VALVE ANNULOPLASTY

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**BACKGROUND:** We describe our early results with the use of biodegradable ring for tricuspid valve annuloplasty.

**METHODS:** 15 patients (mean age 48.5 years, 7 men and 8 women) underwent cardiac surgery during the period of March 2006 - November 2007. 7 patients suffered from congenital heart disease (Tetralogy of Fallot in 5, pul-

monary atresia in 1 and congenitally corrected transposition of the great arteries in 1) and 8 patients had acquired valvular disease. All patients underwent tricuspid valve annuloplasty using the biodegradable ring Kalangos (Bioring SA, Lonay, Switzerland). Concomitant surgical procedures included pulmonary valve replacement (n=6), mitral valve replacement (n=4), modified Maze operation (n=2), restoration of right ventricular outflow tract (n=2) and aortic valve replacement (n=1). The size of the rings ranged from 30mm - 34mm. 6 operations were redo, of which one was 3rd time redo. Mean follow-up was 12.2 months.

**RESULTS:** One patient (n=1) died on the 20th postoperative day due to multiple organ failure from sepsis. One patient (n=1) developed acute tubular necrosis (probably drug induced) on the 3rd postoperative day which was treated with hemodialysis (3 times) and was discharged home with normal renal function. Mean hospital stay was 9 days. Postoperative echocardiography showed no tricuspid regurgitation in 11 patients (n=11) and mild regurgitation (+/++) in 3 patients (n=3). 6 month and 12 month cardiac echo examination showed significant decrease of the right heart chambers size in all patients. All patients are currently in excellent clinical status without symptoms.

**CONCLUSION:** The use of biodegradable ring Kalangos for tricuspid valve annuloplasty is a safe, quick and reliable technique with excellent short term results. Further follow-up is needed in order to evaluate the long term results of this new device.

### OP-1136-INTRA-OPERATIVE TEMPERATURE CONTROL USING THE THERMOGUARD SYSTEM DURING OFF-PUMP CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** Maintaining normothermia during off-pump coronary bypass (OPCAB) surgery reduces metabolic derangements and contributes to improved clinical outcomes. Traditional temperature control strategies have been unsatisfactory. The purpose of this study was to examine the feasibility and efficacy of intra-operative temperature control using a novel endovascular heating system during OPCAB.

**METHODS:** Thirty-eight patients, undergoing OPCAB, were prospectively randomized to receive either conventional warming (operating room temperature 22°C, warmed intravenous fluids, and a convective forced air warming system) or the Thermoguard™ system. The triple lumen temperature control catheter (Icy™ Catheter, Alsius Corp) was inserted, prior to skin incision, in the common femoral vein using a Seldinger technique. Room temperature was kept at 19°C. The catheter was removed after all wounds were closed. The Thermoguard™ was set to a target temperature of 37°C. Temperature measurements (bladder, naso-pharyngeal and blood) were recorded at 5-minute intervals from patient arrival to patient exit from the operating room.

**RESULTS:** Patient and hospital data are depicted in the table below. Control (n=21) Thermoguard (n=17) p value Body mass index  $30.1 \pm 6.2$   $29.8 \pm 6.8$  0.88 Parsonnet score  $10 \pm 6$   $12 \pm 9$  0.40 Bypass Grafts  $2.6 \pm 0.9$   $3.4 \pm 0.6$  < 0.001 Operating time (min)  $108.1 \pm 43.7$   $150.3 \pm 123.4$  0.12 OR IV fluids (ml)  $2,012.3 \pm 723.1$   $1,557.0 \pm 547.7$  0.02 ICU LOS (d)  $1.6 \pm 1.4$   $1.2 \pm 0.5$  0.22 Despite longer operative times (and significantly more bypass grafts), device patients required significantly less warmed i.v. fluids to help maintain normothermia compared to controls. Device patients (n=17) warmed significantly better (start  $36.0^\circ\text{C} \pm 0.1$ , end  $36.7 \pm 0.4^\circ\text{C}$ ) compared to controls (n=21) (start  $36.3^\circ\text{C} \pm 0.6$ , end  $36.5^\circ\text{C} \pm 0.7$ , p=0.03). All catheters were placed successfully on the first attempt. ICU LOS was nearly one half day less (25%) in the device group. There were no device related complications.

**CONCLUSION:** Endovascular based patient warming is a safe and effective strategy. Endovascular warming is simple to employ and obviates the need for uncomfortably warm operating room temperatures. Significantly less intra-operative i.v. fluids may reduce hemodilution and the deleterious effects of over hydration. The Thermoguard system compared favorably to conventional methods for warming during OPCAB.

### OP-1137-SUPPRESSING VEIN GRAFT INTIMAL HYPERPLASIA THROUGH EXTERNAL NITINOL MESHES: SIZE-MATCH MATTERS

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**BACKGROUND:** External mesh-support of vein grafts has been shown to mitigate the formation of intimal hyperplasia (IH). By choosing a non-human primate model that mimicked the anastomotic size-ratio of clinical vein grafts and their host arteries we could previously demonstrate that external meshes made of Nitinol need to be constrictive in order to mitigate intimal hyperplasia and prevent endothelial detachment. The goal of the present study was to demonstrate that size-constriction affected intimal hyperplasia not in absolute terms but in relation to the luminal mismatch (Qc) between the vein graft and the run-off artery.

**MATERIALS AND METHODS:** Thirty-two male Chacma baboons (29.3±2.8kg) each received both a coronary artery bypass graft (CABG) to the LAD and bilateral femoral interposition grafts. In one half of the animals, all vein grafts were externally supported by a compliant, knitted Nitinol mesh (ID=3.3mm). The other half of animals served as controls. In order to determine whether identical grafts experience different biological responses in different positions, the same saphenous vein was used for the CABG and one femoral graft. In order to see if different graft diameters affect the vein graft pathology under identical run-off conditions, the large-diameter femoral vein (OD=7.8±0.9mm) and the smaller diameter saphenous vein (OD=3.8±0.4mm) were used for the bilateral grafting of the femoral arteries (OD=4.2±0.3mm). Sprayed fibrin glue (Tisseel, Baxter) was used to attach the Nitinol mesh to the veins but was also investigated as an independent determinant of IH in both mesh-supported and control grafts. The Qc at implantation was calculated as quotient of cross sectional areas of run-off artery and graft. All grafts were implanted for 180 days. At explantation, the grafts were perfusion fixed at 120mmHg. IH was easily discernible from the media and assessed by image analysis.

**RESULTS:** In control saphenous vein grafts intimal hyperplasia was 1.8 times more pronounced in coronary (Qc=0.08±0.02) than in femoral (Qc=0.63±0.14) position (549±127µm vs. 295±180µm, p=0.0037). The placement of a tight-fitting external Nitinol mesh increased the Qc of saphenous vein grafts by a factor 1.2 in coronary position leading to a significant 2.1-fold suppression of IH (from 549±127µm to 268±102µm; p<0.0001). In femoral position, in contrast, mesh-supported saphenous veins had a 10.1 times higher Qc (p<0.001) than their coronary counterpart (1.11±0.37 vs. 0.11±0.01) and correspondingly had a 4.5 times more pronounced suppression of IH (from 295±180µm to 59±45µm; p<0.0001). When the bilateral femoral implants were compared mesh support resulted in equal Qcs in femoral (Qc=1.24±0.41) and saphenous veins (Qc=1.11±0.37) corresponding with similar degrees of intimal hyperplasia suppression of 3.4 fold (from 384±152µm to 113±161µm; p=0.0003) and 5.0 fold (p=0.0041). The application of sprayed fibrin glue turned out to be a non-significant determinant of IH.

**CONCLUSIONS:** Tight external support of vein grafts with compliant, knitted Nitinol meshes has a distinct effect on the suppression of intimal hyperplasia. This effect is multifold augmented if the graft constriction eliminates the luminal mismatch between vein graft and run-off artery.

### OP-1138-VAC® THERAPY AND PLATE FIXATION SYSTEM FOR COMPLICATED STERNAL WOUND INFECTION: A NEW STERNAL-SPARING TECHNIQUE

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**BACKGROUND:** Conventional surgical treatments of deep sternal wound infection has an increased morbidity and mortality, due to the loss of the whole sternum and the use of different techniques with pectorals major flap. We report the preservation of the sternum and its rigid fixation with plates, after an initial treatment with vacuum assisted therapy (VAC-9).

**METHODS:** During 2007, 2 patients with mediastinitis had restoration of sternal integrity with a new internal rigid fixation system using titanium reconstruction plates. As soon as deep sternal wound infection was diagnosed clinically, the wound was explored, the sternal wires removed and vacuum assisted therapy was initiated until C-reactive protein level were less than 70 mg/L.

Then, after debridement of devitalized bone, a new titanium osteosynthesis system with restoration of sternal integrity was implanted, combined with simple bilateral mayor muscle flaps to close the wound. Table 1. Clinical data Age Sex Comorbidities Cardiac Surgery Culture CRP level VAC therapy Fixation method 58 M Diabetes COPD Aortic valve replacement S. epidermidis 60 5 days 3 transverse + manubrium plates 82 M None CABG S. epidermidis 65 9 days 3 transverse plates CRP: C-reactive protein. COPD: chronic obstructive pulmonary disease

**RESULTS:** The procedures were successfully performed and the sternum could be preserved in both cases. The short-term follow-up showed stable sternal conditions after plate installation.

**CONCLUSIONS:** This new sternal fixation technique is safe and easy to handle, without thoracic instability and broadens the spectrum for closure of complicated sternal wound infections.

### OP-1139-PERCEPTIONS OF EMERGING PERCUTANEOUS TECHNOLOGY: A SURVEY OF CANADIAN TRAINEES AND PRACTICING CARDIAC SURGEONS

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**BACKGROUND:** This study surveyed cardiac surgery trainees and surgeons in Canada, to elucidate and contrast their perceptions of: emerging role of percutaneous heart valves (PHV) and endovascular aortic stenting (EVAS) and their impact on residency training.

**METHODS:** A 42-question survey was distributed to a random selection of 60 trainees and 60 staff across Canada.

**RESULTS:** Overall, 93/120 (78%) surveys were completed (43/60 [70%] trainees, 50/60 [85%] staff). Trainees had mean age of 29±3 years, 32% were junior (years 1-2 of 6-year postgraduate training program), 38% were intermediate (years 3-4) and 30% were senior (years 5-6). Staff had mean age of 50±9 years and average practice was 16±10 years. Exposure to PHV and EVAS was reported by 32% and 84% of all respondents respectively. Surgeons' role was listed as: surgical back-up (72%), vascular access (55%), and/or device deployment (42%). Table 1 summarized the perception of PHV & EVAS by residents and staff surgeons. Regarding training in percutaneous techniques/technology, 70% stated their program currently provides none, 68% were unaware of available fellowships, and 60% were unaware of the STS Guidelines on EVAS credentialing. More training was requested in echocardiography (98%), interventional cardiology (91%) and pacemaker insertion (91%).

**CONCLUSIONS:** Percutaneous technologies were perceived to play a significant role in the future of cardiac surgery. More training in percutaneous techniques were requested by trainees and staff surgeons. Many of them were unaware of existing training programs and credentialing guidelines. Canadian residency programs should incorporate the novel skill set to reflect the changing clinical practice. Table 1. Survey Question PHV EVAS Residents o Practice will involve the new technology 94% 88% o 10-year outcome equivalent/superior versus open surgery 18% 74% Staff Surgeons o Practice will involve the new technology 94% 88% o 10-year outcome equivalent/superior versus open surgery 32% 84%

### OP-1140-TOTALLY ROBOTIC INTERNAL MAMMARY ARTERY HARVEST AND BEATING HEART CORONARY ARTERY BYPASS

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**BACKGROUND:** To Summary the first 25 cases undergoing internal mammary artery (LIMA) harvest using da Vinci S system and minimally invasive direct coronary artery bypass grafting (MIDCAB) on beating heart.

**METHODS:** The average age of patients was 60.4±10.1 years old. 5 case was female and 20, male. All the patients had a history of angina. The coronary arteriography showed severe stenosis of LIMA in all patients, of which 2 case had diagonal and circumflex branch stenosis. 10 cases had myocardial infarction history. All the patients had good lung function and had no medical history of pleurisy. Without sternotomy, The camera cannula was placed in the left, 3cm lateral to nipple in the 4th intercostal space (ICS). Da Vinci instrument arms were inserted through two 1-cm trocar incisions. The right instrument generally was positioned 4 to 6 cm cephalad to camera cannula in the 2nd or 3rd ICS. The left instrument arm was positioned 4 to 6 cm caudal to the camera cannula



in the 5th or 6th ICS. Arm trocar sites were maintained 6 cm apart at chest entry. the internal mammary artery was harvested in routine methods. 12 LIMAs were harvested and the right internal mammary artery were taken down in 1 case and double internal mammary artery was taken down in 1 case. MIDCAB was performed on beating heart in 24 cases and 1 case accepted the totally endoscopic coronary artery bypass (TECAB).

**RESULTS:** All cases were accomplished successfully without complications. The patient was discharged on the second postoperative day from ICU. Robotic surgery had less draining than the conventional coronary bypass.

**CONCLUSIONS:** Totally Robotic internal mammary artery harvest and beating heart coronary artery bypass is less invasive, more precise, safe and efficient.

#### **OP-1141-SUBENDOCARDIALLY IMPLANTED ANULOPLASTY-RING IN A PATIENT WITH PACEMAKER LEAD ASSOCIATED ENDOCARDITIS**

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**BACKGROUND:** Active endocarditis of heart valves is still a serious problem in cardiac surgery. Furthermore the choice of valvular substitute and/or repair techniques respectively can be challenging.

**METHODS:** We report the case of a patient with pacemaker-lead associated tricuspid valve endocarditis who had several re-interventions due to lead dysfunction in previous years. Concomitant coronary bypass grafting was indicated. The tricuspid valve was repaired after all the leads and the infectious thrombus-formation have been removed. The septal leaflet was patched with bovine pericardium. The annulus was stabilized by the endocardially implantable Bio-Ring Kalangos.

**RESULTS:** Intraoperative TEE showed a perfect result of the repaired tricuspid valve. The postoperative course was uneventful. The patient was treated with antibiotics as recommended for the next weeks. TTE seven days after the operation as well as the 3 month follow up control didn't show any recurrence of endocarditis or tricuspid insufficiency.

**CONCLUSION:** Due to the special implantation technique, the Bio-Ring does not present any surface to the bloodstream. Therefore, after removal of all infected material, reinfections of the reconstructed valve should be very seldom.

#### **OP-1142-TRICUSPID VALVE INSUFFICIENCY: WHICH METHOD OF CORRECTION TO CHOOSE**

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**BACKGROUND:** For decades surgical repair of tricuspid valve insufficiency represented a challenge for cardiovascular surgeons. Despite numerous studies the question about superiority of a particular surgical method of annuloplasty remains unanswered. The aim of this study was to establish whether there is a significant difference in short and long-term postoperative level of tricuspid valve regurgitation between various surgical methods of tricuspid valve repair.

**METHODS:** Three different methods of tricuspid valve repair were compared - annuloplasty by De Vega (A), annuloplasty with flexible Duran ring (B) and annuloplasty with rigid Carpentier ring (C). 308 patients with functional tricuspid regurgitation of mild, moderate or severe degree that were treated in our institution between 1985 and 1995 were engulfed in the study. Patients were divided in three groups according to the surgical method used for tricuspid valve repair. The decision about repair method was made intraoperatively based on surgeon's preference. Groups did not differ regarding gender or age. Postoperatively tricuspid valve regurgitation was evaluated by echocardiography immediately after the operation, at 12 months, between 12 and 24 months, between 24 and 36 months and after 36 months. Postoperative mortality and occurrence of complete heart blocks between groups was also compared.

**RESULTS:** No statistically significant differences were found between the three groups regarding pre and postoperative degrees of tricuspid regurgitation. There were also no statistically significant differences between groups regarding postoperative mortality ( $p=0,124$ ) and complete heart block occurrence ( $p=0,32$ ).

**CONCLUSION:** Although no statistically significant differences were found

between the three methods we believe that annuloplasty by De Vega has some advantages over the other two methods: 1) it can be applied to patients with any level of tricuspid valve insufficiency, 2) it seldom causes any complications, 3) it does not involve implantation of expensive and thrombogenic artificial materials and 4) it can be accomplished in a short period of time.

#### **OP-1143-CORRELATION BETWEEN AORTIC STENOSIS DEGREE AND THE LEFT VENTRICLE MASS**

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**BACKGROUND:** Chizner et al esteemed between 3% and 34% the incidence of sudden death in the natural history of aortic stenosis. Three decades ago Rapa-port got the attention for the risk of sudden death in the bearers of aortic stenosis to the point of to recommend the most precocious interruption of the natural evolution as prevention form. With the goal of take a right therapeutic decision as for the procedure type becomes necessary to know the patients profile that seeks cares in the Service. We still tried to establish which the main factors that contributed to the increase of the mass of the left ventricle, in the bearers of aortic valve stenosis.

**METHODS:** The population source was constituted by 79 patient bearers of aortic valve stenosis, stratified in study samples being the first group (G1) formed by the patients with gradient trans-valve left ventricle- aorta (LV-Ao) smaller than 50 mm of Hg and the second for the patients with gradient trans-valve equal or larger than 50 mm of Hg. Observational study, of the traverse type involving fifteen variables disposed in an itinerary elaborated previously for that end and to collect data of the patients' handbooks. Uni-variate statistics analysis (t tests for independent samples and Chi-square) and multivariate (multiple logistics regression). Significance level established in five percent and power of the test of 95%. Established the minimum size of the study samples to allow the statistical inferences. Approved project for the Committee of Ethics of the Institution.

**RESULTS:** The first group (G1) was constituted by 50 (63,29%) patients being 25 (32%) female and 25 (32%) patient male with average of age equal to  $63,87 \pm 14,44$  years and the second group (G2) was constituted by 29 (36,70%) patients being 12(15%) female, 17(22%) male with average of age equal to  $60,39 \pm 18,31$  years. In the patients of G1 we found 42(53%) where the heart rhythm was sinus and eight (10%) in which it was different from the sinus rhythm with predominance for the atrial fibrillation. In the patients of the group G2 24(30%) were bearers of sinus rhythm while only five (6%) where cardiac rhythm are different from the sinus. The uni-variate analysis evidenced: gender ( $p = 0,491$ ), mass of LV ( $P=0,078$ ), maximum trans-aortic gradient. ( $p=0,000$ ), diameters: diastolic ( $P = 0,855$ ), systolic ( $P=0,520$ ), interventricular septum ( $P=0,006$ ), posterior wall ( $p=0,016$ ), ejection fraction ( $p=0,237$ ), delta D% ( $P = 0,131$ ), aorta ( $P=0,153$ ), left atrium ( $P = 0,646$ ).

**CONCLUSIONS:** Our patients' bearers of aortic stenosis are a seniors' patient ( $62,64 \pm 15,93$  years) with predominance for the masculine sex in the proportion of 1,13/1 and in that what is candidate to the surgical treatment presents aortic trans-valve gradient maximum equal to  $76,72 \pm 21,16$  mm of Hg. As the trans-valve gradient increases, happens a parallel increase in the mass of the left ventricle that, through the determination coefficients, were attributed to the age (4,49%), to the increase of the posterior wall (46,48%) and to the increase of the thickness of the interventricular septum (49,84%).

#### **OP-1144-TRICUSPID VALVE REPAIR WITH EDWARDS MC3 ANNULOPLASTY SYSTEM. HOSPITAL UNIVERSITARIO DE CARACAS**

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**INTRODUCTION:** The most common cause of functional tricuspid regurgitation is secondary to left heart valve disorders, with pulmonary hypertension. Pulmonary hypertension also leads to right ventricle enlargement and structural alterations in the tricuspid ring (Type I of Carpentier classification). Some clinical trials have showed better results with prosthetic annuloplasty than other surgical techniques (Bicuspidization, De Vega). However, recent data suggests



moderate to severe residual insufficiency in 10-20% of operated patients, this has been attributed by several authors to determinant factors of recurrence like tethering, pulmonary hypertension, right and left ventricle function. Following we will described the experience of the Cardiovascular Surgery Department in University Hospital of Caracas, using tridimensional rings (Edwards MC3) in the treatment of functional tricuspid regurgitation.

**METHODS AND MATERIALS:** This is a longitudinal prospective study, from November 2006 to March 2007. Thirty three (33) tricuspid valve repair with Edwards MC3 ring were practiced, responding to the following criteria: tricuspid valve ring size, tricuspid regurgitation grade, moderate to severe pulmonary hypertension associated to another cardiac anomaly with transesophageal echo evaluation during surgery and post surgical follow up .

**RESULTS:** The mean age was 46,45 years (16-76), The NYHA functional class: II (13 patients), III (18 patients) and IV (2 patients). The mean EUROSCORE was 5,09 (2-11). The associated procedure were mitral valve repair 5 patients, Mitral valve replacement 12 patients, Mitral valve replacement I + Cox MAZE III and CABG 1 patients respectively, Mitro-aortic valve replacement 3 patients, Aortic valve replacement 4 patients, congenic cardiopathy repair 4 patients, pulmonary tromboendarterectomy and myxoma 1 patients . The severity of regurgitation was mild 12%, moderate 55% and severe 33% The most common MC3 ring size used was 30 and 32 mm. The pulmonary hypertension average 52,93 mmHg (Estandar Deviation: 18,4). Perfution time average 121,54 minute and aortic cross clamp 80,33 minute. Transesophageal echocardiogram was practice in all patients and demonstrate none regurgitation 19 patients, mild regurgitation 12 patients and 2 patients moderate regurgitation. Six percent of patient showed residual tricuspid regurgitation in the immediate post surgical period and 10% of patient showed residual tricuspid regurgitation in a period of 6 to 11 months of follow up. The Thetering average was 0,77 cm. and the righ ventricle diameters was reduce in 15% average.

**CONCLUSIONS:** The tricuspid annuloplasty with Edwards MC3 system its a simple procedure which effectively corrects the tricuspid regurgitation improving patient's hemodinamy, reducing diastolic diameters of right ventricle in the immediate post surgical period and thereafter. However larger number of cases should be practice with its respective follow up in order to evaluate the system effectiveness.

## DIFFERENT ISSUES IN THORACIC SURGERY

### OP-1145-QUALITY OF LIFE OF THE PATIENTS WITH LUNG CANCER AFTER LOBECTOMY AND PNEUMONECTOMY

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**BACKGROUND:** Lung cancer is the most common cause of cancer death in both men and women in our country. It has been estimated that there will be 6,00 lung cancer deaths every year in Greece. However, many patients with bronchogenic carcinoma also have coexistent obstructive lung disease. In these patients, preoperative prediction of functional status after lung resection is mandatory. The aim of our study was to determine the effect of lung resection on postoperative spirometric lung function.

**PATIENTS AND METHODS:** 112 patients underwent spirometric pulmonary tests preoperatively, and at 3 and 6 months after their operation. The predicted postoperative forced vital capacity (FVC) and forced expiratory volume in the first second (FEV(1)) were calculated using the formula of Juhl and Frost: predicted postoperative FEV(1) (or FVC) = preoperative FEV(1)(or FVC) x [1 - (S x 0.0526)], where S = number of segments resected. Statistical significance was defined as a p value < 0.05.

**RESULTS:** The functional percentage losses at 6 months for lobectomies and pneumonectomies were 7.34% and 34.89% for FVC and 7.72% and 32.53% for FEV, respectively. The linear regression analysis derived from the correlation between predicted and measured FEV(1) resulted in 2 equations for lobectomy and pneumonectomy. The first, for lobectomy, was: FEV(1)POSTOP = 0.00211 + 0.896660 x FEV(1)PREOP; and the second, for pneumonectomy, was: FEV(1)POSTOP = 0.145 + 0.65318 x FEV(1)PREOP.

**CONCLUSION:** We conclude that our formulas are a reliable method for predicting postoperative respiratory function of the patients with lung cancer.

### OP-1146-THE ROLE OF INTERCOSTAL NERVE PRESERVATION ON POST OPERATIVE PAIN CONTROL AFTER THORACOTOMY; A DOUBLE CENTER STUDY

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**BACKGROUND:** Pain control after thoracotomy is one of the most important factors which affect the outcome in thoracic surgery. We observed a better post operative pain control through intercostal nerve preservation with or without peri dural anesthesia (PDA). The aim of this study was to determine the role of intercostals nerve preservation on the early and late post operative pain control.

**METHODS:** We analyzed the data of all patients who received thoracotomy at both institutions over a 2 years period (from Dec.2005 to Nov. 2007) retrospectively. There were 375 patients underwent thoracotomy (216 Thoracotomies at the first Institut; Division of general thoracic surgery, University Hospital of Bern, Switzerland, and 159 at the second Institut; Division of general thoracic surgery, evangelic Hospital Bielefeld, Germany). Patients were divided into two groups: group I: patients with intercostals nerve sacrifice, and group II: patients with intercostals nerve preservation. Questionnaires were sent to 355 patients and 341 were available for analysis. Diagnosis, type of thoracotomy, operative procedures, histological findings, degree of early post operative pain, additional pain medication, time of mobilization, time of hospital stay, level of pain at discharge, level of pain 2 weeks after discharge, late pain control, and quality of life during the hospitalization time as well as after discharge were compared.

**RESULTS:** There were 362 patients underwent 375 thoracotomies, There were 270 antero lateral thoracotomie (72%), 92 lateral thoracotomie (25%), and 13 rethoracotomies (3%). There were 240 male patients, mean age was 66 years

(average 27-82 years). Group I (intercostals nerve sacrifice) consisted of 218 patients (158 male). Group II consisted of 167 patients (98 male). The operative procedures performed through thoracotomy were as follow: 1) Pneumonectomy and extended pneumonectomy for non small cell lung cancer (NSCLC) in 40 patients, and for malignant pleural mesothelioma (MPM) in 10 patients, 2) Lobectomy and Bilobectomy for NSCLC in 210 patients, 3) Segmentectomy and wedge resection in 13 patients 4) Open decortication due to pleural empyema in 84 patients, 5) Laminectomy and internal fixation of thoracic vertebral fracture in 8 patients, 6) Removal of intrathoracic hematoma 9 patients, 7) Removal thymus cyst in one patient. PDA was performed in 186 Patients in group I and in 143 patients in group II. Patients who did not receive PDA were managed either with PCA or intra venous morphine in the first 48 hours postoperatively. Postoperative pain control was easier in group II irrespective of the diagnosis and the operative procedure. Operative time was not prolonged in group II than those in group I. The mean hospital stay was significantly different in both group with 12 days in group I and 8 days in group II (p=0.023). The rate of pain free patients at discharge was significantly higher in group II (p= 0.038). Early mobilization of the patients with physiotherapy training was significantly higher in group II (p=0.026). Two weeks control after hospital discharge showed no significant difference in all patients. There was no significant difference in the quality of life after hospital discharge, but significant patient's contentment in group II during the postoperative phase (p=0.041).

**CONCLUSIONS:** Surgical techniques with preservation of the intercostals nerve is feasible, and an effective method to help control pain after thoracotomy in early post operative phase. Randomized studies are needed to support these results.

### OP-1147-INFLAMMATORY MYOFIBROBLASTIC TUMOR OF LUNG (PSEUDOTUMOR OF THE LUNG) THE SECRET OF THE UNKNOWN.

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**INTRODUCTION:** Inflammatory pseudotumor first observed in the lung and described by Brunn in 1939 Was so named by Umiker et al in 1954 because of its propensity to clinically and radiologically mimic a malignant process. An inflammatory pseudo tumor (IPT), known as a plasma cell granuloma, is a relatively uncommon non-neoplastic tumor-like process with an unidentified aetiology that usually occurs in children and young people. Inflammatory pseudo tumor is a rare disease in the adults. Patients with IPT are usually asymptomatic, with a solitary pulmonary nodule or mass detected on routine chest roentgenogram. IPT can behave as a malignant tumor both clinically and radiologically. Cough, fever, dyspnea, and hemoptysis are the usual presenting symptoms. We report a case of lung involvement with radiologic and pathologic correlations in a young patient who presented with cough and left side chest pain almost a year post the removal of his thymus for thymoma. Initial radiological appearance with pathological correlation proved the presence of pseudo tumor in our patient.

**CASE REPORT:** 34 year old man was referred to cardiothoracic outpatient department with complaints of cough and left sided dull aching chest pain lasted for several weeks. His past medical history revealed previous chest surgery for thymoma resection a year before he presented to our clinic. Physical examination was unremarkable. Respiratory examination revealed an impaired percussion note in the left lower lobe area with crackles. Frontal chest radiograph revealed a homogenous opacity with ill defined margins in the left lower lung fields. Computerized tomogram of the chest showed presence of a homogenous solid density mass lesion with defined borders in left lower lobe. Haematological tests were within normal limits. Histology of the resected tumor tissue revealed spindle cells and neoplasm which appears to be pseudo encapsulated, to be hypercellular and to be traversed by strands of fibrous connective tissue associated with foci of haemorrhage and myxoid / oedematous change. The predominant cell is the spindle cell components with plump atypical nuclei associated with abnormal mitoses. These features were suggestive of an inflammatory myofibroblastic tumour. Patient was discharged a week after his surgery in great condition. He received a course of radiotherapy as an outpatient then was followed up a month and three months later to his discharge and remains healthy with no recurrence reported. Discussion Inflammatory pseudotumor has been described in literature by various names in various locations as plasma cell granuloma (heart), inflammatory myofibroblastic tumor (lung), inflammatory myofibrohistiocytic proliferation, histiocytoma, xanthoma, fibroxanthoma, xanthogranuloma, fibrous xanthoma, plasma cell-histiocytoma com-

plex (lung), plasmocytoma, solitary mast cell granuloma, inflammatory fibrosarcoma (bladder). Inflammatory pseudotumor, also known as plasma cell granuloma and inflammatory myofibroblastic tumor, is a rare non-neoplastic lesion in adults consisting mainly of spindle-shaped mesenchymal and inflammatory cells. Inflammatory pseudotumor most commonly involves the lung and the orbit, but it has been reported to occur in nearly every site in the body, from the central nervous system to the gastrointestinal tract. Because inflammatory pseudotumors mimic malignant tumors both clinically and radiologically

#### OP-1148-PULMONARY METASTASECTOMY IN SARCOMA PATIENTS WITH EXTRA-THORACIC METASTASES

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**BACKGROUND:** Although lung is the most common site of metastases of sarcomas, metastases also occurs to other extra-thoracic organs. The presence of extra-thoracic metastases is typically a contraindication to pulmonary resection. Survival has not been analyzed after metastasectomy to lung as well as other extra-thoracic organs. The objective of this study is to compare the survival in two groups of patients, one with metastasectomy to lung only and the other with metastasectomy to lung as well as other extra-thoracic organs.

**METHODS:** Of 14888 soft tissue sarcoma patients, admitted at M.D.Anderson Cancer Center from 1978 to 2005, 1583 developed pulmonary metastases. Out of this group 234 patients had pulmonary metastasectomy as part of their treatment. The patients were divided into two groups, one group had metastasectomy to lung only (group A) and the other group had metastasectomy to lung as well as other organs (group B). The survival data between the two groups were analyzed retrospectively.

**RESULTS:** Of the total group of 234 patients considered for analysis, there were 147 (62.8%) patients in group A and 87 (37.2%) in group B. The most common histologies were osteosarcoma and leiomyosarcoma. The median survival in group A was 35 months and 37 months in group B. The difference was not significant ( $p=0.652$ ).

**CONCLUSIONS:** In patients with sarcoma, more than one site of metastasis does not decrease the potential for long-term survival provided all disease can be resected.

#### OP-1149-ROLE OF SURGICAL RESECTION FOR PULMONARY METASTASIS OF HEPATOCELLULAR CARCINOMA

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**BACKGROUND:** The lung is one of the most important key organs for the metastasis of hepatocellular carcinoma (HCC). However, pulmonary metastasectomy for HCC has not been well-documented. The aim of this study is to evaluate long-term outcomes of pulmonary metastasectomy for HCC.

**METHODS:** Between January 1998 and May 2007, 28 patients (20 males, 8 females) underwent 8 bilateral and 20 unilateral pulmonary metastasectomies for HCC. Retrospective review of medical records and telephone surveys were conducted to evaluate risk factors of long-term survival.

**RESULTS:** The median age at the time of metastasectomy was 56 (18-66) years. The median duration between the time of initial diagnosis of hepatocellular carcinoma and pulmonary metastasectomy was 25 (7-150) months. Surgical procedures performed were wedge resection in 19, lobectomy in 4, and lobectomy with wedge/segmentectomy in 5. Videoscopic surgery was performed in 9, thoracotomy in 16, and combined videoscropy / thoracotomy approach on each side in 3 patients. There were no cases of operative mortality. One patient developed postoperative atelectasis and another developed a minor wound infection. During the median follow-up period of 13 (1-112) months, 20 patients recurred at median of 5 (1-24) months; 5 only at the liver, 4 only at the lung, one at both sites and 10 at distant sites other than liver or lung. Ten patients died of recurrence, 4 are alive with recurrent tumor, and 6 are alive without evidence of cancer including one patient who underwent re-resection for pulmonary recurrence. All 5 patients whose recurrence was limited to the

liver are alive at the time of study. The overall survival and disease free survival rates were  $50\pm 13\%$  and  $10\pm 7\%$  at 5 years, respectively. None of the clinical variables including age, gender, disease free interval, tumor size, numbers, preoperative level of serum AFP could not predict survival. When we analyzed patients who recurred, survival was better in patients whose recurrence was limited at either liver or lung ( $p=0.0106$ ).

**CONCLUSIONS:** Pulmonary metastasectomy for HCC could be performed safely without major morbidity. Recurrence at the organs other than liver or lung resulted in poor survival, which suggested careful search for other distant metastasis is mandatory for patient selection. Our experience is one of the largest series demonstrating a promising role of pulmonary metastasectomy in highly selected patients of HCC.

#### OP-1150-RECURRENCE OF THYMIC EPITHELIAL TUMORS: PREDICTORS, TREATMENT AND OUTCOME

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**BACKGROUND:** recurrence after radical resection of thymic epithelial tumors (TETs) is not infrequently observed and its treatment remains controversial. In this study we focused on predictors of recurrence in TETs and we evaluated the outcome following surgical or non surgical treatments.

**METHODS:** 147 patients with TETs radically resected between 1980 and 2006 were followed-up for a median of 96 months (range 12-312). Twenty-three (15.5%) patients had a recurrence. The most common site of recurrence was the thoracic cavity (18 cases, 78.3%), while extrathoracic localizations occurred in 5 cases (21.7%). The median disease free interval was 30 months (range 3 to 181 months).

**RESULTS:** out of 23 patients with recurrence 13 patients (56.5%) with intrathoracic disease (1 mediastinal, 12 pleural, pericardial or pulmonary metastases), were treated with reoperation, (12 radical, 1 debulking), while the remaining 10 patients (43.5 %) received adjuvant treatments (chemo-radiotherapy). Two patients radically resected presented a second pleural recurrence that was newly operated. The relapse rate showed an increasing from I to IVa stage (stage I: 3.4%; stage II: 6.2%; stage III: 22.7%; stage IVa: 69.2%;  $p=0.00001$ ). and tumors in stages I and II recurred later (median 55 months, mean 85 months) than advanced stages (median 29 months, mean 47 months). On the basis of WHO histotype, almost the totality of recurrences (22 cases, 95.7%) were in types B2-3 and C ( $p=0.00001$ ). On multivariate analysis Masaoka stage ( $p=0.001$ ) was the only independent predictor of recurrence. Overall 5 and 10-year survival from the time of recurrence was respectively 36% and 30% (median survival 29 months), but patients that received a surgical resection had a significantly better prognosis than patients treated with non surgical therapies (5-year survival 60% vs 0%;  $p=0.001$ ). No difference in survival was observed between patients radically operated for recurrence and patients without recurrence (starting from the time of initial operation: 5 and 10-year survival rate 69% and 62% versus 85% and 70%, respectively,  $p=0.10$ ).

**CONCLUSION:** recurrence after radical resection of TETs can occur even many years after operation. The risk of relapse is greater for Masaoka stages III and IV and for B2-B3 and C histotypes. Surgical resection of the recurrence when feasible, is the recommended treatment, achieving an excellent prognosis.

#### OP-1151-UNUSUAL CLINICAL ENTITIES AND RARE TUMORS OF THE THORACIC CAVITY: CASE SERIES

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**BACKGROUND:** The authors present a case series of extremely unusual findings in the thorax.

**MATERIAL:** From 2005 to 2007 250 cases with thoracic tumors have been performed in our institution. The records of these patients were retrospectively analyzed for several clinicopathologic factors. All unusual cases were recorded.

**RESULTS:** Case 1. An intrapulmonary bronchial artery aneurysm located adjacent to intermediate bronchus, associated with previous bronchotomy and recurrent episodes of hemoptysis. Case 2. An acutely symptomatic aneurysm of the ductus arteriosus ADA in a 67-year-old male that presented with hoarseness

(Ortner's syndrome), making the preoperative differential diagnosis from bronchial cyst and malignancies extremely difficult. Case 3. A myofibrosarcoma, or myofibroblastic sarcoma, of the lung. Initial diagnosis was inflammatory myofibroblastic tumor but after extensive pathologic analysis myofibrosarcoma of the lung was disclosed. Case 4. A solitary papilloma of the distal trachea. After two unsuccessful sessions of laser ablation, resection of the lower third of the trachea was performed through a right posterolateral thoracotomy. Post-operative histology results disclosed malignant degeneration into squamous cell carcinoma. Case 5. A case of an isolated left sided pericardial defect with intrathoracic protrusion of the left appendage misinterpreted as hilar lymph node during a left upper lobectomy. The patient suffered from atrial fibrillation which was disappeared after pericardial defect repair. Case 6. An anterior mediastinal mass with histology of an unusual mixed tumor (type I, stage I) consisting 10% of embryonal carcinoma, 40% of extragonadal seminoma, 30% of yolk sac tumor and 20% of mature teratoma. Case 7. Thoracic splenule without prior history of trauma or surgery. Case 8. Esophageal duplication mimicking lung tumor Case 9. Primary lung leiomyoma. Case 10. Pulmonary paraganglioma. Case 11. Pulmonary meningothelioid nodules. Case 12. Lung amyloid tumor.

**CONCLUSION:** The extreme rarity of these clinical entities makes differential diagnosis difficult. However, the correct diagnosis secures the effectiveness of management. Our report underlines the relativity of non-invasive methods on producing a solid diagnosis. Histologic confirmation was a prerequisite for the optimal treatment.

### OP-1152-MALIGNANT SUPERIOR VENA CAVA SYNDROME IS THIS A MEDICAL EMERGENCY

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**BACKGROUND:** Superior vena cave syndrome (SVCS) is an association with a variety of benign and malignant etiologies. The aim of this study was to evaluate if malignant SVCS is a real medical emergency or we are able to obtain a definite histological diagnosis before chemoradiotherapy.

**METHOD AND MATERIALS:** In this prospective case series study, we have evaluated epidemiologic characteristics and ability to obtain a definitive histologic diagnosis before chemoradiotherapy and the role of chemoradiotherapy before obtaining tissue specimen on the results of diagnostic interventions in patients with malignant SVCS who came to thoracic surgery wards of Imam Khomeini (Tehran), Ghaem and Imam Reza hospitals (Mashhad) -IRAN from 2001 to 2006.

**RESULTS:** Among 50 patients with SVCS, M/F ratio was 32/18. Mean age was 61.7 years and the most common symptom was dyspnea (86%). We performed successful tissue sampling before chemoradiotherapy in 44 cases (88%) and histologic diagnosis was established in 100% of these cases but among other 6 patients (12%) who received chemoradiotherapy first because unstable general conditions, histologic diagnosis was obtained only in one patient 16.7% of these cases after chemoradiotherapy ( $P<0.01$ ).

**CONCLUSION:** As we are able to establish tissue specimen by minimally invasive methods in most SVCS cases and as chemoradiation may preclude obtaining exact pathologic diagnosis so we suggest performing diagnostic interventions prior to chemoradiation in patients with SVC syndrome.

### OP-1153-SURGERY FOR MEDIASTINAL DISEASE

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**AIMS:** This study was done to define the indications as well as morbidity & mortality of surgery for mediastinal disease.

**METHOD:** 200 cases of mediastinal pathology underwent surgery at Cardio-thoracic Unit, Lady Reading Hospital Peshawar from June 2002 to December 2005. M: F ratio was 110: 90. Age ranged from 9 days to 72 years with a mean age of 33.6 years. All cases had CT Thorax. 110 cases had diagnostic mediastinotomy while 90 cases underwent curative surgery. Out of 200 cases 75 had SVC obstruction.

**RESULTS:** The diagnostic group of 110 patients had the following breakup Lymphoma 64, Tuberculosis 27, Sarcoidosis 15, Carcinoma 4. Histologic breakup of 90 therapeutic cases was (i) Retrosternal goitres 21, (ii) Thymomas 27, (iii) Thymic cyst 9, (iv) Dermoid Cyst 12, (v) Neurofibromas 18, (vi) Pleu-

ropericardial Cyst 3. Mortality was 3.5% i.e. 7/200 patients died within 30 days of surgery. Morbidity was 6%, i.e. air leak 5, Wound infections 3, hemorrhage 3 & hoarseness 1.

**CONCLUSION:** Mediastinal pathology often presents as both a diagnostic dilemma and at times life threatening condition due to SVC obstruction or airway compression. It is best dealt with surgically in a properly equipped & staffed cardiothoracic unit.

### OP-1154-LONG TERM INDWELLING PLEURAL CATHETER FOR MALIGNANT PLEURITIS UNSUITABLE FOR TALC PLEURODESIS

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**BACKGROUND:** Talc pleurodesis via chest tube is a primary option in malignant pleuritis, since life expectancy is short and surgical decortication is hazardous. Incomplete lung expansion after fluid evacuation, and/or excessive fluid secretion predicts failure of pleurodesis. A mini-invasive alternative was investigated.

**METHODS:** Between March 2004 and september 2005, 51 consecutive patients with malignant pleural effusion, and clinically considered unsuitable for talc pleurodesis, were implanted with an indwelling pleural catheter (Denver Pleur X). In 47, it was done bedside using local anesthesia. There were 24 men and 27 women, median age 63y (range 36-85y), receiving 39 right side, 10 left, and 2 bilateral catheters. There were 19 non-small cell lung cancer cases, 7 mesothelioma, and 25 with other malignancy.

**RESULTS:** At 2 year follow up on september 2007, one patient was alive. Mean survival was 3 months (range 5 days to 37+ months) for all patients, with best median survivals of 5,5 to 6 months in breast and ovarian cancer. Catheter was removed or replaced in 15% (8/51) due to infection, air leak, or blockage. One patient requested decortication for excessive fluid secretion. None required surgery or died due to catheter-related complications. Uninterrupted chemotherapy was given in 35% (18/51). Pleural fusion with catheter removal was achieved in 21 % ( 11/51).

**CONCLUSIONS:** An indwelling pleural catheter is a safe alternative for patients with malignant pleuritis unsuitable for talc pleurodesis. In some, pleural fusion may be achieved.

### OP-1155-CAN SERUM INFLAMMATORY PARAMETERS ESTIMATE OUTCOME OF BLOOD PLEURODESIS IN CASES OF PERSISTENT AIR LEAK?

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**OBJECTIVE:** Blood, outside the vascular system, is known to be related to adhesion formation and fibrosis. Autologous blood may be a safe and inexpensive agent to produce pleurodesis in cases of persistent air leakage. As pleurodesis causes systemic inflammation, C-reactive protein along with white blood cells might predict a successful result in these cases. This study aimed to investigate, whether systemic inflammatory reaction induced by instillation of autologous blood into the pleural cavity might predict the outcome of pleurodesis.

**MATERIAL & METHOD:** From February 2005 through March 2007 a total of 20 patients, 14 male and 6 female, ranging in age from 41 to 81 years were submitted to blood pleurodesis in our department due to persistent air leak (< 7 days). In the majority of patients the underlying disease was emphysema (n=14). Lobectomy was performed in 10 cases, LVRS in 4 and 3 patients suffered from secondary pneumothorax. Venous blood samples were drawn before and at the 4th hour after pleurodesis for the analysis of inflammatory parameters such as white blood cell count and C-reactive protein.

**RESULTS:** Pleurodesis was successful in the majority of patients (n=14, 70%) in less than 12 hours. Only in 2 cases a second instillation of blood took place. All patients had a prominent transitional elevation of the inflammatory parameters. Statistical analysis of the pre-pleurodesis white blood cell count and C-reactive protein levels compared to the post-pleurodesis ones revealed a strong statistically significant difference.

**CONCLUSION:** High levels of C-reactive protein and leucocytes during pleurodesis are due to the inflammatory response and may be used to predict the successful outcome of blood pleurodesis in patients with persistent air leak.



**OP-1156-PROGNOSTIC SIGNIFICANCE OF TUMOR FREE LENGTH OF RESECTED BRONCHUS IN LUNG CANCER**

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**BACKGROUND:** The best survival rates were obtained after complete resection of the non-small cell lung cancer (NSCLC). The increase of the length of the intact bronchus after pulmonary resection can effect the survival.

**METHODS:** Patients performed lung resection due to a NSCLC between 1999 and 2004 were evaluated. Distal bronchial end of the lobectomy or pneumonectomy materials whom not have mediastinal metastasis were examined histopathologically to eliminate tumoral invasion of the margin. In 178 materials which found clear bronchial margin, distance of the bronchus to the macroscopic tumor was measured. Patients were grouped according to this clear post-resectional bronchial length as 1-5 mm, 6-10 mm, 11-15 mm and upper than 15 mm groups. Survival rates of the patients were calculated and analyzed using either univariate or multivariate analysis together with T and N factors.

**RESULTS:** This series was formed from 172 male and 6 female with a mean age of 57,8. Lobectomy in 110 and pneumonectomy in 68 patients were performed. Histopathological tumor types were squamous carcinoma in 124, adenocarcinoma in 43 and others in 11 patients. Thirteen patients staged as T1, 105 as T2 and 60 as T3. No any lymphatic metastasis was determined in 84 but N1 disease was diagnosed in 94 patients. Distance from bronchial end to the macroscopically seen tumor was 1-5 mm in 27, 6-10 mm in 32, 11-15 mm in 19 and upper than 15 mm in 97 patients. Five year survival rates of the patients according to their groups were 32%, 39%, 53% and 58% respectively. This differences were not statistically significant (log rank,  $p=0,4$ ). Similarly, tumor free length of the bronchus was found no effect on survival at multivariate analysis.

**CONCLUSIONS:** Macroscopically tumor free length of the bronchus of resected lung has no effect on the prognosis of the NSCLC patients who resection was performed with microscopically clear bronchial margin.

## CARDIO-THORACIC & MULTIDISCIPLINARY

### OP-1157-EVALUATION OF THE LEVEL OF ANTIBODIES AGAINST CHLAMYDIA PNEUMONIAE AFTER CABG

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**BACKGROUND:** Many researchers believe that inflammatory condition plays an important role in the onset of atherosclerosis. *C. pneumoniae* might modulate this condition. In this paper we present the results of progressive observation of patients with antibodies against *C. pneumoniae*.

**METHODS:** The objective of our research was a prospective observation of antibody titers of *C. pneumoniae* in a group of 155 patients after CABG.

**RESULTS:** Six years after CABG, 128 patients are still alive. The study of the present titers levels in IgA and IgG was done on 118 patients. A positive serological conversion was observed in 36 patients in the IgA, and in 26 patients in the IgG. The group with no antibodies decreased from 23.2% to 3.4% while the group with antibodies in both IgG and IgA classes increased from 52.3% to 83.9%. The average coronary complaint degree evaluated on the CCS scale decreased from 3.18 before CABG to 1.65 in the control examination.

**CONCLUSIONS:** The surgical treatment brought about a long term improvement in patients coronary condition. Microbiological test results indicated a growing tendency for increased antibody titers in *C. pneumoniae* CABG patients. A significant increase in antibody titers in both IgA and IgG classes in patients who previously tested positive for antibodies was observed. These results show no connection between the serological symptoms of a chronic *C. pneumoniae* infection and coronary complaints evaluated on CCS scale during a six year study on post-CABG patients

### OP-1158 IMPENDING PARADOXICAL EMBOLISM: SYSTEMATIC REVIEW OF PROGNOSTIC FACTORS AND TREATMENT

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**BACKGROUND:** Little is known on the optimal management of impending paradoxical embolism, a biatrial thromboembolus caught in transit across a patent foramen ovale. Our aim was to systematically review observational studies on this subject to identify prognostic factors, to compare survival between treatments and risk of treatment-induced embolism.

**METHODS:** We did systematic literature searches for studies on impending paradoxical embolism in Medline, Embase and Cochrane Library and identified 143 studies eligible for inclusion, reporting 154 patients. One more patient was included from an unpublished contribution. Primary endpoints were hospital and 24 hour mortality. The secondary endpoint was treatment-induced systemic embolism.

**RESULTS:** There were 30 in-hospital deaths (19.4%), 20 of which occurred within the first 24 hours after diagnosis (12.9%). On bivariate analysis, age ( $P = 0.05$ ), shock ( $P = 0.04$ ) and coma ( $P = 0.03$ ) at presentation were increased among non-survivors. Surgical thromboembolotomy was the only treatment significantly associated with increased survival ( $P = 0.006$ ). In multivariable models, thromboembolotomy (OR 10.34 [95% CI 2.29-46.63];  $P = 0.002$ ) and anticoagulation (OR 6.50 [1.27-33.43];  $P = 0.03$ ) had increased odds of survival, but not thrombolysis (OR 3.03 [0.55-16.81];  $P = 0.21$ ). Thrombolysis (OR 10.38 [1.58-68.14];  $P = 0.02$ ) and anticoagulation (OR 6.82 [1.26-36.86];  $P = 0.03$ ) had increased odds of treatment-induced systemic embolism compared to surgery.

**CONCLUSIONS:** Surgical thromboembolotomy increases the odds of survival after impending paradoxical embolism and minimizes the risk of systemic embolism. It should be considered the treatment of choice, even for unstable or critically ill patients.

### OP-1159-CIRCULATING MATRIX METALLOPROTEINASE-3 AT THE ACUTE PHASE OF MYOCARDIAL INFARCTION IN RABBITS

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**BACKGROUND:** Research data suggest MMPs to play a central role in post myocardial infarction (MI) remodeling period; specifically the MMP-3 can act on a wide range of myocardial substrates and activate several other MMPs. Concerning the existing literature related to in vivo experiments involving rabbits as experimental small animal study model, a Pubmed search revealed only one study about serum MMP-3 alteration in rabbit through a Langendorff heart preparation with bank blood addition which can adversely affect the alterations in MMPs. In an attempt to address in vivo the alterations in MMP-3 levels after an induced myocardial infarction, we performed the present study.

**METHODS:** In 13 New Zealand white rabbits weighting between 3-4 kg, anesthesia was given and after the tracheotomy, acute MI was induced in ten of them by occlusion for 45 min of the left anterior descending coronary artery. The rest 3 was the control group. A four lead electrocardiogram was recorded throughout the procedure. Monitoring of blood pressure and heart rate was accomplished through femoral artery cut down. Before the operation blood samples were taken for analysis from the ear artery catheter for measurements of the p (H), p (CO<sub>2</sub>), p (O<sub>2</sub>) and other parameters. The onset of ischemia was verified by ST elevation on the electrocardiogram. Forty-five minutes later the occlusion was released. Three hours after reperfusion blood samples were taken for biomedical analysis.

**RESULTS:** Of the 10 rabbits subjected to AMI all survived the entire experimental protocol (approximately 6 hours). Three hours after an artificially induced AMI, serum MMP-3 levels were decreased, by almost 50%, while no change in serum MMP-3 was observed in the controls. The cTn I concentrations were found considerably increased (90x) after MI, further validating the efficiency of our in vivo experimental AMI study model.

**CONCLUSIONS:** To our knowledge this is the first study in vivo, in which MMP-3 expression is measured in serum from rabbits subjected to acute MI. MMP-3 level was determined 3 hours after AMI, which is the shortest period reported after an induced AMI. In most studies the MMP-3 induction after an MI, was observed at or after the 2nd post acute MI day, leaving a 2-day window time period at the acute phase of the ischemic injury. The reduction range of MMP-3 levels is limited compared with other predictor factors like cTn I, which increase is worthiness. However, we demonstrate that plasma fluctuations MMP-3 could be used as supplementary independently predictor of cardiovascular events in patients with stable coronary artery disease.

### OP-1160-RESULTS OF MITRAL VALVE REPAIR VERSUS MITRAL VALVE REPLACEMENT FOR ISOLATED ACTIVE INFECTIVE MITRAL VALVE ENDOCARDITIS: 20-YEAR SINGLE CENTER EXPERIENCE

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**OBJECT:** We retrospectively compared early and long-term results of mitral valve repair (MVRep) and mitral valve replacement (MVR) in patients with isolated infective mitral valve endocarditis (MVE).

**METHODS:** Between 04/1986 and 12/2006, 1143 infective endocarditis operations were performed including 470 infected mitral valves. Fifty-nine of these patients (39 men, median 49 years) received MVRep with pericardium and 194 MVR (124 men, median 57 years) due to isolated MVE. Probability of survival, freedom from recurrence and reoperation were calculated using Kaplan-Meier and Chi2-test to identify predictors. Follow-up (3 months-19.6 years) was completed in all survivors with 306 and 719 patients years in the MVRep and MVR group.

**RESULTS:** Compared to the MVRep group, MVR patients were significantly older, preoperatively significantly more often intubated, in cardiac decompensation and more often underwent emergency operation. MVRep patients had significantly more preoperative septic cerebral embolism. MVRep was associated with significantly better survival than MVR: 30-day, 1, 5, 10 and 15 year survival rate was 91.4%±3.6%, 84.0%±5.0%, 76.6%±6.1%, 62.4%±8.2% and 62.4%±8.2% compared to 80.1%±2.9%, 66.4%±3.5%, 52.8%±3.9%,

39.8%±4.5% and 36.9%±5.0% (p=0.0050). Freedom from MV reoperation due to failure of reconstruction at 1, 5 and 10 years was 86.6%±5.0%, 84.4%±5.4%, and 79.1%±7.2%. Early re-endocarditis occurred in 2/59 (3.3%) after MVRep and 5/194 (2.5%) after MVR.

**CONCLUSIONS:** MVRep for MVE shows much better early and long-term survival than MVR. It should be performed when all infected material can be resected and the remaining tissue allows re-shaping of a competent valve. Patients requiring MVR had advanced endocarditis with annular destruction and were more critically ill.

#### **OP-1161-IS MULTI SLICE CT ANGIOGRAPHY ADEQUATE AS THE SOLE DIAGNOSTIC CRITERIA TO PROCEED FOR CABG ?**

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**BACKGROUND:** Rapid advances in multislice computed tomography (MSCT) have facilitated increasingly accurate noninvasive coronary imaging. The present study was designed to assess the accuracy of the 64 slice MSCT scanner with conventional coronary angiography (CCA) and to conclude whether or not MSCT angiography alone could give sufficient and accurate information to proceed with coronary artery bypass grafting (CABG).

**METHODS:** 50 stable patients with proven severe CAD on CCA for elective CABG underwent MSCT prior to CABG. The MSCT images were compared with CCA and the accuracy, sensitivity and specificity of detecting significant stenosis cross checked.

**RESULTS:** An excellent correlation was found between the two modalities. Comparing the maximal percent diameter luminal stenosis by MSCT versus CCA, the Spearman correlation coefficient between the two modalities was 0.99 (p < 0.0001). Bland-Altman analysis demonstrated a mean difference in percent stenosis of 0.6 ± 2.3% (95% confidence interval 5.1% to -3.9%). 93.4 % of the observations were within ± 1.96 standard deviation. Anomalous and intramural coronary arteries were easily picked up by MSCT.

**CONCLUSIONS:** MSCT is a valuable tool for the cardiac surgeon. It helps in precise planning of the CABG especially off-pump CABG and in prejudging the length of the conduit required. On the basis of our findings we recommend MSCT as a sole criteria for proceeding for CABG without CCA in selected cases.

#### **OP-1162-BILATERAL SKELETONIZED INTERNAL MAMMARY ARTERIES: "in situ" GRAFTS FOR MYOCARDIAL REVASCULARIZATION**

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**BACKGROUND:** Bilateral internal mammary artery (BIMA) has been proposed to improve long-term results in coronary artery bypass grafting (CABG). However, there are specific conditions (low ejection fraction, diabetes, chronic obstructive pulmonary disease (COPD) et cet.) traditionally accepted as a "limiting factors" for usage of BIMA in CABG. This study presents our initial results with "in situ" skeletonized BIMA in CABG.

**METHODS:** There were 94 patients with skeletonized BIMA in CABG procedures operated on between August 15, 2003 and November 1, 2007. Skeletonized IMA was harvested with blunt dissection and gentle operative technique. Right IMAs were used for right coronary artery, and left IMAs for left coronary system. There were 78 (83.0%) male and 16 (17.0%) female patients, with an average age of 55.2 years. All IMAs were used as "in situ" grafts. Fourteen patients (14.9%) were diabetics, 25 patients (26.6%) had COPD, and 9 patients (9.6%) had ejection fraction <30%. In 20 patients (21.3%) radial artery was used in addition to BIMA to achieve total arterial revascularization.

**RESULTS:** There were no postoperative morbidity and mortality (30 days after surgery). The average length of stay was 8 days.

**CONCLUSION:** Bilateral skeletonized IMA could be successfully used as an "in situ" conduit for CABG, especially if total arterial revascularization is preferred. IMA harvesting with skeletonized technique provides better IMA length, detailed graft visualization, and minimal trauma to the chest wall. This operative technique makes previously described limitations for usage of BIMA in CABG irrelevant.

#### **OP-1163-INTERACTION OF THROMBOTIC GENE POLYMORPHISMS AND POSTOPERATIVE OUTCOME AFTER CARDIAC SURGERY**

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**BACKGROUND:** Emerging perioperative genomics may influence the direction of risk assessment and surgical strategies in cardiac surgery. The aim of this study was to investigate whether the genetic variations of thrombosis predispose to increased risk for postoperative cardiovascular adverse events in patients undergoing coronary artery bypass surgery (CABG).

**METHODS:** A total of 220 patients undergoing first-time isolated CABG between January 2003 and May 2005 were screened for Factor V Leiden, PT G20210A mutations, ACE I/D polymorphisms and EPCR 23 bp insertion mutation by DNA analysis using the polymerase chain reaction. Patients' preoperative risk factors were recorded and EuroScores were calculated for each patient. End points were defined as death, nonfatal myocardial infarction, nonfatal stroke, postoperative bleeding, respiratory and renal insufficiency and event-free survival. Patients were compared to assess for any independent association between genotypes for thrombosis and postoperative phenotypes.

**RESULTS:** Heterozygous F V Leiden mutation was detected in 24 patients (%10.9) and PT G20210A mutation was determined in 8 (%3.6) patients out of 220 patients. EPCR 23 bp insertion was detected in 6 patients (%2.97) among 202 patients; ACE D/D genotype was found in 57 patients (%31.5) among 181 patients. None of the genotypes investigated were independently associated with morbidity and mortality. F V Leiden positive patients were associated with higher incidence of totally occluded coronary artery disease.

**CONCLUSIONS:** F V Leiden, PT G20210A mutations, ACE I/D polymorphisms and EPCR 23 bp insertion were not associated with early morbidity or mortality after CABG. F V Leiden positive patients were not associated with the number of diseased vessels however they had a higher incidence of total occluded vessels. With this findings we hypothesized that as F V Leiden mutation is not mainly related to the prevalence of atherosclerosis, it may be related to the formation of thrombosis in atherosclerotic coronary arteries leading to total occlusion. EPCR 23 bp insertion prevalence was found to be higher in CABG group than healthy controls in the literature. Although our study lacks the longer follow-up times and a larger study population, we believe that as it is the first study that evaluates the association of EPCR 23 bp insertion in CABG patients, it may be a pioneer to the future similar studies.

#### **OP-1164-PROSTAGLANDIN E1(ALPROSTADIL) ALLOWS THE SAFE USE OF HEPARIN ANTICOAGULATION IN EMERGENT CARDIAC SURGERY PATIENTS POSITIVE FOR ANTI-PF4/HEPARIN ANTIBODIES**

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Retrospective record analysis of 112 patients. Control group had PF4/Heparin antibody testing but no intervention.

## MINIMALLY INVASIVE SURGERY II

### OP-1165-ENDOVASCULAR TREATMENT OF THORACIC AORTIC DISEASES: RESULTS OF A MULTICENTER STUDY

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**BACKGROUND:** Surgical treatment of thoracic aortic diseases has high morbidity and mortality rates, which increase with age and associated diseases. Use of stent-grafts has been a less invasive alternative to conventional surgery. This study aims at evaluating the evolution of the treatment of thoracic aortic diseases using self-expandable stents at three Brazilian university institutions.

**METHODS:** From November 1998 to October 2007, 255 patients were submitted to endovascular treatment of thoracic aortic diseases, using 303 grafts. The most prevalent diseases were, respectively, descending thoracic aortic aneurysms (89), thoracoabdominal aneurysms (85), aortic dissection (61), coarctation of the aorta (9), penetrating aortic ulcer (8) and aortic arch aneurysm (3). Mean age was 63.2 years (16-90) and there was a 62.7% prevalence of the male gender. Concomitant procedures were performed in 1.6%.

**RESULTS:** In the immediate postoperative period, the main causes of morbidity were hyperthermia (45.9%), endoleaks (9.8%; 7.1% of them were type I), complications related to vascular access (5.2%), renal failure (3.1%) and neurological problems (3.2%). Conversion to open surgery was performed in five patients (1.9%). Immediate mortality was 0.8%, and late mortality was 6.7%, being 44.4% related to the endoprosthesis. Follow-up was achieved in 98% of patients over a period of up to 9 years (mean = 4 years) through clinical assessment and imaging protocol.

**CONCLUSIONS:** The endovascular treatment of thoracic aortic diseases is possible and has low morbidity and mortality rates. It can be a less invasive alternative to conventional surgical treatment. Despite the follow-up period suggesting short- and medium-term good outcomes with low complications, longer follow-up evaluation is necessary.

### OP-1166-THE CHANGING MANAGEMENT OF BLUNT THORACIC AORTIC INJURY: THE IMPACT OF ENDOVASCULAR REPAIR

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**BACKGROUND:** The management of blunt thoracic aortic injury (BAI) is changing with the advent of endovascular treatment. The purpose of this study was to review the treatment of BAI at a single institution over the past 13 years and to compare pre, peri, and post-operative variables and outcomes of both open (OR) and endovascular (TEVAR) repair of these injuries.

**METHODS:** All cases of confirmed BAI caused by blunt trauma from 1994 to present were included in this retrospective review. Data collected included demographic data, injury severity score, Glasgow Coma Score, arrival hemodynamic variables, and associated injuries. Operative data included: type of procedure (OR or TEVAR), duration of procedure, need for and amount of blood transfused, use of anticoagulation, type of anesthesia, and service performing the procedure. Outcomes evaluated were: death, paraplegia, length of stay, days ventilated, secondary procedures and procedure related complications. Specific to TEVAR: access, stent graft type and number, landing zone, presence of endoleak and longterm clinical and radiologic follow-up were evaluated.

**RESULTS:** Thirty-four cases of BAI were identified. Two patients received no treatment and died, 32 patients were treated (OR 16, TEVAR 16) and included for comparison. There were no significant differences between groups with respect to pre-operative variables. Five patients in the OR (31.2%) died in the perioperative period. There were no deaths in the TEVAR group ( $p < 0.05$ ). One OR patient suffered paraplegia. No paraplegia occurred in the EVAR group. There was no difference in length of stay or length of mechanical ventilation

between the groups. Intraoperative variables were similar between groups with the exception of mean units of blood transfused (OR 8.5 units, vs. EVAR 0.22 units,  $p = 0.005$ ). Procedure related post-operative complications in OR included: paraplegia, phrenic nerve injury, recurrent laryngeal nerve injury, post-operative bleeding, severe post thoracotomy pain and wound infection. In the past three years all patients with BAI have been treated with TEVAR. There were no procedure or device related complications in the EVAR group during follow-up (median 24.7 months, range 1-53 months).

**CONCLUSIONS:** Endovascular repair of blunt thoracic aortic injury is technically possible and is associated with lower mortality and perioperative morbidity when compared to open repair. No late complications from stent graft insertion have been observed. Endovascular repair has replaced open repair as the treatment of choice for blunt descending thoracic aortic injury at our institution.

### OP-1167-TOTALLY ROBOTIC INTERNAL MAMMARY ARTERY HARVEST AND BEATING HEART CORONARY ARTERY BYPASS

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**BACKGROUND:** To Summary the first 20 cases undergoing internal mammary artery (LIMA) harvest using da Vinci S system and minimally invasive direct coronary artery bypass grafting (MIDCAB) on beating heart.

**METHODS:** The average age of patients was 60.4 $\pm$ 10.1 years old. 1 case was female and 19, male. All the patients had a history of angina. The coronary arteriography showed severe stenosis of LIMA in all patients, of which 2 cases had diagonal and circumflex branch stenosis. 10 cases had myocardial infarction history. All the patients had good lung function and had no medical history of pleurisy. Without sternotomy, the camera cannula was placed in the left, 3cm lateral to nipple in the 4th intercostal space (ICS). Da Vinci instrument arms were inserted through two 1-cm trocar incisions. The right instrument generally was positioned 4 to 6 cm cephalad to camera cannula in the 2nd or 3rd ICS. The left instrument arm was positioned 4 to 6 cm caudal to the camera cannula in the 5th or 6th ICS. Arm trocar sites were maintained 6 cm apart at chest entry. The internal mammary artery was harvested in routine methods. 20 LIMAs were harvested and the right internal mammary artery was taken down in 1 case and double internal mammary artery was taken down in 1 case. MIDCAB was performed on beating heart in 16 cases and 4 cases accepted the totally endoscopic coronary artery bypass (TECAB).

**RESULTS:** All cases were accomplished successfully without complications. The patient was discharged on the 1st or 2nd postoperative day from ICU. Robotic surgery had less draining than the conventional coronary bypass.

**CONCLUSIONS:** Totally Robotic internal mammary artery harvest and beating heart coronary artery bypass is less invasive, more precise, safe and efficient.

### OP-1168-BLOOD TRANSFUSIONS IN MULTIPLE CORONARY ARTERY BYPASS GRAFTS: BENEFITS OF ENDOSCOPIC VEIN HARVESTING

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**BACKGROUND:** Several published reports showed that endoscopic saphenectomy reduces wound complications without a decrease in the quality of the vein graft. The purpose of this non-randomized prospective study was to analyze another issue: transfusions requirement in patients receiving endoscopic versus open vein harvesting for multiple coronary bypass vein graft.

**METHODS:** From May 2006 to July 2007 112 consecutive patients undergoing isolated CABG requiring 2 or more saphenous vein grafts were included in the prospective study. Patients with urgent operation, varicose veins, off pump surgery and previous sternotomy were excluded. Patients received open (OVH group,  $n = 63$ ) or endoscopic (EVH group,  $n = 49$ ) vein harvesting with Vaso-view 6 system. The technique was selected based on the availability of the endoscopic equipment. Open and endoscopic groups were comparable for demographic data and risk factors for intraoperative bleeding and wound complications: age, sex, BMI, diabetes, peripheral arterial disease, chronic renal disease, preoperative hemoglobin (Hb) level, antiplatelet therapy, bypass time, number of vein grafts, length of vein harvested.

**RESULTS:** Both EVH and OVH groups had a long mean bypass time (108 vs 111 min, respectively,  $p = ns$ ) and a considerable mean length of vein harvested



(47.8 vs 51.1 cm respectively,  $p=ns$ ); number of venous bypass grafts was similar, too (2.38 vs 2.39 respectively,  $p=ns$ ). In the EVH group fewer patients required red blood cells (RBC) transfusions in the operative room (18/49 vs 36/63,  $p<0.05$ ); difference in post-operative RBC transfusion was not statistically significant. Average intraoperative RBC transfusion for EVH patients was 0.77 U compared with 1.44 U for OVH pts ( $p<0.05$ ); again, the difference in the post-op (0.58 vs 0.97) was not significant. Mean difference between pre-operative and discharge Hb level was similar in EVH and OVH pts.

**CONCLUSION:** In patients undergoing on-pump CABG requiring a considerable length of saphenous vein to be harvested, EVH reduce leg blood loss and incidence of intraoperative RBC transfusions. In these patients, beyond the cosmetic and wound healing aspects, benefits of endoscopic technique are maximum.

### OP-1169-SURGERY ON HYDATID CYST OF THE HEART,THAE OUTCOME

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**BACKGROUND:** Hydatid cyst or Echinococcus was known in ancient times and still endemic in many countries. Fifty to seventy percent (50-70%) may infest the liver, while (20-50%) are pulmonary hydatid cysts and only (10-15%) could be found in other tissues, however primary cardiac hydatid cysts are rare, including intra-cavitary lesions or those involving the pericardium, and surgical treatment is indicated as soon as diagnosis is achieved, an operation is urgent in impending or actual rupture of the cyst.

**METHODS:** Fifteen patients with hydatid cyst of the heart over the period of 6 years in Ibn Albitar center for cardiac surgery were studied regarding their age, and sex distribution, the site of hydatid cyst in the heart with other extra-cardiac location, clinical presentation, modalities of diagnosis, surgical approach, post-operative complications, the surgical outcome and their hospital stay.

**RESULTS:** Fifteen patients (15) with ages ranging between (14-42) years, having cardiac hydatid cysts, underwent accurate diagnosis, and urgent proceeding for surgery. Male to female ratio was 2/1 and the commonest blood group was A+ve in (9) patients. The duration of diagnosis ranged between two months up to thirteen years, with a mean of 24 months. Hospital mortality was 0% and no cardiac hydatid cyst recurrence with a follow-up period between 3 months to 3 years.

**CONCLUSION:** Diagnosis with careful and urgent removal of hydatid cyst of the heart, cardiopulmonary bypass with hypothermic cardioplegia with gentle handling is the treatment of choice for cardiac hydatid cyst from morbidity and mortality point of view, and avoidance of recurrence. Key words: Cardiac hydatid cyst, cystic lesions of the heart.

### OP-1170-THE IMPACT OF EMERGING PERCUTANEOUS AND ENDOVASCULAR TECHNOLOGIES ON CARDIAC SURGERY TRAINING: A SURVEY OF CANADIAN CARDIAC SURGERY RESIDENTS' PERCEPTIONS

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**BACKGROUND:** Percutaneous technologies are increasingly used to manage valvular and aortic disease. Possession of catheter skills by cardiac surgeons will be required as clinical practice evolves. Our study aimed to survey Canadian cardiac surgery residents to determine their perceptions of: emerging use of percutaneous heart valves (PHV) and endovascular aortic stenting (EVAS), future role of the cardiac surgeon, and how training should reflect emerging trends.

**METHODS:** A 42-question survey was distributed to all Canadian-funded cardiac surgery residents, at a national conference and electronically in April 2006. The survey included demographic data, residency training program structure, perceptions of PHV and EVAS and of the future cardiac surgery practice.

**RESULTS:** Forty-three of 61 residents (70%) responded. Mean age was 29+/3 years and 88% were male. Junior residents (years 1-2) comprised 32%, intermediate (years 3-4) 38%, and 30% were seniors (years 5-6). Ninety-four percent of residents believed that future practice would involve PHV, but only 18% considered it will, in 10 years, have equivalent to superior outcomes versus current practice. Similarly, 88% of residents believed that their future practice

would involve EVAS, but more (74%) believed this technology will have equivalent to superior outcomes compared to open repair. Cardiac surgeons were found to participate in PHV in 10 and in EVAS in 16 responses. While 23% of this involvement was device deployment, surgeons were mostly limited to vascular access (46%) or standing-by for complications management (92%). With regards to residency, 83% of respondents stated their program provides no training in PHV or EVAS. Only 34% were aware of training programs in North America and 44% were aware of the Society of Thoracic Surgeons Guidelines on EVAS credentialing. Current residents have done rotations in: pacemaker insertion (71%), interventional cardiology (82%), radiology imaging (0%) and interventional radiology (6%). In terms of surgical volume, 91% of residents expected PHV and 100% expected EVAS to increase over the next 10 years, while 18% and 65% expected increases in coronary bypass and valve surgery respectively.

**CONCLUSIONS:** Percutaneous technologies were perceived by current residents to play a significant role in the future practice of cardiac surgery. Despite believing in the value of developing catheter skills during residency, most were unaware of the availability of training programs and published guidelines. It may therefore be important for Canadian residency programs to educate and train residents in percutaneous technologies to anticipate the evolving practice in cardiac surgery.

### OP-1171-MINISTERNOTOMY FOR MULTIPLE OPCAB

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**OBJECTIVE:** To evaluate the efficacy of ministernotomy on multiple OPCAB.

**METHODS:** 107 pts. underwent OPCAB through ministernotomy composed of 79 males and 28 females, with a mean age of 68±15 yrs. old. The angina CCS status was of 65 in Class III, 42 in II. 35 had hypertension, 34 diabetics, and 5 prior-stroke, respectively. The coronary artery angiogram showed isolated LAD lesions in 42 pts, LAD with Diagonal (Dx) 23, LAD with RCA 7, isolated RCA 3, and triple vessel lesion 32, respectively. 36 pts. had restenosis after PCI. The lower ministernotomy was made from xiphoid to the level of second intercostal space. The upper end of incision was clear to the left for harvesting of LIMA, or to the right for that of RIMA, or to both sides for better exposure. Radial artery (RA) or SVG were harvested with endoscope if needed. The target vessel was stabilized with myocardial stabilizer. The LIMA to LAD anastomosis was made first for most of the pts. If more severe vessel lesion happened in other than LAD, we prefer to do other anastomosis first. After completion of LIMA-LAD anastomosis, one proximal anastomosis was made at aortic root, then another graft could be connected to the first one in Y shape if needed. The pt. was put in head-down position, three deep epicardial sutures were put to lift the heart up to the chest incision level. The PDA was anastomosed with either RA or SVG, than the obtuse marginal branches (OM), and finally, the Dx.

**RESULTS:** The mean LIMA harvesting time was 17±6.73 min. The isolated LIMA grafted to LAD was in 42 pts., the RIMA to RCA in 3. The LIMA to LAD, and RA was then to LIMA in Y shape, the another end of RA to Dx in 23 pts., and that to RCA in 7, and to OM in 4, respectively. The LIMA was grafted to LAD, and then the SVG grafted from aortic root, the RA connected to the SVG in Y shape, the both ends of RA and SVG put into PDA and OM in 28 pts. One pt. died at 2nd operative day due to pulmonary embolism. One pt. developed perioperative myocardial infarction at the 4th operative day, one pt. experienced delayed extubation for 7 days because of severe COPD. No other operative complications occurred for the other 104 patients. See the Tab.

**CONCLUSIONS:** The results of the study suggest that the lower ministernotomy can be used not only for isolated LAD lesion, or combined with RCA lesion, it also can be used for triple vessel diseases; the complete revascularization can be reached through this small incision, though the indication of the procedure still on investigation in our centre.

### OP-1172-THE ENDOSCOPIC VERSUS TRADITIONAL OPEN SAPHENOUS VEIN HARVEST: THE EFFECTS ON POSTOPERATIVE OUTCOMES

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**BACKGROUND:** Wound complications associated with long incisions used to

harvest the saphenous vein for coronary artery bypass grafting (CABG) is well documented. A minimally invasive technique has been developed to reduce these morbidities.

**METHODS:** Our objectives were to compare the results of 50 patients undergoing elective coronary artery bypass grafting using endoscopic vein harvesting technique (EVH) with an equivalent retrospective group whom traditional open vein harvesting technique (TVH) was used, also to compare the histological properties of the saphenous veins harvested conventionally and endoscopically.

**RESULTS:** Patients characteristic and demographics were similar in both groups. Time need to close the leg was significantly reduced in the EVH group (7.2 vs 44 minutes;  $P<0.001$ ). There was no difference in the time need to prepare the vein in both the EVH and TVH groups (40 vs 45.1 minutes). Overall wound complications was significantly reduced in EVH group compared with the TVH group (0% vs 6%  $P<0.001$ ). Postoperative leg pain, mobilization and over all patient satisfaction were also significantly improved in the EVH group. Blinded histological assessment of the harvested vein ( $n=20$ ) showed no evidence of any damaged to the specimens in either group.

**CONCLUSION:** Endoscopic vein harvest offered improved patients outcomes in term of wound healing and reduce postoperative pain compared with the open vein harvest technique and does not prolong the operative time nor compromise the vein quality.

### OP-1173-THORACIC EPIDURAL ANESTHESIA IN OPEN HEART SURGERY- CONSCIOUS OPEN HEART SURGERY

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**BACKGROUND:** There are reports of cardiac surgeries, inclusive of open heart surgeries and on and off pump CABGs, performed in Thoracic Epidural Anaesthesia (TEA) alone. We reviewed this literature and took up this approach to accomplish our cardiac surgeries in April 2005. Because of the inherently less invasive nature, excellent analgesia during intra- and post-operative period and significantly reduced need of administering routinely used ionotrops and analgesic agents, significantly increased hemodynamic stability during off-pump CABGs attributed to very specific autonomic changes brought about by thoracic epidural anaesthesia. We present our experience of CABGs, valve replacements, ASDs, valve replacement with CABG, left atrial Myxomas, thymectomy, etc. done under TEA.

**METHODS:** All adult patients hospitalized for open heart surgery were considered for TEA and were screened for presence of contraindication. Out of about 600 cases, 424 cases were chosen for TEA. TEA catheter was positioned at a level varying from T2 to T6. After initial bolus of 0.5% Bupivacaine, analgesia was maintained with continuous infusion of 0.25% Bupivacaine through epidural catheter. Surgical techniques were improvised to safeguard pleural integrity during sternotomy, while dissecting internal mammary arteries (IMA), while harvesting pericardial patches, and while taking cradle stay stitches on pericardial edges to avoid pneumothorax and consequent loss of spontaneous breathing. We also discuss the methods to avoid conversion to General Anesthesia in cases of minor tears or holes in pleura. Rest of the surgery is performed as in general anesthesia making concessions for spontaneous respiratory movements.

**RESULTS:** Over a period of 29 months we attempted TEA in 424 cases. We could successfully conclude the surgery in 266 cases, 93 cases were converted to general anaesthesia while 65 cases were administered general anaesthesia electively. Pneumothorax was the main cause of conversion in our cases apart from various other causes in the remaining. We have noticed a remarkable reduction in intra-operative and post-operative strength and duration of ionotropic agents required, analgesics and insulin. We also noticed early gut motility and early mobilization in these cases. We are currently in the middle of a study which will document these areas in a more statistically correct manner.

**CONCLUSIONS:** Initial reports of successful use of this technique in open heart surgery encouraged us to go and employ this technique not only in CABG but also to other cardiac surgeries overcoming initial difficulties and anxieties. Now after 424 cases we have evolved fairly safe methods to perform these surgeries under TEA. The key to this technique is an enthusiastic theater team, skilled anesthetist and surgeons who are willing to bend their back little further. The results to us have been rewarding and we have no hesitation in recommending this procedure as a routine way of doing adult cardiac surgery.

### OP-1174-WHICH ARE THE IDEAL CANDIDATES TO THE TRANSAPICAL TRANSCATHETER AORTIC VALVE IMPLANTATION? ANALYSIS OF MORE THAN 700 CONVENTIONAL AORTIC VALVE REPLACEMENTS

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**BACKGROUND:** Conventional isolated aortic valve replacement (AVR) is a low-risk procedure. Transapical transcatheter aortic valve implantation (TTI) has been presented as an alternative to the conventional approach in high-risk patients. We retrospectively analyzed our series in order to identify which were the potential candidates to TTI.

**METHODS:** From January 1999 to August 2006, 704 pts (392 men; 312 women) were operated on for isolated AVR at Lancisi Hospital. Preoperative characteristics were (Mean or N): Age (years)=67.5±12.3; Ejection fraction=61%±12; Body mass index > 30 Kg/m<sup>2</sup>=105 (14.9%); NYHA Class IV= 56 (7.9%); Peripheral vascular disease=37 (5.2%); Chronic obstructive pulmonary disease=68 (9.6%); Redo procedure=31 (4.4%). This population was then divided into a high-risk group (HRG; N=30) and a low to medium-risk group (LMRG; n=674) depending on the presence of three or more well-established risk factors (age > 80 yrs, female sex, body mass index > 30 Kg/m<sup>2</sup>; NYHA Class IV, EF<35%, peripheral vascular disease, chronic obstructive pulmonary disease, and redo procedure).

**RESULTS:** Global hospital mortality was 2.2% (16 pts). Mean hospital stay of the survivors was 9.5±8.2 days. Three pts of HRG died (10.0%) vs 13 pts (1.9%) of the LMRG ( $p=0.026$ ; Odds ratio 5.65; 95% CI: 1.51 - 21.00). Mean hospital stay was 11.3±12.8 (HRG) vs 9.4 ± 7.9 days (LMRG) ( $p=0.21$ ; ns).

**CONCLUSIONS:** Conventional AVR may be performed even in very high-risk patients with an acceptable mortality. Hospital stay was longer in HRG but it did not reach a statistical significance. The ideal candidates to the TTI will be rather found among those subjects that are not referred to the surgeon, because of prohibitive preoperative conditions.

### OP-1175-SURGICAL EXPERIENCE WITH ENDOSCOPIC PORT-ACCESS SURGERY

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**OBJECTIVES:** Cardiac surgery has been one of the last of the specialties to embrace the principles of endoscopic surgery. -But recently, the method of port-access surgery has been gained popularity due to reduced trauma, post-operative pain and improved cosmetics. The aim of this study was to assess the prognosis, feasibility, safety and efficiency of this technique, retrospectively.

**METHODS:** Between 01/2004 and 10/2007, a total of 77 patients (48% females) were operated at our institution using minimal-invasive endoscopic techniques. Mean age was 63.5±14.5 years (range 29-87 years), 37 patients were female; all patients were in NYHA-class II-III. A minimal (5-7cm), right-sided anterolateral approach combined with a soft-tissue retractor was used. Multiplane echocardiographic examinations were performed intra-operatively at discharge and at 6-months follow-up. Clinical data, adverse events and patient outcome were recorded prospectively.

**RESULTS:** Thirty-one patients received mitral valve repair, 16 patients mitral valve replacement, and 14 patients were operated on the tricuspid valve (13 repairs, one replacement), of these repairs 9 patients had a combined operation. A concomitant mini-maze procedure was done in 3 cases. Seventeen patients had ASD/PFO closure, and another 5 patients were operated due to cardiac tumors. In seven patients, intraoperative conversion to conventional surgery was necessary. During follow-up, one patient had to be reoperated, due to mitral valve insufficiency. Remaining patients were free from reoperation and valves were competent. On a visual analog scale, 92% of the patients reported no, or only mild postoperative pain. Operative and in-hospital mortality was 0% (0/77) and 1.2% (1/77), respectively.

**CONCLUSIONS:** Video-assisted minimal-invasive port-access surgery is an evolving innovative method, which can be performed safely with pain-free and superior cosmetic results. However, this new method requires a learning curve and furthermore, good preoperative patient-selection is essential, to prevent

intraoperative conversion due to unknown contraindications like severe pleural adhesions or anatomical abnormalities.

#### **OP-1176-RESULTS OF INTENDED OFF-PUMP ROBOTIC TECAB FOR LAD GRAFTING.**

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**BACKGROUND:** Off-pump totally endoscopic coronary bypass (TECAB) is the less invasive concept in cardiac surgery. Our preliminary experience was analysed to assess the feasibility and efficacy of the technique in left anterior descending (LAD) coronary artery bypass grafting.

**METHODS:** In a 3-year period, 62 patients (mean age 58 years) with LAD disease were scheduled for off-pump TECAB using the da Vinci Surgical System. After left internal thoracic artery harvesting, the pericardium was opened. According to the LAD accessibility (size, quality), an endoscopic stabilizer was inserted through a subxyphoid port for stabilization of the target vessel and endoscopic performance of the anastomosis on beating heart, or a small lateral left thoracotomy was done for handsven anastomosis as in MIDCAB procedure. The patency of endoscopic anastomoses was assessed by CT scan before discharge. The mean follow-up was 1.5 years.

**RESULTS:** A TECAB procedure was done in 49 (80%) patients (2 patients had a sequential graft LAD-diagonal artery). Five TECAB patients (10%) had early postoperative myocardial ischemia and had iterative revascularization of LAD after angiography: 1 OPCAB procedure and 4 stenting; one of them died from arrhythmia (2%). Three patients had reoperation for bleeding (6%): 2 through small thoracotomy and 1 with video approach. Except the 5 cases of anastomosis dysfunction and early iterative revascularization, all the 46 endoscopic anastomoses controlled by CT scan before discharge were patent (46/51, 90%). A conversion to MIDCAB procedure was done in 13 (20%) patients (3 patients had a sequential graft LAD-diagonal artery). One patient had reoperation for bleeding with video approach. There was no postoperative MACE in this group of patient. In comparaisn, during the same period, an intended MIDCAB procedure was done in 7 patients according to patient conditions; in this group no postoperative MACE occurred. During follow-up, no secondary MACE occurred in all groups.

**CONCLUSION:** Off-pump robotic TECAB for LAD grafting is challenging but could be achieved with good results in 71% of cases. In our experience the use of U-clips for endoscopic anastomosis has improved the patency, as the use of coronary shunt without occlusion of the distal LAD. MIDCAB procedure remains a good alternative when patient conditions or target vessel quality are not favorable.

## CORONARIES XI

### OP-1177-ROLE OF LEFT HEART PUMP-ASSISTED IN BEATING HEART MYOCARDIAL REVASCLARIZATION

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**BACKGROUND:** Beating heart myocardial revascularization is a well established surgical technique, its applicability is progressively widening. Few patients (pts) with unfavourable clinical characteristics [low ejection fraction (EF), critical left main (LM) stenosis with occluded or severely stenosed right coronary artery (RCA), calcified and/or intramyocardial coronary arteries] have a particular high surgical risk and conversion to on-pump surgery is sometimes urgently performed. We already showed the advantage of Left Heart Pump Assisted in these subsets of high risk patients. Furthermore we compared the Left Heart Pump Assisted (LHPA) and the Close Perfusion System (CPS) in the beating heart myocardial revascularization in a clinical randomized study.

**METHODS:** 80 consecutive patients in need of myocardial revascularization were prospectively enrolled either to LHPA (40 pts Group A) or to CPS (40 pts Group B). For the pts in Group A, a 22 Fr arterial cannula was introduced in to the ascending aorta, a 24 Fr double stage venous cannula was inserted in the left ventricle through the right superior pulmonary vein. The system was connected to a centrifugal pump with a priming of only 120 ml, blood was sucked from the left atrium and the left ventricle and pumped in to the aorta thus obtaining a flow of 3-4 L/min. A standard technique of CPS was used for the pts in Group B.

**RESULTS:** Mean age and sex were similar in the two groups, the length of circulatory support was  $76 \pm 15$  minutes in Group A and  $79 \pm 22$  minutes in Group B. All pts underwent the planned complete myocardial revascularization (3.4 grafts/pts). We did not observe any device-related complication during the procedure. Weaning from both types of circulatory support was uncomplicated, two patients (one in each group) required intra-aortic balloon pump (IABP) assistance for low cardiac output after surgery. The IABP was removed successfully within 6 hours. Postoperative trans-thoracic or trans-esophageal echocardiogram was also similar in both groups, showing the same as preoperative or slightly better left ventricular function. CK-MB, troponin, 12-lead ECG and echocardiography excluded a myocardial infarction (MI), and the evolution of troponin I did not differ between the 2 groups. The clinical outcomes were different between group A and B: patients in group A stayed significantly less on ventilator support and had a shorter ICU and hospital stays, there were non complication in Group A, while there were 6 in Group B (1 sternal dehiscence, 3 pneumonia and 2 bleeding), the use of blood bank product (Fresh Frozen Plasma and Blood Transfusion) was significantly less in Group A.

**CONCLUSIONS:** The LHPA is easily implantable, has a low cost, avoids the use of the oxygenator, can widen the surgical indications of beating heart myocardial revascularization without any risk of urgent conversion from off-pump to on-pump with clear less invasiveness and complications as compare to the CPS.

### OP-1178-ASSOCIATION OF CHLAMYDIA PNEUMONIA DNA IN ATHEROSCLEROTIC PLAQUE AND CORONARY RISK FACTORS

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**BACKGROUND:** Although the presence of Chlamydia pneumonia in atherosclerotic lesions has been suggested in the pathogenesis of atherosclerosis, no agreement has been reached consistently across all studies. The aim of this study was to assess the prevalence of Chlamydia pneumonia pathogen inside the atherosclerotic plaque of patients undergoing CABG by using PCR assay

and determining whether there is any association between the presence of bacteria in atherosclerotic lesions and classic coronary risk factors.

**METHODS:** in this cross-sectional study, 102 patients undergoing CABG in Shariati Hospital were evaluated in terms of major coronary risk factors (including smoking, hypertension, and family history of coronary artery disease, hyperlipidemia and diabetes mellitus). During operation, atherosclerotic plaques obtained from all patients and the presence of Chlamydia pneumonia in the plaque was determined by PCR. All data were analyzed using Medcalc and P values  $<0.05$  were statistically considered significant.

**RESULTS:** 73.5% patients were men. The mean age was 54 (20-79) years. High cholesterol (53.9%) and smoking (49%) were the most prevalent risk factors. Chlamydia pneumonia was found in 22 (23.4%) of 102 coronary plaque specimens. Of these, two patients had no risk factor and the others, had between 1 to 3 risk factors. Patients with positive PCR had statistically significant higher cholesterol ( $P=0.009$ ) and lower HDL ( $P=0.00001$ ) levels in comparison with negative-PCR group. There were no statistical differences in hypertension, diabetes, family history and smoking between PCR positive and negative groups.

**CONCLUSIONS:** Our results imply synergic contribution of C. pneumonia DNA and known coronary risk factors (significantly dyslipidemia) to development of atherosclerotic lesions and coronary events in patients undergoing CABG. **KEY WORDS:** Chlamydia pneumonia, Atherosclerosis, Risk factors, PCR

### OP-1179-ASSESSING QUALITY OF CARE IN CARDIAC SURGERY: COMPARISON BETWEEN ADMINISTRATIVE AND CLINICAL DATA

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**BACKGROUND:** Although administrative data are often used to evaluate outcome indicators, many questions continuously arise about the suitability of that kind of information for "quality of care assessment" purposes. In Italy, the availability of two contemporary sources of information about CABG interventions, allowed 1) to verify the feasibility to perform outcome evaluation studies using administrative data sources and 2) to compare evaluations of hospitals' performance obtainable using the CABG Project clinical database with those derived from the use of current administrative data.

**METHODS:** Interventions recorded in the CABG Project were linked to the Hospital Discharge Record (HDR) administrative database. Only the linked records were considered for subsequent analyses (46% of the total CABG Project). A new selected population "clinical card - HDR" was then defined. Two independent risk-adjustment models were applied, each of them using information derived from one of the two different sources. Then, HDR information were supplemented with some patient pre-operative conditions from the CABG clinical database. The two models were compared in terms of their adaptability to data. Hospitals performances identified by the two different models and significantly different from the mean were compared.

**RESULTS:** In only 4 of the 13 hospitals considered for analysis, the results obtained using the HDR model did not completely overlap with those obtained through the CABG model. However, opposite evaluations occurred for none of the analysed hospitals. When comparing statistical parameters of the HDR model and the HDR model, with the addition of few patient preoperative conditions (i.e. emergency condition and ejection fraction) extracted from the CABG Project clinical database, the latter showed the best adaptability to data.

**CONCLUSION:** In this "clinical card - HDR" population, hospital performance assessment obtained using information from the clinical database is similar to that derived from the use of current administrative data. However, when risk-adjustment models built on administrative databases are supplemented with few clinical variables, their statistical parameters improve and hospitals performance assessment becomes more precise. These findings should definitely prompt institutions towards a close cooperation with clinical professionals in order to effectively monitor hospitals quality of care.



### OP-1180-ADENOVIRUS-MEDIATED OVEREXPRESSION OF NOGO-B PREVENTS NEOINTIMA FORMATION FOLLOWING VASCULAR INJURY

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**BACKGROUND:** Poor patency rates for autologous saphenous vein conduits limit the long-term success of coronary artery bypass grafting (CABG), which necessitates the need for continued research into the potential clinical application of gene therapy. Neointimal expansion is also a major contributory factor in post-angioplasty arterial restenosis. Nogo-B was recently identified as novel regulator of vascular cell function, whereby the normally high vascular expression is rapidly lost following vascular injury. Here, we assess the potential therapeutic effects of Ad-Nogo-B delivery to injured vessels in vivo.

**METHODS AND RESULTS:** Nogo-B overexpression following Ad-Ng-B infection of smooth muscle cells (SMC) blocked proliferation and migration in a dose-dependent manner in vitro. We next assessed the effects of Ad-Ng-B treatment on neointima formation in two distinct and appropriate in vivo models of acute vascular injury. Adventitial delivery of Ad-Ng-B to wire-injured murine femoral arteries (an established model of balloon-angioplasty whereby the artery is denuded and dilated using a straight spring wire) led to a significant decrease in intimal area (0.014 vs 0.030 mm<sup>2</sup>, p=0.049) and intima:media ratio (0.78 vs 1.67, p=0.038) compared to Ad-β-Gal control virus at 21 days post-injury. Similarly, luminal delivery of Ad-Ng-B to porcine saphenous veins prior to carotid artery interposition grafting (an established model for CABG) significantly reduced intimal area (2.87 vs 7.44 mm<sup>2</sup>, p=0.0007) and intima:media ratio (0.32 vs 0.55, p=0.0044) compared to Ad-β-Gal at 28 days post-grafting. Intimal VSMC proliferation was significantly reduced in both the murine and porcine disease models.

**CONCLUSIONS:** Gene delivery of Nogo-B exerts a positive effect on vascular injury-induced remodelling by blocking VSMC proliferation and migration. Overexpression of Ad-Nogo-B significantly reduces neointima formation in both arterial and venous models of vascular injury, representing a novel therapy to prevent post-angioplasty arterial restenosis or vein graft failure following CABG.

### OP-1181-EFFECTS OF MILRINONE ON EARLY OUTCOME OF PATIENTS WITH MYOCARDIAL DYSFUNCTION UNDERGOING CABG

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**BACKGROUND:** Myocardial dysfunction necessitating inotropic support is a typical complication after on-pump cardiac surgery. In this study we evaluated the effect of milrinone on patients with ventricular dysfunction undergoing coronary artery bypass graft (CABG).

**METHODS:** In this randomized control trial we compared the effect of milrinone on patients with impaired left ventricular function (left ventricular ejection fraction (LVEF) < 35%) undergoing on-pump CABG with placebo. Milrinone (50 µg/kg) administered immediately after CABG and continued (0.5 µg/kg/min) during 24 hours later. Creatine phosphokinase (CPK) and CK-MB were measured for each patient immediately after surgery, 4 hrs and 24 hrs later. LVEF was determined by echocardiography before and after surgery.

**RESULTS:** According to the inclusion and exclusion criteria 70 adult patients (53 male) entered the study. Serum level of CPK, CK-MB, evidence of myocardial ischemia and infarction and mean duration of using inotropic agents were lower in milrinone group (P<0.05) while there were no significant differences between two groups regarding development of ventricular arrhythmia, duration of cardiopulmonary bypass, intra aortic balloon pump, use of inotropic support, duration of mechanical ventilation and intensive care unit (ICU) stay and mortality between two groups. Although mean preoperative LVEF was significantly lower in milrinone group, there was not significant difference between postoperative LVEFs. Also, comparing pre and post operative LVEFs showed significant differences in both groups.

**CONCLUSIONS:** We suggest using milrinone in patients undergoing on-pump CABG especially those with low LVEF before surgery. **KEY WORDS:** on-pump

CABG, low output syndrome, left ventricular dysfunction, Milrinone

### OP-1182-REPRESENT THE FEMALE SEX A RISK FACTOR FOR MYOCARDIUM REVASCULARIZATION (CABG) IN OUR CENTER

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**BACKGROUND:** Current evidences indicate that in more developed areas the coronary arterial disease represents the main mortality cause in the women. According to Wenger in developed countries more than 50% of the women die as a consequence of cardiovascular diseases, and the sudden death is responsible for approximately 35% of that mortality. For better adjustment of the therapeutics, specifically gone back to the women bearers of obstructive coronary arterial disease and candidates to the myocardium revascularization, we developed that study. We still wanted to know if the feminine sex represented an isolated factor of risk in the coronary artery bypass graft. For that became necessary to know the woman's profile that seeks the service to be operated.

**METHODS:** This is a study group, observational of the cohort type. Elaborated previous itinerary specify for the collection of data that were extracted of the handbooks and it contained 32 items. The project was approved by the Ethics Committee in Research of the Institution and the accept significance level was five percent. The statistical analysis used was the univariate through the t test for independent samples and the chi-square. That preliminary analysis of the project involved 83 patient eligible, consecutive, submitted to the coronary artery bypass graft that were stratified in study samples and the first group (G1) was constituted by the female patients (23) and the second group was constituted by the male patients (60).

**RESULTS:** In G1 the average of age was of 65,23±12,37 and body mass index was 27,45±6,28. In G2 the average of age was of 61,69±10,15 and body mass index was 28,22±5,99. The univariate analysis identified: age (P=0,045), weight (P=0,07), height (P=0,128), body mass index (P=0,895), angina (P=0,159), cardiac insufficiency (P=0,614), previous infarct (P=0,395), diabetes (P=0,144), chronic obstructive pulmonary disease (P=0,890), tobacco smoker (P=0,819), dyslipidemia (P=0,513), hypertension (P=0,505), previous stroke (P=0,547), number of committed arteries (P=0,868), number of accomplished grafts (P=0,667), extracorporeal use (P=0,104), postoperative infarction (p=0,159), breathing support (P=0,768), postoperative stroke (P=0,577), renal insufficiency (P=0,083), re-operation for bleeding (p=0,321), bleeding (P=0,238), post-operative infection (P=0,579), hospital stay (P=0,221) and hospital death (P=0,666).

**CONCLUSIONS:** In our center the patient bearer of coronary arterial disease, that needs coronary artery bypass graft is a senior patient (62,90 ± 10,92 years), usually with overweight, angina's (100%), with systemic hypertension (68,2%), diabetic (45,6%), with previous myocardium infarct (59,7%) that usually happened there is more than six months, no tobacco smoker (78,9%), no bearer of pulmonary obstructive chronic disease (80%), without previous cerebrovascular accident (94,7%), without dyslipidemia (87,5%), without compromising of the renal function (100%) and usually bi-arterial. The prevalence of the coronary disease was larger in the male patients 2,6/1 and the feminine sex didn't represent an isolated factor of risk for the coronary artery bypass in our center (P=0,901).

### OP-1183-MUIPIROCIN OINTMENT FOR REDUCING THE POSTOPERATIVE SURGICAL SITE INFECTIONS AFTER ON-PUMP CORONARY ARTERY BYPASS

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**BACKGROUND:** Surgical site infections after cardiac surgery are multifactorial conditions and associated with high mortality and morbidity. In this prospective study we aimed to investigate the possible protective role of preoperative nasal mupirocin ointment in order to prevent the postoperative surgical site infections caused by staphylococcus aureus.

**METHODS:** Fifty cases who had diabetes mellitus and coronary artery disease needing surgical revascularization were operated by using pedicled left internal mammary artery and conventional cardiopulmonary bypass. They were divided

ed into two groups; control and mupirocin ointment groups. In all cases pre-operative nasal cultures were taken by the physicians of infectious disease. In the second group mupirocin ointment was performed for 3 days before the operation. The glucose levels were determined to be between 180-250 mg/dl either preoperatively or postoperatively in both groups. Postoperatively first generation cephalosporin administered to all patients at the induction of anesthesia and until the drains were taken out. After the surgery they were followed up for three months for a possible surgical site infection.

**RESULTS:** There were no differences among the groups according to aortic occlusion and total cardiopulmonary bypass times. Nasal cultures revealed 4 staphylococcus species in control group, and 2 in the second group. In the second group none of the patients had surgical site infections. However, in the control group 2 patients had superficial surgical site infections, and 1 had mediastinitis. The cultures of purulent drainages from the surgical sites revealed staphylococcus aureus in these cases. All of these patients were treated successfully with sensitive antibiotics.

**CONCLUSIONS:** Although postoperative surgical site infection is multifactorial, high prevalence of staphylococcus aureus carriage may be considered as a significant co-factor. This study showed that preoperative mupirocin ointment may protect postoperative surgical site infections in diabetic and on-pump coronary bypass surgery performed patients.

### OP-1184-CORONARY ARTERY RECONSTRUCTION WITH INTERNAL MAMMARY ARTERY AND VEIN PATCH GRAFTING WITH OR WITHOUT ENDARTERECTOMY

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**BACKGROUND:** An increase in the numbers of patients with diffuse coronary artery disease who are referred to cardiac surgeons had necessitated the need of developing new techniques to establish the revascularization of specially young patients or elderly with high risks to undergo future re-do surgeries. Long-segmental reconstruction of the diffusely diseased left anterior descending (LAD) coronary artery with the left internal thoracic artery (LITA) and or venous patch has been shown to be beneficial for patients with diffuse coronary artery disease. In this retrospective study, we analysed the long-term outcomes obtained with this technique.

**METHODS:** Between Jan 2003 and October 2007, 1500 coronary artery bypass grafting (CABG) operations were performed by our team. Of these cases, a number of patients were found to have diffusely diseased coronary arteries (mainly LAD) underwent a long-segmental reconstruction procedure with a LIMA graft or saphenous venous patch with or without endarterectomies.

**CONCLUSIONS:** Patients with diffuse coronary artery disease present a major challenge for cardiovascular surgeons. The long-term results of long-segmental coronary artery reconstruction are very encouraging, and this approach may be used safely in this subgroup of patients. Coronary artery reconstructions with exclusion of plaques or associated with endarterectomy when plaques are too calcified or stiff produce good stable results in the long run. Coronary endarterectomy should be reserved for arteries that are truly inoperable by other procedures including exclusion of plaques out of the lumen of a new reconstructed coronary vessel using coronary artery reconstruction technique.

### OP-1185-FACTORS INFLUENCING CORONARY ARTERY BYPASS GRAFTING OUTCOME IN THE AGED

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**BACKGROUND:** Coronary artery disease is the leading cause of death among aged patients. Early and late results were studied in order to improve the indication for coronary artery bypass grafting (CABG) and to enhance outcomes.

**METHODS:** In a 3 year period ending July 2007 a total of 1273 patients aged 70 years and older who had undergone isolated CABG were studied; patients were from the Iranian adult cardiac surgery database. Elective operations (EL) were performed in 1064 patients and 209 patients underwent urgent or emergency operations (UR/EM). Patients were divided into two groups; 92 patients aged  $\geq 80$  years (Octogenarians Group) and 1181 patients aged between 70 to 80 years of age. (Septuagenarians Group). All probable factors influencing early outcome were analyzed by SPSS 11.0. The P-value less than 0.05 was con-

sidered significant.

**RESULTS:** Similar number of diseased vessels and number of grafts were found in the two groups. Total operative mortality rates in the Octogenarians and the Septuagenarians groups were 6% and 3.5%, respectively. However, operative mortality for elective surgery was 2.7% in both groups. The operative mortality of UR/EM CABG was significantly higher in the Octogenarian compared to the Septuagenarian group (19% vs. 5%,  $p=0.01$ ). Also, operative mortality was significantly higher in patients with preoperative abnormal ( $<49\%$ ) left ventricular ejection fraction (LVEF) than in patients with normal ( $\geq 50\%$ ) LVEF (6% vs. 3%,  $P=0.04$ ).

**CONCLUSION:** Preoperative decreased LVEF was significant contributory factors to operative death. When feasible, CABG in octogenarians should be performed electively.

### OP-1186-RISK FACTORS OUTCOMES AND THE EFFECT OF TIME DELAY OF RE-EXPLORATION FOR BLEEDING AFTER CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** We aimed to identify risk factors for reexploration for bleeding after surgical revascularization in our practice. We also looked at the impact of re-sternotomy and the effect of time delay on mortality and other in-hospital outcomes.

**METHODS:** In all, 2095 consecutive patients undergoing coronary artery bypass grafting from January 2005 until July 2007 were retrospectively analyzed from our cardiac surgery registry. Multivariate logistic regression analysis was used to identify risk factors for reexploration for bleeding. We carried out a casenote review to ascertain the timing and causes for bleeding in patients undergoing re-sternotomy.

**RESULTS:** 72 patients (3.4%) underwent reexploration for bleeding. Multivariate analysis revealed smaller body mass index ( $p<0.01$ ), nonelective surgery ( $p=0.02$ ), 5 or more distal anastomoses ( $p=0.03$ ), and increased age ( $p<0.05$ ) to have increased risks. Propensity-matched analysis showed that use of aspirin ( $p=0.001$ ) and heparin ( $p<0.01$ ) within 5 days preoperative were associated with increased risk in the on-pump coronary surgery group only. Patients requiring re-sternotomy had a significantly greater need for inotropic agents ( $p<0.01$ ), and longer intensive care unit stay ( $p<0.001$ ) and postoperative stay ( $p<0.001$ ) than their propensity-matched controls. However, there was no significant difference in the mortality rate. Adverse outcomes were significantly higher when patients waited more than 12 hours after return to the intensive care unit for re-sternotomy.

**CONCLUSIONS:** Risk factors for reexploration for bleeding after coronary artery bypass grafting include older age, smaller body mass index, nonelective cases, and 5 or more distal anastomoses. Preoperative aspirin and heparin were risk factors for the on-pump coronary artery surgery group. Patients needing reexploration are at higher risk of complications if the time to reexploration is prolonged. Policies that promote early return to the operating theater for reexploration should be encouraged.

## CONGESTIVE HEART FAILURE II

### OP-1187-EXPERIENCE HOME FROM USE OF SILDENAFIL IN REDUCTION OF ACUTE PULMONARY HYPERTENSION IN CARRIERS FROM ADVANCED HEART FAILURE: COMPARISON BETWEEN TWO DIFFERENT PROTOCOLS.

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**BACKGROUND:** The evaluation of pulmonary pressure on potential candidates for heart transplant (TC), with caterismo law is mandatory and traditionally performed with sodium nitroprusside as medication vasodilator.

**METHODS:** To compare the haemodynamic effects of two different protocols (Nitroprussiato Sodium vs. Sildenafil) in the reduction of acute pulmonary hypertension in candidate CT. Method: Thirty patients (45 ± 20 years) bearers of ventricular dysfunction (FE: 22 ± 7%) and pulmonary hypertension (HP) (PsAP > 40mmHg) were subjected to right heart catheterization to study the pulmonary pressures. All were randozimizados receivables Nitroprussiato Sodium (0.5 ucg / kg / min) or Sildenafil (100mg oral, single dose) and then, after 15 and 60 minutes respectively, were subjected to new measures hemodynamic. Statistical analysis of data was obtained through the analysis of variance of double-factor.

**RESULTS:** Both the group that received Sildenafil as Nitroprussiato Sodium showed, respectively, in relation to baseline, a significant reduction in PsAP (58.8 ± 11 vs. 49.8 ± 19.15 mmHg and 64.5 ± 8.34 vs. 56.8 ± 21.11 mmHg, CI = 95%, p < 0.05) and RVP (5.8 ± 3.41 vs. 2.81 ± 1.22 U Wood and 6.5 ± 2.05 vs. 3.96 ± 1.63 U Wood, CI = 95%, p < 0.05). The group of Sildenafil was superior in reducing the RVP (2.81 ± 1.22 vs. 3.96 ± 1.63 Wood units, CI = 95%, p < 0.05) without significant change in the pressure systemic (90.3 ± 8.01 vs. 82, 9 ± 15 mmHg, CI = 95%, p = 0.3 and 89.3 ± 10.04 vs. 73.06 ± 26.75 mmHg, CI = 95%, p < 0.05).

**CONCLUSIONS:** Sildenafil is effective alternative in reducing acute HP patients in the queue of TC, without significant systemic effects, and may become a standard drug in the study of these patients.

### OP-1188-GEOMETRY OF LEFT VENTRICLE AND MITRAL VALVE APPARATUS AFTER SURGICAL TREATMENT OF ISCHEMIC HEART FAILURE

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**BACKGROUND:** To evaluate the geometry of left ventricle and mitral valve apparatus in patients with ischemic heart disease complicated of left ventricular dysfunction and mitral insufficiency before and after surgical treatment.

**METHODS:** From January 2003 to December 2007, 52 patients underwent surgical treatment. There were 48 men and 4 - women, with a mean age 56B±8, whom had prior one or more myocardium infarction, with 3-4 NYHA functional class, EF less then 35%, and 3-4 grade of mitral regurgitation. To estimate mitral valve function we used 3-D echocardiography and analyzed the following parameters: grade of mitral regurgitation, localization and direction of regurgitation jet, sizes of mitral annulus, leaflets motion, depth and length of leaflets coaptation, MV tenting area, MV tethering distance, papillary-annulus distance, papillary-papillary distance, papillary-septum distance, diastolic flow in pulmonary veins, sizes of left atrium, pulmonary pressure, function and geometry of LV. For determine the necessity of surgical ventricular restoration we used preoperative modeling of  $\beta_{new} \beta_{LV}$ . Based on the data of complex estimation of anatomy and function of MV apparatus and LV we choose the optimal method of surgical treatment of ischemic heart failure. Myocardial revascularization was performed in all patients, and also mitral valve repair was performed in 43 patients (83%) and mitral valve replacement  $\beta_{new}$  in 9 patients (17%). Surgical correction of coronary and mitral incompetence combined with

left ventricular reconstruction in 25 patients (48%).

**RESULTS:** The total hospital mortality rate was 9.6 %. The mean NYHA functional class decreased from 3,4B±0,6 to 2,1B±0,7 postoperatively. We revealed that after mitral valve repair with left ventricular reconstruction significantly decreased EDV from 293B±38 to 195B±41 and increased EF accordingly from 27B±3 to 36B±4. However after isolated mitral valve repair EF did not increase significantly (from 28B±5 to 29B±6 postoperatively). Grade of MR decreased more significantly after combined treatment (1,2B±0,4 versus 1,6B±0,6 respectively). Surgical ventricular reconstruction decreased end-diastolic diameter, as well as papillary-septum distance and papillary-annulus distance, so improvement geometry of LV leads to changes of chordo-papillary dislocation.

**CONCLUSIONS:** Surgical correction of mitral insufficiency in patients with severe LV dysfunction must include not only mitral annulus reduction, but also left ventricular reconstruction, which helps exclude main reasons of ischemic mitral regurgitation.

### OP-1189-IMPACT OF INFARCTED AREA ON LEFT VENTRICULAR PERFORMANCE AFTER SURGICAL VENTRICULAR RESTORATION

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**BACKGROUND:** Surgical ventricular restoration (SVR) is increasingly being utilized, but there limited data about the extent of myocardium viability that are required to predict degrees of improvement in left function following SVR. The aim of this study was to determine whether the extent and the localization of scar is important in amount of recovery after SVR.

**METHODS:** We prospectively follow SVR patients between 2003-2007. Magnetic resonance imaging was used to define left ventricle function and analyzing the infarcted areas. The cuts were divided into 48 segemnts as follow: cuts 1 and 2 (apical) with 4 segments each; cuts 3 to 6 (middle) with 6 segments each; and cuts 7 and 8 (basal) with 8 segments each. Each segment received a score according to the percentage of involvement obtained on delayed contrast enhancement ( score zero,1,2,3). The total score of each patient was defined as the sum of the score of the 48 segments analyzed. The percentage of the left ventricle infarcted mass was calculated . The total of infarcted areas and this importance of the infarcted areas distribution in the basal, middle, apical cuts were compared.

**RESULTS:** Follow-up was 100%. 142 patients underwent SVR and the percentage of infarcted area was divided in tertiles ( I-small; II-moderate; III-large; 36, 64 and 42 patients, respectively). There was a difference in the post-operative systolic volume and ejection fraction between group I and III ( p=0.002 and p=0.0001, respectively). Two-year Kaplan Meier freedom of clinical events for groups I, II and III were different (p<0.05). Among patients of groups II and III 25% ( 27 of 106) had more than 50% involvement ( scar ) of the middle segments (3-6). Myocardial scar tissue involving > 50% of the middle segments was a significant predictor of mortality ( odds ratio 3.6, p=0.02).

**CONCLUSIONS:** Cardiac function and symptoms improved with SVR, but infarcted extension area and fibrosis involving more than 50% of the middle ventricle may predict mortality.

### OP-1190-SURGICAL VENTRICULAR RESTORATION FOR ISCHEMIC CARDIOMYOPATHY: INITIAL EXPERIENCE

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**BACKGROUND:** Coronary artery bypass graft is considered one of the treatment options for patients with ischemic cardiomyopathy. However in certain cases with severe left ventricular dilatation, left ventricular remodeling continues even after revascularization leading to deterioration in the left ventricular function. Our hypothesis is that combining surgical ventricular restoration with coronary artery bypass can stop or even reverse the process of left ventricular remodeling with greater improvement in the functional class of the patients.

**METHODS:** We prospectively studied the first 30 patients who underwent surgical ventricular restoration in our center. The preoperative and postoperative functional class, left ventricular ejection fraction, and left ventricular end systolic volume index , as well as the postoperative morbidity and mortality were assessed.



**RESULTS:** The mean preoperative functional class was  $2.92 \pm 0.9$ , the mean preoperative ejection fraction was  $28.17 \pm 7.6$ , and the mean preoperative end systolic volume was  $78.33 \pm 19.7$ . There was no hospital mortality, one patient died at 3 months from cerebrovascular stroke. Follow up at 6 months revealed significant improvement in the postoperative functional class ( $p < 0.01$ ), ejection fraction ( $p < 0.05$ ), and end systolic volume index ( $p < 0.05$ ).

**CONCLUSIONS:** Surgical ventricular restoration when indicated, offers a great improvement in the functional class of patients with ischemic cardiomyopathy without added risk of morbidity or mortality. In addition the technique is easy and reproducible.

#### **OP-1191-MORPHOLOGICAL ASPECTS OF POSTOPERATIVE LEFT HEART REMODELING IN ISCHEMIC AND VALVULAR CARDIOMYOPATHY**

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**BACKGROUND:** Understanding the anatomy and function of the normal heart allows surgeons to create techniques that return the pathologic heart to a more normal size and shape. We must train ourselves to see beyond obvious external pathology and appreciate that normal-appearing structures often are key components of abnormal function (Gerald D. Buckberg, 2001).

**MATERIALS AND METHODS:** The object of the study were 48 patients with ischemic cardiomyopathy (ICMP) and 38 patients with valvular cardiomyopathy (VCMP), 18 of them - with aortic valve insufficiency and 20 - with that of mitral valve. All the patients were in NYHA functional class III-IV. In ICMP group preoperative values of end-systolic index (ESI) exceeded  $80 \text{ ml/m}^2$ ; ejection fraction (EF) was less than 40%; mean number of coronary arteries with lesions comprised 2.4. In the valvular cardiomyopathy group preoperative values of ESI were not less than  $50 \text{ ml/m}^2$  and EF - not more than 40-50%. No patients had stenosing atherosclerosis of coronary arteries. All the patients with ICMP underwent coronary artery bypass grafting (CABG) and 34 had additional left ventricle (LV) repair. 18 patients from the valvular cardiomyopathy group were subjected to aortic valve grafting, 20 - to mitral valve grafting. In all the patients intraoperative biopsy of LV and right atrium (RA) auricle was performed. The whole number of morphological parameters were measured for quantitative characteristic of functional morphology of myocardium: parenchimo-stromal ratio (PSR), trophic index (TI), pericardial diffusion zone (PDZ) and Kernogan index (KI). The patients were examined during 1 year period postoperatively. Control group were morphological samples of 25 cadaver hearts of people died from non-cardiac reasons.

**RESULTS:** Routine morphological study of LV and RA myocardium in the patients with valvular cardiomyopathy did not reveal significant differences from the control group. 92.4% of the patients with valvular cardiomyopathy had significantly decreased ESI, increased LV EF and decreased NYHA functional class in one year after the operation. Negative dynamic of clinical and echocardiographical data was revealed in 7.6%. In one year after the operation in ICMP unsatisfactory results of operative treatment comprised 25% ( $n=12$ ) which manifested through significant ESI increase, EF decrease in comparison with preoperative data and lack of positive dynamics of heart failure functional class. In this group data of morphological study differed significantly from those of the control group by PSR, TI, PDZ and KI. Morphological picture of myocardium of the patients with negative effect of operative treatment was identified by diffuse lymphocytic-macrophage inflammatory infiltration of myocardial stroma in combination with acute fibrosis ( $\text{PSR} < 1.5$ ), low TI ( $< 0.015$ ) and high values of PDZ ( $> 1000 \text{ mcm}$ ) and KI ( $> 1.6$ ) of LV myocardium.

**CONCLUSION:** Thus, we did not reveal any echocardiographical markers connected with negative dynamics of postoperative period neither in patients with ICMP nor in those operated for VCMP. On the contrary, application of routine morphological methods of study allows to forecast course of postoperative period in patients with ICMP, but not in those with VCMP.

#### **OP-1192-AN ELASTIC RING INTO DYSFUNCTIONING LEFT VENTRICLE IMPROVES CARDIAC MECHANICS IN AN ANIMAL MODEL**

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**BACKGROUND:** In biomechanical model of heart failure left ventricle (LV) dysfunction is assumed to develop and progress as a result of deleterious changes in cardiac structure and mechanics. These mechanical changes are at least partially determined by variations in the elastic properties of the myocardium at micro and macro level. To our knowledge no treatments have been specifically proposed to improve LV elasticity in failing hearts. We hypothesized that the implantation of an endoventricular elastic ring at equatorial site would positively affect the deranged cardiac mechanics in an experimental model of acutely induced LV dysfunction. The idea was evaluating the effect of the elastic systo-diastolic loading-recoiling device on cardiac dysfunctioning mechanics without any predetermined volume reduction.

**METHODS:** Acute LV enlargement and dysfunction was induced in 13 healthy sheep via the insertion of a large dacron patch into the lateral wall of the ventricle. In this way the endocardial surface of the ellipsoid LV was acutely increased by one third than normal with a stiff and akynetic area which increased the end diastolic volume of 44%. In 6 of these sheep a customized elastic ring was implanted at the inner surface of LV equator (ring group) while the remaining 7 served as controls (dysfunction group). Elastic constant and dimension of the device were chosen to get a final slack dimension of the spring inside the LV approximately in between the end-systolic and the end-diastolic dimension of the dysfunctioning ventricles. Systolic and diastolic function was evaluated using echocardiography and pressure-volume (P-V) analysis.

**RESULTS:** In the ring group LV contractility parameter:  $dP/dt_{\text{max}}$  and the slope of End Systolic Pressure Volume Relation, were significantly better than those without ring ( $1718 \pm 726$  vs  $1049 \pm 269$  and  $1.25 \pm 0.30$  vs  $0.88 \pm 0.19$ , both  $p < 0.05$ ). Pressure Recrutable Stroke Work as a LV function parameter changed even more prominently ( $33 \pm 11$  vs  $17 \pm 5$ ,  $p = 0.005$ ) along with stroke volume, ejection fraction and stroke work. Although ring implantation had no effect on End Diastolic Pressure Volume Relation, it positively affected the active component of diastole:  $dP/dt_{\text{min}}$ , declined significantly ( $p = 0.037$ ). The time constant of relaxation tended to decrease ( $37 \pm 8$  vs  $44 \pm 6$ ,  $p = 0.088$ ).

**CONCLUSIONS:** This study evaluates a proof of concept about the importance of ventricular elasticity for cardiac mechanics. The insertion of an elastic ring in a patch-induced LV dysfunctioning animals not only improved contractility but also benefited the active component of the early diastolic period with no detrimental change in the late diastole. We speculate that the spring helps the onset of systole and promotes early diastolic relaxation optimising the energy balance while effectively bridging systolic and diastolic phases. Moreover the endocardial juxtaposition of an elastic support at the LV equator could relieve or reduce wall stress in a pivotal zone of the contracting chamber, fulcrum of wringing motion and most affected by sphericalization. Although the obvious limitation of this study is the acute time-course in a healthy myocardium, the findings strengthen the notion that the passive elastic properties of LV are crucial and can be addressed in future studies.

#### **OP-1193-NON-TRANSPLANT SURGICAL TREATMENT OF PRIMARY DILATED CARDIOMYOPATHY AND CONGESTIVE HEART FAILURE - RADO OPERATION**

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**BACKGROUND:** Mitral and tricuspid regurgitation are unavoidable complications of the end-stage primary dilated cardiomyopathy (PDCM), express by remodeling of the base of the heart, significantly contributing to congestive heart failure and predicting early lethal outcome. The aim of the study is to show hemodynamic and clinical improvement of congestive heart failure after reductive annuloplasty of double (mitral and tricuspid) orifices (RADO) in the treatment of PDCM. Surgical techniques which reverse remodeling of the base of the heart: o Mitral annuloplasty using a Carpentier Ring was performed on 9 patients, o Posterior semicircular reductive annuloplasty was performed on 90



patients o Reductive annuloplasty with implantation of artificial mitral valve was performed on 67 patients o Modified De Vega's tricuspid annuloplasty was performed on all patients.

**METHODS:** From July, 1991 to October 2007, 166 patients (134 males and 32 females) underwent reductive annuloplasty of double (mitral and tricuspid) orifices (RADO) for end-stage PDCM. The mean ejection fraction was  $27.9 \pm 6.3\%$ . The average time of duration of illness was 24.5 months and the average number of preoperative decompensations was 2.9 (range 1-18) per patients. Thirty five patients were dependent on inotropic agents stimulation (intravenous administration) at the time of operation. Preoperative hemodynamic data were: mean CO=3,9 (2,1 to 6,8 l/min), mean CI=1,9 (1,2 to 3,1 l/min/m<sup>2</sup>), mean mPAP=33,6 (16 to 70 mmHg), mean PCW=21,9 (4 to 41 mmHg), mean PVR=536 (80 to 1829 dyn.sec.cm-5). In order to evaluate the viability of myocytes the perioperative immunohistological analyses were done in 56 pts: apoptosis (Ap), volume density of interstitial tissue (VVi), myofibrillar volume fraction (Mvf), Bcl-2 marker expression (Bcl-2).

**RESULTS:** The expected mortality according to Parsonnet risk stratification system-97 was 9.5% while the observed mortality was 3.0%. Immediate and long-term results showed significant improvement in hemodynamic values and myocardial contractility after operation. Postoperative hemodynamic data were: mean CO=7,2 l/min, mean CI=3,9 l/min/m<sup>2</sup>, mean mPAP=19,4 mmHg, mean PCW=10,5 mmHg, mean PVR=199 dyn.sec.cm-5. Sphericity index was decreased from 87% before operation to 72% and wall stress from 81 before to 63 after operation. The cumulative survival at 3 years was  $51.1 \pm 4.8\%$ , at 5 years was  $39.1 \pm 5.1\%$ , at 7 years  $32.9 \pm 5.1\%$  and at 10 years was  $10.4 \pm 4.8\%$ . Survival was significantly higher in patient with lower Ap, VVi and higher Mvf and Bcl-2. To optimizing RADO procedure and improve long term survival rate we propose introducing of resynchronization therapy if LBBB and cardioverter defibrillator.

**CONCLUSION:** RADO correct remodeling of the fibrous skeleton of the heart, changes the spherical geometry of the left ventricle, improves hemodynamic action of both ventricles and slows down the progression of heart failure. We recommend this procedure as a new surgical alternative or a bridge to heart transplantation in the early stage of PDCM. The preoperative immunohistological analyses might be useful in predicting the prognosis and the optimal surgical treatment.

#### OP-1194-A POTENTIAL SURGICAL SOLUTION FOR UNMET PROBLEM - DIASTOLIC HEART FAILURE

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**BACKGROUND:** Diastolic heart failure (DHF) is emerging as a major cause of congestive heart failure among elderly patients, leading to significant mortality and morbidity. Medical treatment of DHF patients is empirical, limited, and disappointing. We hypothesized that a simple mechanical device exerting outward force during diastole may enhance left ventricular (LV) relaxation and filling, reducing diastolic pressures with potential clinical improvement.

**METHODS:** A device composed of epi-myocardial attachment screws and elastic elements was designed to transfer energy from the normal systole to diastole. The spring-like device is charged with energy during systole and recoils during diastole in expansion manner. The device could be implanted on or off pump. In a series of experiments in healthy sheep (n=8) the safety of the device during two extreme conditions was tested. The device was implanted on the beating heart (video clip of procedure) to evaluate whether it restricts the heart or impairs its function during (1) tachycardia or (2) volume overload. Ejection fraction (EF) and LV pressures were measured three months (n=4) and six months (n=4) after implantation. In vitro study was performed to test durability and efficacy.

**RESULTS:** All animals exhibited good clinical recuperation. EF was preserved up to 170-day follow-up and there were no valve motion disturbances. Angiography demonstrated normal coronary flow. The end diastolic pressure and EF response to extreme conditions was similar in animals before implantation and animals 170 days after implantation. There was no significant change in the average device energy transfer throughout the follow up period (1700 gr-mm). Histopathology of the hearts at three (n=4) and six months (n=4) revealed only mild to moderate fibrosis around the attachment site of each screw within the myocardium. In vitro the device showed pressure reduction with the device (~3 mmHg) and stable function over 450 million cycles (~10 years).

**CONCLUSION:** This study demonstrates that a passive mechanical device, which transfers energy to the ventricle during diastole, can be safely implanted without evidence of restriction during extreme stress conditions, and with minimal local tissue reaction. In vitro study demonstrated efficacy of the device. The device is about to be implanted in clinical trials shortly.

#### OP-1195 MINIMALLY INVASIVE EPICARDIAL LEAD PLACEMENT: AN ALTERNATIVE FOR CARDIAC RESYNCHRONIZATION THERAPY

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**INTRODUCTION:** Biventricular pacing has emerged and proven to be an adjunct treatment for patients with ventricular dysynchrony associated with congestive heart failure. Percutaneous approach of left ventricular lead placement has several limitations due to anatomic variations of the coronary venous system, technical difficulties and lead dislodgement. Epicardial lead placement is often a rescue procedure after failed coronary sinus cannulation. The aim the study is to assess the risks and benefits of left ventricular epicardial lead placement utilizing a minimally invasive approach in this high-risk heart failure population targeted for Cardiac Resynchronization Therapy.

**METHODS:** Between December 2002 and December 2006, 120 patients underwent minimally invasive left ventricular lead placement, videoendoscopic assisted surgery was performed in 44 patients, and minithoracotomy in 76. Ninety-seven patients (80.8%) were males, mean age was  $68 \pm 8.9$  years (48-83), 63 (52.5%) had previous cardiac surgery, 74 (61.6%) had ischemic cardiomyopathy, 44 (36.6%) NYHA III-IV, 37 (30.8%) had more than 3+ mitral regurgitation and 70 (58.3%) had implantable cardioverter defibrillators. Baseline and follow-up clinical, laboratory, electrocardiographic, echocardiographic, and NYHA class were collected and compared using paired t tests. Postoperative complications and mortality (by Social Security Death Index) are reported.

**RESULTS:** NYHA class at 3 months was 2.24 (vs 3.00 baseline,  $p=0.084$ ) and at 6 months 2.29 (vs 3.00 baseline,  $p=0.48$ ). LVEF improved (19.8% to 24.9%,  $p<0.001$ , mean f/u time 8.9 mos), as did LVIDd (6.78 to 6.34 cm,  $p=0.001$ ), LVIDs (5.88 to 5.39,  $p<0.001$ ), serum creatinine (1.49 to 1.27,  $p<0.001$ ), and brain natriuretic peptide (868 to 851 pg/ml,  $p=0.001$ ). One patient (0.8 %) had wound infection and 2 patients (1.6 %) developed lead infections. In-hospital mortality was 1.6 % (1 pts; was hemodynamically unstable preop). Over a follow up period of  $2.6 \pm 0.87$  years, 13 patients (10.8 %) died.

**CONCLUSIONS:** Minimally invasive Left Ventricular Epicardial Lead Placement are effective and safety techniques, with minimal morbidity and mortality. Clinical and hemodynamic benefits were observed inspite of representing a high-risk group facing cardiac surgery, after failed Coronary Sinus Leads. Left Ventricular Epicardial Lead Placement for Cardiac Resynchronization Therapy can be considered as a alternative option for resynchronization therapy with a favorable benefit-risk balance.

#### OP-1196-MITRAL VALVE REPLACEMENT WITH COMPLETE CHORDAE TENDINAE PRESERVATION IN END-STAGE DILATED IDIOPATHIC CARDIOMYOPATHY

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**BACKGROUND:** We aimed to evaluate mitral valve replacement results and a new technique for complete chordae tendineae adjustment for left ventricular remodeling.

**METHODS:** Twenty end-stage idiopathic dilated cardiomyopathy patients with severe functional mitral valve regurgitation underwent mitral valve replacement from July 2000 to December 2004. Three (15%) were in New York Heart Association functional class III; 17 (85%) were in functional class IV. Hospital admissions for congestive heart failure in the 12 months prior to surgery were  $5.4 \pm 3.1$ . Both anterior and posterior leaflets of the mitral valve were divided to obtain 4 pillars of chordae tendineae. These were displaced with traction toward the left atrium and anchored between the mitral annulus and a valvular prosthesis. To evaluate the left ventricular remodeling doppler echocardiography were performed.

**RESULTS:** Two (10.5%) early deaths occurred from bronchopneumonia and multisystem organ failure. Kaplan-Meier showed survival at one year post-operative was 85%, 2 years was 44%, 3 years was 44%, 4 years was 44% and 5 years was 44%. At 48 months of follow-up, McNemar test showed improvement in Functional Class ( $p<0.001$ ). At third month of follow-up, variance analyses showed improvement in ejection fraction ( $p=0.008$ ) and decreasing in end-diastolic diameter ( $p=0.038$ ), end-systolic diameter ( $p=0.008$ ), end-systolic volume ( $p=0.029$ ) and end-diastolic volume ( $p=0.009$ ). No statistical difference were noted in systolic volume. Comparing pre-operative, third and six months of follow-up, Friedmann test showed no statistical differences for all variables studied. Variance analyses for pre, third and final evaluation showed same-thing.

**CONCLUSION:** This new technique of mitral valve replacement, involving the positioning of the chordae tendineae, should improvement in EF and decreasing in DD, SD,SV and DV till third month of follow-up. The variables sustain this changes during follow-up. An improvement in functional class and survival were assigned in this group

### **OP-1197-BATISTA PROCEDURE AS ALTERNATIVE FOR HEART TRANSPLANTATION**

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**BACKGROUND:** The physiologic principles underlying the Batista procedure are sound, according to the law of Laplace, mural tension = intracavitary pressure x radius/2 x wall thickness. Applied to the ventricle, this suggests that reduction of ventricle radius will diminish left ventricle wall tension, thereby decreasing myocardial oxygen consumption and increasing cardiac mechanical efficiency.

**METHODS:** A total of 37 patients with the diagnosis of idiopathic dilated cardiomyopathy underwent the Batista procedure. 34 were male (91,9%), 3 female (8,1%), mean ( $\pm$ SD) age  $39\pm13$  (range 16-60), ejection fraction range 19 %-29%, all patients were in III- IV class of N.Y.H.A. Mean (SD) EDV was  $307\pm48$ ml. All patients had mitral and tricuspid insufficiency from +2 up to +4, 8 (21,6%) patients had atrium fibrillation, 5 patients (13,5%) had preoperative inotropic support (4-8 microg/kg/min).

**RESULTS:** There were no intraoperative deaths. Two (5,4 %) patients required relisting for transplantation. Survival at 6 months was 86,5% (32 patients), and 73,0% (27 patient) were alive at 12 months. There were two in-hospital deaths (5,4 %), both occurred in patients with preoperative ejection fraction less than 20 %. In six months there were 3 deaths (8,1 %). Of the late deaths (5) 3 were likely due to ventricular arrhythmias, and 2 were due to progression of CHF.

**CONCLUSIONS:** Batista procedure has an important place in the surgeon's armamentarium in the treatment of end-stage heart failure. It bridges the patient for transplantation and in some cases disqualify for transplantation, in this way, makes it possible for a sizeable number of patients to avoid transplantation, saving transplantation for patients who failed to benefit from Batista procedure.

## BEGINNING THORACIC ENTITIES

### OP-1198-THORACIC TRAUMA: SEVEN YEARS EXPERIENCE IN NAPLES

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**BACKGROUND:** Data about patients with thoracic trauma admitted in the emergency departments of nine hospitals of Naples (ASL/NA1 Italy) are analysed.

**MATERIALS AND METHODS:** Between November 2000 and November 2007, 2931 patients were retrospectively analysed. Study group was divided into blunt trauma (BT) and penetrating trauma (PT) groups.

**RESULTS:** In BT group, there were 1997 cases (68,1%), whereas in PT, 934 cases (31,9%). Male to female ratio in group BT was 1284/676, and in PT group was 903/68. Mean age was 49,2 years (range, 14-102) in BT group, and 28,3 years (range, 17-73) in PT. The most frequent etiology was traffic accidents-in-vehicle (n=869, 43,5%) in BT and stab injuries in PT (n=623, 66,7%). The most common pathology was the emopneumothorax (n=774, 38,7% and n=448, 47,9% in BT and PT, respectively). The associated injuries were located mostly in cranium in BT group, whereas in PT in the abdomen. Tube thoracostomy was the primary procedure performed (PT, 72% (n=672); BT, 61,5% (n=1228)). Open thoracotomy was mostly performed in PT group (n=41, 4,4%) than BT (n=34, 1,7%). Mortality rate was 3,9 % (n=79) in BT group, although 1,2 % (n=11) in PT.

**CONCLUSION:** Male gender mostly suffered trauma. The mean age was lower in PT group. Open thoracotomy was mostly performed in PT group. Mortality rate was high in BT group. Tube thoracostomy and supportive measurements supplied the successful treatment approaches in both groups. Early diagnosis and correct treatment would cause excellent results.

### OP-1199-INSERTING THE CHEST TUBE THROUGH THE STAB WOUND AT THORACIC INJURIES

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**BACKGROUND:** We evaluated prospectively that chest tube can be used through the stab wound at thoracic injuries.

**PATIENTS AND METHODS:** Two groups were composed in this study. The first group consisted of 30 cases who had stab wound penetrating to the chest and who were admitted to emergency service of the hospital. All of them had pneumothorax or heamothorax or heamopneumotorax. The other group (control group) was composed of 20 cases who had been operated electively on other pulmonary disease such as lung resections etc. Antibiotic therapy for "prophylaxis" was used in all patient. All the cases in both groups were taken culture antibiogram include superficial and deep wound.

**RESULTS:** The mean (range) age of patients was 40 (14-76) years in patient group and 30 (20-65) years in others. The patients had pneumotorax, hemothorax or hemopneumothorax, 19(63%), 7(23%), 4(14%) respectively. Superficial wound culture was positive in 8 (27.6%) of patient group and 2(10.5%) of control group (p > 0.05). Deep wound culture was positive in 1(3.4%) of patient group and was not positive in control group (p > 0.05). There was no meaning statistically in comparison of between superficial and deep wounds culture in both groups (p > 0.05). Infection of wound and intrathoracic were not seen in follow-up of all patient.

**CONCLUSION:** If stab wound is appropriated for dranaige of hemopneumothorax etc, chest tube can be used in this line. It is not need new skin incision for tube thoracostomy.

### OP-1200-TUBE THORACOSTOMY IN CHEST TRAUMA PATIENTS: IS IT WITHOUT COMPLICATIONS?

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**ABSTRACT: OBJECTIVE:** this work was designed to evaluate the morbidity that may result from tube thoracostomy provided to chest trauma patients.

**PATIENTS & METHODS:** In a prospective study, 234 consecutive victims of chest trauma who needed tube thoracostomy were assessed. 161 were victims of blunt chest trauma while 73 were subjected to penetrating thoracic injury. The data were analyzed by electronic spreadsheet Microsoft Excel and analysis was done using SPSS software.

**RESULTS:** patients subjected to penetrating wound were all males. The mean age for patients with blunt chest trauma was 37.74 years while for penetrating injuries 28.07 years. Blunt thoracic trauma needed prolonged ICU stay more than penetrating injuries (4.05±6.2 days vs. 0.62±1.08 days). Also, blunt trauma victims needed longer hospital stay than those subjected to penetrating wounds (11.30±9.5 days vs. 6.62±2.2 days). As regards period of tube thoracostomy both groups needed same duration of time (4.98±2.9 days vs. 4.16±2.18 days). The incidence of associated visceral injuries was in victims of penetrating injuries double the incidence in patients with blunt trauma (15% and 8.7% respectively). 10.7% of patients subjected to chest trauma needed exploratory thoracotomy. The overall rate of complications related to tube thoracostomy insertion was 9.4% distributed as follows; 6.8% improper placement of drain needed re-insertion, lung injury needed thoracotomy for repair 0.85%, post-removal pneumothorax 0.85%, residual hemothorax treated by local injection of streptokinase and thoracotomy 0.85%, and no cases of empyema have been reported in our study. The highest incidence of complications occurred from emergency department residents who inserted chest drains percutaneously.

**CONCLUSIONS:** Tube Thoracostomy in the hands of trained physician is a safe, sometimes, life-saving procedure. Therefore, training of doctors dealing with polytrauma victims to perform such procedure is necessary to decrease complications and hence, comes our recommendation of adopting ATLS to all surgeons. Keywords: Tube Thoracostomy, blunt, penetrating, trauma, complications.

### OP-1201-THE FACTORS AFFECTING THE MORBIDITY AND MORTALITY IN FLAIL CHEST; COMPARISON OF THE ANTERIOR AND LATERAL LOCALISATION

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**BACKGROUND:** Flail Chest is one of the most challenging problems for thoracic surgeons. In this study we evaluate treatment modalities for flail chest according to the effects of localization of trauma on mortality and morbidity.

**METHOD:** Between March 2003- December 2006, 21 patients were treated for flail chest after blunt thoracic trauma. Three female and 18 male, mean age was 45(16-70 year-old) were analyzed for age, sex, chest wall localization of trauma, mechanical ventilation support, prognosis and Injury Severity Score.

**RESULTS:** The major cause of flail chest was car crush in 16 of 21 patients (76%), falling from high 4 patients (19%), subsidence 1 patient (5%). Mechanical ventilation support was carried out in 14 patients; (67%), 12 of 14 was followed with tracheostomy. Injury severity score was 62.8 (30-75) for whole patients. The patients with flail chest who have bilaterally costa-condral separations have significantly higher ISS then, single side postero-lateral flail chest. (ISS: 70/55, p=0.02) Needing for mechanical ventilation support is also higher in bilaterally costa-chondral separation. Morbidity rate is higher in BCCS group then PL group but there is no statistical significany (p=0.198). However mortality rate is significantly higher in group BCCS (p=0.08). The patients with cranial trauma and flail chest have a higher mortality rate (19%) then only flail chest (no mortality). Mean ISS is 75 in cranial trauma and flail chest where as only flail chest ISS is 55.7 (p=0.001). Sepsis and sub-arachnoid bleeding are the major causes of mortality.

**CONCLUSION:** Early intubation and mechanical ventilation is paramount in patients with flail chest. Prolonged mechanical ventilation is associated with the development of poor outcome. Tracheotomy and frequent flexible bronchoscopy should be considered to provide effective pulmonary toilet. When cranial trauma accompanied to flail chest mortality and morbidity rates increase, BCCS is also increased morbidity and needing for mechanical ventilation in patients with flail chest.

## OP-1202-SURGICAL MANAGEMENT OF VASCULAR THORACIC OUTLET SYNDROME

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**BACKGROUND:** Vascular thoracic outlet syndrome (TOS) results from compression or entrapment of the subclavian artery or vein in the scalene or costoclavicular space by osseous and myofascial structures. The incidence of vascular involvement among patients with TOS is 6-10%. Repetitive arterial injury eventually leads to the development of flow-limiting or embolizing lesions. Arterial complications of TOS require prompt treatment in order to avoid irreversible ischemia and tissue loss.

**METHODS:** The vascular compression was evaluated with MRI or conventional angiography. The results were correlated with clinical symptoms in order to decide surgery. Transaxillary approach was the treatment of choice in all cases without aneurysm. Supraclavicular approach was performed in patients with aneurysm. Low dose corticosteroids and high dose NSAID were used in all cases in the postoperative period in order to reduce scar formation. Six weeks physiotherapy was applied in all cases following surgery.

**RESULTS:** Thirty-eighth patients with symptoms of either pure vascular or neurovascular compression were operated on in period of 11 years. The operation was bilateral in five patients. The compression was pure arterial in 20(53%), venous in three(8%), neurovascular in 15 (39%) patients. Complete first rib and/or cervical rib resection was performed via transaxillary approach in 35(92%) and supraclavicular in three (8%) patients. Pleura was opened in all patients in order to avoid hematoma. Although there was no mortality, subclavian venous thrombosis, Horner's syndrome and cyanosis was observed in three (8%) patients. The median hospital stay was 2.7 days (range 2-4 days). The relief of vascular symptoms was achieved in all but one patients (97%). The relief of neurogenic symptoms was good or excellent in 80% of the patients.

**CONCLUSIONS:** Vascular compression at the thoracic outlet is a serious problem however transaxillary or supraclavicular first/cervical rib removal is the best treatment that leads to very low morbidity and complete relief of symptoms in almost all cases.

## OP-1203-PULMONARY DESTRUCTION SECONDARY TO TUBERCULOSIS: CLINICAL FINDINGS AND SURGICAL RESULTS

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**OBJECTIVE:** The aim of this study was to analyze the clinical profile and surgical complications in patients underwent to pneumonectomy due to pulmonary destruction secondary to tuberculosis.

**METHODS:** It was performed a retrospective transversal not controlled study based on medical charts review. Only confirmed infection free treated patients with destructed lungs secondary to tuberculosis were included. Microbiological and pathological confirmation of tuberculous etiology was required. Complete unilateral destruction was confirmed by CT-scan. Age, gender, right/left side, main bronchus stenosis, micro bacteriological treatment and surgical complications were the studied variables. Chi-square and multivariate analysis were performed.

**RESULTS:** From January 2002 to January 2007, 26 (15 female/ 11 male) patients were included. The age average was 39, 6 years, ranging from 16 to 60. Left side destruction was more frequent (2.7:1). Gender was related to the affected side: females had 93% of left side destruction, males had 45%. Main bronchus stenosis was observed more frequently at the left side (10:1).and in the female group (10:1). Pneumonectomy was performed only in symptomatic patients (92.7%). Postoperative complications were: empyema in 29.2%; air leak in 25% and death in 20.8%. Multivariate analysis related right sided destruction and empyema to death.

**CONCLUSIONS:** Pulmonary destruction was more frequent in the left side and females, and was related to main left bronchus stenosis. Right pneumonectomy displayed high mortality.

## OP-1204-MANAGEMENT OF COMPLICATED HYDATID CYST OF THE THORAX

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**BACKGROUND:** Complicated hydatid cyst of the thorax is important to the clinical approaches and treatment modalities in hydatid disease. The aim of this study was to evaluate the problems of complicated pulmonary hydatid cyst including choice of surgical methods, diagnostic clues, and to discuss the inherent risks of medical therapy and the delay of surgical treatment in pulmonary hydatid disease.

**METHODS:** Between 2002 and 2007, 49 operations were performed in 46 patients whose diagnosis were complicated hydatid cyst. The surgical approach was a posterolateral thoracotomy in all patients; a phrenotomy in 2 patients; and a thoracoabdominal approach in 1 patient and 2-stage bilateral thoracotomy was performed in 4 patients. The preferred surgical treatment procedure was cystotomy and modified capitonnage, which was performed in 31 patients (68%). Other procedures included a cystotomy in 7 (15%) and decortication in 2 (16%) patients. Lobectomy in 2 (4%), segmentectomy in 1 (2%), and wedge resection was performed in 4 patients (9%).

**RESULTS:** In 29 patients (63%), there were single hydatid cysts; while in 17 patients (33%), there were multiple cysts. Eleven patients had preoperative hydatid cyst history. Iatrogenic rupture of an intact hydatid cyst occurred in 3 patients. Extrathoracic involvement was apparent in 10 patients (21%). Intrathoracic but extrapulmonary involvement was apparent in 6 patients (13%). The morbidity ratio was 5%; prolonged air leak, atelectasis in each one patient. The mortality ratio was 3% (1 patient). The average hospitalization for all patients was 5.8 days (range, 3-17 days). The mean follow-up was 17.2 months with no recurrence.

**CONCLUSIONS:** Complicated hydatid cyst may cause different clinical manifestations and may present radiologically as a primary lung tumor. In patients with suspicious lung masses owing to endemic area, history of a hydatid cyst, or contralateral or extrathoracic hydatid cyst involvement at the same time should indicate a complicated pulmonary hydatid cyst. Preoperative anthelmintic therapy must be avoided owing to the risk of perforation. Treatment of a complicated hydatid cyst differs from that of an intact hydatid cyst. Anatomic resection may be necessary owing to destroyed lung tissue secondary to suppuration from a hydatid cyst; however, parenchymal preserving surgery is preferable in an uncomplicated hydatid cyst. A modified capitonnage method is recommended for complicated hydatid cyst treatment as it has a low morbidity rate.

## OP-1205-COMPLICATED PULMONARY HYDATID CYST CAN MIMICK VARIOUS PULMONARY DISEASE

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COMPLICATED PULMONARY HYDATID CYST CAN MIMICK VARIOUS PULMONARY DISEASE Serdar HAN1Asc Prof, Bulent KOCER2,M.D, Nesimi GUNAL2, M.D, Gultekin GULBAHAR 2 MD, Unal SAKINCI2, Asc.Prof. 1 Ankara Guven Hospital Dept. of Thoracic Surgery 2 Ankara Numune Training and Research Hospital, Department of Thoracic Surgery, Turkey.

**BACKGROUND:** Pulmonary hydatidosis is one of the important and serious public health problem in Turkey. However it has specific and radiological properties its diagnosis is could have been difficult.

**MATERIALS AND METHODS:** The records of 98 patients who were operated for pulmonary hydatid cysts between 2001 and 2005 were retrospectively evaluated. All the data were supplied from the patient files, operating and discharge forms. Misdiagnosed cases were evaluated and compared with the other cases for their clinical features

**RESULTS:** The gender distribution of the patients was 48 male and 50 female, with a mean age of 34.00±17.21 years (range: 7-82). In 83 patient (84.7%) there was only one cyst, and in 15 patient (15.3%) more than one cyst, totaling 129 cysts. Of 129 cysts, 65(50.4%) were in the right lung and 64 (49.6%) on the left. The most commonly applied surgical procedure (92 patients, 94%) was cystotomy and capitonnage. The numbers of the misdiagnosed cases were 8 (8.2%). Preoperatively, the most false diagnosis was solitary pulmonary nodule (n=3) and abscess of the lung (n=2).

**CONCLUSION:** Because of difficulties in diagnosis of some cases, pulmonary hydatidosis must be kept in mind at the endemic regions.



### OP-1206-RELATIONS BETWEEN INSURGENCE OF SPONTANEOUS PNEUMOTHORAX AND METEOROLOGICAL FACTORS

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**BACKGROUND:** Idiopathic spontaneous pneumothorax (SP) is thought to result from rupture of the alveolar structure with an air leak into the pleural space through the visceral pleura. Weather changes may influence the incidence of SP. The aim of this study was to define the influence of weather changes on the incidence of SP.

**METHODS:** Since 2001, all people living in western sector of Turin and showing symptoms of SP has been hospitalized in Maria Vittoria Hospital. The list of people recovered in the period 2001 - 2006 contains 391 patients with SP. Preliminary statistic analyses have been applied to this dataset. A possible relation between the insurgence of SP and several meteorological factors has been investigated. During this preliminary stage, the following meteorological factors have been chosen: o atmospheric pressure, o temperature, o wind speed, o relative and specific humidity, o concentrations of some pollutants (NO<sub>2</sub>, CO<sub>2</sub>, PM<sub>10</sub>). For each variable, have been taken into account: o daily mean values, o daily excursion of current and previous day, o maximum or minimum difference between current and previous day.

**RESULTS:** The histogram of the number of days in which SP cases have been recorded belongs to a Poisson distribution different from the one calculated using synthetic data, showing that there is a statistically significant clusterization of the recovered people. The preliminary results did not show any statistically significant relations about SP and meteorological factors in Turin. This result is partially in contrast with the findings of some previous studies of other authors, in which some correlations with pressure or temperature differences have been found.

**CONCLUSIONS:** Weather differences were not associated with the development of SP in this study. SP develops in clusters, and this clustering is not related to meteorological changes. However, other possible external contributive factors must be investigated and further research is necessary to identify precise mechanisms of the biological response.

### OP-1207-LUNG HAMARTOMAS IN ALEXANDRIA, EGYPT

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**ABSTRACT: BACKGROUND:** Pulmonary hamartomas are rare benign asymptomatic tumours with occasional compressive effects on the lung parenchyma and bronchi; they are important differential of lung carcinoma. Methodology Records of patients with histopathologically confirmed lung hamartomas managed at the Main University Hospital, Alexandria University, Egypt between 2001 and 2006 were analyzed for sex, age, clinical presentation, treatment and outcome.

**RESULTS:** Five patients constituted the study size. The mean age was 35.6±14.4 years, age range of 8- 60 years and male: female of 1:1.5. Two (40%) were asymptomatic, 2 (40%) had cough of recent onset and 1(20%) presented with haemoptysis. The left lung was more commonly affected (60%) while the upper lobe was more common location (60%). All patients presented with coin lesions on plain radiographs. Pre-operative diagnosis was lung carcinoma in 4 (80%) of patients. Four patients (80%) had lobectomy while one patient (20%) had a local resection of the mass. Histology confirmed fibrochondromatous hamartomas in all with one (20%) showing additional placental transmigration. No recurrence has been observed in the patients.

**CONCLUSION:** Lung hamartomas remain a diagnosis of exclusion in patients presenting with a solitary coin lesion.

### OP-1208-COMPARISON BETWEEN SINGLE AND BILATERAL LUNG TRANSPLANTATION IN A BRAZILIAN COHORT

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**BACKGROUND:** Lung Transplantation (LTX) is an option of treatment for end-stage lung disease, like COPD, pulmonary fibrosis, bronchiectasis, cystic fibrosis and pulmonary hypertension. The decision of the type of transplant (single or bilateral) depends on the disease, the surgical thoracic history and clinical status of the patient. Although Brazil has tradition in other types of transplantation, only few centers in this country are able to proceed with LTX.

**OBJECTIVES:** Analyze all lung transplants performed in our center in the last four years and compare the results between single and bilateral transplants.

**METHODS:** It was performed a retrospective cohort study including all transplanted patients operated on from August 2003 to October 2007. Comparison between groups and survival analysis were performed.

**RESULTS:** It was performed 59 lung transplants. Of those, 24 were single (STX) and 35 were bilateral (BTX). The main indication for STX was pulmonary fibrosis (50% of the patients), followed by emphysema (38%), LAM, histiocytosis X and bronchiectasis (4% each); and for BTX the main indication was bronchiectasis (34%), followed by cystic fibrosis (25%), emphysema (19%), pulmonary fibrosis (11%), LAM (8%) and pulmonary hypertension (3%). The mean age was 45 years (54 for single and 39 for bilateral; p<0,05). Mean time of mechanical ventilation was 27 hours, and there was no difference between groups. Mean length of ICU stay was 15 days, also with no difference between groups. The perioperative survival was 80% (n = 47), with 65% for STX and 91% for BTX (p<0,05). Kaplan-Meier analysis of survival showed 60% probability of survival in four years for all patients, with 76% for BTX and 50% for STX (p=0,032).

**CONCLUSION:** Bilateral lung transplantation had longer survival and was more frequent in younger patients.

### OP-1209-MEDIAL HYPERTROPHY IN PATIENTS WITH PULMONARY EMBOLISM: ANATOMOPATHOLOGICAL STUDY

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**OBJECTIVE:** To compare the arterial response of cases of acute and chronic embolism, seeking to associate ischemic pulmonary remodeling with progression to chronicity.

**METHODS:** Retrospective analysis of 61 necropsies of patients who died in the Instituto do Coração (31 cases of pulmonary embolism and 30 cases of acute myocardial infarction). Slides of pulmonary tissue were obtained from all cases and analyzed qualitative and quantitatively (medial thickness measurement).

**RESULTS:** Qualitative analysis enabled the differentiation between cases of embolism and the control group, thus characterizing the two groups and defining the adequate choice of the control group. The alterations predominated in patients with embolism (alveolar inflammation and edema, infarction, vasoconstriction, concentric intimal proliferation, presence of thrombus). Quantitative analysis demonstrated higher percent medial thickness in the cases of embolism than in the control group; among the cases of embolism, no differences in intra (acute - 19.74 and chronic - 20.04) and pre-acinar (acute - 18.85 and chronic - 18.68) arteries were observed.

**CONCLUSION:** The lack of difference among the groups with embolism and the higher values of percent medial thickness in the peripheral arteries allow the conclusion that the vascular response is more intense and starts in these arteries.

### OP-1210-PULMONARY ENDARTERECTOMY COMBINED WITH MAZE OPERATION: INDICATION, FIRST RESULTS

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**BACKGROUND:** Pulmonary endarterectomy (PEA) is an effective treatment for chronic thromboembolic pulmonary hypertension (CTEPH). Ten percent of our

patients with CTEPH had before PEA operation atrial fibrillation (AF) or flutter. AF can be effectively treated by Maze procedure and we did this procedure concomitant with PEA. The aim of the present study was to analyze early results of combined PEA and MAZE procedures in our small group of patients with rare disease.

**METHODS:** Between September 2004 and December 2007, we operated on 68 patients with CTEPH. All patients underwent PEA using cardiopulmonary bypass (CPB) and deep hypothermic circulatory arrest. Concomitant procedures were carried out during rewarming time of PEA, 12 times ASD closure, 7 times CABG and 5 times MAZE using cryoablation.

**RESULTS:** Overall operative mortality was 5.9 % (4 patients died), none of patients with PEA concomitant with MAZE died. Four patients (80%) have now, in average 12 month after MAZE, sinus rhythm. After operation there was a considerable improvement of haemodynamic parameters (mPA, CI, PVR) in patients with PEA and PEA with MAZE too.

**CONCLUSIONS:** Sinus rhythm is very important for postoperative stability of patient after PEA and concomitant MAZE provides for a very good chance to achieve sinus rhythm in patient. Our group of patients is small, because incidence of this combination is relatively rare, but we think that the treatment of such patients, who suffer CTEPH and AF or flutter with PEA and MAZE, is an effective therapeutic approach. Pulmonary endarterectomy may be performed safely in conjunction with other cardiac operations and particularly with MAZE. This study was supported with grant IGA MZ NR9224-3 of the Ministry of Health, Czech Republic.

## OP-1211-EFFECTS OF BRONCHIAL TRANSECTION AND CYCLOSPORINE A ON MUCOCILIARY TRANSPORT IN RATS

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**BACKGROUND:** Post-transplant infection remains the leading common cause of morbidity and mortality following lung transplantation. Although there are many mechanisms involved, we hypothesized that both surgery and immunosuppression play a key role in the development of infectious complications by impairing airway mucociliary clearance. This study focused on the assessment of the impact of bronchial transection and immunosuppression by cyclosporine A (CsA) on mucociliary transport in rats.

**METHODS:** Sixty four rats were assigned to four groups (n=16 each): sham-operated and saline; bronchial transection and saline; sham-operated and CsA; bronchial transection and CsA (10mg/kg/day). Eight animals from each group were killed on 30th or 90th postoperative day. In vitro transportability, in situ mucociliary transport (MCT) and ciliary beating frequency (CBF) were measured.

**RESULTS:** There was a significant impairment ( $p<0.001$ ) on CBF due to either bronchial transection or CsA therapy. In vitro transportability was impaired only in CsA-treated groups ( $p<0.001$ ). In situ MCT was reduced in CsA-treated animals as well as in those submitted to bronchial transection ( $p<0.001$ ). This impairment was significantly recovered 90 days after surgery. In contrast, the effects of CsA did not change over 90 days of treatment. There was a synergistic effect between CsA and bronchial transection on mucociliary transport.

**CONCLUSIONS:** These results support our hypothesis that mucociliary clearance is impaired after bronchial transection and CsA therapy. Further studies are necessary to relate this find with post-transplant infection and also to test some drugs aiming to protect airway mucociliary system.

## OP-1212-PNEUMONIA AFTER LUNG TRANSPLANTATION IN A BRAZILIAN COHORT STUDY

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**BACKGROUND:** Infectious complications are the mainly cause of death in the first year after lung transplantation. The pulmonary parenchyma and bronchial mucosa are most affected by bacterial and fungal infection, but the impact of microorganisms transmission from donor to recipient is still controversial. The purpose of this study is to describe the epidemiology of bacterial and fungal

pneumonias and tracheobronchitis after lung transplantation and to analyze the impact of donor and recipient microorganisms in early pneumonia post-transplant.

**METHODS:** Retrospective cohort analysis of medical charts of 49 patients submitted to lung transplantations in our institution between August/03 and April/2007. All donors and recipients bronchoalveolar lavages (BAL) cultures were reviewed. For statistical analyzes we compared patients with suppurative and non-suppurative disease using Cox regression.

**RESULTS:** Twenty-seven were bilateral procedures (55%). Seventeen patients (34.7%) had suppurative lung diseases (bronchiectasis and cystic fibrosis). Forty-five BAL cultures were obtained from lung donors: 14 (31%) were negative, 15 positive for *Staphylococcus aureus* (33%) and only 3 were methicillin-resistant (MRSA). Twenty-two patients (44.9%) had pre-operative bacterial colonization. *Pseudomonas aeruginosa* was the most frequently microorganism isolated (19/32 - 59.3% of all positive pre-operative cultures). There were 108 infection episodes (mean of 2.2 episodes/patient) during a mean period of follow up of 412 days (range 1 - 1328 days). Thirty-seven episodes (34.2%) were due to *Pseudomonas aeruginosa*, 34 to *Staphylococcus aureus* and 19 to *Aspergillus* spp. Other fungal pneumonias were due to *Fusarium* spp (3), *Cryptococcus neoformans* (2) and *Paracoccidioides brasiliensis* (1). Eleven episodes of bacteremia occurred and the lungs were the source in five cases (45.4%). Of all deaths, six (37.5%) were due to infection complications. Statistical analyses showed association between pre-operative microorganisms colonization and post-transplant pneumonia only in the suppurative group of patients (RR=4.76,  $p=0.04$ ; CI95% 1.02-22.10). Donor microorganism was not associated with pneumonia after transplantation neither in suppurative nor in non-suppurative groups.

**CONCLUSION:** Bacterial and fungal infections after lung transplantation are frequent and life threatening. *Pseudomonas aeruginosa* was the most frequently isolated microorganism in BAL cultures. There was no association between donor microorganism and post-transplant pneumonia. Nevertheless, pre-operative microorganism colonization was associated with early pneumonia in suppurative patients.

## OP-1213-TREATMENT OF BRONCHIAL COMPLICATIONS AFTER LUNG TRANSPLANTATION

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**INTRODUCTION:** Airway complications following lung transplantation is an important source of morbidity and mortality. It have been reported in up to 27% of patients and may occur as bronchial dehiscence, malacia and stenosis. The use of self expandable stents to treat bronchial stenosis is well established. The purpose of this study is to report our experience in the management of these complications.

**METHODS:** Between 2000 and 2006, 55 lung transplantations were performed at Heart Institute of Clinicas Hospital of Sao Paulo University Medical School. There were 24 bilateral transplants including 79 bronchial anastomosis.

**RESULTS:** Nine patients developed bronchial anastomosis complications (13%), two of them bilaterally. There were four stenosis, four dehiscences and three bronchial necrosis. Four deaths were observed, three of them related to anastomosis complications. Dehiscences were treated by balloon dilatation and/or metallic and plastic self expandable prosthesis placement. One death was secondary to massive bleeding through a broncho-arterial fistula due to bronchial necrosis in the anastomotic area. The other two patients with bronchial necrosis were follow-up without any additional complication and even with spontaneous resolution observed with fiberoptic. Only a small and asymptomatic scar constriction was observed. Two dehiscences resulted in air leaks, followed by empyema and septic shock, but no reoperation was needed.

**CONCLUSIONS:** Post transplant bronchial anastomosis complications are not rare and even can evolve with threatening additional complications. Endoprostheses are good alternative for treating stenosis. Dehiscence and necrosis must be followed up with bronchoscopy in order to define which of them will require surgical intervention and even retransplantation.

#### OP-1214-EFFECTS OF CYCLOSPORINE A ON AIRWAY MUCOCILIARY CLEARANCE IN RATS

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**BACKGROUND:** Infections are the commonest cause of mortality after transplants. We hypothesized cyclosporine A (CsA) impairs mucociliary clearance, the most important airway defense mechanism, by decreasing mucus secretion. Our purpose was to assay CsA effects on mucus secretion and mucociliary transport in rats.

**METHODS:** Twenty-one rats were assigned to three groups: Control (n=5), Saline (n=8) and CsA (n=8; 10mg/kg/day). After 30 days, they were killed and lungs were removed from thoracic cavity. Mucus samples were collected and in vitro transportability was evaluated by using a bullfrog palate model. In situ mucociliary transport (MCT) was timed by direct view of particles trapped on mucus moving across the respiratory tract. Finally, we measured the amount of stored mucins in the goblet cells of the respiratory epithelium.

**RESULTS:** In vitro transportability rate was statistically minor ( $p<0.001$ ) in CsA group. Also, in situ MCT was decreased in all CsA-treated animals ( $p=0.02$ ). Mucus quantity measurements showed a significant decrease on both acid ( $p=0.01$ ) and neutral ( $p=0.02$ ) mucus production from goblet cells in the animals submitted to CsA therapy. The correlation between the percentage of total mucus and in vitro transportability rate was positive and significant ( $r=0.706$ ,  $p<0.001$ ), as well as between the percentage of total mucus and in situ MCT ( $r=0.688$ ,  $p=0.001$ ).

**CONCLUSIONS:** Our results show that CsA plays an important role on the impairment of the mucociliary clearance. This fact can help us to understand the high level of infection after transplants. Further studies with others immunosuppressant drugs will give us a major comprehension about this phenomenon.

#### OP-1215-CLINICAL EVOLUTION AND INFECTIOUS COMPLICATIONS IN CYSTIC FIBROSIS PATIENTS SUBMITTED TO LUNG TRANSPLANTATION

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**BACKGROUND:** Although the improvement in medical management and better survival of patients with cystic fibrosis, ninety percent of them develop bronchiectasis, pulmonary infections and progressive respiratory insufficiency. Lung transplantation represents the only therapeutic option to improve life quality and survival in patients with end-stage disease. Objective: To report the characteristics and clinical evolution of patients with cystic fibrosis submitted to lung transplantation at Heart Institute of Clinics Hospital, Sao Paulo University Medical School (InCor-HC/FMUSP).

**METHODS:** Retrospective study of clinical data in medical records.

**RESULTS:** From August 2003 to April 2007, 49 patients were submitted to lung transplantation at the InCor-HC/FMUSP, of which 7 patients (14.3%; 3 male and 4 female) had cystic fibrosis. Mean age was 24.4 years (from 18 to 37 years). Mean hospital stay was 45 days and 11 days in the intensive care unit. Peri-operative survival was 100%. *P. aeruginosa* was found in 5 patients (71.5%). Lower airway infections (37 cases) were the mainly infectious complication. Three patients from this group were submitted to therapeutic sinusotomy in the late postoperative period (> 6 month). Others bacterial complications: mediastinitis and septic pulmonary embolism. Fungal infections were observed in four patients: tracheobronchitis by *Aspergillus* sp. (3) and pneumonia by *Candida guilliermondii* (1).

**CONCLUSIONS:** Lung transplantation is a safe therapeutic option for cystic fibrosis patients. Infectious complications are frequent but can be well controlled with specific treatment. Clinical data and good evolution of the patients from our service are similar to the observed in others world centers.

#### OP-1216-THE ROLE OF PNEUMONECTOMY IN PULMONARY EDEMA AND NITRIC OXIDE SYNTHASE EXPRESSION IN REMAINING LUNG OF RATS

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**BACKGROUND:** Pneumectomy is associated to high mortality and high rate of complications. Postpneumectomy pulmonary edema is one of the leading cause of mortality. Little is known about the etiologic factors of this disease and its association with inflammatory process or oxidative stress. The purpose of this study was to evaluate the role of pneumectomy as a cause of pulmonary edema and its association with nitric oxide synthase (NOS) expression.

**METHODS:** Thirty one Wistar rats were submitted to left pneumectomy or Sham operation and sacrificed in 48 and 72 hours. Blood gas analysis, perivascular pulmonary edema, inflammatory infiltrate measured by neutrophilic density, oxidative stress by immunohistochemistry expression of inducible and endothelial fractions of NOS (iNOS and eNOS) and vascular reactivity measured by lumen-wall ratio were quantified. ANOVA was used to compare pneumectomy and Sham groups.

**RESULTS:** There was difference between groups in perivascular pulmonary edema, immunexpression of iNOS and eNOS and vascular reactivity. Perivascular pulmonary edema was more intense in the pneumectomized rats in 72 hours. Neutrophilic density was lower in pneumectomized rats in both groups (48 and 72 hours). There was lower immunohistochemistry expression of iNOS in rats submitted to pneumectomy and sacrificed in 72 hours. The expression of eNOS was higher in the pneumectomy group both in 48 and 72 hours. The lumen wall ratio after 72 hours is lower after pneumectomy meaning reactive vasoconstriction. There was no statistical difference in gas exchange between operated and Sham groups, measured by  $pO_2/FiO_2$  ratio.

**CONCLUSIONS:** The left pneumectomy in rats was associated with perivascular pulmonary edema and was not associated with inflammatory process or oxidative stress. There was higher vasoconstriction and eNOS expression after pneumectomy.

#### OP-1217-EFFECTS OF AZATHIOPRINE ON MUCOCILIARY CLEARANCE AFTER BRONCHIAL SECTION IN A RAT MODEL

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**BACKGROUND:** The mechanisms involved in the impairment of the mucociliary function after lung transplantation and immunosuppression therapy are not completely understood.

**OBJECTIVES:** To evaluate the effects of azathioprine (AZA) on the mucociliary system in a model of bronchial section and anastomosis in rats.

**METHODS:** Thirty-six male Wistar-Furth rats were submitted to left bronchial section and anastomosis, and divided in two groups to receive either saline solution or AZA therapy (3mg/kg/day). After 7, 15 and 30 days, six animals from each group were killed and in situ mucociliary transport (MCT), in vitro mucus transportability and mucus contact angle were studied distally to the anastomosis of the left main stem sectioned bronchus and in the right intact bronchus.

**RESULTS:** MCT values were significantly lower in the sectioned bronchus and with AZA administration up to 7 days ( $p<0.05$ ). Otherwise, MCT values continue to be significantly lower only in the presence of bronchial section at 30 days ( $p<0.01$ ). In vitro mucus transportability showed significant lower values only in the group without AZA at 30 days ( $p<0.001$ ), and similar results were observed in the contact angle of the mucus ( $p<0.001$ ).

**CONCLUSIONS:** AZA leads to a temporary marked impairment of MCT, while this occurrence was maintained up to 30 days in the presence of bronchial section. In addition, AZA contributes to preventing alterations in the mucus surface properties. Our results add important news concerning MCT dysfunction after lung transplantation. Further studies are necessary to test the combined action with others immunosuppressant drugs and to know how to protect and recover this important airway defense mechanism.



## PERFUSION I

### OP-1218-THE INFLUENCE OF CARDIOPULMONARY BYPASS PERFUSION PRESSURE ON RENAL FUNCTION

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**BACKGROUND:** Acute renal failure (ARF) usually develops in 5% to 30% of patients undergoing heart surgery with CPB and is associated with a more complicated clinical evolution course and with an excessive mortality of up to 80%. Renal dysfunction following CPB is well recognized, but what is the cause of acute postoperative renal impairment - this question is not fully clear. The aim of the study was to investigate if postcardiac surgery renal dysfunction is influenced by CPB management.

**METHODS:** We studied randomly selected 179 adult patients with normal preoperative renal function, who underwent open-heart surgery at the Kaunas Medical University Hospital, Department of Cardiothoracic and Vascular surgery (Lithuania). Patients were randomized into three groups: the group I included 68 pts in whom the mean perfusion pressure (PP) during CPB was maintained 60-69.9 mmHg; the group II included 59 pts in whom the mean PP was 50-59.7 mmHg and the group III included 52 pts in whom the mean PP was 70-86.3 mmHg. Preoperative patient condition, intraoperative and postoperative periods were recorded. Statistical significance was accepted at a level of  $P < 0.05$ .

**RESULTS:** By the evaluation of the influence of CPB PP on renal excretion, we estimated, that in group II, that the mean PP during CPB was 50-59.9 mmHg, urine output during the surgery procedure was statistically significant lower. It was established, that during 24 hours postoperative period, diuretics therapy (furosemide medication) was used statistically significant more often in the II Group, where the mean PP during CPB was 50-59.9 mmHg. During our research we stated, that the rate of ARF in the early postoperative period was infrequent in all of these groups. In the group I it was 6% patients, 4% in the group II and 6% in the group III. Neither there was found differences in the rate of other complications (cardiovascular, respiratory, neurological disorders, bleeding, etc) among the groups. By the search of determinative ARF development, we have analysed the date of patients with normal preoperative renal function, who developed ARF after surgery on CPB. There were 20 (12,5%) cases of ARF. We found, that these patients with ARF than those without the complication were elders ( $70.0 \pm 1.7$  vs  $63.5 \pm 0.9$ ,  $p=0.016$ ), during the surgery there was performed allogeneic blood transfusion (31,6% vs 18,4%,  $p=0.001$ ). The most of these patients underwent valves replacement or reconstruction surgery (57,9% vs 27,2%,  $p=0.011$ ), or combined valves and cardiovascular surgery procedures (15,8% vs 1,4%,  $p=0.004$ ). These conditions determined longer CPB duration ( $134.74 \pm 14.23$  vs  $100.59 \pm 3.63$  min.,  $p=0.003$ ) and longer duration of aortic cross clamp ( $75.11 \pm 8.21$  vs  $53.45 \pm 2$  min.,  $p=0.001$ ).

**CONCLUSIONS:** We suppose, that cardiopulmonary bypass PP at 50-59.9 mmHg didn't cause postoperative ARF. According to the data of our retrospective study, causes of ARF after cardiac surgery on CPB consist of multiple factors. This is age, complexity of surgery, longer total time of aortic cross-clamping, longer total CPB time and performed allogeneic blood transfusion procedures.

### OP-1219-DOES MINI-BYPASS SYSTEM IMPROVE BLOOD CONSERVATION FOLLOWING CARDIAC SURGERY

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**BACKGROUND:** To assessed the contribution of a mini extracorporeal cardiopulmonary bypass circuit (ECCO® system) as a possible solution in reducing blood transfusion requirements in coronary artery surgery.

**METHODS:** 50 first time CABG patients between 11/04 and 12/05 using ECCO® minibypass system were compared with 50 non randomized first time

CABG controls between 12/03 and 09/04 using standard cardiopulmonary bypass. Demographic, operative and postoperative details were noted. Standard statistical tests and logistic regression analyses were undertaken to examine the factors associated with blood transfusion.

**RESULTS:** Median Euroscore® for both groups was 3 (IQR 2-5) with more women in the control group : 14 (28%) versus 5 (10%),  $p=0.02$ . Preoperative hemoglobin, aspirin usage and cell salvage volume was similar for both groups. In the minibypass group, priming volumes (mean 145ml versus 1838ml,  $p<0.00005$ ) and total fluids used (mean 473mls versus 2501mls,  $p<0.00005$ ) were significantly low. Similarly, immediate post bypass haemoglobin was significantly high : 10.2 (9.9-10.6, 95%CI) versus 9.0 (8.6-9.4, 95%CI),  $p<0.00005$  and blood transfusion requirement was significantly less: 14 patients (28%) versus 34 (68%),  $p<0.0005$ . The mean blood units transfused in the minibypass group was 0.7 (0.3-1.1, 95% CI) versus 1.6 (1.1-2.2),  $p=0.009$ . Logistic regression analysis suggested that the usage of minibypass and aprotinin independently reduced the risk of transfusion: OR 0.23 (0.08-0.64, 95% CI,  $p=0.005$ ) and OR 0.06 (0.01-0.4, 95% CI,  $p=0.004$ ).

**CONCLUSION:** Minibypass system usage was associated with significant reduction in transfusion requirements compared to controls. Further studies to evaluate the clinical and cost-effectiveness of this system is warranted.

### OP-1220-AN EXPERIENCE OF USE DIFFERENT ARTIFICIAL BLOOD CIRCULATION SYSTEMS IN PATIENTS RECEIVING CARDIAC SURGERY

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**BACKGROUND:** To compare the advantages of using rotary or roller pump in surgical treatment of patients with coronary heart disease (CHD) with lesions of left coronary artery tube

**METHODS:** There were examined 67 patients with stenosis of left coronary artery more then 50%, and who had already received the cardiac surgery of CHD. Patients were separated for two groups, depending of type of the arterial pump. The first group consisted of 31 patients, 29 men and 2 women. The middle age was  $56 \pm 4.7$  years. The roller arterial pump was used in the arterial position in these patients. The duration of the artificial blood circulation (ABC) was  $141 \pm 12$  minutes. The quantity of distal anastomosis -  $3,6 \pm 1,3$ . The second group - 42 patients, 38 men and 4 women. The middle age -  $59 \pm 5,1$  years. We used Jostra Rota Flow rotary pump in these patients. The duration of artificial circulation was  $150 \pm 9$  minutes. The quantity of distal anastomosis -  $3,6 \pm 1,3$ . All patients were operated of one surgical team in conditions of total intravenous anesthesia (ketamine, diazepam and fentanyl). The artificial blood circulation was held on the membrane oxygenations in normotermal regimen. The antero-retrograde faltering hypothermic blood cardioplegia was administered for all patients to protect myocardium. To compare the effectiveness of arterial pump working, we have selected the following parameters: the quantity of platelets, the volume of post operating blood loose, free hemoglobin level, cortisol level and inflammatory cytokines (IL-1, IL-2, TNF $\alpha$ ). Blood samples were taken before the perfusions, in 5 minutes from the very outset of ABC, in one hour, in two hours and in 24 hours after beginning of the ABC. All data were statistically treated with the Student's method.

**RESULTS:** Our research have shown that in spite of the equal ABC duration, the quantity of platelets in 24 hours after operation was for certain higher in the second group (comparing to the first group), and was  $193 \pm 9$  thousands/ml and  $162 \pm 10$  thousands/ml. The postoperative blood lose volume in the roller pump group was 51038 ml, and at the same time in the rotary pump group was  $403 \pm 32$  ml, that is significantly lower. During the first hour after perfusion there was no deference in the free hemoglobin level between two our groups. But in two hours after beginning ABC, and in one hour after finishing ABC, the level of haemolysis was lower in the second group -  $13 \pm 4$  mg% ( $P<0,05$ ), and  $30 \pm 6$  mg% in the first group. While evaluating the stress response we found the higher cortisol level in the roller group -  $1005 \pm 43$  nmol/l, and at the same time in the rotary group the cortisol level was nearly normal -  $620 \pm 23$  nmol/l. The inflammatory cytokines level was analyzed to be higher in the first group.

**CONCLUSION:** In patients with lesions of left coronary artery tube the use of rotary pump in ABC leads to the less damage of blood elements and arouse less stress and systemic inflammatory reactions. Use of rotary pump seems to us to be a preferred embodiment in such patients



### OP-1221-COMPLEMENTARY MEASURES DURING CARDIOPULMONARY BYPASS IN VERY HIGH- RISK CARDIAC SURGERY PATIENTS

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**BACKGROUND:** Aim of our study is to examine the complementary measures taken by our surgical team intraoperatively that affect the early survival, therefore to present our experience in treating very high-risk patients. Also late survival is a question in order to examine the long-term benefits of these procedures.

**METHODS:** Subjects of this study were 54 consecutive patients who underwent cardiac procedure in our department in a period of 5 years (2002-2006) having EuroSCORE  $\geq 25$ . The complementary measures during the extracorporeal circulation were in summary: a) monitoring including cerebellar oxymetry and venous blood gases, b) myocardial protection was with cold blood intermittent cardioplegia antegrade, retrograde and the use of myocardial thermometer, c) blood used in the prime if renal dysfunction were present and d) trans-esophageal echo to secure that all air was evacuated. Our population included patients who underwent CABG, valve replacement or repair, aortic surgery. Usually they were patients undergoing urgent, emergency or salvage operations and patients who had Carotid Endarterectomy (CEA) prior to CABG. We contacted by telephone with the survivors in November 2007.

**RESULTS:** From the 54 high- risk patients who were operated, 24 survived and discharged in good condition. From the 24 survivors 16 are in very good condition, 6 patients survived for more than 2 years, and 2 patients died the first year.

**CONCLUSIONS:** It is worthy to operate in very high-risk patients as the overall survival is rewarding. Extracorporeal circulation complementary measures taken are important in achieving these good results.

### OP-1222-REDUCTION OF THE INFLAMMATORY RESPONSE WITH MINIMAL EXTRACORPOREAL CIRCULATION IN CARDIAC SURGERY

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**BACKGROUND:** Cardiopulmonary bypass (CPB) is known to cause part of the systemic inflammatory reaction after cardiac surgery, which can lead to multi-organ failure. Minimal extracorporeal circulation (MECC) system with reduced priming volume, heparin-coated circuit and less blood-air interface has been evaluated versus standard CPB, in 2 prospective studies involving coronary bypass grafting (study I) and single aortic valve surgery (study II).

**METHODS:** Sixty patients in study I, forty patients in study II, were randomly equally assigned to either standard CPB or MECC. Clinical and biological data were collected: specific evaluation of cytokine release (IL-6, TNFa) as well as neutrophil elastase secretion, hematological parameters (leukocyte and platelet counts) were determined pre-, on- and post-bypass.

**RESULTS:** All patients were similar with regards to pre- and intra-operative characteristics in both studies. MECC allowed a reduced hemodilution with a mean drop of hematocrit of 8.5% vs 15.3% in study I; 9.7% vs 18% in study II ( $p < 0.05$ ). Platelet count remained at higher values with MECC compared to CPB. By the end of bypass: IL-6 levels were significantly lower in the MECC group ( $38.8 \text{ pg/ml} \pm 19.6$  vs  $87.9 \pm 38.9$  in study I /  $35 \text{ pg/ml} \pm 16$  vs  $80 \pm 35.2$  in study II). Plasma levels of TNFa raised significantly more in standard CPB ( $17.8 \text{ pg/ml} \pm 15.4$  in study I /  $18 \text{ pg/ml} \pm 7$  in study II) than in MECC ( $10.1 \text{ pg/ml} \pm 5.6$  in study I,  $10 \text{ pg/ml} \pm 4$  in study II). With MECC, the neutrophil elastase release was reduced ( $72.7 \text{ ng/ml} \pm 47.9$  vs  $219.6 \pm 103.4$  in study I /  $116 \text{ ng/ml} \pm 46$  vs  $265 \pm 120$  in study II).

**CONCLUSIONS:** The MECC system demonstrates a lower inflammatory reaction when compared to standard CPB. Because of the low morbidity / mortality rate in both groups, differences in clinical outcome would need inclusion of several hundred patients to be proved.

### OP-1223-BIVALIRUDIN ANTICOAGULATION FOR CARDIOPULMONARY BYPASS(CPB)

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**BACKGROUND:** The standard agent used for systemic anticoagulation during cardiopulmonary bypass (CPB) is heparin. Alternative methods of anticoagulation are required for patients with heparin allergy. Bivalirudin is a direct thrombin inhibitor that has been proposed as an alternative agent for anticoagulation during CPB. Bivalirudin prolongs in a concentration-dependent manner the activated partial thromboplastin time (APTT), thrombin time (TT), prothrombin time (PTT), activated clotting time (ACT) and ecarin clotting time (ECT). We present the case of a patient with heparin hypersensitivity who was anticoagulated with bivalirudin during CPB for coronary artery bypass grafting. This presented unusual challenges surrounding the monitoring of anticoagulation and the mode of myocardial protection.

**METHODS:** A 42-year-old male was admitted with inferolateral myocardial infarction. Cardiac catheterization demonstrated significant three-vessel coronary artery disease and preserved left ventricular function. He remained in hospital and was referred for urgent surgical coronary revascularization. During hospitalization he developed an abdominal eczematous rash at the site of injection of low molecular weight heparin (LMWH). Dermatological consultation and subsequent skin biopsies confirmed hypersensitivity to heparin. It was decided to undertake surgical coronary revascularization with CPB, using bivalirudin for anticoagulation. Anticoagulation monitoring was undertaken by measuring ACT, APTR and international normalized ratio (INR). The target ACT during CPB was between 400 and 500 seconds. Myocardial protection was undertaken using the cross-clamp fibrillation technique, in order to avoid a protracted period of cross-clamping and intravascular stasis.

**RESULTS:** Baseline measurements during anaesthetic induction were as follows: ACT 122 sec, APTR 1.46 and INR 1.1. Initially 100mg (1mg/kg) of bivalirudin bolus was administered intravenously and an infusion of 2.5mg/kg was started. Three further bolus injections of bivalirudin (50mg, 100mg, 100mg) and an increase of the continuous infusion to 5mg/Kg were required to achieve an ACT of 426 sec, APTR  $>5$  and INR to 8.52. Four bypass grafts were performed and the CPB time was 61 minutes. The ACT during CPB ranged between 404 and 462 sec. In the post-CPB period bivalirudin was allowed to spontaneously reverse by renal excretion. ACT values declined from 404 to 270 and 207 sec one and two hours after termination of the infusion respectively. At the same time-points APTR declined from  $>5$  to 4.7 and 2.78 and INR from 7.46 to 3.2 and 2.4 respectively. Satisfactory haemostasis was achieved and the operation was completed 2 hours after the end of CPB. All coagulation parameters normalized within six hours after the end of CPB. There was no excessive mediastinal drainage and the drains were removed the first postoperative day. The patient was discharged home uncomplicated the 6th post operative day.

**CONCLUSIONS:** Bivalirudin can be safely utilized for CPB and its anticoagulant effect can be monitored using currently available laboratory and operating room based tests of anticoagulation. Dose requirement is patient-dependent and needs to be tailored to the anti-coagulant response. Spontaneous intraoperative reversal of the anticoagulant effect of bivalirudin may require a prolonged period of haemostasis.

### OP-1224-EFFECTS OF CONVENTIONAL AND MODIFIED ULTRAFILTRATION ON BLEEDING AFTER ADULT CARDIAC SURGERY

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**BACKGROUND:** Open-heart surgery with the aid of cardiopulmonary bypass has been associated with coagulopathy and increased blood loss. Modified and conventional ultrafiltration effectively minimize coagulation disorders and reduce blood loss in children. Their effects in adults have not yet been addressed properly.

**METHODS:** Over an eleven month period (January 2005 to November 2005), 106 patients underwent first time elective heart surgery (coronary artery bypass graft or valve replacement) in a single institution. These patients were randomized into two groups: Modified Ultrafiltration Technique (MUF) and Con-

ventional Ultrafiltration Technique (CUF). They were operated under mild hypothermic cardiopulmonary bypass using a hollow-fiber membrane oxygenator and a roller pump. The ultrafiltration was achieved using a polysulfone hemofilter. In both groups, hematocrit, hemoglobin, as well as hemotransfusions requirements and postoperative blood loss were recorded.

**RESULTS:** The two groups were similar with respect to age, weight, and surgical data, including cardiopulmonary bypass time. The mean hematocrit levels before ultrafiltration (during cardiopulmonary bypass) were 24,1%(+3,8) and 24,0%(+5,1), (p=0,85) in MUF and CUF groups respectively. The mean values after ultrafiltration were 33,4%(+4,2)(MUF) and 32,6%(+5,1)(CUF), (p=0,37). The ultrafiltrate volume were 1773(+657)ml in MUF group and 1744(+619)ml in CUF group, (p=0,8). The mean postoperative blood loss were 566(+204)ml for MUF and 585(+229)ml for CUF, (p=0,6). The mean necessity of hemotransfusion were 0,4(+0,85) red blood cell units in MUF group and 0,56(+0,78) in CUF group, and of 0,11(+0,37) fresh frozen plasma units in MUF and of 0,12(+0,48) units in CUF group.

**CONCLUSION:** MUF and CUF provide similar results considering postoperative blood loss, hemotransfusion requirements and post-procedure hematocrit and hemoglobin levels.

### OP-1225-ULTRAFILTRATION TO REMOVAL INFLAMMATORY MEDIATORS DURING CARDIOPULMONARY BYPASS IN CORONARY ARTERY BYPASS GRAFT SURGERY

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**BACKGROUND:** To investigate the efficacy of ultrafiltration in removing inflammatory mediators released by extracorporeal circulation and to correlate ultrafiltration with alterations in organ function according to the Sequential Organ Failure Assessment score.

**METHODS:** Forty patients were included and randomized into two groups: no ultrafiltration (n=20) and ultrafiltration (n=20). Activated complement 3 and 4, interleukins 1 $\beta$ , 6, 8 and tumor necrosis factor- $\alpha$  were measured prior to anesthesia induction (Time1), 5 minutes before extracorporeal circulation (Time 2), in the ultrafiltrate fluid (Time 3), 30 minutes (Time 4), and 6 (Time 5), 12 (Time 6), 24 (Time 7), 36 (Time 8) and 48 (Time 9) hours following extracorporeal circulation. Sequential Organ Failure Assessment score was evaluated at Time1, 6 and 9. Statistical significance was established at p < 0.05.

**RESULTS:** In the ultrafiltrate fluid, only tumor necrosis factor- $\alpha$  levels was detectable. Levels of activated complement 3 at times 5 and 7 and activated complement 4 at times 5 and 6 were significantly higher in the unfiltered group, and levels of interleukin 6 were higher in the filtered group at times 7 and 8. Interleukins 1 $\beta$ , 8, tumor necrosis factor- $\alpha$ , and the Sequential Organ Failure Assessment score were not significantly different between groups.

**CONCLUSIONS:** Ultrafiltration significantly filtered tumor necrosis factor- $\alpha$  but did not influence serum levels of this cytokine. Ultrafiltration with the type of filter used in this study had no effect on organ dysfunction and should be used only for volemic control in patients undergoing extracorporeal circulation.

### OP-1226-THE IMPACT OF THE CARDIAC SURGERY ON LEUKOCYTE EXPRESSION OF Fc $\gamma$ RECEPTOR (CD64) AND THE SCAVENGER RECEPTOR (CD163)

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**BACKGROUND:** The cardiac surgical intervention is accompanied by the activation of innate immunity arm. This feature, similar to the process of bacterial infection, is associated with both pro-inflammatory and anti-inflammatory changes. The increase in the expression of a high affinity receptor for Fc fragment of immunoglobulins - CD64 and the scavenger receptor for haemoglobin-haptoglobin complexes - CD163 have been recently identified to be involved in the immunopathogenesis of sepsis and post-infection recovery phase. The changes of these cell surface receptors were studied during and after cardiac surgery.

**METHODS:** 54 patients who underwent primary isolated CABG were included

in our study. They were divided into three groups (each of 17 patients) according to the different surgical approach (OFF PUMP, routine CPB, mini CPB). Peripheral venous blood samples were collected before and after surgery and at the 1st, 3rd and 7th postoperative day. On-pump patients groups consisted of two additional samples - 15 min after the start of CPB and at end of CPB. The same sample in off-pump patients group was taken at the end of the first proximal anastomosis. The receptors were detected by double fluorescence staining using flow cytometry. Fluorescent beads were used for quantification of the receptors on cell surface. The analysis was performed with Leuko64 analysis software and detected changes in the expression of CD64 and CD163 within a group as well as between three groups were evaluated.

**RESULTS:** The earliest changes were observed in the decreased expression of anti-inflammatory molecule CD163 on monocytes after finishing the CPB in on-pump and mini on-pump groups. The expression of CD163 was decreased on monocytes and granulocytes after finishing surgery in all 3 groups of patients. The highest level of both receptors CD163 and CD64 on monocytes was found at the 1st postoperative day in all 3 groups of patients whereas the subsequently activated granulocytes expressed the highest level of the receptors at the 3rd postoperative day. There were no differences found between all groups except more significantly decreased expression of CD163 on monocytes after finishing surgery in on-pump patients group.

**CONCLUSIONS:** The results indicate that the activation of immunity due to surgical intervention is self regulating process which is balanced with changes in expression of pro- and anti-inflammatory parameters. The main impact of different surgical approaches was found when conventional extracorporeal circuit was used and the level of the scavenger receptor on monocytes was declined likely due to more profound stimulus and the subsequent receptor shedding. The research project was supported by the Grant No. NR/9090-4 of IGA of Czech Ministry of Health and Ministry of Education, Czech Republic, contract no. MSM 0021620812.

### OP-1227-EFFECT OF ENRICHED BLOOD CARDIO PLEGIA ON MYOCARDIAL PROTECTION IN COMPARISON WITH CRYSTALLOID AND BLOOD CARDIO PLEGIA

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**BACKGROUND:** All during last two decades, that coronary bypass have promoted, the best way for arresting have been noticed. permanent component of these solutions is (K<sup>+</sup>). But, there are different ideas about just solution, cold or warm blood, or with nutrient substrates, like Glutamat-Asparat or Adenosine. Based on good effects of Adenosine to postpone ATP depletion, reduces ischemia and stunning that's common form of myocardial injury, & limits infarct size, there are different ways for Adenosine injection.

**METHOD:** We did this trial in Martyr Rajaie Training-Researching-Treating Heart Center on 210 patients in three different cardioplegia group. We used Adenosine as (K<sup>+</sup>) mediator in enriched blood cardioplegia, in comparison with blood cardioplegia & crystalloid cardioplegia. Adenosine was injected into the Aorta in single rapid dose & was continued by blood cardioplegia.

**RESULTS:** In first group who took crystalloid, 65% of patients get sinus rhythm, 10% VF & rest part another rhythms started contractions. In second group who took blood cardioplegia 55.8% get sinus rhythm, 16% VF & rest part another rhythms. In third group, who took enriched blood cardioplegia 65% of patients get sinus rhythms, 18% VF & rest of them with another rhythms. About heart enzymes: In crystalloid group 14 patient (20%) had Cpk MB > 70, patient had EKG changes & 2 patient get Q wave on EKG. In second group 11 patient (15/7%) had enzyme rising, 7 of them had EKG changes, 3 patient get Q wave on EKG. In third group 4 patient (5/7%) had enzyme rising, (significant reduced), 2 of them get Q wave. EF assessment showed no relation between cardioplegia & EF, about Renal function 5 patient from 3 groups got creatinin > 2 mg/dl. finally:

**CONCLUSION:** Enriched blood cardioplegia reduced enzyme rising. (5/7% in comparison with 15/7% & 20%) for blood & crystalloid cardioplegia. So, adenosine can make a good protection during CPB & arrest. Long term results need more researches. For Arrhythmia after declamping, there were best results in crystalloid group. So, crystalloid protects heart against VF.

## **OP-1228-EFFECTS OF PROCESSING OF SHED BLOOD DURING BYPASS ON TRANSFUSION AND NEUROCOGNITIVE FUNCTION**

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**BACKGROUND:** During cardiopulmonary bypass, reinfusion of unprocessed cardiomy blood may contribute to post operative neurocognitive dysfunction. Conversely, processing of cardiomy blood may potentially contribute to postoperative coagulopathy. In this trial we assess the effect of processed and unprocessed cardiomy blood on intraoperative transfusion rates, post operative coagulopathy and neurocognitive functions.

**METHODS:** 266 patients undergoing coronary and /or aortic valve surgery using cardiopulmonary bypass were randomized into CONTROL GROUP (n=134) to receive unprocessed cardiomy blood and TREATMENT GROUP (n=132) to get processed cardiomy blood. Patients and physicians were blinded to treatment assignment. A strict transfusion protocol was followed and data were analyzed. Patients were monitored intraoperatively by Transcranial Doppler and underwent Neuro psychometric Testing before surgery and at 5 days and 3 months postoperatively.

**RESULTS:** The treatment group received a higher number of intraoperative red blood cell transfusions (0.23 +/- 0.69 Units vs 0.08 +/- 0.34 Units, p=0.004) and had a higher postoperative bleeding rate. There was no difference in the incidence of postoperative cognitive dysfunction in the two groups (relative risk: 1.16, 95% CI: 0.86 to 1.57 at 5 days postoperatively; relative risk 1.05, 95% CI: 0.58 to 1.90 at 3 months). There was no difference in the number of emboli detected between the two groups.

**CONCLUSION:** Reinfusion of processed cardiomy blood results in higher transfusion rates and greater postoperative bleeding. There is no clinical evidence of neurological benefit with processing cardiomy blood during cardiopulmonary bypass.

## **OP-1229-INTEGRATED MINIMAL PRIME CIRCUITS FOR CORONARY ARTERY BYPASS SURGERY IMPROVES CLINICAL OUTCOMES**

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**BACKGROUND:** Conventional Cardiopulmonary Bypass (CCPB) leads to a host of adverse systemic effects. It has been shown to be associated with neurologic, pulmonary, renal and myocardial injury, increased blood loss and transfusions, all resulting in an increased length of stay. The integration and miniaturization of adult CPB circuits is an attempt to overcome the drawbacks of CCPB. These closed circuit reservoir-less bypass systems (Minimal Prime Circuits - MPC) are an entirely new way of looking at circulatory support and its techniques for cardiac surgery patients. These circuits provide the safety and flexibility of CCPB while minimizing the most hazardous drawbacks, specifically hemodilution and blood-air/foreign surface-contact, by reducing prime volumes and improving the biocompatibility of surfaces. The purpose of this study was to retrospectively compare clinical outcomes of coronary artery bypass patients who have undergone cardiopulmonary bypass with either a MPC or CCPB circuit.

**METHODS:** Between March 1, 2004 and August 31, 2005 1246 patients underwent coronary artery bypass surgery. 168 of these patients were not candidates for beating heart surgery and therefore underwent cardiopulmonary bypass utilizing CCPB in 71 patients and a MPC in 97 patients. Patient demographics, hospital length of stay (LOS), postoperative blood loss and homologous red blood cell usage was retrospectively collected for each patient.

**RESULTS:** When comparing the two groups, there were no differences in patient demographics. As expected there was significantly less pump prime (557+234 ml\* vs 1331+287 ml, p<0.05) and fluid balance post CPB (735+645 ml\* vs 1501+856 ml, p<0.05) when comparing MPC to CCPB. There were also significantly less blood loss (854+906 ml\* vs 1301+1914 ml, p<0.05), blood transfusions (1.2+2.2\* vs 2.5+4.2 units per patient, p<0.05) and average LOS (5.9+2.6\* vs 9.0+7.9 days, p<0.05) favoring the MPC compared to CCPB.

**CONCLUSION:** The use of an integrated minimal prime circuit for CPB provides hemodynamic support and safety similar to traditional CPB with the advantage of improved patient outcomes.

## PERFUSION II

### OP-1230-THE EFFECT OF NORMOTHERMIA ON POSTOPERATIVE BLEEDING IN CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** CABG is the most common type of cardiac surgery which generally is done under cardiopulmonary bypass (CPB). Hypothermic CPB was introduced in cardiac surgery in order to protect organs against hypoperfusion. Hypothermia is associated with many adverse effects on the vital organs, which result in impairment of organ and systemic function. Normothermia on the other hand is more in agreement with the physiology of human organs. The aim of this study is the evaluation of the effect of body temperature during CPB on post-operative bleeding, that increase the risk of bleeding after cardiac operation.

**METHODS:** One hundred patients were randomized into normothermic (35-37°C, N=50) and mild hypothermic (28-32°C, N=50) with respect to blood loss, transfusion requirement and platelet level in primary coronary artery bypass grafting. The patient's hemoglobin level, leukocyte count and platelet count measured before operation immediately on arrival in intensive care unit 4 hours after operative in the morning and 6 days after operative of the first post-operative day at 6-12-24-48 hours for Hb and one time for other values. The volume of blood shed through mediastinal and pleural drainage tubes were recorded at 6-12 and 24 hours after operation.

**RESULTS:** There were no differences in preoperative characteristics including patient age, sex, number of occluded vessels, weight, height, hemoglobin and hematocrit level, platelet and WBC levels. Normothermic patients tended to bleed less at 24 hours (warm 288±30 & cold 580±100). Platelet levels were preserved better in normothermic patients than in hypothermic patients. The warm group had a reduced blood loss by 40 percent after 6, 34% after 12 and 30% after 24 hours as compared with blood loss in patients perfused hypothermically.

**CONCLUSION:** These data suggested that normothermic systemic perfusion reduced post-operative blood loss and preserved platelet. Key words: Normothermia - bleeding - coronary artery bypass grafting - hypothermia

### OP-1231-MILD HYPOTHERMIC CIRCULATORY ARREST WITH SELECTIVE CEREBRAL PERFUSION: A MODIFIED TECHNIQUE OF ANTEGRADE CEREBRAL PERFUSION DURING THORACIC AORTIC SURGERY

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**BACKGROUND:** The mild hypothermic circulatory arrest (MHCA) with bilateral selective cerebral perfusion (SCP) has become the standard technique for the surgical repair of certain congenital and acquired cardiovascular lesions.

**METHODS-RESULTS:** The modification of this technique is that the arterial line is separated into two branches with a Y-connector on the operating table, one for the axillary's artery to perfuse the right hemisphere and the other for graft's branch to perfuse the lower body connected to Extracorporeal circulation setup. A second roller pump is used to perfuse the left common carotid artery with retrograde catheter 10-12 Fr. This method is easy for the perfusionist to install and convenient for the surgeon. The theoretical advantages of the mild hypothermic circulatory arrest with bilateral cerebral perfusion include prolonged safe arrest time, uncompromised surgical field, more physiological flow than any "no flow" or retrograde approach, avoid deep core temperatures with all undesirable effects, shorter total cardiopulmonary bypass time and duration of the operation, reduction of coagulation disorder and transfusion volume, protection of the brain, visceral and spinal cord and finally decreased intubation time and intensive care unit stay.

**CONCLUSIONS:** The application of this technique is confirmed to be a safe, simple and reliable method of brain protection, allowing complex aortic repair to be performed with good results in terms of hospital mortality and neurological outcomes.

### OP-1232-COMBINED CORONARY ARTERY BYPASS SURGERY AND CAROTID ARTERY SURGERY WITH UTILITY OF MILD HYPOTHERMIA

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**BACKGROUND:** Mild hypothermia during carotid surgery for patients with a unilateral critical stenosis and contralateral total occlusion of the carotid arteries is safe and protects cerebral function in the early and late postoperative periods.

**METHODS:** We aimed to determine whether mild hypothermia during combined coronary artery bypass surgery and carotid artery surgery improves outcomes in a patient with unilateral critical stenosis in proximal internal carotid artery and total occlusion on the right side.

**RESULTS:** Because therapeutic hypothermia has been found to be advantageous in many cardiovascular surgical procedures, and perioperative neurological events occur more often in patients with bilateral critical carotid artery disease, we postulated that hypothermia could improve the outcomes of carotid artery surgery in patients with unilateral critical stenosis and contralateral total carotid occlusion.

### OP-1233-TRANSCRANIAL DOPPLER MONITORING AND AORTIC CANNULA MALPOSITION DURING MITRAL VALV REPLACEMENT SURGERY

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**BACKGROUND:** Aortic cannula malposition (ACM) can lead to postoperative neurologic complications; however the clinical relevance and an incidence of this event is not clear because there have been no measures to diagnose it. We report two cases of ACM recognized with transcranial doppler (TCD) during cardiopulmonary bypass (CPB).

**METHODS:** A 33 year old male (Case 1) and 37 (Case 2) year old female two patients with fibrotic mitral valve stenosis were scheduled for mitral valve replacement (MVR). They had no other significant past medical history. Standard cardiac monitorizations were performed. Intravenously induced anesthesia (fentanyl, midazolam and neuromuscular blockade with pancuronium) was used. Also in both cases neurologic monitoring was performed by Electroencephalography (EEG) and Bispectral index scale (BIS). Before and after anesthetic induction and during surgery both middle cerebral arterial (MCA) TCD monitoring was performed. EEG, BIS and TCD monitoring were continuously followed during whole operation in both cases.

**RESULTS:** In case 1, immediately following CPB cross-clamping left MCA maximum velocity compared to right rose evidently. Minimum velocity of left MCA became almost zero while the right remained in normal non-pulsatile flow values. In the case 2, after cross-clamping both MCA maximum velocities rose while minimum velocities reduced to very low values. Meanwhile, there were no pathological changes in the hemodynamic parameters and EEG, BIS values in the cases. Surgeons were warned about the situation. After examination it was seen that the aortic cannula was malpositioned and under partial CPB the cannula position was corrected in both cases. Then, the MCA velocities returned to normal values. The patients were discharged from hospital with no complications.

**CONCLUSIONS:** Intraoperative and postoperative cerebral hypoperfusion may be due to unrecognized ACM. TCD could have vital predicting value in cannula malpositions creating no hemodynamic instability and being not detected by standard monitors in cardiac surgery.

### OP-1234-IMPACT OF PRE-OP VERSUS INTRA-OP IABP INSERTION ON MORBIDITY AND MORTALITY ON OPCAB WITH AORTA NON TOUCH TECHNIQUE

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**INTRODUCTION:** It is known that IABP insertion is beneficial for unstable angina, acute myocardial infarction and impaired LV performance.

**AIM:** To compare the outcomes of patients with pre-op versus intra-op IABP placement.



**METHOD:** We reviewed and analyzed retrospectively the data we collected prospectively. 32 (31 male, 1 female) patients we operated on the last three years, (January 2005-December 2007), with aorta non-touch off pump technique, received IABP either pre-operatively or intra-operatively. The mean age of the patients was 67,5 years (60-75 year). Group A, consists of 18 out of 32 (56,25 %) patients that received IABP pre-operatively. Group B consists of 14 out of 32 (43,75 %) patients that received IABP intra-operatively. Our critical indications for placing the IABP prophylactically in Group were: unstable angina, critical left main stenosis, poor EF<30% and low CI<1.8, which was measured by a SWAN-GANZ catheter right after the patients were induced to anesthesia. Group B had on average a moderate EF>30% -45% and a CI>1.8. Therefore there was not a clear indication for IABP placement pre-operatively. However, the patients received IABP intra operatively, due to acute ischemia they developed, as EKG changes and hemodynamic instability revealed.

**RESULTS:** There was one hospital death from cardiac reason in Group B, (7,14%) while there was zero mortality for Group A. The duration of mechanical ventilator support, (over 48h), was higher for the Group B, 5=35,71% versus 4=22,2% in group A. Both groups had no further pulmonary complications. 6 out of 14 (42,85%) in Group B versus 3 out of 18 in Group A (16,66%) suffered arrhythmia (AF, VT) post-operatively. 2 out of 6 patients of Group B developed VT episodes, while there was not such incident of arrhythmia in Group A. 4 patients of Group B (28,57%) also suffered acute renal failure versus no renal complication in Group A. None of the patients developed any stroke or TIA.

**CONCLUSION:** Despite the fact that Group A had a lower EF than the Group B, it seems to exhibit lower mortality and fewer major organs complication. We conclude that the indications of pre-operative IABP insertion could be expanded to include extensively impaired coronary bed, regardless of the LV performance.

### OP-1235-PEDIATRIC CARDIOPULMONARY BYPASS IN MOZAMBIQUE-A MULTINATIONAL MISSION-OUR EXPERIENCE

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**INTRODUCTION:** Intracardiac Fibrosis is a disease which causes cardiac failure in children in Central and South Africa and Asia. The disease is of unknown origin. Malaria is speculated to be one of the risk factors. Valvuloplasty and myocardial muscle resection from the inner wall of the left ventricle was the applied treatment.

**METHOD:** We had 3 missions in 3 years (2005, 2006, and 2007: a total of 31 cases). Children were between 5 and 17 years of age with a weight of 19 to 41 kgr. The pump used was a Stockert roller pump with 4 pump heads (1 main, 1 cardioplegia, 2 suction). There was one heater-cooler with only 1 port for both A-V circuit and cardioplegia circuit. The disposables used were an A-V circuit of 3/8 arterial line, 3/8 venous line, 'O' suction lines and an arterial line filter (Polystan), oxygenator TERUMO CAPIOX SX10 for children between 19-30 kgr of weight, oxygenator DIDEICO D905 for children over 30 kgr, a CPG circuit from Medtronic, aortic cannulas 14-20 Fr (Edwards or Medtronic), one stage-straight venous cannulas 22-32 Fr (Edwards or Medtronic), and Polystan pediatric hemoconcentrators. The flow kept during by-pass was calculated for a CI of 2.0 to 2.6 l/m<sup>2</sup>/min. Patient's temperature was kept at 30°C (only esophageal thermometer), while CPG was given at 7°C at a rate 4:1 (high K<sup>+</sup> and Low K<sup>+</sup> solutions). There were no level sensors. Blood samples for gases were taken every 15 to 20 minutes and hemoconcentration was a routine for all cases. No blood products were used because of the high risk of contamination (there were doubts about blood being properly checked in this country). The prime was consisted of Ringer's 800ml, Sodium Bicarbonate 8% 20ml and mannitol 20% at 0.5gr/kg of body weight, with a total volume of about 950-1000ml.

**CONCLUSIONS:** The post-operative results were encouraging: extubation immediately after surgery (in most cases) with a stay of less than 24h in ICU. There was only one death in ICU due to cardiac temponate. Nevertheless, there are difficulties having a proper follow-up for these patients after dismissal from the hospital, because of the social situation in the country (poverty, social and health services being at a very low level).

### OP-1236-PERITONEAL CHEMOTHERAPY FOR EPITHELIAL MALIGNANT MESOTHELIOMA

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**BACKGROUND:** Studies have shown that peritoneal carcinomatosis is a termi-

nal disease with a median survival of 6 months. Many centers have aggressively pursued intraperitoneal chemotherapy combined with surgery for more than 15 years.

**METHODS:** The technique of Continuous Hyperthermic Peritoneal Perfusion (CHPP) is used by the general surgeon in conjunction with major abdominal procedures, is applied for an interval of 60 to 120 minutes, and requires Chemotherapy agent delivered at 42 to 47.5 degrees C. CHPP is administered via infusion catheters placed in the cephalad portion of the abdominal cavity and effusion catheters placed deep within the pelvis that are attached to a roller pump circuit and heat exchanger. The catheters are positioned after resection of the primary tumor when peritoneal metastases have been detected. All peritoneal adhesions are lysed to ensure uniform distribution of fluid over all the peritoneal surfaces. The abdomen is temporarily closed and the peritoneal cavity is filled with approximately 2 liters of perfusate (Chemotherapy: e.g.-cisplatin, mitomycin) until it is slightly distended. The occluding clamp on the out-flow catheter is then removed and a recirculating perfusion through the closed peritoneal cavity is begun.

**RESULTS:** Since 1999, we have treated 76 patients with 65 month median survival for those patients with epithelial malignant mesothelioma.

**CONCLUSION:** CHPP can be performed successfully with no mortality. This procedure continues to make advances in the oncological community and the advancement of further phase II trials will help to define the optimal treatment approach.

### OP-1237-OBSERVATION OF SPINAL CORD FUNCTION AFTER DESCENDING AORTA CLAMP IN CHRONIC PORCINE MODEL

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**BACKGROUND:** In this study, chronic animal models were established using piglets. The spinal cord function was monitored with somatosensory evoked potentials (SEP) and outcomes was compared between single clamp and left heart bypass.

**METHODS:** 12 piglets were used in the chronic models. Spinal cord ischemia was established by 30 minutes of descending aorta clamp. Single clamp and left heart bypass was two different intervenes during the procedure. SEP was recorded to monitor the function of spinal cord. The behavior outcomes were observed postoperatively. The changes of ultrastructure were observed with electron microscope.

**RESULTS:** All animals underwent the procedure steadily. The animals in single clamp group developed 1 incomplete paralysis and 5 paraplegia. The animals in left heart bypass recovered unevenly and there was no paraplegia/ paralysis. The record of SEP showed amplitude decreased to below 50% of baseline and prolong of latency was beyond 10% of baseline in single clamp group but not in left heart bypass group. The measurement with electron microscope indicated serious damage of layers in spinal cord in single clamp group while the morphology was almost normal in left heart bypass group.

**CONCLUSIONS:** (1) Serious spinal injury would take place if 30 minutes of single clamp was used during descending aorta surgery; (2) Compared to single clamp, left heart bypass may provide superior spinal protection; (3) From this chronic model, SEP may provide useful information of spinal cord.

### OP-1238-HEAT SHOCK PROTEIN 70 GENE ANTI-Ca<sup>2+</sup> OVERLOAD PROTECTS RAT MYOCARDIUM CELL AGAINST ANOXIA-REOXYGENATION INJURY.

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**BACKGROUND:** Many studies showed that the expression of heat shock protein 70 induced by heat stress are associated with protection against ischemia-reperfusion injury. But the protective effects may be confused by other factors in the same stress. To study the protective role of HSP70 expression in acute myocardial A/R injury, the liposome-mediated gene transfer technique was used for the introduction of pCDNA HSP70 into the neonatal rat myocardial cells. In addition, heat shock stress cytoprotection was also investigated for comparison.

**METHODS:** The cultured primary neonatal rat myocardiocytes with the acute myocardial A/R injury model and HS-treated rat myocardiocytes model were used. The cultured myocardiocytes of 3 d were randomly divided into four

groups (n=8), Control group, A/R group, HS +A/R group and pCDNA HSP70 + A/R group. Liposome-coated HSP70 pCDNA plasmid was transfected into the primary neonatal rat myocardiocytes; HSP70 mRNA and its protein were confirmed by RT-PCR and Western Blotting. The cell viability in MTT, LDH<sup>+</sup> ACPK activity of cells incubation and the changes of cells ultrastructure were examined. [Ca<sup>2+</sup>]<sub>i</sub> in the primary neonatal rat myocardiocytes was measured with flow cytometry.

**RESULTS:** Compared with A/R group, the cell viability in HS + A/R group and pCDNA HSP70 + A/R group were improved significantly (p < 0.05). The activity of LDH and CPK elevated obviously in A/R group. However, in HS+A/R group and pCDNA HSP70 + A/R group, significant decreases for activity were observed. The cells ultrastructure of A/R group were abnormal, whereas nearly normal ultrastructure were observed in HS + A/R group and pCDNA HSP70 + A/R group. HSP70 mRNA and its protein were slightly expressed in the myocardiocytes of A/R group. However, obvious overexpression were observed in HS+A/R group and pCDNA HSP70 + A/R group (p<0.01). And there was significant difference between HS+A/R group and pCDNA HSP70 + A/R group in expression of HSP70 mRNA and its protein (p<0.01). [Ca<sup>2+</sup>]<sub>i</sub> of the rat myocardiocytes in A/R group was higher than that in Control group ~ AA/R + HS group and A/R + pCDNA HSP70 group (p<0.01).<sup>~E</sup>

**CONCLUSIONS:** Overexpression of HSP70 alone by gene transfection leads to the protection for cardiac myocyte against anoxia-reoxygenation. These cytoprotective effects may be partly due to the prevention of calcium influx and overload. Key Words: gene transfection; HSP70 gene; Ca<sup>2+</sup> overload; anoxia-reoxygenation injury.

### OP-1239-100% MASSIVE AIR EMBOLI PROTECTION SAFETY VALVE DURING CPB

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**BACKGROUND:** The clinical occurrence of massive air embolism is dangerous life threatening event. A number of cases of massive air entry into cardio-pulmonary -bypass (CPB) circuit have been documented. Reported incident rate is 1:1000 cases (reference CPB principles and management by Kenneth.M. Taylor) Venous reservoir run dry due to insufficient venous return due to accidental incidences. Massive air embolism remains a most frequent major life threatening problem. The cardiectomy reservoir becomes empty and air gets pumped into aorta leading to dangerous neurological complications like unconsciousness, paraplegia, decortications, decerebration and even brain death. Hence the high morbidity & mortality related to these occurrence detailed in the clinical setting was reported by STONEY ET.AL in 1980 and indicated the important needs for very effective device to protect total massive air embolism. 100% MASSIVE AIR EMBOLI PROTECTION SAFETY VALVE during CPB protects the massive air embolism without allowing any air into arterial system keeping a minimum level of blood in venous cardiectomy reservoir keeping the patient's life very safe. It will be built in the recent hard shell cardiectomy reservoirs & no need to pay anything extra.

**METHODS:** This is inbuilt cardiectomy reservoir designed by myself. A small cylindrical tube is fixed inside over the 3/8 outlet of cardiectomy reservoir. The cylindrical tube has 1cm holes exactly opposite to each other at 5cms height from the inside bottom level of outlet port for blood flow through holes. The cylindrical tubes contain a piston with a rubber cock at the bottom having 3mm height and a diameter just larger than the outlet opening of the cardiectomy reservoir. An air tight container measuring 1.5x1.5cms height & diameter is fixed on the top of piston, moving up and down freely inside the cylindrical tube. Piston slippage pins are placed to protect the slipping of piston from the cylindrical tube.

**RESULTS:** The safety valve is used in our cardiac centre on an experimental basis on various high and low pump flows. The cardiectomy reservoir venous return was purposefully done empty by attaching the arterial line to another cardiectomy reservoir. The valve is working safely protecting massive air emboli without emptying and allowing any air after cardiectomy. CPB was re-established again by just rotating pump reversibly for few seconds, immediately after achieving sufficient venous return & cardiectomy reservoir level. Without any refilling of fluids & disconnecting arterial system tubing's to remove the air in system. I am sure that this revolutionary idea of 100% MASSIVE AIR EMBOLI PROTECTION SAFETY VALVE is totally eliminating risk of massive air emboli

from CPB field keeping the patients life very safe.

**CONCLUSIONS:** 1) The safety valve will not allow any air at any condition into arterial system. 2) 100% safe & easy to re-establish CPB within few seconds 3) No need to remove air from Oxygenators & arterial tubing's 4) No extra attachments & adding of fluids needed. 5) The very new perfusionists conducting CPB for first time can also conduct CPB very safely without and fear & risk.

### OP-1240-POSSIBILITIES OF DESIGNING A MINIMISED EXTRACORPOREAL CIRCULATION (ECC) SYSTEM TO OPERATE NEW-BORNS AND INFANTS, BASED ON STANDARD PRODUCTS AVAILABLE ON THE MARKET

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**ASSUMPTION:** Selection of predefined technical parameters of the equipment, available on the market, will provide a possibility to modify and minimise the ECC system. The open system oxygenators for new-borns and infants, which are - at present-offered on the market, are characterised by wider blood flow range, smaller static filling and less resistance to blood flows. They have bio-compatible coating and allow for disconnection of the venous cardiectomy reservoir from oxygenator. These reservoirs have got separate flow ranges: one for both sections together and the other for each section individually - see the user manual for a detailed description - and support the use of VAVD.

**METHODOLOGY:** An analysis of the effects of priming contents and blood flow on the state of operated patients. Following the selection of optimal system elements, particular groups of patients may be modified, taking into account the criterion of body mass. The criterion of body mass has now to consider a possibility of increased blood flow in ml/kg b/w. A co-operation of a team of perfusionists with anaesthesiologists and surgeons, consisting in verifying the assumption of differences between the reaction/play of the vascular bed, observed in paediatric and adults patients. An infinitely variable control of blood flow rate with regards to the body weight criterion assures safe control of the systemic blood pressure and satisfying diuresis, without intentional pharmacological stimulation. While modifying the priming contents, we analysed pH of infusion fluids, protection of the CNS with Mannitol, the concentration of proteins, dosing of NaHCO<sub>3</sub>, dosing of calcium and Hct correction by means of erythrocyte concentrate. The changed location of a HLM device at the theatre required acceptance of surgeons and anaesthesiologists but it provided for shortening the length of drains and reduction of the artificial surface.

**STUDY:** An observation and evaluation of the effects of changes, introduced into the protocol during post-operative treatment at clinical environment. Three-year observations included an analysis of: - safety of performed operations of congenital heart defects in all the patients, - Hct values during ECC and in the course of post-operative treatment, - doses of anaesthetic drugs at the theatre, - dosage of blood-derived preparations, - the time period of hospitalisation,

**CONCLUSIONS:** At present, minimisation of the ECC system does not require any increased costs to be incurred for the purchase of equipment. We have now access to wider selection of more ergonomic equipment for ECC, characterised by clearly better application parameters and higher biocompatibility, decreases the degree of immunisation, even in patients submitted to the most complex surgical procedures. Minimising of the system does not mean any increase in the risk of operation, neither does it make the work more difficult for perfusionist or surgeon, even if they have to modify a little their procedural habits. The operating surgeon has to pay more attention to the selection and positioning of venous cannulas, conditioning safe and satisfactory venous drainage. The lower position and disconnection of the venous cardiectomy reservoir from the oxygenator provide gravitational underpressure at approximately 30 - 50 mmHg. The volume of funds, allocated for the purchase of state-of-the-art. equipment has been fully justified, as the obtained results entirely confirm our decisions, which have allowed us to improve all the monitored haematological and biochemical parameters.

## CARDIO - SURGERY & NURSING

### OP-1241-A PILOT-TESTING POINT-OF-CARE COMPUTER SYSTEM: A NEW CHALLENGE FOR BRAZILIANS NURSES

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**BACKGROUND:** The introduction of computerized systems in the health organizations in Brazil is becoming a challenge. The adoption of new equipments leads to the largest automation and the need of the redraw the production process. In Brazil it is observed that the initiatives of incorporation the computer in nursing process are focused, mainly, in the care plan under the form of nursing intervention. Several experiences have been made in different states. Due to importance of the nursing documentation and all phases of the clinical judgment, the hospitals of the State of Sao Paulo are mobilizing in the sense of forming study groups to implement the Nursing Process in all their phases. Development and introduction of clinical information systems have the purpose to structure data collection in a conceptual model of nursing, to organize and to optimize the information generated by the patients and, to reduce the time nurses spend documenting patient care. Also, the underlying idea is to increase nursing productivity, including cardiovascular postoperative units. Objective: This study aim to demonstrate that high-tech solution can give nurses more time to direct patient care, analyzing the use of computers to help the nursing process documentation.

**METHODOLOGY:** This is a descriptive/exploratory study. The research has been conducted in a 136-bed Public Hospital. The pilot test was set in the Coronary Unit and Adult semi-intensive care unit. To document the nursing process was used a notebook for data collection linked to a point-of-care device (Palmtop) using wireless for real time data transmission. Eleven nurses participated in this study.

**RESULTS:** The results demonstrate that the appropriate choice of equipment makes the difference. Also it is important the nurses be computer literacy. It was observed that the electronic information system documentation help reduce errors and save time to spend on patient care and assessments. Furthermore, the nurses studied did not have to interrupt to document care to find new information. The system allows an ordinary user to retrieve and compare very important data like breathing rate, heart rate, blood pressure, or any combination of such vital signs. Also, the information is documented more quickly. From the nurses' viewpoint, the technology used is a wonderful tool when they have to review a chart and do not have to try to decipher things. The active participation of the nurses through out the pilot-testing point-of-care computer system made possible to analyze, in depth, the user needs and to determine the basic system requirements and functions, focusing the potential computer application.

**CONCLUSION:** Installing a modern computerized nursing information system in Coronary Unit, Semi-intensive Care Unit and Postoperative Units can significantly reduce the time spent by nurses on documentation, giving them more time for direct patient care. Despite all the benefits showed by the technology used, the nurses do not believe that Brazilian hospitals are prepared to adopt this type of technology facing the cost of it. FAPESP, CNPq

### OP-1242-TELEHOME MONITORING IN THORACOSCOPICALLY-ASSISTED ABLATION OF LONE ATRIAL FIBRILLATION PATIENTS

*Struthers, Christine; Eastwood, Kathryn; Lam, Khanh University of Ottawa Heart Institute, Clinical Services, Ottawa, Canada*

**BACKGROUND:** Transthoracic ablation of lone atrial fibrillation (TALAF), a minimally invasive surgical procedure, consists of bilateral pulmonary vein isolation using bipolar radiofrequency energy, autonomic ganglia denervation and left atrial appendage resection. TALAF is performed on patients with a prolonged history of atrial fibrillation (AF) who have failed chemical and electrical cardioversion. We instituted daily telehome monitoring (THM) in the postoperative management of TALAF patients to follow their hemodynamic and rhythm trends and for early detection and prevention of adverse events.

**METHODS:** During September 2005 to April 2006, 13 patients with lone AF (5 persistent, 8 permanent), mean age 61 years, underwent TALAF. Mean AF duration was 6.9 years. Most patients had either anticoagulation related hemorrhages, were intolerant to anti-arrhythmic drugs or had failed cardioversions (mean of 2.5/patient). Postoperatively, patients were provided with a home monitor and pocket ECG for daily transmission via phone live to a central station at the surgical center manned by an advanced practice nurse. Ten (77%) patients were discharged to remote communities. Vital signs and a 6 second lead II rhythm strip were transmitted daily for an average of 137 days (range 91-274 days).

**RESULTS:** During the follow-up period, early detection of asymptomatic AF was made in 3 (23%) patients, which led to successful early cardioversion. Other interventions by the THM team included: reintroduction of anticoagulation, facilitation of cardioversion arrangements in 4 (31%) patients and adjustment of anti-arrhythmic medication in 4 (31%) patients in response to either bradycardia or tachycardia. The THM team also provided ongoing educational and emotional support for 9 (69%) patients.

**CONCLUSIONS:** Our initial experience suggests that THM technology permits continuous access to specialized cardiac services, thus decreasing the likelihood of adverse outcomes, ER visits and health care resource utilization. In addition, THM was also beneficial in providing ongoing postoperative support to TALAF patients. Current data will be presented at the conference.

### OP-1243-TRANSITIONING FROM HOSPITAL TO HOME: USING TECHNOLOGY TO KEEP CARDIAC SURGERY PATIENTS SAFE

*Sherrard, Heather; Stolarik, Anne; Harper, Linda; Kearns, Sharon Ann; Mesana, Thierry University of Ottawa Heart Institute, Clinical Services, Ottawa, Canada*

**BACKGROUND:** Transition from hospital to home is a high risk period when patients are vulnerable. This period is associated with changes in care providers and frequently inadequate communication between hospital and community physicians. Patients often experience complications and adverse drug effects before they can access their primary care provider. The University of Ottawa Heart Institute saw the need to bridge the contact with patients between hospital discharge and the first contact with their primary care provider. Interactive Voice Response (IVR) bridges this gap.

**METHOD:** An IVR system is a computer-based, interactive telephone system, with a data management component, that can deliver automated telephone information and follow-up questionnaires. Patients are called during the early stages of their recovery and the system identifies them by name. As they interact with the system their responses are captured in a database designed to provide automatic alerts. Responses may indicate they need follow-up for management of a minor issue (call-back) or they may be experiencing symptoms requiring urgent intervention (live calls), in which case they are held on the line and immediately connected to an RN who intervenes during the call. All post operative patients discharged home are called by the IVR system at day 3 and day 10 post discharge. Patients discharged to a convalescence facility were excluded.

**RESULTS:** Our experience after 1110 patients indicates: IVR is reliable (it reaches all numbers in the database); IVR technology using phone lines has maximum reach particularly for elderly and rural patients; the web-based application allows for easy adoption in the field and the technology is relatively inexpensive for its reach. Patients are highly satisfied with the follow-up system and ongoing access to expert care post discharge. IVR allows us to follow-up on 96% of our patients in the first two weeks post discharge. System Results After 1 Year Day 3 Day 10 Completed Calls 295 (27%) 382 (34%) Call-backs 369 (33%) 283 (25%) Live Calls 60 (5%) 45 (4%) Reasons for Call Backs Day 3 Day 10 Chest Pain 162 (14%) 89 (8%) Incision Problems 93 (8%) 57 (5%) Sleep Problems 177 (16%) 141 (12%) Appetite 56 (5%) 60 (5%) Constipation 138 (12%) 103 (9%)

**CONCLUSIONS:** The IVR system successfully identifies patients with problems, enabling early intervention. Algorithm development is the most important element, followed closely by use of focus groups to determine if the algorithms are meaningful to patients. IVR creates a database for identification of: unresolved problems; timing issues; and new program requirements. Four other hospitals offering cardiac surgery services have adopted the IVR system. Further development of the algorithm has recently been done to enable patient access to automated information regarding sleep and appetite.

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# Presentation of Abstracts

## Video Presentation

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## VIDEO I

### VD-1300-OPERATIVE TECHNIQUE OF ULTRASONIC CARDIAC ABLATION FOR ATRIAL FIBRILLATION DURING CONCOMITANT CARDIAC SURGERY.

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**BACKGROUND:** A video describe the operative technique of cardiac ablation using therapeutic ultrasound in the form of high intensity focused ultrasound (HIFU), (Epicor, St.Jude Medical).

**METHODS:** The system consists of an array of transducers (UltraCinch) positioned after proper sizing around the left atrium (LA) wall over the pulmonary veins. The device creates a circumferential transmural lesion from the epicardium. Using an UltraWand, this primary lesion is completed by a linear lesion extending from the left lower pulmonary vein to the mitral valve annulus, to create the mitral line of the maze procedure. These left-side lesions may be completed by additional right-side lesions using the UltraWand, creating an inter vena cava line and then an atrial line from the tricuspid annulus to the previous line. The operative technique is performed while the normally perfused heart is fully beating before the operation is carried out for the concomitant surgery. The surgical dissection is limited to freeing the pericardial reflections around the both vena cava.

**RESULTS:** Cardiac ablation using HIFU takes 10 to 14 minutes according to fully automated algorithm. The technique described may be performed through a right mini thoracotomy with video assisted approach. The excellent safety of the technology is confirmed. The efficacy reaches 85% of patients free of atrial fibrillation at 6, 12 and 18 months. According to our experience, results are improved by additional mitral line ablation and right-side lesions.

**CONCLUSIONS:** Cardiac ablation using HIFU is safe and effective; It is an alternative to the maze procedure

### VD-1301-IMPLANTATION TECHNIQUE OF THE CARDIOWEST TOTAL ARTIFICIAL HEART FOR ENDSTAGE CARDIAC FAILURE

*Wahlers, Thorsten; Wittwer, Thorsten; Madershahian, Navid*  
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**BACKGROUND:** Endstage ischemic heart failure with mitral insufficiency has led to the introduction of various therapeutic principles including operative and interventional mitral reconstruction, transplantaion or assist device implantation.

**METHODS:** This surgical video describes the implantation of the syncardia total artificial heart in a male patient suffering from endstage ischemic herat failure following interventional mitral reconstruction device implantation and subsequent heart failure due to device malfunction. Following resuscitation total artificial heart implantation was performed.

**RESULTS:** By single step explanation case history and device implantation is illustrated.

**CONCLUSIONS:** The total artificial performed well as a tool for endstage heart failure treatment. A word of caution is addressed regarding interventional mitral reconstruction since device malfunction can lead to disastrous complications.

### VD-1302-THE SANO-NORWOOD OPERATION FOR HYPOPLASTIC LEFT HEART SYNDROME - USEFUL SURGICAL TECHNIQUES TO MINIMIZE OPERATIVE MORTALITY

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The Sano modification of the Norwood operation has resulted in improved hospital outcomes in the surgical management of Hypoplastic Left Heart Syn-

drome. Despite this modification, the hospital survival is still only around 80% in many established units. We have found that certain surgical strategies and technical modifications may reduce ventricular dysfunction in the immediate postoperative period, and make the Sano-Norwood operation more predictable and reproducible. These will be illustrated in a motion picture summary of an actual operation. Surgical techniques illustrated include (i) reconstruction of pulmonary artery bifurcation, (ii) optimal positioning of 5mm RV-PA conduit, (iii) skirting the proximal conduit with patch of pulmonary homograft, (iv) technique of proximal RV-PA conduit anastomosis, and (v) use of simplified aortic cannulation (SAC). Using these techniques, we have been able to successfully and reproducibly palliate even very small neonates with HLHS, including those identified as being at higher risk of not surviving i.e. neonates <2.5kg, and those with ascending aortas <2mm in diameter.

### VD-1303-REPAIR OF TRUNCUS ARTERIOSUS WITHOUT THE USE OF CONDUITS

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**BACKGROUND:** The accepted methods of establishing right ventricle (RV) to pulmonary artery (PA) continuity in the repair of truncus arteriosus is by the use of conduits- either an allograft or xenograft valved conduit. However, the RV to PA confluence could be alternatively reconstructed without the use of conduits i.e employing flap and direct anastomoses technique with poly-tetra-fluoro-ethylene (PTFE) monocusp valve and anterior autologous pericardial patch augmentation. This type of reconstruction without using conduits may delay or abolish subsequent needs for RVOT reconstruction. These two methods of RVOT reconstruction were evaluated and compared in infants undergoing truncus arteriosus repair.

**METHODS:** A retrospective analysis of 26 infants undergoing repair of truncus arteriosus by a single surgeon between January 2002 and December 2007 was performed. Median age was 4 months (range 3 days to 11.4 months). The patient cohort was subdivided into two groups # (A). Valved Conduit: RV to PA continuity performed with a conduit in 16 patients using xenograft (9-Biocor and 7-Contegra) and # (B). RV to PA reconstruction with monocuspid valve performed in 10 patients.

**RESULTS:** There were three hospital deaths and all in group A with RV to PA conduit. Mean follow up was 30 months (range 12 to 50 months). Significant RV to PA stenoses were the same in both group ( 2 in each group) and out of these 1 in the reconstructed group had undergone re-operation at 14 months post repair.

**CONCLUSIONS:** In truncus arteriosus repair, the RV to PA reconstruction without the use of conduit was associated with lower mortality and an accepted incidence of surgical RVOT re-intervention rate.

### VD-1304-CONGENITAL MITRAL INSUFFICIENCY REPAIR WITH THE WORLD'S SMALLEST ANNULOPLASTY RING: VIDEO PRESENTATION

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**BACKGROUND:** The last step of mitral valve repair procedures in adult patients is described as the implantation of the annuloplasty ring for annulus remodeling. Because implantation of the classic, nondegradable annuloplasty rings may cause iatrogenic stenosis secondary to the ring itself as the child grows, there is no appropriate size for pediatric population in the market except the biodegradable ring (Biodegradable Mitral Annuloplasty Ring- Bioring®/Lonay, Switzerland). We present in this video presentation repair of a congenital mitral insufficiency with world smallest mitral annuloplasty ring.

**METHODS:** A 21-month-old boy, weighing 10.5 kg, was referred for heart failure due to severe mitral regurgitation. The preoperative echocardiogram showed decreased left ventricular ejection fraction, a dilated left ventricle and severe mitral regurgitation from annular dilatation. Because of limited left ventricular function, the patient underwent urgent mitral valve repair. At operation, the valve was structurally intact and surgical analysis confirmed the suspicion of Carpentier type I mitral regurgitation. The anterior leaflet surface was measured and the appropriate mitral biodegradable annuloplasty ring was chosen (size

no. 16). The annuloplasty ring was implanted according to intra-annular implantation technique.

**RESULTS:** On surgical testing, there was no residual mitral regurgitation. The aortic cross-clamp and extracorporeal time was of 18 and 28 minutes. Per-operative transesophageal echocardiography showed good coaptation of the leaflets, trivial mitral regurgitation, with no significant trans-mitral gradient, and improved left ventricular ejection fraction. The hospital stay was uneventful.

**CONCLUSIONS:** Biodegradable mitral annuloplasty rings allow simple, fast, effective mitral repair in children. Once implanted, the ring material is degraded by hydrolysis and replaced by fibrous scar tissue which allows normal growth of the valvular orifice. Implantation of the material into the annulus prevents to use of anticoagulant treatment. Intra-annular implantation keeps the possibility for re-repair operations without creating dense adhesions and fibrosis on the annulus, which may occur after mitral plication annuloplasty with Teflon pledgets.

### VD-1305-OFF-PUMP ANTERIOR REPAIR OF AORTIC COARCTATION AND HYPOPLASTIC AORTIC ARCH

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**BACKGROUND:** Aortic coarctation may be repaired through a median sternotomy when associated malformations need simultaneous correction or when the whole aortic arch is hypoplastic. Repair is usually performed using extracorporeal circulation with circulatory arrest or low-flow cerebral perfusion.

**METHODS:** We employed an off-pump median sternotomy approach for repair of aortic coarctation in 21 patients (2 type A interruption of the aortic arch). The only exclusion criterion was hypoplasia of the ascending aorta. Nineteen were neonates, the weight was  $3.2 \pm 0.8$  Kg (2.0 to 5.7 Kg). Fifteen patients had an entirely hypoplastic aortic arch with a mean Z-score = -3.01. Associated malformations included ventricular septal defects in 12, mitral atresia or hypoplasia in 3, transposition of great arteries + ventricular septal defect in 2, complete atrio-ventricular septal defect in 1 and pulmonary artery stenosis in 1; the two patients with interruption of the aortic arch had a ventricular septal defect and a aortic-pulmonary window, respectively. All patients underwent extensive dissection of the aorta down to the first intercostal arteries. An end-to-side anastomosis was performed between the descending and the ascending aorta using a continuous reabsorbable suture, applying a partially occluding clamp to the ascending aorta to preserve cerebral perfusion and cardiac performance. Helpful manoeuvres included posterior extension of the descending aortic incision and retraction of the ductus arteriosus stump. Open repair (7), palliation (9) and off-pump repair (the aorto-pulmonary window was closed with a clip) was immediately thereafter performed in 17 patients (81%).

**RESULTS:** No coarctation related death occurred. One early failure of the aortoplasty occurred: one patient with interrupted aortic arch needed immediate revision under extracorporeal circulation because of suture bleeding. There was one early death (4.7%): a 3.1 Kg neonate with subarterial ventricular septal defect died suddenly after repair because of possible acute coronary ischemia. Two late deaths (10.0%) occurred: a double outlet right ventricle with uncommitted ventricular septal defect died at attempted biventricular repair at 6 months; an unbalanced atrio-ventricular septal defect died two months after repair, because of sepsis. Seven recoarctations (35%) occurred between 2 and 5 months; six were successfully treated with aortic angioplasty; one, after two months, was treated surgically. All 18 survivors are well at a mean follow-up of  $44 \pm 34$  (1-101) months without evidence of arch obstruction.

**CONCLUSION:** Our series demonstrates that an off-pump anterior approach may be effective for adequate reconstruction in aortic coarctation with an entirely hypoplastic aortic arch and in selected cases of interruption of the aortic arch. An end-to side anastomosis, bypassing the hypoplastic arch can be successfully performed without extracorporeal circulation. Recoarctation still remains a risk, particularly in the first months after surgery, but it can be appropriately treated with percutaneous angioplasty.

### VD-1306-HOW TO DO IT: TRICUSPID VALVE REPAIR WITH A BIODEGRADABLE ANNULOPLASTY RING FOR EBSTEIN'S ANOMALY

*Cikirikcioglu, Mustafa; Myers, Patrick; Pektok, Erman; Kalangos, Afkendiyo*  
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**BACKGROUND:** Ebstein's anomaly is a malformation of the tricuspid valve and right ventricle that is characterized by adherence of tricuspid leaflets to the underlying myocardium (mainly the anterior leaflet), downward displacement of the septal and posterior leaflets, dilatation of the atrialized portion of right ventricle and dilatation of the right atrio-ventricular junction. The goals of surgery for Ebstein's anomaly repair are to treat both valvular and right ventricular dysfunction. Reinforcement of the tricuspid annulus by an annuloplasty ring is advised for older children and adult patients, but not for small children because it can induce iatrogenic stenosis secondary to child growth. We share in this video our technique for Ebstein's repair combined with the implantation of a biodegradable ring, the only annuloplasty ring available for pediatric sizes.

**METHODS:** Six year-old boy was transferred to our center with the diagnosis Ebstein's anomaly, type B. The preoperative echocardiogram showed limited tricuspid anterior leaflet mobility, severe tricuspid regurgitation and good right ventricular function. After aorto-bicaval cannulation and crystalloid cardioplegic arrest, the right atrium was opened. The anterior and posterior tricuspid leaflets were detached from the annulus, and the adhesences between leaflets and right ventricular free wall were resected. After longitudinal plication of the atrialized right ventricular segment, the anterior leaflet surface was measured to choose the proper size of annuloplasty ring. A size 24 biodegradable tricuspid ring was implanted into the annulus. The anterior and posterior leaflets were reattached to the annulus using the clockwise rotation technique.

**RESULTS:** The per-operative surgical control showed good closure of the tricuspid valve with rotated anterior leaflet. Per-operative echocardiographic control showed trivial tricuspid regurgitation.

**CONCLUSIONS:** Reinforcement of the tricuspid annulus by an annuloplasty ring is important in order to preserve an efficient long-term tricuspid repair. On the other hand, preservation of the growth potential of the tricuspid annulus is important in order to prevent iatrogenic stenosis secondary to child growth. The only available annuloplasty ring for pediatric sizes is the biodegradable ring, which is degraded by hydrolysis after implantation, replaced by fibrous scar tissue, which allows normal growth of the valvular orifice. Tricuspid annuloplasty with an annuloplasty ring is easy, fast and effective. We suggest this equipment may help to improve effective tricuspid valve repair for Ebstein's anomaly in adults as well as in children.

### VD-1307-SUCCESSFUL TREATMENT OF A PATIENT WITH EISENMENGER SYNDROME BY A SURGICAL-INTERVENTIONAL PROCEDURE :THE WHOLE IS MORE THAN THE SOME OF ITS PARTS

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Presented is a 41-year-old patient with Eisenmenger-Syndrome. He suffered on end-stage heart failure and severe secondary pulmonary hypertension due to congenital malformation of the mitral and tricuspid valve combined with an unrestricted perimembranous ventricular septum defect (VSD). He was cyanotic even at rest (arterial oxygen saturation (SaO<sub>2</sub>) 56%, Htc-45%, MCV 62). Echocardiography revealed a VSD, pulmonary artery trunk with a diameter of 38mm, and a severe mitral and tricuspid regurgitation (EF=15%, EDV=265ml, ESV=202ml). Lung biopsy showed pulmonary vascular changes grade IV. Based on the patho-physiological considerations that low central venous oxygen saturation should result in a lower pulmonary vascular resistance by pulmonary remodeling uneventful mitral and tricuspid annuli reconstruction were performed together with placement of a central pulmonary artery banding. Pulmonary arterial pressure decreased to a level of half systemic pressure. Increased intra-cardiac right-to-left shunt resulted in a immediate decrease of the systemic as well as pulmonary artery oxygen saturation. Two years later, a significant mitral regurgitation relapsed. Mechanical mitral valve implantation together with pulmonary de-banding and closure of the membranous VSD using a pericardial patch was performed as a rescue treatment. Despite the need for permanent pacemaker, which was necessary due to postoperative AV-block, the patient recovered from functional class IV to II. Six months later

echocardiographic re-evaluation showed a residual VSD. Considering a significant left to right shunt and a pressure gradient of almost 50mmHg, percutaneous VSD closure utilizing a 14mm membranous Amplatzer device was performed with further improving of the hemodynamics and the clinical functional status.

#### **VD-1308-DESCENDING BRANCH OF LATERAL FEMORAL CIRCUMFLEX ARTERY IN CORONARY ARTERY BYPASS GRAFTING: TECHNICAL ASPECTS AND INITIAL RESULTS**

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**BACKGROUND:** the descending branch of lateral femoral circumflex artery (DBLFC) presents attractive anatomical and functional qualities and can be a good option for the myocardial revascularization (MR) with arterial conduits.

**METHODS:** between may and october of 2007, three patients (pt) had been submitted to the MR with the use of the DBLFC. The age varied from 61 to 72 years and all were men. None pt presented signals of peripheral vascular disease. The patency of DBLFC had been evaluated by the computerized tomography scan (CT), carried through to the 7 and 90 days of follow-up.

**RESULTS:** All pt received left internal mammary artery (LIMA) to the anterior descending artery (AD) and DBLFC: 2 for circumflex branches (CX) and 1 for the diagonal branch (DG). The DBLFC was in composition with LIMA in 2 cases and with safen vein in one. Five safenous grafts were done: 1 for AD; 1 for DG; 1 for diagonalis artery; 1 for right coronary artery and 1 for CX. The intra-operative evaluation of DBLFC showed diameter from 1,5 to 1,75 mm and length from 8 to 19 cm. All the pt had presented good postoperative evolution. The CT at 7 days disclosed 100% of patency for all grafts. At 90 days of follow-up, the result is the same.

**CONCLUSION:** These initial results suggest that DBLFC may be a good option for the MR with arterial grafts.

#### **VD-1309-EFFECTS OF PRIOR PERCUTANEOUS REVASCLARIZATION ON LATE OUTCOMES OF CABG IN DIABETIC AND TRIPLE-VESSEL DISEASE PATIENTS**

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**BACKGROUND:** Given recent percutaneous coronary intervention (PCI) practices, an increasing number of the patients undergoing their initial multi-vessel coronary artery bypass surgery (CABG) have had a history of 1 or more PCI procedures with or without intra-coronary stent placement. In triple-vessel disease patients and in patients with diabetes mellitus, the long-term outcomes of coronary artery revascularization using either PCI or CABG are generally worse than for their single/double-vessel disease and non-diabetic counterparts, respectively. It is also reported that history of prior PCI has an adverse effect on the early postoperative CABG outcomes in diabetic triple-vessel disease patients. To our knowledge, the corresponding late effect of prior PCI on CABG outcomes has not been investigated.

**METHODS:** We reviewed survival data in 1729 consecutive triple vessel disease and diabetic patients (1997-2006; 65+/-10 yrs; 64% male; 34% insulin-dependent) undergoing primary CABG. Patients undergoing concomitant valve or aortic surgery were excluded. Emergent-salvage (N=11) and repeat cardiac surgery patients (N=160) were also excluded. Patients were grouped based on their PCI history, and PCI patients were further subgrouped to: 1) patients with balloon angioplasty only (PCI-Angioplasty) and 2) patients with a history of 1 or more intra-coronary stents (PCI-Stent). Complete all-cause mortality follow-up was obtained for all patients as of September 2007. Risk-adjusted survival was assessed using multivariate Cox regression methodology.

**RESULTS:** Expectedly, angioplasty was more frequent in early PCI patients while stent-use was predominant late in the series. Of the 1729 overall patients, a history of pre-CABG PCI was confirmed in 334 (19.3%). Incidence of PCI-Stent (N = 225; 67%) was twice that of PCI-Angioplasty (N=109; 33%). An average of 3.62+/-0.84 grafts (1.62+/-0.80 arterial) were placed per patient. Internal tho-

racic (ITA) and radial artery grafts were used in 98% and 47% of patients, respectively. A total of 436 deaths (25.2%) were documented divided to 344 No PCI (24.7%) and 92 PCI (27.5%). The early or 30-day deaths [52 (3.0%) overall] occurred in 39 No PCI (2.8%), 5 PCI-Angioplasty (4.6%) and 8 PCI-Stent (3.6%) patients (all p =NS). Excluding PCI as a covariate, predictors of improved survival in this patient series were a greater number of grafts and use of arterial versus vein grafts. Alternatively, left main disease, lower ejection fraction, older age, renal failure, peripheral vascular disease, congestive heart failure, arrhythmia and insulin-use predicted increased 10-year mortality. Subsequently, the risk-adjusted (mean of covariates) 1-, 5- and 10-year mortality were estimated at 93.9%, 81.7% and 61.9%, respectively. History of PCI (Any kind) was associated with increased 0- to 10-year mortality [Risk Ratio (95% confidence interval)= 1.26(0.98-1.62); p=0.074], but was more pronounced in the PCI-Stent [RR= 1.31(0.98-1.71); p=0.070] compared to PCI-Angioplasty [RR= 1.21(0.86-171); p=0.26].

**CONCLUSION:** History of prior PCI before CABG in triple-vessel disease patients with diabetes mellitus is associated with increased risk-adjusted late mortality. This finding - particularly if confirmed in larger or national scale series - suggests a need to revise the current trend of routine intra-coronary stent use for revascularization in triple-vessel diabetic patients.

## VIDEO II

### VD-1310-WORLDS FIRST CASE REPORT OF A UNIQUE THERAPEUTIC STRATEGY IN POST MYOCARDIAL INFARCTION SEPTAL RUPTURE

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**BACKGROUND:** Post myocardial infarction septal rupture is a rare but disastrous complication needing urgent surgical intervention. Even today in high risk situations the mortality of conventional patch repair is 50%. Trans catheter device closure of these defects also carries suboptimal results.

**METHOD:** A 60 yr old hypertensive male presented with acute inferior and right ventricular MI with septal rupture complicated by cardiogenic shock and anuria. Echo revealed a dissecting type III mid interventricular septal rupture (VSR) of 18 mm capped by a septal aneurysm on the right ventricle side, LVEF of 30% and RVEF 20%. Patient was managed aggressively with inotropic and IABP support and as soon as urine started cardiac catheterisation and coronary angiography was undertaken which revealed critical tripple vessel disease with PAH and Qp/Qs of 2.7:1. He was advised surgical intervention but since the risk of conventional surgery was unacceptable to the family the surgical approach was modified since he continued to be in severe CHF with NYHA IV symptoms. After off-pump tripple bypass the point of maximum thrill was localised on the RV with finger under TEE guidance, size 9Fr. vascular sheath was inserted through a pledgeted purse string snared suture using seldinger technique. A 20 mm Amplatzer muscular occluder device was placed across the septal rupture, which got inadvertently deployed in the septal aneurysm, but abolished the major left to right shunt.

**RESULT:** Uneventful recovery, discharged on th 9th post operative day. Serial echos revealed stable device position with trivial residual shunt. At 18 mth. follow up he is in NYHA I, with LVEF 50% and RVEF 30%

**CONCLUSION:** Appropriate patient and device selection, refinements in hardware is likely to smoothen & standardise this hybrid procedure in high risk patients

### VD-1311-THORACOSCOPIC IMPLANTATION OF EPICARDIAL ELECTRODE FOR RESYNCHRONIZATION THERAPY INTO THE MYOCARDIUM OF THE LEFT VENTRICLE.

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**THE PURPOSE OF RESEARCH:** To develop and to examine technical feasibility of the epicardial electrode implantation into various walls of LV.

**MATERIALS:** The study was carried out in 2006 - 2007 in 10 mongrel dogs (mean weight 18-20kg). Operations were performed under artificial lung ventilation, open pneumothorax and total intravenous anesthesia. 10-mm 30° optics, 5-mm laparoscopic toolkit and the equipment of firm "Storz" were used. Intraoperative ABP, CVP, ECG, Sat. O<sub>2</sub> were monitored.

**RESULTS:** Through 4 port left thoracoscopy the pericardium was linearly opened from the aortic root up to the heart apex. Implantation of the electrode was carried out in the intervacular zone of the myocardium which was stabilized by two laparoscopic swabs. The head of the electrode was grasped by the grasper and led through the port into the chest where it was settled down perpendicularly in relation to the surface of the stabilized myocardium. Then the electrode cautiously twisted into the myocardium on 2.5 revolutions clockwise by the grasper. The electrode was additionally sutured. The wire of the electrode was led under the skin and connected to the electronic pacemaker. The electrodes were implanted in anterolateral and posterolateral walls of LV. There were no surgical complications. Central hemodynamics was stable; on ECG - single ventricular extrasystoles during implantation.

**CONCLUSIONS:** The thoracoscopic method allows to implant epicardiac electrodes into all walls of LV safely and effectively.

### VD-1312-MINIMAL ACCESS AORTIC SINGLE SUTURE LINE PERICARDIAL STENTLESS VALVE IMPLANTATION

*Schroeyers, Pascal*

*Roeselare, Belgium*

In this video, we provide a special emphasis on the surgical technique peculiarities of aortic valve replacement with a supra-annular single suture line stentless aortic valve, the Freedom Solo prosthesis. Stentless valves were designed to provide more physiological flow and lower transvalvular gradient, which is offered by the novel design of the valve and by its implantation technique. Care must be taken to place the 3 running suture in the sinuses of Valsalva at the nadir of the commissures and at 3-4 mm from the host annulus of each of the sinuses, exiting the sinus wall supra-annularly. The supra-annular stentless aortic valve implantation is demonstrated throughout a minimally access (J-sterotomy) with venous groin cannulation which is our standard technique for single aortic valve replacement.

### VD-1313-TOTAL AORTIC VALVE REPLACEMENT WITH AUTOLOGOUS PERICARDIUM : AN EASY AND REPRODUCIBLE SURGERY USING A NEW DEVICE

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**BACKGROUND:** The conservative surgery for aortic valve dysfunction keeps limited indications leading most patients to Aortic Valve Replacement (AVR) and its complications. The ideal aortic valve substitute must be biologic, non antigenic, pliable, providing optimal hemodynamics and long-term durability. Since 1990, several studies used autologous pericardium for aortic valve reconstruction or AVR and showed good hemodynamics and durability. This surgery did not found wide spread because of technical and surgical limits.

**METHODS:** we report a new surgical technique of AVR with autologous pericardium. Once the pericardium is harvested, a piece of 7/11cm is removed and immersed in a Glutaraldehyde solution 0.625% during 10 minutes. Pericardium is washed by three baths of saline serum of 6 minutes each and then a bath of ethanol 80% for 1 minute. Pericardium is divided into three strips, approximated by a central stitch. The three juxtaposed extremities are pulled by three silk sutures. The AorticPlastySizer (APS) Device is then used, introducing the three strips of pericardium between the stamps. The chuck is tightened, on the jubilee clip. The matrix is then adjusted by positioning its three metallic stems through the appropriate way in the defiles of the holder, and finally through the washer. The latter is turned to lock the extremities of the stems providing contention of pericardium. Excess pericardium is excised leaving a margin of tissue of 5 mm inverted by a continous suture following the circumference. After resection of the pathological aortic valve, the autograft is kept on the APS and sutured to the native annulus with three running sutures of polypropylene 4/0-17mm. The matrix is removed by opening the spanner and turning the washer. The running sutures are tightened. The coaptation of the new cusps is started by a polypropylene 5/0 suture. Then median knot can be removed.

**RESULTS:** This surgical technique gives a biological stentless pericardial autograft in aortic position providing good hemodynamic settings even in case of small aortic annulus. The main advantages are the absence of antigenicity and the absence of thrombogenicity (no life anticoagulation). This surgery has a rapid learning curve reaching the conventionnal aortic cross clamp time for AVR in a few weeks. The surgical technique is reproducible thanks to the APS device. Post-operative echocardiography revealed no significant transaortic gradient, nor significant aortic insufficiency.

**CONCLUSION:** AVR with autologous pericardium seems to be a good alternative to AVR with mechanical valve or bioprosthesis. The surgical use of the pericardial autograft is safe, easy and reproducible thanks to the APS device. Early outcomes are favourable.



### **VD-1314-SAFE STERNAL RE-ENTRY IN REDO CARDIAC SURGERY. USING THE daVINCI SYSTEM**

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Sternal reentry is the primary cause of bleeding in reoperations. The technique described save reentry.

**METHODS:** Thirty-seven patients undergoing re-operations with previous bypass surgery (25) and valve surgery (12) are the subject of this presentation. After the conduits were harvested the patient was positioned with the right chest elevated and the right pleural space was entered by three ports, the center one for the camera and the upper one with a bipolar grasper and spatula in the lower port. The daVinci system was docked. With proper identification of the right mammary the dissection was started along the posterior wall of the sternum with care to identify previous bypasses until the left pleural space was entered. Once this was accomplished the ports and da Vinci system were removed, now the the sternum can be open without risk of injuring major structures.

**RESULTS:** No complications were encountered as a result of this procedure and the extra small incisions on the right chest were not a source of complaints.

**CONCLUSIONS:** 1.- The procedure adds a great deal of safety 2.- There were no complications 3.-The procedure adds little time to the operation 4.- Potential decrease of bleeding 5.- Decrease manipulation of previous bypasses 6.- Easy dissection of the right internal mammary

### **VD-1315-SURGICAL MANAGEMENT OF ESOPHAGO-AIRWAY FISTULA IN THE ADULT**

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**INTRODUCTION:** Benign esophagoairway fistulae are rare and difficult clinical problems. Therefore, many surgeons are unfamiliar with management. This video chronicles the diagnosis, surgical technique, and outcome in a 70 year old woman with a benign fistula between the esophagus and the superior segment of the right lower lobe.

**METHODS:** The pertinent preoperative radiographic and endoscopic findings are presented. The steps in repair are demonstrated. A brief discussion of possible etiologies and differential diagnosis is also included.

**RESULTS:** Initially, right thoracotomy was performed. The intercostal muscle was harvested as a vascularized flap. Adhesions were divided and subcarinal lymph nodes were resected. The diverticulum was separated from the trachea and esophagus, and was then resected. Suture lines were reinforced and separated using the intercostal muscle flap. The patient had an uneventful and uncomplicated post-operative course.

**CONCLUSIONS:** Benign esophagoairway fistula is rare and many surgeons are unfamiliar with its management. This video presents the diagnostic data, surgical methodology, and didactic knowledge necessary to successful management of this difficult and unusual clinical problem.

### **VD-1316-THE TECHNIQUE OF MONOBLOC AORTO-MITRAL HOMOGRAFT IMPLANTATION FOR RECURRENT DESTRUCTIVE ENDOCARDITIS**

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**BACKGROUND:** We here present a video that describes the monobloc aorto-mitral homograft implantation technique performed in two cases of recurrent endocarditis.

**METHODS:** The first patient was a 34-year-old man operated on by a complex mitral valvuloplasty after an episode of endocarditis that involved only the mitral valve. The second was also a 34-year-old man with endocarditis of both the aortic and mitral valves, with an abscess of the aortic annulus. The aortic and mitral valves were replaced by mechanical prostheses and the abscess was removed and repaired by autologous pericardium. Both presented symptoms of recurrent endocarditis respectively 7 and 3 months after the first episode, treated by a monobloc aorto-mitral homograft implantation.

**RESULTS:** Both patients did well and discharged in sinus rhythm. The echocardiography showed no mitral or aortic regurgitation for the first patient at 15 months of follow-up and mild paramitral homograft regurgitation and no aortic valve dysfunction for the second at 10 months of follow-up.

**CONCLUSION:** Recurrent destructive endocarditis remains a technically demanding procedure. Where wide resection of all the septic tissue is mandatory the monobloc aorto-mitral homograft implantation can be a reproducible technique.

### **VD-1317 A NOVEL NEW DESIGN FOR POSTERIOR MITRAL LEAFLET RESECTION BUTTERFLY RESECTION AND ROTATION PLASTY**

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**BACKGROUND:** McGoon's quadrangular resection and a prosthetic ring annuloplasty has been a procedure of choice for posterior leaflet prolapse. However with high posterior leaflet or excess anterior leaflet tissue, LV outflow tract obstruction is caused by systolic anterior motion (SAM) of anterior mitral leaflet. Sliding plasty has been proposed, but it requires extensive resection of adjacent non-prolapsing segments of posterior leaflet. Our new idea of posterior leaflet resection designed focusing on treating only prolapsed segment and no posterior annular plication. The video demonstrates our new design and compares to the previous resection methods.

**METHODS:** Transesophageal echocardiography (TEE) is introduced for all cardiac cases after anesthesia induction. Cardiopulmonary bypass (CPB) is instituted with aortic and bicaval cannulations. Heart is protected with antegrade and retrograde cold blood cardioplegia. Mitral exposure is obtained by Carpentier retractor. Inspection of mitral apparatus and regurgitation water test is carried out. In the case of posterior leaflet prolapse, the quadrangular resection mandates annular circumference reduction. It subsequently reduces the size of the ring as well as its antero-posterior annular diameter. This is a risk factor of SAM following mitral valve repair in certain group of patients. Whereas the sliding plasty can reduce the height of posterior leaflet with excessive leaflet tissue resection, but still reduces annular circumference. On the other hand, the butterfly plasty consists of two triangles resection, resembling a butterfly or a hour-glass shape. The defect is covered with rotated remaining leaflet tissues of both sides. It preserves annular size and reduces the leaflet height with freehand. Then a prosthetic ring is chosen with the the anterior leaflet size. Adequate coaptation of mitral leaflets is obtained with coaptation line close to posterior annulus. Ring annuloplasty is performed with Carpentier Physio Ring. Following termination of CPB, mitral regurgitation is evaluated by TEE making sure less than trivial.

**RESULTS:** The patient was recovered without any complications. The postoperative echocardiogram demonstrated good coaptation of both leaflets with no mitral regurgitation and no left ventricular outflow obstruction.

**CONCLUSIONS:** Our new design, \_gbutterfly resection and rotation plasty\_h of posterior leaflet is safe and effective. This method can simply create mitral valve coaptation without annular plication. It is not only preventing SAM, but it may also be an useful technique in difficult mitral valve repair cases, such as Barlows disease and posterior leaflet prolapse with severe mitral annular calcification We believe mitral valve repair with this method is reliable and can be a procedure of the first choice for posterior leaflet prolapse.

### **VD-1318-SURGICAL TREATMENT OF ISCHEMIC MITRAL VALVE INSUFFICIENCY**

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**BACKGROUND:** Midterm clinical and echocardiographic results after mitral valve (MV) surgery for chronic ischemic mitral regurgitation (MR) were investigated to evaluate validity of criteria for surgical treatment and applying of our new created suture annuloplasty.

**METHODS:** From 2000-2007,192pts with ischemic MR underwent MV surgery(190 repairs and 2 replacements).Mitral ring (> 3,5 cm,)and regurgitate jet (>+2) were key factor that allowed surgical treatment.87pts underwent combined surgery:CABG,LV aneurysmectomy and MVSurgery.New created suture annuloplasty reconstructed posterior part of mitral annuli using double continuous suture,with knotting after every parallel bite.Pts had been controlled by transthoracic and transoesophageal echo pre/postoperatively.

**RESULTS:** 56pts (29.2%)had transventricular mitral valve annuloplasty combined with CABGandLV aneurysmectomy;98 (51.1%)had transatrial mitral

annuloplasty(24pts-DeVega annuloplasty, 10-complex reconstruction and 64pts-new kind of suture annuloplasty).33(17,2%)combined with tricuspid annuloplasty. 6pts got flexible ring,2had been re-operated(ring dehiscence).2pts got mitral valve replacement.Intraoperative TEE showed decreasing of average valve systolic gradient $25\pm5.7\text{mmHg}/7\pm0.9\text{mmHg}$ , with decreasing of EDV volumen for additional 40ccm(reducing of subvalvular space),with increasing of EF: $20\pm5.2\%/35\pm4.3\%$ .Follow up results showed that: NYHAclass at six weeks was improved(mean:  $2.4 \pm 0.5$ )in pts with new kind suture annuloplasty and transventricular mitral valve annuloplasty, without development of significant MR.5pts with DeVega annuloplasty developed MR>+3, and 2had been reoperated.19 pts died.Actuarial survival was 89.5%,follow up period 1-84months.

**CONCLUSION:** Correction of chronic ischemic MR through classic way of reconstruction or new kind of suture annuloplasty provides good mid-term survival rate with more than 89% of survivors in NYHAclass/ II. Pts with our new created suture annuloplasty had better clinical outcome, without regression of MR.

### **VD-1319-OFF-PUMP LEFT VENTRICULAR ANEURYSMORRHAPHY: EXO-ANEURYSMORRHAPHY**

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**BACKGROUND:** OPCAB surgery has recently become popular for multi-vessel coronary revascularization. In high-risk patients and patients with poor LV function, where off-pump surgery offers most benefits, the standard LV aneurysmorrhaphy requiring the use of cardiopulmonary bypass becomes counter-intuitive. In properly selected cases off-pump LV exo-aneurysmorrhaphy is possible, safe and sometimes becomes a necessity.

**METHODS:** Off-pump exo-aneurysmorrhaphy of LV aneurysm was performed successfully in patients at the time of OPCAB. Purse string technique was used in all of the patients. Aneurysms with significant clot are usually thick and diastolic collapse is not obvious when the apex is lifted. Pre operation echocardiography And intraoperation epicardial echocardiography are helpful in diagnosis of clot.

**RESULTS:** Preoperative echocardiography demonstrated absence of mural thrombus in all except one. There was no operative mortality. One patient underwent reoperation for intraventricular clot. Post operative echocardiography demonstrates decrease mean LVEDD (5.7mm), LVESD (2.5mm) and improved mean of LVEF (55.3%).

**CONCLUSION:** In selected clear cut cases with the LV aneurysm without clot, exo-aneurysmorrhaphy will make the positioning during OPCAB easier and provide significantly improved LVEF. Further modification of technique may allow exclusion of residual septal aneurysm. Use of pledgetted suture and avoiding LAD occlusion is emphasized. Intraoperative assessment of the LV wall thinness and lack of clot using epicardial echocardiography is helpful.

## VIDEO III

### VD-1320-ROSS PROCEDURE: MODIFIED (SUPPORTED) ROOT REPLACEMENT USING AUTOLOGOUS TISSUE - video presentation

*Kelpis, Timotheos; Bougioukas, Ioannis; Dardas, Petros; Ninios, Vlasis; Nikoloudakis, Nikolaos; Bougioukas, Georgios; Pitsis, Antonis*  
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Pulmonary autograft has been used in clinical practice for decades in patients with aortic valve disease (Ross procedure). Pulmonary autograft dilatation and regurgitation however, may occur after a free-standing root autograft implantation. A simple partially supported root replacement (PSRR) technique of the Ross procedure which preserves the native aortic root remnants up to the level of the sinotubular junction (to support the pulmonary autograft root) has been developed in our medical center. In addition, incorporation of the host aortic root resulted in a significant improvement of hemostasis. We present the video of this method which it was applied on a man with mixed aortic valve disease with excellent results. Insertion of the pulmonary autograft using the PSRR procedure may decrease the long term risk of pulmonary artery dilatation. This method can be applied to the majority of patients candidates for the Ross operation.

### VD-1321-SURGICAL TREATMENT OF ISCHEMIC HEART DISEASE

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**BACKGROUND:** Heart failure due to severe CAD is associated with LV dilatation, low ejection fraction, poor quality of life and high mortality rate. Arterial revascularization, valvular reconstruction and different surgical technique for ventriculoplasty can improve patient's haemodynamic

**METHODS:** After median sternotomy total revascularization was performed. With inspection the aneurysm localization was marked and the appropriate type of ventriculoplasty was performed (for pts with anterior aneurysm direct circular repair-DCR with or without cardioplagia, anterior LV placcation or linear resection were performed; for posterior aneurysm pts got direct circular repair or linear reconstruction, and for lateral linear reconstruction or plication were performed. Including criteria for our prospective study were: severe CAD, large LV aneurysm diagnosed by transthoracic and transoesophageal ultrasound.

**RESULTS:** From 03/00-12/07, 336 pts with left ventricle aneurysm have been operated. According to the LV aneurysm localization 184pts with anterior aneurysm had been operated with DCR with cardioplegia, 64pts with anterior aneurysm with DCR without cardioplegia, 71pts with anteroapicoposterior aneurysm with DCR combined with linear resection and 17 with anterior aneurysm had been operated on OPCAB with LV placcation. Evident haemodynamic improvements were noted in all patients without an difference between the different surgical techniques. The incidence of the complication was the highest in third group -patients with anteroapicoposterior aneurysm. Valvular reconstructions were performed when indicated. Mean intubation time was the longest in the third group as well as inhospital stay. Mean dosage of catecholamines was 0.03-0.06 µg/kg/min. The average survival was 93% in group with anterior aneurysm, 100% in group with LV placcation and 81% in group with anteroapicoposterior aneurysm.

**CONCLUSIONS:** All surgical techniques for LV reshaping ensure improvement of the patient condition, with stabile mid-term results. The difference of the clinical outcome depends directly from preoperative patients condition, not from type of surgery.

### VD-1322-BILEAFLET MITRAL VALVE REPAIR - video presentation

*Kelpis, Timotheos; Visouli, Aikaterini; Dardas, Petros; Deliaslani, Despina; Ninios, Vlasis; Bougioukas, Georgios; Pitsis, Antonis*  
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We present the video of the surgical repair of a 53 year old male patient who presented with increased shortness of breath (NYHA II). Preoperative transesophageal echocardiography (TEE) and 3D echocardiography showed degenerative severe mitral regurgitation (MR) due to bileaflet prolapse. The mitral valve was approached via the superior septal approach and repair was accomplished by bileaflet repair and annuloplasty. Bileaflet repair included quadrangular resection of the middle scallop of the prolapsing posterior mitral leaflet (P2) and sliding plasty, and also the use of two pairs of synthetic chordae for prolapsing anterior mitral leaflet (A1/A2, A2/A3). A complete rigid annuloplasty ring (30mm Physio) was implanted. The procedure was performed under intraoperative TEE guidance. On follow up, two years after the operation, the patient still remains free of mitral regurgitation.

### VD-1323-THE USE OF REAL TIME ENDOBRONCHIAL ULTRASOUND IN THE EVALUATION OF MEDIASTINAL LYMPHADENOPATHY

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**BACKGROUND:** The evaluation of mediastinal lymphadenopathy is crucial in the treatment of lung cancer. Several open and minimally invasive surgical techniques including mediastinoscopy and thoracoscopy, have been used to achieve this goal. Most recently, Real Time Endobronchial Ultrasound (EBUS) has been utilized with increase success.

**METHODS:** In this video, we present the case of a 66 yo female s/p Right Middle Lobectomy for a T1N0 Lymphoepithelioma-like carcinoma. On surveillance CT scan approximately 20 months post-operatively, the patient was found to have an enlarging lower subcarinal lymph node (not attainable via mediastinoscopy), now 11 mm in diameter and positive on PET scan with an SUV of 4.8. Real time EBUS was used to biopsy this lymph node.

**RESULTS:** The patient underwent a successful EBUS biopsy without complication. Results were positive for metastatic disease

**CONCLUSION:** EBUS provides a safe and minimally invasive technique to biopsy mediastinal lymph nodes.

### VD-1324-MANAGEMENT OF THE BRONCHIAL STUMP INSUFFICIENCY CLOSURE BY COMBINATION OF ENDOBRONCHIAL AND SURGICAL TECHNIQUES -VIDEO PRESENTATION

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**OBJECTIVE:** is to present the management of bronchial stump insufficiency (BSI) empyema in a video demonstration. The film shows all the technical details of the procedure in a step by step manner.

**METHODS:** Between 08/2004 and 09/2007; 3 patients (2 males, 1 female, mean age 71 yrs) with postresectional empyemas were treated in our Institute (out of 900 thoracic procedures/ year). In all of them the BSI was verified by bronchoscopy. Due to the poor condition of the pts, the empyema cavity drainage with the wide-spectrum antibiotics application was performed as the first step in accordance to our own algorithm in the management of BSI. In the case of failed endobronchial closure, the limited thoracoplasty with myoplasty, debridement and re-closure of the bronchial stump are than performed.

**RESULTS:** Only after this active surgical access was possible to discharge the patients with healed bronchial stump home. They left the hospital at the 35th, 41st and 42nd postoperative days; within the mean follow-up of 21 Mo they are without any signs of septic complication or recurrence of BSI.

**CONCLUSIONS:** The post-interventional empyema after the BSI is still the feared complication with high morbidity and mortality rate. Endobronchial procedures for BSI are reported with controversial results in the literature. Due to the poor performance status, sepsis of the patient, the definitive endoscopic closure of the bronchial stump can only be hardly obtained. The definitive solu-

tion - surgical BSI closure combined by the myoplasty and limited thoracoplasty (after the detoxication and stabilization of the patient) - is the recommended treatment for BSI empyema.

### VD-1325-THE ROLE OF HIGH THORACIC EPIDURAL ANESTHESIA AND ANALGESIA IN COMBINED ANESTHESIA AND IN THE POSTOPERATIVE PERIOD IN CARDIAC SURGERY

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**BACKGROUND:** To estimate results of use high thoracic epidural anesthesia and analgesia in cardiac surgery operations and in the postoperative period.

**MATERIAL AND METHODS:** Prospective randomized study was carried out from January 2005 till December, 2006. 40 patients were enrolled in our study (20 pts in each group) depending on used HTEA as addition to the general anesthesia (group 1) or not (group 2). We have made the comparative analyses of the central haemodynamic, respiratory function, efficiency of postoperative patient control epidural analgesia (PCEA), time of extubation and mobilization, complications, ICU stay and hospitalization.

**RESULTS:** In group of patients with HTEA during operation and 6 hours after extubation it has been marked stable haemodynamic. PE2 was more in the first group during operation, it is authentic ( $p < 0,05$ ) prevailed during the period of sternotomy. Extubation, ( $p < 0,05$ ) was carried out earlier in group 1, accordingly time of artificial ventilation was ( $p < 0,05$ ) more shortly in the first group. Average time of mobilization of patients is less in the first group ( $p < 0,05$ ). The quantity used of Sufentanil during operation in group 1 was authentically lower ( $p < 0,05$ ). In the postoperative period average value of a visual analog pain scale (VAS) at group 1 was lower ( $p = 0,06$ ), in comparison with control group. Terms of stay in ICU and time of hospitalization were authentically less ( $p < 0,05$ ) in patients of the first group.

**CONCLUSIONS:** HTEA as the component of the combined anesthesia improves parameters of the central haemodynamic and respiratory functions. Use HTEA and PCEA allows to achieve height effective anesthesia alongside with reduction of quantity used of analgetics. Use HTEA in a combination with PCEA enables early extubation and promotes mobilization of patients. Use HTEA and PCEA allows to reduce time of a staying of the patient in ICU and the hospital period. HTEA and PCEA are safe for cardiac surgery patients at precise observance of indications, contra-indications and techniques of their carrying out.

### VD-1326-TRACHEOPLASTY FOR GRANULAR CELLS TUMOR IN YOUNG PATIENT

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The tracheoplasty is an operation performed by the majority of thoracic surgeons. The most frequent indication is stenosis of the trachea after intubation, and the operation for tumor is rare. The granular cell tumor is a rare neoplasm, with origin in the Schwann cells and described in the first time in 1926 by Abrikossof. Only 6 to 10% of these tumors are of the respiratory tract and its location in the trachea is rare too, described for the first time by Frenckner in 1937. The incidence is higher in women from black race. In general, it has a benign clinical evolution, with symptoms related to airways' obstruction, but has potential for local invasion and relapse. For the rarity of the granular cells tumor in trachea, we relate the case of a patient. Report We related a woman of 22 years, black, with progressive dyspnea complaint four months ago, initially treated as asthma. She used bronchodilator and inhaled corticosteroids in that period. Antecedent: smoking of 10 cigarettes a day for ten years. Physical examination showed stridor with inspiration. The laboratory tests and chest radiography were normal. The Spirometry showed a moderate obstructive pattern, with FVC: 76,4%, FEV1: 20,1% and FEV1%: 28,5%. It was performed a bronchoscopy, which showed a tumor three cm above the vocal folds, with obstruction of approximately 90% of lumen. The biopsy showed a granular cell tumor. We did an additional study with chest and cervical tomography. The patient was submitted to surgery, cervicotomy, tracheal resection of 3cm, a tracheo-tracheal anastomosis with monofilamentar posterior continuous suture (poliglicaprone) and anterior separate suture. The patient was discharged from the hospital on the first post-operatively day, with excellent progress. The histological exam, stained by the method of hematoxylin - eosin, showed neoplasm

composed of polygonal and spindle cells with granular cytoplasm, and eosinophilic edges somewhat defined. The core was small, regular and nucleoli with little apparent. Mitoses were absent. These stromal cells infiltrated the glands submucosas and cartilage. The immunohistochemical study by the method of complex avidina - botina - peroxidase revealed the expression of the following antigens: protein S-100, vimentin and enolase neuron-specific. The expression of antigens of epithelial lineage, neuroendocrine and muscle resulted negative. The search for HIV (human immunodeficiency virus) resulted negative. After one month, the spirometry showed a FVC: 92%, FEV1: 94% and FEV1%: 99%. The bronchoscopy : a good suture without evidence of tumor or stenosis and she did not have any recurrence during 6 months of follow-up.

### VD-1327-REPAIR OF POSTINFARCTION VENTRICULAR SEPTAL DEFECTS: THE DOUBLE PATCH TECHNIQUE

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Postinfarction ventricular septal defects complicate approximately 1% to 2% of cases of acute myocardial infarction and account for about 5% of early deaths after myocardial infarction. Many techniques have been developed that have improved salvage of patients suffering this catastrophic complication of myocardial infarction but the closure of the septal defect without tension, which in most instances will require the use of prosthetic material and the buttressing of the suture lines with pledgets or strips of Teflon felt or similar material to prevent sutures from cutting through friable muscle remains the critical problem of all surgical techniques. This video presents the double patch technique that we developed specifically to reduce tension on the patch sutures and to avoid the blood infiltration into suture lines among patch and muscle that is the main cause of recurrence of shunt after the septal defect closure.

### VD-1328-MODIFIED TECHNIQUE OF PERCUTANEOUS TRACHEOSTOMY IN THE HIGH RISK ICU PATIENT

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**OBJECTIVES:** Percutaneous Tracheostomy(PT) is a safe and established technique for creation of a surgical airway compared to traditional open tracheostomy in cardiothoracic patients subject to a prolonged mechanical ventilation. None-the-less, many surgeons use obesity, previous neck operations, coagulopathy, previous tracheostomy, high FIO2 requirements or elevated airway pressures as relative contraindications. Our experience indicates that PT can be performed safely in high risk cardiothoracic patients. We have developed a modification of the standard percutaneous tracheostomy technique, performed in the intensive care unit, that allows near continuous control of the airway in high risk patients. We have reviewed our modified PT technique in order to demonstrate its safety and efficacy in patients often considered too unstable to travel to an operating theater for traditional open tracheostomy.

**METHODS:** A review of PT at the University of California at San Francisco from 2002-2007 was performed. Data was prospectively gathered on patient diagnosis, height, weight, current ventilator settings, underlying coagulopathy, previous neck operations and hospital course. The PT procedure begins with direct visualization of the distal trachea with a pediatric bronchoscope followed by guidewire access to the trachea. Dilation of the tracheal stoma adjacent to the orotracheal tube is then performed without withdrawal of the orotracheal tube. The tracheostomy prosthesis is then advanced past the skin and strap muscles until the cuff is beneath the epidermis. In one continuous movement, the orotracheal tube is removed and replaced with the tracheostomy prosthesis. Ventilation is never interrupted during this process.

**RESULTS:** 24 modified PTs were performed on high risk patients using this modified technique. We recorded zero deaths and no bleeding complications or tracheal injuries. As shown in Table 1, we performed PT on patients with relative contra-indications of coagulopathy, obesity, previous tracheotomy, and severe respiratory distress. In four cases, patients had multiple relative contra-indications. Table 1. VAD cannulation on full dose heparin (7) ECMO/ARDS with anticoagulation (4) Fulminant ARDS with Peak Airway Pressures of 40 mmH2O (5) Full Anticoagulation for PE (1) Morbid obesity with BMI greater



than 40 (2) Morbid obesity and anticoagulation BMI greater than 40 (1) Redo tracheotomy (3)

**CONCLUSIONS:** Our experience indicates PT can be a safe and effective procedure in critically ill cardiothoracic patients. Straight-forward modification of technique permits continuous ventilation and lessens the risk of catastrophic airway loss. Furthermore, this technique allows for PT in patients with relative contraindications. Overall, PT can be performed at the bedside and can be done safely despite previous neck operations, obesity, coagulopathy, and high ventilatory support. This eliminates the need for expensive operating room time or transport of unstable patients.

## **VD-1329-DIRECT CIRCULAR REPAIR FOR LEFT VENTRICLE ANEURYSM**

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**BACKGROUND:** Most patients with large left ventricular aneurysm undergo either linear resection of the dyskinetic area or endoventricular patch repair. Both techniques have numerous beneficial effects, but also several adverse ones. In order to avoid these imperfections, direct circular repair (DCR) was created.

**METHODS:** After median sternotomy total revascularization was performed. With inspection the aneurysm localization was marked and the incision was started at the apex of the aneurysm, forwarded toward the border zone with a vital myocardium. For geometric reconstruction, a prolene purse string suture was placed within fibrous sewing ring and pulled to reduce the new created orifice to 1cm. Next, a prolene suture was used over two pericardial stripes to bring the circular cuff together. In case of aneurysmal septal involvement, incision is extended toward the posterior wall, followed by a profound circular suture; so dyskinetic septum is completely excluded. The final continuous over-and-over suture was applied over pericardial strips for definite hemostasis. Including criteria for our prospective study were: severe CAD, large LV aneurysm diagnosed by transthoracic and transoesophageal ultrasound.

**RESULTS:** From 03/00-12/07, 195 pts with anterior or aneteroapical aneurysm have been operated. Evident haemodynamic improvements were noted: decrease of EDV from 316.5 on 182 ml, ESV from 250 on 102 ml, increase of EF from 20.5% on 37.2%, and CI from 1.8 on 3.2. Valvular reconstructions were performed when indicated. 164pts had been operated under total warm cardioplegia. Mean intubation time was  $9\pm 2.3$ h, mean dosage of catecholamines was  $0.03\mu\text{cg/kg/min}$ , average inhospital stay  $10\pm 4,6$  days. Early mortality rate was 6.7% (13pts).

**CONCLUSIONS:** Direct circular repair ensures geometric reconstruction of the LV, without use of foreign body after maximal resection and exclusion of the non-viable myocardium. In combination with total myocardial revascularization and valvular reconstruction improves patient's condition with a good clinical benefit.

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# Presentation of Abstracts

## Poster Presentation

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## POSTER SESSION I

### P-001-ANTICOAGULATION DRUGS - IS IT POSSIBLE FOR PREGNANT WOMAN WITH MECHANICAL HEART VALVE PROSTHESIS?

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**BACKGROUND:** To investigate the effect of anticoagulant therapy during pregnancy for patients with mechanical heart valves.

**METHODS:** 53 pregnant women with mechanical heart valves and 54 pregnancies gave birth to 55 babies. With indirect anticoagulative drugs were treated 51 (94.4%) women during 36-38 week of the pregnancy and 2-4 weeks before delivery received heparin. During the first trimester of the pregnancy 1 woman was treated with low molecular weight heparin or non-fractured heparin, afterwards and during the last month before delivery - heparin was given again.

**RESULTS:** Two (3.7%) pregnant women had suffered CNS thromboembolism and two (3.7%) women had their mechanical heart valve thrombosis during delivery. Vaginal hematoma had 1 woman (1.8%) during the labour, 1 (1.8%) had excessive bleeding, as labour began on the 30th week of pregnancy when the patient was treated with Orfarin. 50 (90.9%) babies were in good health, 2 (3.6%) were stillborn (one - underdeveloped, one - had umbilical cord around his neck). One baby (1.8%) had extracranial hematoma. There was non-embriopathy case. During the pregnancy we had to diminish indirect anticoagulant doses by 1/3 for 23 (42.6%) women because they were sensitive to the drug.

**CONCLUSION:** 1. Pregnant women with mechanical heart valves can be treated with indirect anticoagulants; 2. Sensitiveness to indirect anticoagulants increases during the pregnancy for approximately 43% of women.

### P-002-ANTICOAGULATION IN PREGNANT WOMEN WITH PROSTHETIC HEART VALVE - PROSPECTIVE STUDY

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**BACKGROUND:** Pregnancy after mechanical heart valve replacement is highly risky for both mother and child because of the aggravation of maternal heart function and adverse effects of anticoagulation therapy. We investigated the risk and outcome of anticoagulation in pregnant women who had a mechanical valve.

**METHODS:** This prospective study was undertaken for 49 pregnancies from September 2002 to September 2007. Patients were divided into 2 groups: group I (n= 38) took warfarin throughout the pregnancy and group II (n= 11) took in the 1st trimester and warfarin from a gestational age 12 to 36 weeks.

**RESULTS:** In group I, there were 22 live births (57.9%), 15 (39.5%) abortion and 1 (2.6%) maternal death; in group II, there were 7 live births (63.6%), 3 (27.3%) spontaneous abortion and 1 (9.1%) IUFD; No significant difference was observed between two groups in term of successful delivery rates (P= 0.24). Thirty three (86.8%) of pregnancies in group I and 5 (45.4%) in group II (P= 0.001) were without complications. No warfarin embryopathy was seen.

**CONCLUSION:** We conclude that low dose warfarin ( $\beta_{0.5}$  mg/day) during pregnancy is almost safe, with minimal feto-maternal complication. On the other hand, if we switch to heparin instead of warfarin, although no embryopathy happens, there is a risk of maternal complication.

### P-003-ASSESSMENT OF REGISTERED AND STUDENT NURSES' KNOWLEDGE ABOUT WARFARIN'S INTERACTIONS WITH DRUGS AND FOODS

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**BACKGROUND:** Warfarin is the most widely used oral anticoagulant. This drug has numerous potential drug-drug and drug-food interactions. These interactions may be harmful for patients and prevent successful treatment. Nurses play an important role in educating patients about anticoagulant therapy. The aim of this descriptive study was to determine the knowledge among registered and student nurses with respect to warfarin therapy.

**METHODS:** This research was conducted between May 2006 and June 2006. Data were collected using a specifically designed questionnaire based on the current literature. Nurses and students completed this self-administered questionnaire, which included a test to assess their knowledge about warfarin's interactions with foods and drugs.

**RESULTS:** Most of the nurses and nearly all of the students had a poor knowledge about warfarin's interactions with foods and drugs. There was a significant difference between nurses' and students' points ( $t= 4,789$  df=67,  $p=0.00$ ).

**CONCLUSION:** This study group needs education on food and drug interactions with warfarin. Because, inadequate knowledge of warfarin interactions with drug and food may lead to inappropriate patient counseling and result in adverse medical consequences such as insufficient anticoagulation or hemorrhagic complications. Relevance to Clinical Practice: In light of these findings, if the students will be register upon graduation for certain areas of nursing and new nurses/new graduates be well-oriented to the specialty environment when hired. By doing so, they would be better prepared to nurse safely in these certain areas.

### P-004-PREVALENCE OF PROTHROMBOTIC GENE POLYMORPHISMS IN CARDIAC SURGERY PATIENTS

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**BACKGROUND:** The role of polymorphisms of genes involved in haemostasis as risk factors for coronary heart disease remains controversial. We therefore determined the prevalence of polymorphisms of genes involved in haemostasis (FV Leiden HR 4070G>A; PRTH G20210A and A19911G), in cholesterol (apoE 2/3/4, CEPT Taq IB) or homocystein (MTHFR C677T) metabolisms, platelet glycoprotein (GP IIIa P1A 1/2, GP Iba HPA2, GP Ia 807C>T) or fibrinolysis (ACE Intron 16 I/D, PAI I 4G75G) in patients who underwent cardiac surgery. T trends to be higher in CABG patients without reaching significance ( $p=0.07$ ).

**CONCLUSION:** Despite the multifactorial pathogenesis of coronary artery disease we were able to correlate two of twelve gene polymorphisms involved in CAD following surgery intervention associated metabolic pathways to the CABG patients. Among the studied polymorphisms so far FV Leiden was associated with an increased risk for CAD whereas the apoE2 genotype seemed to be protected in CABG patients. We there conclude that screening for gene polymorphisms maybe helpful in risk determination in these collective.

### P-005-PROSTHETIC MITRAL VALVE THROMBOSIS IN TWO PATIENTS WITH INADEQUATE ADHERENCE TO ANTICOAGULANT THERAPY

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**BACKGROUND:** Prosthetic valve thrombosis is a rare complication after prosthetic heart valve replacement surgery. There are different clinical presentations: from an insidious and chronic process to an acute episode presenting with cardiac insufficiency and cardiogenic pulmonary edema. Depending of the grade of thrombosis and valve stenosis produced, the prosthetic valve

thrombosis can manifest as a mortal event. Treatment (medical or surgical therapy) varies depending the patient's hemodynamic state. We present two cases of prosthetic valve thrombosis, showing two different clinical pattern of manifestation.

**METHODS:** We show our experience in two cases. Case 1: A 59 year-old man with a previous history of chronic auricular fibrillation and severe mitral insufficiency treated with metallic mitral valve replacement. The patient presented low levels of anticoagulation after surgery. Three months later, he presented a transient ischemic attack. A cardioembolic origin was suspected. An echocardiography study showed a nonmobile disk of the prosthetic valve. Due to the hemodynamic stability, a conservative treatment was indicated with anticoagulant therapy and echocardiography follow up. Five months later and due to the progression of symptoms, a mitral prosthesis valve thrombectomy was performed. The low levels of anticoagulation during the first months postoperative were demonstrated as the main cause of valve thrombosis. Case 2: A 47-year old woman previously diagnosed of depressive and bipolar disorder, with inadequate control. She suffered from rheumatic heart disease and treated with metallic mitral valve replacement. Ten months after, she was admitted to hospital with an embolic transient ischemic attack. A transesophageal echocardiography showed a partial thrombosis of the mitral prosthesis. An initial treatment with anticoagulant and fibrinolysis treatment was established. Two months later the patient presented an episode of acute decompensated heart failure and pulmonary edema. Thus, urgent cardiac surgery was made and a new biologic valve replacement was performed. An inadequate adherence to anticoagulant treatment because of her bad treated mental disorder was the root of the valve thrombosis.

**RESULTS:** Both cases were successfully treated with surgery, presenting a satisfactory recovery.

**CONCLUSIONS:** Prosthetic valve thrombosis is an infrequent complication in patients with valve replacement. Prosthetic valve thrombosis can manifest as a chronic disease or as an acute heart failure, in some cases with fatal onset. Inadequate anticoagulant treatment or insufficient postoperative anticoagulant levels are considered one of the most important causes of thrombosis. Our experience shows that surgical treatment plays an important role in selected cases.

#### **P-006-ADMINISTRATION OF RECOMBINANT ACTIVATED FACTOR VIIa (NOVO SEVEN) AS "ULTIMA RATIO" FOR MANAGEMENT OF SEVERE UNCONTROLLABLE INTRAOPERATIVE BLEEDING IN A PATIENT UNDERWENT SURGICAL REPAIR OF ACUTE TYPE A AORTIC DISSECTION UNDER DEEP HYPOTHERMIC CIRCULATORY ARREST**

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**BACKGROUND:** The recombinant activated factor VIIa (rFVIIa, Novo Seven) is a prohemostatic agent, which was originally developed and only clinically approved for the treatment of bleeding complications in patients with congenital or acquired hemophilia and inhibiting antibodies towards factors VIII or IX. Limited informations exist regarding the use of rFVIIa in cardiac surgery patients. We report herein on a favorable outcome of emergent surgical repair of acute type A aortic dissection under deep hypothermic circulatory arrest (DHCA) and further administration of Novo Seven as "ultima ratio" to manage otherwise uncontrollable severe intraoperative bleeding.

**METHODS:** A 58 years old female patient referred on 7. September 2007 to our hospital because of sudden onset of acute chest pain, hypertensive crisis, left side hemiparesis, clinical suspicion of intracerebral bleeding and acute type A aortic dissection. A CT scan confirmed the diagnosis of acute type A aortic dissection. A transthoracic echocardiogram and Doppler study showed a dissection flap originating above the aortic valve and extending to an aneurysmatic truncus brachiocephalicus and involving the right common carotid artery. The aortic valve was moderately insufficient. An emergent surgical repair was undertaken on 7. September 2007. Repair of the aortic hemiarch and the truncus brachiocephalicus was done through separate prosthetic grafts under open distal anastomosis. Repair of the aortic valve and replacement of the ascending aorta was accomplished during the re-warming phase.

**RESULTS:** The patient was weaned uneventfully from the cardiopulmonary bypass under low dosage of catecholamines after bypass time of 285 min., circulatory arrest duration time of 70 min and total reperfusion time of 90 min. Diffuse and massive intraoperative bleeding was persistent despite meticulous surgical efforts of hemostasis and massive transfusion of blood products and

coagulation factors. Four grams of fibrinogen, 10 units of fresh frozen plasma, 6 million units of aprotinin, 4 units of thrombocyt, 1500 units of other coagulation factors (PPSB) were administered and a further biological glue was used to strengthen the sutures lines. The bleeding was progressive and seemed to be uncontrollable despite these measurements. A decision was therefore made to administer two doses of 4,8 mg of recombinant activated factor VIIa (Novo Seven) as "ultima ratio". Minutes after the administration of this pharmacological agent the operative field and the suture lines became completely dry as likely due to a "magic effect" of Novo Seven. Combined chest tubes losses were postoperatively 340 ml. There were neither neurological nor cognitive deficits and the remainder of her postoperative course was uneventful. She was discharged on the 14 postoperative day. Three months later, in December 2007, the patient had recovered clinically very well and reported neither hematological nor clinical sequelae related to surgery or to the administration of Novo Seven.

**CONCLUSIONS:** The management of intraoperative bleeding in patients who undergo surgical repair of aortic dissection under DHCA may present considerable anesthetic and surgical challenges. The rFVIIa, Novo Seven, may play a role in hemostasis management as rescue therapy for massive blood loss that is refractory to standard therapies. However, well designed and rigorous randomized controlled trials are needed to establish the efficacy and risks related to this potential indication and clarify its risk-benefit profile in cardiac surgery patients.

#### **P-007-IMMEDIATE RESULTS OF SURGICAL CORRECTION OF AORTIC STENOSIS WITH LOW LEFT VENTRIVULAR EJECTION FRACTION (LVEF < 35%)**

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Object of investigation: evaluation of the immediate results of surgical correction of aortic stenosis with low LVEF (EF < 35%).

**MATERIALS AND METHODS:** 34 patients with aortic stenosis and low ejection fraction were operated in Bakoulev SCCVS AHD departments during the period between 1997 and 2006. Patient age ranged from 31 to 72 years (mean 50.9± 12.0 years): 29 (85.3%) were male and 5 (14.7%) were female. The causes of aortic defects included CHD (bicuspid aortic valve) in 15 (44.1%) patients, rheumatism in 11 (32.4%) patients, and degenerative aortic defect in 8 (23.5%) patients. Patients without hemodynamically significant coronary artery stenoses were included in the investigation. Aortic valve calcification of the III degree was diagnosed in most patients. All patients were class III and IV according to NYHA classification (14.7% and 85.3% respectively). All patients underwent aortic valve replacement under cardiopulmonary bypass with moderate hypothermia at 26 - 28 °C. Mean cardiopulmonary bypass time was 146.6± 49.5 minutes (86 to 265 minutes), and mean aortic cross-clamping time was 90.2 ± 29.1 minutes (51 to 172 minutes).

**RESULTS:** Hospital mortality was 2.9% (1 out of 34 patients). According to EchoCG investigation data, increase in LVEF (from 30.0± 4.7% to 49.5± 9.0%) and hemodynamic indices normalization were registered in early terms after operation: peak systolic gradient decrease (83.3± 31.2 mm Hg before operation, and 24.3± 7.4 mm Hg after operation); heart volumes reduction (ESV 97.5± 44.8 ml and EDV 177.2± 56.3 ml with initial ESV 159.3± 46.2 ml and EDV 236.5± 62.5 ml, p < 0.01). Left heart sizes: ESV 4.4± 0.8 cm and EDV 5.9± 0.7 cm (with preoperative ESV 5.6± 0.7 cm, EDV 6.7± 0.8 cm), LV (5.2± 0.7 cm preoperatively, 4.5± 0.5 cm postoperatively).

**CONCLUSION:** Surgical correction of aortic stenosis in patients with low LVEF results in improvement of clinical condition and hemodynamic indices in early terms after operation. Evident systolic myocardial dysfunction in patients with aortic stenosis is not a contraindication to defect surgical correction.

#### **P-008-ENDOVASCULAR REPAIR OF POST-SURGICAL PSEUDOANEURYSM OF SUPRARENAL ABDOMINAL AORTA IN BEHCET'S DISEASE**

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Vascular Behcet's disease is a poor prognosis manifestation of this multisystemic vasculitis. This poor prognosis is due to postoperative complications



including pseudoaneurysm with 50% occurrence after previous surgical repair of aneurysm especially in the site of surgery. It is suggested that the fragility of the vascular wall may play a major role in this recurrence. Recent studies have demonstrated the effectiveness of endovascular stent-grafting for recurrent aortic aneurysm in patients with Behcet's disease. We present a recurrent aneurysm of the abdominal aorta at a previously scarred operative site in a known case of Behcet's disease. We attempted an endovascular treatment.

#### **P-009-AORTIC STENTGRAFTS. NOT EVERYTHING ACCORDING TO RULES**

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**BACKGROUND:** In our humble experience (26 stentgrafts in 22 patients from 2005) on aortic stentgrafts we met situations where solutions were not stereotyped.

**METHODS-RESULTS:** 72 years female with serious comorbidities and ruptured aneurysm in descending aorta was treated with stentgraft inspite of severe aortic tortuosity and because of it disapproving by legal company's manufacturing stentgrafts consultant. Helped "Buddy wire", popular in interventional cardiology. 76 years patient with ruptured aneurysm of abdominal aorta hadn't aortic necks (proximal and distal) for routine AAA stentgrafting. Surgery was too risky because of comorbidities. Single stentgraft in aneurysm stopped bleeding. In third case stentgrafting wasn't realized. 42 years female with mild pulmonary valve stenosis (gradient 20 mmHg) had pulmonary artery (truncus and main branches) aneurysm. In discussion surgery (homograft) or interventional radiology/cardiology (AAA type) won surgeons, but idea stays open.

**CONCLUSION:** Possibilities of stentgrafts overcome current usage.

#### **P-010-HYBRID ENDOVASCULAR APPROACH FOR DISTAL AORTIC ARCH - PROXIMAL DESCENDING AORTA ANEURYSMS: PRELIMINARY RESULTS**

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**BACKGROUND:** Conventional surgical repair of aortic aneurysm involving the distal aortic arch and proximal descending aorta, using cardiopulmonary bypass and deep hypothermic circulatory arrest still carries significant mortality and morbidity and predicts a high incidence of permanent neurological injury. Endovascular stent-graft placement has been developed as an effective therapeutic approach in these cases. In order to establish a secure proximal landing zone and to ensure complete exclusion of the lesion, covering of one or more aortic branches is sometimes inevitable; thus compromising adequate blood flow to the brain and upper extremities. Hybrid aortic arch surgery offers an essential solution to this problem.

**METHODS:** Among 64 endovascular stenting repairs for chronic degenerative aortic aneurysms, 10 were inserted in the thoracic aorta, two of which during the last 6 months in the aortic arch and treated using a hybrid approach. The first patient was 66 years old suffering from distal aortic arch aneurysm extending to the proximal descending aorta (zone 2). The second patient, 52 years of age suffered from a saccular descending aorta aneurysm just below the origin of the left subclavian artery (zone 3). In these patients, device design and implant strategy were on the basis of evaluation of aortic morphology with spiral CT. In the first patient, the stent graft (37mm x 15cm) was inserted through the right femoral artery. A supra-aortic vessel bypass graft was performed (anonymous-to-left carotid artery bypass and ligation of the origin of the left common carotid artery). In the second, endovascular stenting (40mm x 15cm) of the proximal descending aorta through the left femoral artery was performed first followed by left common carotid-to-left subclavian artery bypass after to ligation of the left subclavian artery at its origin. Postoperatively patients were monitored in the ICU for 24 hours and thereafter were transferred to the ward. No blood transfusion was administered. Follow-up included clinical examination, chest X-ray and computed tomography at discharge and 3 months post-operatively.

**RESULTS:** Primary technical success rate was 100% and patency of all endografts and extra-anatomic bypasses was 100%. No endoleak or graft migration

was observed. There were no neurological complications apart from a brachial plexus numbness, which resolved. The median hospital stay was 5 days.

**CONCLUSIONS:** Hybrid distal aortic arch and proximal descending aorta repair is technically challenging but feasible. This therapeutic approach may be an alternative to standard open procedures in high-risk patients. These promising early results need to be confirmed by longer follow-up and larger series. To the best of our knowledge these cases represent the first attempt using this particular technique in Greece.

#### **P-011-PEARLS AND PERILS OF PALMAZ STENTING IN THORACIC AORTIC ANEURYSMS**

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**BACKGROUND:** Palmaz stents were invented over two decades ago and approved by the Food and Drug Administration for use in peripheral arteries. Its application in the thoracic aorta has been reported in the literature only sporadically. We report our experience with three recent patients with thoracic aortic aneurysms.

**METHODS:** We describe a case series of three patients with descending aortic aneurysms who were considered high risk for open repair due to their age and comorbidities. All of them were treated by Gore TAG endovascular stent grafting that ultimately had type one endoleaks. After a failed observation period, additional thoracic stent grafts along with a higher radial force Palmaz stent were placed, in order to obliterate the endoleaks.

**RESULTS:** Our first patient was an 86 year old male who had a six cm thoracic aneurysm repaired with a Gore TAG device. He subsequently developed an endoleak which was successfully treated with a Palmaz stent. The second patient, a 74 year old male, had a ruptured thoracic aneurysm and survived the initial stent graft procedure. Two days later a type one endoleak was successfully repaired with an additional stent graft and a Palmaz stent. The last patient was an 84 year old female, who also had a ruptured aneurysm and survived the initial thoracic stent procedure. Six months later a type one endoleak was repaired with an additional proximal stent graft and a Palmaz stent, only to develop a retrograde type one dissection which was repaired with an open operation using circulatory arrest. She died postoperatively from a stroke.

**CONCLUSION:** For high risk patients who undergo thoracic aortic stent graft placement that develop a type one endoleak, Palmaz stent placement is a viable adjunct treatment option. However, one should keep in mind that complications may occur from the use of any high radial force balloon expandable stent in the somewhat unforgiving environment of the thoracic aorta.

#### **P-012-INITIAL EXPERIENCE IN ENDOVASCULAR TREATMENT OF THORACIC AORTIC DISEASES**

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**BACKGROUND:** Conventional surgery of descending thoracic aorta has an important morbidity and mortality, specially in acute aortic dissection. To show the experience of our institution in the endovascular treatment of thoracic aneurysms and type B aortic dissection with endografts.

**METHODS:** From July 2001 to January 2007, 21 patients were subjected to an endovascular procedure (20 men and 1 woman), with a medium age of 67.1 years (42-81years). The causes of the surgery were: 11 patients presented thoracic aortic aneurysm (52.4%), 2 cases presented aortic pseudoaneurysm (9.5%), 6 patients presented a type B aortic dissection (28.6%), 1 patient presented a penetrating atherosclerotic ulcer (4.7%), and one patient presented an aortic intramural hematoma (4.7%). CT-scan follow up was carried out in all patients (1 month, 6 months, 12 months and 1 year postoperative).

**RESULTS:** All procedures were carried out under general anesthesia. It was not necessary to perform an open surgery in any endovascular procedures. The subclavian artery was covered deliberately in 4 patients. In 2 patients a type II endoleak was detected, solved spontaneously in the postoperative period. A

late type III endoleak and lesion of an iliac artery during endovascular procedures appeared in two cases. The mortality observed was of 9.5% (2 patients), due to a multiorganic failure in the context of an acute aortic dissection and a rupture of thoracic aortic aneurysm. In the follow up, the mortality rised to 10.5% with no relation with the endovascular treatment.

**CONCLUSIONS:** The endovascular technique is an efficient alternative of treatment in the pathology of descending thoracic aortic diseases. Consist an alternative in those patients with a high anesthetic risk and elevate morbidity, where the conventional open surgery is contraindicated. Results and risk derived from endovascular procedures are acceptable from the initial learning of the endovascular technique.

### **P-013-ONE STAGE OFF PUMP SURGICAL AND ENDOVASCULAR REPAIR OF AN AORTIC ARCH ANEURYSM AND CORONARY OCCLUSION**

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**BACKGROUND:** Repair of an aortic arch aneurysm traditionally requires cardiopulmonary bypass, hypothermia, and circulatory arrest, all of which are associated with significant morbidity and mortality. Recently endovascular stent grafts have become an alternative, less invasive treatment option for some patients. In the literature, sequential transposition of aortic arch vessels and endovascular stent graft placement in two stages has been described. Off pump CABG is another method of coronary revascularization without using cardiopulmonary bypass.

**METHODS:** We describe a patient with bovine aortic arch anatomy and a 6.5 cm saccular aneurysm of the aortic arch, originating proximal to left subclavian artery. His heart catheterization revealed an occluded right coronary artery. We performed a hybrid procedure via a midline sternotomy: a right aorto-coronary venous bypass graft, an aortic arch transposition with a bifurcated Hemashield graft, and a thoracic endovascular stent graft repair of an arch aneurysm, all performed in one stage and all off pump.

**RESULTS:** An intraoperative angiogram revealed no endoleaks. A few days later the origin of left subclavian artery was coiled to prevent a retrograde endoleak via subclavian artery backflow into the aneurysm. A follow up ultra-fast CT scan at 12 months showed his stent graft to be in good position with no endoleaks and a patent right coronary artery bypass graft.

**CONCLUSION:** Aortic arch aneurysms and coronary artery disease can be repaired by a hybrid procedure all without the use of cardiopulmonary bypass, hypothermia, or circulatory arrest. This unique single stage off-pump approach may be considered in selected high risk patients.

### **P-014-POSTOPERATIVE ATRIAL FIBRILLATION TREATMENT WITH INTERNAL CARADIOVERSION IN PATIENTS SUBMITTED TO CARDIAC SURGERY**

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**OBJECTIVE:** To estimate the efficacy of postoperative atrial fibrillation (PAF) treatment and restoration of the sinus rhythm using the internal electrical cardioversion (IEC) with temporary epicardial wire electrodes and an external device interface module (EDIM).

**METHODS:** 128 patients submitted to open heart surgery for CABG (n=79), valve replacement (n=36) or combined CABG and valve surgery (n=13) with cardiopulmonary bypass and cold blood cardioplegic arrest under moderate systemic hypothermia (28o- 32oC). The electrodes were applied on the epicardium during the rewarming of the patient. The patients were classified in 2 groups according to the type of treatment used to manage AF: 1) Group A (n=70); amiodarone (300mg bolus IV plus 700mg/24h) was administered to control the ventricular response and restore the sinus rhythm. 2) Group B (n=58); patients were treated with IEC using EDIM with low initial shock energies (6 joules). The treatment was considered successful if AF was converted to sinus rhythm. Any recurrence of AF within 60sec after the successful cardioversion was considered as early recurrence and a new attempt of IEC was performed. A third and final attempt was performed with 9 joules of energy in case of failure to restore the

sinus rhythm. The IEC was considered unsuccessful if the third attempt failed to restore sinus rhythm whereupon intravenous amiodarone administration was initiated. No prophylactic antiarrhythmic drugs were administered.

**RESULTS:** Thirty-nine (30.5%) out of the 128 patients enrolled in this study developed AF during the early postoperative period at a mean of  $1.8 \pm 1.2$  days after surgery. Twenty-two patients were included in group A and 17 in group B. PAF in patients of group A was treated with amiodarone. The total restoration rate to sinus rhythm was 77.3%. IEC was performed on all patients of group B with an overall 82.4% (14/17) conversion rate to sinus rhythm. However, 6 of those patients developed early recurrence of AF and needed a second shock. IEC was not successful in the rest 3 patients and treatment with amiodarone was initiated. Two patients finally restored sinus rhythm, while the third patient developed resistant chronic AF. Three patients from group A and another from group B presented transient ischemic attacks after the restoration of sinus rhythm. One patient of group A sustained stroke, but none in group B did. The time to extubation, the time to conversion to sinus rhythm, the length of stay in the ICU and the overall length of stay were significant ( $P < 0.05$ ) shorter for the patients of group B. None of the patients experience any discomfort, while no complications were observed.

**CONCLUSIONS:** PAF treatment with IEC can be an efficient alternative to drug therapy in patients submitted to open heart surgery. The defibrillating wires can be placed and removed easily, without complications, while they can concurrently serve as pacing wires. IEC is safe and can be performed without receiving anesthesia, even in the ward. Moreover, antiarrhythmic drugs can be generally avoided thus their side effects eliminated, while the overall cost and length of hospital stay is reduced.

### **P-015-THE IMPACT OF ATRIAL FIBRILLATION ON CARDIAC SURGERY: A 10-YEAR REVIEW OF AN ASIAN SURGICAL DATABASE**

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**BACKGROUND:** Atrial fibrillation (AF) surgery is becoming established in our repertoire of intervention. We review the extent of AF in our existing practice before we can understand the impact of surgical correction.

**METHODS:** We retrospectively reviewed 7926 consecutive cardiac surgery registry patients (January 1996-December 2005). Pre-operative AF was present in 657 (8.3%) patients. Post-operative new-onset AF occurred in 982 (13.5%). We studied the impact of pre-operative and post-operative new-onset AF on survival following cardiac surgery and identified risk factors for post-operative AF.

**RESULTS:** Patients with pre-operative AF were younger, male, ethnic Chinese with renal impairment, cerebrovascular disease and on anticoagulants. They were more likely to have elective surgery: mainly valve surgery; mitral replacement surgery; and redo-surgery. There was no significant difference in operative complication between patients with and without-AF, although patients with AF were more likely to have pulmonary and renal complication, and be readmitted within 30-days from surgery for arrhythmias. Patients with post-operative AF were older with multiple comorbidities, and history of congestive cardiac failure. Patients with NYHA functional class III-IV, undergoing valvular surgery, having longer bypass and cross-clamp time were more likely to have new-onset post-operative AF. The unadjusted mortality was significantly higher for patients with pre-operative AF (Hazard ratio, HR 1.67, 95% CI: 1.4-2.0,  $p < 0.001$ ), and for patients with post-operative new-onset AF (HR 1.59, 95% CI: 1.3-1.9,  $p < 0.001$ ), compared to those without. The 5- and 10-year survival of patients with new-onset post-operative AF compared to patients without AF were respectively: 82% vs 88%; and 63% vs 76%.

**CONCLUSION:** We reviewed the impact of atrial fibrillation on the outcome of cardiac surgery and identified the risks for post-operative AF in our patient population.

### **P-016-CRT (CARDIAC RESYNCRONISATION THERAPY) OUR EXPERIENCE WITH ST JUDE MYODEX LEAD.**

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**BACKGROUND:** Biventricular pacing has demonstrated improvement in car-

diac function in treating congestive heart failure associated with ventricular dys-synchrony. Sometimes the endocardial implantation of the lead by way of the coronary sinus fails. In these cases an epicardial approach could be a valid alternative.

**METHODS:** Between February 2003 and September 2007, 36 patients with depressed left ventricular function (mean ejection fraction  $28.89 \pm 8.08\%$  ranging from 15 to 40%), left bundle-branch-block (QRS  $>140\text{ms}$ ) and congestive heart failure NYHA III or higher were enrolled. 28 were males, mean age was  $71.42 \pm 5.07$  years, 21 had previous cardiac surgery. A limited left-lateral thoracotomy (6-10 cm) was performed after a thoracic epidural space blockage was performed 15 minutes prior to an incision being made at the Th 3-Th 5 level. Four patients were awake. By using routine instruments, an incision was made under the phrenic nerve and the device was placed on the postero-lateral left ventricular wall in the obtuse marginal branch area. In 15 patients we implanted an epicardial lead with a suture and in 21 patients were placed a steroid-eluting bipolar suturless lead. In a second moment the lead was guided subcutaneously to the pacemaker.

**RESULTS:** No hospital deaths and major complications occurred. Mean intra-operative threshold was  $1.13 \pm 0.72$  V. All patients remained in the intensive care unit for less than 18 h. Chest drain were removed after a mean of 2 days and the patients were discharged after a mean of 5 days. Postoperative pacing thresholds at 7,5 months follow-up were satisfactory in all cases and there was no lead dislocation. The percentage of responder patients (based on NYHA class improvement) was 80%.

**CONCLUSIONS:** Epicardial approach is effective and safe and it can be considered a primary option for resynchronization therapy in congestive heart failure.

#### P-017-OPTIMAL ATRIAL LEAD POSITION FOR PERMANENT PACING AFTER MITRAL VALVE SURGERY COMBINED WITH MODIFIED MAZE PROCEDURE

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**BACKGROUND:** The aim of this study was to analyze the patients (pts) with the sinus node dysfunction after the two different approaches of modified Cox-maze procedure and mitral (MV) valve surgery, in whom permanent pacemaker had to be implanted. Due to the incisions and ablation lines in the right atrium (RA) it is problematic to find an optimal place for implantation of atrial lead.

**METHODS:** From January 2001 through September 2007, pacemakers have to be implanted in 22 of 156 pts after biatrial RF modified maze procedure in combination with MV surgery using septal approaches. Transseptal approach (TA) has been used 95 pts and septal-superior approach (SSA) in 61 pts. The optimal place for atrial lead implantation was searched using measurements of the pacing threshold, atrio-ventricular (AV) interval and intra-atrial conduction time. P-wave duration was measured using unipolar electrogram registered from the pacing lead.

**RESULTS:** The permanent pacing was necessary in 22/156 (14%) patients: 13 (14%) of TA group patients and 9 (15%) of SSA group ( $p = \text{NS}$ ). Active fixation bipolar leads were implanted in the region of low RA in 5 pts, at the base of RA appendage's stump in 2 pts, in the interatrial septum in 3 pts, and near the ostium of coronary sinus (CS) in 12 pts. The mean acute pacing threshold was  $1 \pm 0.48$  V. The shortest P-wave duration and resulting AV intervals were detected when the leads were implanted in the region of CS ostium. The mean AV interval when pacing at the CS ostium was  $180 \pm 50$  ms vs  $230 \pm 147$  ms at other places. The amplitude of atrial potential was higher near the CS ostium (mean  $2.07 \pm 1.14$  mV) than at other sites ( $1.4 \pm 1.2$  mV). Follow-up duration was 3-60 months, with no early or late lead dislodgement. In 3 pts (14%) subsequent transvenous catheter ablation using CARTO system to cure left atrial flutter was performed. At 24 months of follow-up 80% patients (16/20) had no atrial flutter/fibrillation and at 60 months - 6/7 patients (86%).

**CONCLUSIONS:** In our opinion, the region of CS ostium is most useful for atrial lead fixation after RF modified maze procedure in both TA and SSA groups. The need for permanent pacing did not significantly differ in the TA and SSA groups.

#### P-018-EFFECTS OF TEMPORARY ATRIAL PACING ON THE PREVENTION POSTOPERATIVE ATRIAL FIBRILLATION

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TEMPORARY ATRIAL PACING IN THE PREVENTION OF POSTOPERATIVE ATRIAL FIBRILLATION Vicente Avila Neto, M.D., PH.D.,\* Roberto Costa, M.D., PH.D.,† Katia Regina da Silva, R.N.,† Andri Luiz Mendes Martins, M.D.,\* Luiz Felipe Pinho Moereira, M.D., PH.D.,† Leticia Bezerra Santos, M.D.\* From the Real e Benemrita Associação Portuguesa de Beneficência, Hospital, Brazil, and Heart Institute (InCor), University of Sao Paulo Medical School, Brazil

**BACKGROUND:** Atrial fibrillation is a common complication after coronary artery bypass grafting. Since its prevention with prophylactic drug therapy has limited success, alternative approaches are desirable. This study examined the efficacy of atrial or biatrial pacing, compared with no pacing, on the incidence of atrial fibrillation after isolated coronary artery bypass grafting.

**METHODS:** From August 2002 to September 2004, 240 patients underwent coronary artery bypass grafting. After surgery, right and left atrial epicardial pacing wires were implanted for 72 hours of temporary pacing. Patients were randomly assigned to one of three groups: no pacing (control group), right atrial, and biatrial pacing. Cardiac rhythm was monitored continuously during intensive care, or daily on the ward. The primary endpoints of this study were an episode of atrial fibrillation occurring up to 72 hours after coronary artery bypass grafting and the risk factors correlated with this event.

**RESULTS:** Atrial and Biatrial pacing significantly lowered the incidence ( $1.25\% \text{ vs } 25\%$ ,  $P = 0.001$ ) of atrial fibrillation episodes, and were both correlated (odd ratio 0.038; 95% confidence interval 0.005-0.29) with a decrease in rates of post-operative atrial fibrillation. Multivariable analysis identified older age (odd ratio 1.074; 95% confidence interval 1.024-1.12) and no pacing as independent risk factors of postoperative atrial fibrillation.

**CONCLUSIONS:** Temporary right atrial or biatrial pacing after coronary artery bypass grafting significantly decreased the postoperative incidence of atrial fibrillation. Multivariable analysis identified older age and no pacing as predictors of atrial fibrillation occurrence.

#### P-019-INTRAOPERATIVE TRANSESOPHAGEAL ECHOCARDIOGRAPHIC EVALUATION OF RIGHT VENTRICULAR GEOMETRY AND FUNCTION IN PATIENTS UNDERGOING LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION.

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**BACKGROUND:** Left ventricular assist devices (LVAD) have been demonstrated to be effective in bridging patients with end-stage heart failure to transplantation and as permanent support. However, success can be limited by right ventricular failure (RVF), with subsequently prolonged ICU stay and elevated mortality. There are as yet no accepted preoperative predictors of postoperative RVF. Based on geometry and function of the RV evaluated by transthoracic echocardiography (TTE) we developed an algorithm for patient selection for LVAD implantation. This study assesses the value of transesophageal echocardiography (TEE) for further improvement of patient selection.

**METHODS:** A retrospective review was performed on patients who underwent LVAD implantation at our institution between 01.01.2005 and 01.11.2007 ( $n=162$ ). Patients with acute heart failure (e.g. postcardiotomy, graft failure after heart transplantation, acute myocardial infarction) and children  $<18$  years old were excluded from the analysis. Since 2006 in our institution we perform routinely preoperative TTE evaluation of the RV function and select patients for LVAD accordingly to algorithm of device selection based on preoperative evaluation of tricuspid regurgitation and RV geometry. Thirty-seven patients selected for LVAD implantation with mild or no tricuspid regurgitation in preoperative transthoracic echocardiography were included in our study. The geometry was evaluated in terms of the basal RV enddiastolic diameter (RVEDD 1), the mid RVEDD (RVEDD 2), base to apex length of RV (RVEDD 3), enddiastolic diameter of RV outlet tract above aortic valve (RVOT 1) and above pulmonary valve (RVOT2). Short/long axis ratio was calculated (RVEDD1/RVEDD3 and RVEDD2/RVEDD3). RV function was assessed by fractional area change (FAC), tricuspid annular plane systolic excursion (TAPSE) and strain (deformation) of free RV wall. Patients were divided into two groups: RV failure ( $n=6$ ), and a non-



RV-failure group (n=31).

**RESULTS:** The overall incidence of right heart failure was 16%. All patients were supported by continuous flow pumps. There were no differences in demographic or clinical characteristics between the two groups before LVAD implantation. Similarly, no differences could be seen between the groups regarding hemodynamic or laboratory data before LVAD implantation. There were also no differences in TEE data between the two groups.

**CONCLUSION:** Routine use of TTE evaluation of the RV has been shown to be effective in the selection of patients at risk of developing postoperative right heart failure. No additional predictors of postoperative right heart failure in the preselected patient cohort were identified using TEE.

## **P-020-HIGH URGENCY TRANSPLANTATION AS AN ALTERNATIVE FOR ASSIST DEVICES IN ACUTE HEART FAILURE PATIENTS.**

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**OBJECTIVE:** Despite a significant mortality, the number of assist device implantation is increasing. The major reason are the lack of suitable donor hearts and the severe nature of disease leading to heart failure. However, in selected cases, high urgency transplantation might be an excellent alternative.

**METHODS:** Since 2005 until June 2007 74 orthotopic heart transplantations were performed in our institution. Mean recipient age was 49 years. 82 percent of these patients were in NYHA class 4 and listed for high urgency transplantation according to Eurotransplant rules (n=61). All patients were on ICU with moderate to high dosage of i.v. catecholamines, except 13 patients with end-stage cardiac amyloidosis, where no medical treatment is effective. Mean waiting time on HU was 34 days. All transplantations were performed as total orthotopic heart transplantations with inhalative NO starting with reperfusion. Immunosuppression consist of induction therapy with ATG combined with steroids, FK 506 and MMF.

**RESULTS:** Of these 74 patients, 69 are alive. Survival rate for HU patients was 93.44 percent compared to a 92.3 percent for regular listed patients. (100% for 30 days, 97.3 % 6 month survival). Of the five observed deaths, only two were cardiac related. There was no early graft failure. All surviving patients were in NYHA class I and II.

**CONCLUSION:** Despite end-stage heart failure, high urgency heart transplantation can be performed with excellent results even in this high risk group. Despite the fact that all of these patients could be bridged to transplant by means of an assist device, high urgency transplantation should be intended with priority. However, the limiting factor for survival is a donor organ in time.

## **P-021-THE USE OF pVAD AS A BRIDGE TO OFF-PUMP SURGICAL REVASCLARIZATION**

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**BACKGROUND:** Traditionally intra-aortic balloon pump (IABP) counterpulsation has been used for mechanical circulatory support in patients in cardiogenic shock (CS). However, passive counterpulsation can only modestly increase cardiac output and coronary blood flow and cannot provide total circulatory support in case of hemodynamic collaps. Percutaneous left ventricular assist devices (pVAD) have recently been developed and have been shown to provide superior circulatory support to IABP in patients with CS.

**METHODS:** We present a case of a patient admitted in CS due to myocardial infarction. Active hemodynamic support with pVAD was established and since the patient was a poor candidate for PCI, off-pump surgical revascularization was performed.

**RESULTS:** A 59-year old male treated for diabetes mellitus, hypertension and dyslipidemia was admitted to our hospital due to anteroseptal STEMI and cardiogenic shock. Coronarography revealed critical 95% left-main stenosis (LM) and occlusion of proximal RCA. Ejection fraction was estimated to less than 15%. Percutaneous left ventricular assist device - pVAD was placed in a standard fashion as a bridge to surgical coronary revascularization and LM was subsequently stented. When patient was stabilised we opted for elective surgical coronary revascularization. Since the patient was on active circulatory support with a pVAD, off pump revascularization of the myocardium was performed. Patient tolerated the procedure well. Further hospital course was unremarkable

and the patient was discharged home.

**CONCLUSION:** With an aggressive medical management and the widespread use of primary coronary intervention in acute myocardial infarction (AMI) the incidence of CS seems to be decreasing. When CS does occur it is related to unacceptably high in-hospital mortality rates reaching up to 70%. Neither medical management nor IABP placement have been proven to affect long-term survival in CS patients. Emergency revascularization after AMI has been the only approach shown to improve long-term survival in CS patients. In these no published strategy to date has been able to improve short-term survival. Recently pVADs have been developed and have been shown to provide superior circulatory support to IABP in patients with CS due to AMI, myocarditis and advanced heart failure. Our patient had a critical LM stenosis and occlusion of RCA and emergency surgical revascularization was indicated. However, patient rapidly deteriorated to CS and surgical revascularization was not pursued at that time. We opted for pVAD, planning to reverse CS and stabilize the patient before further surgical intervention. Due to recent large upper gastrointestinal bleeding, we were reluctant to perform coronary revascularization using extracorporeal circulation with full heparinization. Instead, off-pump coronary revascularization on pVAD was performed. The patient tolerated the procedure well. There were no episodes of hypotension, cardiac arrest or malignant arrhythmias. pVADs have been proven superior to passive counterpulsation in variety of clinical settings. Although being technically more challenging to place and manage, our experience confirms its usefulness, enabling us to treat patient that were, even couple of years ago, beyond our reach. We believe pVAD should in time replace IABP as a golden standard in management of CS.

## **P-022-IABP SIZING: THE LENGTH OF THE AORTA FROM THE LEFT SUBCLAVIAN ARTERY (LSA) TO THE CELIAC AXIS (CA) CAN BE PREDICTED**

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**BACKGROUND:** Traditionally patients shorter than 162cm are treated with 35 cc IAB and taller with the 40cc with the risk of patient-balloon mismatch. This pilot study attempts to lead to more optimal IABP size selection by being able to predict the aortic lengths from LSA to CA.

**METHODS:** Internal aortic lengths and various demographics were collected from a series of 40 cadavers during autopsy. External somatometric measurements were also obtained. There were 23 males and 17 females. The mean age was 73.1+/-13.11years, weight 56.75+/-12.51kg and the height 166+/-9.81cm.

**RESULTS:** Multiple regression analysis revealed the following predictor variables ( $R^2 > 0.70$ ) for estimating the length from LSA to CA: height (standardized coefficient (SRC)=0.37,  $p=0.004$ ), age (SRC=0.35,  $p<0.001$ ), sex (SRC=0.21,  $p=0.088$ ) and the distance from the jugular notch to trans-pyloic plane (SRC=0.61,  $p<0.001$ ). Using discriminant analysis the model was cross validated.

**CONCLUSION:** Routinely, IABP size selection is being dictated by the patient's height. Inevitably, this leads to pitfalls. We reported a mathematical model of optimal IAB sizing, which is easy to be applied and has a high predictive value.

## **P-023-HEARTMATE II AND QUALITY OF LIFE: ALARMS AND ADVISORIES IN THE OUT CLINIC SETTING**

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**BACKGROUND:** The HeartMate II (HMII) is a small axial flow pump, controlled by a System Driver (SD) and powered by batteries or main power supply by means of a Power Base Unit. The SD reproduces advisories and alarms by means of an audible tone and/or illuminated lights. These advisories and alarms, and events not perceptible for the patient, are stored in a data file consisting of 120 lines and operating on "first in-first out" basis. Although patients inform the hospital staff in the event of an abnormal alarm, they are not aware of, for instance, a decrease in speed caused by depleted batteries. The purpose of this study is to determine which alarms and advisories patients experience in the out clinic setting.

**METHODS:** During the out patient clinic, with an interval of approximately one month, data files of 14 patients, 13 males and 1 female, age 45  $\pm$  11, range 28



- 64 years, BSA 1,94±0,14 m<sup>2</sup>, flow 5,9±0,5 l/m, resp, were obtained and analysed. Advisories caused by normal handling, like changing the batteries, and not perceptible events for the patient which do not influence the behaviour of the pump, were excluded.

**RESULTS:** Out of 6,2 pyears of support, 78 data files were analysed enclosing 6970 hrs, 0,8 pyear, of support. Low battery advisories, 637, of which 107, 17 %, 134/patyear, resulted in a low battery hazard with power save mode ( 8000 Rotations Per Minute (RPM)) and suction events, 489, 612/patyear, resulting in a decrease in RPM to Auto Low Limit value, were recorded. One patient experienced a short pump stop due to the removal of both batteries at once, two patients a low battery of the SD battery cell and three patients a separation between the strain relief on the controller-end of the percutaneous lead and the underlying connector after resp. 183, 210 and 315 days post implant. There was no failure of the pump nor the SD.

**CONCLUSIONS:** Although this study is limited by the time-interval, data was obtained, it shows the HM II system to be reliable and durable and patients are almost only confronted with alarms due to normal handling and habituation. The question arises whether alarm signals, audible and visual, caused by rarely occurring advisories and alarms, should be improved for faster understanding by the patient. Further investigations would be necessary to clarify this hypothesis.

#### P-024-COMPARISON OF CARDIOMYOCYTE CULTURE FROM DIFFERENT SPECIES FOR AUTOLOGOUS TRANSPLANTATION

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**BACKGROUND:** Few studies have compared the cardiomyocyte culture patterns of different animal species. In this study, we compared the characteristics of adult cardiomyocyte cultured from the sheep, rat, and GFP mouse.

**MATERIALS & METHODS:** Four of each of Corridale sheep, Sprague-Dawley rats and GFP mice were used. Cardiomyocyte culture was performed using portion of left ventricular muscle from each animal. Phase contrast light microscopy was performed immediately after isolation and periodically during culture.

**RESULTS & CONCLUSION:** Cardiomyocytes freshly isolated from the ventricles of the three species showed similar morphological forms, but their sizes tended to decrease in accordance with species size. During primary culture, cardiomyocytes from all three species attached to the culture dish and proliferated with some contaminating non-cardiomyocyte heart cells. These cardiomyocytes progressively lost their original morphologies. In GFP mice, cardiomyocytes characteristically lost their viabilities during subculture and died, but the cardiomyocytes of sheep and rats did not. We presume that genetic manipulation used for fluorescence in these animals may have contributed to this result. To the best of our knowledge, this is the first report of GFP mice cardiomyocyte culture.

#### P-025-CALCIFICATION RESISTANCE WITH PROCYANIDINS TREATED DECELLULARIZED PORCINE AORTIC VALVE IN VIVO

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**BACKGROUND:** Conventional glutaraldehyde fixation is conducive to calcification of bioprosthetic tissues. The aim of this study was to test calcification resistance of procyanidins treated decellularized porcine aortic valve in rat model. Materials and

**METHODS:** After crosslinking of the decellularized porcine aortic heart valves by procyanidins, morphologic performance were observed and the tensile strength and crosslinking index were examined. Then samples of procyanidins crosslinking decellularized valves, glutaraldehyde crosslinking decellularized valves and decellularized valves were implanted in rat subcutaneously. The retrieved grafts were stained with hematoxylin-Ceosin (H&E) and von Kossa and were analyzed with scanning electron microscopy (SEM), X-ray energy dispersive spectroscopy (SEM-EDS) after 21 and 63 days.

**RESULTS:** After decellularized and crosslinking pretreatment, the procyanidins crosslinked leaflets were soft and stretchable. And the cellular components of the porcine aortic heart valve leaflets were completely removed and extracellular matrix were maintained completely. Examination of tensile strength revealed a significant higher tissue resistance to tension in procyanidins crosslinked tis-

sue than in others including glutaraldehyde group ( $p<0.05$ ), even though the extents of crosslinking of each group are roughly the same at about 92%. Histopathologic examination showed that procyanidins crosslinked valve matrix had no significant calcification in 21-day and 63-day rat study. And there were no calcium peaks in the EDS profile of procyanidins crosslinked samples in 21-day rat and 63-day rat study.

**CONCLUSION:** This study demonstrated that procyanidins crosslinked decellularized heart valves can resist calcification to some extent.

#### P-026-REPAIR OF TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE - VIENNA EXPERIENCES

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Despite growing improvements in surgical techniques and perioperative management, total anomalous pulmonary venous drainage (TAPVD) is still considered one of the more challenging congenital defects. Between 1991 and 2006, 34 children (aged between 1 and 165, mean 35 days, 68 % male) and one adult with TAPVD underwent surgical correction. 59 % had decompensated heart failure, whereas 3 were moribund at admission. The anomalous drainage was supracardiac in 14 (40 %), infracardiac in 9 (26 %), cardiac in 7 (20 %), and mixed in 5 children (14 %). Fifteen neonates (43 %) underwent repair during first week of life. Perioperatively 4 children (11.4 %) died. Ages: 5, 16, 65, and 100 days, respectively, with cardiac, mixed, and in two cases infracardiac type, two thereof following postoperative ECMO treatment. All four deaths were in patients with anatomically borderline small left ventricle, operated on emergently within 24 hours after urgent admission and first diagnosis or preoperatively catecholamine dependent with ventilation and ECMO support. Mortality rate was 0 % for supracardiac type, and 14, 22, and 20 % for cardiac, infracardiac, and mixed type, respectively, and 13 % for the subgroup of neonates. So far, with an average follow-up of 111 months there was neither late death nor reoperation. Among all 30 children surviving repair, 76 % are asymptomatic and without medication. With consistent surgical approach to repair as early as possible in hemodynamically stabilized neonates and children with TAPVD, low early mortality and so far promising long-term results are achieved.

#### P-027-TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION: EARLY AND MIDTERM RESULTS OF A LOW VOLUME PAEDIATRIC CARDIAC CENTER IN THE CURRENT ERA

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**BACKGROUND:** The experience of a low volume Paediatric Cardiac Centre in the surgical treatment of total anomalous pulmonary venous connection (TAPVC) in the current era is presented.

**METHODS:** From June 2001 to November 2007, 17 infants had surgical repair of TAPVC in our centre. There were 10 male (59%) and 7 female patients with a median age of 46 days (range, 2 days to 13.4 months), and a median body weight of 3.7 (range, 2.7 to 7.3) kg. Presenting symptoms were: cyanosis, 13 (76%); failure to thrive, 12 (71%); congestive heart failure, 10 (59%). Cardiac catheterization confirmed exact diagnosis in all but 3 cases, whereas in 3 cases (18%) the exact anatomy of the lesion was confirmed intraoperatively. The anatomic types of TAPVC were: supracardiac, 8 (47%); cardiac, 5 (29%); infracardiac, 2 (12%); mixed, 2. All had repair of TAPVC, as well as associated heart defects (ASD, 15; PDA, 6; VSD, 1), using cardiopulmonary bypass and hypothermia (22°C). All patients received NO postoperatively.

**RESULTS:** Two patients (TAPVC, cardiac type, 1; infracardiac type, 1) died on postoperative days 32 and 11, respectively, due to infection and pulmonary hypertension / low cardiac output syndrome (in-hospital mortality, 11.7%). Median ICU stay for the survivors was 6 (range, 4-8) days. At a mean follow-up of 37 (range, 2 to 75) months including all the survivors, one patient (6.6%) developed pulmonary venous obstruction within 6 months post surgery, and had reoperation elsewhere. The rest are doing fine with no problem in pulmonary venous return, and no medication.

**CONCLUSION:** Surgical repair of TAPVC can be performed in low volume centres with good early and midterm results.

## P-028-OVERVIEW OF POSSIBILITIES OF CAVA PULMONARY CONNECTIONS

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**BACKGROUND:** The idea of Fontan to turn blood from systemic vein directly to the pulmonary artery gave a possibility for complete hemodynamical correction first of all of complex congenital anomalies, such as tricuspid atresia and common ventricle. During the time, surgical technique developed forwards many modifications and new indications for this operation were established. The aim of this work was to overview various possibilities to treat special cardiac diseases and evaluate results.

**MATERIAL & METHODS:** The most often indications for Fontan or hemi Fontan procedure were tricuspid atresia and varieties of common ventricle (78 procedures were made in our clinic). Non classical indications for total or partial cardiopulmonary connection were: 1.Ebstein's anomaly: - Bidirectional Glenn procedure and correction of Ebstein's malformation was performed for 3 patients, - Bidirectional Glenn procedure and replacement of tricuspidal valve using biological prosthesis was performed for 3 patients. 2.The problem of tricuspid stenosis after radical correction of common atrioventricular canal and Tetralogy of Fallot was solved by creating bidirectional Glenn procedure in 1 patient. 3.Heart lymphogranulomatosis with obstruction of right ventricle. The problem was solved by creating total cavapulmonary connection and late chemotherapy (1 patient).

**RESULTS:** Results of the Fontan operations performed in the first period were with comparatively high mortality and a reasonable number of late complications (long lasting pleural effusion, right-side decompensation and protein losing enteropathy). Since 1993 fenestration has been introduced and results improved. In the last period since 2000 Fontan circulation has been performed by using technique of extracardiac conduit, or lateral tunnel, or intracardiac conduit. In these series we had 1 death. All 8 patients with non classical indications for cavapulmonary procedure survived operation and are doing well.

**CONCLUSIONS:** We conclude that brave idea of Fontan is still very actual and after various modifications is very useful for treating some difficult and very rare and unusual diseases.

## P-029-AUTOPERICARDIAL VALVED CONDUITS AS AN ALTERNATIVE FOR RIGHT VENTRICULAR OUTFLOW TRACT REPLACEMENT IN CHILDREN

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**BACKGROUND:** There is still no perfect conduit for reconstruction of the right ventricular outflow tract (RVOT) in children. Homografts and Xenografts are not always available in the appropriate size in pediatric patients, specially for neonates or infants and degenerate in a few years. This study evaluates the autopericardial valved conduit as an alternative for RVOT construction.

**METHODS:** From January 1, 1994, to December 30, 2006, a autopericardial valved conduit was inserted in all patients undergoing RVOT reconstruction. In patients without a native main pulmonary artery or connection RV-PA. Data were collected by retrospective review, follow-up echocardiograms, and assessment by a single cardiologist.

**RESULTS:** There were 32 patients with implanted RV-PA autopericardial valved conduit. Diagnosis included tetralogy of Fallot (n = 6); truncus arteriosus (n = 8); ventricular septal defect with PA (n = 7); DORV (n = 5); D-TGA with PS (n = 6). Patient age ranged from 3 ws. to 11 ms( 5.3±2.1) years and 11% were reoperations. The conduit sizes ranged from 12 to 14 mm and the median hospital length of stay was 5±2 days. There were 2 late deaths, none related to the conduit. At a follow-up of 6 to 60 months (mean 23 ± 11 months), all remaining 29 patients are New York Heart Association class I, all autopericardial valved conduits are functional, and no patient has required valve or conduit replacement or revision; more importantly, echocardiogram revealed no significant valve or conduit stenosis (mean gradient 14 ± 6 mm Hg) and no evidence of regurgitation or structural degeneration.

**CONCLUSIONS:** An autopericardial valved conduit provides a reliable alternative for RVOT reconstruction in pediatric patients, specially for neonates and infants. It is readily available, molds in the limited retrosternal space, and has outstanding intermediate results with no evidence of failure or deterioration up to 5-6 years after insertion.

## P-030-ACUTE RIGHT HEART FAILURE DUE TO AN AORTOVENTRICULAR FISTULA SECONDARY TO TETRALOGY OF FALLOT OPERATION (CASE REPORT)

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A 20 years-old male, who was previously operated due to Tetralogy of Fallot, was admitted to our Cardiology clinics, with abdominal pain and dyspnea complaints. Inspectionally, he had also jaundice. He was urgently taken into echocardiographic evaluation and aorto-right ventricular fistula, with a mean gradient of 39 mmHg was detected. Pulmonary arterial pressure was elevated (60 mmHg) because of the shunt. Pulmonary-to-systemic flow ratio was 1,2. His liver enzymes dramatically increased in his follow-up and he was scheduled for emergency operation. In the operation, it was observed that patch which closed the VSD was unstitched and a fistulization was formed both sub- and supraaortically between ascending aorta and the right ventricle. The defect was repaired primarily with 2/0 pledgetted Ti-cron sutures. Postoperative period was uneventful. The liver enzymes decreased dramatically and his jaundice resolved. On his echocardiographic evaluation, his pulmonary artery pressure was measured as 52 mmHg in the early-postoperative period. He was discharged from the hospital without any complication. Aorto-ventricular fistulas may be seen rarely, but they may cause life-threatening conditions, unless urgently corrected.

## P-031-COMPLETE ARTERIAL CORONARY ARTERY BYPASS GRAFTING in PATIENTS with LEFT VENTRICULAR DYSFUNCTION (EF≤40%)

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**BACKGROUND:** Patients presenting with left ventricular (LV) dysfunction undergoing coronary artery surgery are at increased risk of perioperative morbidity and mortality. The purpose of this study was to analyze the early outcome in patients with left ventricular dysfunction (LVD) who undergo complete arterial revascularization and to compare these results with those of conventional coronary artery bypass grafting (CABG).

**METHODS:** We reviewed, retrospectively, 180 patients with left ventricular dysfunction (EF≤40%), who underwent coronary artery bypass grafting surgery in our clinic. Group 1 consisted of 42 patients undergoing complete arterial revascularization (using internal thoracic and radial arteries) and group 2 consisted of 138 patients undergoing conventional CABG (using one internal thoracic artery and additional vein grafts).

**RESULTS:** Mean distal anastomosis number was 3.14±0.84 in group 1 and 2.57±1.01 in group 2 (p<0.001). The mortality rate in the arterial and saphenous group was 0% and 2.2%, respectively (p>0.05). We didn't find any significant difference in the incidence perioperative myocardial infarction, atrial fibrillation, use of inotropic support and intraaortic balloon pumping between groups. ICU and hospital stay was similar in two groups. There was no difference significantly with regard to other complication.

**CONCLUSION:** Especially in selected patient groups, complete arterial coronary revascularization using radial artery can be safely performed in patients with left ventricular dysfunction. Operative mortality and morbidity is comparable with conventional group.

## P-032-AMPLATZER ATRIAL SEPTAL OCCLUDER: WHEN NOT TO USE IT

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**BACKGROUND:** Amplatzer atrial septal occluder (AASO) is widely used to close atrial septal defects (ASD). However it can migrate into the pulmonary artery. Our aim is to determine why it does that and how to avoid it.

**METHODS:** The AASO was used in 73 consecutive patients in our institution. These were 5-63 year old (23.7±18.7); 38 were females. In 31 cases the AASO

was needed to close a POF (permeable oval foramen). In the remaining 42 cases AASO was used to close an ASD: 40 of them were less than 30 mm and the other 2 were longer. All ASD had a clear rim.

**RESULTS:** All AASO implants were fine but 2 (man and woman, 17 and 21 year old), both ASD bigger than 30 mm. The AASO migrated into the pulmonary artery, so it had to be removed performing a CPB procedure. In both cases the operation went well, they could be weaned shortly after closure of the ASD and the AASD rescue, being hospital-discharged in good condition.

**CONCLUSIONS:** The AASO device implantation was successful in all POF and ASD cases with less than 30 mm but unsuccessful when the diameter was bigger. Therefore, the Amplatzer atrial septal occluder must be avoided when the diameter is bigger than 30 mm.

### P-033-A CASE OF PATENT DUCTUS ARTERIOSUS CLOSING WITH THE AMPLATZER DUCT OCCLUDER USING AN ALTERNATIVE TECHNIQUE

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A 31 year-old-woman presented to our clinic with a history of weakness, dizziness, fatigue, palpitation, orthopnea and exertion dyspnoea even with minimal effort for a year. Her NYHA functional class was III. There was a grade 3/6 continuous machinery murmur over the left sternal edge. A patent ductus arteriosus (PDA) was detected with transthoracic echocardiography and cardiac catheterization. The PDA size was measured 6.5 mm. in TTE and 5.9±0.7 mm in cardiac catheterization (Fig.1A). PDA was occluded percutaneously using an Amplatzer duct occluder (ADO) (Amplatzer®, size: 12/8/6 mm) in the catheter laboratory by a different technique. 8F and 6F sheaths were placed in the femoral vein and artery. First, to localize the PDA accurately, a 0, 35 inch guide-wire (300 cm) inserted to the pulmonary artery from aorta. Because the attempts to pass a delivery sheath to the aorta from the pulmonary artery through PDA were unsuccessful, the guide-wire in the PDA was pushed to the right atrium and withdrawn from the femoral vein with a snare (Fig.1B-C). After a delivery sheath was passed to the descending aorta through the PDA with the help of this guide-wire, the occluder deployed easily (Fig.1D). Postprocedural follow-up period was uneventful. **DISCUSSION** Over the past 20 years, the efficacy and safety of transcatheter device closure for ducts smaller than 8 mm have been established with complete ductal closure achieved in more than 85 percent of patients by 1 year following device placement at a mortality rate of less than 1 percent. A self-expanding ADO device which is a combination of a plug and a double umbrella was firstly deployed by Masura et al in 1998 (1). Residual shunt is less likely with Amplatzer. The standard method to deploy an ADO device involves passing a guide-wire through the duct from the pulmonary side into the descending aorta. This is a relatively easy technique for large PDAs, however, advancing the catheter through a small PDA against the direction of blood flow may be difficult and time consuming. And sometimes these attempts may fail as in our patient. In such circumstances, capturing and withdrawing the guide-wire advanced to the pulmonary artery and up to the right atrium from the aorta with a snare may be helpful. This alternative technique may be preferred when the catheter cannot be pushed to the aorta through PDA and may shorten the duration of the procedure. Moreover, this technique may be the first choice in the percutaneous closure of small PDAs. **REFERENCES** 1. Masura J, Walsh KP, Thanopoulos B, et al. Catheter closure of moderate- to large-sized patent ductus arteriosus using the new Amplatzer duct occluder: immediate and short-term results. *J Am Coll Cardiol.* 1998 ;31:878-82.

### P-034-TELEMETRICALLY ADJUSTABLE PULMONARY ARTERY BANDING: FIRST APPLICATION IN GREECE

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**AIM:** Pulmonary blood flow control in congenital heart diseases has been the "dream" of many decades. Today, this dream seems to have come true. We present the first application in Greece of a telemetrically adjustable device for control of pulmonary blood flow after pulmonary artery banding ("FloWatch\_¥PAB" device) in a baby with congenital heart disease (CHD) and pulmonary hypertension.

**CASE REPORT:** A 40-day-old baby weighting 3.6kg with Down's syndrome and prenatally diagnosed congenital heart disease (complete atrioventricular

septal defect, secondary atrial septal defect, patent ductus arteriosus- PDA) was admitted to our hospital because of vomiting and failure to thrive despite maximum medical treatment. Cardiac catheterization revealed severe pulmonary hypertension (pulmonary artery pressure at 80% of systemic). PDA ligation and pulmonary artery banding (PAB) with the "FloWatch\_¥PAB" device were performed at the age of 2 months. Surgical approach was the same as in conventional PAB. The application of the device was easy, the postoperative course of the patient was smooth, the in-hospital stay shorter than usual. The telemetric regulation (tightening) of the device was simple and effective, and was performed initially at surgery, and then several times within the first postoperative days under echocardiographic guidance until the desired pressure gradient across PAB was achieved. At follow-up one and two months after discharge, the patient is fine, has gained weight, and no further adjustment was necessary.

**CONCLUSION:** The "FloWatch\_¥PAB" device can precisely control pulmonary blood flow in both directions (decrease - increase); it is, in fact, accompanied with no surgical mortality post PAB, and no surgical morbidity for PAB adjustment; we believe it should replace conventional PAB in most infants and small children with CHD and pulmonary hypertension.

### P-035-HYBRID PALLIATION IN THE CRITICALLY ILL NEONATE WITH HYPOPLASTIC LEFT HEART SYNDROME AND INTACT ATRIAL SEPTUM

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**BACKGROUND:** The modified Norwood procedure using a right ventricle-pulmonary artery conduit (Sano modification) can be performed in patients with hypoplastic left heart syndrome (HLHS) with a significant improving survival. However, pulmonary venous obstruction is associated with a significantly high risk of mortality. We report successful hybrid palliation in a case of HLHS with intact atrial septum (IAS) combined bilateral pulmonary artery banding immediately after birth.

**METHODS:** A 2.6-kg male infant prenatally diagnosed with HLHS and IAS was delivered by cesarean section after 37 weeks of gestation. Immediately after birth we performed atrial septectomy following method. At first, the needle punctured crossing atrial septum to the left atrium under guiding epicardial echo via the right atrium. Then a guiding wire for the balloon catheter inserted through through that needle. After that, septectomy successes using balloon catheter. Bilateral pulmonary artery banding using a 3 mm ePTFE tube had then performed. Inter-atrial stent was implanted for maintaining good communication on the 19th of age.

**RESULTS:** The baby had been improved hypoxia and hemodynamic state after hybrid palliation. On the day 34th of age the modified Norwood operation was performed successfully. Eleven months after the Norwood operation, the bidirectional Glenn procedure and tricuspid valve plasty was performed. He remains well and is awaiting a Fontan operation.

**CONCLUSIONS:** Hybrid palliation on pre-Norwood procedure might improve the outcome for the patients with HLHS and IAS.

### P-036-PULMONARY ARTERY BANDING FOR HEMI-TRUNCUS ARTERIOSUS: A CASE REPORT

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**BACKGROUND:** Anomalous origin of the right pulmonary artery (RPA) from the ascending aorta is a rare congenital malformation, which is also known as hemi-truncus arteriosus. Patients with this condition usually present in infancy with respiratory distress, tachycardia and failure to thrive. Adult presentation is extremely rare and the presence of unilateral pulmonary hypertension poses unique challenges in the management of these patients. We present a case of hemi-truncus arteriosus in an adult patient that was treated successfully with banding of the RPA.

**METHODS:** A 41-year-old female with long-standing history of intermittent haemoptysis presented with increasing frequency and severity of haemoptysis episodes requiring hospitalization and observation. Transthoracic echocardiography and computerized tomography demonstrated a hemi-truncus arteriosus, with normal connection of the right ventricle to the pulmonary trunk and left



pulmonary artery, while the RPA arose from the posterior aspect of the ascending aorta. Cardiac catheterization confirmed the diagnosis of Hemi-truncus arteriosus and hypoplastic right lung. There was no pulmonary hypertension in the left lung and the ascending aortic pressures were 120/80 mmHg.

**RESULTS:** Surgery was undertaken through a median sternotomy and the RPA was seen to arise from the right side of the posterior aspect of the mid-ascending aorta. The RPA was banded using two nylon tapes that were tied around the proximal part of the vessel. This reduced the mean pressure in the RPA distal to the tapes to 45mmHg with a mean ascending aortic pressure of 75mmHg. The patient had an uncomplicated postoperative course and was discharged from hospital on the 5th postoperative day. At 6 months postoperatively the patient remained clinically entirely well and there had been no further episodes of haemoptysis. Repeat transthoracic echocardiography demonstrated good biventricular function, although the RPA pressure could not be measured.

**CONCLUSIONS:** Significant haemoptysis can be the presenting symptom of adult patients with hemi-truncus arteriosus. Banding of the right pulmonary artery can be undertaken safely and represents a simple but effective procedure for the management of this complex condition

### P-037-UNIQUE CASE OF DOUBLE AORTIC ARCH IN INFANT: DIAGNOSTIC IMAGING AND SURGERY VIDEO

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**BACKGROUND:** Double aortic arch (DAA) is one of the two most common vascular ring forms with the incidence of latter of approximately 1,4% of congenital heart defects. Although DAA has various forms, the common defining feature is that both the left and right aortic arches are present. We describe a unique case of DAA with discontinuation between ascending aorta and left non-dominant arch which was proximally connected to the pulmonary artery.

**METHODS:** A 3-month old boy with the history of dysphagia and significant respiratory insufficiency was admitted to our Center. The patient had elevated pulmonary pressure and initially was diagnosed with patent arterial duct. Further angiographic and MDCT studies revealed vascular ring due to persistence of double aortic arch. The anatomic features were: right dominant aortic arch from which right subclavian and right carotid arteries originated, left aortic arch which was proximally connected with the pulmonary artery, gave an origin to the left carotid and left subclavian arteries and completed the vascular ring distally in the area of aortic isthmus. The anatomical course of ligamentum arteriosum was typical. The baby underwent surgery which consisted in ligamentum arteriosum division, division of the left aortic arch from the pulmonary artery and mobilization of great vessels.

**RESULTS:** Postoperative course was complicated with severe respiratory insufficiency which was successfully managed. Predischage CT showed restoration of tracheal dimensions. After 9 months patient is asymptomatic and well.

**CONCLUSIONS:** Herein we present a successful surgical management and short-term follow-up of a patient with unique vascular lesion. MDCT study was crucial in preoperative defining of exact anatomic features. Searching the literature we have not found similar anatomical arrangements being reported previously.

### P-038-ATRIAL SEPTAL DEFECT SURGERY THROUGH LIMITED RIGHT POSTEROLATERAL THORACOTOMY IN CHILDREN

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**BACKGROUND:** In the emerging era of atrial septal defect (ASD) device closure surgical methods are changing to less invasive also. We present our results of ASD surgical closure through limited right posterolateral thoracotomy (RPLT) access with conventional surgery technique and instrumentary.

**PATIENTS AND METHODS:** 205 patients underwent (ASD) closure through limited access (RPLT) during the 1998-2007 years period. Patients' age varied from 9 months to 18 years. A retrospective analysis of cardiopulmonary bypass time, mechanical ventilation duration, postoperative blood loss, intensive care stay was done.

**RESULTS:** There were no major complications regarding institution of cardiopulmonary bypass or bleeding during the operation and afterwards. Morbidity possibly related to approach consisted of pneumonia in 3 pts (1.5%), hydropneumothorax in 3 pts (1.5%), right phrenic nerve paresis in one patient (0.5%), sup. caval vein stenosis in one patient (0.5%). Hemodynamically significant residual shunting was observed in one patient.

**CONCLUSIONS:** Limited right posterolateral thoracotomy approach for ASD closure appears to be a safe alternative to total median sternotomy or device closure

### P-039-LONG-TERM RESULTS OF RASTELLI OPERATION USING VALVED CONDUITS

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**BACKGROUND:** Allograft and xenograft valved-conduits are placed between the pulmonary ventricle and pulmonary artery for the repair of many complex congenital cardiac anomalies. We analyzed the long-term results after Rastelli operation using valved-conduits.

**METHODS:** Between November 1978 and December 2002, 40 patients underwent operation with valved-conduit placement from pulmonary ventricle to pulmonary artery. The median age was 68 months (12 days - 25.3 years). Diagnosis included pulmonary atresia (15), transposition of the great arteries (16), double outlet right ventricle (7) and truncus arteriosus (4). Used valved-conduits were Capentier-Edwards conduit (16), Hancock conduit (7), Ionescu-Shiley conduit (8), Polystan conduit (4), and allograft pulmonic valve (6). The median diameter of the conduits was 18 mm (12 - 25 mm). Conduit failure was defined as pressure gradient higher than 40 mmHg, moderate to severe conduit regurgitation, cardiac death, and conduit replacement.

**RESULTS:** Early mortality rate was 25% (10/40). Median follow-up was 16.8 years (0.42 - 28.3 years). Overall survival rates were 65 % at 5 years and 59% at 10 years. Freedom from conduit replacement was  $92 \pm 3\%$  at 5 years,  $42 \pm 9\%$  at 10 years and  $24 \pm 8\%$  at 15 years. On univariate analysis, younger age was associated with conduit replacement. But, size of the conduit and type of conduits (homografts vs. xenografts) was not associated with conduit replacement. Freedom from conduit failure were  $59.8 \pm 8.0\%$  at 5 years and  $23.6 \pm 7.4\%$  at 10 years.

**CONCLUSIONS:** Even though the initial surgical mortality rate was not low and most of the patient required reoperation for conduit replacement, the long-term survival rate was satisfactory. Younger age at operation was associated with reoperation for conduit replacement. Allograft and xenograft did not showed difference in durability.

### P-040-ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY ASSOCIATED WITH ACCESSORY PATHWAY-COMBINED SURGICAL AND INTERVENTIONAL TREATMENT

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**BACKGROUND:** Anomalous origin of left coronary artery from pulmonary artery (ALCAPA) is a rare congenital cardiac malformation requiring surgical treatment in infancy. To the best of our knowledge the combination of ALCAPA and supraventricular tachycardia (SVT) has not been described before.

**METHODS AND RESULTS:** A 6-month-old male infant (weight 6.3 kg, height of 63 cm, BSA: 0,32 m<sup>2</sup>) presented with episodes of SVT and tachypnea and was diagnosed with ALCAPA via echocardiography and multislice computed tomography. The contractility of the LV preoperatively was depressed with an ejection fraction of 30% and mild MR. He underwent direct re-implantation of the left coronary artery to the aorta using the trapdoor flap technique. He was extubated on the second postoperative day. Recurrent episodes of SVT were noted at that time and were converted to sinus rhythm with adenosine or rapid atrial pacing. Pharmacologic treatment with amiodarone and subsequent addition of propranolol, digoxin and propafenone at maximal tolerated doses was unsuccessful. On the 25th postoperative day an electrophysiologic study was performed using a 5 Fr decapolar catheter placed via the left subclavian vein in



the coronary sinus (CS), a 4 Fr bipolar catheter placed from the left femoral vein in the right ventricle and a 5 Fr mapping catheter placed from the right femoral vein. Atrioventricular reentry tachycardia was induced reproducibly with programmed atrial stimulation, with a tachycardia cycle length of 250 msec and earlier retrograde atrial depolarization in the distal tip of the CS catheter. A left posterolateral accessory pathway was diagnosed. Access to the left atrium was achieved using a transseptal approach and mapping was performed using a non-fluoroscopic navigation system (Ensite-NavXTM) during tachycardia. During the 4th application of RF energy the tachycardia stopped in 2.7 seconds. The lesion was continued for 30 sec with an additional 30 sec bonus application at the same site. Total fluoroscopy time was 24.7 minutes, maximum power: 30w, max temperature: 58o C and total procedure duration 4 hours. Aortography pre- and post ablation revealed patency of the left coronary artery without stenosis of the left main coronary artery. There was no recurrence of the SVT in a drug-free state after a follow-up of 1 month.

**CONCLUSION:** We described the coexistence of ALCAPA and persistent SVT due to accessory pathway (a previously not described combination) and its successful combined surgical and interventional therapy.

#### **P-041-PATENT DUCTUS ARTERIOSUS CLOSURE IN PREMATURE INFANTS LESS THAN 1000 GRAM BY SUBAXILLARY MINI-THORACOTOMY**

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**BACKGROUND:** Patent ductus arteriosus is frequently encountered in premature babies and the surgical closure is provided more frequently in the group of extremely low birth weight babies who usually are in critical condition and deemed unsuitable for pharmacological closure. We have adopted subaxillary mini-thoracotomy instead of conventional posterolateral thoracotomy in the hope of lessening surgical trauma in these babies who often have various comorbidities in addition to inherent problem of prematurity and the clinical results were analyzed.

**METHODS:** From April 2004 to August 2007, 20 premature infants less than 1000 gram of body weight underwent surgical closure of the patent ductus arteriosus at the discretion of neonatologist and pediatric cardiologist. Ten babies were males and mean gestational age was 27 weeks ranging from 23+3 to 30+2 weeks. The average age at operation was 16.0~Y8.0 days. The procedures were performed in the newborn intensive care unit via 2 cm long subaxillary mini-thoracotomy in lateral position with left arm abduction. The mean size of the patent ductus arteriosus was 3.4~Y0.7mm. For the most part, the ductus was closed with titanium clips; one infant in whom the ductus was ruptured while on dissection underwent ductal division.

**RESULTS:** Sixteen babies survived to discharge. The mortalities were from the infant's inherent problem of prematurity and co-morbidities, not related to the operation itself. In most cases, hemodynamic instability and respiratory distress were rapidly improved after the procedure, thus enabling early ventilator weaning and easier volume management. Hoarseness and wound infection developed in one infant respectively after the operation. Out of 16 infants who had been ventilator dependent preoperatively, 15 infants could be weaned off successfully 15.9~Y22.4 days after the operation.

**CONCLUSIONS:** Considering satisfactory surgical outcome along with its simplicity and less invasiveness, subaxillary mini-thoracotomy is highly recommended for the ductal closure in extremely low weight premature babies.

#### **P-042-HYBRID PROCEDURES IN PAEDIATRIC CARDIAC SURGERY**

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**BACKGROUND:** Hybrid paediatric cardiac surgery is an emerging concept that combines skills and techniques used by paediatric cardiac surgeons and interventional cardiologists. The goal is to provide optimal therapy by minimizing the potentially harmful effects of methods that accompany conventional surgical procedures. We herein present an alternative treatment in 3 patients with

congenital heart disease employing the hybrid approach.

**METHODS:** Two patients aged 4 and 6 months old underwent beating heart closure of a muscular ventricular septal defect (VSD) with an occluding device. Also an 8 year old patient with supra-aortic, main and branch pulmonary artery (PA) stenosis underwent conventional surgical patch augmentation of the ascending aorta and the main pulmonary artery. The branch PA stenosis was dilated intraoperatively, followed by direct placement of stents into both PA branches with the heart beating. Diameter increased from 6 to 14mm for the right and 4 to 12mm for the left PA respectively.

**RESULTS:** There were no deaths. The patient with aortic and PA stenosis developed a postoperative pneumothorax. Median ICU and hospital stay for the VSD patients was 1 and 3 days and for the other 2 and 20 days respectively. At median follow up of 18 months, all patients remain well and free from further interventions.

**CONCLUSIONS:** Patients with muscular VSD who are eligible for device closure, yet cannot undergo percutaneous closure due to lack of small size catheters can currently be treated in one setting with the hybrid approach. Intraoperative pulmonary artery stenting in addition to conventional surgical repair can be performed safely and may be complementary in patients with complex lesions.

#### **P-043-SECUNDUM TYPE ATRIAL SEPTAL DEFECT IN ADULT PATIENTS: OPERATIVE RESULTS AND MID-TERM FOLLOW-UP.**

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**BACKGROUND:** Secundum type atrial septal defect is the most commonly congenital heart disease which has been detected in adults. It is relatively common to observe atrial fibrillation in these patients after the age of forty. Our study includes the mid-term follow-up results of patients who were operated due to secundum type ASD.

**METHODS:** 45 adult patients were operated in our clinic between January 2001 and December 2006 due to secundum type atrial septal defect. Mean age was 35.1±12.2 (range 18-60 years) where 30 (66.7%) were female and, 15 (33.3%) were male. Patients were grouped into two with respect to age: Group I included patients aged between 18-40 and Group II included those between 40-60 years of age. 9 patients presented preoperative atrial fibrillation (20%). Preoperative mean pulmonary /systemic flow ratio was 2.4 ± 0.6 and mean pulmonary artery pressure was 34.6±10.8. Before the operation 31 patients were in New York Heart Association functional class II (68.9 %), 13 were in class III (28.9%) and one was in class I (2.2%).

**RESULTS:** Preoperative atrial fibrillation converted to sinus rhythm in 4 of 9 patients. Postoperative atrial fibrillation continued in five patients in the follow-up period despite the medical treatment. In the follow up period 35 patients were in New York Heart Association functional class I (77.8%) and 10 were in class II (22.2%). Mean follow up period was 39.0±19.8 months. No mortality was observed neither in intraoperative nor in the post operative or follow-up periods.

**CONCLUSION:** Surgical closure of secundum type atrial septal defect in adult patients and antiarrhythmic therapy in those with atrial fibrillation is a effective method in decreasing morbidity and mortality rates.

#### **P-044-OPERATIVE TECHNIQUE FOR THE TREATMENT OF SUBVALVULAR AORTIC STENOSIS CAUSED BY DIVERTICULUM OF THE MITRAL ANTERIOR LEAFLET**

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**BACKGROUND:** Diverticulum of the mitral anterior leaflet is a rare reason of aortic subvalvular stenosis. Although it is usually seen as a complication of bacterial endocarditis, congenital diverticulum of the mitral valve has rarely described in the literature. We report a patient with subvalvular aortic stenosis caused by a congenital mitral diverticulum and pertinent surgical technique for this pathology.

**METHODS:** 3 years old boy was under follow-up after he was operated for aortic coarctation when he was 15 days old. At his first operation the coarcted aortic segment was resected and aorta was anastomosed using end-to-end tech-

nique. Although an accessory tissue was diagnosed on the mitral anterior leaflet, it was left untouched because not having any regurgitation or stenosis at that time. During his follow-up, the augmentation on the size of this accessory tissue on the mitral anterior leaflet and mild aortic stenosis was measured. Echocardiographic examination has shown an augmentation of velocity on the left ventricular outflow tract caused by the mitral accessory tissue. The maximal pressure gradient was measured 18 mmHg. An early operation was decided while the patient still had good ventricular functions. Operation was performed by a transvers aortotomy. During the inspection of the left ventricular chamber, the accessory tissue described by preoperative echocardiography was found to be a diverticulum arising from the edge of the anterior mitral leaflet. Diverticulum was resected with a triangular incision and the defect at the free edge was closed primarily with 3 separated stitches (Figure).

**RESULTS:** Infectious etiology was excluded by the morphologic examination of the tissue and by negative blood and tissue cultures. Per-operative transesophageal echocardiography control showed no gradient at the aortic valve. The pathology report showed us fibrotic tissue without having inflammation, neovascularization and bacterial involvement. The patient was discharged after a normal postoperative period. Control echocardiograms showed normal mitral valve functions and no trans-aortic gradient.

**CONCLUSIONS:** Diverticulum of the mitral valve has reported in the literature mainly as a complication of bacterial endocarditis. Congenital diverticulum of the mitral valve is very rare. In the case here we report there were no anamnesis, morphologic or pathologic findings of active or healed endocarditis. The expansion of the diverticulum during the systole towards to the left ventricular outflow tract is explained by venturi effect of the flow. The surgical technique is effective and easy, once the diagnosis is accurate and confirmed in the operation.

#### **P-045-ATRIAL SEPTAL DEFECT CORRECTION IN PATIENTS OVER 40 YEARS OLD**

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**BACKGROUND:** Complete correction of atrial septal defect (ASD) associated with pulmonary hypertension (PH) has been reported to account for an increased surgical risk. The aim of this report is to summarize the experience in total repair of ASD in patients over 40 years old.

**METHODS:** Between January 1980 and January 2007, 218 consecutive adults with ASD underwent complete correction (male 50, female 168; ages 40-74, mean 48 $\pm$ 6 years old). In the group, there were 32 cases with atrial fibrillation, 39 cases with severe tricuspid valve incompetence and 4 with mitral valve incompetence. All patients revealed high PH (49 of them had mean pulmonary artery pressure (mPAP) more than 45 mm Hg and pulmonary vascular resistance more than 7 U/m<sup>2</sup>). Lung biopsy was performed at the time of defect closure and was classified according to Heath and Edwards. 17 lung specimens were analysed in accordance with preoperative and intraoperative findings as well as operative outcome.

**RESULTS:** Surgical closure of 200 cases were done by patches and 18 more by interventional catheterization. Right sided maze procedures were performed in 21 patients. Tricuspid valve repair was performed in 39 cases (18 of them with ring) and mitral valve repair in 4 cases. Four (1.8 %) hospital deaths occurred in this series (no one after interventional catheterization). Causes of death included progressive PH and heart failure in two patients, cardiac dysrhythmias in one patient and multiple organ failure in the other patient. There were no statistically significant relations between histologic findings and preoperative clinical and hemodynamic data and operative outcome. Nevertheless, both deaths due to PH took place in patients more than 55 years old with mPAP > 55 mm Hg and with poor functional NYHA class (II and IV). In both cases pulmonary vascular changes were Heath-Edwards grade  $\Psi$ .

**CONCLUSIONS:** Atrial septal defects should be operated as early as possible. Age of more than 55 years old with high PAP and poor functional class may be risk factors for outcome. During and after operation much attention should be paid to preventing and curing arrhythmia.

#### **P-046-RISK FACTORS FOR EARLY DEGENERATION OF ALLOGRAFTS IN PULMONARY CIRCULATION**

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**OBJECTIVE:** External conduits used for the repair of congenital heart diseases having discontinuity between the pulmonic ventricle and the pulmonary artery, still carries a high risk of reoperation. The aim of this study was to define risk factors for early degeneration of allografts in pulmonary circulation and to recommend some guidelines to minimize them.

**METHODS:** Between March 1995 and May 2005, 32 patients with various types of congenital heart disease received cryopreserved allograft conduits for reconstruction of their right ventricular outflow tract. We report on 32 patients receiving allografts ranging from 9-24 mm size within the first 2 years of life.

**RESULTS:** Survivors have been followed for 3-48 months. Survival at 5 years, including hospital mortality, was 61.6 %. One patient died at reoperation. Of the patients 15.6% (5/32) had early structural deterioration (SD) of their vascular allografts at a mean of 15.2 months after implantation. Three of these have already been reoperated with allograft exchange. Freedom of reoperation was 65% at 5 years. Infants showed 45.7% freedom of reoperation at 5 years compared to 91.6% in the 1-2 years age group, while freedom of SD was 57.8 % in infants at 48 months compared to 82.7 % in the 1-2 years age group. Of allografts with SD in the infant group 63.7 % had an allograft size of < 14 mm. In aortic allografts freedom of SD was 57% compared to 89% in pulmonary allografts. Freedom of allograft wall calcification was 41.8 % at 18/20 months in all patients. In the statistical analysis, only infant age ( $P = 0.03$ ) and aortic allograft ( $P = 0.02$ ) were shown to be significant risk factors for early SD.

**CONCLUSION:** The use of pulmonary allografts, avoidance of relatively short and small conduits of < 14 mm in diameter, might improve the durability of allografts in infants and small children.

#### **P-047-TRILEAFLET EQUINE PERICARDIAL EXTRACARDIAC CONDUIT IN PULMONARY POSITION: MEDIUM-TERM FOLLOW-UP WITH EXCELLENT HEMODYNAMICS AND FREEDOM FROM CALCIFICATION**

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**BACKGROUND:** This study was designed to evaluate the outcome of trileaflet equine pericardial extracardiac conduit.

**METHODS:** From March 1999 to December 2006, 63 patients with a mean age of 2.1  $\pm$  1.3 years (2 months to 9 years) and a mean weight of 12.5  $\pm$  9.2 kg (4 to 24 kg) were discharged after implantation of a trileaflet equine pericardial extracardiac conduit. The diagnosis contained the following: transposition great arteries with VSD and stenosis PA ( $n = 11$ ) pulmonary valve regurgitation ( $n = 3$ ), tetralogy of Fallot ( $n = 10$ ), pulmonary atresia with ventricular septal defect ( $n = 20$ ), double outlet right ventricle ( $n = 9$ ), truncus arteriosus ( $n = 12$ ), Taussig-Bing ( $n = 3$ ), obstructed conduit ( $n = 5$ ). Conduit size was 14 mm in 2, 16 mm in 7, 18 mm in 12, 20 mm in 13, and 22 mm in 33 patients. Mean cardiopulmonary bypass was 151  $\pm$  44 min (62 to 329 min) and mean aortic cross clamping was 61  $\pm$  32 min (0 to 142 min). All patients underwent echocardiography, 23 of 63 (40%) patients had cardiac catheterization, and 23 of 63 (40%) patients had electrocardiograph-gated multislice computer tomography.

**RESULTS:** In a mean follow-up of 22.7 months (1 to 48 months) there was one late death (1 of 63 patients; 1.5% mortality) unrelated to the conduit. Six patients underwent reoperation; four were nonconduit-related and two was to replace a twisted conduit. Seven patients underwent interventional cardiology; four were nonconduit-related and three were to stent a twisted or stenotic conduit. Echocardiography showed absent valve regurgitation in 30 of 63 (33%) patients, trivial in 21 of 63 (42%) patients, mild in 16 of 63 (47%) patients. The transconduit pressure gradient remained stable during follow-up, with peak pressure gradient 15  $\pm$  12 mm Hg and mean gradient 9  $\pm$  5 mm Hg. Internal diameters corresponded to 112%  $\pm$  22% of the implanted diameter at level of proximal anastomosis, 110%  $\pm$  18% at valve level, and 110%  $\pm$  18% at distal anastomosis. Calcifications were not found, with the exception of a minimal (2.3 mm) parietal calcification.

**CONCLUSIONS:** The trileaflet equine pericardial extracardiac conduit provided excellent morphology and hemodynamics, and freedom from calcification in a medium-term follow-up.

#### **P-048-GIANT ANEURYSMAL DILATION OF A NATIVE PERICARDIAL PATCH USED FOR RECONSTRUCTION OF THE RIGHT VENTRICULAR OUTFLOW TRACT**

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**BACKGROUND:** Pericardium patches are commonly used for the repair of congenital heart diseases. Aneurysmal dilation is a complication specific to the use of pericardial patches.

**METHODS:** A 3-year-old girl had undergone a total corrective surgery for tetralogy of Fallot 4 months ago at our institution. Although she didn't experience any ongoing complaints, her routine postoperative follow-up investigations revealed a progressing large aneurysm of the autologous pericardial patch prepared with glutaraldehyde. Therefore she was referred to our institution for reoperation.

**RESULTS:** Echocardiography demonstrated aneurysmal dilation of the native pericardial patch. Cardiac catheterization and angiography revealed moderate pulmonary insufficiency and a large aneurysmal dilation of the pericardial patch in our patient. Reoperation was indicated because of progressive distention of the aneurysm. For reconstruction of the right ventricular outflow tract (RVOT), the pericardial patch was excised, and the RVOT reconstructed using a e-PTFE patch. Postoperatively at the discharge day and after 3 months an echocardiographic investigation was normal. The functional capacity of our patient was in New York Heart Association class I.

**CONCLUSION:** When re-reconstruction of the right ventricular outflow tract is necessary because pericardial patch aneurysm, we recommend a e-PTFE patch. Reoperation is associated with a low early mortality and good long-term results.

#### **P-049-HYPOPLASTIC LEFT HEART SYNDROME ASSOCIATED WITH CONGENITAL DIAPHRAGMATIC HERNIA AND INTERRUPTED AORTIC ARCH**

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**BACKGROUND:** Hypoplastic left heart syndrome (HLHS) is a prevalent congenital cardiac anomaly that leads to a situation of systemic and pulmonary blood flow mismatch that often requires great clinical efforts in order to prevent irreversible clinical and metabolic deterioration. The aim of the perioperative care consists in maintenance of adequate pulmonary -to-systemic circulation ratio, by the means of adequate drug management and avoidance of high inspiratory fraction of oxygen (FIO<sub>2</sub>). Congenital diaphragmatic hernia (CDH) results in variable degrees of pulmonary hypertension (PH) that often require treatment with supplemental oxygen delivery, usually achieved by the means of artificial breathing with high FIO<sub>2</sub>. Interrupted aortic arch (IAA) leads to further pulmonary hypertension in a setting of patent ductus arteriosus dependence that is essential to adequate distal perfusion. As a result the management of combined HLHS, CDH and IAA leads to a conflict of therapeutic strategies in terms of oxygen delivery and drug management.

**CASE REPORT:** Male neonate, weighting 2600 g, presented marked cyanosis after birth requiring tracheal intubation and controlled ventilation. The chest roentgenogram showed a right sided diaphragmatic hernia that was further evaluated by contrast study. The patient was referred to our center, and the echocardiography showed the presence of HLHS and IAA. Administration of prostaglandine and dopamine was started and the oxygen delivery was set to arterial oxygen saturation of 70%. The case was reviewed by the services of pediatric cardiac surgery, pediatric cardiology and pediatric surgery, that decided to perform a surgical one-time approaching. After clinical stabilization, the child was taken to the operation room, and a transverse sub-costal laparotomy was performed, but surgical resolution of the diaphragmatic hernia by this approach was not possible due to strong adhesions between the hypoplastic right lung and the liver. A median sternotomy was then performed, joining with the transverse laparotomy, thus allowing excellent exposition to the right hemithorax. The adhesions were broken diaphragmatic foramen closed. During the CDH manipulation there was not clinical instability. After this, cardiopulmonary bypass started with the arterial line placed at inominate artery, allowing partial circulatory arrest while keeping brain perfusion.

A Norwood-Sano procedure along with aortic arch reconstruction were performed, but at the surgical end the patient was not able to keep proper oxygenation in spite of all maneuvers and was declared dead.

**DISCUSSION:** To our acknowledgment this is the first case of HLHS, CDH and IAA ever reported. Even knowing that gravity was extreme an one-time approach was considered the only possibility of survival. At the operation time we saw that right lung was marked hypoplastic and therefore presented as a source of great resistance to right ventricle ejection via PTFE-Sano shunt, leading to a set of left pulmonary overflow, that increased even more the pulmonary resistance and not allowing proper oxygenation, that was the responsible for surgical unsuccessful fate.

#### **P-050-CHANGES OF THE AORTIC VALVE SIZE AND FUNCTION AFTER THE ROSS AND ARTERIAL SWITCH OPERATIONS**

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**BACKGROUND:** Repositioning of the pulmonary valve and root in to the system position after the Ross and arterial switch (AS) operations shows disproportionate dilatation of the neo-aortic (new-Ao) root. Purpose. To evaluate the size and function of new-Ao valve after the Ross and AS operations.

**METHODS:** 54 pts with mean age 12 yrs (range 4-18) after the Ross procedure with maximum follow-up 13 yrs (group I) and 37 pts after AS operation, 29 (75.6%) were newborns, 7 pts between 2-11 months and 1 at three yrs old, maximum follow-up 9 yrs (group II) were evaluated. Changes of the neo-Ao valvular size according to body surface area (BSA) were measured and valve function was assessed.

**RESULTS:** The body surface area in patients of I group changed from 1.3±0.23 after operation to 2.1±0.37 m<sup>2</sup> at follow-up. In patients of II group body surface area changed from 0.34±0.13 to 1.0±0.2 m<sup>2</sup> at follow up. Aortic annulus in I group was 2.1±0.37 cm after operation and 2.4±0.54 cm at follow up. In II group respectively 1.15±0.18 and 1.2±0.14 cm. Aortic root in first group was 2.5±0.27 cm after operation and 2.9±0.16 cm at follow up. In II group respectively 1.2±0.12 cm and 1.6±0.28 cm. Neo-Ao insufficiency 0-trivial was in 38 pts (69.4%) in group I and in 21 pts (56.7%) in group II, mild in 13 (23.6%) pts and in 14 (37.8%), moderate in 1 pt (3.4%) and in 2 (5.5%) pts and severe in 1 (3.4%) in group I. Reoperation due Ao insufficiency was performed in one patient in group I.

**CONCLUSIONS:** 1. Changes of the neo-Ao annulus were associated with growth in both groups. 2. Changes of the neo-Ao root were related with growth and dilatation without progressive Ao insufficiency in both groups.

#### **P-051-THE EARLY PRIMARY REPAIR OF TRUNCUS ARTERIOSUS COMMUNIS WITH REDUCED TO BICUSPID PULMONARY HOMOGRAFT - LATE AND MIDTERM RESULTS**

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**BACKGROUND:** Repair of TAC in neonates and infants in the early period of life encounters difficulties concerning availability of small homografts in tissue banks. We report our experiences and results of early primary repair of neonatal TAC with special regard to surgical technique of homograft size reduction.

**METHODS:** From August 1991 to December 2006 21 pts with median age 39 days (range 13-240 days) and median body weight 3,8kg (range 3,4-7,3 kg) underwent repair of TAC. There were 11 males and 10 females in our series. The anatomical classification according to Collet-Edwards was as follows: I-13 pts, II-6 pts, III- 2 pts. Prior palliation- ventricle-to-pulmonary shunt was performed in 2 pts in neonatal period. Reduced to bicuspid pulmonary homografts were implanted in 13 pts (valve size 17-25 mm). The follow-up ranged from 1 to 14 yrs was completed for all patients. 8 pts were in long-term follow-up (>5 yrs). IAA(2 pts) and CAV (1 pt) were noted as associated heart defects.

**RESULTS:** Hospital mortality was 10%. 1 pt died 1 yr after procedure due to rhythm disturbances (WPW). In 1 pt homograft replacement was needed 2 yrs after repair due to leaflet deterioration. None of midterm or long-term survivors required aortic valve replacement nor interventional procedures concerning pulmonary valve or artery obstruction. The mean pressure gradient at the pulmonary valve level was 12 mm Hg and in 3 patients exceed 20 mm Hg. Aortic



valve regurgitation was trace in 16 pts, mild in 5 pts. The overall freedom from any reintervention at 5 yrs was 95%.

**CONCLUSIONS:** Early repair of TAC with reduced to bicuspid pulmonary homografts may be performed with acceptable perioperative mortality and low mid and long-term postoperative morbidity. Reconstruction of RVOT with in-situ prepared diminished homografts decreased limitations concerning small-sized homografts supply.

## **P-052-CORONARY PATTERN IN ANATOMICALLY CORRECTED MALPOSED GREAT ARTERIES AND THEIR SURGICAL IMPLICATIONS**

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**BACKGROUND:** Coronary artery (CA) anatomy of anatomically corrected malposition of the great arteries (ACM), vital for corrective surgery, has not been well elucidated. We studied the correlation between CA pattern and aortopulmonary rotation (APR) in ACM.

**METHODS:** CA anatomy of ACM and relation of the great arteries were identified by angiography or surgical intervention from 1995 to 2006 at our hospital. The degree of APR was defined by patterns of the aortic sinus of Valsalva (ASV) on the lateral angiogram. Reported CA types of ACM were reviewed.

**RESULTS:** Three CA types were presented in eight patients. Six patients had the same usual CA type in complete transposition (Type 1), one patient had left anterior descending (LAD) from the left-hand sinus that also gave rise to right CA (Type 0). Another patient had LAD from the left-hand sinus and other CAs from the right-hand sinus (Type 10). In Types 0 and 10 with LAD from the left-hand sinus, the aorta was left lateral and posterior to the pulmonary trunk, respectively ( $n = 2$ ); in contrast to Type 1 with LAD from the right-hand sinus, the aorta was located in the anterior ( $n = 6$ ,  $p < 0.05$ ). In the literature, single CA (Type 3c) as well as Types 0 and 1 were also reported.

**CONCLUSIONS:** The marriage of convenience between the CA and the nearby ASV in accordance with the APR is observed. The APR identified by the ASV pattern could implicate the CA patterns and the surgical options in ACM.

## **P-053-LONG TERM RESULTS OF TRILEAFLET EQUINE PERICARDIAL EXTRACARDIAC CONDUIT USED FOR THE CORRECTION OF ANOMALIES HAVING PULMONIC VENTRICALE-PULMONARY ARTERIAL DISCONTINUITY**

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**BACKGROUND:** External conduits used for the repair of congenital heart diseases having discontinuity between the pulmonic ventricle and the pulmonary artery still carries a high risk of reoperation. Between January 2002 and May 2007, handmade equine pericardial conduit with fabricated trileaflet valve had been the conduit of choice in our institute. The aim of this study is to clarify the temporal sequence of conduit obstruction in this material and to formulate the optimal surgical strategies for this disease entity.

**METHODS:** Forty patients have undergone extracardiac conduit repair using this conduit. Postoperative catheterization performed within 6 months showed pulmonary to systemic ventricular systolic pressure ratio of  $0.59 \pm 0.12$  with the pressure gradient between pulmonic ventricle and pulmonary artery of  $24.3 \pm 12.4$  mm Hg. In 23 patients among the survivors, a series of Doppler two-dimensional echocardiographic images could be clearly obtained.

**RESULTS:** Moderate-to-severe degree of pulmonary insufficiency represented only 4.1% of all cases within 6 months, which rapidly increased to 11.4% at 2 to 4 years and 37.1% at 3 to 5 years. However, the rate of increase of pulmonary insufficiency diminished beyond 5 years with 30.7% at 5 to 7 years and 37.4% at 7 to 10 years. Estimated pressure gradient calculated by Bernoulli's equation applied in the same patient subset was  $3.9 \pm 5.7$  mm Hg within 4 months, which progressively increased to  $6.7 \pm 12.2$  mm Hg at 1 to 3 years,  $24.1 \pm 21.3$  mm Hg at 3 to 5 years,  $38.5 \pm 21.4$  mm Hg at 5 to 7 years, and  $67.4 \pm 29.3$  mm Hg at 7 to 9 years. Among patients with a pressure gradient across the conduit of more than 40 mm Hg at follow-up catheterization, the primary cause of the obstruction was attributed to degeneration of the valve in 3 patients, whereas sternal compression was strongly suspected as the primary cause in the other 4 patients. Intimal peel was obvious in 2 the excised specimens.

**CONCLUSIONS:** Degeneration of the valve in the equine pericardial conduit became prominent at 3 to 5 years after the operation, whereas the pressure gradient across the conduit continued to progress thereafter. A thick and hardened valve from degeneration and varying degrees of external compression by the sternum were delineated at the site of stenosis.

## **P-054-SUPRAVALVULAR AORTIC STENOSIS WITH ASCENDING AORTIC HYPOPLASIA AND PULMONARY STENOSIS: A NEW MODIFICATION OF BROM'S 3-PATCH TECHNIQUE (TWO CASES)**

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Supravalvular aortic stenosis is an uncommon congenital anomaly. Supravalvular aortic stenosis may occur as an isolated form that can be inherited as an autosomal dominant trait, or it may be an important feature of the Williams syndrome. A deletion of the elastin gene results in thickening of the aortic wall characteristically at the sinotubular junction. The abnormal thickening may extend into the ascending aorta or even into the aortic arch with narrowing of the ascending aorta, aortic arch, and arch vessels. Enlargement of the supravalvular aortic stenosis by means of a single patch is the most commonly used technique to treat the anomaly. Doty and associates used an extended aortoplasty involving 2 sinuses instead of only 1 sinus of the aortic root. Brom introduced symmetric aortoplasty with enlargement of all 3 sinuses by the 3-patch technique. We report two cases of supravalvular aortic stenosis with ascending aortic hypoplasia and central pulmonary stenosis. Aortic stenosis was relieved by means of a modification of Brom's 3-Patch Technique, in which extending the right coronary patch (teardrop shaped) from the aortic root to the ascending aorta. We recommend this modification because extending the patch in right coronary position provides less suture line which might decrease thrombotic surface. Furthermore, it will reduce operation time. Anatomical restoration is much better than the original Brom's 3-patch technique in such cases. We report the modification of Brom's three patch technique for the enlargement of the hypoplastic distal segment of ascending aorta on two cases.

## **P-055-MAGNESIUM SUPPLEMENTATION DURING PEDIATRIC CARDIOPULMONARY BYPASS: A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL**

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**BACKGROUND:** Ionized hypomagnesaemia occurs frequently after pediatric cardiac surgery and is associated with higher PRISM III scores, prolonged mechanical ventilation and intensive care unit (ICU) stay. Though magnesium supplementation during cardiopulmonary bypass (CPB) seems to reduce the incidence of arrhythmias and associated with improved survival in adults, exact pediatric dosage guidelines and outcomes remain unclear.

**METHODS:** We performed a randomized, double-blind, controlled trial, in 99 children undergoing congenital cardiac surgery. Study included, Group I: 25mg/kg of magnesium sulphate (30 patients), Group II: 50mg/kg magnesium sulphate (40 patients) and Group III: placebo group (intravenous saline, 29 patients). Both magnesium and placebo were given during the rewarming phase of CPB. Primary endpoint was incidence of arrhythmias and secondary endpoints were PRISM III score, duration of mechanical ventilation, ICU stay and mortality.

**RESULTS:** There were no differences in the baseline, demographics, ionized magnesium levels or surgical complexity. Junctional ectopic tachycardia (JET) developed in Gr I=2 patients (7%), Gr II=0 patients and Gr III=5 patients (18%) ( $p=0.02$ ). One patient in Gr I had ventricular tachycardia. There were no other arrhythmias. No significant differences were found in the PRISM III score ( $p=0.68$ ), ICU stay or ionized magnesium levels in the ICU and there were no mortalities. Patients with and without JET had similar magnesium levels.

**CONCLUSIONS:** This study demonstrates that though magnesium supplementation during the CPB does not alter the duration of mechanical ventilation, ICU stay or PRISM III score, it does reduce the incidence of JET in pediatric patients undergoing cardiac surgery. It also appears that higher magnesium dose, 50 mg/kg, has a more protective effect.



## P-056-SYSTEMIC-TO-PULMONARY ARTERY SHUNTS IN CYANOTIC CONGENITAL HEART DISEASES

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**BACKGROUND:** The aim of this study is to evaluate early and late results in children with congenital heart disease and decreased pulmonary blood flow who underwent a systemic-to-pulmonary shunt.

**METHODS:** During the past 9 years, 157 systemic-to-pulmonary artery shunts were performed in 130 patients (69 male, 61 female) with ages from 1 day to 31 years old. There have been evaluated for their clinical effectiveness, the need for a repeat operation and the mortality and morbidity.

**RESULTS:** There were 101 (77.7%) modified Blalock-Taussig shunts, and 19 (14.6%) modified Waterston shunts, and 8 (6.2%) Central shunts, and 1 Waterston shunt, and 1 Glenn shunt created. Tetralogy of Fallot comprised the majority of cases (113; 86.9%). A 5 mm polytetrafluoroethylene graft was used in 74 (57.8%) children, a 6 mm graft in 29 (22.7%), and a 4 mm graft in 25 (19.8%) cases. There were eight postoperative thrombosed shunt. Early mortality was 12.3% (16 patients). Second shunts were created in 25 (19.2%) patients. Forty patients (30.8%) have undergone subsequent intracardiac repair 37.7 ± 17.8 months after original shunt procedure. There were four (3%) late deaths. Follow-up was achieved in 105 of 114 early survivors for a period of 3 to 117 months (mean 31.7 ± 19.4 months). All surviving patients had subjective and objective improvement.

**CONCLUSION:** Modified BT shunt was performed most frequently in our service; it was associated with less closure and mortality than other types of shunt and had excellent clinical palliation and patency rates.

## P-057-EXPERIENCE OF SURGICAL TREATMENT OF CONGENITAL HEART DISEASES COMPLICATED WITH INFECTIVE ENDOCARDITIS

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**BACKGROUND:** Elaboration of surgical tactics in treatment of congenital heart diseases, complicated with infective endocarditis.

**METHODS:** During period 1986 - September 2007 73 patients with infective endocarditis developed against a background of congenital heart disease were operated in a cardiosurgery center. 56 (76,7%) were men, 17 (23,3%) - women. Age was from 2 to 60 years. 19 (26%) patients were related to III functional class, 54 (74%) patients were related to IV functional class according to classification of NYHA. Presence of congenital heart diseases contributed to the development of infective endocarditis: ventricular septal defect - 12 patients; bicuspid aortic valve - 33 patients; atrial septal defect - 3 patients, arterial duct - 3 patients; mitral valve prolapse with regurgitation - 11 patients; atrial septal defect with bicuspid aortic valve - 4 patients; subaortic stenosis with aortic insufficiency - 3 patients; atrial septal defect with mitral valve prolapse and tricuspid insufficiency - 2 patients; coronary-right ventricle fistula - 1 patient; ventricular septal defect + pulmonary artery subvalvular stenosis - 1 patient. 23 (31,5%) patients were revealed signs of pulmonary hypertension. Pulmonary infarction was diagnosed in 6 (8,2%) patients. Left ventricular aneurysm had formed in 1 patient with mitral valve prolapse. Indications for operation were: 1. Progressive cardiac insufficiency. 2. Intractable sepsis. 3. Thromboembolic disorders. 4. Paravalvular abscesses. Following operations were made: I. Aortic valve replacement - 38 patients, from them in combination with correction: ventricular septal defect - 3 patients; subaortic stenosis - 3 patients; atrial septal defect - 4 patients; arterial duct - 1 patient; with paravalvular abscess suture - 5 patients. II. Mitral valve replacement - 15 patients, from them in combination with correction: atrial septal defect - 3 patients; atrial septal defect with tricuspid valvuloplasty - 7 patients; with paravalvular abscess suture - 2 patients. III. Mitral valve replacement and aortic valve replacement - 2 patients, from them with paravalvular abscess of mitral valve suture - 1 patient. IV. Ventricular septal defect plasty - 12 patients, from them in combination with: tricuspid valvuloplasty - 2 patients; tricuspid valve cusp fenestration suture + tricuspid valve annuloplasty - 3 patients; vegetations removal from tricuspid valve cusps - 1 patient; open oval window suture + tricuspid valve replacement - 1 patient; open oval window suture + aortic valvuloplasty + excision of pulmonary artery

subvalvular stenosis + plasty of right ventricle outlet part with autopericardium patch - 1 patient. V. Vegetations removal from tricuspid valve cusps + coronary-right ventricle fistula suture + open oval window suture + tricuspid valvuloplasty (by Boyd) - 1 patient. VI. Vegetations removal from tricuspid valve cusps + cusp defect suture - 1 patient. VII. Resection of arterial duct + vegetations removal from pulmonary valve cusps - 1 patient. VIII. Resection of left ventricular aneurysm - 1 patient. IX. Arterial duct suture + vegetations removal from pulmonary trunk - 2 patients.

**RESULTS:** There were no lethal outcomes in early postoperative period. Long-term results were analysed for 65 (90%) patients in the period from 6 months to 16 years. Recurrence of infective endocarditis after the operation was in one patient who had aortic valve replacement and arterial duct suture. During repeated operation resection of arterial duct and vegetations removal from pulmonary valve cusps were made. 3 (4,6%) patients had a recurrence of infective endocarditis. Repeated mitral valve replacement was made for one patient in 6 years after the operation and for the second patient repeated aortic valve replacement was made in 3 years after the operation. Another patient had mitral valve replacement and aortic valve replacement in 9 years after ventricular septal defect plasty and vegetations removal from tricuspid valve cusps. In a long-term postoperative period 2 (3%) patients died after ventricular septal defect suture and tricuspid valve replacement in 6 years after the operation and in 3 years after repeated aortic valve replacement.

**CONCLUSIONS:** the early surgical intervention made for patients with congenital heart diseases complicated with secondary infective endocarditis helps to increase the number of valve preserve operations and prevent the development of serious infectious complications, improve long-term results of heart diseases surgical correction.

## P-058-DID THESE PATIENTS BENEFIT FROM ABSENT PULMONARY VALVE ?

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**BACKGROUND:** Many patients with Tetralogy of Fallot/Absent Pulmonary Valve(TOF/APV) were asymptomatic and had good operation results. Did these patients benefit from APV? We review our experience on tetralogy of Fallot with absent pulmonary valve syndrome and to identify the pathological and hemodynamic character of these asymptomatic children.

**METHODS:** We retrospectively analyzed the records of 7 patients with TOF/APV syndrome who underwent operation in a single institution between 1998 and 2006.

**RESULTS:** 6 patients were asymptomatic, one patient only had mild respiratory distress. The mean age at operation was 3.6 years (ranged, 1 to 10).The mean z score of pulmonary annulus was -4.51 ranged from -3 to -7. All of their McGoon >2. All patients underwent complete repair incorporating patch closure of the ventricular septal defect and reconstruction of the right ventricular outflow tract . There were no hospital death. Follow-up ranged from 6 months to 102 months (mean follow-up, 66 months), there were no readmission and late death

**CONCLUSIONS:** Well developed pulmonary artery and good prognosis were obtained in asymptomatic patients with TOF/APV syndrome. On this pathological and hemodynamic basis, a new palliative procedure: an artificial APV made by percutaneous pulmonary valve resection may be a good choice for patients with TOF and diminutive pulmonary arteries and hypoplastic pulmonary annulus. So the diminutive pulmonary could be well developed because of appropriate antegrade blood because of the result of interaction between artificial APV and hypoplastic annulus, which is the same as asymptomatic TOF/APV. The percutaneous pulmonary valve resection is feasible under the nowadays condition of cardiac intervention. This new palliative procedure may have some merits as follow: 1 the antegrade blood got from artificial APV could improve the growth of diminutive pulmonary arteries; 2 the interaction between hypoplastic annulus and artificial APV could prevent pulmonary arteries from aneurysmal dilation; 3 it could lessen the risk of subsequent complete repair by avoiding the sternotomy and cardiopulmonary bypass; 4 it could overcome the defects which presented in Blalock-Taussig shunt and antegrade palliation. Keywords: tetralogy of Fallot; absent pulmonary valve; palliative procedure

### P-059-DEXTROPOSITION OF AORTA IN TETRALOGY OF FALLOT

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**BACKGROUND:** Infundibular stenosis may develop secondary to ventricular septal defect and transannular patch plasty can affect mortality and morbidity rates. Therefore, dextroposition of aorta (DOA) has been investigated in order to eliminate discrepancies in literature.

**METHODS:** A. Figures and illustrations of following references have been investigated and dextroposition of aorta has been evaluated whenever aorta was visible. 1-Cardiac surgery of the neonate and infant 2-Surgery for congenital heart defects second edition 3-Pediatric cardiology 1987 4-Cardiac Surgery 1986, 5-Cardiac Surgery 2003, 6- Surgery for congenital heart defects third edition, 7-Thoracic and cardiovascular surgery 1986, 8- Thoracic and cardiovascular surgery 1991. B. Surgical anatomy of 23 patients (17 months to 16 years) have been evaluated.

**RESULTS:** A:1- Fig: 13- 5a, b, d, g DOA (-) 2- Fig: 26- 2, 3, 4, 7DOA (-) 3- Fig: 32- 2, 5, 6, 7, 10, 11 DOA (-), fig 32-8, 14/b, 15, 20 DOA (+), 4- Fig: 23- 1, 2, 4, 5, 14, 15, 16, 17, 25, 26, 28, DOA (-) 5- Fig: 24- 1, 3, 12, 13, 14, 24, 25/c,d,e, 65, 66, 6- Fig: 26- 15 a, 15 b DOA (-) 7- Fig: 27- 57-7 a, b, c DOA (-) 8- Fig: 82-5 b DOA (-) B: None of these 23 patients had dextroposition of aorta.

**CONCLUSION:** 1- For dextroposition of aorta, aorta and ventricular septal defect should be adjacent but this situation is not enough only 2- The plane where aorta exits from the ventricle should penetrate the plane of VSD into the right ventricle. 3- Considering the plane of aortic annulus as a circle and the plane of VSD as another circle would make understanding easier 4- If aorta and VSD join at one edge, aorta seems to be dextroposed 5- The findings mentioned above make one think that new treatment techniques are needed

### P-060-ECTOPIA CORDIS: A REPORT OF TWO CASES

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**BACKGROUND:** Ectopia cordis is a rare congenital malformation with very few reported survivors after surgical correction.

**METHOD:** We report two cases, one with thoracic type and the other with thoracoabdominal type. Both patients had associated intracardiac defects, namely atrioventricular septal defect (Rastelli type A), double outlet right ventricle with mild pulmonary stenosis, malposed great arteries in one; and double outlet right ventricle with mild pulmonary stenosis, subaortic ventricular septal defect, side-by-side great arteries, with aorta to the right of the pulmonary artery in the other.

**RESULTS:** The newborn with the thoracoabdominal form was observed to have other associated congenital anomalies like omphalocele, short sternum, hypoplastic nailbeds on all extremities, imperforate anus, and rectovaginal fistula. She underwent partial reduction of the heart and modified Blalock-Tausig shunt procedure. She had unstable hemodynamics in the immediate post-operative period, but later improved. Parents withdrew medical support and patient died on the fifth post-operative day because of chronotropic insufficiency. The newborn with the thoracic type had a successful complete reduction of the heart and primary skin closure of the defect, but later underwent plication of the right diaphragm due to paralysis. Patient also developed chylothorax. He later succumbed to sepsis at 32 days old.

**CONCLUSION:** We present our institutional management of 2 cases of ectopia cordis and present a review of pathogenesis and surgical management in the literature.

### P-061-AORTIC IMPLANTATION OF THE ANOMALOUS LEFT CORONARY ARTERY FROM THE PULMONARY ARTERY-TREATMENT OF CHOICE IN INFANCY

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**BACKGROUND:** Anomalous left coronary artery arising from pulmonary artery

(ALCAPA) is a rare but potentially fatal congenital coronary anomaly. Infants presenting with ALCAPA are generally in heart failure and often have significant mitral regurgitation (MR). Although establishing a dual coronary circulation is the procedure of choice, there remains controversy as to how the mitral valve is handled. Recent experience with coronary transfer for the arterial switch has prompted the application of this technique to ALCAPA.

**METHODS:** We reviewed our experience with aortic re-implantation of the left coronary artery (LCA) in all patients presenting with ALCAPA between June 2002 and July 2007. Over the last 5 years there were 18 children with ALCAPA, 15 of whom were infants less than 9 months of age, (mean-4.83±2.32 months) all of whom were treated with aortic re-implantation of the anomalous LCA. All presented with varying degrees of heart failure; 9 patients had moderate MR and two had severe MR.

**RESULTS:** There was no operative mortality. There was one early death and no late death. The early death was in a 4 month old infant with severe MR, left ventricular (LV) dilatation & dysfunction. Normal flows in the reimplanted LCA were confirmed by postoperative echocardiogram in all patients. There was excellent improvement in LV function and good resolution of MR over a prolonged period in all survivors. All patients had primary sternal closure. There was no incidence of supraventricular pulmonary stenosis.

**CONCLUSIONS:** Direct aortic re-implantation is possible in all infants, no matter from which pulmonary sinus the anomalous coronary is arising from and yields excellent results. Mitral valve repair is not generally necessary at the time of initial operation in most patients with MR. There is excellent and prolonged recovery of LV function and resolution of MR in almost all patients.

### P-062-BRAIN NATRIURETIC PEPTIDE AS PROGNOSTIC FACTOR OF DEVELOPMENT AND PROGRESSION OF CONGESTIVE HEART FAILURE

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**STUDY OBJECTIVE:** To study the circulating level of BNP as a marker of congestive heart failure development in open-heart operated patients with low LV ejection fraction in and late postoperative periods. Patients: Twenty six patients, female/male ratio 7/19, middle age 43.54±14.2, middle LVEF 32±10%, middle FC (NYHA) 2.95±0.84. In the majority of cases the cause of CHF was DCMP (23 patients), 3 patients had myxomatosis and mitral valve prolapse, 1 patient had decompensated hypertonic heart. Standard drug therapy was administered in 13 cases; other 13 patients underwent reconstructive surgery on left ventricle.

**INTERVENTION:** Measurement of BNP level initially, and one and six months after surgery. Also were evaluated severity of CHF and degree of surgery risk is according to EuroScore, SHOCK scale, 6-minutes walking test.

**MAIN RESULTS:** The median level of BNP was 635.5 pg/ml. The BNP level perfectly correlated with following indexes: LVEF (k=-0.516, p=0.041), EDV index (k=-0.793, p=0.004), EDS index (k=-0.654, p=0.026), myocardium mass of LV (k=-0.635, p=0.02). The BNP level also had a strong correlation with heart failure indexes: NYHA functional class (k=0.548, p=0.028), 6-minutes walking test (k=0.478, p=0.061), SHOCK scale index. (k=0.722, p=0.04). In operated patients the BNP level correlated with intraoperative doses of adrenalin (k=0.949, p=0.002), and dobutamin (k=-0.966, p=0.002), postoperative staying in reanimation department (k=0.882, p=0.09), and in clinic ward (k=0.781, p=0.036), EuroScore risk (k=0.915, p=0.002), SHOCK scale index one month after surgery (k=0.988, p=0.001), 6-minutes walking test (k=-0.99, p=0.001) after one and six months since surgery. In patients that did not have surgery, there was not any correlation between BNP level and congestive heart failure severity after 1 and 6 months.

**CONCLUSION:** BNP is the factor that can be a marker of low LVEF, and severity CHF. In open -heart operated patients, the initial level of BNP correlates with adrenalin and dobutamin doses administered in intraoperative and postoperative periods and with postoperative staying in reanimation department and in clinic ward. BNP level can be used as a prognostic factor for dynamic evaluation of CHF in open-heart operated patients in early and late postoperative period. According to our data patients treated non-surgically have BNP levels that do not possess prognostic value for CHF development during the following 1-6 months period.

## P-063-MECHANICAL CIRCULATORY SUPPORT SYSTEMS AND HEART TRANSPLANT

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**BACKGROUND:** The number of patients with cardiovascular diseases and end-stage heart failure (HF) is dramatically increasing world wide. Prevention of HF doesn't give expected

**RESULTS:** The World Heart Federation says that cardiac diseases in the 21st century will increase: up to 137% with male patients and 120% with female patients starting from today to 2020 worldwide. Development of pharmacotherapy, mechanical circulatory support systems (MCSS) and heart transplant (HTx) can help HF patients. Unfortunately nor pharmacotherapy neither MCSS today are efficient help to HF patients. Only HTx can be an effective method to patients with end stage heart diseases. However its application is extremely limited due to the storage of donor hearts. MCSS treatment in our Heart Surgery Center was started in 1999.

**METHODS:** 41 patients - 33 males and 8 females - were connected to MCSS, 27 of them as a bridge to HTx. The age of patients was from 37 to 63 years. All patients were with low cardio output index. It was less than 1.8 L/min/m<sup>2</sup>. Small left ventricle ejection fraction from 10% to 22% and large left ventricle diastolic diameter from 6.3 to 7.9 mm. All patients were on maximal doses of inotropic drugs, diuretics and intraaortic balloon pump support. The diagnoses of patients were: dilatation cardiomyopathy - 17, ischemic cardiomyopathy - 7, toxic cardiomyopathy post antimalignancy treatment - 1, other - 2. Operative technique: extracorporeal blood pump inflow cannula was implanted in the apex of native heart left ventricle, using single Prolene 2/0 sutures with Bard® PTFE felt. The power and controller cable was connected with systems out of the body. Outflow cannula was connected with ascending aorta using continuous Prolene 4/0 suture. Inflow and outflow cannulae were connected with intracorporeal blood pump. The cannulae of paracorporeal heart ventricles were placed out of skin and connected with ventricles. After air embolization prophylaxis pump was turned on.

**RESULTS:** Duration on MCSS was from 12 to 1097 days. 18 recipients were successfully transplanted (67%). Four recipients (14%) died on MCSS because of septicemia - 1, stroke - 2 and 1 patient died because of multiorganic damage. Five patients (19%) are on the waiting list. All of them are at home and have normal social live.

**CONCLUSION:** The MCSS is important for patients whom other medical measures cannot help.

## P-064-THE TREATMENT TO PATIENTS WITH END STAGE HEART FAILURE

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**BACKGROUND:** According to the European Society of Cardiology, 4% of European citizens have a pathological heart failure (HF). When HF is diagnosed, about 50% of all patients die in the first four years, and in the case of end-stage HF, 50% die in the first year. HF is treated medically, with the help of mechanical circulatory support systems and heart transplant.

**METHODS:** Patients with marginal HF are on the list as heart transplant recipients. In our Heart Surgery Centre, heart transplant operations started in 1987. Since then up to the year 2000, 173 recipients were on the waiting list for heart transplant and 16 heart transplant operations were performed (9%). Heart transplant operations were performed sporadically, 1-2 times per year; there also were years with no heart transplant at all. In the last five years, 40 heart transplant were performed (37%). On the waiting list there were 107 recipients - 13 female and 94 male. 14 of them were diagnosed ischemic cardiomyopathy, 2 - hypertrophic cardiomyopathy, 91 - dilatative cardiomyopathy. The age of recipients varies from 18 to 65 years (average 41.5 years). Left ventricle ejection fraction (LV EF) of all of them was < 20%. All of them were treated medically with ACE inhibitors, diuretics, BAB, aldosterone antagonists, glykozides, sometimes medicine with a positive inotropic effect was administered (dopamine, dobutamine, levosimendan). The majority of the patients had the intravenous adrenomimetics therapy, antiarrhythmic drugs. All of them were administered anticoagulants or antiagregants due to the increased risk of thromboembolic complications.

**RESULTS:** Due to application of medical treatment, 29 patients lived to see the

heart transplant (27%), 39 recipients died (36%), 9 patients (8%) were excluded from the recipients list as their LV EF improved significantly. Because of contraindications to heart transplant, 4 recipients (4%) were excluded from the list. At the moment 27 recipients (25%) are waiting for heart transplant.

**CONCLUSIONS:** 1. When complex heart failure treatment was applied, heart transplant increased by 9 to 37%. 2. The condition of 8% of recipients improved, which resulted in the fact that they no longer needed heart transplant.

## P-065-DO PATIENTS WITH CHRONIC HEART FAILURE IN NYHA II BENEFIT FROM CARDIAC RESYNCHRONISATION THERAPY?

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**BACKGROUND:** Cardiac resynchronisation therapy (CRT) has become an important therapeutic option for patients with chronic heart failure and conduction delays. Current guidelines recommend selection candidates for cardiac resynchronisation therapy in III - IV NYHA functional class. One of the major controversies in the field of CRT is the inclusion of patients with NYHA class I or II of chronic heart failure. It was reported that clinical symptomatic improvement was not seen in such a minimally symptomatic population. However, changes in objective functional capacity, left ventricular function and are not well studied.

**METHODS:** Two young patients suffering from dilated cardiomyopathy in NYHA II functional class with critically low LV EF and prolonged QRS duration (170 - 200 ms) were assigned to CRT. A 44 and 34 years old males were evaluated before and 1 year post CRT device implantation. Both patients underwent clinical examination, 12 lead ECG, 2D echocardiographic evaluation, cardiopulmonary stress test, and NT-proBNP measurement at baseline and 12 months after implantation.

**RESULTS:** First patient (St. Jude Medical Frontier II at 16.10.2006) before implantation had LV EF 13%, LVEDV 220 ml, LVEDD 71 mm, VO<sub>2</sub> peak 19 ml/kg/min, NT-proBNP 496 ng/l; 1 year after implantation - LV EF 46%, LVEDV 136 ml, LVEDD 54 mm, VO<sub>2</sub> peak 29 ml/kg/min, NT-proBNP 53 ng/ml. Second patient (Medtronic InSync III at 05.12.2006) before implantation had LV EF 13%, LVEDV 217 ml, LVEDD 75 mm, VO<sub>2</sub> peak 16,6 ml/kg/min, NT-proBNP 2451 ng/l; 1 year after implantation LV EF 52%, LVEDV 101 ml, LVEDD 49 mm, VO<sub>2</sub> peak 29,6 ml/kg/min, NT-proBNP 121 ng/l.

**CONCLUSION:** These excellent results illustrate the dramatic effect of CRT in restoring left ventricular function and concomitantly improving functional capacity and neurohumoral status in patients with NYHA II. These clinical examples confirm the dominant deleterious effect of left bundle branch block on left ventricular function and progression of heart failure in young patients with dilated cardiomyopathy. This group of patients might be proper candidates for CRT.

## P-066-EARLY AND LONG TERM OUTCOMES OF PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION FOLLOWING DOR PROCEDURE

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**BACKGROUND:** Patients with severe LV dysfunction have a higher mortality following coronary artery bypass grafting with left ventricular reconstruction. The aim of this study was to define the potential for long-term survival with left ventricular dysfunction after the myocardial revascularization with left ventricular reconstruction and to quantify any improvement in overall functional status.

**METHODS:** Institutional approved retrospective investigation of 146 consecutive patients who underwent coronary artery grafting connected with left ventricular reconstruction (Dor procedure) was performed. Twenty three (15.8%) of them were female, and 123 (84.2%) men. Mean age of the patients was 60±10 years (range from 31 to 80 years). The mean preoperative LVEF was 32,3±8.7% (ranged from 12 to 56%). Mean LVdd was 6.37±0.9 cm, mean CCS class was 3.11±0.63 and NYHA functional class was 3.47±0.58.

**RESULTS:** Perioperative mortality in this group of patients was 6.8%. The mean follow-up was 30.0±17.6 months (range from 2.0 to 71.0 months). 12 patients had died of cardiac related cause at that period (late mortality 9.5%). Actuarial survival rates at 1, 2, 3, 4 and 5 years were 90.7±2.6%, 83.7±3.6%, 80.6±4.1%, 77.9±4.8%, 69.2±9.2%, respectively. Average CCS functional class improved



from  $3.11 \pm 0.63$  to  $0.07 \pm 0.38$  at 1 year and to  $0.24 \pm 0.63$  at 5 years follow-up ( $p < 0.001$ ). Mean LVEF improved to  $37.5 \pm 8.0\%$  at 1 year and  $38.5 \pm 8.3\%$  at 5 years postoperatively ( $p < 0.001$ ). Mean NYHA functional class improved to  $2.31 \pm 0.47$  at 1 year and  $2.40 \pm 0.49$  at 5 years postoperatively ( $p < 0.0001$ ). Mean LVdd improved to 6.01 at 6 months and 6.3 at 5 years postoperatively ( $p < 0.2$ ). One year following surgery  $60.3 \pm 4.5\%$  of survived patients were in functional class I-II and  $47.9 \pm 5.1\%$  after 5 years.

**CONCLUSIONS:** Patients with left ventricular dysfunction can derive long-term benefit from left ventricular reconstruction with myocardial revascularization through improved left ventricular contractility by a significantly increased ejection fraction, improved New York Heart Association functional class. Successful left ventricular reconstruction with coronary bypass was associated with a 69% actual 5-year survival rate.

### P-067-AN EXPERIMENTAL STUDY OF TRANSPLANTATION OF SKELETAL MYOBLASTS TRANSFECTED BY VEGF GENE COMBINED WITH LEFT VENTRICULAR REPAIR SURGERY ON ISCHEMIC CONGESTIVE HEART FAILURE

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**BACKGROUND:** Congestive heart failure is the end stage of ischemic disease caused by myocardial infarction. Because the mature myocytes lack of the ability of self repair, the infarcted area will be replaced by fibrous tissue. When akinetic areas extend 1/3 of the left ventricular wall, the synchronous systolic movement of the whole ventricle will be impaired, and the enlargement of the ventricular dimension and decrease of cardiac function will appear, which leads to refractory heart failure. Traditional medicine therapy may lower the mortality of patients with heart failure, but it cannot reverse the pathological derangement. The ultimate option is heart transplantation, but still many problems remain to be solved. Recently, a surgical procedure by Dor and colleagues (endoventricular circular patch plasty procedure) proved satisfactory early and midterm outcome as a result of restoration of LV geometry and decrease in LV tension. However, postoperative LV dilation has been reported during long-term follow-up. So if we can seek ways to preserve the results of LV repair operation, it will provide a new choice for end-stage heart failure patients. Cell transplantation and angiogenic growth factor gene transfer have emerged to be new strategies in treating ischemic heart disease in recent years and satisfactory progresses have been achieved. In this study, the effect of combined treatment of myoblast transplantation (enhanced by VEGF gene transfection) and surgical left ventricular repair on ischemic congestive heart failure were evaluated.

**METHODS:** Firstly, rat skeletal myoblasts were cultured in vitro, then transfected with Ad.VEGF165. Secondly, a rat model of left ventricular repair surgery on ischemic heart failure was created. Then combined transplantation of VEGF gene carrying myoblasts and left ventricular repair surgery were conducted on model animals. 4 weeks later, the survival of the transplanted cells and the neovascularization in ischemic zone were tested and the cardiac function was assessed.

**RESULTS:** Rat skeletal myoblasts were isolated and cultured successfully in vitro. The left ventricular repair surgery animal model was stable. Echocardiography revealed the LV dimension decreased and cardiac function improved significantly 7 days after LV repair, but the improvement tended to deteriorate by time without additional treatment given. The surgery+myoblast+ Ad.VEGF165 Group showed the best cardiac performance, most transplanted cells survived and best neovascularization in the ischemic myocardium (differences of magnificent significances) 28 days after the treatment.

**CONCLUSIONS:** Skeletal myoblasts cultured in vitro can survive in the transplanted heart, improve the elasticity of the diseased myocardium. Transfection of Ad.VEGF165 can improve the survival of the transplanted cells, stimulate angiogenesis and preserve the cardiac function better. Combination of gene transfer, cell transplantation and LV repair surgery can improve the systolic and diastolic function of ischemic congestive failure hearts significantly, prevent the development of left ventricular remodeling and preserve the surgical effects.

### P-068 CHANGEMENT OF GENERAL CONDITION BEFORE AND AFTER OPERATION IN CHRONIC CONSTRICTIVE TUBERCULOUS PERICARDITIS

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**BACKGROUND:** Constrictive pericarditis typically presents with chronic, insidious signs and symptoms of predominantly systemic venous congestion. Due to early diagnosis and surgery, severe cases have become rare.

**MATERIAL AND METHODS:** We reviewed 39 consecutive patients with constrictive tuberculous pericarditis who underwent surgery from January 1993 to January 2007. Preoperatively, there were no patients in New York Heart Association (NYHA) functional class I, 6 patients (15%) in class II, 20 patients (51%) in class III, and 13 (34%) in class IV.

**RESULTS:** The early operative mortality rate was 10.2% (4 patients). Many of the patients whom we characterized as being in "poor general condition before operation" were in New York Heart Association (NYHA) functional class III or IV. During the 1st postoperative month, the functional capacity of our patients improved dramatically (Table 1).

**CONCLUSION:** Conventional open pericardiectomy which enables a safer, wider, and more effective approach and it relieved the symptoms and altered the hemodynamic findings.

### P-069 VENTRICULAR RESTORATION SURGERY: LONG-TERM RESULTS AND IMPACT OF ISCHEMIC MITRAL VALVE REGURGITATION

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**BACKGROUND:** Ischemic mitral valve regurgitation (IMVR) was found to be an independent predictor of mortality in some studies. One of the major reasons for the improved survival rate was that valve repair results in improved LV function, better functional capacity and lower rate of postoperative heart failure. But some groups have shown that IMVR was not an independent predictor of poor long-term survival and is no clear benefit from valve repair. IMVR remains a challenge. Some authors have reported high recurrence rates after annuloplasty for chronic IMVR, other groups have demonstrated more durable results and essentially complete freedom from recurrent IMVR. Treatment of moderate IMVR remains controversial. The goal of present study was to identify impact of IMVR on survival and late functional results after surgical ventricular restoration in patients with severe LV dysfunction.

**METHODS:** We retrospectively analyzed the data of 135 consecutive pts with LV aneurysm and/or ischemic cardiomyopathy with mean LVEF  $32.3 \pm 8.7\%$ , who underwent surgical ventricular restoration plus CABG. Mean NYHA class was  $3.47 \pm 0.58$ . Preoperatively mild IMVR was presented in 73 (54.1%) of pts, moderate - in 41 (30.4%) and severe - in 6 (4.4%) of pts. In 19 (14.1%) of pts concomitant MV repair was performed. Statistical analysis was performed with SAS 9.1.

**RESULTS:** Mean NYHA class improved to  $2.3 \pm 0.4$  at 1 year and  $2.4 \pm 0.5$  at 5 years postoperatively ( $p < 0.0001$ ), actuarial survival rates at 1 and 5 years were  $90.7 \pm 2.6\%$  and  $69.2 \pm 9.2\%$ , respectively. In NYHA class III-IV were  $52.1 \pm 5.1\%$  of pts at 5 years follow up. Degree of IMVR alone did not predict the death after CABG plus LV reconstruction surgery (Cox regression,  $p = 0.133$ ) and IMVR had no impact on survival even in pts with LVEF  $\leq 35\%$  (Cox regression,  $p = 0.161$ ). IMVR had no correlation with NYHA class 1 year after surgery (chi-square 4.34). But the need for MV repair (moderate and severe IMVR, NYHA class III-IV) and concomitant MV procedure increased risk of death after operation (RR 4.82; 95% CI 1.88; 12.35;  $p = 0.001$ ). Perioperative mortality after CABG plus LV reconstruction and MV surgery was 21.0% (6.7% in all patients). 28.6% of survivals were free from recurrent IMVR at 1 year after operation. 50.0% of survivals after MV repair had mild IMVR. 5 pts died during 2 year follow up period because of acute myocardial infarction or recurrence of moderate IMVR and progression of heart failure, producing 20.0% mortality rate at 2 years after CABG plus LV reconstruction and MV surgery.

**CONCLUSIONS:** Degree of IMVR alone did not predict poor outcome after CABG plus LV reconstruction surgery in patients with severe LV dysfunction and had no correlation with NYHA class 1 year after operation, but the need for MV repair and concomitant MV procedure increased risk of death 4.8 fold.



#### **P-070 OUTCOME OF CORONARY ARTERY BYPASS SURGERY IN DIABETIC AND NONDIABETIC PATIENTS: A COMPARATIVE STUDY**

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**OBJECTIVE:** Diabetes mellitus is commonly regarded as a risk factor for mortality and morbidity after coronary bypass. We evaluated the impact of diabetes mellitus on in-hospital mortality and morbidity after coronary artery bypass grafting.

**METHODS:** 9163 patients (3094 diabetic and 6069 nondiabetic) were retrospectively analyzed after isolated coronary artery bypass grafting. Demographic and preoperative data and postoperative in-hospital mortality and morbidity were compared in both diabetic and non diabetic groups. Analysis was performed in both univariate and multivariate logistic regression to compare the results.

**RESULTS:** Diabetic patients were older than the nondiabetic population (mean age 59.6y versus 57.9y), included more women (37.6 % vs 19.4%), had more postoperative mediastinitis (0.7% vs 0.2 %), renal failure (0.8% vs 0.3%), cardiac arrest (1.1% vs 0.7%) and in-hospital mortality (1.5% versus 0.5%) ( $P < 0.05$ ). No significant differences were found in postoperative prolonged ventilation (1.2% vs. 0.8%) and atrial fibrillation (6.3% vs 5.6%) between the two groups ( $p > 0.05$ ). There were also significant differences for in-hospital stay (mean 8.09 vs 7.24 days), mean aortic cross clamp and cardiopulmonary bypass times between diabetics and non-diabetics (44.38 vs 42.95 min and 74.28 vs 71.85 min respectively) ( $p > 0.05$ ). Logistic regression showed that there was a significant relationship between diabetes and postoperative renal failure as well as mediastinitis (deep and superficial) but it did not show any relationship between diabetes and in-hospital mortality.

**CONCLUSION:** It seems that diabetes mellitus has a significant impact on postoperative mediastinitis and renal failure. But diabetic patients do not necessarily have an increased risk of in-hospital mortality and other complications.

#### **P-071 BIOMARKERS OF T-CELL FUNCTION FOR POST-OPERATIVE RISK STRATIFICATION AFTER CARDIOPULMONARY BYPASS SURGERY**

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**BACKGROUND:** Impairment of T-cell function after cardiopulmonary bypass surgery (CPBS) is associated with an increased risk for postoperative complications like infections, thus determining postoperative outcome. To further evaluate the mechanism of T-cell dysfunction we developed whole-blood assays to analyze the expression of biomarkers of T-cell function in patients undergoing CPBS.

**METHODS:** Blood was obtained from patients undergoing CPBS ( $n=11$ ) preoperatively, at day-3 and -7 postoperatively (POD). Blood was stimulated with four different concentrations of concanavalin A (ConA). As cyclosporine (CsA) and sirolimus (SRL) inhibit different target enzymes at different stages of the cell cycle (G0- and G1-phase, respectively), we added clinical relevant concentrations of both drugs to whole-blood. Flow cytometric analysis was performed of T-cell expression of both CD25, required for activation, and CD95, involved in apoptosis.

**RESULTS:** In untreated blood expression of CD25 and CD95 significantly increased with higher ConA concentrations ( $p < 0.05$ ), but regardless stimulation, expression of both biomarkers decreased over time with maximum at POD-7 compared to preoperative values ( $p < 0.05$ ). Interestingly, when comparing all time points, inhibition of CD25 and CD95 expression was significantly higher preoperatively for SRL, but on POD3 for CsA, regardless the degree of stimulation ( $p < 0.05$ ). At all time points inhibition of CD25 and CD95 expression was significantly higher after CsA treatment compared to SRL, regardless of ConA stimulation ( $p < 0.001$ ).

**CONCLUSION:** Our results showed that different pathways of T-cell activation are impaired after CPB surgery over time. Future studies are needed to show the predictive value of biomarkers of T-cell function regarding clinical outcome after CPB surgery and therapeutic consequences.

#### **P-072-NEUROTROPHINS IN VASCULAR WALL AND PERIVASCULAR ADIPOSE TISSUE OF HUMAN CORONARY AND INTERNAL THORACIC ARTERIES**

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**BACKGROUND:** Neurotrophins, such as nerve growth factor (NGF) and brain-derived neurotrophic factor (BDNF), may acts not only on neuronal cells but also on a variety of nonneuronal cells including vascular smooth muscle cells and immune cells. We have previously reported that serum levels of NGF and BDNF are reduced in patients with acute coronary syndrome (ACS) as compared to control subjects (Manni et al, 2005). Here we aimed to determine the neurotrophin vascular wall levels in coronary arteries (CA; atherosclerosis-prone vessels) or internal thoracic arteries (ITA; atherosclerosis-resistant vessels) obtained from autopsy cases with or without advanced atherosclerotic lesions.

**METHODS:** The samples were obtained from autopsy cases or during coronary artery bypass graft (CABG) surgery. They were directly frozen for protein analysis or immersed in 4% paraformaldehyde for histology. Upon total protein isolation, neurotrophin levels were measured by enzyme-linked immunosorbent assay (ELISA). Standard immunohistochemical techniques were used for in situ immunodetection of neurotrophins and their receptors. Coronary arteries with advanced atherosclerotic lesions were compared to coronary arteries without atherosclerotic lesions as well as to respective ITA samples. Further, perivascular adipose tissue was investigated for neurotrophin expression.

**RESULTS:** Neurotrophin protein levels were reduced in atherosclerotic coronary arteries compared to nonatherosclerotic coronary arteries. Further, we found structural reorganization as mast cells and vasa vasorum number increased, and adventitia-associated vascular lymphoid tissue prominently developed in atherosclerotic coronary arteries as compared to nonatherosclerotic coronary arteries. All but two ITA specimens studied revealed no atherosclerotic lesions, and also no significant difference in both NGF levels and mast cell/vasa vasorum number. The two ITA specimens that showed presence of early atherosclerotic lesions also revealed decreased NGF levels. Perivascular adipose tissue revealed changes in neurotrophin expression.

**CONCLUSIONS:** Reduced neurotrophin levels in vascular walls and/or perivascular adipose tissue levels may be involved in the development of human atherosclerotic cardiovascular disease.

#### **P-073-CORONARY ARTERY BYPASS SURGERY VERSUS PERCUTANEOUS CORONARY INTERVENTIONS: CURRENT STATE OF THE ART**

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**BACKGROUND:** Coronary artery bypass grafting (CABG) and percutaneous coronary interventions (PCI), with or without stents, are alternative approaches to coronary artery revascularization. These techniques are two of the commonest medical procedures performed in Europe and North America. The ratio of PCI to CABG may exceed 4 to 1 in many industrialized countries. There are categories of patients in whom both procedures are technically feasible but the effectiveness of PCI and CABG is poorly indicated. In patients with most forms of single vessel disease PCI is the preferred form of revascularization and in patients with left main-stem or triple vessel disease with reduced left ventricular function, CABG is preferred. An analysis of reported studies [retrospective, randomized controlled trials (RCTs), meta-analyses] was conducted to establish the benefits of CABG against PCI in isolated left anterior descending (LAD) and multivessel coronary artery disease.

**METHODS:** A comprehensive search of retrospective, RCTs and meta-analyses, evaluating: a) the benefits of minimally invasive internal thoracic artery (ITA) bypass against PCI for isolated LAD disease and b) the benefits of CABG against PCI for multivessel coronary artery disease, was conducted in Medline, Embase, Cochrane Trials Register and large databases from 1980 to 2007. The following characteristics were assessed: study design, characteristics of population, cardiovascular risk factors and outcomes of interest such as: recurrence of angina, incidence of myocardial infarction, stroke and need for repeat revascularization.

**RESULTS:** Twelve studies (6 RCTs- 1952 patients) and one meta-analysis were retrieved for the analysis of isolated LAD disease. Fifteen studies (15 RCTs- 8000 patients), one meta-analysis and four large observational databases (Duke, New England, Cleveland and New York) were retrieved for evaluation of mul-

tivessel coronary artery disease. A higher rate of recurrence of angina, a higher incidence of MI, stroke and a higher rate of repeat revascularizations were observed with PCI for isolated LAD disease but there were no major difference in MI, stroke or mortality at medium follow up of 4 years. CABG provided a higher rate of survival at five and eight years for multivessel coronary disease. A three-fold reduction in need for repeat reintervention was shown at 5 years with CABG. PCI resulted in a significant decrease in nonfatal MI at 3 years. Large observational databases reconfirmed the results that the greatest benefit from CABG was seen in patients with multivessel coronary disease.

**CONCLUSION:** Minimally invasive LITA bypass for isolated lesions of LAD artery resulted in fewer complications in the mid-term compared with PCI. CABG was associated with lower mortality at five years, eight years and fewer revascularization procedures in multivessel disease. But, even in both isolated LAD and multivessel disease, the potential survival benefit of surgery was underestimated because the patients with more severe and complex lesions (high-risk) who were unsuitable for stenting, were excluded from the trials; the patients who would be benefited more from CABG. Besides the intention-to-treat analysis, made in many trials, discounted the benefits by those patients who crossed from PCI to CABG. CABG is superior to PCI in these groups of patients.

#### **P-074-TOTAL ARTERIAL REVASCLARIZATION IN HIGH RISK PATIENTS**

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**BACKGROUND:** In our endeavor to pass on the long term benefits of Total Arterial Revascularization (TAR), we have performed TAR in all high risk patients presenting for CABG. This study aims at analyzing the strategies used to achieve TAR in all patients. Methodology Patients with LVEF less than 30%, those requiring other concomitant procedures like valve repairs / replacement or LV Volume reduction were considered high risk for surgery. Of the 1246 patients who presented for CABG between January 2004 and December 2007, 419(33.6%) were considered high risk and included for analysis. LVEF was assessed by a Transthoracic echo.

**RESULTS:** In the 419 patients included for analysis, the average pre op LVEF was 24%(13 - 30). The 24 patients who underwent additional AVR had a Y graft, the 20 patients who had MVR had either Y (14) or pure grafts(6), and 4 patients who underwent DVR had 'Y' grafts. Those who had LV reduction procedures (22) had either Y grafts (14) or pure grafts (8). The average number of anastomoses was 3.1 (1-6), and 344(82%) patients underwent OPCAB. TAR was possible in all the patients. IABP was used in 33(8.1%), high doses of inotropic support was used in 75(18.1%) of the patients. There were 11(2.6%) deaths due to post op infection (4), low cardiac output (4), or ventilatory complications (3).

**CONCLUSION:** TAR is possible in all patients including those who are a high risk for CABG. Strategies to achieve this include OPCAB, Y grafts, and liberal use of sequential grafting.

#### **P-075-THE ANESTHESIA MANAGEMENT IN A CORONARY BYPASS SURGERY PATIENT WITH SICKLE-CELL ANEMIA**

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**BACKGROUND:** Sickle cell anemia is a hereditary hemolytic anemia which is autosomal recessive and characterized by structural gene abnormality. The homozygous state for HbS gene (SS) is called sickle cell anemia whereas the heterozygous state for HbS gene (AS) is called sickle cell trait. In case of sickle cell trait, HbS is seen 20-40% and HbA is present. In HbS, in a chain of HbA, the 6th amino acid changes from glutamic acid to valine. In deoxygenated environment and especially in low PH it causes crystallization of HbS to form sticks. Crystals causes deformation of erythrocytes and formation of sickle shape. Due to sickle shaped and stiffed erythrocytes, viscosity of blood increases, blood flow in small vessels slows down, capillary and arteriolar occlusion and also infarction in surrounding tissue occurs. Sickle cells hemolyze easily due to increased mechanical fragility. Situations like hemoglobin desaturation or decreased flow rate should be avoided. Measures should be taken to avoid hypothermia, acidosis, mild hypoxemia, hypotension and hypovolemia. In postoperative period to avoid hypoxia and pulmonary complications, supple-

mental oxygen therapy, optimal pain control, pulmonary physiotherapy and early mobilization are needed.

**METHODS:** Our case was 44 years old and operation had been planned for Coronary Artery Disease. His CBC formula was Hb: 13,7, Hct: 40, WBC:5,500 and Plt: 205,000. In his hemoglobin electrophoresis HbS was %35, HbA was %50 and HbA2 was %4. As a result of preoperative hematology consultation, preoperative erythrocytapheresis had been applied for 5 days prior to operation and in every application 4 units of blood were taken and 4 units of erythrocyte suspension were given. In patient to whom CABG planned, to protect from hypothermia it is provided for all fluids given to be heat. In induction 100 mcg fentanyl, 250 mg sodium thiopental was used and muscle relaxation was achieved with pancuronium. Hypoxia and acidosis were avoided.

**RESULTS:** Without any problem during operation patient had been taken to ICU, in postoperative 24 hours 400 ml of drainage had been occurred and in postoperative 3rd day patient was taken to the service.

**CONCLUSION:** In sickle cell anemia off-pump CABG application is a favorable method to avoid complications which may be caused due to pump.

#### **P-076 A SINGLE DOSE OF APROTININ PREVENTS PLATELETS HYPOREACTIVITY FOLLOWING CORONARY ARTERY BYPASS SURGERY**

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Surgical bleeding following coronary arteries bypass graft (CABG) is the main complication of the procedure leading to increased mortality and morbidity. Aprotinin, an antiprotease drug, can reduce the surgical bleeding but its efficacy was recently questioned due to risk of the adverse effects. We completed a randomized placebo-controlled double blind study, in which 24 patients with stable coronary artery disease who underwent CABG received a single dose aprotinin (2 million units) or saline placebo. Functional status of blood platelets was monitored before, immediately after CABG and 2 days later using an originally developed method of platelets activation in the whole blood and immunostaining at the patient's bedside. Expression of platelet selectin P and activated form of glycoprotein IIb/IIIa (PAC-1 antibody) was measured at baseline and following activation with ADP or TRAP-6 peptide, an agonist of protease activated receptor-1. Patients were monitored for clinical parameters, surgical bleeding and urinary metabolite of thromboxane A2. A complementary genetic study controlled for the platelets PIA1/A2 polymorphism and a novel functional variant of the platelets 12-lipoxygenase 261Gln. Aprotinin effectively reduced post-operative bleeding by 26% (p<0.01). No adverse effects of the aprotinin treatment were observed. Administration of aprotinin prevented a 4.2 fold decrease in blood platelets sensitivity to ADP immediately following CABG procedure. No effects of aprotinin were detectable during platelets activation using the agonist of PAR-1 receptor. A common 261Gln variant of 12-lipoxygenase correlated with a decreased peripheral blood platelets count, and with increased platelets reactivity to ADP, but it had no effect on efficacy of aprotinin. Interaction of aprotinin treatment with ADP pathway of blood platelets activation is an attractive hypothesis supported by our data. Aprotinin prevented inhibition of blood platelets reactivity to ADP in the postoperative period and significantly reduced surgical bleeding. The single dose regimen of aprotinin did not bring adverse clinical effects and did not inhibit platelets activation by protease activated receptor-1.

#### **P-077-LONG TERM OUTCOMES AFTER SURGERY MANAGEMENT IN PATIENTS WITH SEVERE VENTRICULAR DYSFUNCTION**

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**BACKGROUND:** Controversy still exists regarding the optimal surgical technique for treatment of patients with coronary artery disease (CAD) and severe LV dysfunction. The aim of this study was to evaluate and compare functional status, according to the NYHA functional class, at long term follow-up period after isolated coronary artery bypass grafting and concomitant Dor procedure for LV reconstruction.

**METHODS:** We retrospectively analyzed two groups of pts with CAD and LV

dysfunction: 1 gr. - 216 consecutive pts with mean LVEF  $31.01 \pm 5.1\%$ , who underwent CABG alone; 2 gr. - 135 consecutive pts with LVEF  $32.8 \pm 8.7\%$ , who underwent Dor procedure for LV repair and concomitant CABG. We compared NYHA functional class, mean LV diastolic dimension (LVdd) in these groups at long-term follow-up period.

**RESULTS:** At follow-up patients clinical symptoms improved and were in better mean NYHA functional class with respect to the preoperative value. In 1 gr. NYHA functional class improved from  $3.3 \pm 0.5$  to  $2.49 \pm 0.5$  ( $p < 0.001$ ) at 1 year postoperatively. In NYHA functional class I-II were 51% of patients at 1 year, 40% of patients after 3 years and 33% after 7 years postoperatively. Mean LVdd increased from  $6.02 \pm 0.63$  to  $6.98 \pm 2.1$  cm at late follow-up period. In II group NYHA functional class improved from  $3.47 \pm 0.58$  to  $2.31 \pm 0.47$  ( $p < 0.001$ ) at 1 year postoperatively. In NYHA functional class I-II at 1 year postoperatively were 60.3% of patients, and after 5 years postoperatively - 47.5% of patients. Mean LVdd remained unchanged at late follow-up period:  $6.37 \pm 0.84$  cm versus  $6.22 \pm 0.40$  cm ( $p = 0.32$ ). Benefit from isolated CABG is time limited with large percentage of patients eventually developing recurrent or persisting heart failure symptoms.

**CONCLUSIONS:** We have demonstrated that the functional status of patients with severe LV dysfunction at late follow-up period after isolated CABG remains suboptimal and is inferior to CABG plus ventricular restoration.

### P-078-THE TREATMENT OF OSTIAL CORONARY ARTERIOPATHY SECONDARY TO THORACIC IRRADIATION WITH OFF-PUMP CORONARY BYPASS GRAFTING :A CASE REPORT AND REVIEW OF LITERATURE

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**OBJECTIVE:** We report a case who suffered from angina of increasing frequency and severity due to mediastinal irradiation received off-pump coronary bypass grafting in our hospital 3 years ago.

**METHODS:** one patient got angina after 8 years radiation therapy due to Hodgkin's lymphoma, and we retrospectively report the data who received off-pump CABG in our hospital and 3 years information after operation. This case is only one from our review of Chinese literature and is firstly reported. Result: mediastinal irradiation caused the patient have significant ostial stenosis of left main coronary and right coronary artery as well as significant stenosis of proximal circumflex artery. Off-pump coronary artery bypass grafting was performed on this patient 3 years ago. His angina disappeared after operation, and he has good recovery during follow-up.

**CONCLUSION:** patients with malignancies who have received mediastinal irradiation should be carefully followed up and routinely screened for the premature development of coronary artery disease. CABG may be a novel approach to treat coronary artery disease caused by mediastinal irradiation.

### P-079-CARDIOPROTECTIVE EFFECTS OF INSULIN, GLUCOSE, AND NORMOGLYCEMIA AFTER CORONARY ARTERY BYPASS GRAFTING SURGERY

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**BACKGROUND:** The occurrence of acute hyperglycemia during coronary artery bypass grafting surgery (CABG) and cardiopulmonary bypass (CPB) is a common feature in patients, even those without a history of diabetes. Perioperative hyperglycemia during cardiac surgery has been shown to be associated with significant morbidity and mortality. The aim of this study was to investigate the myocardial protective effects of high-dose insulin, glucose, and tight glycaemic control during CABG surgery.

**METHODS:** A total of 70 diabetic and non-diabetic patients undergoing elective CABG surgery were randomly assigned to receive an intraoperative hyperinsulinemic normoglycemic clamp at an insulin infusion of 5 mU/kg/min ( $N=35$ ) or a titrated insulin infusion according to an insulin sliding scale ( $N=35$ ). In the clamp group, arterial blood glucoses were measured every 5-10 min with the aim of preserving a glycemia between 4.0 - 6.0 mmol/L. Troponin I, a sensitive marker for myocardial injury, was measured and compared for both groups preoperatively and postoperatively at 0, 4, 8, 16, 24 and 48 hours. The amount of inotropic and vasopressure support required in both groups were taken as a measure of post-operative cardiac function based on the

achievement of pre-defined hemodynamic goals. These goals include maintaining a cardiac index  $> 2.0$  L/min/m<sup>2</sup>, a MAP 60 - 100 mmHg, and a HR 50 - 90 min<sup>-1</sup>.

**RESULTS:** Operative characteristics including CPB time did not differ between the two groups. The group receiving the hyperinsulinemic normoglycemic clamp required significantly less inotropic as well as vasopressure support intra-operatively, as well as post-operatively at 12 and 48 hours ( $p < 0.05$ ). Moreover, the clamp group showed significantly lower Troponin I levels at 4, 8, 16, 24 and 48 hours ( $p < 0.05$ ) postoperatively compared to the control group receiving an insulin sliding scale. There was no difference in outcome when comparing diabetics and non-diabetics within each group.

**CONCLUSION:** High-dose insulin, glucose, and normoglycemia improves cardiac function as well as prevents myocardial damage after CABG surgery in both diabetics and non-diabetics.

### P-080-30-YEAR PATENCY OF A SAPHENOUS VEIN GRAFT IN A CASE OF CORONARY BYPASS SURGERY

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A 74-year-old man was admitted to our hospital complaining of unstable angina pectoris. He was asymptomatic at rest. Signs of the left bundle-branch block were showed in electrocardiography. He had a history of using acetylsalicylic acid for thirty years. There was no history of diabetes mellitus, hypertension or hyperlipidemia. Thirty years ago, a saphenous vein graft (SVG) from the ascending aorta to the LAD had been performed for myocardial revascularization in another country. Critical stenoses of the proximal RCA and proximal Cx were established in coronary angiography (Fig.1A-B). The proximal LAD artery occluded completely, but previous performed anastomosis of aorto-LAD saphenous vein graft was working perfectly (Fig.2-A). The intermediate coronary artery was normal. Meanwhile, two steel bands was interestingly seen in angiography which was used for sternotomy closure from the first operation (Fig.1A, Fig.2-A). Two stents was implanted successfully to proximal RCA and proximal Cx (Fig.1C-D). The post-interventional period of patient was uneventful.

**DISCUSSION:** The first saphenous vein graft was used in CABG by Favalaro et al. in 1967 (1). 10 year-patency at was 60-80 % for SVG compared with 85-95 % for IMA grafts according to the previous reports (2). Thrombotic occlusion and neo-intimal hyperplasia are earlier causes of graft occlusions. The main cause of SVG occlusion in late period after first operative year is atherosclerotic disease of SVG in CABG (3). The best predictor of graft patency in long term period is the diameter of the vessel after surgery. Generally, the 10-year patency is 88 % in vessels  $> 2.0$  mm compared with 55 % in vessels with diameters  $\leq 2.0$  mm. For SVGs to performed to the LAD, the 10-year patency is 90 % for vessels  $> 2.0$  mm compared with 52 % for vessels  $\leq 2.0$  mm (2). In our patient, the diameter of LAD was measured 2.5 mm in the anastomotic region by comparing with a 6F Judkins guiding catheter (size: 2.00 mm) used in angiography (Fig.2-B). Shah et al (4) reported that a younger age is a decreasing factor of SVG patency as well as a small diameter of coronary artery. Considering 40-year-history of SVGs in CABG surgery, this 30-year-patency is a noteworthy case. To our knowledge, this is the first successful case of a 30-year patency of SVG performed from the aorta to the LAD artery.

### P-081-LOW INCIDENCE OF COMPLICATIONS IN COMPLETE ARTERIAL MYOCARDIAL REVASCLARIZATION

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**BACKGROUND:** Advantages in late outcomes of myocardial revascularization with arterial conduits are widely recognised. However, the cardiac surgery community still remains reluctant to extend the use of the second internal mammary artery or the gastroepiploic artery because of potential higher complication rates. Concerns regarding early complications, particularly in patients with diabetes, obesity and chronic obstructive pulmonary disease (COPD), prevents the systematic adoption of these procedures. This retrospective study evaluates the rate of mortality and morbidity in a consecutive cohort of patients who underwent complete myocardial revascularization with the exclusive use



of skeletonized arterial conduits.

**METHODS:** From January 1996 to January 2007, 2662 consecutive patients (mean age 72 years, 80% male) underwent myocardial revascularization using both internal mammary arteries (LIMA, RIMA) in 1986 cases and LIMA, RIMA and right gastroepiploic artery (GEA) in 676 patients. Age ranged from 35 to 81 years (mean 67.2), 34% patients were diabetic, 17% obese, 12% had COPD, 8% had both diabetes and obesity, 3.4% had both diabetes and COPD, 2% were affected by diabetes, obesity and COPD, 18% of the surgical procedures were urgent. Bilateral in situ IMAs were employed in 968 patients, composite Y graft in 898 cases.

**RESULTS:** Hospital mortality was 1.2%. Incidence of perioperative myocardial infarction, stroke and mediastinitis were respectively 0.8%, 1.3% and 0.7%. Intra-aortic balloon pump was utilized in 0.6% of the cases. In 7 cases (0.2%) an arterial conduit had to be replaced by a venous graft because of inadequate blood flow. Statistically significant relations between mediastinitis and risk factors have not emerged: diabetes ( $p=0.346$ ), obesity ( $p=0.671$ ), both factors ( $p=0.690$ ), COPD ( $p=0.569$ ), all factors ( $p=0.249$ ).

**CONCLUSIONS:** Complete myocardial revascularization using exclusively arterial conduits can be routinely performed with low mortality and complication rates. Diabetes, obesity and COPD do not represent a contraindication even in urgent cases, if arterial conduits are harvested as skeletonized. Inadequate blood flow from skeletonized arterial grafts is a very rare event.

#### P-082-UTILITY OF B-TYPE NATRIURETIC PEPTIDE IN PREDICTING POSTOPERATIVE ATRIAL FIBRILLATION AFTER CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** Atrial fibrillation (AF) is still the most frequent rhythm disturbance after coronary artery surgery. Our aim was to evaluate the predictive ability of preoperative BNP levels to determine post operative new-onset atrial fibrillation in patients undergoing isolated first time coronary artery bypass grafting (CABG) by the help of the cardiopulmonary bypass (CPB).

**METHODS:** We recruited 45 female, 63 male totally 108 consecutive patients undergoing isolated CABG. Preoperative and postoperative data were collected. Preoperative BNP levels were measured the day before surgery.

**RESULTS:** Median preoperative BNP level was 67.5pg/ml. Post operative AF occurred in 29 (26.9%) of the patients. Univariate analyses showed advanced age and median preoperative BNP levels are both associated with postoperative AF (196 pg/ml vs. 64 pg/ml,  $p<0.001$ ;  $63.8 \pm 9$  years vs.  $56.6 \pm 9.6$  years,  $p=0.001$ ). Both variables remained as independent predictors of postoperative AF after multivariate logistic regression analyses (Odds ratio 1.085, 95% confidence interval 1.020-1.154,  $p=0.009$  for advanced age; Odds ratio 1.003, 95% confidence interval 1.000-1.006,  $p=0.035$  for preoperative BNP level). Receiver operating characteristics curve demonstrated preoperative BNP level as a predictor of postoperative AF with area under curve 0.720. A cutoff value of 135 pg/ml for atrial fibrillation demonstrated 69.6% sensitivity, 62.1% specificity, 57.1% positive predictive value, 83.3% negative predictive value and 67.6% accuracy for predicting postoperative AF.

**CONCLUSIONS:** Elevated preoperative BNP levels and advanced age together are significant predictors for development of postoperative AF in patients undergoing isolated CABG with CPB.

#### P-083-GHRELIN LEVELS AND EFFECTS ON THE PATIENTS UNDERGOING CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** Ghrelin is an endogenous natural ligand of growth hormone (GH) secretagogue receptor, and is recognized an important regulator of GH secretion and energy homeostasis. Inadequate plasma ghrelin levels determine the suppression of appetite, nutritional state and morbidity. Ghrelin improves cardiac performance by increasing the cardiac output, stroke volume, and LV fractional shortening and by increasing fractional cell shortening and shortening velocity of isolated myocytes. We investigated the changes of plasma ghrelin levels in cardiopulmonary bypass patients.

**METHODS:** Twenty consecutive patients were enrolled in this study. All patients

were clinically stable at the time of evaluation and had no evidence of active infection, gastric ulcer, or other primary cachectic states, such as cancer, thyroid disease, and severe liver disease. Blood samples were taken from the antecubital vein in the morning between after an overnight fasting, because plasma ghrelin level has been shown to be altered by food intake. We measured plasma ghrelin levels at four intervals during preoperatively, and postoperative first hour, first day and fifth day. Patients were divided into two groups: Group A including 10 diabetic patients and Group B including 10 non-diabetic patients.

**RESULTS:** Group A including 10 diabetic patients (mean age  $56.4 \pm 9.7$ ) and Group B including 10 non-diabetic (mean age  $63.7 \pm 11.8$ ) patients. Body mass index in non-diabetic group (Group B) was ( $28.7 \pm 0.3$ ) and in diabetic group (Group A) ( $30.2 \pm 4.3$ ).

**CONCLUSION:** Considering ghrelin-induced positive energy effects, increased ghrelin in plasma may represent a compensatory mechanism under catabolic-anabolic imbalance. Ghrelin level changes affects postoperative appetite. It is shown that a specific receptor for ghrelin exists not only in the hypothalamus and pituitary but also in blood vessels and the heart and that intravenous injection of ghrelin causes beneficial hemodynamic effects via reducing cardiac afterload and increasing cardiac output without an increase in heart rate.

#### P-084-PREOPERATIVE IDENTIFICATION OF PATIENTS WITH HIGH RISK FOR POST CABG STERNUM INSTABILITY

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**OBJECTIVE:** An increasing percentage of patients undergoing coronary artery bypass grafting (CABG) show a high EURO-Score. In these patients the use of the internal mammary artery (IMA) may have a significant impact on postoperative wound healing. In this study we investigated whether the peristernal tissue perfusion may be impaired after IMA usage.

**METHODS:** Two hundred patients undergoing CABG-procedures were included ( $m=140$ ;  $f=60$ ; age  $72 \pm 6.8$  yrs.). Patients with an EURO-Score  $<2$  were considered group A, patients with an EURO-Score 3-5 were group B and high risk patients formed group C (EURO-Score  $>6$ ). A non invasive device (Masimo Radical 7) was used to quantify blood perfusion in the peristernal tissue. Measurements were performed before and after surgery. A Perfusion index was determined and put in relation to the risk groups.

**RESULTS:** Most patients showed no significant alterations in peristernal tissue perfusion after IMA preparation. However, few patients in the high risk group showed a significant drop in tissue perfusion after IMA grafting. Of these patients 10% had to undergo sternal restabilisation. Patients with a significant perfusion index drop after IMA preparation are at higher risk for sternum instability.

**CONCLUSIONS:** To reduce the risk for postoperative sternum instability intraoperative measurements of peristernal tissue perfusion may be useful. Therefore further investigations are necessary.

#### P-085-PREOPERATIVE ENDOTHELIAL FUNCTION PREDICTS CARDIOVASCULAR MORBIDITY AFTER CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** Endothelial dysfunction is a known risk factor for acute ischaemic events but implications of this on cardiovascular morbidity has not yet been tested in patients undergoing coronary artery bypass grafting (CABG). The aim of our study was to test whether preoperative endothelial function, as assessed by the measurement of blood concentration of soluble adhesion molecules (sVCAM-1 and sICAM-1), has a relation to postoperative cardiovascular morbidity after elective CABG with cardiopulmonary bypass (CPB).

**METHODS:** Prospective single centre study in 42 patients scheduled for CABG surgery with CPB. All patients had a perioperative risk within the low to moderate range as estimated by standard Euroscore. Endothelial function was evaluated measuring vascular (sVCAM-1) and intercellular (sICAM-1) adhesion molecules from peripheral blood samples with enzyme-linked immunosorbent assays (ELISA) (BioSource, Belgium). In addition, troponin I, creatinine, C reac-



tive protein, and a complete blood count analysis were performed. Samples were obtained before induction of anaesthesia and on the first postoperative day. Predefined postoperative complications during the first 30 postoperative days were documented. Comparisons were based on Chi-Square test for categorical data and Mann-Whitney U test and Wilcoxon-signed-ranks test for continuous data when appropriate. Values were expressed as median and [25% percentiles; 75 % percentiles].  $P < 0.05$  was deemed to be statistically significant. Statistical analysis was performed with the SPSS 11.5 software package.

**RESULTS:** sICAM-1 and sVCAM-1 levels increased after surgery compared to baseline values. sICAM-1 increased from 201 [146-336] to 268 [215 - 375] ng/ml ( $p=0,022$ ) and sVCAM-1 increased from 1003,5 [709,5 - 2117] to 1638,2 [1268,25 - 2094,125] ng/ml ( $p=0,023$ ). Postoperative complications occurred in 29 (69 %) patients: myocardial infarction in 21 (25 %) - acute pulmonary dysfunction in 10 (22,7 %) -stroke in 1 (2,3 %) - circulatory failure in 21 (50 %) - atrial fibrillation in 2 (4,5 %) and systemic inflammatory response syndrome in 5 (11,4 %). Patients with cardiovascular complications had a higher preoperative value of sICAM-1 (213 [164,5 - 389] vs 164 [125 - 228,5],  $p=0,026$ ); had a higher operative risk (EuroSCORE - 3 [1-4] vs 1 [0-2];  $p=0,007$ ); were older (66 [60-70,5] vs 59 [54-64,5] years old;  $p=0,023$ ) and had a higher baseline concentration of high sensitivity C reactive protein (hs-CRP) (4,0 [2-8] vs 1,6 [1,1-2,3] mg/l;  $p=0,001$ ).

**CONCLUSION:** Higher baseline concentration of sICAM-1 and hs-CRP were related to a higher postoperative morbidity in patients who benefited from CABG surgery with CPB. Postoperatively sICAM-1 and sVCAM-1 increased significantly, demonstrating endothelial activation in those patients. Research was supported by Lithuanian State Science and Studies Foundation.

#### **P-086-THE BEATING HEART REVASCLARIZATION OF CORONARY ARTERIES THOSE PRESENT AT THE POSTERIOR CARDIAC WALL AND THE COMPARISON OF THE ANGIOGRAPHIC FINDINGS OF THE BEATING HEART PROSEDURE WITH THE CONVENTIONAL CORONARY ARTERY BYPASS PROSEDURE**

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**BACKGROUND:** In our study, we investigated the preoperative, operative and postoperative datums of the patients who had beating heart coronary artery bypass procedure in which the posterior cardiac arteries were revascularized.

**METHODS:** We determined that off-pump CABG procedure were applied more for the patients who had low EF, chronic obstructive lung disease and chronic renal failure and the postoperative blood transfusion and drainage were lower for off-pump CABG procedure when it was compared with conventional surgery.

**RESULTS:** Also according to postoperative datums; postoperative entubation time, the time of hospitalization and staying at the intensive care unit were lower for off-pump surgery in an statistically meaningful fashion. For both groups graft patency was fine and the anastomosis were open for the posterior target wall revascularization of the off-pump group.

**CONCLUSION:** For the appropriate and chosen cases the target coronary arteries those present at the posterior cardiac wall can be revascularized with the beating heart coronary artery bypass procedure that is applied without CPB.

#### **P-087-EMERGENCY REINSTITUTION OF CARDIOPULMONARY BYPASS DURING CORONARY ARTERY BYPASS GRAFTING SURGERY: RISK FACTORS AND OUTCOMES**

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**BACKGROUND:** In a number of cases during cardiac surgery weaning from cardiopulmonary bypass (CPB) may be specially difficult, and in a few situations simply impossible. Resumption of cardiopulmonary bypass (CPB) is occasionally required during cardiac surgery procedures. The aim of our study was to evaluate the incidence, etiology and impact on patients outcomes of reinstitution of CPB during coronary artery bypass grafting (CABG) surgery.

**METHODS:** A institutional ethics committee approved retrospective review of 3156 consecutive CABG patients operated on-pump between January 1, 2000 and December 31, 2006. Patients who underwent elective and nonelective myocardial revascularization surgery were included. Exclusion criteria were other than isolated CABG procedure and patients primary operated off-pump who needed conversion to on pump surgery. The patients demographics, peri-operative data and postoperative outcomes were collected and analysed. Pre-operative operative risk stratification was performed using the Euroscore system in all patients. Mortality was the primary endpoint, however, major morbidity occurring in the postoperative period was also evaluated. Univariate and multivariate analysis was performed to analyze the results.

**RESULTS:** Sixty nine patients (2,2%) needed resumption of CPB and it occurred at a mean of  $22 \pm 27$  minutes (range 1 - 120) after the discontinuation of initial cardiopulmonary bypass. The main cause of resumption of CPB was worsening of myocardial dysfunction. The in-hospital mortality of patients who needed resumption of CPB was significantly higher compared to those with single CPB run (43,7 % vs 2,4%,  $p < 0,05$ ). Reinstitution of CPB was also associated with higher postoperative morbidity - higher incidence of stroke (10,3% vs 1,1%,  $p < 0,05$ ), higher incidence of intraaortic balloon pump support for treatment of low cardiac output syndrome (49 % vs 2,9 %,  $p < 0,05$ ), longer duration of ICU stay ( $4,3 \pm 3,7$  vs  $1,8 \pm 2,2$  days,  $p < 0,05$ ).

**CONCLUSIONS:** The resumption of CPB during surgery was necessary in 2,2% of consecutive CABG patients and was associated with significantly increased risk of in-hospital mortality and morbidity.

#### **P-088-SURGICAL TREATMENT OF RADIAL ARTERY SPASM**

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**BACKGROUND:** The radial artery (RA) is a widely used conduit for coronary artery bypass grafting (CABG) and its impact on patient's outcomes has been extensively studied. Spasm of RA is a rare phenomenon, but in some cases it can occur. We report a case when postoperative RA spasm resulted in severe ischemia and low cardiac output syndrome. Our experience with surgical treatment of RA spasm is reported.

**METHODS AND RESULTS:** The patient with triple vessels disease was scheduled for elective CABG surgery. He had no saphenous veins which could be used as conduits for myocardial revascularization. Both radial and mammary arteries were used (left internal mammary artery (LIMA) to left anterior descending artery (LAD), left RA to right coronary artery (RCA), right RA to obtuse marginal (OM) and diagonal (D) branches sequentially). Seven hours after the patient was admitted to intensive care unit his condition started deteriorate. Signs of ischemia were noted on the patient ECG. The inotropes (epinephrine) infusion was increased to  $0,2 \text{ } \mu\text{g/kg/min}$ . High doses of intravenous nitrates were not effective to diminish ECG changes. Re sternotomy was performed and intraaortic balloon (IABP) was inserted through the ascending aorta (patient had severe peripheral artery disease). During reexploration both RA's conduits were found spastic. Nitroglycerin and papaverin solution was injected in to the adjacent tissues of radial arteries. Following this treatment RA became dilated, ST segment on ECG came to normal limit and patient started to improve. RA fasciotomy is usually used in our institution to prevent RA spasm. We usually divided RA together with adjacent and concomitants veins. We observed in some cases diffusely spastic grafted RA and extended concomitants veins. When we started to use division of fascia propria from one side of RA (semiskeletonisation) and the reactivity of grafted RA occurs less often in our experience.

**CONCLUSION:** RA spasm can occur in rare cases despite all antispastic measures. The semiskeletonized radial artery harvest could be an option to further reduce the incidence of postoperative vasospasm.

### P-089-EFFECT OF PREOPERATIVE INTRAAORTIC BALLOON PUMP SUPPORT FOR HIGH RISK OFF PUMP CORONARY ARTERY BY PASS OPERATIONS

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**BACKGROUND:** Displacement of the heart to expose the target vessels during off pump coronary artery bypass grafting (OPCABG), often causes hemodynamic deterioration, especially in high risk patients (significant left main coronary artery disease, unstable angina, left ventricular dysfunction, recent acute myocardial infarction). Usefulness of preoperative intraaortic balloon pump (IABP) therapy in this high risk group was the objective of our study.

**METHODS:** Four hundred twenty three consecutive patients who underwent OPCABG through median sternotomy between July 2004 and November 2007 were studied. Patients were divided into group I (77 high risk patients - preoperative use of IABP) and group II (346 patients - no preoperative IABP). Of the 77 patients satisfying the insertion criteria, 19 had critical left main stem disease, 32 had unstable angina, 14 had acute myocardial infarction and 12 had left ventricular dysfunction (ejection fraction < 35%). Number of distal anastomoses, conversion rate, need for inotropic support, average operating time, mortality, ventilator support time, low cardiac output syndrome, cerebrovascular accident, acute renal failure, length of stay in intensive care unit (ICU) and hospital stay were studied and compared in both groups.

**RESULTS:** The average number of distal anastomoses in group I and II were 3,1±0,8 and 3,3±0,7 respectively ( $p>0.05$ ). There were no significant differences in the number of posterior vessels anastomoses per patient. There was only one case of conversion to on pump surgery (1,2%) in group I compared to 13 patients (3,7%) in group II. IABP appeared to facilitate intraoperative management by improved hemodynamic stability and elimination of the need for inotropic support. There were no differences in ventilator support time, length of stay in the ICU, hospital stay and morbidity in both groups. There were 2 deaths in group I and 4 deaths in group II. There was only one IABP-related complication (leg ischemia).

**CONCLUSIONS:** Preoperative use of IABP is valuable in conduct of off pump coronary artery procedures in high risk patients, providing results similar to patients at low operative risk.

### P-090-ROLE OF PROSTAGLANDINS ON VASOPRESSIN-INDUCED CONTRACTION OF HUMAN GASTROEPICLOIC ARTERY AND SAPHEOUS VEIN

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**BACKGROUND:** the present experiments were designed to evaluate differences in the effects of COX-1 and COX-2 inhibition on contractile responses of human gastroepiploic artery (GEA) and saphenous vein (HSV) elicited by vasopressin.

**METHODS:** Rings of human GEA were obtained from 32 patients undergoing gastrectomy and rings of HSV were obtained from 30 patients undergoing coronary artery bypass surgery. The rings were suspended in organ baths for isometric recording of tension. We studied the responses to vasopressin in the absence and in the presence of either the vasopressin V1-receptor antagonist d(CH<sub>2</sub>)<sup>5</sup>Tyr(Me)AVP and the COX inhibitors aspirin, nimesulide and SC-560.

**RESULTS:** Vasopressin produced concentration-dependent contractions with an EC<sub>50</sub> value of 4.3x10<sup>-10</sup> mol/L for GEA and 3.4x10<sup>-10</sup> mol/L for HSV. The vasopressin antagonist induced significant shifts ( $p<0.01$ ) of the control curves to the right. The COX1 and COX2 inhibitor aspirin and the COX-2 inhibitor nimesulide induced leftwards shifts of the concentration-response curve for vasopressin in GEA. Lower concentrations of aspirin or the COX1 inhibitor SC560 did not affect the responses of GEA. COX1 or COX2 inhibition did not modify the contraction of HSV to vasopressin.

**CONCLUSION:** The results provide functional evidence that aspirin at high concentration and the COX2 selective inhibitor nimesulide potentiate the contractile response of GEA to vasopressin, thus suggesting the release of relaxant prostaglandins by the peptide. However, contractions of HSV were unaffected. The amplifying effect of aspirin on vasopressin induced contraction may contribute to early graft failure when gastroepiploic artery is used as a coronary

bypass graft.

### P-091-LATE RESULTS OF MINIMALLY INVASIVE OPERATIONS OF MYOCARDIAL REVASCULARIZATION

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**BACKGROUND:** Surgical treatment of ischemic heart disease in patients with acute and chronic coronary syndromes significantly increases quality of life and survival. In order to improve arterial heart revascularization, minimally invasive operations are performed, which are less traumatic and could be done more safely. There are still a lot of discussions about improving beating heart surgery technique and what is the future of coronary artery bypass surgery in off-pump technique.

**METHODS:** We studied 71 patient with acute and chronic coronary syndromes that underwent minimally invasive operations of myocardial revascularization in Kaunas University of Medicine Clinic of Cardiothoracic and Vascular surgery between 2000-2005. Late results were evaluated 4.4±0.2 years postoperatively.

**RESULTS:** The mean age was 61.1±9.3 years. 44 patients had stable angina pectoris, 19-unstable angina pectoris and 11 patients were ill with acute myocardial infarction. 74.6% had arterial hypertension, 33.8%- dyslipidemia, 8.5% were ill with diabetes. Preoperative left ventricular function ejection fraction was 46.2±1.2 %. In 49.3% cases there was performed 1 distal anastomosis and in 50.7%- 2-3 distal anastomoses. Complete arterial revascularization was achieved in 57.7% of cases. Postoperative lethal and non-lethal cardiovascular complications were in 14 cases: 5 patients died from cardiovascular complications, 4 had myocardial infarction, 5 - cerebrovascular accident, 2 patients had angina symptoms and underwent percutaneous angioplasty, 1 patient had peripheral vascular revascularization.

**CONCLUSION:** Late term results of minimally invasive operations of myocardial revascularization are satisfactory in patients with acute and chronic coronary syndromes.

### P-092-RING-FREE MITRAL VALVE REPAIR WITH CONCOMITANT CORONARY ARTERY BYPASS GRAFTING

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**BACKGROUND:** The aim of the study was to evaluate the patients' (pts) survival, changes of functional status, residual mitral regurgitation (MR) and reoperation rate after CABG with concomitant ischemic mitral regurgitation (IMR) ring-free repair.

**METHODS:** Study group consisted of 70 pts, who underwent suture anuloplasty mitral valve (MV) repair with/without other plastic procedures on the cusps (suture anuloplasty-36 patients(51.4%), valvuloplasty-34 patients(48.6%), central coaptation suture-29 cases(41.4%)) for IMR with concomitant coronary artery bypass grafting (CABG) in Vilnius University Heart Surgery Center between 2000 January and 2006 December. We analyzed general clinical data, NYHA functional class, LVEF, mitral valve repair procedures, data of echocardiography before and after the operation.

**RESULTS:** Retrospective analysis of 63 man and 7 woman with average age of 64.4±8.64 after CABG operations (3.73±0.51 grafts/patient) with concomitant ring-free mitral valve repair showed advanced heart failure in the group: EF-29.28±9.27, NYHA- 3.73±0.51, MR- 2.83±0.38. Medium follow-up period was 34,75±18.95month Regardless of ring-free mitral valve repair technique, significant reduction of MR: early - from 2,83±0,38 to 0,87±0,34( $p<0,001$ ) and late - from 2,83±0,38 to 1,03±0,59 ( $p<0,001$ ) - was observed. NYHA functional class changed from 3.73±0.51 to 2.27±1.12 ( $p<0,001$ ), LVEF - from 29.28±9.27% to 32.03±11.36%, ( $p<0.01$ ). In our series we had 10% (7 pts) of residual MR after ring-free MV repair and 5.5% (3 pts) of reoperations due to recurrent valve incompetence. One, two and six-year survival was 65%, 61%, and 50% respectively. Hospital mortality was high (intraoperative mortality - 6 patients -8.6%), in-hospital mortality - 9 patients - 12.8% due to poor pts preoperative status. Late mortality was rather low - 7.2 % (4 patients) in 6 years.

**CONCLUSIONS:** Ring-free mitral valve repair with or without cusp plastic procedures is effective method of treatment for ischemic mitral insufficiency with concomitant CABG: patient's postoperative status improves significantly in terms of MR, NYHA functional class, LVEF. One-year survival was 65%, two-year survival - 61%, and 6-year survival - 50%. Residual MR after repair (10%) and reoperation rate (5.5%) is acceptable.

#### **P-093-FIBRIN GLUE AS EXTERNAL SUPPORT ENHANCED ADVENTITIAL GENE TRANSFECTION**

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**ABSTRACT OBJECTIVE:** Intraluminal gene therapy is limited by inadequate exposure time due to run-off associated with blood flow and prolonged ischemia time which would worsen intimal injury. Peri-adventitial gene delivery is a promising alternative therapy to reduce intimal hyperplasia. But it is limited by low and transient levels of gene transfection. To get more effective gene transfection through peri-adventitial, a study was undertaken to investigate whether mixing adenovirus with fibrin glue may increase the level and prolong the time period of gene expression.

**METHODS:** Right jugular vein to common carotid artery interposition grafting was performed in sixteen male New Zealand white rabbits (2.5-3.0 kg) and the animals were divided into two groups: Ad-GAL group (n=8); fibrin glue/Ad-GAL group (n=8). Commercially available fibrin glue and adenovirus expressing the gene for  $\beta$ -galactosidase (Ad-GAL) was applied separately or in mixing around vein grafts. At 7th day and 14th day after implantation, the grafts were harvested to evaluate transfection rate.

**RESULTS:** Compared with weak staining in  $2.1 \pm 0.5\%$  in Ad-GAL alone grafts, a high level of  $\beta$ -Galactosidase staining was evident in  $13.2 \pm 4.6\%$  in fibrin glue/Ad-GAL grafts at 7th day (p<0.001). At 14th day, almost no staining (0%) was detected in Ad-GAL alone grafts. However, there was still a relative high level staining ( $6.3 \pm 3.8\%$ ) in fibrin glue/Ad-GAL grafts (p<0.001 vs Ad-GAL alone group).

**CONCLUSIONS:** A novel method of adventitial gene delivery using fibrin glue as external support is proposed. Fibrin glue may be an ideal candidate for controlled release delivery which would facilitate adventitial gene transfer. Key words: fibrin glue, external support, adventitial delivery, gene transfection

#### **P-094-EARLY POSTOPERATIVE COMPARISON OF RENAL FUNCTIONS IN ONPUMP AND OFFPUMP CORONARY ARTERY BYPASS GRAFTS**

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**BACKGROUND:** Coronary artery bypass grafting is the surgical treatment option for single and multivessel coronary artery disease and also where percutaneous coronary intervention fails to achieve the desired result. This study was aimed at comparing the difference in renal functions pre- and post operatively when the surgery was done on pump and off pump.

**METHODS:** The study group consisted of 118 patients who had the surgery done off pump and 313 patients who had it done on pump between January 2004 and May 2007. Random intercept and slopes model were fitted to the urea, creatinine and creatinine clearance on post operative days 1 and 4. Values were adjusted for variables not in the Euroscore like diabetic status, smoking, blood pressure etc.

**RESULTS:** Those with high Euroscores had a higher value for urea than those with low Euroscores in the on pump group. However those with a high Euroscore had a lower urea level than those with a low Euroscore in the off pump group. The creatinine clearance increased between postoperative days 1 and 4 in the high Euroscore group who had the surgery done off pump compared to those with a low Euroscore who had their surgery done on pump.

**CONCLUSION:** Patients with a high Euroscore who had their CABG done off pump had a significantly low urea and creatinine levels over postoperative days 1 to 4 when compared with those who had a low Euroscore and who had their surgery done on pump.

#### **P-095-VINEBERG'S PROCEDURE WITH DISTAL MAMMARY ANASTOMOSIS: A NEW PROPOSE FOR EXTENSIVE CORONARY DISEASE**

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**BACKGROUND:** Patients with advanced, diffuse coronary artery disease (CAD) pose a major challenge for myocardial revascularization procedures. New strategies have been sought for this growing group of patients. Objective: To show the feasibility and safety of a new surgical technique for myocardial revascularization in patients with limiting angina due to diffuse and extensive CAD, and objectively demonstrable ischemia.

**METHODS:** 5 male patients (65 $\pm$ 3 years) were enrolled. All patients had demonstrable myocardial ischemia and viability of the left ventricle anterior wall, and an extensive atherosclerotic involvement of the left anterior descending artery (LAD), precluding its direct revascularization. Briefly, after an median thoracotomy, the left internal thoracic artery (LITA) was harvested and two or more collateral branches were cut to ensure proper bleeding. Then, LITA was pulled into a myocardial tunnel (Vineberg procedure) using a Swan-Ganz catheter introducer, entering the LV anterior wall superiorly, under the diagonal branches. After LITA emerged from the myocardial tunnel, it was anastomosed to the distal portion of the LAD. During surgery, graft's blood flow (mL/min), pulsatility index, and the diastolic fraction (%) were measured.

**RESULTS:** There were no complications related to the procedure including electrocardiographic changes or cardiac markers. Flowmeter measurements of the LITA anastomosed to the LAD after tunnelization were: flow =  $34.2 \pm 10$  mL/min, pulsatility index =  $4.1 \pm 0.7$ , and diastolic fraction (%) =  $88.2 \pm 2.7$ .

**CONCLUSION:** Patients with severe, diffuse CAD with extensive involvement of the LAD are at high risk of graft occlusion, even though LIMA is used. For these patients, we describe here the safety and feasibility of a new technique based on a modification of the original Vineberg procedure (LITA myocardial tunnelization followed by distal anastomosis to the LAD). This strategy could be of clinical value if collateral circulation develops in the middle portion of the LAD, therefore restoring myocardial perfusion.

#### **P-096-ANOMALOUS CORONARY ARTERY IN ADULT**

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**BACKGROUND:** The anomalous origin of the coronary arteries is a rare and serious congenital cardiopathy. About 90 percent of the patients develop heart insufficiency and they die until the childhood. From the revision done by Ogden, in autopsies, they were related some rare anatomical situations among the ones one in which the anomalous origin of the coronary artery happened in the right pulmonary artery. Exist in the literature cases related in children in which the circumflex coronary artery isolated, has anomalous origin in the right pulmonary artery, however, I didn't find any report regarding that situation, in adult patients.

**METHODS:** It is a study type case report.

**RESULTS:** Patient of 35 years, white, of superior level, sought the Service referring precordial pain to the efforts, 17 years after being submitted to the surgical treatment for correction of the thoracic aorta coarctation. He alleges that until the time of the operation just presented sporadic episodes of headache and pain in the inferior members. Physical examination / subsidiary exams: To the exam he did be in good general state, eutrophic, with blood pressure in the superior members of 130/70 and in the inferior members 120 /?? mm Hg. In the examination of the thorax was verified a scar in left infra-mammary region. The lungs auscultates was normal. In the precordial region, the ictus was palpable, the heart sounds were rhythmic and there was a discreet hyper-phonetic of the second cardiac sound in the aortic area. In the exercise stress testing the patient reached maximum heart frequency exhibiting supra level of the J point and the horizontal ST segment of two mm at the fifteen minutes of the test. In the scintigraphy of the myocardium, with physical effort, using radioisotope was diagnosed ischemia of the posterior wall of the left ventricle, without redistribution in rest. The hemodynamic study showed normal manometry in heart cameras. The coronary arteriography evidenced circumflex coronary



artery with anomalous origin that became contrasted for collateral circulation coming from the interventricular posterior branch and the right coronary artery. It was not possible to determine the place of origin of the circumflex coronary artery accurately. At first it was considered that the circumflex coronary artery originated in the pulmonary artery. The left ventriculography allowed visualizing normal ventricular function and the correction of the coarctation of the aorta, previously accomplished, it was perfect.

**CONCLUSIONS:** The patient was submitted to the surgical treatment through medium sternotomy, use of extracorporeal circulation and hypothermia. After the opening of the pulmonary artery it was not possible visualize the anomalous ostium. Before the fact the clamp of the aorta was opened allowing like this to identify a thread of blood coming from the right pulmonary artery, where the anomalous ostium was evidenced, that was sutured. Proceeded the revascularization using free graft with the intern right thoracic artery (‘‘mammary’’) for the circumflex coronary artery. The patient developed without complication and he left the hospital in the seventh day of postoperative.

### **P-097-CORONARY ENDARTERECTOMY WITH OFF-PUMP CORONARY ARTERY BYPASS SURGERY**

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**BACKGROUND:** Coronary artery bypass grafting with concomitant coronary endarterectomy is used in patients with severe coronary atherosclerosis to revascularize otherwise ungraftable targets. Advances in off-pump coronary surgery, make it possible to perform off-pump coronary endarterectomy. We evaluated our institutional experience to define the role of coronary endarterectomy in off-pump coronary surgery.

**METHODS:** Between January 2001 and November 2007, 67 patients underwent CABG combined with coronary endarterectomy. The patients were divided into two groups: with or without CPB and compared for clinical outcomes. Group I, 23 (34.3%) patients had off-pump coronary endarterectomy. The mean age was  $55.7 \pm 2.4$  years. All had long coronary artery disease history (CAD): 17 (73.9%) were in angina class III and 2 (8.7%) were in class IV. Three-vessel disease had 18 (78.2%) patients. The mean preoperative left ventricular ejection fraction (LVEF) was  $0.48 \pm 0.44\%$ . Group II, 44 (65.7%) patients had conventional CABG. The mean age was  $56.5 \pm 4.1$  years. 31 (70.5%) were in angina class III and 3 (6.8%) were in class IV. Three-vessel disease had 28 (63.6%) patients. The mean preoperative LVEF was  $0.49 \pm 0.64\%$ .

**RESULTS:** Total amount of distal anastomoses were 73, i.e. 3.18 per patient in group I, and 137, i.e. 3.11 per patient in group II. Perioperative myocardial infarction (MI) developed in 2 (8.7%) patient in group I, and 3 (6.8%) in group II. There were no intraoperative and inhospital deaths. Only autoarterial grafts were used to bypass left coronary artery system (LIMA, radial artery). Circumflex artery area was bypassed with radial artery grafts only. RCA system was bypassed with saphenous veins only. Complete revascularization was achieved in all patients. All patients were discharged in CCS class I

**CONCLUSIONS:** Off-pump coronary artery bypass graft surgery with coronary endarterectomy is feasible and achieves total surgical revascularization in patients with diffuse coronary artery disease.

### **P-098-INFLUENCE OF CORONARY BYPASS GRAFT COMPLIANCE ON BYPASS FLOW AND PULSATILITY INDEX**

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**BACKGROUND:** In case of stenosis at the site of distal anastomosis of the coronary bypass graft there is a decrease in diastolic flow and mean flow measured by transit-time flow probe. The absolute value of systolic flow can increase or decrease, however, it always increases relatively to diastolic flow, causing an increase in pulsatility index. The physiologic basis for these flow changes is poorly understood. In the present study the role of graft compliance was investigated.

**METHODS:** The role of coronary bypass graft compliance was studied by means of a computer model of a coronary artery with a bypass graft, each of them modeled as a series of two resistances with a compliant chamber in

between. In vivo graft compliance was estimated from transit-time flow measurements of occluded bypass grafts (mean flow less or equal to 1ml/min) taken from the database of flow measurements at our institution. The influence of graft compliance on flow and pulsatility index of a functioning graft was demonstrated on a LIMA to LAD graft by comparing the flow curves measured distally (at the site of distal anastomosis) and proximally.

**RESULTS:** In the computer model, the pulsatility index increased linearly with increasing graft compliance. The mean graft flow was unaffected by graft compliance. During the phase of the pressure rise in systole the graft volume increased rapidly and decreased to the initial value during the late systole and diastole. The flow due to pulsatile expansion and contraction of the graft (equal to first derivative of the graft volume) was positive in the early and mid systole and negative during the rest of the heart cycle, which was confirmed by in vivo transit-time flow tracings of occluded grafts. The estimated maximum change in graft volume during one cardiac cycle in five saphenous vein grafts and two LIMAs was  $0.053 \text{ ml} \pm 0.025 \text{ ml}$  and  $0.051 \text{ ml} \pm 0.012 \text{ ml}$ , respectively. Assuming pulse pressure in the range of 30 to 60 mmHg the estimated mean linear compliance was between 0.0009 and 0.0018 ml/mmHg.

**CONCLUSION:** Graft compliance has a significant influence on the transit-time pulsatility index, by increasing the systolic flow and decreasing the diastolic flow, however, it has no influence on graft mean flow. The pulsatility index increases with large graft compliance and low mean flow. In case of LIMA to LAD, where often a negative systolic flow is observed, the graft compliance can also decrease the pulsatility index, again by increasing systolic and decreasing diastolic flow. The graft compliance could be one of the causes for relative increase in systolic flow with decrease in mean flow in case of a stenosis at the site of distal anastomosis.

### **P-099-TEN YEAR OUTCOME OF SKELETONIZED BITA GRAFTING FOR LEFT MAIN DISEASE**

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**BACKGROUND:** Left main coronary artery (LM) stenosis is a class I indication for surgical revascularization. Percutaneous intervention (PCI) - is class III. Recent publications have shown favorable midterm outcome (2.4 years) in selected group of non bifurcation LM patients treated with Drug Eluting Stent (DES). In order to provide reference for future long term PCI results we reported long term outcome of skeletonized bilateral internal thoracic artery (BITA) grafting for non selected LM patients

**METHODS:** From 1996 to 2001, 428 consecutive LM patients underwent BITA grafting in our center. There were 335 males and 93 females, 51% were older than 70 years, 30% were diabetics. 114 (26.6%) were emergency cases, 93 (28%) had acute myocardial infarction (MI) and 49 (11%) were supported by intra-aortic balloon pump. 75.5% of the patients were operated on with cardiopulmonary bypass (CPB) and 24.5% without CPB.

**RESULTS:** Mean number of grafts per patient was three. Thirty day (early) mortality was 3.3% (7% for emergency cases and 1.9% for non-emergency cases). Early morbidity included 1.6% sternal infections, 0.9% perioperative MI and 4.4% strokes. Follow up ranged between 6 and 11 years, mean - 8.5 years. Ten year survival for patients younger than 55 years old, 55-64, 65 - 74 and older than 75 were 93.2%, 90.7%, 74.4% and 53.5%, respectively. Return of angina and re-intervention rates were 14% and 7%, respectively. Patency of ITA grafts in symptomatic patients who underwent postoperative coronary angiography (94 grafts) was 84.1%

**CONCLUSION:** Long term outcome of BITA grafting for LM disease is good and our data may serve as a benchmark for alternative Methods of LM revascularization. Until long term outcome of LM stenting with DES will proven to be similar in randomized controlled trials, LM stenosis should be regarded as a surgical disease.

### **P-100-CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH PULMONARY HYPERTENSION**

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**BACKGROUND:** The aim of our study was to evaluate early results of coronary



artery bypass grafting in patients with pulmonary hypertension and compared them with patients who had normal pulmonary arterial pressure.

**METHODS:** 585 patients who had coronary artery bypass surgery were included in our study. They were divided into two groups: Group 1 (patients with pulmonary hypertension; pulmonary artery pressure  $\geq 30$  mmHg, preoperative mean pulmonary artery pressure was  $39.4 \pm 9.7$  mmHg, range from 30 to 75 mmHg) included 74 patients and group 2 (patients who have normal pulmonary arterial pressure) included 511 patients. When we compared both groups; incidence of female gender (37.8% versus 24.9%;  $p=0.018$ ), incidence of left ventricular dysfunction (44.6% versus 30.8%;  $p=0.018$ ), incidence of unstable angina (31.1% versus 19%;  $p=0.016$ ), mean age ( $63.9 \pm 10$  versus  $61.2 \pm 9.3$  years;  $p=0.027$ ), mean Euroscore ( $6.37 \pm 3.6$  versus  $4.7 \pm 2.7$ ;  $p=0.001$ ) were higher in group 1.

**RESULTS:** Hospital mortality was 1.4% in group 1 and 1.8% in group 2 ( $p>0.05$ ). There was no significant difference in the number of grafts between the groups ( $2.82 \pm 0.98$  vs  $2.72 \pm 0.96$ ;  $p>0.05$ ). In the early postoperative period the need of inotropic support was higher in the group 1 (24.1% versus 13.7%;  $p=0.017$ ). The extubation time, ICU and hospital stay were similar in both groups. There was no significant difference with regard to major complications such as postoperative renal failure, neurologic complications, gastrointestinal complications, respiratory failure in both groups. When we compared both groups for major complications such as postoperative renal failure, neurologic complications, gastrointestinal complications, respiratory failure, there was no significant difference.

**CONCLUSION:** Coronary revascularization can be achieved with acceptable mortality and morbidity rates in patients with pulmonary hypertension when compared with patients who have normal pulmonary arterial pressure.

#### **P-101-POSTOPERATIVE DELIRIUM AS A PROGNOSTIC FACTOR FOR THE LONG-TERM OUTCOME OF ON-PUMP CORONARY OPERATED PATIENTS**

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**BACKGROUND:** The aim of the study was to investigate the significance of the occurrence of postoperative delirium after on-pump bypass heart surgery in the long-term outcome of heart-operated patients.

**PATIENTS AND METHODS:** We included in the study 23 patients who developed postoperative delirium after on-pump bypass heart surgery and compared them to a second group, consisting of 29 patients, operated by the same surgical group during the same period, who did not show postoperative delirium. The patients were examined 2 years postoperatively per telephone with the Mini Mental State Examination (MMSE) -verbal part and the Geriatric Depression Scale (GDS). We did not statistically perform neutralization between the 2 groups concerning risk or multimorbid factors, taking for granted that delirious patients are by definition multimorbid patients. In other words we used postoperative delirium as an index of bad general condition of heart-operated patients.

**RESULTS:** Patients with postoperative occurrence of delirium presented an older mean age ( $70.4$  vs  $69.1$ , a longer mean duration of surgery ( $205$  minutes vs  $188$  minutes) and a higher percentage of previous stroke ( $13.04\%$  vs  $10.34\%$ ), and diabetes mellitus ( $17.39\%$  vs  $13.79\%$ ) than the rest of the patients. They also showed much worse results in both tests (MMSE  $24.5$  vs  $21.9$ , GDS  $3.1$  vs  $0.9$ ,  $p<0.05$ ). None of the patients deceased, so a mortality-associated comparison could not be drawn.

**CONCLUSION:** Postoperative delirium, known to be precipitated by various multimorbid situations (age, neurological disease, long surgery, diabetes mellitus) seems to be a bad prognostic factor for the quality of life, psychological condition and the long-term mobilization and social intergration of heart-operated patients.

#### **P-102-LIPOPROTEIN LIPASE GENE POLYMORPHISMS AND COGNITIVE DECLINE AFTER CORONARY SURGERY: IS THERE A CONNECTION?**

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**BACKGROUND:** The aim of the study is to investigate the possible role of the genetic polymorphisms of the lipoprotein lipase (LPL) gene in the development of cognitive decline after bypass heart surgery. These polymorphisms are associated with the brain cholesterol metabolism and have been implicated in the etiology of Alzheimer's disease and other dementias.

**PATIENTS AND METHODS:** We included in the study 137 patients planned to undergo on-pump bypass heart surgery and controlled them with a neuropsychological battery, consisting of the Mini mental State Examination, Brief Psychiatric Rating Scale and Wechsler Memory Scale-Revised, on admission and one month after surgery. We genotyped the participants for the single nucleotide polymorphism SNP rs268 (with the variant TT having a potentially burdening effect and the variants TC/CC having a potentially protective one against postoperative cognitive decline). We also genotyped them for the SNP rs328 (with the variant GG allegedly playing a burdening effect and the variants CC/GC allegedly playing a protective role against cognitive decline). T stands for thymine, G for guanine and C for cytosine in the sequence of nucleotides within these polymorphisms. We included in the statistical analysis all factors (age, neurological history, diabetes mellitus, long surgery) known to be influencing cognitive capacity after heart surgery results. We found a significant decline in postoperative test results affecting the majority (95%) of the patients. This finding could not be associated to anyone of the above mentioned polymorphisms.

**CONCLUSION:** The alleged role of the Lpl polymorphisms in the development of cognitive decline after bypass heart surgery was not confirmed through the findings of the study.

#### **P-103 TWO INTERNAL THORACIC ARTERIES IN DIABETIC PATIENTS SUBMITTED TO OPCAB**

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**OBJECTIVES:** evaluate the immediate evolution in diabetic patients submitted to OPCAB using both internal thoracic arteries.

**METHODS:** we analyzed 332 patients divided in two groups, submitted to revascularization without extracorporeal circulation using two thoracic arteries. The first 120 patients received the two thoracic arteries in a pedicle form and the rest were skeletonized. In group A, 213 non-diabetic patients were analyzed and in group B 119 diabetic patients were analyzed. All patients were operated without extracorporeal circulation using a suction stabilizer and LIMA stitch.

**RESULTS:** In group A, 79.35% of the patients were male against 68.91% in group B (ns). The mean age in group A was  $53.05 \pm 8.37$  against  $53.92 \pm 8.69$  in group B (ns). In regard to risk factors, 88.26% of the patients in group A were hypertensive against 95.8% in group B (ns), 48.83% in group A were dyslipidemic against 47.9% in group B (ns) and 56.34% in group A were smokers against 26.05% in group B ( $p<0.05$ ). In group A 44.13% were in functional class III/IV against 36.97% in group B (ns). In group A, 33.33% of the patients presented bad ventricular function against 35.3% of the patients in group B (ns). The mean euroscore in group A was  $3.68 \pm 2.81$  against  $4.12 \pm 2.88$  in group B (ns). The mean number of distal anastomoses in group A was  $3.13 \pm 0.93$  against  $3.27 \pm 0.87$  in group B (ns). In regard to complications, 0.47% of the patients in group A presented CVA against 0.84 in B (ns), 1.88% of the patients in A presented AMI against 1.68% in B (ns), 5.16% in group A presented AF against 12.6% in B ( $p<0.05$ ) and 2.34% in group A had mediastinitis against 3.36% in group B (ns). Mortality reached 1.88% in group A against 2.5% in group B (ns).

**CONCLUSION:** in this series the use of both internal thoracic arteries in diabetic patients did not lead to an increase of complications and mortality. The use of two internal thoracic arteries in association to revascularization without extracorporeal circulation should be considered in all patients.

## **P-104 RELIABILITY OF SJM AORTIC CONNECTOR AS A TOOL FOR PROXIMAL VEIN GRAFT ANASTOMOSIS DURING CABG**

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**BACKGROUND:** Proximal anastomoses are currently primarily care out with the use of running monofilament suture. Recently, a renewed interest has developed for facilitated mechanical anastomotic device, especially for limited access surgery. An example of such device is St. Jude Medical symmetry aortic connector (SJMSAC). The aim of present work was to report our initial experience with SJMSAC and to examine its reliability and durability.

**METHODS:** SJMSAC was used in 21 consecutive patients in our institution between 2003 - 2007. The average age of the patients was  $64 \pm 9$  years (from 35 to 78). A total of 24 anastomosis were performed with SJMSAC. In 19 patients the SJMSAC was used during OPCAB procedure, in 1 patient the SJMSAC was used because of lead pipe aorta during conventional CABG and in 1 patient the device was used during redo-CABG, without aortic side clamping. The overall performance of the device was examined.

**RESULTS:** The time required for performing an anastomosis was less than 10 seconds. Hemostasis was instantaneous in all anastomoses. All anastomoses were found to be patent at the end of the operation. Postoperative course of all patients was uneventful regarding ECG, CPK, MB, Troponine T.

**CONCLUSIONS:** Our experience showed that SJMSAC is a user friendly, effective, quick, geometrically perfect reliable device. The technology is attractive for all CABG procedures because aortic manipulation is in generally avoided. Thus the potential risk for cerebral embolization of debris material is reduced to the absolute minimum. The use of SJMSAC during OPCAB procedures could make them minimally invasive.

## **P-105-ITALIAN CABG MODEL AND EUROSCORE SYSTEM: THEIR USE IN THE EVALUATION OF CARDIAC SURGERY PERFORMANCE**

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**BACKGROUND:** In recent years, several models were developed to stratify patients before open heart surgery, according to factors affecting mortality. In the "Italian CABG Outcome Project" a local empirically derived risk function was applied to control for real confounders. Although it is well acknowledged that risk adjustment models work best when applied to the same population in which they were developed, this choice aroused bitter controversy among Italian cardiac surgeons who regularly employ the EuroSCORE system to assess their patients' pre-operative risk. Aim of this work is to compare the risk-adjustment model empirically derived from the "Italian CABG Outcome Project" with the additive and logistic EuroSCORE models in terms of accuracy, predictive power and ability to rank hospital performances.

**METHODS:** The Italian CABG model, the logistic and additive EuroSCORE were applied to the Italian CABG population; the observed deaths /expected deaths (O/E) ratios, as obtained by the three models, were computed for each Italian cardiac surgery centre and for 6 classes of risk-stratified patients. The performance of the three models in predicting the 30-day mortality was formally assessed for calibration (Hosmer-Lemeshow test) and discrimination (ROC area). According to the three models, risk-adjusted mortality rates (RAMR = O/E \* Italian CABG population mortality rate) were estimated for each centre; possible differences were detected in the identification of hospitals with mortality rates significantly higher and lower than average.

**RESULTS:** The Italian CABG model uses fewer variables than the EuroSCORE system (14 vs 17) and exhibits the best performance in terms of discrimination and calibration. Contrary to the other tested models, the logistic EuroSCORE shows a significant Hosmer-Lemeshow test ( $X^2$  H-L=19.30,  $p<0.0001$ ), indicating unsatisfactory calibration, and a clear predicted death overestimation in each of the considered risk classes (O/E = 0.4). When a proper recalibration procedure is applied, the logistic EuroSCORE performance parameters achieve acceptable levels. The Italian CABG model identified 7 centres as having higher than average mortality, while the EuroSCORE identified the same 7 centres plus one other. The Italian CABG model identified 8 centres with lower than average mortality, 5 of which were identified by the additive EuroSCORE and 4 of which were identified by the logistic EuroSCORE. The additive EuroSCORE identified 4 more and the logistic EuroSCORE 3 more low mortality centres.

**CONCLUSION:** Although this analysis reveals a satisfactory concordance

between results from the three models, a detailed comparison shows that the Italian CABG model uses fewer variables and performs better than the others. Nevertheless, when properly recalibrated, the EuroSCORE model can be exported to the Italian population and successfully used to rank hospital performances as well as to evaluate the pre-operative risk of patients undergoing open heart surgery.

## **P-106-QUALITY OF CARE ASSESSMENT IN CARDIAC SURGERY: THE USE OF HIERARCHICAL MODELS**

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**BACKGROUND:** The "Italian CABG outcome study" represented the first Italian experience to evaluate and publicize outcome indicators. The classical logistic regression approach was used in order to evaluate risk-adjusted mortality rate in each Italian cardiac surgery centre. . Actually, hierarchical modeling represents a statistical methodology used to analyze nested data, such as those concerning patients afferent to different hospitals. Aim of this work was to use data from the "Italian CABG outcome study" to build a hierarchical regression model and to evaluate the amount of differences in adjusted mortality rates attributable to differences between centres.

**METHODS:** The study population consisted of all adult patients undergoing an isolated CABG between 2002-2004 in the 64 participating cardiac surgery centres. A risk adjustment model was developed using a classical single-level regression. In the multilevel approach, the variable "clinical-centre" was employed as a group-level identifier. Group-level residuals were adopted to evaluate the effect of "clinical-centre" on mortality and to compare hospitals performance. Spearman correlation coefficient of ranks ( $\rho$ ) was used to compare results from classical and hierarchical model.

**RESULTS:** The study population was made of 34,310 subjects undergoing isolated CABG interventions (mortality rate=2.61%; range 0.33-7.63). The multilevel model estimated that 10.1% of total variability in mortality was explained by differences between cardiac surgery centres. The analysis of group-level residuals highlighted 3 centres (VS 8 in the classical methodology) with estimated mortality rates lower than the mean and 11 centres (VS 7) with rates significantly higher. Results from the two methodologies were comparable ( $p=0.99$ ).

**CONCLUSION:** Despite almost all known individual risk-factors were accounted for in the single-level model, the high variability explained by the variable "clinical-centre" states the importance of "cardiac surgery centres characteristics" in predicting 30-day mortality after CABG. Other studies, trying to develop new and valid instruments that can better measure cardiac surgery centre characteristics, would be of great interest and could contribute to warrant a more appropriate use of hierarchical methodologies in this field.

## **P-107- "ISLETS' TECHNIQUE" FOR COMPLICATED ENDARTERECTOMY OF THE LEFT ANTERIOR DESCENDING CORONARY ARTERY**

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**BACKGROUND:** The rapidly growing use of percutaneous coronary intervention methods for myocardial revascularization led to a fundamental change in the patient subset selected for coronary artery bypass grafting surgery. Therefore, an increasing number of patients are referred to surgeons with advanced and diffuse coronary artery disease. We describe an alternative technique to solve the problem of complicated endarterectomy of the left anterior descending (LAD) coronary artery.

**METHODS:** Cardiac catheterization and angiocardiography of a 54-year-old man revealed preserved left ventricular function (ejection fraction of 0.60) with severe triple-vessel disease. There was a 90% stenosis of the right coronary artery, and occlusion of the circumflex coronary (Cx) artery and LAD, both supplying viable myocardium. The vein graft was used to bypass the right system. To revascularize diffusely and heavily calcified Cx coronary artery was an impossible task. Unfortunately, the endarterectomy of the LAD (started as classic "open" endarterectomy) converted to technically unsatisfactory procedure, due to lack of a proper plane for dissection in some areas. Finally, along 9 cm of "endarterectomized" LAD territory, there were only three "islets" of proper-

ly endarterectomized LAD left, separated with totally disrupted coronary bed areas. The first "islet" was in proximal LAD area including one diagonal branch, the middle one contained one small septal branch, and the third one extended to very distal part of LAD. As we were reluctant to ligate LAD supplying viable myocardium, we decided to incorporate all three "islets" in venous graft using sequential technique (proximal and distal «islets" were connected with venous graft in end-to-end fashion, the middle one in end-to-side manner). Then, the LITA was anastomosed to the venous graft.

**RESULTS:** The aortic cross-clamp time was 73 minutes. The patient was weaned from the cardiopulmonary bypass easily. Anticoagulation (warfarin sodium,) which was started on the 1st postoperative day, would be continued for the following 6 months to maintain an international normalized ratio between 2.0 and 2.5. Postoperative transthoracic echocardiography confirmed no change in the ejection fraction. On the 8th postoperative day, 64-slice multidetector row computed tomography was done, confirming patent LITA graft as well as sequential venous graft connecting LAD segments, thus reconstructing the LAD coronary bed. The patient had regular follow-up for the following 9 months and is in NYHA class I with a normal stress test result.

**CONCLUSION:** Although it seems that application of the reconstructive techniques to solve the problem of diffusely diseased LADs offer better results, it is sometimes impossible to avoid coronary artery endarterectomy procedure (CAE). During technically unsatisfactory CAE procedure of the LAD we were left with three segments of properly endarterectomized coronary bed. These three "islets" were incorporated into vein graft with blood supply from LITA conduit. In such a configuration, the endarterectomized area is reduced (due to exclusion of totally disrupted LAD areas) and endothelial covering might be achieved rapidly, decreasing the risk of thrombus formation in the early stage and myo-fibrointimal proliferation later on. We strongly believe that this technique sometimes may be the good rescue technique for complicated coronary artery endarterectomy.

#### **P-108-EVALUATION OF CARDIOVASCULAR RISK FACTORS AFTER CABG : EVIDENCE FOR AN AGGRESSIVE STRATEGY**

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**BACKGROUND:** Coronary artery by-pass graft surgery is the treatment of choice for patient with multivessel disease. This is a palliative therapy in which risk factors must be controlled to prevent ischemic heart disease resurgence and ischemic heart failure. The goal of our study was to evaluate prematurely the outcome of cardiovascular risk factors after CABG, and to adjust an aggressive strategy to normalize these factors.

**METHODS:** 216 consecutive patients needing CABG were included. 16 were excluded (for death or personal reasons). Patients were hospitalized 7 months after surgery for risk factors evaluation and to organize an aggressive strategy to reduce the level of risk (hospitalization). They were interviewed 8 months later for a new evaluation (follow up).

**RESULTS:** Study concerned 200 patients (77 males, 64±11 years). Four patients died after surgery and twelve were excluded for personal non suitable follow up. A mean of 2.6±0.6 grafts per patient were performed. Mean Euroscore was 5.6±2.5. Pre-operative risk factors were : current smoker 41%, High Blood Pressure 61%, Cholesterol 47%, Diabetes 30%, and Obesity 25%. During hospitalization: 91% of patients presented at least one anomaly of cholesterol metabolism. In 5% patients, a new diabetes was found. 18% of patients presented a non controlled High Blood Pressure and 10% continued to smoke. Body mass index was increased and physical activity was less than reduced in 55% of case. Reported medication included: 85% of anti-platelets, 65% of statins and 68% of anti-ischemia. During follow up: Cholesterol metabolism was normalized in 70% of patients. Fasting glucose was significantly reduced and no new diabetes was found. 9% of patients presented a non controlled High Blood Pressure and only 4% continued to smoke. Weight was stabilized and 65% had moderate or important physical activity. 2 patients had presented an ischemic event successfully treated by angioplasty. Reported medication included: 93% of anti-platelets, 85% of statins and 72% of anti-ischemia.

**CONCLUSION:** As evidence, the level of risk was high after surgery and the different risk factors were not controlled. This study indicates our difficulty to reduce the level of cardiovascular risk after CABG. We purposed an aggressive strategy including a short hospitalization for evaluation and optimization of these risk factors, associated with patient's education ( follow up). This strategy seems to be effective to reduce the level of risk of these patients and to pre-

vent the ischemic resurgence. Long term results are warranted to appreciate the interest of this attitude.

#### **P-109-OPCAB SURGERY IN VERY HIGH RISK PATIENT: WHY WE DO IT?**

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**BACKGROUND:** Coronary artery by-pass graft surgery (CABG) is the treatment of choice for patient with multivessel coronary artery disease. The gold standard of this surgery was to use Cardiopulmonary By-Pass with cardiac arrest. However, with this strategy, left ventricle dysfunction and severe co-morbidities are responsible of an important source of complication after CABG. Off Pump Coronary Artery By Pass surgery would be an interesting alternative in very high risk patient reducing post operative complications. The goal of this study was to evaluate prematurely the safety and the relevance of the OPCAB technique in a very high risk group of patient needed CABG.

**METHODS:** inclusion was decided with at least two of the following criteria : Euroscore strictly > 9, severe Left Ventricle dysfunction < 30%, recent and acute Myocardial Infarction, end stage renal failure, severe lung dysfunction, Peripheral Vascular Disease, BMI > 30. All Patients were operated with the Octopus® (Medtronic) stabilizer system.

**RESULTS:** 110 patients, mean age 69.2 ± 10.2 years, with 74 % of men, have been operated. Usual risk factors were: tabacco 44%, HBP 60%, Cholesterol 63%, Diabetes 57%. Pre operative high risk score has been determined by : Mean Euroscore 11.4, logistic Euroscore >20 42%, Left Ventricle function 35.7 ± 12 %, Left Ventricle <30 44%, acute or recent Myocardial Infarction 57 %, end stage renal failure 46 %, recent pulmonary oedema 31%, severe lung dysfunction 38 %, Peripheral Vascular Disease 38 %, severe obesity 34 %, left main stenosis 40%. All surgery were performed OPCAB with no conversion. Mean graft per patient is 2.18 ± 0.84. LAD was grafted in 97% of case, Lateral in 62%, Right in 25% and Diagonal in 22%. 3 % of patients were secondary treated with PTCA for incomplete revascularization. 16 % have needed a combined surgery for Left Ventricle contention (CORCAP®), defibrillator implantation, atrial fibrillation surgery (Epicor®) or carotid surgery. Early post operative mortality at one month was 5%. Mean Intensive care unit stay was 2.67 days. Discharge from hospital was at day 9±6. Early repertoried complications were : Low out syndrome and CPIAB necessity 3 %, post operative Myocardial Infarction 1 %, Tamponnade 3%, Chest revision 5%, Reventilation 5%, Stroke 1 %, kidney support 6 %. The Graft permeability was systematically analysed by coronarography or CT-coroscanner. No early thrombosis was found but 2 untreated moderate stenosis (less than 30%) on saphenous grafts to the lateral coronary artery were observed.

**CONCLUSION:** OPCAB was safe and secure in this group of patient. OPCAB strategy seems to be effective in very high patients reducing early complication and multi organ failure. Long term results are needed to verify the interest of this strategy.

#### **P-110-PROTECTIVE ROLE OF INTRACORONARY SHUNT IN OFF-PUMP CORONARY BYPASS OPERATIONS**

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**PURPOSE:** Although there are too many advantages of off-pump coronary bypass surgery, there is still too much argument about this technique. One of the most important subjects about off-pump coronary bypass surgery is the interruption of coronary blood flow during anastomosis to maintain a bloodless secure anastomosis site. In our study, we aim to find out if there are any advantages of using intracoronary shunts, compared to shuntless operations, in the context of whether it has a protective role for the myocardium.

**METHOD:** The study was prospective, randomized and included 100 (60 men and 40 women) consecutive patients with coronary artery diseases. This study took place in two different Cardiovascular Surgery Departments which were The Social Security Ankara Ihtisas Hospital and Hacettepe University Hospital between September 2002 and July 2006. Patients were operated by the same team and the same technique. Patients were divided into two groups. In Group I off-pump coronary bypass operations were performed with intracoronary shunts. In Group II shunts were not used during off-pump coronary bypass sur-

gery. Blood samples were collected on postoperative 6th hour, 12th hour and 24th hour from central venous lines and CK-MB, Myoglobin and Troponin T levels were studied on venous blood samples.

**RESULTS:** There were significant increases in serum creatine kinase levels in Group II at postoperative 6th, 12th and 24th hours. In Group II the increase of myoglobin was statistically significant at only postoperative 24th hour. Troponin-T levels were significantly higher in Group II at postoperative 6th, 12th and 24 th hours.

**CONCLUSIONS:** Off-pump coronary surgery is cost effective but there is some questions about myocardial protection while maintenance bloodless secure surgical field. But using intracoronary shunts in off-pump coronary bypass surgery technique provides distal coronary flow and reduces the risk of myocardial ischemia, while maintaining comfortable blood free anastomosis area.



## POSTER SESSION II

### P-111-COMPOSITE BILATERAL INTERNAL THORACIC GRAFTING: IS THE FLOW ENOUGH FOR LEFT CORONARY ARTERY?

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**BACKGROUND:** Left coronary artery revascularization through internal mammary artery (ITA) improves survival and decreases the recurrence of ischemic events after surgery. Bilateral internal mammary artery (BITA) as a T graft (composite BITA) with distal anastomosis from left ITA (LITA) and right ITA (RITA) to left anterior descending (LAD) and circumflex (Cx), respectively, is a common approach for left coronary artery revascularization. The objective was to evaluate, using intraoperative transit time measurement, if flow through LITA is enough to assess an adequate revascularization of both territories.

**METHODS:** Between October 2005 and December 2007, 44 patients (39 male and 5 female) underwent coronary revascularization with BITA as T grafts. The age was  $65.73 \pm 9.91$  years old and LV ejection fraction was  $54.89 \pm 13.45$ . Left main coronary artery disease was present in 38.64% and 39.64% of patients were diabetic. All the procedures were performed through median sternotomy and cardiopulmonary bypass (CPB), constructing a T graft with free RITA attached end-to-side to an in situ LITA, prior to aortic and atriocaval cannulation. Revascularization of LAD and Cx arteries was achieved with an end-to-side anastomosis to LITA and RITA, respectively. Transit time flowmetry was employed for intraoperative graft flow measurement (Flowmeter®, MediStim, Norway).

**RESULTS:** One patient (2.27%) died during the perioperative period because of a massive pulmonary embolism and group mortality expected by logistic Euroscore was 2.95%. CPB and ischemia times were  $87.32 \pm 28.8$  y  $59.07 \pm 25.37$  min., respectively. Diastolic dominant curve pattern was present in 42 cases (95.45%). Maximum and mean graft flows were  $56.14 \pm 28.37$  and  $26.91 \pm 16.28$  cc/min., respectively and pulsatility index was  $3.02 \pm 1.23$ . Low flow associated to anterior hypoperfusion was detected in two cases (4.55%), both were female that required a saphenous vein graft to distal LAD anastomosis inside the procedure.

**CONCLUSION:** Surgical revascularization with composite BITA is safe and effective. Flow through LITA is adequate for both LAD and Cx territories in most cases.

### P-112-ENDARTERECTOMY FOR DIFFUSE CORONARY ARTERY DISEASE - IS IT WORTHWHILE?

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**OBJECTIVES:** During the last decades the application of percutaneous coronary intervention methods has contributed to select patients with less attractive anatomical substrate for surgery. Thus, there are an increasing number of patients with advanced and diffuse coronary artery disease (CAD) requiring coronary artery bypass grafting (CABG) surgery. Coronary artery endarterectomy (CAE) still remains one of the most controversial methods in cardiac surgery. We have evaluated our institutional experience of more than 25 years, to redefine the role of CAE for treatment of diffuse CAD.

**METHODS:** During the 26-year period (1981-2006), 21302 patients (pts) had CABG procedures, including 1458 cases of CAE (6.84%). The mean age of the pts was  $64.7 \pm 7.5$  years, and 1047 pts (71.8%) were men. Eight hundred and forty-two pts (57.6%) had sustained previous myocardial infarction, and ejection fraction of less than 30% was registered in 30.4% of pts (431/1458). Triple vessel disease was detected in 1211 pts (83.1%), left main stenosis in 191 (13.1%), and unstable angina in 526 (36.1%) pts, while 931 (63.9%) pts were in NYHA class III or IV. For the left coronary artery system we have used extensive open CAE, with long arteriotomies. Coronary artery bed of endarterectomized coronary arteries has been reconstructed with an autologous vein patch completed by ITA grafting onto the patch or with an on-lay ITA patch.

For the right coronary artery we preferred closed CAE (converted to the open one, if necessary). Single vessel CAE was performed in 1109 (76.1%) pts, double in 272 (18.6%) and triple in 77 (5.3%) pts. Till the end of 1997 myocardial protection was achieved by a single dose (up to 500 cc) of cold, crystalloid cardioplegic solution together with efficient topical cooling of the heart. Later on, myocardial protection was obtained by repeated doses of cold, crystalloid or blood cardioplegic solution combined with topical cooling (ice slush) of the heart.

**RESULTS:** Hospital mortality was 5.8% (84/1458) and the postoperative infarction rate was 9.8% (143/1458). Inotropic support was necessary in 17.5% of pts (255/1458) and 6 pts (0.4%) required mechanical circulatory support beyond the intraaortic balloon pump. After a mean follow up of 123.6 months (8-253), the actuarial survival rates were 82%, 70.5% and 61.5% at 5, 10 and 12 years, respectively. Freedom from recurrent angina was 83.5%, 73.3% and 63% at 5, 10 and 12 years respectively. There were 53 redo procedures during the follow up period, with a mortality of 7.5% (4/53).

**CONCLUSION:** The results have supported CAE to be a worthwhile procedure in patients with diffuse CAD, despite somewhat higher hospital mortality and postoperative morbidity.

### P-113-LEFT ANTERIOR DESCENDING CORONARY ARTERY REVASCULARIZATION USING CORONARY-CORONARY ARTERIAL CONDUIT

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**BACKGROUND:** Nowadays coronary-coronary bypass grafting (CCBG) has been performed in patients with such specific characteristics such as porcelain aorta or heavily calcified ascending aorta, arch and supra-aortic branches, or when we are faced with inadequate length of available graft material. Although the internal thoracic artery (ITA) is unquestionably the best coronary graft, it is sometimes (used as an in situ graft) too short for grafting of distal lesions. Alternatively, a short segment of ITA or radial artery may be used in coronary-coronary fashion to bypass distal lesions of large coronary arteries.

**METHODS:** In four (41, 47, 52 and 61 years) patients with progressive angina, good left ventricular function and multivessel disease, including distal lesions on large left anterior descending (LAD) coronary arteries were revealed. In two patients (41 and 47 years) who presented without proximal stenoses on LADs, we decided to use a short, free segment of left ITA (LITA) and radial artery, respectively, to perform CCBG over that distal stenoses. Ramus intermedius was bypassed with in situ LITA remnant (first patient), while the remnant of radial artery grafted the circumflex artery lesion in the other. Two other patients (52 and 61 year) have had additional proximal stenoses on LADs. In addition to CCBG over distal stenoses (a short, free LITA segment) both LITAs were used as an in situ graft to solve the problem of the proximal LAD stenoses. Additional lesions were bypassed using vein grafts.

**RESULTS:** The patients' postoperative course progressed without any difficulty. Predischarge check angiograms (between 9th and 11th postoperative day) showed patent all coronary-coronary grafts, as well as in situ pedicled ITA grafts. The patients have been on regular follow-up for  $32 \pm 11.3$  months (24 - 48 months), and all are presently in the New York Heart Association functional class I with normal stress tests. We have recently confirmed a perfect angiographic patency of coronary-coronary conduit (free left ITA segment) over single, distal LAD lesion, 3.5 years following surgery.

**CONCLUSION:** It is well known that major problem influencing early free arterial (ITA, radial a.) conduit patency was related to construction of proximal anastomosis on ascending aorta. In case of CCBG we have situation that segment of free arterial graft in site of proximal anastomosis matches better the less dp/dt of the LAD artery, than the ascending aorta. That is the reason that we can expect even better patency rate over years. Thus, CCBG might be an attractive approach for bypassing distal lesions of large coronary arteries (combined with arterial or venous grafting of targeted arteries if the proximal stenoses are also present). The proximal remnant of ITA can be used as an in situ or free graft as well as radial artery remnant. CCBG might also be an alternative for percutaneous coronary interventions in "hybrid" myocardial revascularization.

### **P-114-COMPARING HEPARIN-COATED AND NON-COATED OXYGENATORS ON RENAL FUNCTIONS IN CORONARY ARTERY BYPASS SURGERY**

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**BACKGROUND:** Renal damage and subsequent acute renal failure is one of the most important complications in patients who had cardiac surgery. Multicenter studies with thousands of patients which exposed the risk factors for acute renal failure has been published especially in the last decade. The effects of extracorporeal circulation on renal functions are closely related with complement activation. This study is designed for evaluation of heparin-coated and non-coated oxygenators on the renal functions.

**METHODS:** This study has been performed prospectively with 50 patients who had undergone coronary bypass surgery in our clinic from March 2006 to September 2006. The patients have been divided into two groups as heparin-coated oxygenators (n = 25) used and non-coated oxygenators (n = 25) used. Blood samples were collected at the preoperative, and at 1, 24 and 96 postoperative hours.

**RESULTS:** There were no statistical differences between the evaluated parameters like BUN, creatinin, sodium, potassium, calcium, clor, phosphor, urine protein, urine clarence, urine sodium, urine calcium and urine clor at preoperative period in both groups. We did not detect renal dysfunction in any patients. There are no statistical differences in the urine clearance in preoperative and postoperative periods in both groups. In group one creatinin levels were lower than group two at 24 hours after surgery and these differences were statistically important in two groups. We found no significant difference between two groups regarding the other parameters for renal function during the postoperative period.

**CONCLUSION:** In this study we compared the impacts of heparin-coated and non-coated oxygenators on renal functions and we found that heparin coated oxygenators have no additional beneficial effects on renal functions.

### **P-115-GIGANTIC SAPHENOUS VEIN GRAFT ANEURYSM LATE AFTER BENTALL OPERATION**

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**BACKGROUND:** Coronary artery revascularization with saphenous vein grafts (SVG) has become a standard surgical approach for treatment of coronary artery diseases since Favaloro first described it in 1967. Riahi and associates described in 1975 the rare complication of saphenous vein graft aneurysm (SVGAs). SVGA is defined as a localized dilatation of the vessel to 1.5 times of the expected normal diameter. These are classified as true, when all the 3 layers of the vessel wall are involved and false aneurysm, when 1 or more layers of the vessel wall are involved with formation of a well defined collection of blood or hematoma outside the endotelium. Although further classification of SVGAs as large or small is not well defined, a dilatation of more than 2cm is an indication for surgical therapy. SVGAs are more common in men, present 10-20 years after CABG operations and in symptomatic patients the mortality rate is high (28%) within 90 days of initial symptoms.

**METHODS:** We report a case of a 68-year old female who was admitted to our hospital for evaluation of ischemic heart disease. The patient had had an aortic valve replacement 11 years ago due to grade III aortic regurgitation. 4 years later progressive dyspnoea and grade IV CCS (angina) led to a coronary angiography which revealed an ascending aorta aneurysm with mild aortic valve regurgitation, left coronary main stem stenosis, RM1 and RD 75% stenosis and an EF<30%. The ascending aorta and the aortic valve were replaced with a conduit consisting of a mechanical prosthetic aortic valve and an aortic prosthesis (Bentall Technique). Revascularization was performed using 2 saphenous vein segments for CABG to RCA and RM1 and the LITA to LAD. 4 weeks before third admission due to persistent ventricle arrhythmias (Grade IVb Lown) and an EF<30% she underwent an ICD implantation. On admission day she presented with sudden onset of chest pain with dyspnoea on minimal exertion and cardiac catheterization confirmed large (6cm x 12cm) aneurysmatic formation in the region of the proximal anastomosis of the SVG to the right coronary artery with a fistulous communication between the upper portion of the SVG and the

right atrium. Contrast enhanced CT scan was not performed because of previous allergic reaction and MRI because of the ICD.

**RESULTS:** We performed a R. anterior - lateral thoracotomy for better exposure of the SVGA. The entire procedure was performed under deep hypothermic circulatory arrest. The aneurysm was excised, the vein graft was ligated distally and the fistulous communication was directly closed. Histopathological examination of the SVGA showed complete rupture of the intima and media. Postoperative the patient could be relieved from endotracheal intubation 3 days after the operation. She required inotropic support and an Intra Aortic Balloon Pump for 4 days.

**CONCLUSIONS:** True aneurysm formation within a saphenous vein graft is rare - incidence of 0.07% - when mild aneurysmal dilatation of SVGs is relatively common, with a frequency of approximately 14% within 5-7 years of surgery. No long-term studies are available and prognosis is partly related to patient's underlying coronary artery disease and co-morbid conditions. Although successful coil occlusion treatment has been reported, in cases of symptomatic aneurysms, suspected mycotic aneurysm, fistula formation and / or confirmed false aneurysm surgical approach remains the treatment of choice given the morbidity and mortality associated with aneurysm rupture.

### **P-116-ACUTE ISCHEMIC HEPATITIS FOLLOWING CARDIAC SURGERY**

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We reported a case of ischemic hepatitis with no obvious predisposing and/or contributing factors following open cardiac surgery. A 50 years old male referred for mitral valve replacement surgery. There was no significant past-medical or surgical history. Patient had recurrent palpitation and exercise induced dyspnea. Electrocardiography revealed slow rate atrial fibrillation, third degree mitral regurgitation with mild tricuspid incompetence was confirmed by echocardiography. Perioperatively the patient was stable with 97 minutes cardiopulmonary bypass time. There were no clues of any hypoxic, mal- or reperfusion organ injury. In the immediate postoperative period a sharp increase in the liver function test was reported. For the next five days, there was steady increase in the liver function test values. Hepatic ultrasonography and doppler flow imaging revealed evidence of ischemia and congestion. After fifth postoperative day, regression in the clinical and laboratory findings accomplished. After two months, there was complete remission with liver function tests which returned within normal levels.

### **P-117-ASSESSMENT OF METABOLIC IMBALANCE OF POSTISCHEMIC MYOCARDIUM AFTER CABG PROCEDURE USING INTERMITTENT WARM BLOOD CARDIOPLEGIA (IWBC)**

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Aim of the study was to monitor and assess duration of global metabolic imbalance of postischemic myocardium in patients undergoing CABG with IWBC for myocardial protection. In 12 pts who underwent CABG, metabolic monitoring of global ischemia indicators with measurements of myocardial pH (Khuri monitor), simultaneous coronary sinus and arterial lactate concentrations, expression level of myocardial heat shock proteins (HsP 70, 72) and hemodynamic recording using Millar tipmanometer, were performed. The lactate wash-out during cross-clamp period varied considerably (1-3x the basic value) among pts, the lactate cross-over point (COP) was reached at an average of 15 min (range 12-32 min) of reperfusion time. The degree of lactate wash-out during cross-clamp period correlated with the time to reach COP. The Khuri monitoring was revealed to be as not useful in the postischemic period. In conclusion, the degree of the global metabolic imbalance of postischemic myocardium correlates with the lactate expression during cross-clamp period. A modified protocol with higher perfusion volumes and pressures seems to influence lactate expression.

### P-118-PREVALENCE OF LEFT MAIN CORONARY DISEASE AND THE EFFECTIVE RISK FACTORS ON ITS DEVELOPMENT

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**BACKGROUND:** Regarding the higher danger of left main coronary arterial disease (LMD) in comparison with other kinds of coronary artery disease (CAD), the study of the rate of this disease in the total CAD patients and their ages and sex, may probably help us to diagnose these patients earlier.

**METHODS:** A questionnaire was filled out for all patients who were candidate for CABG during a period of six months (from 23 September 2003 to 19 April 2004) after bedside interviews, lab tests, and angiography.

**RESULTS:** Out of 1465 CAD patients, 136 patients (7.2%) had more than 50% left main coronary stenosis (79.7% male and 20.3% female). This shows no statistically meaningful difference between both sexes in comparison with the total number of each sex. From the viewpoint of the patients' ages, the most common age for development of this disease was 55-65 which is the same as CAD. In four age groups, classified from under 45 to 75 years, the rate of the disease in men was 8.3%, 24%, 34%, and 28% respectively, while in women the rate was 0%, 21%, 39%, and 32%. Regarding the age of CAD development, there was no meaningful difference. From the viewpoint of the number of risk factors (RF), 14.2% of men had no risk factors, 26.4% had one risk factor, 43.4% two risk factors, 9.4% three risk factors, 4.7% four risk factors, and 1.9% five risk factors, which shows a meaningful difference in comparison with the number of risk factors in CAD patients of 45-55 age group. 7.1% of the women had no risk factors, 25% had one risk factor, 49.5% two risk factors, 17.9% three risk factors, 3.6% four risk factors, and 0% five factors, which shows no meaningful difference in comparison with the number of risk factors in CAD patients. There was a meaningful difference, from the viewpoint of the rate of RF, between LMD patients and the total number of the patients.

**DISCUSSION:** The prevalence of LMD in our patients is almost similar to that of other communities and some factors such as having two risk factors, age group of 55-65, cigarette smoking for men, and DM for women, increase the probability of LMD development.

### P-119-ASSISTED MYOCARDIAL REVASCULARIZATION WITHOUT CARDIOPULMONARY BYPASS

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**INTRODUCTION:** Despite the technological advances to assure surgical performance, complete revascularization and maintain patient safety during myocardial revascularization surgery without cardiopulmonary bypass, still, there is a large population of patients that have to undergo conventional myocardial revascularization. Based in the early experience with ventricular support for the treatment of heart failure utilizing roller and centrifugal pumps we developed a "simple" auricular-arterial shunt using a roller pump to assist "off the pump" myocardial revascularization.

**METHODS:** After assessing that the operation can not be done due to cardiac instability with the conventional resources done for routine "off the pump", 20 patients with depressed ventricular function, 55% male, 45% female, mean age 66.1 yr age, mean EF 27%, 100% COPD, 10% Renal Failure 10% acute MI, underwent the procedure.

**RESULTS AND DISCUSSION:** All patients tolerated well the operation, 3.4 grafts per pt. were done. Average support time was 37 min, 55% had left support, 40% biventricular support and 5% had right support. 65% had early extubation and short ICU stay, 3 required IABP and 2 long inotropic support, there was no operative mortality, at 36 months follow-up 85% survival. 1 pt died from renal failure, 1 pt presented with a stroke and 1 died from ongoing heart failure. Discussion Even though the clinical experience is limited, our results demonstrate that the circuit described above is safe, efficient, and specially "cost-effective; being able to operate with out cardiopulmonary bypass a select population of patient

### P-120-OBSERVED VS PREDICTED MORTALITY IN THE PATIENTS AFTER MYOCARDIAL REVASCULARISATION WITH SKELETONIZED INTERNAL MAMMARY ARTERY

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**BACKGROUND:** During the past decade the different risk stratification systems are used for evaluation of results 30 days after open heart surgery.

**METHODS:** In a period from January 01, 2004 and December 31, 2006 there were 113 patients who underwent single myocardial revascularisation (LAD or D1) using skeletonized left internal mammary artery at our Clinic. All of these patients were categorized into four risk groups in relation to expected operative risk based on V. Parsonnet's risk stratification model '96 - postoperative mortality 30 days: I group  $\leq 3\%$ ; II group 3-6%; III group 6-9%; IV group  $\geq 9\%$ . 30 days after operation we evaluated observed mortality. The observed mortality (O) was compared with expected mortality (E). The O/E index was used for evaluation of results.

**RESULTS:** All patients were in group I and II according to V. Parsonnet's risk stratification model. The expected mortality was 0.88%, while the observed mortality was 0.76%. The O/E index was 0.84.

**CONCLUSIONS:** Use of the modified Parsonnet's '96 stratification system shows good correlation between expected and observed outcomes. These are the real sign for adequacy of cited cardiosurgical procedure with possibilities of enlargement of indications for its use.

### P-121-CORONARY ARTERY BYPASS GRAFTING AND CONCOMITANT DESCENDING AORTA TO BIFEMORAL BYPASS VIA STERNOTOMY

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**BACKGROUND:** Some patients have advanced atherosclerotic coronary and peripheral vascular diseases in which surgeons are sometimes forced to perform concomitant coronary and peripheral bypasses in the same session. We evaluated a new approach of combined coronary and aorto-bifemoral bypass grafting performed through median sternotomy using the descending aorta as the inflow source.

**METHODS:** 4 patients with advanced coronary and aortoiliac diseases were operated in the same session. Following the coronary artery bypass grafting (CABG), posterior pericardium was bluntly dissected and the proximal anastomosis of a bifurcated Dacron graft to descending aorta was performed. The limbs of the graft was passed through an opening in the diaphragm and then passed through retroperitoneal space. Two tunnels are created in both groins. The limbs passed through the tunnels and the distal anastomosis in the groins were carried out in the conventional fashion.

**RESULTS:** The postoperative course was uneventful in all 4 patients. The patients were discharged from the hospital on 7-10th postoperative day (mean 8th day). In the second year follow-up multi slice computerized tomographies and magnetic resonance angiographies, all grafts were patent.

**CONCLUSION:** As far as we are concerned, this is the first report in English literature showing the concomitant CABG with descending aorto-bifemoral bypass grafting procedure where sternotomy is used for both operations. We believe this technique is a reliable alternative procedure to consider in CABG patients who are not suitable candidates for standard aorto-femoral operations with reasonable morbidity and excellent patency rate.

### P-122-TO WHAT EXTENT IS POSTERIOR PERICARDIOTOMY EFFECTIVE IN PREVENTING POSTOPERATIVE PERICARDIAL EFFUSION?

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**BACKGROUND:** Pericardial effusion develops in 30% of patients four to ten days after open heart surgery which may result in low cardiac output syndrome due to delayed cardiac tamponade. The role of posterior pericardiotomy in preventing pericardial effusion and delayed tamponade especially in patients treated with anticoagulants remains controversial.

**METHOD:** A total of 410 patients who underwent coronary artery bypass graft-



ing were studied. The patients were randomized into posterior pericardiotomy group (group A) and non- pericardiotomy group (group B). Prevalence and severity of pericardial effusion as well as delayed tamponade were compared in two groups by echocardiographic examination performed before discharge from hospital, 15 days and 30 days after the operation.

**RESULTS:** Pericardial effusion was detected in 9.8% of patients in group A and 30.3% of patients in group B at the time of discharge. On the 15th day, control echocardiogram showed pericardial effusion in 64.4% in group A and 94.2% in group B. One month after the operation 33.2% of patients in group A and 73.2% of patients in group B had pericardial effusion.

**CONCLUSION:** Posterior pericardiotomy is an easy-to-do, safe and useful procedure that can reduce the prevalence of postoperative pericardial effusion and cardiac tamponade.

### **P-123-DOES COMBINED ANTEGRADE - RETROGRADE CARDIOPLEGIA HAVE ANY SUPERIORITY OVER ANTEGRADE CARDIOPLEGIA?**

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**BACKGROUND:** In a prospective randomized clinical study we assessed and compared antegrade versus combined antegrade - retrograde cardioplegia in patients underwent elective coronary artery by pass grafting.

**METHODS:** Between March 2006 and Jan 2007, eighty seven consecutive patients were randomly divided into 2 groups. Group A (n=45) received antegrade cold (4°C) blood cardioplegia. Besides antegrade cardioplegia, Group B (n=42) received continuous retrograde cardioplegia passively by gravitational force. The need for cardiac support during and after cardiopulmonary bypass, post operative morbidity, ICU stay, hospital stay and mortality were compared in two groups.

**RESULTS:** There was no significant difference between two groups in gender, age and pre-operative ejection fraction. Sixteen patients in group A and 8 patients in group B needed inotropic support while weaning off cardiopulmonary bypass (p=0.04). Four patients in group A (8.9%) and 2 patient in group B (4.8%) needed Intra Aortic Balloon Pump (p=0.44) in the ICU. We found no statistically important difference between two groups in post operative morbidity and mortality.

**CONCLUSIONS:** Retrograde continuous infusion of cardioplegia by gravitational force combined with antegrade cardioplegia, provides satisfactory myocardial protection and eliminates the need for inotropic support compared with antegrade technique alone.

### **P-124-RECONSTRUCTION OF THE BRACHIAL-ULNAR ARTERY CONTINUITY AFTER JATROGENIC INJURY DURING THE HARVESTING OF THE RADIAL ARTERY AS CORONARY ARTERY BYPASS GRAFT FOR MYOCARDIAL REVASCULARIZATION**

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**BACKGROUND:** The radial artery (RA) has been reintroduced in 1992 and is increasingly gaining acceptance as arterial conduit for coronary artery bypass grafting (CABG). The harvesting of the RA for CABG is an established standard surgical technique; however, complications due to jatrogenic surgical injuries of forearm structures during RA harvesting are not completely excluded. There is an evident reluctance to report in the medical literature on own jatrogenic surgical complications. We report herein on a case of clinical follow-up of reconstruction of the brachial-ulnar artery continuity after its injury during the harvesting of the RA.

**METHODS:** A 56 years old female patient underwent in January 2001 a CABG with the left internal mammary artery on the left anterior descending artery and the RA on the right coronary artery. The harvesting of RA was done through a standard open conventional technique. An incision extending from the elbow to the wrist was accomplished. A meticulous inspection of the bifurcation of the brachial artery (BA) before the closure of the forearm revealed the absence of the ulnar artery (UA). The discontinuity of the BA-UA artery was evidently due to an unintentional jatrogenic surgical dividing of the UA. The continuity of the BA-UA artery was restored through an interposition of autologous reversed saphenous vein graft (SVG).

**RESULTS:** The intraoperative and the postoperative courses were uneventful. A

Doppler study done before hospital discharge showed a patent SVG. Neither hand ischemia nor neurological disabilities were documented. A clinical follow-up, Doppler study and angiography of the forearm were performed in August 2007, six years later after the primary operation. The Doppler study showed again the continuity of the BA-UA artery through widely patent SVG. The systolic flow velocity and the diameter of the UA were greater than the UA of the non operated forearm. The angiography showed patent SVG, BA and UA. Furthermore, the superficial and deep palmar arches were also widely demonstrated. Clinically, neither symptoms of vascular insufficiency of arm nor hand ischemia were complained. Complete motor and sensitive functions of the operated arm were also demonstrated. The patient reported no symptoms of angina pectoris and she is doing clinically very well.

**CONCLUSIONS:** The reconstruction of the BA-UA artery continuity with interposition of autologous SVG seems to be safe, durable and effective. A long-term clinical follow-up and Doppler study after such reconstructive procedure are mandatory. A meticulous attention during the harvesting of the RA to conserve important structures of the forearm is necessary.

### **P-125-ROLE OF REAL-TIME THREE-DIMENSIONAL ECHOCARDIOGRAPHY IN DIAGNOSTICS OF ATRIOVENTRICULAR CANAL DEFECT**

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**BACKGROUND:** Real-time three-dimensional echocardiography is a new modern technology for assessment of complex anatomy and morphology of heart. The diagnostic performance of real-time three-dimensional echocardiography is visualization of details of cardiac anatomy in patients with congenital heart disease.

**METHODS:** Real-time three-dimensional echocardiography (GE Vivid 7Dimension) was used in children with atrioventricular canal defect.

**RESULTS:** 25 patients with atrioventricular canal defect at the age from 3 months to 3 years were examined. Anatomy, morphology, type of lesion was assessed. We visualized cardiac structures, including chambers, ventricular and atrial septum, valves, subvalvar, chordal and papillary structures, left ventricle and outflow tract, pulmonary artery. We studied three components of atrioventricular canal: atrial, ventricular and valvular portions of the canal. The atrioventricular valve was with a common valve annulus, two well-formed annuli or condition somewhere between these two morphologic shapes. Within spectrum mildest form a "cleft" in the anterior leaflet of the left valve was present. The left ventricular volume was calculated by multiplane method. The small size of left ventricle was in some of our patients.

**CONCLUSION:** 3D-echo is a feasible and accurate method for the best estimation of the cardiac abnormalities. Real-time three-dimensional echocardiography allows us to visualize in detail of cardiac anatomy in patients with atrioventricular canal defect, multiplane imaging can quantify LV volumes.

### **P-126-ABERRANT RIGHT SUBCLAVIAN ARTERY: AN UNUSUAL TREATMENT FOR A RARE ANOMALY**

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**BACKGROUND:** The aberrant right subclavian artery (aRSA) is the most frequent anomaly of the aortic arch and it is often associated with its different anatomical anomalies. The following case has been selected as a very interesting specimen: a thirty-two years old man with an aberrant right subclavian artery combined with a common origin of the carotid arteries, bicuspid aortic valve, ascending aorta ectasia and aortic coarctation, which was previously treated. In June 2006, he was referred to our institution for upper limbs paresthesia followed by progressive dysphagia and cephalgia.

**METHODS AND RESULTS:** The patient was immediately subdued with medical tests and computed tomography scan at the chest, showed the aRSA crossing the midline behind oesophagus, an ascending aorta ectasia (supraaortic  $\Psi$  51 mm, proximal arch  $\Psi$  28 mm) and a common origin of the bilateral carotid arteries. (Figures 1-2). Finally, the decision ended up to proceed with a surgical intervention through a single-stage correction of ascending aorta replace-



ment and reconstruction of the aRSA. Unfortunately, it was impossible to mobilize the aRSA for hard adherences between the artery and the oesophagus, maybe they were due to the previous operation. Therefore, the distal part of the aRSA was over sewn before the origin of the right vertebral artery, too. Consequently, a termino-terminal anastomosis between a Gelsoft plus (Vascuteck Ltd, Renfrewshire, Scotland) and the aRSA was carried out with careful preservation of the right vertebral artery. Then, an end-to-side anastomosis was performed between the prosthesis and the ascending aorta. To this extent, a six month-one year clinical follow up showed the absence of any signs and symptoms of esophageal compression.

**CONCLUSION:** Basically, the anomalies associated with aRSAs included a common origin of the bilateral carotid arteries, a replaced right or left vertebral artery, a non recurrent right inferior laryngeal nerve, coarctation of the aorta, a right-sided thoracic duct, and a right-sided aortic arch. Eighty percent of aRSA travel behind the oesophagus, fifteen percent travel between the oesophagus and trachea, and five percent travel anterior to the trachea or main stem bronchus. As a matter of fact almost forty percent of patients complain for symptoms. An unusual finding in the report described was an upper limbs paresthesia as a first symptom, than afterwards, followed by dysphagia and cephalgia. Even after a careful review in literature, this case was different from the others because of many anomalies associated: common origin of the bilateral arteries, bicuspid aortic valve, ascending aorta ectasia and aortic coarctation. Numerous alternatives have been described to treat these kind of anomalies. However, the low frequency and the anatomic variability have not been allowed to standardize a proper surgical approach. Although the second intervention would be unavoidable, it could have been more appropriate to treat the aRSA when previously operated in order to avoid the early appearance of symptoms. Mainly, the best aim of surgery is to save lives last but not least to ensure a better quality of life and to try to prevent from unpleasant and complex re-interventions as much as possible

### P-127-TEE MONITORING FOR EMPTY BEATING HEART AORTIC VALVE REPLACEMENT WITH PATENT CORONARY BYPASS GRAFTS

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**BACKGROUND:** Avoidance of deteriorating effects of protection with cardioplegia during aortic cross clamp preserves myocardial function after standart aortic valve replacement. It may be crucial when severe impaired left ventricular function coexists with critical aortic stenosis.

**METHODS:** Preoperative history: 77y female; 12y after previous coronary bypass (LIMA-LAD, VSG-OM) and 3y after PCI-RCA; hypertension, NIDDM, COPD (FVC: 1.2 l, FEV1: 1.1 l, FEF25-75 1.4 l/s). Echocardiographia: EF 25%, aortic valve area 0.4cm<sup>2</sup>, MI II, TI II, pulm. syst. pressure 61 mmHg. Coronarographia: patent grafts and RCA stent. Surgical technique: partial upper sternotomy, standart aortic and right atrial appendage cannulation, decompression through the upper right pulmonary vein, coronary perfusion through the grafts and the right coronary. CO<sub>2</sub> was used to reduce the risk of air embolism. Intra-operative TEE was employed to monitor adequate coronary perfusion (segmental wall motion abnormality /SWMA/), effectiveness of left ventricular vent and adequacy of de-airing. Besides TEE, standart intraoperative monitors were used (5 lead EKG with ST segment analysis, direct art. pressure, CVP, pulseoximetry, temperature, urinary output).

**RESULTS:** The patient was haemodynamically stable throughout the operation. Only one event of SWMA was observed during the preparation and it was promptly resolved by modifying surgical manipulation. There was no SWMA during the ECC and left ventricular cavity was totally empty. Before removal of aortic cross-clamp, the heart was completely de-aired. Low dose dopamine was used to facilitate termination of the ECC. The patient was extubated 6 hours after the operation. ICU stay was uneventful and it took 21hours. Due to combined anticoagulation and anti-platelet therapy, there was a gastrointestinal bleeding at the ward. It prolonged hospital stay, that was 28 days.

**CONCLUSIONS:** With the assistance of TEE, aortic valve replacement is safe in empty beating heart. Upper partial sternotomy impairs less respiratory mechanics and antegrade blood supply of the myocardium preserves heart function.

### P-128-VENTRICULAR CLEAVAGE: A NOVEL FINDING. THE ROLE OF CMR IN SUCCESSFUL DIAGNOSIS AND SURGICAL REPAIR

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**INTRODUCTION:** While a two-dimensional echocardiogram (2DE) is considered the "diagnostic standard" to establish the diagnosis of mechanical complications of acute myocardial infarction (AMI), its sensitivity is low. Cardiac magnetic resonance imaging (CMR) has been proposed to be superior to echocardiography for obtaining an accurate diagnosis. Since echocardiographic findings are often equivocal, advances in CMR have expanded its indication and increased its utilization. This is the first reported case of a patient with an unusual pathological finding after an AMI in which we propose a novel term: ventricular cleavage. The use of CMR in making its diagnosis led to a successful surgical repair.

**METHODS:** PK is a 66-year-old male who was transferred to our institution after presenting with intractable chest pain and a new systolic ejection murmur following an acute inferior wall myocardial infarction. The 2DE suggested a communication between the left and right ventricles; however, it was uncertain if this was a VSD or a pseudoaneurysm. A swan-ganz catheter showed a marked "step-up" in oxygenation from the right atrium to the pulmonary artery but the initial surgical exploration at an outside institution could not identify the defect. The patient then underwent CMR which diagnosed a subepicardial tract connecting the left ventricle (LV) to the right ventricle (RV). The imaging made it clear that the myocardium had been spliced through the LV wall making its way to the RV in the form of a fistula. Surgical reexploration revealed the unique pathological finding and the defect was repaired with a two layer Teflon felt sandwich. The patient was discharged home on postoperative day 6, without complications and free from chest pain.

**RESULTS:** CMR revealed a high flow systolic jet that entered the RV free wall between the endocardial and epicardial layers, "cleaving" the RV free wall into two layers. Post fistula repair, the patient recovered well with no evidence of right atrial-pulmonary artery step up in oxygenation and the murmur was obliterated. The final pathology revealed a serpiginous like tract that spliced the myocardial wall making a connection between the left and right ventricles, a new and rare finding.

**CONCLUSIONS:** Several cases of patients benefiting from CMR have been reported. Our case not only reports a new complication found after AMI, but also the positive role CMR played in its detection in a timely and life-saving manner. The clinical course and 2DE led to an operative indication but they did not uncover the "ventricular cleavage". Only the CMR and reexploration gave us detailed information to approach the complex nature of the lesion.

### P-129-SEEING IS BELIEVING: MR IMAGING OF PARTIAL ANOMALOUS PULMONARY VENOUS RETURN BEFORE AND AFTER SURGICAL CORRECTION

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**BACKGROUND:** Partial anomalous pulmonary venous return (PAPVR) is found in less than 1% of patients with congenital heart disease. Pre-operative recognition of this rare anomalies with a proper imaging technique is especially important for the convenient planning of surgery for high risk patients. We present an old patient with PAPVR, operated in our department because of developing pulmonary artery hypertension and right heart failure. Magnetic resonance imaging (MRI) was used for comprehensive pre-operative evaluation and faster intervention.

**METHODS:** A 76 year old woman who was referred to our hospital with respiratory distress. Transthoracic echocardiography showed dilated right cardiac cavities, pulmonary artery hypertension and anomalous pulmonary venous return. MRI showed right superior pulmonary vein(RSPV) was draining to superior vena cava and left superior pulmonary vein(LSPV) to innominate vein (Figure 1) which was performed for better operative planning in order to decrease advanced age related morbidity risks.

**RESULTS:** The surgical correction was performed under cardiopulmonary bypass. RSPV directed to the left atrium by a bovine pericardial baffle via a hole on the interatrial septum and LSPV anastomosed directly onto the left atrium appendix. The postoperative period was uneventful and control by MRI was shown patent pulmonary venous- left atrial connection at 6th postoperative month (Figure 2).

**CONCLUSIONS:** Surgical treatment of PAPVR is indicated for symptomatic

patients and asymptomatic patients if the pulmonary to systemic ratio begins to be greater than 1.5 or the the right heart chambers begins to be dilated. Pre-operative recognition of this rare anomaly is important for the convenient planning of surgery. Although most of the patients with congenital cardiac malformations can be diagnosed by echocardiography, MRI should be kept in mind as an additional diagnostic tool to provide detailed anatomical informations.

### **P-130-ENDOSCOPIC VESSEL HARVESTING (EVH): THE LEARNING EXPERIENCE OF A TEACHING HOSPITAL**

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**OBJECTIVE:** Minimalization of operative techniques in Cardiac Surgery is mandatory in today's attractive high standards. The introduction of EVH in Europe, led us to the application of the EVH System (Guidant®/Boston Scientific®, Vasoview 6) in our teaching hospital. We present our learning experience, analyzing technical and functional factors. Method: Thirty-two patients (20 male, 12 female) with a mean age of  $64 \pm 9$  yrs underwent CABG, using the Vasoview 6® System by 2 surgeons, for SVG harvesting. The IMA was used 29 patients. Harvesting time was  $45 \pm 15$  min, with a steadily decreasing rate leading to 25 min. in the last consecutive 5 cases. A mean  $1.5 \pm 0.5$  SVGs were harvested with a mean graft length of  $17.5 \pm 5$  cm.

**RESULTS:** Inexperience was the primary reason to conversion in 4 early cases. Four hematomas were observed at the early stage of the learning curve. Patient satisfaction and cosmetic results were remarkable with no wound infections observed. Antibiotic use was reduced by 25% and analgesics by 35%, compared to patients with the open technique. Postoperative hospitalization was not prolonged ( $7 \pm 2$  days). Difficulties observed included negative reactions by the OR staff to the introduction of the EVH System. Familiarization with the set-up of the endoscopic tower, within our space limited OR, was a barrier encountered. Reimbursement was also a major obstacle we stumbled upon.

**CONCLUSION:** Despite the significant learning curve (20 cases) for each surgeon and the multilevel obstacles encountered, we believe that cosmetic and medical benefits induce the use of the EVH Vasoview 6® System. With proper training it can be reliable in everyday use to the satisfaction of our patients.

### **P-131-PERCUTANEOUS CARDIOPLEGIA DELIVERY USING THE MINIORT IN MINIMALLY INVASIVE MITRAL VALVE SURGERY**

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Minimally invasive cardiac surgery involves limited exposure of cardiac structures. Extracorporeal circulation is usually conducted by peripheral cannulation. Crossclamp can be achieved by remote ways of either balloon endoclamp or transthoracic clamp. Effective delivery of cardioplegic solution is somewhat more difficult than those abovementioned tasks. Some surgeons adopt percutaneous retrograde cardioplegia. However, this technique significantly increases the cost and procedural complexity. Antegrade cardioplegia is usually preferred. Aortic root infusion catheter is incorporated in the commercially available endoaortic balloon clamp system. Cardioplegic delivery associated with the balloon endoclamp is through an extended and narrow catheter. High delivery pressure and time consuming are always encountered. Several precautions remain as clinical obstacles. The proper position of endoaortic balloon, completeness of balloon occlusion, slow rate and high delivery pressure of cardioplegic solution, and effectiveness of left ventricular venting are all influential to this practice. Direct aortic root cannulation with the extended-length cardioplegic needle via thoracotomy wound is recommended by many surgeons performing less invasive mitral valve surgery. Both cardioplegic needle and snaring tourniquet somewhat jam the surgical field. Some surgeons use the angiocath which is inserted by direct transthoracic puncture. The angiocath is good in term of creating a tiny stab wound on the chest. The diameter of angiocath limits the flow of cardioplegic solution and also the efficacy of de-airing process after de-clamping. Loss of stiffness while removing the needle inside increases the difficult of manipulation or re-positioning. We sought to deliver cardioplegic solution in a simple, reproducible, and cost-effective way. The miniport

is used for this application. The procedures in details will be reported. Our application using the miniport provides advantages in easy handling, manipulation, re-position and high flow delivery in regard to cardioplegic delivery. To adopt this simple technique in routine minimally invasive mitral valve surgery is recommended.

### **P-132-ENDOSCOPIC HARVEST OF SAPHENOUS VEIN-A LESSON LEARNED FROM 1348 CASES**

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**BACKGROUND:** Endoscopic harvest of saphenous vein is a relatively new technique, developed to minimize the wound and postoperative complications. It has gained patients' acceptance and become popular in cardiac surgical practices. Because most centers have limited experience with this approach, we summarized the clinical profiles in patients undergoing endoscopic vessel harvest (EVH).

**METHODS:** Between March 2001 and august 2006, 1348 patients (945 male, 403 female) with a mean age of 67.2 (range 28 to 89) underwent EVH of the saphenous vein for coronary artery bypass surgery, peripheral artery reconstruction and miscellaneous conditions. The EVH was performed using the Vasoview system (Guidant, Menlo Park, CA) under the assistance of carbon dioxide (CO<sub>2</sub>) insufflation.

**RESULTS:** Technical success was achieved in 98.6% of cases. Two saphenous veins were discarded due to obvious vein injury. The mean harvest time was 45 minutes. The mean harvest times for the first 50 cases and last 200 cases were 68 and 23 minutes, respectively. Ninety-eight percents of patients had only saphenous vein harvested from thighs; only 1.5% patients had saphenous vein harvested from legs. Postoperative wound complications occurred in 61 patients. There were 25 tract hematoma, 19 wound dehiscences or poor healing, 16 wound infections and 1 overlying skin necrosis. Overall, 13 subsequent revisions were required for these complications. There were detectable air embolisms in 143 patients and numbness in the saphenous nerve territory in 169 patients.

**CONCLUSION:** EVH of the saphenous vein is a valid alternative to open saphenectomy, providing excellent surgical results, and should be considered as the standard of care for saphenous vein harvest.

### **P-133-OPEN HEART SURGERY IN PATIENTS AGED OVER 75: OUTCOMES FOLLOWING THE MINIMALLY INVASIVE APPROACH**

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**BACKGROUND:** More cardiac surgical procedures are performed via a minimally invasive, thoracotomic access. We present our latest experience in patients aged over 75 years undergoing a minimally invasive surgery.

**METHODS:** From January 2004 to November 2007, 65 consecutive patients aged above 75 years (37 females; age  $78.7 \pm 3.0$  years) underwent mitral repair (40), mitral replacement (13), aortic valve replacement (9) or removal of cardiac myxoma (3) through a right minithoracotomy. Cardio-pulmonary bypass (CPB) established via femoral access and endoaortic balloon clamp was used in 19 patients while external cross-clamping and central cannulation was employed in 40. Mean CPB time was  $112.7 \pm 27.9$  min. Mean cross-clamp time was  $69.7 \pm 27.9$  min. Other 5 patients had associated CAD, and 7 underwent PTCA prior to surgery. Also, 25 patients had atrial fibrillation, 12 had chronic renal failure, 9 had COPD, and 11 underwent Redo operations. The mean pulmonary artery pressure was  $49 \pm 18$ . The mean logistic Euroscore was  $22.0 \pm 18.7$ .

**RESULTS:** There was no hospital mortality. One patient, subsequently to transfer to a rehabilitation facility, died on POD 45 for respiratory failure. Another 5 patients had neurologic complications, 3 underwent revision for bleeding, and 2 had respiratory failure requiring BiPAP. One patient underwent early reoperation via a median sternotomy approach for mitral repair failure. The median time on assisted ventilation was 8 h (4-127), ICU stay was 1 day (1-9), and postoperative stay was 6 days (3-16).

**CONCLUSIONS:** Minimally invasive cardiac surgery allows excellent results in patients aged over 75 years, with acceptable morbidity and mortality. The minithoracotomy access reduces surgical trauma which appear particularly favourable in the elderly patient with multiple severe comorbidities.

### **P-134-MINIMALLY INVASIVE PORT ACCESS VERSUS CONVENTIONAL MITRAL VALVE SURGERY- EXPERIENCE AND EVOLUTION OF A PRACTICE**

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**BACKGROUND:** Despite the popularity of minimally invasive surgery, cardiac surgery as a specialty arguably remains one of the slowest to adopt the approach. Moreover, for reasons such as poor resources and high-profile clinical governance incidents, the United Kingdom trails most Western nations. Despite these constraints, we have been offering minimally invasive mitral valve surgery (MIMVS) to patients since 2001. As techniques and instruments have developed, we have adapted our approach to embrace the advances. This paper describes our evolving practice and provides a comparison of the technique to the conventional open approach.

**METHODS:** We analysed all patients who underwent MVS, either by the endoscopic or open method, by a single surgeon between 2001 and 2005. Data were obtained from the prospectively collected and validated database used for submission of unit results to the national registry.

**RESULTS:** Over 51 months, 65 patients had MVS. 15 had MIMVS with success in 14. Although total procedure time and cardiopulmonary bypass times for the endoscopic groups were significantly longer than the open approach, cross-clamp (ischaemic) times were similar. The endoscopic group stayed in hospital on average 4 days less than the open group (11.1±8.0 days vs. 7.6±6.3 days respectively;  $p<0.05$ ). All patients reported symptomatic benefit from surgery with a significant reduction in NYHA score. The endoscopic approach was easily modified as technological advances such as robotic arms and percutaneous techniques were introduced.

**CONCLUSIONS:** MIMVS is as safe and efficient as the open approach. It offers quicker recovery and is easily adaptable to technological advances.

### **P-135-A TOUCH OF GLUE TO REPLACE SUTURE KNOTS, STITCHES AND STAPLES: PRELIMINARY STUDIES**

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**BACKGROUND:** There are about 880 000 WEB references devoted to surgical knots which occupy a good deal of surgical skills and operating time. The thinner is thread the more laborious is knotting. Magnifying glasses make not easy to find the ends of the thread and control knotting. Knots remain difficult for robotic and endoscopic procedures. A rupture of the thread is perceived as a catastrophe. To overcome shrinking effect in anastomoses using of interrupted sutures is advisable but laborious with many knots and prevention of residual bleeding. Some authors directly advice to cut out surgical knots by replacing them with staples. Recent advances in tissue bonding open more simple way - gluing of the suture in critical points.

**METHODS:** In vitro [cattle hearts] coronary reconstruction procedures were chosen as a model for testing of glue fastening suture technique [GFST]. In 56 experiments the following situations were imitated and repaired: \* Fastening of the start and finish points of the running continuous suture; \* Fixing of rupture of the thread during continuous sewing; \* Fixing of prolonged continuous suture in several points to reduce shrinking effect; \* Fortify each stitch or staple of interrupted suture to simplify its treatment; \* Construction of coronary anastomoses with rare skeleton sutures or staples, gapes fixed with fast working glue. Mean diameters of coronary arteries and grafts were 2.01 and 1.57 mm accordingly. In experiments were used: 7-0 atraumatic polyamide stitches/sutures, original staplers with 1 mm staples made of 0.1 mm wire, fast bonding commercially available glues.

**RESULTS:** Positive results were achieved in 94.6% of experiments. Sticking exposition was around 5-7 seconds. For better control at the starting and final points of a continuous suture additional overstitches are recommended. A glue surplus was especially harmful for construction of anastomoses.

**CONCLUSIONS:** In vitro testing of the GFST brought promising results. Next in vivo experiments are mandatory before clinical trials.

### **P-136-FEASIBILITY OF ASSISTED VENOUS DRAINAGE USING A TINY CENTRIFUGAL BLOOD PUMP (TINYPUMP) FOR TRANSFUSION-FREE CARDIOPULMONARY BYPASS IN NEONATAL PIGLETS**

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**INTRODUCTION:** We evaluated efficacy of TinyPump assisted venous drainage and studied whether using this miniaturized circuit without blood transfusion could reduce coagulation and the inflammatory cascades compared to the conventional blood primed CPB circuit.

**METHODS:** Twelve piglets aged 1-week-old (3.6\_0.2kg) were divided into two groups: group M (miniaturized circuits with assisted venous drainage without blood prime) and group C (conventional circuits with gravity drainage with blood prime). CPB was conducted under moderate hypothermia at a flow rate of 180 ml/kg/min for two hours including one hour's cardiac arrest and then modified ultrafiltration (MUF) was performed. Data were acquired before CPB and after the end of MUF.

**RESULTS:** The priming volume including the hemofilter circuit required 152ml in group M, but 300ml in group C. Employment of the TinyPump amplified flow rates of venous return from 531\_21 ml/min to 683\_67 ml/min. Hematocrit in group M and C was not different significantly during CPB (22.3\_2.5 vs. 23.5\_3.4%) and after MUF (31.1\_1.9 vs. 36.0\_5.5%). The group M after MUF had lower thrombin-antithrombin complex levels (17.9\_4.3 vs. 30.3\_5.5 ng/ml), lower IL-6 (2795\_1371 vs. 4871\_1770 pg/ml) and IL-8 levels (2763\_773 vs. 10626\_4017 pg/ml) than the group C. Additionally, lung compliance and cardiac index after MUF were better in group M than group C (0.286\_0.053 vs. 0.177\_0.041 l/min/kg and 5.11\_3.3 vs. 2.26\_0.3 ml/cm H<sub>2</sub>O).

**CONCLUSIONS:** The TinyPump assisted venous drainage system could augment venous return and make transfusion-free CPB feasible in neonatal piglets. Employing this technique may attenuate blood requirements as well as improve post-operative outcomes in neonatal open-heart surgery.

### **P-137-VENTRICULE ASSISTANCE IN CARDIAC FAILURE**

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Since the beginning of cardiac surgery and extra-corporeal circulation the results of heart surgery are directly correlated of the hemodynamics and heart functions and the timing of operation and aortic clamping. Usually over 15% of ventricular ejection fraction, the outlet of E.C.C. should be without any troubles, in coronary bypass as well as in valve replacement. Under 15%, the outlet of E.C.C. is difficult, the first type of left ventricle assistance was counter pulsation intra-aortic balloon; but in some cases it is not enough. The nimbus hemopompe? Used at Texas heart institute and put in place the same way may be useful. But in others cases, direct implantation of biopomps like biomedicus or abimed is necessary: more often of left ventricle with direct cannulation and outside pompe regulation than of right ventricle or both. The most extreme case is total heart failure what may happen in heart transplantation, for example graft rejection or cardiac index under 2 unite woods. Then a total heart artificial heart device is necessary: there are several now on the market, I have more experience with the jarvik 7, pitie experience of 25 cases implanted in 6 months, first the 1st may 1987. the technic is the same that cardiac transplantation to cut out the recipient heart and than to suture left and right artificial auricles and the cannulation at the roof of pulmonary artery and aorta, regulation is also extracorporeal and the type of energy electro-pneumatic. Some patients survived with a second operation to implant a new heart transplant. the new cardiotrop medicaments influence also in a good way. But the future would be in a ventricle assistance device implanted, so small like a pace maker and with an intrinsic auto regulation. Bioengineering need still to make progress and it would be better than a total heart artificial device were is no return possible for the recipient heart once cut out.



### **P-138-OUR EXPERIENCE WITH A NEW RIGID PLATE FIXATION OF THE STERNUM IN HIGH RISK PATIENTS UNDERGOING HEART SURGERY**

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**BACKGROUND:** The sternotomy is the most used way to access to the heart in cardiac surgery. Even it is a safe way and the incidence of mediastinitis is just about 2/5%, the mortality rate with this complication goes up to 15%. If we consider that an increasing number of our patients are considered 'high risk' patients today (Age above 70, osteoporosis, COPD, reoperations, diabetes, renal failure, etc) we think that the development of a safer way with a lower rate of complications to close the sternum is important.

**METHODS:** We performed the closing of the sternum with a new rigid plates fixed to the sternum with screws. We used the method in 43 patients considered 'high risk' patients, considering 'high risk' patients those who have three or more of the following risk factors: Preoperative: - COPD - Renal failure - Reoperation - Diabetes - Morbid obesity - Immunocompromised - Concurrent infection Intraoperative: - Transverse fractures - Off mid-line sternotomy - Long pump times (more than two hours) - Osteoporosis We used 'Sternal-lock' system which is a method that closes the sternum with rigid plates fixed with screws. We used two stainless steel wires: proximal (manubrium) and lower end of the sternum. We used plates in central position, usually 'X' and 'box' plates.

**RESULTS:** We do not have cases of mediastinitis, sternal dehiscence and no patients with sternal instability were found in the group of patients undergoing this kind of closure. All of the patients were people included in the 'high risk' group with and the average age was 75 years old and all of them had three or more 'high risk' factors.

**CONCLUSION:** Analysing our preliminary results we found the 'Sternal-lock' system a reliable method of fixation of the sternum, safe and efficient. We think that, even more clinical experience is required, the first results suggest improved stability of the sternum compared with non rigid methods, decreasing the possibility of mediastinitis and sternum dehiscence.

### **P-139-IS THERE A CORRELATION BETWEEN SYSTOLIC TIME RATIO AND EJECTION FRACTION AFTER CARDIAC SURGERY?**

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**BACKGROUND:** Knowledge of ejection fraction is very valuable for estimating perioperative risk and optimising postoperative medication. Usually this is achieved by echocardiography. This method of measurement has its limits in the early postoperative period due to the poor quality of the echocardiogram. But there are some indications that ejection fraction and systolic time ratio are correlated. Since systolic time ratio could be measured easily by means of impedance cardiography, the aim of this study was to prove the correlation between systolic time ratio and ejection fraction.

**METHODS:** 20 adult patients underwent coronary artery bypass grafting or valve surgery. Before surgery and on postoperative days 3 and 6 systolic time ratio was measured. 4 electrodes of the impedance-cardiography device were placed on the patients' cervices and thoraxes. Simultaneously, transthoracic echocardiography was performed to measure the ejection fraction.

**RESULTS:** The range of the ejection fraction was between 42% and 80% with a mean of  $58.8 \pm 7.0$ . The range of the systolic time ratio was between 0.27 and 0.68 with a mean of  $0.397 \pm 0.0826$ . There was a good correlation ( $r^2 = 0.48$ ) between ejection fraction and systolic time ratio.

**CONCLUSION:** Measurement of systolic time ratio can easily be performed using this new device. Additionally, the assessment could be done continuously. Since there is a good correlation between ejection fraction and systolic time ratio this method of measurement is indicative of ventricular function. Changes in ventricular performance can be detected immediately.

### **P-140-NEW ULTRA-HIGH SENSITIVE CCD CAMERA FOR CAPTURING OF COLOR AND NEAR-INFRARED IMAGES DURING ICG ANGIOGRAPHY IN CABG**

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**BACKGROUND:** In coronary artery bypass graft (CABG), total arterial grafting improved long-term graft patency, postoperative mortality, and Off-pump coronary artery bypass graft (OPCAB) decreased postoperative complications. Intraoperative graft assessment was one of the most important factors on CABG, because perioperative mortality was dependent on graft failure. Many institutions performed intraoperative graft assessment using transit flow measurement (TFM). Recently to provide intraoperative visual graft imaging, ICG fluorescence Angiography system (SPY system) was developed, which captured the fluorescence on monochromatic camera and illuminated with laser light source. Our institution developed an advanced ICG Angiography system, which captured the fluorescence on Color CCD camera and illuminated with LED light source.

**METHODS:** We developed the one-chip CCD camera with 840nm cut-on filter and 780nm LED light source to capture color and near-infrared imaging during ICG angiography. We performed clinical prospective study to assess intraoperative graft patency in 10 OPCAB using the Color CCD camera and TFM. ICG was injected 0.02mg/kg through CV line. All patients signed a consent form before operation. Operation was performed by a single surgeon, and exclusion criteria include allergy to ICG dye and cardiogenic shock.

**RESULTS:** In animal study, the Color CCD camera detected clearly myocardial infarct lesions, abdominal organs perfusions and femoral artery perfusions. In clinical study, we obtained intraoperative graft flows and images in 41 anastomoses of 30 grafts. Mean number of distal anastomoses was  $4.0 \pm 0.81$  per patient. The LITA to LAD grafting was performed all patients, the RITA to D1 was 1 patient, the GEA to RCA was 1 patients and the SVG grafting was performed all patients. And 7 among 10 patients were performed sequential anastomoses with long SVG. Although TFM was unable to detect any abnormal perfusion in the peripheral portion of the graft, the color CCD camera imaged irregular flow and unfavorable perfusion in 6 grafts: 5 moderate to poor fluorescence and 1 delayed fluorescence. Moreover the CCD camera detected that the fluorescence pattern in the proximal portion of the native coronary was intermittent, and the patent graft flow pattern was captured continuous fluorescence in the peripheral portion of the graft. The CCD camera system was able to evaluate native coronary flows and graft flows on surgical fields. After early postoperative angiography assessment, 6 true positive and 1 false negative was detected in the Color CCD groups, 1 true positive and 6 false negative in TFM groups. Although the sensitivity of the TFM is 14.2% and the percentage of false negative is 12.5%, the sensitivity of the color CCD system is 85.7%, the percentage of false negative is 2.8%. Our findings suggest that the color CCD system is high-sensitivity assessment tool rather than TFM.

**CONCLUSIONS:** The Color CCD images directly cooperated with surgical fields and the sensitivity is 85.7%. Our system may become a standard intraoperative surgical management tool on CABG.

### **P-141-IN VITRO STUDY OF ALTERED GEOMETRY OF MITRAL VALVE IN FUNCTIONAL MITRAL REGURGITATION**

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**BACKGROUND:** Functional mitral regurgitation in patients with ischemic or non-ischemic heart failure has been related to several overlapping factors: altered force balance on mitral cusps caused by displacement of papillary muscle and/or annular attachments, which restricts adequate leaflet closure, and global ventricular dysfunction with reduced transvalvular pressure to close the leaflets. In vivo these overlapping factors are very difficult to study independently of dynamic processes such as ventricular wall motion or annular contraction. Aims: An in-vitro left ventricular model was developed that allows independent variations of annular size, papillary muscle position and transvalvular pressure. We tested the hypothesis that functional mitral regurgitation is a consequence of altered balance of tethering and coapting forces acting on leaflets.

**METHODS:** Hemodynamic measurements were made on 4 excised porcine



valves under physiological pressures (transmitral pressure 10 to 140 mmHg) and flows (0 to 1500 mL/min). Testing was done by systematic variation of annular size and papillary muscle position. Three annular sizes were evaluated (normal, 50% dilation and 75% dilation) and for each annular size papillary muscles were sequentially studied in one of three positions that can be encountered clinically (lateral, posterolateral and apicoposterolateral displacement). Effective regurgitant orifice (ERO) was calculated for each valvular configuration using continuity equation. Preliminary

**RESULTS:** Preliminary experiments show that annular dilatation increases regurgitant flow for any given papillary muscle position. Apicoposterolateral papillary muscle displacement increases regurgitant flow to a higher degree than isolated lateral or posterolateral displacement. Increased transvalvular pressure decreases ERO for any given geometric configuration of the mitral valve.

**CONCLUSION:** Clinically observed pathological configurations of the mitral valve can be accurately reproduced in-vitro by altering the tethering forces (relationship between annular and papillary muscle attachments) and the coapting forces (transvalvular pressure) acting on mitral leaflets. Our preliminary measurements are in accordance with previously published data and show that mitral regurgitant flow increases with annular dilation for any given papillary muscle configuration and with a decrease in transvalvular pressure. These results support the mechanism of mitral regurgitation where increased tethering forces and decreased coapting forces acting on the leaflets create the regurgitant orifice.

#### **P-142-IMMEDIATE RESULTS OF SURGICAL CORRECTION OF AORTIC STENOSIS WITH LOW LEFT VENTRICULAR EJECTION FRACTION (LVEF < 35%)**

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**OBJECT OF INVESTIGATION:** Evaluation of the immediate results of surgical correction of aortic stenosis with low LVEF (EF < 35%).

**MATERIALS AND METHODS:** 34 patients with aortic stenosis and low ejection fraction were operated in Bakoulev SCCVS AHD departments during the period between 1997 and 2006. Patient age ranged from 31 to 72 years (mean 50.9  $\pm$  12.0 years): 29 (85.3%) were male and 5 (14.7%) were female. The causes of aortic defects included CHD (bicuspid aortic valve) in 15 (44.1%) patients, rheumatism in 11 (32.4%) patients, and degenerative aortic defect in 8 (23.5%) patients. Patients without hemodynamically significant coronary artery stenoses were included in the investigation. Aortic valve calcification of the III degree was diagnosed in most patients. All patients were class III and IV according to NYHA classification (14.7% and 85.3% respectively). All patients underwent aortic valve replacement under cardiopulmonary bypass with moderate hypothermia at 26  $\sim$  28  $^{\circ}$ C. Mean cardiopulmonary bypass time was 146.6  $\pm$  49.5 minutes (86 to 265 minutes), and mean aortic cross-clamping time was 90.2  $\pm$  29.1 minutes (51 to 172 minutes).

**RESULTS:** Hospital mortality was 2.9% (1 out of 34 patients). According to EchoCG investigation data, increase in LVEF (from 30.0  $\pm$  4.7% to 49.5  $\pm$  9.0%) and hemodynamic indices normalization were registered in early terms after operation: peak systolic gradient decrease (83.3  $\pm$  31.2 mm Hg before operation, and 24.3  $\pm$  7.4 mm Hg after operation); heart volumes reduction (ESV 97.5  $\pm$  44.8 ml and EDV 177.2  $\pm$  56.3 ml with initial ESV 159.3  $\pm$  46.2 ml and EDV 236.5  $\pm$  62.5 ml,  $p$  < 0.01). Left heart sizes: ESV 4.4  $\pm$  0.8 cm and EDV 5.9  $\pm$  0.7 cm (with preoperative ESV 5.6  $\pm$  0.7 cm, EDV 6.7  $\pm$  0.8 cm), LV (5.2  $\pm$  0.7 cm preoperatively, 4.5  $\pm$  0.5 cm postoperatively).

**CONCLUSION:** surgical correction of aortic stenosis in patients with low LVEF results in improvement of clinical condition and hemodynamic indices in early terms after operation. Evident systolic myocardial dysfunction in patients with aortic stenosis is not a contraindication to defect surgical correction.

#### **P-143-AORTIC VALVE REPAIR: CLINICAL AND ECHOCARDIOGRAPHIC MIDTERM RESULTS**

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**BACKGROUND:** Reconstruction of the aortic valve for aortic regurgitation has

been increasingly proposed as an alternative to valve replacement. Still it has remained a technically challenging procedure and different results have been reported. The goal of the present study was to evaluate clinical and echocardiographic midterm results of aortic valve reconstructive surgery.

**METHODS:** From 2003 to 2006, 83 patients with aortic regurgitation underwent aortic valve repair in Heart Center of Kaunas Medical University Hospital. Study protocol included clinical data (age), patients functional status (NYHA) and echocardiographic assessment (grade of aortic regurgitation, diameter of aortic annulus, end diastolic diameter and myocardial mass index of left ventricle (LV) preoperatively and after surgery. 52 patients underwent follow up echocardiographical evaluation for a mean period of 16,4 months.

**RESULTS:** Aortic valve repair was performed mostly for IA and II functional types of aortic regurgitation (respectively in 37,5% and 40% of the pts). Mean patient age was 60,8 $\pm$ 16 years. 82% of the pts were in III-IV NYHA functional class preoperatively compared with 10,5% after surgery ( $p$ <0,05). The follow up echocardiographic investigation revealed, that the grade of aortic regurgitation was less than II in 90% of the pts, the diameter of aortic annulus decreased significantly (25,6 $\pm$ 4,1 vs 22,1 $\pm$ 2,2 mm,  $p$ <0,05). Positive remodelling of left ventricle (LV) was observed - the LV end diastolic diameter and LV myocardial mass index decreased (respectively 58,6 $\pm$ 9,1 vs 52,2 $\pm$ 8,9 mm and 166,2 $\pm$ 62,6 vs 129,7 $\pm$ 38,9 g/m<sup>2</sup> ( $p$ <0,05))

**CONCLUSIONS:** Aortic valve repair is a feasible surgical technique with good midterm results in terms of clinical outcome, aortic valve function and left ventricle positive remodelling.

#### **P-144-AUTOLOGOUS PERICARDIUM PATCH IN TRICUSPID VALVE REPAIR : INDICATIONS AND SURGICAL RESULTS IN TRICUSPID VALVE DISEASE**

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**BACKGROUND:** Organic tricuspid valve disease is uncommon, and requires complex valve surgery in some cases. Annuloplasty alone is unable to solve the dysfunctions when valve retraction is severe and the surgeon needs to perform an autologous pericardium patch for tricuspid valve extension in order to restore normal tricuspid valve functions. The current study evaluates indications and results of this surgical technique of tricuspid valve repair.

**METHODS:** We report a retrospective study of consecutive patients operated on from 2000 to 2007 for valvular tricuspid dysfunction non related to congenital heart disease. From Five hundred and one patients (n=501) operated one hundred and fifteen (n=115) had tricuspid valvular organic lesions. Among them seventeen patients (n=17) underwent tricuspid valve repair using autologous pericardium patch for tricuspid valve extension. The mean age was 31.1 years  $\pm$  9.1 years (range : 20 - 45). The etiology was rheumatic in all patients. Clinical and echocardiographic follow-up were complete, and were 34.6 months  $\pm$  19.1 months.

**RESULTS:** Once pericardium is harvested, a large piece is removed and immersed in a Glutaraldehyde solution 0.625% during 10 minutes. Pericardium is washed by three baths of saline serum of 6 minutes each and then a bath of ethanol 80% for 1 minute. The surgeon sews an oval piece of pericardium of appropriate size on the previously opened tricuspid valve : from the antero-septal commissure to the middle of the posterior leaflet. Incomplete Ring with Modulated Flexibility (IRMF) was required for tricuspid annuloplasty in all cases. Commissurotomy was performed in 41.1% (n=7), papillary muscle fenestration in 29.4%(n=5), and chordal fenestrations in 23.5%(n=4). Concomitant procedures included mitral and aortic valve replacement in 64%, mitral valve replacement in 18% and mitral valve repair in 18%. The mean aortic cross clamp time was 151 min  $\pm$  28 min. There was no hospital nor late deaths. There was no reintervention for tricuspid valve dysfunction. After surgery all patients were in NYHA functional class I. Only one patient ,with a very small tricuspid annulus and severe organic tricuspid valve disease, presented a significant trans tricuspid gradient at echocardiographic follow-up. There was no significant tricuspid insufficiency in the last echocardiographic control.

**CONCLUSION:** In some particular conditions, the valvuloplasty extension technique is of great interest. Surgical results are much more better compared with tricuspid valve repair for functional tricuspid dysfunction or other organic tricuspid valve diseases. This could result from an early valve surgery in these very symptomatic patients with severe organic tricuspid valve disease.

### **P-145-AORTIC VALVE REPLACEMENT WITH ST.JUDE MEDICAL - TORONTO SPV STENTLESS PORCINE BIOPROSTHESIS: TEN - YEAR EXPERIENCE**

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**BACKGROUND:** The aim of our study was to evaluate the impact of aortic valve replacement procedure with stentless bioprosthesis on early postoperative results (one month after operation) and hemodynamic changes in comparison to mechanical prostheses.

**METHODS:** Study group consisted of 58 patients (48% with concomitant procedure: MV repair, TV repair) who received stentless aortic bioprosthesis, and control group of 227 (with the same percentage of concomitant surgery as in the stentless group) patients, who received mechanical aortic valve substitute (St.Jude mechanical valve) during the same time, in 1997-2007 at the Heart center of Kaunas Medical University. Study protocol included clinical data (age), risk evaluation using EuroSCORE, patients functional status (NYHA) and Echocardiographic assessment (left ventricle mass index - MVI and the mean transvalvular gradient of the aortic valve).

**RESULTS:** Patients with stentless aortic bioprosthesis showed advanced age  $72.6 \pm 5$  y. vs.  $55 \pm 11.7$  y. in comparison to the patients who received a mechanical prosthesis ( $p < 0.0001$ ). NYHA functional status in a stentless group was  $3.3 \pm 0.5$  vs.  $2.9 \pm 0.5$  in mechanical group ( $p < 0.0001$ ). Mean predicted mortality rate with EuroSCORE in a stentless group was 10.8% vs. 4.2% within mechanical group ( $p < 0.0001$ ). Actual mortality rate in a stentless group was 0% vs. 3.52% in mechanical group. Significant decrease of MVI was in both groups, nonetheless it was more pronounced in the stentless valve group - from  $168.3 \pm 44.5$  g/m<sup>2</sup> to  $140.7 \pm 34$  g/m<sup>2</sup> vs. from  $170.2 \pm 43.5$  g/m<sup>2</sup> to  $144.2 \pm 38.3$  g/m<sup>2</sup> in mechanical group ( $p < 0.03$ ). Decrease of mean transvalvular gradient across aortic valve was pronounced in the stentless group from  $60.9 \pm 19.8$  mmHg to  $14.1 \pm 5.8$  mmHg vs. from  $44.2$  mmHg  $\pm 19.9$  to  $15.5 \pm 6$  mmHg in mechanical group.

**CONCLUSIONS:** 1. Despite more advanced patient age, including more demanding stentless bioprosthesis implantation techniques, early postoperative results are in favor of stentless bioprosthesis. 2. Low and acceptable postoperative mortality rate, lower mean transvalvular gradient, could be achieved with both groups, however positive postoperative left ventricular remodeling in stentless group was superior: reduction of left ventricle mass index with improved patients survival. 3. The initial clinical results have been favorable and request further clinical investigation for long-term results.

### **P-146-ST. JUDE SILZONE VALVE PROSTHESIS FOLLOW-UP AT MEDIUM TERM**

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**BACKGROUND:** The St. Jude Silzone prosthesis has been related to many problems (dehiscence, thromboembolism, etc) by many authors, due to the silver compound covering its ring. Our goal was to study if our series showed such problems and its implications. Material and

**METHODS:** From January 1998 to December 2000, sixty-one patients received 70 prostheses in 62 procedures. Twenty-six patients received 27 mitral prostheses (one patient was operated twice), 29 received an aortic prosthesis and 7 patients suffered a double valve replacement. Thirty-five patients were male and 26 were female. The mean age of the patients was  $53.2 \pm 6.1$  years. Sixty eight percent of the patients were in sinus rhythm. Five of them died within the 30 first days of operation (4.8% mortality). The 58 discharged patients were followed for a minimum of 6.7 years and a maximum of 9.9 years (464.2 patients/year). The follow-up was completed in 98.6% of the patients. Six patients died in this follow-up period, four of them within the first 18 months after discharge. In five patients, (four aortic and one mitral) severe paravalvular leakage was detected. Three of the four aortic leakages should be reoperated and two of them had an initial diagnosis of endocarditis. Five patients had thromboembolic episodes and another patient presented mitral thrombosis and suffered emergent prosthesis replacement. All the six thrombosis episodes happened within the first 18 months of follow-up. In our series, the St. Jude Silzone prosthesis presented an elevated rate of leakage (8.6%) and thromboembolism (10.3%) and most of these complications happened in the early follow up period.

**CONCLUSIONS:** The prosthetic replacement rate due to leakage or thrombosis is also elevated (6.8%). Silzone does not protect against endocarditis. However, as the majority of the patients have overcome the most dangerous period, the first 18 months of follow up, we do not consider elective prosthetic replacement as a real alternative.

### **P-147-AORTIC ROOT SURGERY: EARLY POSTOPERATIVE RESULTS OF DIFFERENT SURGICAL TECHNIQUES**

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**BACKGROUND:** The traditional surgical approach for patients with aortic root disease is to replace the diseased aorta with a synthetic valved-conduit, using either a mechanical or a biological valve prosthesis, but it takes many disadvantages: mechanical valves while long lasting, require life-long anticoagulation and patients with biological valves are exposed to the potential need for re-operation in 10-15 years. Aortic valve sparing surgery offers a unique opportunity to preserve the aortic valve of patients with aortic root disease. The main advantage of these operations is that the patient retains his native aortic valve and therefore avoids the problems associated with artificial valves.

**METHODS:** Between January 2004 and November 2007, a cohort of 83 patients underwent aortic root surgery in the Heart Center of Kaunas University of Medicine: Reimplantation of the aortic valve within a vascular graft, David ( $n=18$ ), aortic root replacement with St.Jude Toronto root or Medtronic Freestyle Stentless Porcine Bioprosthesis ( $n=17$ ), replacement of the ascending aorta and aortic valve with a valved conduit, Bentall de Bono ( $n=48$ ). Study protocol included clinical data (age), patients functional status (NYHA), postoperative major adverse effects: reoperations for bleeding, stroke and lethal outcomes. Patients groups were compared at 30 days follow-up.

**RESULTS:** Mean age in groups were: David group -  $50.3 \pm 3.5$  y., aortic root replacement group -  $67.8 \pm 3.3$  y., Bentall de Bono -  $57 \pm 2.0$  y. In comparing preoperative status (NYHA) of patients of each group it was approximately equal  $2.8 \pm 0.2$ ,  $3.1 \pm 0.1$ ,  $3.0 \pm 0.1$ , respectively ( $p > 0.05$ ). Actual mortality rates observed within the first 30 days were: David group - 5.8% ( $n=1$ ), aortic root replacement group - 5.5% ( $n=1$ ) and Bentall de Bono group - 10.4% ( $n=5$ ). Reoperation rates due to bleeding events were noted in David 22.2% ( $n=4$ ) and Bentall de Bono 14.5% ( $n=7$ ) groups. Neither thromboembolic complications nor stroke events were noted in either group.

**CONCLUSIONS:** Aortic root surgery is feasible with low perioperative mortality and good early results in comparing different surgical techniques.

### **P-148-ROSS PROCEDURE VERSUS MECHANICAL AORTIC VALVE REPLACEMENT HOSPITAL AND SHORTTERM RESULTS**

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**BACKGROUND:** The objective of this study was to compare the performance of pulmonary autografts with mechanical aortic valves, in the treatment of aortic valve disease.

**METHODS:** Forty patients with aortic valve stenoses, and below the age of 40 years, were assigned to receive either pulmonary autografts ( $n=20$ ) or mechanical valve prostheses ( $n=20$ ). Clinical outcomes, left ventricular mass regression, ejection fraction, and mean gradients were evaluated at discharge, 3 months, and 6 months after surgery. Follow-up was complete for all patients.

**RESULTS:** Hemodynamic performance was significantly better in the Ross group (mean gradient 2.6 mm Hg vs 17.4 mm Hg,  $p=0.0005$ ). Overall, a significant decrease in left ventricular mass was found six months postoperatively. However, there was no significant difference in the rate and extent of regression between the groups. There was one intra operative mortality in the Ross group, one major bleeding, one minor bleeding, one minor valve thrombosis and one case of infective endocarditis complication in the mechanical valve group.

**CONCLUSIONS:** In our randomized cohort of young patients with aortic valve stenoses, the Ross procedure was superior to the mechanical prostheses with regard to hemodynamic performance. However, this did not result in an accelerated left ventricular mass regression. Clinical Advantages like reduced valve-

related complications and lesser myocardial strain will have to be proven in the long term.

### **P-149-COMPOSITE GRAFT REPLACEMENT OF THE AORTIC ROOT: A SAFE AND EFFICIENT PROCEDURE FOR BOTH STANDARD AND COMPLEX SURGERY**

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**BACKGROUND:** Composite graft replacement (CGR) is a standard surgical approach for several aortic root diseases. There is, however, some concern regarding postoperative complications. We therefore reviewed and report our results.

**PATIENTS AND METHODS:** Between 10/99 and 10/07 105 patients (pts), 24 females and 81 males, mean age  $61 \pm 11$  years, underwent CGR (Kouchoukos technique). Underlying pathology was in 73 pts (70%) aneurysm, in 19 pts acute aortic dissection (18%), in 8 pts (8%) acute endocarditis, in 3 pts (3%) severe atheromatosis. Surgery was elective in 73 cases, urgent/emergent in 16 and in 2 as salvage. Results In-hospital mortality was 4.8 % (5/105), expected risk (mean logEuroscore) was  $14.8 \pm 16.4$ , the IS/EXPECTED ratio was 0.32. Surgery was classified as "standard" in 94 and as "bail out" procedure in 11 cases (in-hospital mortality of 4.3% and 9%, IS/EXPECTED ratio of 0.34 and 0.24 respectively). Mean ECC- and clamp-times were  $164 \pm 74$  and  $101 \pm 34$  min. Reexploration for bleeding occurred in 14% (15/105 pts), transfusion requirements (units) were  $8.6 \pm 8.1$  red cell packs,  $3.8 \pm 5.6$  FFP and  $1.6 \pm 2.7$  platelets. Mean hospital-length-of-stay was  $11.8 \pm 9.5$  days. There were no peri-operative myocardial infarctions, no endocarditic recurrences.

**CONCLUSIONS:** CGR of the aortic root is a versatile and safe procedure even under difficult circumstances.

### **P-150-SURGICAL REMOVAL OF PAPILLARY FIBROELASTOMA OF THE TRICUSPID VALVE COMPLICATED WITH SEVERE AORTIC VALVE INSUFFICIENCY REQUIRING URGENT AORTIC VALVE REPLACEMENT**

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**BACKGROUND:** Papillary fibroelastomas (PFE) are the most common primary benign tumors of the heart valves, especially those of the left side. PFE of the tricuspid valve (TV) are uncommon. We report herein on a case of complete surgical excision of PFE of the TV, which complicated with severe aortic valve insufficiency and required urgent aortic valve replacement.

**METHODS:** A 63 years old male patient has been admitted for coronary artery bypass grafting (CABG) and removal of asymptomatic mobile echogenic, 15 mm x 15 mm, tumoral mass attached to the anteroseptal commissure of the TV, discovered accidentally through preoperative echocardiography (ECHO). Surgery was undertaken in March 2005. Median sternotomy, standard cannulation of the aorta, both cavae and conduction of cardiopulmonary bypass (CPB) were accomplished. Opening the right atrium, the tumor was visualized to be attached to the anteroseptal commissure of the TV and extended to the atrial septum. Particular efforts were done to excise in toto the tumor, in attempt to avoid future recurrence, and to conserve the TV leaflets and function. To achieve these goals, the anterior leaflet of the TV has been detached from the TV annulus and the tumoral mass with a part of the atrial septum wall were removed. The secondary atrial septum defect was closed with DeBakey artificial patch, the anterior leaflet was reattached to the TV annulus, a further anteroseptal commissureplastik and a CABG procedure were also performed.

**RESULTS:** The weaning from the CPB was uneventful and under low dosage of catecholamines. The histological exam of the tumoral mass was consistent with typical PFE. On the first postoperative day, at the intensive care unit, the patient developed a sudden heart arrest with consequent cardiopulmonary resuscitation. A transesophageal ECHO performed immediately revealed severe aortic valve insufficiency due evidently to restrictive motion of the non coronary leaflet (NCL) of the aortic valve and incomplete coaptation of the aortic valve leaflets. Prompt reoperation was undertaken on the same day, 30. March 2005. Through a transaortic approach we observed a restrictive movement of the NCL of the aortic valve, which was unintentionally sutured from the right atrium side

to the artificial patch used to close the atrial septum defect. A decision was done to replace the aortic valve with Omnicarbon mechanical prosthesis, after unsuccessful attempt to repair it. The postoperative course was complicated with pneumonia, respiratory and renal insufficiency which required tracheostomy and haemodialysis. The patient was discharged on the 45 postoperative day with satisfactory clinical conditions. A clinical follow-up and transthoracic ECHO control done in September 2007 revealed again competent TV and no recurrence of the PFE. The aortic valve prosthesis functioned properly and the patient recovered very well.

**CONCLUSIONS:** A radical surgical excision of the PFE should be accomplished as soon as the diagnosis is done because of their propensity to embolise. Particular care is warranted while removing the PFE from the TV to avoid surgical damage to the aortic valve leaflets because of the close anatomical relations of the heart valves. A long-term clinical follow-up after surgical removal of PFE is mandatory.

### **P-151-BRUCELLA ENDOCARDITIS AND ITS RARE COMPLICATIONS**

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**BACKGROUND:** Endocarditis is a rare and the most fatal complication of brucellosis and can cause severe cardiac injuries.

**METHODS:** Ten patients were admitted to our institution with a diagnosis of Brucella endocarditis. They were medically treated with triple antibiotherapy regimen (doxycycline, rifampin and ceftriaxone). We identified splenic infarctus due to septic embolization in one patient preoperatively. In another patient we demonstrated the echocardiographic evaluation of mitral valve injury due to brucella endocarditis. Patients were taken to cardiac operation without any delay as the fever and the other symptoms disappeared.

**RESULTS:** Six patients had aortic valve replacement whereas 3 patients had both aortic and mitral valve replacements and one patient had aortic valve replacement with mitral ring annuloplasty. Perforation of the aortic cusps were seen in 4 patients. In another patient we determined a perforation located at the commissure between right and left coronary leaflets. No mortality or morbidity was seen in any of our patients. All patients were discharged using double antibiotherapy regimen for a mean of 4 months (range, 2-6 months). None of our patients needed hospitalization or reoperation during their follow-up.

**CONCLUSION:** Since the valve injury is severe, surgical therapy must be combined with adequate preoperative antibiotherapy. Continuation of postoperative antibiotherapy according to clinical evaluation is necessary for a successful radical therapy and long-term quality of life.

### **P-152-IS THERE A DIFFERENCE BETWEEN REPLACEMENT AND REPAIR IN MITRAL VALVE SURGERY FOR ISCHAEMIC REGURGITATION-OUR EXPERIENCE**

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**OBJECTIVE:** Mitral incompetence is chronic sequel of myocardial infarction. It is caused by apical displacement and tethering of the mitral valve leaflets after myocardial infarction, resulting in incomplete coaptation. There is a consensus about a need for mitral surgery in the presence of significant ischaemic mitral regurgitation. In early times that was only mitral valve replacement with mechanical or tissue valve. Because of suboptimal results several methods of mitral repair have been developed. Today most commonly used is undersized annuloplasty.

**METHODS:** This is retrospective non randomized study of all patients operated for coronary artery disease and ischaemic mitral regurgitation in period between 2000 - 2006. Surgical method used for mitral valve was surgeons choice. Most commonly used were restrictive annuloplasty and replacement with mechanical prosthesis. For comparison we used standardized statistical methods, chi square test, Fischer's exact test, Kaplan Mayer curve, etc.

**RESULTS:** In that period we operated on 138 patients. 52 got MVR and 86 MVP. Both groups were comparable by demographic data and risk factors. There was statistically significant difference in NYHA class for two groups. Hospital morbidity and mortality were similar and there was no statistical difference between two groups. Our follow up was up to 84 months and includ-



ed 83% of patients. There was significant difference in NYHA class and EF between two groups. Mortality rate measured by Kaplan Mayer method was without statistical difference  $p=0.97$ .

**CONCLUSION:** Correction of chronic ischemic mitral regurgitation through either repair or replacement provides a good mid-term survival rate, with around 75% of the survivors in New York Heart Association classes I and II. There is a need for prospective randomized study for better comparison of these two groups.

### P-153-CLINICAL EVALUATION OF THE MITROFAST™ SIZER: CAN IT BE USED FOR CONVENTIONAL MITRAL VALVE REPAIR?

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**BACKGROUND:** In most cases of Mitral Valve Regurgitation (MVR) only the PML has a prolapse or restrictive alteration (fibrotic or ischemic). Secondary ring dilatation increases the MVR. Reconstructive procedures of the MV do require a certain experience of the surgeon and are time-consuming. Because of the increase of multimorbid patients with different organ function impairments and of combined surgical therapy cross clamp time and perfusion time has to be kept as short as possible to improve postop outcome. The Shelhigh MitroFast could be a new concept for repair of MVR, especially if only the PML is involved. The aim of this clinical study was to evaluate, if the use of the MitroFast Sizer allows a quick and reliable prediction whether a conventional MVRepair is possible or a primary replacement is necessary.

**METHODS:** Between 08/2004 and 10/2006, 363 patients underwent cardiac surgery for MVD at our department. In 54 patients (random selection) we used the Shelhigh MitroFast Sizer to evaluate the MV whether a MVRepair was possible or not. Mean age (26 women and 28 men) was 68.9 years, 31/54 patients underwent a combined cardiac surgery (CABG  $n=23$ , CABG+TKRepair  $n=1$ , CABG+PFO  $n=2$ , AVReplacement  $n=4$ , TKRepair  $n=3$ , Radioablation  $n=9$ ), 11/54 had atrial fibrillation. 44 patients were in NYHA class III and all patients suffered from severe MVR III° or IV°.

**RESULTS:** The MitroFast Sizer was tested successfully in 50/54 patients (93%) to evaluate the morphology of the MV. Only in 4 patients the sizer was too small. Using the MitroFast Sizer, we detected severe prolapse of the AML and PML reliable in 19/24 patients. 5 patients had a severe restrictive (type III) alteration of the PML. 15 of these 24 patients had a combined cardiac surgical therapy, therefore we rejected the time-consuming and complex mitral valve repair and performed a valve replacement. 30/54 patients received a MVRepair. In 25 patients we were able to establish a perfect coaptation area with the AML using the MitroFast Sizer. Only in 4 patients the sizer was too small. The results of the 30 MVRepairs were excellent.

**CONCLUSIONS:** In our experience the MitroFast Sizer is a reliable and suitable device to evaluate the morphology of the diseased MV and the feasibility of MVRepair. The coaptation area with the AML is visible without previous intervention on the PML and the decision whether a MV is repairable or not, can easily be made. Also the degree of involvement of the AML to the MVR and the feasibility of repair can be evaluated. Evaluating the MV, we found no difference of the MV (AML) morphology compared to the standardized analysis recommended by A. Carpentier. Therefore, based on our experience, the MitroFast Sizer is a useful device in conventional MVRepair.

### P-154-VALVE REPAIR IN RHEUMATIC MITRAL DISEASE

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**BACKGROUND:** This study aims to assess the middle and long-term results of valve repair in rheumatic mitral disease.

**METHODS:** From January 1996 through November 2006, 164 patients (106 women and 58 men) underwent mitral valve repair in our institution. The mean age was  $30.9 \pm 13.8$  years (range 10-63 years). All patients had evidence of rheumatic disease. The preoperative New York Heart Association (NYHA) functional classes were III-IV in 132 cases (80%). Ninety one (55%) were in atrial fibrillation. Forty three (26%) had a pure mitral regurgitation and 121 (74%) a pure or predominate stenotic lesion. All patients underwent mitral annuloplasty with Incomplete Ring with Modulated Flexibility (AIFM). Repara-tive procedure included commissurotomy ( $n=121$ ), reparation of subvalvular

apparatus ( $n=74$ ), cusp thinning ( $n=54$ ), and cusp resection ( $n=3$ ). Associated procedure included tricuspid annuloplasty ( $n=44$ ), aortic valve replacement ( $n=38$ ), reduction of the left atrium ( $n=16$ ), and extension of anterior valve of tricuspid with pericardium ( $n=12$ ).

**RESULTS:** Early mortality was 2.4%. Early morbidity was marked by 1.8% of reoperation and by infective endocarditis ( $n=1$ ). No case of SAM (systolic anterior motion) has been signalled. 137 patients (83.5%) have been reviewed. The median follow-up was 54 months (range 1 to 113 months). Actuarial reoperation-free was 89%. At 9 years the global survival was 94.1%. Ninety seven patients (70.8%) were in NYHA functional class I, 50.3% presented a minimal mitral regurgitation, 13.1% a moderate mitral insufficiency and 19.2% presented a moderate mitral stenosis.

**CONCLUSION:** Despite the evolutionary character of rheumatic lesions, mitral valve repair provides acceptable long-term results.

### P-155-RESULTS AND OUTCOMES OF AORTIC VALVE REPLACEMENT IN OVER 75 YEARS OLD

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**BACKGROUND:** The incidence and prevalence of aortic valve disease is increasing in a growing elderly population. Aortic valve replacement is associated with significant benefit to improve symptoms, survival and quality of life of patients. Due to the high surgical risk many patients who could benefit greatly from surgery are treated medically instead. In this study we examine the outcome of an elderly population who underwent Aortic Valve Replacement (AVR).

**METHODS:** We conducted a retrospective study evaluating all patients over 75 years who underwent aortic valve replacement alone or with any other cardiac procedure in a single surgeon experience over five years (September 2002 till November 2007).

**RESULTS:** In the study period, 33 patients of mean  $80 \pm 4$  years; mean EuroScore  $8.09 \pm 1.63$ , underwent isolated AVR or in combination with other cardiac procedures, 17 (51.5%) patients had isolated AVR and concomitant procedures were performed in 16 patients (48.5%) with CABG in 12, Hybrid PCI in 2, and MVR in 2. Mean mean pressure gradient was  $75.3 \pm 28.4$ , and all patients had bioprosthetic valves, mean size  $21.12 \pm 1.73$  mm. All operations were done using the normothermic cardiopulmonary bypass using antegrade cold blood cardioplegia. Mean CPB was  $142 \pm 35$  minutes and mean aortic cross clamp time was  $106 \pm 26$  min. Our overall mortality in the study period was 3.03% (1/33 patients) due to ischemic bowel. All other patients were discharged at a mean of  $16 \pm 10$  days. Major complications include one patient had stroke (3.03%), one patient was re-explored for bleeding (3.03%), one patient required re-intubation for poor gas exchange, 9 patients (27.3%) had renal impairment 2 of them required haemofiltration, one patient with sternal wound infection required re-wiring, AF in 18 patients (54.5%). Six of them required readmission to intensive care unit. One patient had valve endocarditis required redo replacement after a month and was eventually discharged.

**CONCLUSION:** Aortic Valve Replacement is a safe operation in patients above 75 years of age with acceptable morbidity and mortality. Elderly patients should not be denied operation because of their age, and referrals for AVR should not be delayed.

### P-156-CURRENT RISK FACTORS OF REOPERATIVE VALVE SURGERY.

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**BACKGROUND:** Redo valve surgery is routine practice nowadays, still however remaining a surgical challenge. Compared to first heart valve operations, redo surgery carries a higher mortality and morbidity. The NYHA functional class and emergent surgery are the two most frequently quoted risk factors for death. The purpose of this study is to report a single center experience during a recent period of time in redo valve surgery and to identify risk factors of peri-operative death.

**METHODS:** In hospital data of 238 consecutive patients, who underwent redo valve surgery between January 1997 and December 2006, are retrospectively analyzed. All patients were operated by a single surgical team. Predictive value of the EuroSCORE is analyzed. Uni- and multivariate logistic regression are car-



ried out to identify predictive risks factors of hospital death. An univariate logistic regression is applied to identify predictive factors of transfusions requirements.

**RESULTS:** Overall observed mortality was significantly lower than predicted by Euroscore 8.0% vs 8.5  $\pm$  2.0% (95% conf. limit). Despite a tendency to overestimate the mortality, EuroSCORE was a good predictive tool for hospital mortality in this series. Predictive factors for hospital death were: age, NYHA class, EuroSCORE, number of previous interventions, emergent surgery, low preoperative hemoglobin and high urea, creatinine and lactico-dehydrogenase. Revision for bleeding procedures were required in 3.8% and transfusions in 34%. Predictive factors for transfusion were: NYHA class, EuroSCORE, emergent surgery, low preoperative hemoglobin and isolated tricuspid valve surgery.

**CONCLUSIONS:** Redo valve surgery carries an acceptable risk nowadays. However, patient in NYHA functional class IV, with higher EuroSCORE, in emergent situation, with multiple previous operations and with low hemoglobin, high urea, creatinine and LDH remain at very high risk. Reoperation timing and indication should take into account the increased mortality in the subgroup of patients in an advanced stage of their disease.

### P-157-PITFALS IN AORTIC VALVE REPLACEMENT

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**BACKGROUND:** It is suggested increasingly to treat patients with multi comorbidity by interventional aortic valve replacement (AVR). To make a contribution to this open discussion we performed a retrospective study to identify high risk groups, surgical pitfalls, and the impact of the type of prosthesis.

**METHODS:** Data were obtained from the files of 1299 consecutive patients operated on from 01.01.1999 to 31.12.2003. The Euro Score of 865 patients was more or equal 6.5 (high risk group). 622 patients received an isolated AVR (185 biological, 437 mechanical) and 532 patients (237 biological, 295 mechanical) an additional CABG. Multiple valve replacement or additional repair of the mitral or tricuspid valve received 119 patients, including 5 with Re-AVR. 26 patients had Re-AVR, including 3 with CAB.

**RESULTS:** Altogether 73 (5.6 %) patients died. Early mortality after isolated AVR was 3.9 %, after AVR plus CAB was 4.7 %, after isolated Re-AVR 13.0 %. Primary multivalve procedures had a mortality rate of 9.6 %. 51 patients of whom 1 died needed postop. permanent pacemaker implantation (4 %).

**CONCLUSIONS:** According to the present data Re-AVR, acute endocarditis, neurological dysfunction, preoperativ respiratory failure, and preoperative myocardial infarction were high risk factors for mortality. Surgical intraoperative high risk factors were repeat ECC, IABP, and bleeding, which needed operative revision. The low mortality rates, particular in primary procedures, seem to be a strong argument against a change to interventional aortic valve implantation.

### P-158-OUTCOMES AFTER AORTIC VALVE REPLACEMENT WITH SMALL MECHANICAL AND BIOPROSTHETIC VALVES

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**BACKGROUND:** Prosthesis-patient mismatch (PPM) after aortic valve replacement is an important problem, however the effect on clinical outcomes remains controversial. Our objective was to evaluate clinical outcomes on mortality and cardiac events in patients underwent small aortic valve replacement, retrospectively.

**METHODS:** Between August 1983 and December 2006, 295 patients received a labeled 21-mm or less St Jude Medical Standard valve (n = 59), ATS mechanical valve (n = 66), bovine Carpentier-Edwards Perimount bioprosthesis (n = 136) and porcine Medtronic Mosaic bioprosthesis (n = 34). Total follow-up was 1585 patient-years, mean follow-up was 5.4  $\pm$  5.5 years. We defined PPM as Group A if an indexed effective orifice area was  $>0.85$  cm<sup>2</sup>/m<sup>2</sup> (n = 181), as Group B if  $>0.75$  cm<sup>2</sup>/m<sup>2</sup> and  $\leq 0.85$  cm<sup>2</sup>/m<sup>2</sup> (n = 84), and as Group C if  $\leq 0.75$  cm<sup>2</sup>/m<sup>2</sup> (n = 30). Each group was obtained hemodynamic results at rest by postoperative transthoracic echocardiography, cardiac event-free survival.

**RESULTS:** Early postoperative transaortic peak pressure gradients did not show significant differences (Mechanical: Group A 25.2  $\pm$  11.2 mmHg, Group B

30.6  $\pm$  13.0 mmHg, group C 31.2  $\pm$  9.3 mmHg. Bioprosthesis: Group A 28.2  $\pm$  11.9 mmHg, Group B 28.6  $\pm$  11.8 mmHg, Group C 36.1  $\pm$  12.0 mmHg). Freedom from cardiac events was 93.1  $\pm$  2.0%, 86.8  $\pm$  3.0%, and 78.7  $\pm$  5.8% at 1, 5, and 10 years, respectively in Group A, 88.8  $\pm$  3.5%, 76.6  $\pm$  6.2%, and 61.7  $\pm$  9.3% at 1, 5, and 10 years, respectively in Group B, 100  $\pm$  0%, 100  $\pm$  0%, and 87.5  $\pm$  11.7% at 1, 5, 10 years, respectively in Group C. Although patients with normal left ventricular contraction (preoperative ejection fraction  $\geq 50\%$ ) showed no significant difference on cardiac event-free survival between each group, those with impaired left ventricular contraction (preoperative ejection fraction  $<50\%$ ) showed a decreased cardiac event-free survival between Group A and Group B (p = 0.016). Patients with impaired left ventricular contraction of Group C were not available because of small evaluated number.

**CONCLUSIONS:** In terms of aortic valve replacement, PPM is an independent predictor of cardiac events in patients with preoperative reduced left ventricular function.

### P-159-EARLY AND LONG-TERM RESULTS FOR INFECTIVE ENDOCARDITIS VALVE REPLACEMENT SURGERY

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**OBJECTIVE:** The results of infective endocarditis (IE) treatment are associated with short survival rates and high risk of complications. The objective of this study was to report our hospital and long-term results for acute and subacute endocarditis valve replacement surgery, including the evaluation of quality of life.

**METHODS AND RESULTS:** We studied 126 patients with IE (age 12-63 years, 98 men and 28 women), who have received 136 valve replacement procedures over a period from 1998 till 2007. Acute or active endocarditis was present in 51 patients; prosthetic valve endocarditis was in 18 patients. Mean NYHA functional class 3,11 $\pm$ 0,83. Mean end-diastolic left ventricle size was 60,3 $\pm$ 9,9 mm, mean left ventricle ejection fraction 52,5 $\pm$ 9,27. Single valve replacement was performed in 91 patients, including 23 cases of 2nd valve repair and 5 reoperations. Multivalve replacement took place in 45 cases, including 19 cases of 2nd valve repair and 2 reoperations. Paravalvular and aortic root abscess were found in 7 patients. We have studied the cases where only mechanical valves prostheses were used. The early mortality was 6.35%. 3-year long term survival was 95.7 $\pm$ 5%, with 5-year 90 $\pm$ 8%. 86,3 $\pm$ 9,2 patients were alive for 7 years after the discharge. 7-year freedom from valve complications was 90.28%, freedom from embolic events was 95,9 $\pm$ 2.6%, freedom from endocarditis was 88.6 $\pm$ 0.9% and freedom from paravalvular leak 93,6 $\pm$ 4.7%. Long-term data shows following dynamics: average NYHA functional class 2,67 $\pm$ 0,93; mean end-diastolic left ventricle size was 55,7 $\pm$ 8,1 mm, mean left ventricle ejection fraction 58,9 $\pm$ 9,6 in 1-7 years after manipulation. Comparing of quality of life evaluation in long-term period, it was established, that early operation in patients with acute IE leads to the improvement of quality of life level in comparison with preoperative state and in comparison with quality of life level of patients with subacute IE.

**CONCLUSIONS:** The study indicates that acute and subacute infective endocarditis treated surgically, especially using early intervention, can show acceptable early and late results, good postoperative functional status and the improvement of the quality of life.

### P-160-THIRD-TIME AORTIC VALVE REPLACEMENT: PATIENT CHARACTERISTICS AND OPERATIVE OUTCOME

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**BACKGROUND:** Re-operative cardiac surgery is being performed with increasing frequency. Third-time aortic valve surgery remains a rare procedure. We retrospectively analysed the outcome of third-time aortic valve replacement (AVR) at our institution.

**METHODS:** Between 1990 and 2005, 49 patients underwent third-time AVR. Data analysed included pre-operative patient characteristics, type of pre-existing aortic valve prosthesis, prosthetic valve pathology necessitating third time AVR, postoperative morbidity and mortality and echocardiographic data.

**RESULTS:** The mean age was 47.4 $\pm$ 17 years. The mean interval between the first

and second operation was  $8.7 \pm 5.7$  years and between the second and third operation was  $10.2 \pm 5.6$  years. Prosthetic valves, at the time of second AVR included 32 (65.3%) homografts, 11 (22.5%) mechanical prostheses and 6 (12.2%) xenografts. At third-time AVR, 29 (59.2%) patients received a homograft or autograft, 12 (24.5%) a mechanical valve and 8 (16.3%) a xenograft. In-hospital mortality was 4.1%. The mean follow-up was  $80 \pm 69$  months. Freedom from re-operation was  $84\% \pm 6$  at 5 years and  $65\% \pm 11$  at 10 years. Long-term survival was  $79\% \pm 6$  and  $73\% \pm 7$  at 5 and 10 years respectively. Multivariate analysis showed that age, female sex and postoperative high LVM were factors associated with decreased long-term survival. Mean LV mass decreased from  $320 \pm 133$  g to  $263 \pm 102$  g at one-years postoperatively ( $P=0.01$ ).

**CONCLUSIONS:** Third-time AVR can be performed with low operative mortality, low cumulative operative mortality and satisfactory long term survival and freedom from re-operation. The procedure results in significant regression of left ventricular mass.

### P-161-MID-TERM RESULTS OF SURGERY FOR ACTIVE INFECTIVE ENDOCARDITIS

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**BACKGROUND:** Endocarditis represents a small proportion of cardiovascular disease but is associated with high mortality and morbidity. The objective of this retrospective study was to report our mid-term results in patients with acute infective endocarditis undergoing surgical treatment.

**METHODS:** Between 1996 and 2007, 95 surgical interventions were performed in 93 patients due to acute infective endocarditis. 73 of them survived to the first month (in-hospital survival) and are the object of our study. The mean age was  $55 \pm 16$  years, and 86% were men. In 57 (78%) patients the infected valve was native, in 15 (20.5%) was prosthetic, and in 1 patient the infected valves were native and prosthetic. The aortic valve was most frequently affected (58%), followed by the mitral (33%). Multiple valves were affected in 25%. Streptococcus (33%) and staphylococcus (30%) were the microorganisms more frequently isolated. The most common indications for surgery were congestive heart failure (55%) and periannular extension (26%). 17 (23%) patients presented renal failure, 15 (20%) shock and 4 (6%) recent stroke. The surgical intervention was urgent or emergent in 43 cases (60%); paravalvular abscesses were found in 20 cases (27%). Mechanical valves were implanted in 31 (42%) patients, bioprostheses in 28 (38%) patients, homograft in 7 cases (10%), pulmonary autograft in 5 (7%) and isolated mitral valve repair was performed in 2 cases (3%).

**RESULTS:** The mean follow-up was  $47 \pm 32$  months and was 100% complete. 15 (20%) patients died during the follow-up. The causes of deaths were neoplasia in 5 (33%) patients, stroke in 3 (20%), myocardial infarction in 2 (13%), sudden cardiac death in 1 (7%), hepatic failure in 1 (7%), and unknown in 3 (20%). 1 year survival was  $95 \pm 6\%$ , 5 years survival was  $77 \pm 12\%$ . 3 (4%) patients suffered recurrence of endocarditis, 2 of them reoperated, 1 was treated with antibiotics alone. Freedom from recurrence was  $99 \pm 3\%$  and  $92 \pm 10\%$  at 1 year and 5 years, respectively. 4 (5.4%) patients were reoperated, 2 of them due to valve dehiscence without endocarditis and the others for recurrent infective endocarditis (one with a history intravenous drug use, occurred within the first month, and the second patient after 61 months). Freedom from reoperation was  $95 \pm 6\%$  and  $91 \pm 10\%$  at 1 year and 5 years, respectively.

**CONCLUSIONS:** According to our experience, surgery in acute infective endocarditis has a high hospital morbidity and mortality, but mid-term results in the survivors are acceptable regarding overall survival, freedom from recurrence and freedom from reoperation.

### P-162-RESULTS OF CORRECTION MITRAL VALVE INSUFFICIENCY WITH SEMIREGIDE ANNULOPLASTY RING "MEDENG"

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**BACKGROUND:** Mitral valve repair is the procedure of choice to correct mitral regurgitation, but used suture annuloplasty techniques is complicated high incidence of residual or recurrent valvular insufficiency.

**METHODS:** From 2005 to 2007 years in our clinic was implanted 124 annulo-

plasty semiregid rings "MedEng" for mitral valve repair. The age of the patients was from 19 to 58 y.o. ( $34.8 \pm 13.1$ ). The average Functional Class (NYHA) was 3,2. The etiology of mitral valve insufficiency were degenerative changes in connecting tissue at 48 (38,7%) patients; in 19 (15,3%) cases was revealed rheumatic reason. In 16 (12,9%) cases was revealed ischemic genesis, in 25 (20,2%) was diagnosed relative mitral insufficiency, owing to dilatation mitral annulus at aortic valve disease and damage mitral valve by myxoma 16 (12,9%). Annuloplasty of mitral valve was added to complex reconstructive interventions: triangular resection of posterior leaflet - 33 (26,6%); quadrangular resection of anterior leaflet - 12 (9,7%); chordal transfer posterior leaflet to anterior leaflet - 9 (7,3%); replacement of chordae tendineae 4-0 Gore-Tex suture - 5 (4,0%); shortening of chordae tendineae by implantation in papillary muscle - 1 (0,8%); open commissurotomy - 2 (1,6%).

**RESULTS:** There were 3 hospital deaths (2,4%) not related with implanted device. Causes of death included cardiac failure (pereoperation MI) in 1 (0,8%) cases multisystem organ failure - 2 (1,6%) patients. Four patients (3,2%) was re-explored for bleeding. At a follow-up time of  $22.8 \pm 12.1$  months was significant difference FC (NYHA) dynamics from  $3.24 \pm 0.24$  before operation to  $1.71 \pm 0.26$  (mean decrease  $1.53 \pm 0.41$ ). Freedom of recurrent mitral regurgitation was 97,1% after 25 months. Echocardiography data before operation and follow-up were: area of mitral orifice  $4.6 \pm 0.9$  and  $3.8 \pm 0.4$  sq.cm; volume of mitral regurgitation (at a volume of left atrium)  $42.4 \pm 8.4$  and  $11.2 \pm 3.9\%$ ; size of left atrium  $7.1 \pm 1.2$  and  $5.1 \pm 0.9$  cm. We did not reveal thromboembolic complications. At absence of a mechanical prostheses in aortic position and presence of sinus rhythm anticoagulation therapy was appointed to the period necessary for endothelization - of ring braid - in current of three months.

**CONCLUSIONS:** Results of use annuloplasty semi-rigid rings "MedEng" has shown their high efficiency in correction mitral valve hemodynamic disturbances with low hospital mortality and minimal risk possible specific complications. According mid-term results reveal low level of recurrent mitral regurgitation and significant FC (NYHA) reduce.

### P-163-EARLY FAILURE OF A MECHANICAL BILEAFLET AORTIC VALVE PROSTHESIS DUE TO PANNUS - A RARE COMPLICATION

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**BACKGROUND:** Mechanical alular prostheses have the advantage of long-lived duration. Most common reasons for failure are thrombosis or pannus which can lead to a blockade of the valve. Early postoperatively, the thrombotic complication is most common whereas the pannus occurs later especially in bileaflet valves in the aortic position.

**METHODS:** A 53-year-old woman with a history of an aortic valve replacement with a mechanical bileaflet valve prosthesis due to severe aortic valve stenosis six months before and a mechanical bileaflet mitral valve prosthesis because of mitral valve stenosis due to rheumatic fever twenty years before, was referred to our hospital because of severe dyspnea and reduced exercise capacity. Echocardiography now showed a blockade of one of the leaflets of the mechanical aortic valve prosthesis with high transprosthetic gradient which was confirmed on fluoroscopy and 64-slice spiral computed tomography, while the mitral valve prosthesis still was properly working.

**RESULTS:** Reoperation was performed and intraoperatively the reason for the failure of the valve was a pannus formation which led to a blockade of one of the leaflets. The pannus was dissected and after cleaning and testing the leaflets the prosthesis was functioning normally. The postoperative echocardiographic examination showed also a normal prosthetic function so that the patient was discharged home again. The histological findings confirmed macroscopic suspicion of pannus formation.

**CONCLUSION:** There are two uncommon circumstances: First the short term development of the pannus formation and that it occurred at the aortic valve prosthesis and not at the mitral valve mechanical prosthesis which had been in place much longer. The reason for this could be the small size of the aortic valve bed, facilitating obstruction even with a relatively small amount of thrombus while the bigger diameter of the mitral valve prosthesis protected it from pannus formation blockade. Prosthetic valve dysfunction in aortic position due to pannus formation six months after surgery is very uncommon but is possible in patients with a small heart valve prosthesis and a history of rheumatic fever.

#### **P-164-MITRAL VALVE REPLACEMENT IN A PATIENT WITH SYSTEMIC LUPUS ERYTHEMATOSUS- A CASE REPORT**

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**BACKGROUND:** Systemic lupus erythematosus is an autoimmune disorder involving all components of the heart.

**CASE REPORT:** We report a 42-year-old man, who had severe mitral valve disease associated with systemic lupus erythematosus. He underwent successfully mitral valve replacement. The patient showed good postoperative outcome without complications.

**CONCLUSION:** Although the postoperative complication is common, cardiac surgery may be safely performed in patients with systemic lupus erythematosus

#### **P-165-SPECIFIC VALVE COMPLICATIONS AFTER AORTIC VALVE REPLACEMENT PROSTHESES «MEDENG-2» (CARDIAMED)**

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**BACKGROUND:** In view of the advent of new-generation bileaflet valve prostheses a thorough clinical evaluation is warranted to determine their hemodynamic parameters, early and mid-term outcome.

**METHODS:** There were 510 patients undergoing aortic valve replacement with bileaflet valve prostheses "MedEng-2" (Cardiamed). Isolated aortic valve replacement (AVR) - 382 patients, included 51 supra-annular valve prostheses, aortic and mitral valve replacement (DVR) - 128.

**RESULTS:** Specific valve complications were revealed from 1% to 3%. Hospital mortality for the prostheses of all types was equal, with a mean of 3,6% for AVR; 5,4% and 7,5% for DVR. The follow-up for 80,7% of 412 patients, undergoing valve replacement with "MedEng-2" (Cardiamed), ranged from 1 year to 9 years. Survival at 9 years after AVR was 93,6%. Freedom from thrombosis and prosthetic valve endocarditis, reoperation and embolic complications for AVR were 98,7%; 97,6%; 97,1% and 97,5%, respectively. Freedom from complications for DVR were 100% and 97,4%; 97,5% and 97,4%, respectively; survival was equal to 92,8%.

**CONCLUSIONS:** In terms of the early and mid-term outcome, hemodynamic parameters of "MedEng-2" (Cardiamed) and specific prosthetic complications are similar to clinical data, being implanted.

#### **P-166-CONCOMITANT AORTIC, MITRAL AND TRICUSPID VALVE RECONSTRUCTIONS#**

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**BACKGROUND:** Since renaissance in aortic valve reconstruction appeared after introducing the classification on its insufficiency based on "functional aortic annulus" by El-Khoury, concomitant repair of all incompetent heart valves in one procedure became possible.

**METHODS:** In Dept. of Cardiac Surgery Medical University of Gdansk (Poland) we have operated between May 2003 and November 2007 (4,5 years period) 33 patients with concomitant aortic and mitral incompetence. 5 of them had significant tricuspid insufficiency. All patients had particular TTE and TEE analysis done preoperatively. As a routine TEE was used intraoperatively. Because of patients safety (also learning curve) - if repair failed there were no re-repair on second pump run and valve was replaced. All significant tricuspid valve incompetencies were reconstructed at the same procedure. The repaired valves were assessed by TEE after pump stop in OR, and 5 days postoperatively by TTE. Control visits with TTE examination were done 3 months, 1 year and 2 years postoperatively.

**RESULTS:** The concomitant repairs were satisfactory in 30 patients, in 3 one of repaired valves had to be replaced (2 AVR, 1 MVR). There were no hospital deaths. Another 2 patients had reoperation within 2 years (1 of recurrent AI and 1 because of secondary MI). The rest operated patients went well after 2 years and will be examined again 5 years after operation.

**CONCLUSIONS:** Concomitant repair of aortic, mitral and tricuspid valves seems to be an optimal surgical treatment for patients with clearly incompetent valves. Early and mid-term results look satisfactory. We suspect long term results confirm stability of repairs.

#### **P-167-GEOMETRIC CULPRITS OF PAPILLARY MUSCLE DISPLACEMENT IN FUNCTIONAL ISCHEMIC MITRAL REGURGITATION ASSESSED BY 3D MAGNETIC RESONANCE IMAGING**

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**BACKGROUND:** Papillary muscle displacement away from the mitral annulus plays a pivotal role in functional ischemic mitral regurgitation (FIMR), but so far detailed analysis of three-dimensional (3D) papillary muscle position has relied on invasive measuring techniques. In this study we apply a new non-invasive clinically applicable 3D cardiac magnetic resonance imaging (MRI) technique, which allows precise anatomical definition of the papillary muscle position in a 3D matrix.

**METHODS:** Ten pigs with moderate chronic FIMR were examined by 3D morphology cardiac MRI at end-diastole and end-systole. Dedicated analysis software enabled coordinate-free assessment of the anterior (APM) and posterior (PPM) papillary muscle positions relative to the anterior (Atrig) and posterior (Ptrig) trigones. Furthermore, coordinate-based analysis was used to define APM and PPM displacement in the apical, posterior and lateral directions relative to the mitral annulus.

**RESULTS:** Following statistically significant increases in distances ( $\pm$ SEM) were observed at end-systole (chronic FIMR - Control); Coordinate-free analysis: PPM to APM =  $15.3 \pm 2.6$  mm, PPM to Atrig =  $11.7 \pm 2.4$  mm, PPM to Ptrig =  $7.6 \pm 1.7$  mm. Coordinate-based analysis: lateral PPM displacement =  $8.9 \pm 2.0$  mm, posterior PPM displacement =  $8.2 \pm 2.7$  mm. There was no significant apical PPM displacement. The mitral regurgitant volume was correlated to the PPM to APM distance ( $R=0.92$ ,  $p < 0.01$ ) and the sum of posterior and lateral PPM displacement ( $R=0.65$ ,  $p=0.04$ ).

**CONCLUSIONS:** This novel non-invasive 3D cardiac MRI modality enabled a detailed analysis of the local left ventricular remodelling effects, that cause chronic FIMR. The PPM was displaced from both trigones and the APM in posterior and lateral directions, but not apically. This new imaging technique may become a valid tool for preoperative planning of surgical strategy, which in this chronic FIMR model should include PPM relocation towards the trigones and APM.

#### **P-168- OCHRONOSIS: A RARE FINDING AT AORTIC VALVE OPERATION**

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**BACKGROUND:** Alkaptonuria is a rare genetic disorder occurring in one of 250,000 to 1 million live births. It is an autosomal recessive inborn error of metabolism involving an absence of the enzyme homogentisic acid oxidase, which is responsible for the degradation of homogentisic acid, formed by the breakdown of the amino acids phenylalanine and tyrosine. The deficiency leads to excretion of homogentisic acid in the urine which turns dark when it is allowed to stand, due to oxidation to a melanin-like product. Homogentisic acid also gradually accumulates in connective tissues, causing a bluish-black pigmentation which Virchow termed "Ochronosis" in 1866.

**METHODS:** A 77 year old patient with alkaptonuria presented with symptoms of aortic valve disease. An echocardiogram demonstrated aortic stenosis with calculated valve area of  $0.7 \text{ cm}^2$  and an ejection fraction of 55%. The patient suffered by vertebral arthropathy typical for the disease.

**RESULTS:** A rare finding during surgery was a black discoloration of the aortic wall mimicking aortic dissection. A TOE excluded this and a normal aortotomy was performed. A black discoloration of the aortic valve was also found and a biologic aortic valve was implanted.

**CONCLUSIONS:** Alkaptonuria is a very rare disorder. The black discoloration that occurs in connective tissues and aorta mimic aortic dissection which must be excluded before proceeding with a normal aortic valve replacement.



### P-169-VERY RARE COMPLICATIONS DIAGNOSED IN OUR INFECTIVE ENDOCARDITIS CASES

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**BACKGROUND:** Endocarditis can cause severe cardiac injuries. Following the endocarditis; many structural anomalies such as vegetations, thickening, perforation, bulging and aneurysm can be developed. Embolism due to vegetations or infected tissues is the most frequent complication that is closely related with prognosis. Vegetations which are the most wanted invention for the echocardiographic diagnosing in the time of infective endocarditis impulsives can be displayed in the rate of % 13-18 and give clinic symptom in a rate of % 10-50.

**MATERIAL AND METHODS:** We present 5 specific infective endocarditis cases demonstrated very rare complications. In our first case infective endocarditis (IE) was due to methicillin sensitive, coagulase negative *Staphylococcus aureus* and he had three rare complications. Our second case was a man who was dealing with the *Brucella* diagnosis with the specific symptomatology and positive serologic tests. Our third case was 60 years old man and treated for brucellosis. For 4. case we're presenting an *Enterococcus Faecalis* endocarditis case. Our 5. case was a methicillin sensitive coagulase negative staphylococcal (MCONS) IE.

**RESULTS:** We diagnosed a 1.5x1.5cm perforation defect at mitral anterior leaflet A2 region and a 2x2cm bulging lesion which was thinned and tended to rupture and prolapsed to left atrium, and septic embolic splenic infarction at the same time in first case. In the peroperative exploration of our second case, after aortotomy, besides right coronary leaflet perforation complication multiple vegetations also observed on the left coronary leaflet. Both of the leaflets were destructed. In the native aortic valve excision aortic mitral annulus resultant a pocket forming was observed as a consequence of abscess destruction. This specific symptom was called as "kissing/stallit vegetation". Following aortotomy, a 8x8mm perforation at medial part of right coronary cusp was explored in the third case. Native valve was calcific and thickened, and was consistent with senile degeneration which enhances the destruction of *Brucella* endocarditis. In 4. case mitral valve was effected and non coronary and right coronary leaflets (tissue erosion) of aortic valve were injured due to vegetation's localization. In 5. case, we diagnosed bilobular saccular mycotic aneurysm at cerebral artery and frontal region infarction secondary to septic emboli.

**CONCLUSION:** Frequency of infective endocarditis increased progressively in the last twenty years. Only medical treatment is not sufficient for radical therapy and surgery is necessary. Antibiotic and surgery combination is the best and most effective treatment method. Survival is positively effected and quality of life is increased in long term.

### P-170-SUCCESSFUL SURGICAL REMOVAL OF PAPILLARY FIBROELASTOMA OF THE AORTIC VALVE PRESENTING WITH ACUTE MYOCARDIAL INFARCTION

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**BACKGROUND:** Papillary fibroelastomas (PFE) are the most common primary benign neoplasms of the heart valves. The clinical manifestations of PFE result mostly from systemic embolization. These lesions can manifest with angina pectoris, heart arrhythmias, transient ischemic attacks, strokes and sudden death. We report herein on a case of papillary fibroelastoma of the aortic valve (AV), which presented with acute myocardial infarction and completely removed under preservation of the aortic valve.

**METHODS:** A 56 years old female patient was admitted at our hospital because of sudden onset of acute myocardial infarction (AMI). A coronary angiogram revealed normal coronary arteries. A transthoracic (TTE) and transesophageal echocardiogram (TEE) demonstrated a mobile echogenic mass attached to the right coronary leaflet of the aortic valve and hypokinesia of the inferior wall. Surgery was undertaken in March 2006 on urgency basis. Median sternotomy, standard cannulation, cardiopulmonary bypass, cardioplegic arrest and transaortic approach were accomplished. Intraoperatively, a 0.5 cm x 1.5 cm gelatinous tumoral mass was observed to be originating near the commissure between the right coronary leaflet and the non coronary leaflet of the AV. The tumoral mass was completely removed through careful shaving without damaging the leaflets of the AV. A further commissureplastik was necessary to achieve optimal coaptation and competence of the AV.

**RESULTS:** The intraoperative and postoperative courses were uneventful. A TEE done intraoperatively showed competent AV and no residue of the tumoral mass. The histological finding of the tumoral mass excluded malignancy and was consistent with typical PFE. The patient was anticoagulated for long-term. A TTE performed again in September 2007 confirmed these results and no tumoral recurrence was documented. The patient is doing clinically very well.

**CONCLUSIONS:** Papillary fibroelastoma of the aortic valve can manifest with acute myocardial infarction due either to coronary embolism or to intermittent dynamic occlusion of the coronary ostia. PFE of the AV should be suspected in a setting of acute myocardial infarction with otherwise normal coronary arteries. Surgical excision, also in asymptomatic patients, must be promptly undertaken as soon as the diagnosis of PFE is done, in attempt to avoid coronary and cerebral embolization. Long-term clinical follow-up and echocardiographical control after removal of PFE are mandatory.

### P-171-LONG-TERM CLINICAL AND ECHOCARDIOGRAPHIC FOLLOW-UP OF A PORCINE STENTLESS AORTIC PROSTHESIS

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**BACKGROUND:** This report was undertaken to evaluate the long-term clinical and echocardiographic follow-up of patients who underwent aortic valve replacement with the BRAVO 400 Xenograft, an entire porcine aortic root.

**METHODS:** Between February 1992 and January 1994, 67 underwent aortic valve replacement with Bravo Model 400 stentless porcine bioprosthesis at one single institute. Data were obtained annually by means of direct visits and telephone interviews. Transthoracic echocardiography was performed preoperatively, at discharge, at 3 months, at 1 year and annually thereafter. Left ventricular mass (LVM) was assessed using the formula proposed by the Penn Convention and indexed to body surface area (Left ventricular mass index, LVMI). Survival and time-related event analysis was performed with the Kaplan-Meier method. Significant differences in echocardiographic parameters were evaluated with repeated-measures ANalysis Of VAriance (ANOVA). If statistically significant, Student's paired t test was then performed, with Bonferroni's method used to correct for multiple comparisons. A P<0,05 was considered statistically significant.

**RESULTS:** There were 26 late deaths at follow-up, 7 were valve-related deaths. The actuarial freedom from valve-related death 14 years was 87.0%±4.6%. The actuarial freedom from cardiac-related death at 14 years was 84.1%±4.9%. The actuarial freedom from non-cardiac death at 14 years was 69.2%±6.6% respectively. 14-year Kaplan-Meier survival of patients younger than 65 years at surgery was 81.8%±8.2% versus 45.7%±8.2% for older patients (p = 0.012, Log Rank Test). Freedom from valve-related death and from cardiac related death was not significantly different between patients younger and older than 65 years at surgery (Log Rank Test). Freedom from non-cardiac deaths was significantly better in patients younger than 65 years at surgery (p = 0.004, Log Rank Test). Prosthesis replacement was necessary in 7 patients for degeneration of the prosthesis. The actuarial freedom from reoperation at 14 years was 85.4%±5.2% respectively. At echocardiographic follow-up, the most significant decrease of mean transvalvular gradient was a reduction to 37.4% of the preoperative value at 3 month. LVMI was significantly reduced by 20.7% at 3 month and continued to decrease down to 72.4% of the preoperative value at 14-year follow-up. These changes reflected mainly the reduction in septal and posterior wall thickness.

**CONCLUSION:** The Bravo 400 aortic prosthesis has provided good clinical and echocardiographic outcomes up until 14 years of follow-up.

### P-172-PREDICTIVE RISK ANALYSIS AFTER VALVULAR REOPERATIONS

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**BACKGROUND:** Re-operative valvular surgery is common nowadays. Increased mortality and morbidity are generally associated. Re-operations in cardiac surgery are technically more difficult because of adhesions and a more advanced cardiac status of the patient. To determine the incidence and risk factors of mor-



tality and morbidity in valvular reoperations.

**METHODS:** A series of 61 redo procedures performed on a total of 57 patients in the period between 2002 and 2007 at our institution was retrospectively analyzed. Univariate and multivariable analyses were performed. 648 underwent primary valve operations. The reasons for reoperations were reconstructive surgery in first operation (10 patients, 16.3%), prosthetic valve endocarditis (17 patients, 27.8%), periprosthetic leakage (4 patients, 6.5%), new valve degenerations (7 patients, 11.4%), bioprosthetic dysfunction (10 patients, 16.3%), acute thrombotic stuck valve (4 patients, 6.5%), and pannus formation (9 patients, 14.7%).

**RESULTS:** Hospital mortality was 6 patients 9.8%. Multivariate analysis demonstrated that age > 60, emergency surgery, impairment of renal function, hemodynamic instability, preoperative cerebrovascular accident, aspergilloma, repeat infective endocarditis were independent risk factors.

**CONCLUSION:** Valvular reoperations can be carried out with acceptable morbidity and mortality in elective operations but mortality rates are still very high in age > 60, emergency surgery, impairment of renal function, hemodynamic instability, preoperative cerebrovascular accident, aspergilloma, repeat infective endocarditis.

### P-173-NORMALIZATION OF CORONARY ARTERY DIASTOLIC FLOW AFTER AORTIC VALVE REPLACEMENT

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We present a case of a 87-year-old man with severe aortic valve stenosis and insufficiency, who underwent aortic valve replacement with a stentless tissue valve. Intraoperative assessment of coronary flow with Doppler X-Plore probe (MediStim, Oslo) showed severe reduction of diastolic flow in the left anterior descending coronary artery and right coronary artery before replacement, which normalized after valve replacement.

### P-174-LACK OF CORRELATION BETWEEN PREOPERATIVE SMOKING STATUS AND EARLY POSTOPERATIVE OUTCOME IN PATIENTS UNDERGOING VALVE SURGERY

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**OBJECTIVE:** Previous studies have examined the effect of smoking on outcome in patients undergoing coronary artery bypass graft (CABG). However, no study so far has examined the effect of smoking on short term outcome in patients undergoing valve surgery.

**METHODS:** This is a retrospective review of prospectively collected departmental data base between the period of February 2000 and July 2007. Patients were enrolled in this study if they underwent isolated aortic and /or mitral valve surgery (whether replacement or repair). Our cohort consisted of 590 patients stratified into three groups: current smokers (n=94), ex-smokers of >4 weeks (n=243) and non-smokers (n=253).

**RESULTS:** There were no significant differences in the in-hospital mortality between current smokers, ex-smokers and non-smokers (3% vs. 5% vs. 4%, p-value N/S). Likewise, length of both hospital stay and intensive care unit stay were also similar among the three groups. Furthermore, the rate of postoperative complications (i.e. pulmonary, renal, infective, gastrointestinal, neurological, arrhythmias) as well as postoperative blood transfusion requirement were also similar in all three groups. These findings remained statistically not significant, even after adjusting for potential confounders such as age, gender, hypertension, etc.

**CONCLUSION:** Smoking does not seem to be associated with an increased early postoperative risk in patients undergoing valve surgery. However, because of the known effect of smoking on the risk of cardio-vascular diseases and the effect of smoking on long term survival in patients undergoing valve surgery remains unknown, patients should still be encouraged to quit smoking. Larger and prospective studies are required to ascertain our findings.

### P-175-SUCCESSFUL SURGICAL REPAIR OF THE TRICUSPID VALVE FOR SYMPTOMATIC SEVERE REGURGITATION DUE TO LEAFLET PERFORATION FOLLOWING PERMANENT PACEMAKER VENTRICULAR LEAD INSERTION

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**BACKGROUND:** Perforation of the tricuspid valve (TV) leaflets induced by insertion of permanent pacemaker leads with secondary valve regurgitation is uncommon. This complication remains underrecognized till the valve regurgitation becomes severe symptomatic and results in congestive heart failure. Most of such cases have been diagnosed at autopsy. We report herein on a case of successful surgical repair of symptomatic severe TV regurgitation induced by insertion of three ventricular leads and perforation of the anterior leaflet of the TV.

**METHODS:** A 78 old female patient referred from outside clinic to our department because of severe TV regurgitation and symptoms of right congestive heart failure. The patient had underwent elsewhere an implantation of dual chamber pacing modus (DDD) pacemaker and insertion of further two ventricular transcuspid electrodes. A transthoracic (TTE) and transesophageal echocardiography (TEE) showed severe TV regurgitation and also visualized a prolaps of the anterior leaflet of the TV. A surgical intervention was performed on 1. September 2006. A median sternotomy, standard cannulation of the aorta, both cavea and conduction of cardiopulmonary bypass were accomplished. Opening the right atrium on beating heart, a severe central TV regurgitation was evidently observed. After cardioplegic arrest, a perforation of the anterior leaflet of the TV, a cleft between the anteroposterior commissure and evident dilatation of the TV ring were recognized. The perforating ventricular lead was removed from the anterior leaflet, a commissureplastik and a further implantation of an incomplete Sorin-ring were also performed to achieve satisfactory coaptation of leaflets and competence of the TV.

**RESULTS:** A TEE performed intraoperatively confirmed sufficient TV and optimal coaptation of the valve leaflets. The postoperative course was uneventful. A repeated TTE done in October 2007 showed again competent TV. The pacemaker functioned properly and the patient recovered clinically very well.

**CONCLUSIONS:** A damage to the tricuspid valve leaflets after insertion of permanent pacemaker leads should be suspected in presence of severe TV regurgitation and symptomatic right congestive heart failure. The pathogenesis of the malfunction of the tricuspid valve after transcuspid permanent pacemaker leads insertion is, in our opinion, multifactorial and due to an abnormal valve coaptation, leaflet laceration and lead impingement. The TV repair in such clinical situation seems to be feasible and safe. However, long-term clinical follow-up is mandatory.

### P-176-THE PREDICTORS OF THE SALINE IRRIGATED RADIO-FREQUENCY ABLATION TREATMENT SUCCESS RATES FOR THE ATRIAL FIBRILLATION

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**BACKGROUND:** The purpose of our study is to find out the risk factors influencing the success rate of SIRFA at the end of one-year period.

**METHODS:** Between October 2002 and June 2006, 210 patients with AF selected for rheumatic mitral valve surgery have undergone SIRFA with an available unipolar probe. Each patient had a 12-lead electrocardiogram (ECG) for routine control at the end of one year.

**RESULTS:** While the incidence of early postoperative AF was found to be 17.61% (37), this ratio was 14.75% (31) at the first month and 15.7% (33) at the sixth month after surgery, and 16.2% (34) at the end of one year. The univariate analyses have revealed that, patients older than 60 years old, the presence of chronic AF, patients with AF for more than 6 months, left atrium diameter >60 mm, left atrium diameter >60 mm after left atrium diameter reducing procedure, postoperative antiarrhythmic treatment requirement and patients undergoing temporary epicardial pacemaker implantation at the end of surgery are significant risk factors. Multivariate analyses have revealed that, patients older than 60 years old, patients with left atrium diameter >60 mm, with left atrium diameter >60 mm after left atrium diameter reducing procedure, and with postoperative antiarrhythmic treatment requirement are under significant risk.

**CONCLUSIONS:** In our study, left atrium diameter greater than 60 mm before or after surgery, age older than 60 years, and antiarrhythmic drug requirement in the postoperative period have been established as the main predicting factors unfavorably influencing the success of SIRFA.

#### **P-177-A CASE OF CANDIDA PARAPSILOSIS TRICUSPID VALVE ENDOCARDITIS: 3 YEARS FOLLOW UP AFTER SURGICAL TREATMENT**

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**CASE REPORT:** Right-sided infective endocarditis is a frequent complication among intravenous drug abusers. In non-addicted patients, several states such as alcoholism, immunodeficiency states, prolonged intravenous hyperalimentation, permanent pacemakers, and some congenital heart diseases can provide the predisposing factors for tricuspid valve endocarditis. It is an extremely rare occurrence in patients with normal native cardiac valves. Even the ideal treatment strategy for Candida endocarditis has not been formally tested in prospective randomized controlled studies; in the review of cases documented in the literature show combined surgical and medical therapy is associated with a lower mortality rate. In this report we present a case of 67 years old woman with tricuspid native valve endocarditis related to Candida parapsilosis which is very rare cause of infective endocarditis and carries a high mortality risk. In our case, predisposing factor seems using prophylactic broadspectrum antibiotics during intervention for carpal tunnel syndrome. An operation was indicated for her due to persistent enlarging vegetation on the tricuspid valve, severe tricuspid regurgitation and septic pulmonary emboli. She underwent tricuspid valve replacement with bioprosthesis and in well condition at 3 years follow up. As a conclusion, right-sided endocarditis is one of the most serious manifestations of the candidiasis. But with aggressive medical and surgical therapies the patients may have long term favorable outcomes even they need valve replacement due to destruction and widespread infection of the native valve.

#### **P-178-MATERNAL AND FETAL RISKS FROM HEART SURGERY DURING PREGNANCY**

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**BACKGROUND:** Functional deterioration of patients (pts) with heart disease during pregnancy may require cardiac surgery when mother life is threatened. The scarce of data in this area demands continuous information to improve the maternal and fetal care. Our objectives were to assess maternal and fetal outcomes of cardiac surgery during pregnancy and to study the prognosis factors. **METHODS:** We analyzed 40 open heart surgeries, 36 during gestation (mean= 20.5 ± 9 weeks) and 4 on post-partum time (mean= 10.2 ± 8 days). The procedures were mitral valve replacement (17 pts); aortic valve replacement (9 pts) and both valves (4 pt); mitral commissurotomy (7 pts); aortic aneurysm correction (3 pts) and myocardial revascularization (1 pt). Seventeen (42.5%) of them were valve reoperation due to valve prosthesis dysfunction. The clinical indications were due to clinical refractory heart failure in 23 pts, cardiogenic shock (5), aortic dissection (3), infective endocarditis (2), mechanical prostheses thrombosis (2) and myocardial infarction (1). All women were followed by the same clinical, obstetrical and surgeon team and they were monitored by cardiotocography to control uterine activity and fetal heart beats during surgical procedure.

**RESULTS:** Fourteen (38.8%) out of 40 pregnancies had maternal and fetal uneventful course. Fifteen (37.5%) cases had maternal events equivalent to: heart failure (7), stroke (2), infective endocarditis (2), bleeding (2) and 3 (7.5%) deaths in the immediate postoperative period. There were 14 (35%) stillbirth (6 spontaneous abortions and 8 neonatal deaths). Out of 26 alive newborns 12 (46.1%) were premature babies and 4 (15.3%) cases presented neurological malformation (cerebral palsy, hydrocephaly and cortex atrophy). Higher fetal complications were observed in women who suffered emergency

cardiac surgery ( $p < 0.03$ )

**CONCLUSIONS:** The high maternal risk from cardiac surgery during pregnancy was correlated with maternal critical situation specially due to refractory heart failure. Cardiopulmonary bypass during pregnancy carries a high risk of fetal morbidity and mortality. Cardiac surgery must be restricting in the absence other therapeutic option to maternal survival.

#### **P-179-THE OUTCOMES OF ELDERLY PATIENTS WITH LOW-DOSE WARFARIN AFTER AORTIC VALVE REPLACEMENT WITH THE MECHANICAL VALVE**

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**BACKGROUND:** In general, bioprosthetic valve are favored for the elderly patients to avoid long-term anticoagulation therapy mainly because of bleeding complication. In our hospital, the international normalized ratio (INR) is controlled from 1.5 to 2.0 after aortic valve replacement (AVR) with mechanical valves. Is the mechanical valve acceptable to elderly patients in the aortic position if low-dose Warfarin is used?

**METHODS:** Patient outcomes and echocardiographic data were retrospectively compared between 60 patients performed AVR with bioprosthetic valves (group B) and 48 patients with mechanical valves (group M), who were older than 65 years old. The operative procedures were isolated AVR and AVR with concomitant coronary artery bypass grafting. The mechanical valve was chosen when a patient was on hemodialysis or a patient had a small aortic annulus. In the group B, anticoagulation therapy with Warfarin is initiated and continued for 3-6 months after surgery, followed by antiplatelet therapy using aspirin. In the group M, anticoagulation therapy is initiated and continued indefinitely in all patients with using aspirin. INR is controlled between 1.5 and 2.0 in our out-patient clinic.

**RESULTS:** The average ages of patients were 73.7 (standard deviation (SD): 4.8) years old in the group B and 70.5 (SD: 3.8) years old in the group M. The mean follow-up period in the group B was 1235 days (range: 19 to 2900) and 1174 days (range: 23 to 3063) in the group M. There were no differences between the group B and the group M in actuarial survival (1 year: 96.7 % vs. 91.6 %, 5 years: 88.4 % vs. 76.8 %). There were no significant differences in the rate of bleeding events (group B: 1.00 % per patient-years, group M: 1.30 % per patient-years) and in the rate of thromboembolism (group B: 0.49 % per patient-years, group M: 1.94 % per patient-years). The mean value of the INR in the group M was 1.66 (SD: 0.17) in our hospital. The valve size of the group M (19.7 (SD: 2.9)) was significantly smaller than that of the group B (21.9 (SD: 1.8)). But there were no significant differences in the data of echocardiography, including peak aortic pressure gradient after surgery (group B: 24.4 (SD: 11.1) mmHg, group M: 26.8 (SD: 12.8) mmHg) and left ventricular mass index before and after surgery (before surgery, group B: 211.6 (SD: 70.5) g/m<sup>2</sup>, group M: 210.5 (SD: 67.4) g/m<sup>2</sup>, after surgery, group B: 148.4 (SD: 42.4) g/m<sup>2</sup>, group M: 149.4 (SD: 45.4) g/m<sup>2</sup>). In both groups, left ventricular mass index significantly decreased after surgery.

**CONCLUSIONS:** Aortic valve replacement using the bioprosthetic valve and the mechanical valve provided good clinical and hemodynamic outcomes for the elderly patients. Anticoagulation therapy with low-dose Warfarin, a target range of 1.5 to 2.0 INR that is lower than the range of 2.5 to 3.5 recommended by the American Heart Association, can be effective for the elderly patients with the mechanical valve to avoid bleeding complication without increasing the incidence of thromboembolism. We also think that there is racial difference in controlling INR value between Asians and Europeans.

#### **P-180-AN INFLUENCE OF PREOPERATIVE LEFT VENTRICULAR FUNCTION ON MITRAL VALVE REPAIR FOR ISOLATED MITRAL REGURGITATION**

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**BACKGROUND:** Mitral valve repair has been associated with better preservation of left ventricular (LV) function for isolated mitral regurgitation (MR). The objective of this study was to evaluate an influence of preoperative LV function on mitral valve repair for isolated MR, especially change in postoperative LV dimension, ejection fraction (EF).

**METHODS:** Thirty-one patients undergoing mitral valve repair for isolated MR between 2000 and 2006 was divided into two groups. Patients with decreased preoperative LVEF ( $< 50\%$ ; group I,  $n=22$ , M: F=12:10, age  $56 \pm 9$ ) were compared with patients with normal preoperative LVEF ( $\geq 50\%$ ; group II,  $n=9$ , M: F=3:6, age  $48 \pm 20$ ). The etiology of regurgitation was degenerative (I/II: 12/7), rheumatic (7/2), endocarditis (1/0), ischemic (1/0), marfan (1/0) disease. All patients underwent transthoracic echocardiography preoperatively, postoperative 1 month and annually during the follow-up period (40 $\sim$ Y18).

**RESULTS:** One patient died of heart failure in group I, and no mortality in group II. The complications were 1 gastric ulcer and 1 cerebral infarction in group I and no complication in group II. There is no reoperation in two groups. Group I demonstrated significant increase in LVEF ( $P<0.001$ ), decrease in LV end diastolic dimension (LVEDD) ( $P<0.001$ ), decrease in LV end systolic dimension (LVESD) ( $P<0.001$ ) postoperatively compared with preoperative condition. But, group I showed decrease in LVEF ( $P<0.05$ ), increase in LVEDD ( $P<0.05$ ), increase in LVESD ( $P<0.05$ ) compared with group II postoperatively during follow up.

**CONCLUSIONS:** Mitral valve repair in patients with LV dysfunction and isolated MR are effective improvement of LV function, however there are not so much improve compared with the group of normal LV function. The LV function was restored to normal during follow up period even in patients with LV dysfunction.

#### **P-181-INVESTIGATING LEFT VENTRICUL MASS REGRATION AFTER MECHANICAL AORTIC VALVE REPLACEMENT FOR THE PATIENTS WITH INTERVENTRICULAR SEPTUMS 20 MM AND OVER**

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**AIM:** The most important addepted response after left ventricular mechanical loading depending on the serious aortic stenoses is ventricular hypertrophy. the long time lasting of this mechanical loading paves the way for breaking down of myocardial contractil situation and the pumping function depending on this situation. we investigated left ventricular mass regration, decreasing in transvalvular gradient and interventricular septum thickness, increasing in left ventricular function and effort capacity of the mechanical aortic valve replaced patient with interventricular septum thickness 20 mm and over.

**MATERIAL AND METHOD:** The study included 5 patients with aortic stenosis whose interventricular septum thickness 20 mm and over and who are made mechanical aortic valve replacement. the mean age of these 5 patient was  $61.6 \pm 2.08$  and 3 (%60) of them were men. ün 3 patients there were aortic stenosis only and in 2 of them there wer aortic valve stenosis and insufficiency. preoperatively these 5 patients effort capacity were NYHA 3-4. In 2 patients 21 no, ün 2 patients 23 no st jude and ün one patient 23 no carbomedics mechanical valve replacement have been performed. all of the patients left ventricular functions and diameters were evaluated with echocardiography at at least 6 months.

**FINDINGS:** Left ventricular mass indexis, maximum valve gradients, thickness of interventricular septum and posterior wall, left ventricular end diastolic and end sistolic diameters of the patient were decreased statistically in postoperatively 6 months when compared with preoperatively. ün non of the patients left ventricular mass index and interventricular septum thickness measured in normal ranges. Left ventricular ejection fractions increased statistically significant ( $p<0.05$ ) and also in functional capacities a statistically significant increase has been noticed.

**CONCLUSION:** The aortic valve replacement performed patients left ventricular diameters and functions have been affected positively. the normalization ratio of left ventricular mass after aortic valve replacement is not only dependent on the valve type and number but also to difference in the etiology of aortic valve sickness ,surgical timing, the degenareted myocardial area namely degree of left ventricular hypertrophy ,decreasing reserve in the left ventricle, and the residual gradient after operation.

#### **P-182-THE AFFECT OF PYROLITIC CARBON COATED MECHANICAL VALVES TO D-DIMER**

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**INTRODUCTION:** We aimed to investigate the affect of different types of mechanical valves on d dimer when coated with pyrolitic grahit according to biocompatibility and anticoagulation affect (by the way of absorbtion and neutralization) of this material.

**MATERIAL AND MEHOD:** The fresh frozen plasmas those were heparinized with 5000IU were shaken. they were put in the same size jar as 200 cc. A jar has been made control group , sorin beleaflet mechanical valve was put in the second jar, st jude beleaflet mechanical valve was put in the third jar and they have been taken out 2 hours after and d dimers have been measured with the same encounter for the examples. the mean values of the groups, Standard varies, the difference between the groups have been measured with t test (coupled-one tail).

**RESULTS:** A (Control) B (Sorin) C (St.Jude) D-dimer 228,4 253,2 248,6 Std 41,2 41,1 41,4 A ile B P:0,000005 A ile C P:0.00000001 B ile C 0,1

**CONCLUSION:** There was no difference in d dimer values between the different amounts of pyrolitic grahit those were used in different mechanical valve types. Both of the mechanical valve groups d dimer values were higher when compared with control group. this difference shows the affect of pyrolitic grahit and we think that additional studies are necessary for showing the affect of the diffrent valve types.

#### **P-183-REST AND STRESS ECHOCARDIOGRAPHIC EVALUATION OF PATIENTS WITH AVR FOR ESTIMATION OF MISMATCH BETWEEN EFFECTIVE ORIFICE AREA AND BODY SURFACE AREA**

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**BSA:** Body surface area PG: peak gradient MG: mean gradient Valve Index: effective orifice area BSA

**AIM:** The aim of this study is to evaluate the appropriation between the size of prosthetic Aortic valve and Body surface area in patients with AVR because of AS. Back ground: Prosthetic Aortic valve replacement in a small aortic root raises concern about its hemodynamic effect.

**METHODS:** 12 AVR patients were evaluated with exercise stress echocardiography, peak gradient, effective orifice area and valve index were evaluated at rest and peak exercise.

**RESULTS:** 2 patients had ideal hemodynamic results (peak gradient, Mean gradient appropriate, valve index  $> 1 \text{ cm}^2/\text{m}^2$  at rest and exercise) (group AI) 5 patients had intermediate hemodynamic results (good peak and mean gradient and valve index  $> 1 \text{ cm}^2/\text{m}^2$  at rest but peak gradient, MG and or VI  $< 1 \text{ cm}^2/\text{m}^2$  at peak exercise) (group A II) 5 patients had inappropriate hemodynamic results at rest (PG, MG elevated and / or valve index  $< 1 \text{ cm}^2/\text{m}^2$ ) prosthetic Aortic valve size / BSA = 14.48 AI 12.53 AII 12.22 B the difference between group AI and AII was significant, but not meaningful statistically, (Pv = 0.08) the difference between group AI and B was meaningful statistically, (Pv = 0.05)

**CONCLUSION:** for ideal hemodynamic results, we can consider Aortic root enlargement in small Aortic Roots with large BSA.

#### **P-184-RESULT OF CABG CONCOMITANT WITH MITRAL VALVE REPLACEMENT VERSUS REPAIR IN PATIENTS WITH MODERATE TO SEVERE MITRAL REGURGITATION ACCOMPANYING CORONARY ARTERY DISEASE**

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**OBJECTIVES:** We studied outcome of surgery in patients with moderate to severe mitral regurgitation (MR) suffering from coronary artery disease (CAD), undergone mitral valve replacement (MVR) vs mitral valve (MV repair) accompanying coronary artery bypass grafting (CABG).

**METHODS:** From March 2002 to January 2004, 40 consecutive patients (mean age:  $59/78 \pm 8/9$ ) undergone CABG plus MVR or MV repair. From 40 patients,



18(45%) were in NYHA functional class III or IV, 36(90%) of them had MR grade III. The mean follow-up time was 7/7B±5/9 months.

**RESULTS:** Mitral valve was replaced in 16(group A) and repaired in 24(group B) concomitant with CABG. Risk for CABG was similar in both group according to parsonet scorer. 1) Early mortality was similar in both groups(0 in group A, 3 in group B(7/5%),  $p=0.26$ ), late mortality also had no significant difference between two groups(1 in group A, 0 in group B,  $p=0.9$ ). Multivariate analysis identified poor coronaries as a risk factor for early death ( $p=0.004$ ). Pulmonary hypertension had a trend for increased mortality ( $p=0.12$ ), but recent unstable angina, low ejection fraction (EF) and history of pulmonary edema had no influence. 2) In group A, EF decreased from mean  $51.87B\pm 10.14$  to  $44.37B\pm 8.3\%$  after surgery ( $p=0.002$ ), in group B no significant change in EF occurred (from  $43.42B\pm 11$  to  $43.7B\pm 13\%$ ) ( $p=0.86$ ).

**CONCLUSION:** in patients with moderate to severe MR accompanying CAD, mortality was similar in MVR vs MV repair plus CABG, but EF significantly decreased after MVR, thus according to this study there is a trend for MV repair concomitant with CABG in patients with significant MR accompanying CAD, but we need more studies for definite

### P-185-TREATMENT OF MITRAL REGURGITATION AND CORONARY DISEASE BY CORONARY BYPASS ALONE

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**BACKGROUND:** In cases of moderate mitral regurgitation and coronary artery disease operative strategy continues to be debated between coronary artery bypass grafting alone and concomitant valve replacement or repair.

**METHOD:** From March 2002 to June 2004, 20 consecutive patients mean age  $63.30 B\pm 8.16$  years were treated for moderate mitral regurgitation and coronary artery disease with CABG alone, mean EF was  $47.22B\pm 14.16$  and parsonet score was  $12.55B\pm 9.40$  and follow up time was  $9.4 B\pm 4.5$  months.

**RESULTS:** MR reduced from mean 1.61 to 1.16 but difference was not statistically significant. ( $PV=0.12$ ). EF reached from  $47.22B\pm 14.16$  to  $48.61B\pm 9.6$  post operatively. In hospital mortality was 0 and late mortality was 10% (2 patients)

**CONCLUSION:** Severity of MR in most patients with moderate ischemic MR reduces with CABG alone, but this reduction is not statistically significant and we need more studies. According to this study and literature, patients with moderate ischemic MR are high risk patients with high late mortality for CABG alone.

### P-186-A MODIFIED MANOUGUIAN PLASTY FOR STENTED BIOLOGICAL VALVE IMPLANT IN VERY SMALL AORTIC ROOT

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For patients with severely calcified very small aortic root being at risk for patient-prosthesis-mismatch (PPM), in whom implantation of biological valve was mandatory and the choice of stented bioprosthesis reasonable, a modified Manouguian plasty with subtotal resection of the non-coronary sinus was established, its rationale and advantages are now presented. 21 consecutive patients aged 45-92 yrs (mean 71 yrs), with BMI ranging 22.6-40.3 (mean 22.6), and aortic annulus of 19mm and less, were operated on using this modification. 18 pts received 21mm and 3 pts 23 mm stented bioprostheses. In 17/21 (80%) CABG, and in 6/21 (28%) septal myectomy as concomitant procedures were performed. The mean projected iEOA was 0.62 (0.45-0.78)  $cm^2/m^2$  (all pts with potentially severe PPM). The mean postoperative calculated iEOA was 0.75 (0.54-0.92)  $cm^2/m^2$ : no PPM was observed in 6 pts, moderate PPM (iEOA 0.65-0.85) in 14 pts, and severe PPM (iEOA < 0.65) in 1 pt (129 kg b.w.). The mean cross-clamp time and ECC time were 88' (60'-132') and 125' (78'-192'), respectively. 3 pts required IABP support, no pt died. In conclusion, the presented modification of the Manouguian technique is especially advisable for pts at risk for PPM in whom stented biological valve implant is mandatory and reasonable, its advantage is constituted by the possibility of implant of bioprosthesis with one labelled size larger as compared to the conventional Manouguian procedure.

### P-187-RARE LOCALIZATION OF RIGHT-HEART ENDOCARDITIS A FALSE ALERT FOR MYXOMA A CASE REPORT

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**BACKGROUND:** Right-sided endocarditis occurs predominantly in intravenous drug users, patients with pacemakers or central venous lines and with congenital heart diseases [1]. The vast majority of cases involve the tricuspid valve.

**CASE PRESENTATION:** A case of a 20-year-old man who had right-sided vegetation attached to the septal leaflet of the Tricuspid valve is presented. Transthoracic echocardiography revealed a vegetation in the right atrium inflow tract. Transesophageal echocardiography clearly showed that the 3.03 cm vegetation adherent to tricuspid valve which was also thought to be likely a myxoma.

**CONCLUSIONS:** Our case points to an unusual location of right-sided endocarditis. It confirms that TTE remains an easy and highly sensitive first-line examination for the diagnosis of right-sided endocarditis.

### P-188-MITRAL VALVE REPAIR VERSUS REPLACEMENT FOR ISOLATED MITRAL REGURGITATION IN PATIENTS WITH PREOPERATIVE LEFT VENTRICULAR DYSFUNCTION

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**BACKGROUND:** The objective of this study was to evaluate change in postoperative left ventricular (LV) dimension, ejection fraction (EF) following mitral valve repair and replacement with preservation of partial subvalvular structure in patients with LV dysfunction and isolated mitral regurgitation (MR).

**METHODS:** Between January, 2000 and December, 2006, 37 patients with MR and LV EF < 50% underwent isolated mitral repair (Group I n=22, M: F=12:10, age 56~Y9) or replacement (Group II n=15, M: F=3:6, age 48~Y20). The etiology of regurgitation was degenerative (I/II: 12/4), rheumatic (7/10), endocarditis (1/1), ischemic (1/0), marfan (1/0) disease. All patients underwent transthoracic echocardiography preoperatively, postoperative 1 month, and annually during the follow-up period (42~Y21 months)

**RESULTS:** There is no statistical difference between two groups in preoperative echo data. 1 patient died of heart failure and no reoperation in group I, 1 patient died due to heart failure and one reoperation for valve failure in group II. Group I demonstrated significant decrease in LV end diastolic dimension (LVEDD) ( $P<0.001$ ), LV end systolic dimension (LVESD) ( $P<0.001$ ), increase in EF ( $P<0.001$ ) postoperatively compared with preoperative condition. Group II showed significant increase in EF ( $P<0.05$ ), decrease in LVEDD ( $P<0.05$ ), LVESD ( $P<0.05$ ) postoperatively during follow-up. But there is no significant difference between two groups.

**CONCLUSIONS:** Mitral valve repair and replacement with preservation of partial subvalvular structure in patients with LV dysfunction and isolated MR are effective improvement of LV function in this study.

### P-189-1000 AORTIC PERICARDIAL VALVES: RISK FACTORS FOR 30-DAY POSTOPERATIVE VALVE RELATED COMPLICATIONS

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**BACKGROUND:** Valve related complications carry a high morbidity and mortality. Identification and avoidance of risk factors could reduce 30-day postoperative valve related complications after aortic valve replacement (AVR).

**METHODS:** Of 1000 consecutive patients, who underwent AVR with a pericardial valve between 1986 and 2006, a file study was performed. Mechanical valves and valves in other positions were excluded. Thromboembolism, bleeding and complex ventricular arrhythmias (bigeminy, runs of extrasystoles, tachycardia and fibrillation) were recorded. Statistical analysis for the effect of age, gender, 15 preoperative factors (renal and pulmonary dysfunction, hypertension, CVA, ejection fraction < 50%, myocardial infarction, coronary artery disease, atrial fibrillation, ventricular arrhythmias, conduction defects, previous CABG, previous AVR, use of digitals, NYHA class, need for urgent AVR), prosthesis diameter and concomitant procedures (CABG, mitral annuloplasty, surgery on the carotid artery or ascending aorta) on valve related complications was performed with Fisher-exact, Pearsons' chi-square and multivariate logistic



regression analysis.

**RESULTS:** For thromboembolism, only one independent predictor was found: EF<50% [p=0.030, Odds Ratio 2.5, 95% Confidence Interval 1.1-5.7]. For bleeding, independent predictors were 1°) concomitant CABG [p=0.046, OR=3.6, 95%CI=1.0-12.5]; 2°) surgery on the ascending aorta [p=0.058, OR=3.5, 95%CI=1.0-12.6]. Coronary artery disease was only significant in an univariate analysis (p=0.029). For ventricular arrhythmia, independent predictors were 1°) preoperative myocardial infarction [p=0.025, OR=2.4, 95%CI=1.1-5.0] and 2°) EF<50% [p=0.050, OR=2.1, 95%CI=1.1-4.4]. Preoperative ventricular arrhythmia was only significant in an univariate way (p=0.046).

**CONCLUSION:** 1°) Low ejection fraction is a predictor for 30-day postoperative thromboembolism and ventricular arrhythmia. Since this predictor is a recognized consequence of aortic valve disease, AVR should be performed before the ejection fraction starts to decrease. 2°) Coronary artery disease and its consequences (myocardial infarction and need for concomitant CABG) also pose a risk.

### P-190-OPTIMAL MULTIPLANAR MECHANICAL AORTIC VALVE

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**INTRODUCTION:** In aortic valve surgery, using stented valves creates a problem that matching the orifice area to the body surface area of the patient is difficult. In order to overcome this problem, many experimental and theoretical studies are published reporting that multiplanar mechanical valves dissolve this problem. This study was designed to achieve the largest orifice for a multiplanar valve.

**METHODS:** The angle (that stent forms with the aortic annulus) where the sum of areas that free edges of the leaflets scan from closed to maximally opened position equals to orifice area of the stent creates the shape of the optimal multiplanar mechanical aortic valve. In recently used mechanical valves the area that leaflet scans is larger than the orifice area that leaflet forms. We can increase the orifice area by decreasing the opening angle of the leaflet thus making it equal to orifice area.

**RESULTS:** Area that leaflet scans (as a semicircle) = Area of sphere/360/opening angle of leaflet. When the angle is 45 degrees the scanned area becomes equal to leaflet's area. For an optimal aortic valve, the angle between stent and aortic annulus is revealed to be 45 degrees.

**CONCLUSION:** 3D shapes of optimal aortic valve are enclosed.

### P-191-PROSTHETIC MITRAL VALVE MALFUNCTION ;COMPARISON OF THROMBECTOMY AND Re-MVR

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**BACKGROUND:** Different approaches have been proposed for management of patients with prosthetic valve malfunction. We present our follow up results in patients with prosthetic mitral valve malfunction underwent reoperation with two different

**METHODS:** Between April 2000 and Jun 2002, a total number of 93 patients underwent reoperation because of prosthetic valve malfunction. The patients in whom the valves were savable tolerated thrombectomy (group T), and mitral valve replacement was performed on patients in whom we were not able to save the valves.

**RESULTS:** Of 93 patients, fifty one patients (54.8%) underwent thrombectomy (group T) and 42 patients (45.2%) underwent mitral valve replacement (group M). A significant proportion of patients completed follow-up (84.8% in group T and 89.4% in group M). The mean follow up time was 41 months in group T and 37.9 months in group M. There were no statistically important differences between two groups in age, weight, NYHA class, ejection fraction and duration of ICU and hospital stay. In group T, aortic cross-clamping time and bypass time were significantly shorter than group M (p<0.0001 and p<0.007 respectively). In-hospital mortality was 9.8% in group T and 9.5% in group M (p>0.05). The need to reoperation was 8.6% in group T and 26.3% in group M. Late mortality rate was 4.3% in group T and 15.7% in group M.

**CONCLUSION:** Thrombectomy is an admissible approach in cases of prosthetic mitral valve malfunction if the valve is savable.

### P-192-TRICUSPID COMMISSUROTOMY FOR RHEUMATIC VALVE DISEASE. A 30-YEAR CLINICAL RESULTS

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**BACKGROUND:** The long-term behaviour after surgical repair of the rheumatic tricuspid valve is unknown. We present a 30-year clinical results.

**METHODS:** Between 1975 and 2006, 148 patients underwent tricuspid valve repair including a tricuspid commissurotomy (133 female and 15 male with a mean age 47.4±13.3 years). Annuloplasty was associated in 90.5% of the cases. Mitral (145) and/or aortic (65) valves underwent repair or replacement. Follow-up was 97.8% complete with a mean follow-up 15.8 years (range: 1 - 31 years)

**RESULTS:** Hospital mortality was 4.7%. Multivariate analysis showed mitral annuloplasty and post-clamping time predictive risk factors for hospital mortality. Late mortality was 48% with body surface area and mitral annuloplasty as a predictive risk factors. Actuarial survival curve was 12±6.1% at 30 years. During the follow-up 46.8% patients required a valve reoperation for isolated tricuspid dysfunction (n=2), tricuspid + mitral or aortic dysfunction (41) or mitral and/or aortic dysfunction (23). Actuarial freedom from valve reoperation was 19.9±6.1% at 30 years. Predictive risk factors for valve reoperation was mitral annuloplasty.

**CONCLUSION:** Early results of tricuspid commissurotomy are acceptable but late mortality and the risk of valve reoperation are high in the very long-term follow-up.

### P-193-CHRONIC CONSTRICTIVE PERICARDITIS (ABOUT 36 CASES)

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**BACKGROUND:** This study aims to analyse epidemiological, diagnosis, therapeutic and prognostic aspects of 36 patients who presented chronic constrictive pericarditis.

**METHODS:** Between January 2000 and July 2007, 36 patients (25 men and 11 women) were operated in our institution for chronic constrictive pericarditis. The mean age was 30.7 years (range 16 - 53 years). Twenty -for patients (66.6%) were treated for tuberculosis. All patients were symptomatic. Thirty-three patients (91.6 %) were in NYHA functional class III-IV and twenty-two patients (61 %) were in atrial fibrillation. The diagnosis was mainly assessed at the echocardiography. All patients underwent subtotal pericardectomy via median sternotomy without cardiopulmonary bypass.

**RESULTS:** The early mortality was 2.7 % (n =1). In the postoperative course, some complications were seen: low cardiac output (n =18), transient renal insufficiency (n=11), respiratory insufficiency (n = 2) and mediastinitis (n =1). No case of perioperative bleeding was notified. Thirty- three patients (91.6 %) were reviewed. The median follow-up was 39 months (range 3 to 78 months). There was one late death. At follow-up, there were thirty- two survivors, 90.6 % were asymptomatic and 3 patients (9.3 %) were in NYHA functional class III and require diuretics.

**CONCLUSION:** The chronic constrictive pericarditis occurs usually in young population and the tuberculosis is the prevalent cause in our context. The echocardiography allowed diagnosis and the treatment consists in subtotal pericardectomy with acceptable morbi-mortality.

### P-194-CARDIAC TUMORS ABOUT 31 CASES AND LITERATURE REVIEW

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**BACKGROUND:** Cardiac tumors are rare, and are represented by benign tumors in 75% of cases, whereas the primitive cardiac malignant tumors accounted for 25% of the cases. We describe through this work, the specifics epidemiological, diagnostic, therapeutic and prognosis of this entity long been underestimated.

**METHODS:** This is a retrospective study, covering a period from May 1980, to

April 2007. 31 patients with cardiac tumors were operated in our training.

**RESULTS:** 29 cases of myxomas (93% of all cardiac tumors), a single case of fibroelastoma papillary (3.2%), and one case of primary malignant cardiac sarcoma (3.2%). In patients with a myxoma, the middle age was 44.6 old years with a female predominance (21 women and 8 men). The fortuitous discovery was noted in 5 cases, and at variously associated symptomatology among 24 patients. The fibroelastoma was discovered in a man of 36 old years, while we explore the etiology of ischemia vascular accident, whereas the primitive cardiac sarcoma, was found in one patient who has 45 old years, he has operated and lost sight during 13 months after this, he returned for a local recurrence, without a distance metastasis, the tumor was removed, after the operation, three months were normal, then again the patient is lost sight and refusing any adjuvant treatment. In all cases the diagnosis was suspected by echocardiography and confirmed by anatomo-pathological study of the surgical specimen. The attitude consisted of surgical resection, under CEC followed, by a renovation of the loss of substance. Cardiac benign tumors, accounting for 75% of primary heart tumors, which more than 50% are myxomas. In our series myxomas are the most common, especially among women between 30 and 50 old years, as well as the primitive cardiac sarcoma, the fibroelastoma is less common in our series. Clinically, the polymorphism reported in the literature, was found in our series. Echocardiography remains an essential consideration, magnetic resonance imaging MRI is more effective in expansion investigation, however the diagnosis for confirmation is anatomo-pathological. The prognosis of benign tumors after surgery is favorable, except for a case of myxoma who recurrence for the second time, joining the 7 cases reported in the literature. The primitive recurrent cardiac sarcoma is fitted with a poor prognosis (life expectancy between 6 months-12 months).

**CONCLUSION:** Since the advent of echocardiography, and the discovery of the CEC, coupled with advances in cardiac surgery, cardiac tumor pathology, was treated early and better, to improving the quality and hope life in the event of cardiac malignant tumors.

#### **P-195-PRESSURE ULCERS PREVENTION AFTER CARDIAC SURGERY OPERATIONS**

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**BACKGROUND:** The incidence of pressure ulcers in the cardiac surgery population has been reported to be very high. The prolonged compressive forces from lying on the operating room table are considered to be the major cause of pressure ulcers in this population. Pressure-reducing devices on the operating room table have been used to reduce the patients' interface pressure.

**MATERIALS-METHOD:** In our study 420 patients who underwent cardiac surgery during a period of one year were studied. In all of our patients, specific soft pads were used during surgery and a special intensive postoperative care in the ICU was followed by the nurses. The rectal and the skin temperature were measured and the differences in temperature between the rectum and the skin were listed. Any skin lesion was recorded accordingly.

**RESULTS:** All patients had a constant temperature difference of  $\approx 4^\circ\text{C}$  between the rectal and the skin temperature during the CPB, at the end of the operation and at least 2 hours after the operation. Patients with low EF who were treated with high dose of inotropes, demonstrated prolonged maintenance of the difference in their temperature that lasted 2-8 hours. Totally, 42 patients (10%) developed pressure ulcers. 23 patients were men (54.76%) and 19 were women (44.18%). 20 patients underwent a bypass operation and 22 a valvular operation. 30 of the patients had pressure ulcers of 2nd grade and 12 patients developed pressure ulcers of 3rd or 4th grade. The 42 patients who finally developed pressure ulcers, had the following clinical characteristics: 7 had respiratory insufficiency and were intubated for more than 7 days (16.67%), 8 had low EF (19.04%), 5 had IABP (11.90%), 20 took inotropes such as noradrenalin, adrenalin, dobutamin in various doses for 2-5 days (47.62%), 12 had diabetes mellitus type II (28.57%), 10 were immobilized on bed for more than 7 days (23.80%) and 2 had psychosis. 5 patients were immobilizing on bed for a long period (more than 15 days) in the cardiology department, before they were transferred to our department for surgery (11.90%).

**CONCLUSION:** Pressure ulcers during cardiac surgery are often unavoidable, especially in patients with diabetes mellitus and patients suffering from peripheral vascular disease. Pressure ulcers affect patients of all ages and sexes and may constitute a serious postoperative problem. Predisposing risk factors are:

Hypothermia during the operation, increase time of extracorporeal circulation, prolonged immobilization in the ICU, heart failure, female gender, diabetes mellitus and obesity. The skin temperature during operation should be kept at the level of  $32-34^\circ\text{C}$ . The incidence of pressure sores can be dramatically decreased if soft mattresses filled with liquid, gel or air are used in the operating room and the ICU. Also, changing the position of the patient every two hours in the ICU and maintenance of the albumin's serum levels normal can also prevent pressure ulcers development after cardiac surgery operations.

#### **P-196-RIGHT VENTRICULAR OUTFLOW TRACT TUMOR-A CASE REPORT**

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**INTRODUCTION:** Primary cardiac tumors have a very low incidence. Incidence varies from 0.001% to 0.28% in the general population and is in most cases (75%) benign. Diagnosis is usually difficult since clinical manifestations are varied and sometimes patients may be asymptomatic or present nonspecific symptoms. Lipomas account for approximately 10% of all neoplasms of the heart and represent 14% of benign cardiac tumors. There are few reported cases of Lipomas in various places in the heart i.e. endocardium, myocardium, and epicardium and seen in the IVS, IAS, free wall of Left ventricle. To our knowledge there has been no report of a case of Lipoma seen in the RVOT with symptomatology.

**CASE REPORT:** We present a case report of a middle-aged female with RVOT tumor, which turned out to be Lipoma associated to the LAD Artery. Patient was a middle aged female complaining of palpitation and history of syncope twice in the recent past. On further evaluation and work up patient had systolic murmur, which led to investigation by 2D echo. 2D Echo showed an RVOT tumor. A T1-weighted, ECG-synchronized MRI scan of the transaxial plane and the oblique sagittal plane demonstrated this tumor as Lipoma of RVOT. Patient was planned for surgery electively. On standard CPB heart was arrested and RVOT was opened. There was a well-encapsulated tumor arising from the Interventricular septum projecting into the RVOT. On further dissection tumor was seen arising from around the Left Anterior Descending artery, with one branch supplying it. Carefully tumor was dissected out free from LAD and removed and sent for Histopathological examination. A pericardial patch covered raw and weakened area of Septum. RVOT closed and patient came off Bypass and was discharged on 7 postoperative days without any complication. Histopathological examination revealed this tumor to be Lipoma. Postoperative Echo was done and showed no residual tumor and intact septum. In followup this patient was symptom free and no recurrence of arrhythmia.

**DISCUSSION:** Lipomas account for approximately 10% of all neoplasms of the heart and represent 14% of benign cardiac tumors. Symptoms may be produced by large lipomas, but more often the patients are asymptomatic and the diagnosis is made by chance. Lipomas are benign tumors typically found in adults, and usually circumscribed, spherical or elliptical masses. Cases of multiple cardiac lipomas have also been reported. They are frequently found in the epicardial region of the atrial or ventricular myocardium, sometimes attached via a pedicle, although they can also be intramural or subendocardial. With the advent of good imaging technology like Echocardiography, MRI, CT Scan, more and more lipomas are being diagnosed. To date, > 70 cases of lipoma have been described. In the case we report, the lipoma arose from the interventricular septum and enlarging and obstructing the RVOT. Looking at the position of the tumor, it seems to have arisen from the fat around the Left anterior descending artery and it was even supplied by the branch of LAD artery. This Lipoma penetrating the septum might be the cause of arrhythmias, the exact nature of which was not available and recorded. To our knowledge till date no Lipoma of RVOT has been reported, and this is the first case report. At follow up of this patient at 5 months post op, patient is fine with no symptomatology and no arrhythmias.

#### **P-197-RIGHT ATRIAL ANGIOSARCOMA --A CASE REPORT**

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**OBJECTIVE:** This is an unusual presentation of a patient with right atrial wall angiosarcoma who presented with atrial fibrillation. As a part of surgical treatment extensive Resection of the tumor with the RA wall was done followed by

reconstruction of the Right Atrium using the pericardium.

**CASE STUDY:** A young male patient of 29 years who had presented with recurrent atrial fibrillation with no other symptomatology. On further Investigation 2D Echo showed a small atrial wall mass. For Atrial fibrillation catheter based RF ablation of the right atrium was tried. But was not successful. Follow-up Echo after one month showed rapid growth of the tumor. Tumor size was 6.5x5x7cm. Patient was taken up for surgery, Extensive resection of the tumor in the free wall of RA, extending up to the AV septum, IA septum and even the tricuspid septal leaflet, was done. SVC and IVC were spared. After tumor excision RA was reconstructed by pericardium connecting the SVC, IVC, IA septum and the AV septum. Patient was weaned of Bypass, and was extubated 24 hours after surgery. He was discharged on 10 post-op day with stable haemodynamic condition. Histopathology showed epithelial cell type of angiosarcoma. CT- Thorax showed no Metastasis in the Lungs. He was advised for chemotherapy for the same. Two month follow up shows patient in stable haemodynamics with no macroscopic evidence of metastasis. This was one of the rare types of Cardiac neoplastic lesions which presents late and only palliative form of treatment can be offered. Tumor excision with the atrial wall and Right atrial reconstruction with the pericardium was the only form of surgical treatment that can be offered to this patients.

#### **P-198-REPAIR OF LEFT VENTRICULAR ANEURYSM AND LARGE PSEUDOANEURYSM USING PERICARDIAL PATCH AND BIOGLUE™**

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**BACKGROUND:** Ventricular pseudoaneurysm is a rare entity that can be the result of a wide range of inciting events. There are many potential causes of left ventricular pseudoaneurysms described in the literature. Regardless of the inciting event, a pseudoaneurysm is defined as rupture of the myocardial wall with containment of free rupture by pericardial and fibrous tissue. Inflammation, infective endocarditis, cardiac surgery, trauma, MI, and coronary spasm, among others, have all been implicated as potential causes. Due to the propensity of pseudoaneurysms to rupture, which is nearly always fatal, the definitive treatment of choice is surgical resection. We report a case of a female patient who developed a large pseudoaneurysm secondary to a contained rupture of a left ventricular aneurysm 2 months after she had successful stenting of a left anterior descending artery.

**METHOD/RESULT:** A 62-year-old female presented with severe shortness of breath. Two months prior the patient had a drug eluting stent placed in her left anterior descending artery. Congestive heart failure with bilateral pleural effusion was confirmed and the patient subsequently underwent a 2-D echocardiogram.

**RESULTS:** showed that the middle, distal, and apical segments to be non-contractile secondary to severe aneurysmal changes. Ejection fraction was calculated to be approximately 15% with diameter of the left ventricle at 7 centimeters. At the distal portion of the septum the ventricular aneurysm was noted to be communicating with a 4 centimeter pseudo-aneurysm with a 1.5 centimeter neck through which there was bidirectional flow. The mitral and tricuspid valves were noted to have 3+ and 3-4+ regurgitation, respectively. The patient was taken to the operating room for resection and repair of the ventricular aneurysm and pseudoaneurysm using a pericardial patch and Bioglue™ (CryoLife - Kennesaw, GA). Post-operative transesophageal echocardiogram showed minimal tricuspid and mitral regurgitation. 2-D echocardiogram on post-operative day number four showed concentric left ventricular hypertrophy with an ejection fraction to be 55-60 percent with trace to mild tricuspid and mitral regurgitation and complete restoration of normal left ventricular shape.

**CONCLUSION:** Left ventricular pseudoaneurysm is a rare and often fatal complication following a myocardial infarction unless early surgical resection is completed. This potentially disastrous complication typically occurs three or five days after the onset of acute myocardial infarction. Because the aneurysmal wall, by definition, is composed of pericardium and fibrous tissue, there is an increased susceptibility over true aneurysms for pseudoaneurysms to rupture. Even more rare is a pseudoaneurysm arising from a true ventricular aneurysm. Our case report outlines the necessity to consider a pseudoaneurysm in the differential diagnosis of any patient who has undergone coronary intervention, regardless of apparent success. Unfortunately for our patient, despite the seeming successful intervention of coronary stenting, the patient subsequently developed a ventricular rupture with formation of a massive pseudoaneurysm. In a

time where coronary intervention is on the rise, it will be important for those evaluating recurrent angina or dyspnea in the days, weeks and months after successful intervention to consider failure and complication of intervention as possible etiologies of the complaints.

#### **P-199-MURINA FISH IMAGE OF A GIANT RIGHT ATRIAL THROMBUS: ASSOCIATION WITH PERSISTENT LEFT SUPERIOR VENA CAVA**

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Persistent left superior vena cava is the most common thoracic venous anomaly reported in the literature. It is usually seen with congenital anomalies but in adulthood, it is usually diagnosed incidentally.

**CASE REPORT:** A 74-year-old man admitted to our cardiology clinics with symptoms of orthopnea, tachypnea and chest pain. In his echocardiographic evaluation, a mobile thrombus moving like a murina fish in the right atrium and persistent left superior vena cava opening into aneurysmatic coronary sinus was detected. His pulmonary artery pressure was measured 120 mmHg with moderate-severe tricuspid regurgitation. Because of worsening respiratory dysfunction, he was emergently taken into operation. In the operation, aneurysmatic persistent left superior vena cava was inspected with rudimentary right superior vena cava. Using standard cardiopulmonary bypass procedure right atriotomy was performed and a giant organized thrombus reflecting from inferior vena cava was removed. Aneurysmatic coronary sinus was plicated externally between the right atrial entry and left persistent superior vena cava cannulation side. Pulmonary artery structures were sucked for probable pulmonary thrombi but it was clear. After the operation his symptoms resolved. On the first post-operative day, echocardiography yielded a 60 mmHg decrease in systolic pulmonary artery pressure. In such cases emergent surgery is life saving and also pre- and peroperative echocardiographical evaluation provides a better surgical approach decision by showing associated congenital anomalies.

#### **P-200-ENDOMYOCARDIAL FIBROSIS: PATHOLOGICAL FINDINGS IN SURGICAL SPECIMENS AND CLINICOPATHOLOGICAL CORRELATION**

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**BACKGROUND:** Endomyocardial fibrosis (EMF) is a restrictive cardiomyopathy of unknown etiology prevalent in tropical regions. Most authors believe it could be related to systemic or heart infection/parasitism, previous blood eosinophilia or malnutrition. Surgical resection of the thickened endocardium is recommended to patients with advanced heart failure of functional class III or IV (NYHA). The gross and histological features of the heart have been comprehensively studied in autopsies and endomyocardial biopsies. Studies in surgical samples, however, are still lacking.

**AIMS:** This study was conducted to evaluate: (1) the histological changes of EMF as seen in surgical specimens by means of routine histological and immunohistochemical methods in an attempt to correlate them with clinical symptoms and coronary angiographic features; (2) to compare histological data between surgical and autopsy samples, and (3) to discuss probable pathogenetic mechanisms of the disease, as well as to investigate cardiotropic infective agents by means of molecular analysis of endomyocardial surgical samples.

**METHODS:** We collected all available clinical records and endomyocardial surgical samples from 31 patients with EMF who had been submitted to surgery between 1991 and 2005. The diagnosis was based on clinical, hemodynamic and angiocardiographic findings. The surgical samples were submitted to standard processing and stained with H&E, Masson's trichrome, reticulin and elastic stains. Immunohistochemical methods were employed to detect collagen fibers type I, III, and IV, inflammatory cells (CD3, CD20, CD68) and lymphatic vessels' endothelium (d2-40). Nine samples from autopsied hearts of EMF patients were used as a positive control group. Polymerase chain reaction (PCR) and reverse transcription-PCR were used retrospectively to search for genomes of T. gondii and cardiotropic viruses (enterovirus, adenovirus, influenza A e B,



cytomegalovirus, parvovirus B19 and herpes simplex) in the surgical material. **RESULTS:** Ventricular endocardium was thickened by superficial acellular hyaline collagen fibers type I and III. Type-IV collagen fibers were seen only around vessels. Focal chronic inflammatory infiltrate with T-lymphocytes, macrophages and a few B-lymphocytes was seen around blood vessels with a peculiar pattern of vascular changes and numerous lymphatics within the endocardium. The superficial myocardium showed borderline myocarditis. RNA and DNA were successfully extracted from 12/36 samples. Infective agents were detected in 6/12 patients; two of them were positive for cytomegalovirus, two for enterovirus, one for both and one for *T. gondii*. No histopathological differences between surgical samples and autopsy fragments were observed. Vascular blush was detected in 9 of the 16 coronary cineangiographies reviewed. Clinicopathological characteristics are associated neither with infective genomes in the endocardium nor with vascular blush.

**CONCLUSIONS:** Results indicate that there is a non specific chronic inflammatory process maintained by an anomalous vascular net rich in lymphatics situated deep within the endocardium. This angiolymphatic web probably contributes to the maintenance of the fibrotic plaque and might be considered an important pathological finding concerning in the pathogenesis of EMF. Histopathological changes as seen in surgical material are diagnostic of EMF. Molecular analysis of the endomyocardium revealed high incidence of cardiotropic infective agents, but their role in the pathogenesis of the disease is still controversial.

## P-201-RESULTS OF OPEN HEART SURGERY IN PATIENTS WITH SICKLE CELL TRAIT OR DISEASE

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**BACKGROUND:** Reduced life expectancy coupled with tendency for complications in patients with sickle cell trait (SCT) or disease (SCD) is believed to negatively affect survival after open heart surgery. This study examined our experience with SCT and SCD patients who underwent a cardiac operation.

**METHODS:** From January 1995 through December 2006, 47 patients with SCT or SCD underwent an open heart operation at our institution. There were 29 males, 18 females with average age of 20 years (range=1 to 46 years). Using institutional database, patient outcomes were analyzed. Clinical and echocardiographic follow-up was complete in all but 3 and it averaged at 46 months (range=0 to 112 months). Current status could only be confirmed in 32 patients.

**RESULTS:** The most common operation performed in this subset of patients was heart valve replacement and repair of a congenital cardiac anomaly. There was no coronary bypass operation. Average weight of the patients were 45 kg (range=8 to 91 kg). Total bypass time was 95 min (range=11 to 231 min) and total ischemia time 69 min (range=15 to 204 min). Postoperative complications included exploration for hemorrhage in 3 patients (6.4%), stroke 2 (4.3%), renal failure 2 (4.3%) and prolonged ventilation 1 (2.1%). Average hospital stay was 8.3 days (range=4 to 27 days). Early (30-day) hospital mortality was 2.1% (1/47). Currently 31 patients (66%) remain alive and free of cardiac symptoms.

**CONCLUSIONS:** In patients with SCT or SCD, heart valve replacement and/or congenital heart operation can be safely performed with acceptable outcomes and survival.

## P-202-LEUKOCYTE DEPLETING FILTERS IN HEART TRANSPLANTATION: A PROSPECTIVE, RANDOMISED CLINICAL TRIAL

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**BACKGROUND:** The mortality after heart transplantation might be associated with leukocyte-mediated reperfusion injury to myocardium. The study examines the efficacy of leukocyte depleting filters in cardiopulmonary bypass in heart transplantation.

**METHODS:** We prospectively randomised 40 patients, undergoing orthotopic heart transplantation, to receive either leukocyte-depleted reperfusion (n = 20), or whole blood reperfusion (n = 20). We used the secondary blood cardioplegia in all patients.

**RESULTS:** The leukocyte-depleted hearts presented lower mitochondrial injury

in postreperfusion myocardial biopsies ( $0.85 \pm 0.75$  vs  $2.65 \pm 0.50$  grade;  $p < 0.001$ ), and reduced intraoperative markers (CK-MB) of reperfusion injury. The leukocyte-depleted hearts showed better spontaneous rhythm resumption ( $60$  vs  $10\%$ ;  $p < 0.001$ ), and lower need for isoprenaline ( $0.02 \pm 0.01$  vs  $0.03 \pm 0.02$  g/kg/min;  $p < 0.05$ ) and epicardial pacing ( $25$  vs  $60\%$ ;  $p < 0.05$ ) for weaning off CPB. Postoperatively, leukocyte depletion cut the need for inotropic support ( $48 \pm 46$ , median =  $35$  vs  $131 \pm 68$ , median =  $109$  hrs;  $p < 0.001$ ), and epicardial pacing ( $6 \pm 14$ , median =  $0$  vs  $25 \pm 52$ , median =  $1$  hrs;  $p < 0.01$ ), which contributed to the shorter intubation time ( $8 \pm 3$ , median =  $7.5$  vs  $14 \pm 12$ , median =  $8.5$  hrs;  $p < 0.05$ ) and shorter stay at ICU. Leukocyte depletion reduced severe humoral rejections ( $20$  vs  $52\%$ ,  $p < 0.05$ ) in post-transplant endomyocardial biopsies. The 30-month mortality was  $15\%$  in both groups.

**CONCLUSION:** The leukocyte depleting filters in heart transplantation reduce significant ultrastructural reperfusion injury, improve post-transplant graft function, and attenuate post-transplant rejection episodes. Leukocyte depletion is the effective, easy, and safe method of myocardial protection.

## P-203-RIGHT-SIDED BOCHDALEK HERNIA IN AN ADULT: REPORT OF A CASE

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**BACKGROUND:** Bochdalek first reported herniation in the posterolateral region of the diaphragm in 1848, referred to as 'Bochdalek hernia'. The hernia defect results in utero from failed closure of the pleuroperitoneal ducts, primitive communications between the pleural and abdominal cavities. It is a common congenital anomaly, occurring in approximately 1 in 2200 to 12,500 live births, but is widely considered to be extremely rare in adults. Most Bochdalek hernias present with life-threatening cardiorespiratory distress in the neonatal period, and emergency surgical repair is usually performed in infants. Right sided Bochdalek hernias are more rare because the right pleuroperitoneal canal closes earlier and the liver buttresses the right hemidiaphragm. Rarely, right sided Bochdalek hernias that remain clinically silent until adulthood. We report a 21-year-old male in whom a right posterolateral diaphragmatic hernia was diagnosed as intrathoracic kidney and colon with Bochdalek hernia.

**METHODS:** We review a case of a 21-year-old male with right-sided Bochdalek diaphragmatic hernia who presented with abdominal pain and dyspnea. Diagnosis is established by definitive conformation by plain chest graphy, and computed tomography (CT) scanning of thorax and abdomen. The patient was underwent a right posterolateral thoracotomy whereby 10-cm posterolateral diaphragmatic defect with herniation of the colon and kidney through the opening was found. At surgery the colon and right kidney were reduced into peritoneal cavity, and diaphragmatic defect was repaired using non-absorbable sutures. The patient's postoperative recovery was uneventful and the patient was well 6 months after surgery without radiographic evidence of recurrence.

**RESULTS:** A Bochdalek hernia may cause life-threatening respiratory distress in the first hours or days of life. The defect can cause respiratory distress or feeding intolerance in later infancy or childhood or may be identified on a radiograph obtained for unrelated reasons in an asymptomatic patient. An emergency surgical repair is usually performed in infants. Congenital right diaphragmatic hernia of Bochdalek rarely occurs in adults and usually is asymptomatic. The physical examination of bochdalek hernia in adults is typically misleading, as in our present patient. The current treatment of choice of a Bochdalek hernia is surgical repair even in asymptomatic cases because of the risk of visceral herniation and strangulation. The open thoracic approach has traditionally been performed in the right-sided Bochdalek hernias because of claimed superior visibility of the ipsilateral hemidiaphragm and the presence of the liver.

**CONCLUSIONS:** Congenital right diaphragmatic hernia of Bochdalek rarely occurs in adults. Its successful management is based on both emergency diagnosis and timely surgical management. Right side thoracotomy produces satisfactory results. Which we recommend as the best chance for a successful outcome.



## **P-204-OBSTRUCTIVE HYPERTROPHIC CARDIOMYOPATHY: STILL GOOD RESULTS WITH OLD FASHIONED SURGERY**

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**BACKGROUND:** Obstructive hypertrophic cardiomyopathy (OHCM) is classically treated with surgical resection, lately less invasive alternatives have been proposed with variable results.

**METHODS:** We collected data of all patients operated on for OHCM January of 1996 to December of 2007. Mean age was 48,56 years, and there were 26 patients, 13 been female. All patients had been submitted to left ventricle out-flow tract (LVOT) muscle resection via trans-aortic approach (Morrow operation). Seven patients received associated procedures. Pre and post-operative echocardiograms were performed in all subjects to evaluate LVOT. Systolic left ventricle-aorta gradient (SLVAG) was between 156 and 30 mmHg in the pre-operative period (mean 105,27). Fourteen patients had mitral regurgitation (MR) varying from minimum to high grade.

**RESULTS:** Systolic left ventricle-aorta gradient was reduced in all patients in the post-operative period (variation 24 - 4 mmHg, mean 14,20). Mitral regurgitation was reduced in ten patients (there were made one mitral valve repair and one replacement). One patient needed permanent pacing, one patient was reoperated on because of post-operative bleeding, and two had aortic valve replacement later due to aortic regurgitation. There were no deaths in our sample.

**CONCLUSIONS:** Surgical treatment of OHCM relieved SLVAG in approximately 85% (mean regression of 89,61 mmHg) showing low incidence of complications and no mortality. Associated conditions were also successfully treated, allowing complete and effective treatment of our patients.

## **P-205-COMPARISON OF OLIGON CENTRAL VENOUS CATHETERS WITH STANDARD IN CARDIAC SURGERY ICU PATIENTS**

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Catheter-related infections account for a large part of all nosocomial infections and clinical studies have suggested that impregnation of catheters with antiseptics or antibiotics could decrease the rates of colonization. The purpose of this study was to assess the efficacy of oligon catheters to reduce bacterial colonization.

**METHODS:** A prospective, randomized clinical study was conducted among patients admitted to our 16-bed CSICU from 1st of Dec. 2006 to 1st of Dec. 2007 and required a central venous catheter after cardiac surgery. A total of 139 patients were prospectively randomized to receive either an oligon (O group, n=69) or a standard catheter (S group, n=70), expected to remain in place for  $\geq$  3 days. Catheter colonization, catheter related blood stream infection and non-bacteremic catheter related infection was defined according to the Center for Disease Control and Prevention. Blood cultures were drawn at catheter removal, and removed catheters were analyzed with quantitative cultures. Catheters were removed aseptically if no longer necessary, patient died or there were signs of sepsis.

**RESULTS:** A total of 69 catheters were studied in the oligon group and 70 in the standard group. Characteristics of the patients, insertion site, duration of catheterization, and other risk factors for infection were similar in the two groups. Catheter colonization 3 (4.35 %) in O vs. 3 (4.28 %) in S groups, failed to reach significance despite the relative long median duration of catheterization of 9 vs. 8 days respectively. When catheter colonization occurred CNS was found most frequently.

**CONCLUSION:** Oligon central venous catheters did not significantly reduce bacterial catheter colonization compared with the standard catheters, or the catheter-related infection rate. This means that usual preventive measures are the cornerstone to control catheter-related infections.

## **P-206-DISASTER MEDICINE: IS IT A CHALLENGE FOR CARDIO-THORACIC SURGEONS?**

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**INTRODUCTION:** The aim of this study is to identify the educational needs of medical personnel working in the Cardiothoracic department in the UHW and whether they would like and/or deem necessary to participate in Disaster Medicine (DM) training. The hospital location was chosen because the primary investigator is affiliated with this hospital.

**METHODS:** Questionnaires were used to identify the extent of the educational needs, the priorities and the willingness to be involved in DM (Disaster Medicine). Questionnaire length was kept to a minimum to maximize the response rate with 15 items relating to the demographics, previous experience and prioritization of needs. The participation was voluntary and we got 21 out of 28 responses.

**RESULTS:** The majority of the doctors do not have formal training in DM 16/21 (76%). Regarding the management of mass casualties, 2/21 (9.5%) were not confident at all, 8/21 (38%) were not very confident and 9/21 (43%) were moderately confident. Only 2/21 (9.5%) were very confident. From the 21 surgeons who participated, only 3 were experienced in mass casualties. Regarding a possibility in involvement in mass casualties, 11/21 (52%) considered the possibility and 9/21 (43%) replied positively. The rest considered no possibility in such involvement. An astonishing 15/21 (71%) were not familiar with Hospital evacuation plan. 10/21 (48%) were interested in getting training in DM, 5/21 (23%) were not interested, 4/21 (19%) said they would consider it as an under-graduate study. 20/21 (95%) of the participants would like to have an ATLS/ALS type course. 8/21 (38%) would like to volunteer in DM type organisation, 8/21 (38%) would consider it and 5/21 (24%) would not be interested. Finally, 16/21 (76%) of participants believe that cardiothoracic surgeons should have training in DM, 4/21 (19%) consider it as possibility and 1/21 (5%) disagree. The priority lies sequentially from highest to lowest in: improvement of knowledge, improvement of clinical skills, maintenance of clinical skills, keeping up to date with new developments in DM, gaining organizational and management experience, obtaining a certificate or diploma in DM, gaining academic research experience in DM.

**CONCLUSION:** DM is an interesting and increasingly expanding field. Medical education and disaster planning are both undergoing changes providing challenging opportunities for collaboration between different disciplines. We believe that cardiothoracic surgeons should receive clinical exposure and relevant training in Disaster and Emergency Medicine as part of their contribution to social needs in times of crisis. As society of cardiothoracic surgeons is often in the forefront of continuously developing medicine we believe there would be a collective benefit in such participation. Finally, early training in DM encourages a sense of responsibility and increases the number of volunteers for the response system in a crisis situation.

## **P-207-SURGICAL RESECTION OF VENTRICULAR FIBROMA IN AN ADULT**

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**BACKGROUND:** Cardiac Fibromas are benign tumors that usually present as a murmur in infancy. They are rare and most of them are diagnosed in infants or children younger than 10 years. We present a case of a 35-year-old lady with a previously undiagnosed left ventricular fibroma, who underwent successful surgical resection.

**METHODS:** A 35-year-old Caucasian female was admitted for investigation with an episode of collapse on exertion. Her history revealed chest pain, palpitations and worsening exertional shortness of breath for a year. Cardiac MRI demonstrated a 7 by 5 cm intramural mass in the region of the left ventricular apico-lateral wall. The radiological differential diagnosis included left ventricular fibroma, hydatid disease and tripanosomiasis. No raised inflammatory markers were reported and serology results were negative for T. Cruzi and Hydatid disease. Surgery was performed through a median sternotomy, under cardiopulmonary bypass. The 7 by 5cm mass was confirmed in the wall of the left ventricle. The mass was entirely intramyocardial and was not entering left ven-

tricular cavity. Macroscopically, mass had the appearance of a fibroma. A frozen section was sent and the diagnosis was confirmed. The mass was approached through two left ventriculotomies, one anteriorly and one on the lateral wall. The mass was completely resected taking care not to breach the endocardium and epicardial layers.

**RESULTS:** The patient was separated from CPB without difficulties, and the postoperative course was entirely uncomplicated. Patient was discharged on 8th postoperative day and remained well on a clinic review six weeks after the operation. Transthoracic echo showed only a small haematoma at the area of the resection.

**CONCLUSION:** Surgical resection of left ventricular fibromas in adult patients may represent a significant surgical challenge. Our case demonstrates that aggressive surgical resection, utilising more than one ventricular incisions if necessary can produce in a good outcome.

## **P-208-COMPARISON BETWEEN ASSESSMENT OF PULMONARY ARTERY PRESSURE WITH ECHOCARDIOGRAPHY AND CATHETERIZATION IN PEDIATRIC PULMONARY HYPERTENTION**

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**BACKGROUND:** Continuous-wave Doppler echocardiography was used to estimate the pulmonary artery pressure by measuring the pulmonary regurgitant flow velocity in 41 patients with pulmonary hypertension (mean pulmonary artery pressure > 25 mmHg). The pulmonary regurgitant flow velocity patterns, characterized by a rapid rise in the flow velocity immediately after the closure of the pulmonary valve and gradual deceleration until the next pulmonary valve opening, were successfully obtained in 30 of the patients (73%). The peak of Doppler determined that pressure gradient during diastole correlated with the mean pulmonary artery pressure ( $r=74\%$ ). In addition the Doppler-determined that the gradient at end-diastole correlated with the catheter measurement of the pressure gradient ( $r=69\%$ ). Introduction and Objective: Cardiac catheterization is the gold standard for the measurement of the pulmonary artery (PA) pressure. Be that as it may, as it is an invasive and expensive procedure which requires the hospitalization of the child, attempts have been made to utilize other diagnostic techniques, such as continuous wave Doppler echocardiography. The purpose of this study was to examine the detection rate of pulmonary regurgitation with continuous wave Doppler echocardiography and to estimate the PA pressure by analyzing the flow velocity patterns of pulmonary regurgitation.

**MATERIALS AND METHODS:** For 1.5 years, from April 2000 to September 2001, at the pediatric ward of Rajaei Heart Hospital, 41 (43.3% female, 56.7% male) patients at a median age of 2.1 years were evaluated (mean pulmonary artery pressure > 25 mmHg). Pulmonary regurgitant flow velocity was seen in 30 patients (73%). Cardiac catheterization was performed for each patient, and the pressure gradient between the right ventricle and the pulmonary artery was measured at the beginning and at the end of diastole using continuous wave Doppler echocardiography and simplified Bernoulli equation ( $PG=4V^2$ ). The data of the catheterization and echocardiography were compared with each other.

**RESULTS AND CONCLUSION:** The results of this study are as follows: 1-Among the 41 qualified patients, 30 cases (73%) showed pulmonary insufficiency during diastole. Therefore, the absence of pulmonary insufficiency (PI) in a patient is not synonymous with a normal PA pressure; and in these cases, other echocardiographic techniques must be used. 2-There is no significant difference ( $P>0.2$ ) between the mean PA pressure measured by catheterization and that measured by Doppler echocardiography. Consequently, Doppler echocardiography can be used in the assessment of the mean PA pressure. It must, however, be noted that this technique does not have a high correlation coefficient ( $r=74\%$ ); and in the cases that the PI velocity is not seen, another echocardiographic technique must be employed for the evaluation of PA pressure. 3-End-diastolic PA pressure measured by catheterization shows a significant difference from that measured by Doppler echocardiography ( $P<0.009$ ,  $r=0.69\%$ ). Even after the summation of the mean right atrial pressure with the difference between the right ventricular end-diastolic pressure and PA pressure, the difference between the measurement by echocardiography and that by catheterization is significant ( $P=0.002$ ,  $r=69\%$ ). As a result, the use of Doppler echocardiography in the measurement of end-diastolic pressure is not recommended. R: Correlation Coefficient PA: Pulmonary Artery PI: Pulmonary Insufficiency RV: Right Ventricle

## **P-209-ENDOVASCULAR REPAIR OF TYPE III ENDOLEAK. EXPERIENCE IN THREE CASES**

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**AIM OF THE STUDY:** We present 3 patients with Infra renal Abdominal Aortic Aneurysm (AAA), who underwent endovascular repair. Type III endoleak was detected on follow-up period.

**METHODS:** All the patients were males and had a symptomatic aneurysm considered suitable for endoluminal therapy. Case 1: A 59 years-old patient with a 6,2 cm of diameter AAA was treated with a Lifepath (Edwards) bifurcated stent graft. A type I endoleak was detected at 1 month follow-up, and was successfully treated by a Zenith (Cook) proximal extension. After 4 years, a type III endoleak was observed on a CT-scan, because of distal migration of the previous bifurcated graft. A Talent (Medtronic) aorto-uniiliac prosthesis was implanted, with contralateral iliac occlusion and femoro-femoral bypass. The leak was corrected. Case 2: A Zenith (Cook) bifurcated endoprosthesis was implanted in a 80 years-old patient who had a 6 cm of diameter AAA. After 5 years, disconnection and distal migration of both iliac grafts was observed on a CT-scan. The type III endoleak was successfully treated with bilateral iliac extensions. Case 3: A 78 years-old patient with a 6,3 cm of diameter symptomatic AAA underwent endovascular repair with a Zenith (Cook) bifurcated graft. At 2 years follow-up, a Thoracic Aneurysm and a type III endoleak at iliac gap were detected. The thoracic aneurysm was treated with a Relay (Bolton Medical) stent graft prosthesis and the leak was sealed with an iliac extension.

**CONCLUSIONS:** Type III endoleaks are less common than others, but when detected, they must be treated because the risk of aneurysm rupture is highly increased. The endovascular approach appears to be the treatment of choice with satisfactory results.

## **P-210-EARLY RESULTS OF LEFT VENTRICULAR ANEURYSMECTOMY IN PATIENTS WITH EJECTION FRACTION OF 30% OR LESS**

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**BACKGROUND:** Left ventricular aneurysmectomy is a surgical technique to overcome the dyskinetic malfunction of the heart after myocardial infarction. Controversy still exists regarding the optimal surgical technique for postinfarction dyskinetic left ventricular aneurysm repair. The aim of this study is to evaluate the results of two specific surgical techniques (linear versus circular) in patients with severely depressed pump function as well as the influence of revascularization in left ventricular aneurysmectomy.

**METHODS:** Between 1995 and 2006, 73 patients (21 women, 52 men) with severe left ventricle dysfunction, were operated on for post-infarction left ventricular aneurysm. 24 patients underwent linear repair (group A) and 49 circular patch repair (group B). Preoperative and postoperative left ventricular ejection fraction and early mortality were studied. Retrospective analysis of medical files and preoperative and postoperative echocardiographic results was done. A multivariate regression analysis was done to determine variables associated to ejection fraction changes.

**RESULTS:** Mean perioperative follow-up was 182,69 days (Range 7-215 days). Mean age was 67,77 $\pm$ 10,80 (30-83). All aneurysms were anterior. The ejection fraction increased from 24,17 $\pm$ 6,01% to 37,71 $\pm$ 7,98% in group A and from 24,22 $\pm$ 6,22% to 42,11 $\pm$ 7,14% in group B. All patients underwent concomitant coronary artery bypass grafting; The left anterior descending coronary artery was revascularized in 17 patients of group A (70,80%) and 36 of group B (73,50%); 7 patients of group A (29,20%) and 4 of group B (8,20%) suffered of low cardiac output syndrome. Hospital mortality in group A was 12,50%, in group B was 8,16%. 6 months survival was 79,20% in group A and 89,80% in group B. Adjusting for age, gender, surgical technique, preoperative ejection fraction, revascularization left anterior descending coronary artery and New York Heart Association class in a multivariate linear regression model, was observed that independent variables in the prediction of ejection fraction increase were gender (male,  $p<0.05$ ) and surgical technique ( $p<0.05$ ).

**CONCLUSION:** Increased of ejection fraction and short-term survival was higher after circular patch repair with concomitant coronary artery bypass grafting

of postinfarction left ventricular anterior aneurysm in patients with ejection fraction of 30% or less. Gender (male) is an independent variable in the prediction of ejection fraction increase ( $p < 0.05$ ).

### P-211-SUTURELESS REPAIR OF ACUTE LEFT VENTRICULAR WALL RUPTURE WITHOUT CARDIOPULMONARY BYPASS

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**BACKGROUND:** Acute left ventricular (LV) wall rupture is a rare complication of myocardial infarction but carries a high mortality. Surgical repair is conventionally performed with the use of cardiopulmonary bypass (CPB) and involves infarctectomy with or without a prosthetic patch. This technique is associated with a high morbidity and mortality. We describe a case of acute LV rupture successfully operated upon without CPB by applying a pericardial patch over the ventricular rupture in a sutureless fashion.

**METHODS:** A 68-year-old man with no previous cardiac disease presented with a 2-day history of central chest pain. Electrocardiogram and measurement of cardiac enzymes confirmed a posterolateral myocardial infarction. In view of the delayed presentation, no thrombolysis was attempted. Acute haemodynamic instability was observed the following day and transthoracic echocardiogram demonstrated a pericardial effusion, moderate LV dysfunction with posterolateral hypokinesia and appearances highly suspicious of LV rupture. CT-scan of the chest confirmed blood in the pericardial cavity. Emergency surgery was undertaken via a median sternotomy. A large amount of blood and clot was removed from the pericardium with immediate haemodynamic improvement. A large recent myocardial infarction was identified involving the obtuse margin of the heart. Persistent bleeding was seen through the middle of the infarcted area. Surgery was performed without CPB with the patient in Trendelenburg position to facilitate elevation of the cardiac apex and access to the ruptured area. A 10 cm bovine pericardial patch was applied over the ventricular defect in a sutureless fashion using Cryolife glue. A large piece of fibrillar was applied over the patch to enhance haemostasis. A brief period of arrhythmias following manipulation of the heart resolved spontaneously and good haemodynamic performance was achieved using a dopamine infusion and an intra-aortic balloon pump (IABP).

**RESULTS:** Postoperative recovery was uneventful and the IABP and inotropic support were discontinued on the 2nd postoperative day. A pre-discharge trans-thoracic echocardiogram did not show any leak of blood across the ventricular repair. There was minimal pericardial effusion and moderate left ventricular ejection fraction with no valvular abnormalities. Three months after the procedure the patient was readmitted due to ventricular tachyarrhythmia and an implantable cardioverter defibrillator was inserted by the cardiologist. On 6 months follow up patient was feeling well and a repeat echocardiogram showed moderate LV dysfunction with akinetic posterolateral walls, normal valves and no pericardial effusion.

**CONCLUSIONS:** This case demonstrates that LV free wall rupture after myocardial infarction can be repaired without the use of extra-corporeal circulation using the sutureless technique with glue and pericardial patch. This case and other previously described cases suggest that this is a simple and efficient technique for surgical repair of this difficult condition and may lead to a superior outcome.

### P-212-NT BRAIN NATRIURETIC RELATED PEPTIDE AS A PROGNOSTIC BIOCHEMICAL PARAMETER IN CARDIAC SURGERY

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**BACKGROUND:** Our aim was to evaluate NT-proBNP levels in patients undergoing CPB with regard to their clinical characteristics before surgery and the outcome after surgery.

**METHODS:** We examined NT-proBNP levels of 55 patients (45 men and 10 women). NT-proBNP measurements were carried out preoperatively, 10 min after ischemia, and once every day until the 5th postoperative day. We measured postoperative patients' data (haemodynamic status, inotropes) and com-

pared them to NT-proBNP levels.

**RESULTS:** Preoperative NT-proBNP levels were higher in patients with previous history of myocardial infarction ( $P = 0.0045$ ) and low ejection fraction (30-40%) ( $P = 0.0001$ ). Preoperatively no relationship was found between type of surgery or other patients' characteristic. After surgery, NT-proBNP levels started increasing until the fifth day and then started decreasing. Higher levels were noted in high risk patients (higher score in Euroscore classification, worse NYHA class) and in those requiring inotropes after surgery.

**CONCLUSIONS:** Preoperative NT-proBNP levels seem to constitute a valuable predictive factor in patients with worse NYHA class and Euroscore and they increase after cardiac surgery. Patients with higher preoperative NT-proBNP levels made use of higher doses of inotropes. There was no relationship between NT-proBNP levels and complications.

### P-213-HEART TUMORS - 37 YEARS OF EXPERIENCE IN 121 PATIENTS

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**BACKGROUND:** With the development of modern diagnostic tools and surgical techniques the relevancy of cardiac tumors basically changed. Whereas in the fifties of the last century these findings mostly exclusively were "diagnosed" by the pathologist, today most of these patients can successfully be treated surgically.

**METHODS:** We evaluated retrospectively 121 patients which were treated because of cardiac tumors in our center from may 1970 until august 2007 concerning age, gender, diagnosis, surgical treatment and outcome.

**RESULTS:** In our center 0.36 % of all operations with heart lung machine were due to cardiac tumors. Primary cardiac tumors were found in 76% whereof myxomas represented 89,1 %. Additionally there were six more benign tumors (two lipoma, two rhabdomyoma, two papillary fibroelastoma) and four malignant tumors (three rhabdosarkoma, one malignant histiocytoma). These four patients all died in the follow up period. In 24 % there were secondary tumors of the heart, whereas ten were metastasis of other primary carcinoma (two melanoma, two renal tumors, three lung tumors, two malignant thymoma, one breast carcinoma). All patients died in the follow up period. In 15 cases thrombotic material was found, in five cases no diagnosis could be achieved.

**CONCLUSION:** Our experiences comply with the literature concerning frequency and allocation of the different types of cardiac tumors. While surgical treatment of benign primary and secondary cardiac tumors is very successful and can achieve a healing of these patients, this therapy option in malignant tumors of the heart can only be a palliative treatment.

### P-214-PRIMARY CARDIAC RHABDOMYOSARCOMA OF THE RIGHT ATRIUM: CASE REPORT

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Rhabdomyosarcoma is a rare malignant tumor of the heart and it accounts for 20 % of all primary malignant neoplasms of the heart. Symptoms differ in accordance with the location of the mass; unfortunately, by the time the patient becomes symptomatic, the tumor is metastasized to other organs. Diagnosis is frequently obtained by transthoracic or transesophageal echocardiography and nuclear magnetic resonance imaging. Surgery is indicated for cardiac malignant neoplasms to relieve cardiac symptoms and prolong survival of the patient. Subsequent postoperative chemotherapy or radiotherapy is necessary and long-term prognosis is poor. In this paper, we present a case of primary cardiac rhabdomyosarcoma, arising from the lateral wall of the right atrium and needed permanent cardiac pacemaker implantation after surgery.

**INTRODUCTION:** Primary cardiac malignant tumors are rare. They occur with an incidence of 0,001-0,28 % and 25 % of them are malignant (1). Rhabdomyosarcoma accounts for almost 20 % of all primary malignant neoplasms of the heart. It is usually localized in the ventricular walls, interventricular septum (2) and the right atrium (3). Symptoms differ according to the location of the mass. In adults, it sometimes mimics atrioventricular valve stenosis if it arises from the atrial walls. It is also associated with poor prognosis; due to diagnostic delay, therapeutic difficulty, and high metastatic potential. In this paper, we report a case of right atrial rhabdomyosarcoma which presented with dys-



pnea and chest pain.

**CASE REPORT:** A 50 year old man was admitted to our hospital because of exertional dyspnea and chest pain with a history of 15 days. Physical examination, routine blood tests and chest radiography were performed and all were nonspecific. Blood pressure was 110/70 mmHg, and heart rate was 88 beats/min. Transthoracic echocardiography revealed an echogenic mass of 3.2x2.4 cm in size at the lateral wall of the right atrium. Computed tomography (CT) and nuclear magnetic resonance imaging (MRI) showed the origin of the mass was the lateral wall of the right atrium (Figure 1). Positron Emission Tomography (PET) scan revealed the malignant potential of the mass but other lymph node or organ metastasis were negative. Coronary angiography was performed because of the patient's history of chest pain and showed isolated noncritical stenosis of the circumflex coronary artery. The patient was prepared for surgery. Operative Technique The median sternotomy was performed and pericardium was distended. A large cardiac mass (4x5x9 cm) was detected on the right atrium, infiltrating the sinus node. Moderate systemic hypothermia (32°C), antegrade and retrograde cold blood cardioplegia were used for myocardial protection. The mass was solid, encapsulated, and irregular (Figure 2). The mass was completely excised with a large atrial tissue and the sinus node. The right atrium was reconstructed with a dacron graft in its anatomical shape. Temporary cardiac pacing leads were placed. Cardiopulmonary bypass (CPB) time was 77 minutes and aortic cross-clamp time was 52 minutes. The patient easily weaned from CPB and was transferred to the intensive care unit (ICU) without significant inotropic support. He was extubated 9 hours after the surgery. He was discharged from the ICU on the first postoperative day with temporary cardiac pacing. Microscopic analysis revealed fusiform tumor cells with pleomorphic nuclei. Monoclonal antibody tests (positive for desmin, vimentin and muscle actin) confirmed the histologic diagnosis of rhabdomyosarcoma (Figure 3). A permanent cardiac pacemaker was implanted to the patient on 18th postoperative day and he was discharged from the hospital on 21st postoperative day for subsequent oncologic treatment.

**DISCUSSION:** Primary malignant tumors of the heart are rare. Twenty five percent of cardiac neoplasms have malignant potential (1). These tumors mainly arise from the ventricular walls and deteriorate the valvular function (2). Sometimes, they arise from the atrial walls in adults (3). Angiosarcomas generally originate from the right side of the heart, usually from the right atrium. The tumor was localized on the right atrial wall in our patient. The diagnosis is frequently confused with pericardial inflammatory disease because of pericardial involvement (4). Like other sarcomas, rhabdomyosarcoma is very aggressive. Patients are often presented with cardiac failure. By the time cardiac symptoms become evident, metastatic lesions are usually diffuse. Prognosis is very poor, patients usually survive less than 1 year in spite of excision of the primary tumor and subsequent radiation and chemotherapy (5). Transthoracic and transesophageal echocardiography can be used to determine the localization, size, shape, attachment site, and mobility of the tumor (6,7). Computed tomography and MRI is more beneficial to define the nature of the mass (5). Coronary angiography can be performed to exclude coexisting coronary artery disease. In our patient, all of the diagnostic imaging techniques were used. Also, PET scan did not reveal any metastasis and gave information about the expected survival of the patient. Microscopy and immunomorphology diagnosed malignant rhabdomyosarcoma. Surgery is indicated for cardiac malignant neoplasms to relieve symptoms of acute heart failure and to prolong survival of the patient (8,9). In the presented case, the tumor was completely removed, the right atrium was anatomically reconstructed, and cardiac rhythm was established with a permanent cardiac pacemaker, and the oncologic treatment has been initiated. As a result; rhabdomyosarcoma is an aggressive malignant cardiac tumor, surgery is indicated to relieve cardiac symptoms and to prolong survival, echocardiography and nuclear magnetic resonance imaging are beneficial for diagnosis, PET scan can be performed to detect potential metastasis, subsequent oncologic treatment is necessary, and finally; if the sinus node is infiltrated and excised during the surgery, permanent cardiac pacing is indicated.

## P-215-MODIFIED SUTURE OF INFECTED WOUND AFTER HEART SURGERY

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**BACKGROUND:** Wound infection after heart surgery develop in 0.1 - 4.0% of patients. It generally accepted that the success of treatment of this serious complication is determined by optimal antibiotic therapy, timely performed surgical intervention and management of primary pathology. However, greater

attention to duration of the treatment, patient's quality of life during and after the treatment is currently paid. The esthetic result of the treatment is important, also. We started to perform a modified method of wound suture, resulting in better alignment of the tissues, decreased impairment of tissue microcirculation and pain, better esthetic result.

**METHODS:** A total of 24 patients with infected wounds after heart surgery underwent this method of treatment. These patients included 8 patients with superficial wound infection (33.3%), 12 - with sternal (50%) infection and - 4 with mediastinitis (16.7%). The age of patients ranged from 59 to 71 years. None of them suffered from diabetes mellitus or other metabolic diseases. The patients underwent debridement of the wound and flushing with antiseptic solutions, the edges of the renewed. In the event of mediastinitis the drain under the sternum was inserted, the sternum was fixed by means of wire sutures and the tissues superior to the sternum were drained. In other subsets of patients the tissues superior to the sternum were also drained. The running suture of monofilament prolene 0 - 0 or 2 - 0 is begun by means of a knot above the skin, and then circularly involves muscles, fascias and subcutaneous tissue; this suture is finished supracutaneously by a knot. The lengths of this segment vary from 5 to 8 cm. The skin is sutured intracutaneously by means of monofilament 5 - 0, 4-0 prolene. The sutures are removed after 10 - 14 days.

**RESULTS:** The treatment using this method resulted in convalescence without re-operation. The patients experienced less pain and discomfort. The better esthetic result was achieved, also. Infectious complications after heart surgery remain an unsolved problem, influencing greater mortality and morbidity, greater treatment related expenses and decreased quality of life even after successful treatment. We suppose that our method of suture is less traumatic, improves healing, reduces pain and has better esthetic effect.

**CONCLUSIONS:** The closure of infected wound after heart surgery by means of circular and intra-cutaneous suture is an optimal method and may be used more frequently.

## P-216-STATINS FOR AORTIC VALVE STENOSIS: WHERE DO WE HEADED

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**BACKGROUND:** Calcific aortic stenosis is a progressive disease which has common characteristics with atherosclerosis, including hypercholesterolemia. This disease is affecting an increasing number of people in developed countries. There is no known medical treatment to prevent or slow progression. This disease leads to aortic valve replacement when stenosis becomes severe and symptoms develop. The growing number of valve replacement procedures is a burden on health care. The role of lipid-lower therapy is debated whether statins could inhibit aortic valve calcification and therefore slow the progression of aortic valve stenosis. An analysis of the reported studies [retrospective, randomized controlled trials (RCTs), meta-analyses] was conducted to establish if statins really slow the progression of aortic valve stenosis.

**METHODS:** A comprehensive search of retrospective, RCTs and meta-analyses, evaluating if there is a correlation between treatment with statins and calcific aortic stenosis, was conducted in Medline, Embase and Cochrane Trials Register. The following characteristics were assessed: the method of follow up (echocardiography, electron beam computed tomography or computed tomography), the mean duration of follow up, the number of patients, the baseline characteristics of the patients enrolled (demographic data, concurrent diseases such as hypertension, diabetes, coronary artery disease), mean total cholesterol and mean LDL cholesterol. The main parameter of interest that showed the effect of statins on disease progression was the peak aortic-jet velocity (decrease or not decrease in aortic valve area).

**RESULTS:** Six retrospective trials, two RCTs and no meta-analysis were retrieved. We identified the studies where the above parameters were reported. The method that was used for follow up was echocardiography, electron beam computed tomography and computed tomography. The main parameter of interest was the peak aortic-jet velocity. The mean duration of follow up varied from 21 months to 44 months. The number of patients had a range from 65 to 242 patients. In every retrospective study the patients who received statins were less than the half of the patients enrolled in the study. Demographic data, concurrent diseases and parameters such as mean total cholesterol and mean LDL-cholesterol were similar. The range of peak aortic-jet velocity was from 2.65 to 3.96 m/sec. The six retrospective trials described a lower rate of progression of aortic stenosis with the treatment of statins. The SALTIRE trial (RCT) showed that intensive lipid-lowering did not halt the progression of calcific aortic stenosis.



sis or induce its progression. But the RAAVE trial (RCT) slowed the hemodynamic progression of aortic stenosis.

**CONCLUSION:** There are no evidence that statins are justified for a stenotic aortic valve. There were differences in the design of the studies, the inclusion criteria, and the indications of the treatment with statins in the studies evaluated. Long-term, large-scale, randomized controlled trials have been designed (SEAS study and ASTRONOMER trial) and are now conducted for establishing the role of statins in patients with calcific aortic stenosis and are going to answer questions such as: which patients should we treat or not and should we initiate the therapy early in the course of the disease or not.

### **P-217-APICOAORTIC CONDUIT: AN ALTERNATIVE TO AORTIC VALVE REPLACEMENT IN SEVERE AORTIC STENOSIS WITH PORCELAIN AORTA**

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**BACKGROUND:** Apicoaortic conduit is the construction of a vascular graft containing a prosthetic valve from the apex of the left ventricle to the descending thoracic aorta. It is an alternative to conventional aortic valve replacement in selected high-risk patients, mainly those with complex reinterventions, porcelain aorta, mediastinal radiation or small aortic annulus. We report our recent clinical experience.

**METHODS:** 2 patients (79 years old male, 78 years old female) with severe aortic stenosis had insertions of an apicoaortic valved conduit because of a porcelain aorta. They were in New York Heart Association class III before surgery. Conventional valve replacement had very high risk of atheroembolic events or inability to close the aorta. The patients underwent a standardized preoperative workup that included transesophageal echocardiography, cardiac catheterization, and multislice computed tomography. Operations were performed through a left thoracotomy, on pump and beating heart. A graft with side branch, which was later used for arterial inflow from the heart-lung machine, was sewn to the descending aorta during side clamping. An apical connector (Medtronic) was anastomosed to a valved conduit incorporating a 22-mm (male) or 18-mm (female) bioprosthesis (Hancock, Medtronic). Cardiopulmonary bypass was initiated with the graft attached to the descending aorta for arterial access and right femoral vein for venous access. The apex was exposed, and pledgeted monofilament sutures placed in a circumferential fashion about the location of the proposed ventriculotomy. The sutures were passed through the collar of the connector, and the connector was lowered toward the heart. During insertion of the apical connector, the heart was transiently paced at 200 beats per minute to minimize blood loss. A stab wound was performed and the tip of the coring device was pushed into the left ventricle. By using the trocar blade, a core of ventricular muscle was removed, and the connector was quickly slid into place. The interrupted sutures were securely tied. Finally, the valved conduit and the graft attached to the descending aorta were anastomosed and the flow was established in the conduit.

**RESULTS:** There were no hospital deaths. No patient suffered perioperative neurological complications. A patient had a thoracic empyema. Postoperative echocardiography confirms excellent apicoaortic conduit function with preservation of ventricular ejection performance, low gradient over the valved conduit and a hardly detectable antegrade flow through the stenosed valve. Computed tomography showed adequate positioning from the apex of the left ventricle to the descending thoracic aorta without evidence of any apical anastomotic complications. Both patients are in New York Heart Association class I and no thromboembolic events have been observed at follow-up 14 and 9 months postoperatively.

**CONCLUSIONS:** Apicoaortic conduit is an alternative to conventional aortic valve replacement in patients with severe aortic stenosis in the presence of a severely calcified ascending aorta. This method avoids manipulation of the ascending aorta and diminishes the incidence of perioperative neurological complications in a group of patients at very high risk for stroke.

### **P-218-EARLY RESULTS OF COMBINED AORTIC VALVE REPLACEMENT AND CORONARY ARTERIES BYPASS GRAFTING USING DIFFERENT METHODS OF MYOCARDIAL PROTECTION**

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**BACKGROUND:** To examine the early results of combined operations of aortic valve replacement (AVR) and coronary arteries bypass grafting (CABG) using different methods of myocardial protection.

**METHODS:** Since May, 1997, to December, 2006, 112 patients (78 (69,6%) males, 34 (30,4%) females, mean age 61,8±8,2 years, range: 42 to 79 years) underwent combined operations of AVR and CABG. Mean cross-clamp time was 105,4±28,3 minutes, mean bypass time was 157,2±50,1 minutes. We used artificial valves "MedEng", "St. Jude Medical" and "Carpentier-Edwards". Mean number of distal anastomoses was 2,1±0,9 (range: 1 to 4). 58 (51,8%) operations performed using cold crystalloid cardioplegia (group I), 25 (22,3%) - cold blood cardioplegia (group II) and 29 (25,9%) - warm blood cardioplegia (group III).

**RESULTS:** Overall hospital mortality was 8,0% (9 patients). In group I died 5 patients (8,6%), in group II - 3 patients (12,0%) and in group III died one patient (3,4%). 23 (39,6%) patients from first group, 9 (36,0%) patients from second and 3 (10,3%) patients from third group, respectively, suffered from low cardiac output syndrome. Atrial fibrillation postoperatively was recognized in all groups - in group I and II in 45,5% and 40,0% cases, respectively, and in group III only in 27,5% cases. Only patients from first and second group suffered from neurological complications, no neurological complications were diagnosed in third group. Mean ICU stay among patients from third group was lower than in other groups (1,9±1,5 days). Mean ICU stay among patients from group I was 3,0±2,8 days, among patients from group II - 2,5±2,3 days.

**CONCLUSION:** Using of warm blood cardioplegia decreases hospital mortality and risk of post-operative complications after combined operations.

### **P-219-INFORMATION NEEDS OF CABG PATIENTS CONCERNING THEIR MEDICATION AND DISEASE**

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**OBJECTIVE:** The aim of this explorative survey among patients with CHD was to investigate patients' information needs concerning their disease and medication. Furthermore several laboratory parameters (cholesterol, blood pressure, HbA1c) and the medication on admission were analysed.

**METHODS:** The survey included twenty patients after CABG with at least one of the following risk factors hypertension, hyperlipidaemia or diabetes mellitus. The anonymous questionnaire was distributed prior to discharge and collected data with regard to the patients' knowledge and information needs. The mean age was 60.7 (±8.9) years.

**RESULTS:** The information demand was highest in terms of basic principles of CHD, its risk factors and possible means to improve them. With regard to drug-related information patients were most concerned about the correct dosing time and potential drug interactions. Only few patients achieved the target values of the national guideline for diagnosis and treatment of CHD (German Society of Cardiology, 2003). The average number of prescribed drugs on admission was 6.3 (±2.2).

**CONCLUSIONS:** The results showed that patients with CHD have a considerable need for information about their disease and medication. An analysis of preoperative laboratory parameters indicates an alarming lack of control of the main risk factors despite patients taking more than six drugs on admission. Poor adherence to drug therapy is one possible explanation for these disappointing results. Therefore, an increased adherence to the ongoing therapy achieved by a systematic improvement of patients' knowledge can optimise the treatment of patients with CHD.

## **P-220-CARDIAC TUMOR REPRODUCING CONGENITAL CARDIOPATHY**

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**BACKGROUND:** According to Mc Allister, the primary tumors of the heart are infrequent, happening in 0,0017 to 0,03 percent of the necropsies in different series. The malignant tumors constitute less than a fourth of the told cases, and among these the angiosarcoma is the more common histological type. It is neoplasia of great invasiveness and precocious metastasis, with medium survival from four to ten months. The primary angiosarcomas of the heart (APC) are located at right atrium in 93 percent of the cases, with precocious invasion of the vena cava, tricuspid valve or pericardium. Metastasis, in general is precocious and disseminated, it happens in 89 percent of the cases, attacking more the lungs, liver, lymph nodes and bones. They happen in adults from the 2nd to 7th decades, on average to the 40 years of age, preferentially in the masculine sex, with abrupt beginning and fast progression; obstructive manifestations or cardiac tamponade. They frequently prevail associated to systemic feverish square.

**METHODS:** Study of case report type.

**RESULTS:** A 19 years-old-female with primary right atrial angiosarcoma partially obstructing the tricuspid valve, developed severe hypoxemia due-to-right to left shunting through a patent foramen ovale. This is the first report of such a clinical situation with this type of tumor. A complete resection of the tumor was attempted, and the right atrium had to be rebuilt with a bovine pericardial patch. Postoperative cranial, thoracic and abdominal CT scans and bone scintigraphy did not show metastatic spread. Chest radiation therapy was started on the third postoperative week. Chemotherapy was not used. The patient died a few months after surgery due to disseminated metastatic disease but no evidence of the tumor was found in the necropsy examination of the heart.

**CONCLUSIONS:** The approach of the heart tumor with use of extracorporeal circulation was accomplished for the first time in 1955, when Craaford extirpated an atrial myxoma. Rossi et al, in 1976, accomplished the first resection of APC under perfusion. Total or partially resection of the tumor, associated with radiates and/or chemotherapy, results in survival of  $10,6 \pm 10,3$  months. As in our patient, other cases treated with removal of the primary tumor following by chemotherapy or local radiotherapy and chemotherapy died for disseminated metastasis, but without recurrence of the neoplasia in the heart. Cleveland Clinic experience suggests that radio or postoperative chemotherapy has little effect on the survival in the primary malignant tumors of the heart. However, the behavior of APC, with precocious and disseminated appearance of metastasis didn't detect before, the surgical approach, and the possible paper of the extracorporeal circulation and the manipulation in the spread of the disease, have been taking us to suggest institution of chemotherapy in the perioperative, associated with the widest resection possible and postoperative radiotherapy. For make possible that tactics type remains to establish no invasive methods, as the magnetic resonance, that can come allow a better discrimination of the cardiac tumors type preliminary to the surgical approach.

## POSTER SESSION III

### P-221-SECONDARY PREVENTION AFTER BYPASS HEART SURGERY IN GREECE: HOW PLEASED CAN WE BE?

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**BACKGROUND:** The aim of the study is to evaluate the level of secondary prevention after bypass heart surgery in Greece.

**METHODS:** We prospectively included in the study 750 heart-operated patients admitted to/ or examined for any reason in 3 medical and 3 surgical departments in Greece during the period 2004-2006. We controlled their basic biochemical markers and also checked them for compliance to the standard pharmacologic regimen and for their health-associated life habits.

**RESULTS:** We noticed a suboptimal level of prevention as far as compliance to the standard medication is concerned. The most received drug was acetylsalicylic acid, (75,6% of the patients), followed by b-blockers, (65,6%), statins (44,7%) and ACE-inhibitors (37,8%). On the contrary, secondary prevention was satisfactory in regard to the adoption of a low fat diet (86,5%) and abstinence from smoking (85,4). Female patients seemed to have a better level of prevention as far as these last two parameters are concerned. Diabetic patients appeared to be well adjusted to their special medication. Patients with perfect adjustment had significantly better blood pressure values and biochemical test results than the rest of the patients.

**CONCLUSION:** Secondary prevention for heart-operated patients is at a relatively satisfactory level in Greece, but steps towards improvement still need to be done.

### P-222-THIRD RECURRENCE OF CARDIAC MYXOMA, LEFT VENTRICULAR AND LEFT ATRIA IN A YOUNG PATIENT. A CASE REPORT

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We report the case of a 23-year-old female with a third recurrence of cardiac myxoma. Her first diagnosis was at the age of 17 years, when cardiac tumors were withdrawn from her left atrium. Her first recurrence was at the age of 21 years, when tumors were removed again from the left atria. After two years the transthoracic and transesophageal echocardiography showed a small tumor in left atrium in the interatrial septum, close to the superior vena cava, and another tumor 2-3cm larger in the apex of the left ventricle. The patient was referred to surgery, in which myxomas were removed from the left atrium and left ventricle. The postoperative period was uneventful.

### P-223-ROUTINE IMMEDIATE EXTUBATION OF PATIENTS UNDERGOING OPCAB SURGERY IN THE COMMUNITY HOSPITAL SETTING

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**BACKGROUND:** We evaluated the evolution of techniques that allowed immediate extubation (IE) versus postoperative extubation (PE) in the majority of patients > 70 y.o. undergoing OPCAB at a community hospital.

**METHODS:** All patients > 70 y.o. undergoing OPCAB during a 2 year period were evaluated (112 patients). A number of techniques were utilized to minimize perioperative pain. Patients were divided into 2 periods: Implementation phase (12/1/03-7/31/04); Adoption phase (8/1/04-12/31/05). We compared

STS risk and postoperative course in IE, PE and reintubated patients.

**RESULTS:** Implementation phase: 24/51 patients (47%) had IE. Average age=77. STS risk in IE versus PE group was 3.55% versus 4.19%. Reintubation occurred in 5/24 IE patients (20.3%) versus 3/27 PE patients (11.1%). Reintubated IE patients were more likely to have CHF and DM, but their STS risk was not significantly different (3.8%). The mean LOS was 18.6 days in this group. Adoption phase: 39/61 (64%) had IE. Average age=76. IE versus PE STS risk was 2.0% versus 6.06%. Reintubation occurred in 3/39 (7.7%) of the IE group and none of the PE group. Postoperative LOS was 6.7 days in the IE group versus 8.0 in the PE group. Risk factors not affecting IE: smoking history and obesity. Risk factors negatively affecting IE: preoperative IABP, diabetes, CHF and EF<35% and COPD.

**CONCLUSIONS:** IE in elderly patients undergoing OPCAB can be safely performed. A multidisciplinary approach to perioperative pain management and appropriate patient selection are required. Commitment from anesthesia, ICU nursing and respiratory therapy is imperative.

### P-224-BIOCHEMICAL MONITORING OF METABOLIC CHANGES IN SKELETAL MUSCLE DURING CARDIAC OPERATIONS WITH AND WITHOUT CARDIOPULMONARY BYPASS. A MICRODIALYSIS STUDY

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**BACKGROUND:** Serious complication of cardiac surgery using cardiopulmonary bypass (CPB) could be a hypoperfusion of peripheral tissues. The aim of this study was to monitor and to compare the metabolism changes in the skeletal muscle during the cardiac operations in CPB and operations without CPB by means of interstitial microdialysis.

**METHODS:** Surgical revascularization (CABG) was performed in 40 patients. 20 patients (group On-pump) were operated using CPB, 20 patients (group Off-pump) without CPB. Interstitial microdialysis was performed by probe CMA 60 (CMA Microdialysis AB, Solna, Sweden) inserted into the patient's deltoid muscle. Microdialysis measurements were performed at 30 minutes intervals. Glucose, lactate, pyruvate and glycerol were measured in samples using CMA 600 Analyser (CMA/Microdialysis AB, Sweden). Results in the both groups were statistically processed and compared.

**RESULTS:** The both groups were similar with regards to preoperative characteristics. Dynamic changes of interstitial concentrations of the measured analytes were found in the both groups (On-pump vs. Off-pump) of patients during the operation. There was no significant difference in dialysate concentrations of glucose and lactate between the groups. Significant difference was detected in pyruvate and glycerol concentrations, lactate/pyruvate ratio and lactate/glucose ratio between On-pump vs. Off-pump patients. Pyruvate concentrations were higher in Off-pump group and the values of the concentrations of glycerol were lower in Off-pump group. The lactate/pyruvate ratio and the lactate/glucose ratio indicating the aerobic and anaerobic metabolism status were lower in Off-pump group.

**CONCLUSION:** The dynamic changes in the interstitial concentrations of the glucose, glycerol, pyruvate and lactate were found in the both groups of patients (On-pump and Off-pump). These results showed significantly higher aerobic metabolic activity of the peripheral tissue of patients in Off-pump group vs. On-pump group during the course of cardiac revascularization surgery. Results suggest that extracorporeal circulation, cardiopulmonary bypass (CPB) compromises peripheral tissue (skeletal muscle) energy metabolism. This study was supported by grant NR / 8944-3 of the Internal Grant Agency of the Ministry of Health of Czech Republic and by Research Project MZO 00179906.

### P-225-POST OPERATIVE BLEEDING AND BLOOD TRANSFUSION IN CARDIAC SURGERY

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**BACKGROUND:** In spite of the recent advances in heart surgery, patients undergoing cardiac surgery with cardiopulmonary bypass are at risk of developing significant post-operative bleeding and substantial blood requirements. The aim of this prospective study is to evaluate the impact of some peri-opera-

tive predictors of post-operative bleeding and blood transfusion after heart surgery and offer suggestions on the preventive measures.

**METHOD:** The peri-operative factors studied were haemoglobin level, international normalised ratio, platelet count and total bypass time. Eighty-seven consecutive patients who underwent heart surgery in the year 2004 were selected. Each of the patients had laboratory work up which included full blood count, clotting profile, kidney and liver function tests. The immediate post-operative platelet count was recorded. The total blood loss within the first twenty-four hours and the total blood transfused before the patient was discharged were also recorded.

**RESULTS:** The pre-operative haemoglobin was found to be significant in determining the total blood received by a patient. Increasing total bypass time showed a significant increase in the percentage reduction of the pre-operative platelet count ( $p=.004$ ). However even though there was an increasing trend of post-operative bleeding with increase in total bypass time, this was not significant from the analysis ( $p=.069$ ). The percentage reduction in platelet count and immediate post-operative platelet count were significant predictors of post-operative bleeding ( $p=.009$ ) and ( $p=.003$ ) respectively.

**CONCLUSION:** It is concluded that pre-operative haemoglobin, percentage reduction in platelet count after cardiopulmonary bypass and immediate post-operative platelet count are significant predictors of post-operative bleeding and blood requirements.

## P-226-THE FUTURE OF CARDIAC SURGERY

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There had been pessimism about the future prospect of cardiac surgery, particularly from effects of "disruptive technology". The future is in fact, bright. Data supports increasing volume of coronary surgery, reducing percutaneous interventions, particularly with an ageing population. Different parts of the world will be affected differently. The future for Asia appears brighter than in western countries. We do need to seek new areas for cardiac surgery: particularly surgical options for heart failure and lone atrial fibrillation. Current regulations may hinder innovations in surgery. Innovation and collaborative research with engineers and scientists will be key to the future. It is also important to review training programs in cardiac surgery, to acquire and incorporate percutaneous techniques into our training systems. Leaders in cardiac surgery will need to inspire and systematically plan for the long term, recruit the best to join our profession and provide for an atmosphere of academic, high integrity, long term result based surgical endeavor.

## P-227-NON-BACTERIAL PYOPERICARDIUM LEADING TO LETHAL SEPSIS IN A PATIENT WITH SEVERE HUMORAL IMMUNODEFICIENCY

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**BACKGROUND:** Pyopericardium is the accumulation of pus in the pericardium mainly caused by bacterial infection. Purulent pericarditis most commonly occurs as a direct extension of an infection from an adjacent pneumonia or empyema. Alternatively, a distant infection can haematogenously seed the pericardium. Primary pericardial infection is rather rare. Pyopericardium is an illness requiring acute intervention by the heart surgeon (pericardial drainage) and adequate medication

**METHODS (CLINICAL SUMMARY):** A 55-year old man was admitted with diffuse chest pain, dyspnoea, tachycardia and nausea. Laboratory examination revealed massive leukocytosis and elevation of C - reactive protein. Echocardiogram showed circumferential pericardial effusion without valvular vegetations. After a subsequent clinical impairment to a highly septic state, he underwent surgical pericardial drainage. The pericardium was full of pus of creamy aspect. After continuous pericardial lavage and operative revision in several steps, final sternal closure took place ten days later. No infectious agent could be identified to be responsible for the purulent pericarditis. At the term of next surgery, 1.5 litres of serous ascites and 0.5 litres of serous pericardial effusion were drained. The patient developed a gangrenous cholecystitis, op-site findings revealed a non-purulent ascites, intra-operative cholangiography was without pathological findings.

**RESULTS:** Detailed immunological analysis showed a severe decompensated immunodeficiency with adenitocytæmia. The therapy with polyvalent immunoglobulin and imutin was ineffective, the patient died one day later from a therapy-refractory septic shock.

**DISCUSSION:** In cases with unclear non infectious purulent pericarditis, it is of high importance to carry out the correct diagnosis as soon as possible to provide an adequate therapy.

## P-228-RENAL PROTECTION IN CARDIAC SURGERY PATIENTS WITH RENAL DYSFUNCTION

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**BACKGROUND:** Patients with renal dysfunction are prone to develop more deterioration in their renal function or acute renal failure after cardiopulmonary bypass. To prevent or reduce the incidence of post cardiac surgery renal failure and therefore its morbidity and mortality, the protective effect of perioperative Dopamine and Lasix was tested in this study.

**METHODS:** 120 patients with renal dysfunction (Creatinine level more than one and a half above normal value (High normal value:110 mmol/l) and not on dialysis were included in the study. Other criteria include: EF > 30%, coronary artery disease required coronary artery bypass graft X 2-4. The patients were divided in to two well statistically matched groups of 60 patients each. Group(I): given Dopamine I.V. 2.5-5µg/Kg/min at the beginning of the surgery, followed by Lasix 5-10mg/min postoperatively on the arrival to the Intensive care unit. Creatinin and Urea levels as well as the need for dialysis were monitored in both groups. Group (II) did not receive Lasix drip, Dopamine drip was needed in 14 patients in this group for hemodynamic reasons. Statistical analysis of the results was conducted and the statistical significant values were determined with a P value of <0.05.

**RESULTS:** 1)Creatinine and Urea rise occurred in all patients. The degree of the rise was 6-55% range in group (I) and 11 - 157% in group (II),  $p<0.001$ . 2) Hemodialysis was needed in 2 patients in group(I), and in 9 patients of group(II)  $P<0.001$

**CONCLUSIONS:** The data of this study indicates that the use of perioperative I.V. Dopamine and Lasix has a significant renal protective effect in this kind of patients.

## P-229-A SIMPLE AND SAFE TECHNIQUE TO MANAGE THE INTERNAL MAMMARY ARTERY IN REDO CARDIAC SURGERY

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**OBJECTIVES:** The presence of patent Internal mammary artery (IMA) represents a well known technical challenge in redo cardiac surgery. Dissecting the IMA and controlling its flow during Cardioplegia delivery is an essential and standard step. This kind of manoeuvre in addition to its difficulties is associated with the risk of damaging the IMA. A new technique in which the IMA clamping is avoided was developed and used in 32 consecutive redo cases.

**METHODS:** The following surgical technique was used in 32 consecutive redo cardiac procedures.(19Pt:Coronary bypass grafting (CABG),7Pt Aortic valve replacement, 3Pt Mitral valve replacement,3 Pt combined CABG and valve replacements. All patients were operated on electively except 4Pt "emergency" in the CABG group. Technique:1) No attempts to dissect or clamp the IMA. 2) Retrograde and or antegrade Cold blood cardioplegia was used continuously or in frequent intermittent doses "5-10 minutes" 3) The body systemic temperature was kept at 25C while the aorta is clamped. Clamp time range (34-126 Minutes).

**RESULTS:** No evidence of regional ventricular wall motion changes was seen in 21 Pt. 11 Pt(Clamp time73-126 Minutes) developed various degrees of global hypokinesia and required inotropic support. one patient required intra aortic balloon pump. 2Pt required reoperation for bleeding, One patient developed sternal dehiscence. One patient died 7 days post operatively of sudden stroke. These results are comparable with the reported ones in the standard approved cardiac surgery literature.

**CONCLUSIONS:** These results showed the technique of avoiding the IMA clamping during redo cardiac surgery is 1)safe. 2) Not only simplify the surgery but also reduces the chance of injuring the IMA



### P-230-CHRONIC TOTAL OCCLUSION OF LEFT MAIN CORONARY ARTERY, A CASE SERIES

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**OBJECTIVE:** Acute occlusion of left main coronary artery as a complication of cardiac catheterization is well-known clinical entity; but few reports exist about chronic total occlusion, its incidence and management.

**METHODS:** From 2000 to 2003, 10 patients with chronic total occlusion of left main coronary artery, underwent coronary revascularization with conventional technique (cardio-pulmonary bypass and combined antegrade with retrograde cardioplegia delivery technique). Patients were followed regularly.

**RESULTS:** No mortality, no major morbidity except one episode of postoperative bleeding required re-exploration. At mean follow up of 30 months all patients were in NYHA class I.

**CONCLUSION:** Total occlusion of left main coronary artery is not as rare as literature review suggests and can be managed as other patients with left main stenosis.

### P-231-EVALUATION OF RISK FACTOR FOR CORONARY DISEASE IN YOUNG PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING

*Kamangari, Arash  
THC, Tehran, Iran*

**OBJECTIVE:** This study was down to evaluate of risk factors for CAD in patients < 40 years old.

**METHOD:** Among 2269 patients undergoing CABG operation. A total of 86 patients were <40 years old at the time of surgery (group 1) and the others were > 40 years old (group 2). Gender, family history, smoking, diabetes, hyperlipidemia, hypertension, functional class, number of vessels disease, Ejection Fraction, prior MI were studied and we compared CAD risk factors between 2 groups.

**RESULTS:** From 86 patients who were <40 years old (group I), 81.2% were male and 18.8% female. Smoking (41.1%), family history (46.6%), hyperlipidemia (45.5%), hypertension (20.7%) and prior MI (37.5%) were more prevalent compared with group II where as the occurrence of diabetes was lower in group 1 than group 2 ( $p=0.001$ ). In group I, there were 10 patients (8.6%) with one diseased vessel, 27 patients with 2 diseased vessel and 50 patients with multi-vessel diseased. Patients were predominantly in NYHA functional class II and III (61.2%). There were 10 post-op arrhythmia, one post-op bleeding and 1 in hospital mortality in young patients. The mean hospital stay was 6 days.

**CONCLUSION:** Family history, smoking, hypertension are the most important risk factors for CAD in young adults. Results of this study show that CABG is a safe and useful method in this group.

### P-232-METASTATIC ADENOCARCINOMA OF RIGHT ATRIUM

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A 65-yr-old man presented with palpitation, difficulty in breathing for six months, and epigastric pain, abdominal distention, loss of weight, appetite for two months. Clinical examination revealed hepatosplenomegaly and ascites with engorged veins on abdominal wall. Laboratory investigations showed anemia (HB 8.0 gm%) and echo-cardiography revealed right atrial mass with thrombotic obstruction of inferior vena cava and hepatic vein. CT scan and USG study of whole abdomen revealed only peripancreatic lymphadenopathy and ascites. There was no malignant cell detected in ascetic fluid. The patient was undertaken for surgery in view of symptoms and right atrial mass. Through a median sternotomy, heart was exposed and cardiopulmonary by pass was established via aortic and SVC and left femoral vein. Patient was cooled to 28°C and cardioplegic arrest was achieved after aortic cross clamp. Right atrium was opened and a firm cauliflower like mass was seen measuring approximately 7 x 8 cm in size relatively with a narrow base on lateral as well superior aspect of IVC orifice with obstruction to it. The mass was excised with sharp dissection and IVC was cleared of thrombus with suction. Lower half of right atrial wall around IVC was found thickened and adherent to pericardium. Patient was

weaned off smoothly from CPB and had an uneventful recovery. Histopathology of mass showed to be metastatic adenocarcinoma without obvious primary lesion on available investigations at this centre. On postoperative echocardiogram, there was no residual mass seen and LV function was normal. Patient was put on 1st pulse of 5 fluorouracil and discharged with advice to take subsequent pulse at the local hospital. Dr. ANIL BHARALI, M.S., M. Ch. GNRC Heart Institute Dispur Guwahati 781006 Assam India

### P-233-MAINTAINING ANNULO-PAPILLARY MUSCLE CONTINUITY IN MITRAL VALVE SURGERY: ANATOMIC STUDY IN NORMAL AND DISEASED HUMAN HEARTS

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**BACKGROUND:** Preservation of the annulo-papillary muscle continuity in mitral valve replacement is important. Even in patients who require excision of the mitral apparatus, the continuity can be restored. However, there is no guide to the proper length for the resuspension.

**METHODS:** In 38 normal and 24 ischemic cadaveric hearts, the distance from the tip of the papillary muscle to its corresponding mitral annulus was directly measured.

**RESULTS:** The distance from the tip of the anterolateral papillary muscle to the left trigone (10-o'clock position: D10) and to the point between the anterior and the middle scallops of the mural leaflet (8-o'clock position: D8) was  $22.8 \pm 2.9$  mm and  $21.2 \pm 4.6$  mm in normal hearts and  $24.3 \pm 2.7$  and  $23.7 \pm 1.9$  mm in diseased hearts; respectively ( $p=NS$ ). The distance from the tip of the posteromedial papillary muscle to the right trigone (2-o'clock position: D2) and to the point between the middle and the posterior scallops of the mural leaflet (4-o'clock position: D4) was  $24.5 \pm 3.0$  mm and  $25.5 \pm 4.9$  mm in normal hearts;  $22.3 \pm 1.8$  mm and  $23.5 \pm 2.7$  mm in ischemic hearts ( $p=NS$ ), respectively. There was no statistically significant difference between the two groups ( $P=0.826$ ). Each distance was significantly longer than the corresponding chordae tendineae in diseased hearts (D10 vs the anterior main chorda:  $16.2 \pm 4.9$  mm, D8 vs the anterior cleft chorda:  $14.7 \pm 1.2$  mm, D2 vs the posterior main chorda:  $16.8 \pm 3.3$  mm, and D4 vs the posterior cleft chorda:  $15.1 \pm 2.2$  mm, respectively;  $P=0.001$ ). The mean distance had a significant correlation with the mitral annular diameter in both groups ( $r=0.31$ ,  $P=0.019$ ).

**CONCLUSIONS:** In normal and ischemic hearts, the annulo-papillary muscle distances of the mitral apparatus are similar in 2-, 4-, 8-, and 10-o'clock positions and correlate with the mitral annular diameter.

### P-234-HOW TO DO IT: THOROSCOPIC EXCISION OF BRONCHOGENIC CYST IN THE PARA VERTEBRALSULCUS

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**BACKGROUND:** Para vertebral lesions are commonly caused by neurogenic tumours, neurogenic cysts and secondaries. We describe a bronchogenic cyst presenting as a rare cause of paravertebral lesion and its successful excision by video assisted thoracoscopy.

**CASE REPORT:** A 58-year old woman was referred for surgical consideration for excision of a para vertebral mass. She presented with left sided musculo-skeletal chest pain, otherwise she was clinically well. CT scan demonstrated a 3 x 4.5 x 5 cm elliptical left para-spinal soft tissue mass with smooth outline abutting descending thoracic aorta at the level of T10-T12 suggestive of a neurogenic tumour, the MRI scan supported this diagnosis. Under general anaesthesia the procedure was performed with three ports. The pleural cavity was inspected with a 10 mm zero degree thoracoscope. This revealed a 3 x 5 cm mass wedged between the diaphragm and pericardium below the inferior pulmonary ligament with some adhesions to the diaphragm. The mass was soft with a solid element at its superior pole. Aspiration of the mass revealed pus hence the capsule was opened, 200ml of pus was drained and the abscess cavity was excised. Recovery was swift and uncomplicated. The chest drain was removed on the second day and after which she had a satisfactory chest radiograph. She was discharged home on the third post operative day. Histology revealed the lesion was a bronchogenic cyst lined with pseudo-stratified columnar

nar epithelium, with a small collection of mucous secreting glands.

**DISCUSSION:** Bronchogenic cysts are rarely seen in the adult, and mostly are asymptomatic and free of complications. However they may present with evidence of infection or with compression symptoms of the neighbouring structures due to enlargement. Surgical excision is indicated to prevent complications such as mass effect or infection; this may be done using an open or minimally invasive approach. Thoracoscopic techniques are widely used in thoracic surgery for pulmonary, pleural and oesophageal pathology. Its use now encompasses evaluation of anterior mediastinal masses and mediastinal cyst resection. Thoracoscopic approaches have been used to resect bronchogenic cysts with good

**RESULTS:** These cysts were mostly in the anterior and posterior mediastinum. Our case is particularly interesting because it represents thoracoscopic excision of a paravertebral bronchogenic cyst. We found thoracoscopy to be a valuable tool for allowing precise dissection of the lesion in the para vertebral gutter particularly as the magnification enables the surgeon to visualise the adjacent structures, any neural communications and feeding vessels avoiding thoracotomy and its attendant morbidity.

### **P-235-COST BENEFIT ANALYSIS COMPARING MEDIWRAP HEAT RETENTION BLANKET AND FORCED AIR WARMING BLANKETS IN THORACIC SURGICAL PATIENTS**

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**OBJECTIVES:** Perioperative hypothermia is associated with an increased morbidity. We have demonstrated that Mediwrap passive heat retention blankets can be as effective as these Forced air warming blankets (FAW) (1). The aim of this study was to compare the cost effectiveness between these two devices in the study population and annual cost savings if applied for all major thoracic procedures routinely.

**METHODS:** Patient data was obtained from the 30 patients from our study(1) (FAW: 14 & Mediwrap:16). The cost analysis was performed considering the costs of blankets and electricity {Consumption determined by multiplying kilowatt rating of the equipment (11 KW) with price of electricity / KW (£0.15) and duration of use}. The results obtained were extrapolated to the total number of thoracic surgical procedures performed in our hospital for the year 2004-05.

**RESULTS:** The cost of blankets was £161.00 for FAW (£11.50x14) and £88.00 (£5.50x16) for mediwrap, cost of rescue blankets in FAW was £46 (£11.50x 4) and mediwrap group was £23.00 (£11.50x2), the electricity consumed in the FAW group was £43.26 and the electricity charges for treatment failures in FAW was £13.20 and Mediwrap was £6.60. The costs per patient for the FAW group was £18.82 and Mediwrap group was £7.35. Extrapolating these results to the number of similar procedures performed/annum (569) gives a cost savings of £6526.43 if mediwrap blankets were used instead of FAW blankets.

**CONCLUSIONS:** Use of mediwrap blankets are not only clinically effective but have a significant cost savings in patients undergoing thoracic surgical procedures. Reference: 1. Peri-operative Patient Warming: A randomised controlled trial comparing mediwrap heat retention blanket and forced air warming in thoracic surgical procedures. Proceedings of the Society of Cardiothoracic Surgeons of Great Britain and Ireland 2007.

### **P-236-TEMPORAL OCCLUSION FISTULUS OF THE BRONCH BY ACUTE PURULENT DESTRUCTION OF LUNGS**

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**BACKGROUND:** The present research is based on experience of supervision 512 patients with various forms of acute purulent destruction of lungs, taking place of treatment in clinic for the period 1991 - 2007 years. In connection with formation of pulmopleural fistulas, 79 patients, in the age of from 15 to 68 years, were exposed temporal occlusion of lobar or segmentary bronchus. In 49 patients process was located in right lung, in 27 in left. In 3 cases disease had bilateral character. In 24 patients was damaged the upper lobus. In 43- lower and in 12 cases is marked polysegmentary destruction of lungs.

**METHODS:** Occlusion "Solid" obturator, executed to the 55 patients, preceded obligatory sanitation of affected bronchopulmonary parts, in 11 patients was progressing destructive process in parenchyma, distal entered in a bronchus of

obturator. In the last years in 16 patients with pyopneumothorax and in 9 with giant pulmonary abscesses for temporal occlusion of bronchus was used obturator, designs of authors, with built in him sanitative character ( the patients of Russia 'H 2092108). It has provided in conditions executed occlusion, an opportunity of sanitation of damaged bronchopulmonary zones in a combination with gradual lung spread.

**RESULTS:** 4 patients has died. Positive results of treatment (recovery) are received in 75 from 79 treated by this method of patients.

**CONCLUSION:** Positive results of treatment (recovery) are received in 75 from 79 treated by this method of patients.

### **P-237-VIDEOTHORACOSCOPIC MANAGEMENT OF CATAMENIAL PNEUMOTHORAX DUE TO POROUS DIAPHRAGM SYNDROME**

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**BACKGROUND:** The aim of this study was to define the incidence and to evaluate the effectiveness of the thoracoscopic management of catamenial pneumothorax (CP) without thoracic endometriosis among women who have been referred for the videothoracoscopic management of spontaneous pneumothorax (SP).

**METHODS:** The records of all female patients with recurrent spontaneous pneumothorax, who were selected for endoscopic surgical management from 2000 to 2006, were collected. Their records were retrospectively analysed for age, time of diagnosis (preoperatively or intraoperatively), surgical technique, duration of hospital stay, recurrent episodes and postoperative drug management.

**RESULTS:** In an almost seven-year period, 17 women with SP were referred for surgery. In 4 (23.5%) cases, the catamenial character of the pneumothorax was recognized by clinical history. In all these patients, diaphragmatic holes were the only abnormalities found at surgery. No intrathoracic or pelvic endometrial implants were documented.

**CONCLUSIONS:** (1) CP incidence is high, (2) diaphragmatic defects play an important role in its pathogenesis, and (3) simple closure of the diaphragmatic holes proved to be a successful method.

### **P-238-VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) FOR DRAINAGE AND DECORTICATION OF LATE ORGANISED EMPYEMA**

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*Dept. of Cardio, Thoracic & Vascular Surgery, National University Hospital, Singapore, Singapore*

**BACKGROUND:** Late organized empyema is a challenging clinical condition to manage. Conventional treatment usually requires drainage and decortication through open thoracotomy to remove the multiloculated empyema as well as the empyema peel. The use of video-assisted thoracoscopic surgery (VATS) is usually reserved for early empyema and not commonly used for late stages. The efficacy of VATS in the management of late organized empyema is studied.

**METHOD:** Patients undergoing VATS for thoracic empyema at our institution from December 2006 to December 2007 are included. Patient demographics, pre-operative, operative and post-operative variables were analyzed. Morbidity and mortality rates were also reviewed.

**RESULTS:** There were 24 patients in our study with a mean age of 45.9 years (range 14 - 80 years). All patients have late organized empyema. The most common presenting complaints in these patients were fever (62.5%), dyspnoea (54.2%) and cough (41.7%). Four patients (16.7%) had septic shock with respiratory failure at presentation and required intubation. The underlying causes of empyema were pneumonia (n=22), tuberculosis (n=1) and post-esophagectomy (n=1). Twenty-three patients underwent a unilateral procedure and one patient required bilateral procedures in the same setting. The median operative time was 150 (mean = 168) minutes. Thirteen patients (56.5%) only require 2 small incisions (1 cm each) while 10 patients (43.5%) had 3 incisions (1 cm each). Five patients had re-operation by VATS due to recurrent effusion, hemothorax or pneumothorax. In the remaining 19 patients, the median ICU and the median HD stay was 0 days (mean = 0.57) and 1 day (mean = 1.17) respectively. The median duration of postoperative chest tube drainage was 6

days (mean = 6.11). The average length of postoperative stay was 9.89 days. There was no intra-operative mortality. One post-operative mortality occurred due to aspiration pneumonia.

**CONCLUSION:** This study demonstrates that VATS is an effective and safe treatment for late organized empyema. Despite the late presentation and the severity of their conditions in this group of patients, successful drainage and decortication can be achieved by VATS using very small incisions with low associated morbidity and mortality.

### **P-239-HOMOLATERAL THORACIC MUSCLE FLAPS FOR THE MYOPLASTY OF THE RESIDUAL CAVERNA IN THE TREATMENT OF THE PULMONARY ASPERGILLOMA**

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**BACKGROUND:** Pulmonary aspergilloma (PA) following pulmonary tuberculosis may lead to massive and fatal hemoptysis. We reviewed the results of three patients undergoing single stage cavernostomy and myoplasty as an alternative therapy of pulmonary resection in the surgical treatment of PA.

**METHODS:** From 2001 to 2007 we use in 9 patients muscle flaps for obliteration of pleuro-pulmonary spaces and in three cases it was after cavernostomy for the removing of a fungus ball. We chose and prepared a pectoralis major, latissimus dorsi, or trapezius muscle flap for myoplasty according to the location of the cavity. The space was sterile and enough obliterated with a muscle flap with an efficient blood supply.

**RESULTS:** It was two men and one woman with PA; the underlying lung diseases was cavitating tuberculosis - 2 anterior and one posterior- severely compromised lung function, FEV1<40% All were asymptomatic with no episode of massive hemoptysis prior to hospitalization and all tests to search active tuberculosis were negative. Computed tomography (CT) confirmed a thick walled cavity with a fungus ball and a diseased lung parenchyma. We use twice the pectoralis major for anterior cavity and once latissimus dorsi and trapezius for posterior localization. There was no 30-day local or general complications or in-hospital mortality.

**DISCUSSIONS:** Pulmonary resections including the caverna with the micetoma seems to be the treatment of choice for PA but technically difficult in view of extensive adhesions between the lung, pleura, diaphragm and mediastinum. Cavernotomy was considered for poor-risk candidates based on spirometric data and CT scan findings and using the muscle flap for dealing with the remaining caverna as a single stage procedure seems to be an interesting alternative to torocoplasty.

**CONCLUSION:** This may be an alternative technique to resection for patients with PA and compromised lung function.

### **P-240-ENDOBRONCHIAL HAMARTOMA IN A CASE WITH NEUROFIBROMATOSIS**

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A 60 years old male patient with neurofibromatosis type 1 presented with a right pulmonary mass. Bronchoscopic evaluation revealed endobronchial mass at right upper lobe. He was operated because bronchial biopsy and FNAB (fine needle aspiration biopsy) revealed nonspecific findings. Pathological evaluation of right upper lobectomy material was compatible with endobronchial hamartoma and right upper lobar abscess. Hamartoma is a component of neurofibromatosis syndrome however endobronchial hamartoma as in our case is a rare condition. Since concomitant neurofibromatosis and endobronchial hamartoma is not seen in literature we have decided to present this case.

### **P-241-PERI-OPERATIVE DATA ON THE PLATINUM-CHINA ANNIVERSARY OF THE NUSS PROCEDURE: SURVEY OF DATA FROM THE INITIAL 20 YEARS OF MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM**

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**BACKGROUND:** To report cumulative data on the Nuss operation, being introduced approximately twenty years ago for correction of pectus excavatum by insertion of metal bars.

**METHODS:** PubMed search, English language, accessed 31 December 2006, search word 'Nuss', cross-validation by hand search.

**RESULTS:** We accumulated and merged data from 19 reports, total of 1991 patients in 20 years. Cumulative Mortality in these series was zero and cumulative morbidity 10.2%. The commonest complications are bar-related adverse events (infection and displacement, 5.6%) and pneumothorax (3.4%). The average procedure time was 69 minutes (range 28'-200'). The average hospital stay was 5.7 days, (range 2-27 days).

**CONCLUSIONS:** Our data suggest that the Nuss procedure is now established as a safe option for correction of pectus excavatum.

### **P-242-EMPYEMA THORACIS DUE TO MALPRACTICE**

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General Hospital of Piraeus, Athens, Greece

**OBJECTIVE:** To present two cases of empyema thoracis due to malpractice.

**MATERIAL:** 1st case: Empyema necessitatis is a rare complication of empyema characterized by a spontaneous extension of pus from the pleural space into adjacent soft tissues. A 52 year old patient with a previous free medical history was admitted to our department with a dorsolateral abscess and the diagnosis of pleural empyema. The diagnosis was confirmed 3 months earlier and the patient was treated with antibiotics and repetitive punctures by a general practitioner. The patient underwent surgery including drainage of the pleural and intramuscular empyema, removal of subcutaneous and muscular necrotic tissue and partial decortication of the lung. All intraoperative cultures were found negative. After a long ICU stay due to many postoperative complications he was discharged on the 43rd postoperative day. 2nd case: A bilious empyema caused by a wrong placement of a transhepatic catheter is a rare complication that has not been reported yet. A 58 year old patient was admitted to our hospital due to jaundice. Three years earlier was operated on a pancreatic insulinoma (Whipple operation). The gastroenterologists decided to drain the bile by using a percutaneous transhepatic tube. When the patient presented high fever a CT scan revealed a right pleural empyema. The patient was led to surgery and bilious pleural empyema was found since the percutaneous tube draining the bile went through the pleural cavity and the diaphragm into the abdomen. The tube was removed and the patient was referred to the general surgeons. After a long hospital stay he recovered and was discharged on the 65th postoperative day.

**CONCLUSION:** More information and education of our colleagues are needed in order to prevent these cases of empyema thoracis.

### **P-243-GENE EXPRESSION PROFILING OF THORACOSCOPIC RESECTED LUNG TISSUE IN PRIMARY SPONTANEOUS PNEUMOTHORAX**

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**BACKGROUND:** Primary spontaneous pneumothorax (PSP) often occurs after the rupture of small bullae or a subpleural bleb in otherwise normal lungs. The mechanism of bulla formation remains speculative. Here, we use microarray analysis to survey the differences in gene expression profile between patients with PSP and control subjects.

**METHODS:** This was a prospective study of 7 consecutive patients with PSP who received standard surgical care in Changhua Christian Hospital. The gene expression patterns in PSP compared with structurally normal lung tissue were analyzed using oligonucleotide microarray technology; real-time polymerase chain reaction (PCR); and immunohistochemistry (IHC). For the data analysis, gene clusters were generated and the gene expression pattern differences



between PSP and control lung tissue were compared.

**RESULTS:** Most of these genes belong to the functional categories of behavior, cell communication, response to stimulus; and cell motility. We confirmed the microarray results used real-time PCR using five up or down regulation genes. The IHC staining used for localization the expression of hypoxic induce factor  $\alpha$  V 3 and caspase 8 in type II pneumocytes and mesothelial cells.

**CONCLUSIONS:** We conclude that the microarray gene expression technique is a new and useful molecular tool that provides novel information pertinent to a better characterization and understanding of the pathobiology of the distinct clinical phenotypes of PSP. The hypoxia and apoptosis may play an important part in formation PSP.

## **P-244-CLINICAL AND DIAGNOSIS AND THERAPEUTIC ISSUES IN COMPLICATED HYDATID CYSTS OF THE LUNG**

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Respiratory Diseases & TB research center of Guilan Surgery Department, Razi Hospital, Rasht, Iran

**BACKGROUND:** Hydatid cyst caused by the *Echinococcus granulosus*. Liver and then lungs are the most common site of lodgment of the hydatid disease. Our primary objective in this study is evaluation of clinical signs and symptoms and diagnosis and treatment outcome in patients with complicated lung hydatid cyst and postoperative complications.

**MATERIALS & METHODS:** We retrospectively evaluated 54 patients with ruptured lung hydatid cyst in 152 patients who were hospitalized in Rasht's hospitals since 1993 to 2005 and were surgically treated and by preparation of the form of data collection, recorded statistics and information's related to objectives of the investigation, then statistically analyzed these objectives.

**RESULTS:** Of 54 patients who were studied, 38 (70%) were male. Age of patients were 4 to 69 years. Chief complaints of the patients were cough in 47 cases (87%), dyspnea in 42 cases (77/8%), sputum in 37 cases (68/5%), chest pain in 31 cases (57/5%) and hemoptysis in 13 cases (34%), ELISA in 11/1% of patients. Most common location of cyst in the lungs was right lower lobe in 34 cases (63%) In 42 cases (77/8%) rupture occurred in tracheobronchial tree and in 12 cases (22/2%) rupture of the cyst into pleural space. Complication after surgery occurred in 15 patients. 3 patients (5.5%) were needed reoperation for treatment of bronchopleural fistula in 2 cases and Billo- pleural fistula in one case. After surgical treatment, 53 patients (98.1%) were completely cured and recurrence occurred in one patient (1.9%) which treated with albendazol. Hospital mortality was not occurred.

**CONCLUSION:** Some of the patients with lung hydatid cyst, present with complication the cause of complication are, lately referring to physician and delay in diagnosis. In endemic area all cystic lesion of lung must be rolled out for hydatid cysts. Early treatment with medical and surgical approach recommended. Keywords: Echinococcosis, -, hydatid disease, Complicated cysts, intact cysts.

## **P-245-RESULTS OF CHEST WALL RESECTION AND RECONSTRUCTION WITH AND WITHOUT PROSTHESIS**

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**BACKGROUND:** Chest wall defects continue to present a complicated treatment scenario for thoracic and reconstructive surgeons and chest wall resections are associated with significant morbidity, with respiratory failure. The purpose of this study is to report our experience with chest wall resections and reconstructions with and without prosthesis.

**METHODS:** The records of all patients undergoing chest wall resection and reconstruction were reviewed. Patient's Diagnostic procedure, use of preoperative therapy, the location and size of the chest wall defect, performance of lung resection, the type of prosthesis, and postoperative complications were recorded.

**RESULTS:** From May 1995, to July 2005, 162 patients (median age, 40 years) underwent chest wall resection. Surgical indications included: chest wall tumors in 132 and infection in 12 patients, pectus in 12, sternal cleft in 2, radiation necrosis in 4 patient. The most common localized chest wall mass had been in the anterior chest wall. Results of chest x-ray in patient before surgery had soft tissues mass in the chest wall & destroy of ribs, destroy of sternal cor-

tex, mass of lung invade the chest wall. The most finding of CT Scanning the chest had been show soft tissue mass. The median number of ribs resected was 3 (range, 2 to 6). Lung resection was performed in 15 patients. Prosthetic reconstruction was (polypropylene mesh/methylmethacrylate composite) in 18. nonrigid (polypropylene mesh) in 42. In 8 of cases had been used of Latissimus Dorsi and in 4 cases pectoralis muscle musculocutaneous flap used in chest wall reconstruction and none in 90 patients. Postoperatively, 1 patient died (3.8%). Respiratory failure occurred in 4 patients (3.1%). Wound infection occurred in 8 patients. The size of the chest wall defect was.

**CONCLUSIONS:** respiratory failure is lower in prosthetic reconstruction patients than previously reported and may relate to our use of rigid repair for defects likely to cause a flail segment the most significant predictor of complications.

## **P-246-ESOPHAGEAL SURGICAL EMERGENCIES**

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**BACKGROUND:** Esophageal surgical emergencies include esophageal perforation, iatrogenic, traumatic and secondary to caustic ingestion and anastomotic dehiscence. An aggressive immediate management should always be undertaken since delay in treatment reduces survival.

**PATIENTS AND METHODS:** We present a retrospective analysis of 21 patients, 15 males and 6 females with mean age of 55 (range from 20 to 83), who underwent urgent esophageal surgery at the Department of Cardiothoracic Surgery at Patras University from 1996 to 2006. All patients presented with a septic profile as a result of esophageal, gastric or gastroesophageal anastomosis rupture.

**RESULTS:** Eight patients presented an esophageal perforation after foreign body ingestion. There was one patient with post-traumatic esophageal perforation and 2 patients with rupture after ERCP and esophageal dilations respectively. One patient with severe cirrosis was referred to us because of a spontaneous rupture at the gastroesophageal junction. There have been 2 patients with rupture due to acute gastric ischemia. One patient had an esophageal tear of 3 cm caused by intra-abdominal esophageal traction in the attempt to perform a gastrojejunal anastomosis. One female patient was admitted with both esophageal and gastric perforation after caustic ingestion. The rest of the patients (n=5) presented an anastomotic dehiscence shortly after esophagogastrectomy was performed for esophageal carcinoma. The site of the lesion was approached with cervical incision in 4 patients, thoracotomy in 7 patients left thoracoabdominal incision in 9 patients and left trans-diaphragmatic approach through the abdomen in one patient. Primary repair with direct suture covered by muscle flap was undertaken in 12 patients. The rest of the patients were treated with upper GI exclusion, cervical esophagostomy and feeding jejunostomy or trans-diaphragmatic transthoracic gastrostomy. All patients received postoperative enteral or parenteral nutritional support. Mortality was 23,8% (5/21). Nine out of 16 patients survived (60%) presented complications, Reoperation was necessary in two of them. One patient became febrile in the 4th postoperative day with evidence of mediastinitis at the chest CT scan and underwent mediastinal drainage through right thoracotomy. The second patient presented dehiscence at the site of the previously performed suture. An esophageal stent was placed to cover the defect and one month later the patient was readmitted with an esophago-bronchial fistula. Through a left thoracoabdominal incision, the esophageal stent was removed and esophageal exclusion was performed, followed by cervical esophagostomy and feeding jejunostomy. Upper gastrointestinal restoration was carried out 2 month later with retrosternal gastric pull up and esophagogastric anastomosis performed at the neck.

**CONCLUSIONS:** Esophageal perforation and anastomotic dehiscence require immediate surgical management. A delay in diagnosis and management leads to a decreased survival. Surgery in this subset of patients carries a high mortality and morbidity because of mediastinitis and sepsis that compromise patients' general and nutritional status.



### **P-247-A PHASE I STUDY OF DOCETAXEL WITH CONCURRENT RADIOTHERAPY IN PATIENTS WITH ESOPHAGEAL CANCER**

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**BACKGROUND:** In chemoradiation for esophageal cancer, protocols which use 5FU and CDDP with concurrent radiation have been mainly performed. Now taxanes are widely used for esophageal treatment, and there are already some protocols using these drugs. But, there is no evidence about the optimal dose of taxanes used in the chemoradiation. So, we planned the phase I study to determine the optimal dose of docetaxel used in the chemoradiation for esophageal cancer.

**METHODS:** Nine patients with clinical stage IIA to IVB squamous cell carcinoma of the esophagus were enrolled in a chemoradiation comprised of a escalating doses of docetaxel (10mg/m<sup>2</sup> in level I, 15mg/m<sup>2</sup> in level II, or 20mg/m<sup>2</sup> in level III once a week), repeated 6weeks with concurrent radiotherapy (60Gy).

**RESULTS:** Between May 2004 and August 2005, a total of 9 patients entered this trial, all of whom were considered evaluable for toxicity assessment. They were treated in sequential cohorts of three to six patients per dose level. The maximum tolerated dose was reached at level II with one grade 4 esophagitis, one grade 4 leucopenia, and one grade 4 hyperglycemia. Thus, recommended dosing schedule was level 1. Of 8 patients treated in this trial, 2 patients had esophageal perforation and 2 patients had grade 3 esophagitis. Two of these 4 patients had chemotherapy before chemoradiation.

**CONCLUSIONS:** The combination of docetaxel with radiation seemed to have considerably strong local control, and recommended dose was 10mg/m<sup>2</sup> in our protocol. Severe esophagitis, sometimes esophageal perforation, would develop especially in patients who had chemotherapy before chemoradiation.

### **P-248-DEFINITIVE CHEMORADIATION VS SURGERY IN ESOPHAGEAL CANCER**

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**BACKGROUND:** Definitive chemoradiation is an acceptable treatment for esophageal cancer. It has great advantage of preserving the esophagus. Chemoradiation and surgery are quite different treatments and we must decide treatment by clinical diagnosis. Therefore, we examined long-term survival of each treatment in every clinical stage to determine better therapy.

**METHODS:** From January, 2000 to December, 2004, 652 patients who had intrathoracic esophageal cancer underwent definitive chemoradiation or esophagectomy as primary treatment in our institute. Their clinical stages were I, II, or III. They had no other cancers. Surgery cases had transthoracic esophagectomy with 3 fields lymph node dissection as general. Chemoradiation cases had 60Gy external irradiation concurrently with 5FU and CDDP chemotherapy. We retrospectively examined their 5 year survival rates according to their clinical stages and primary therapies.

**RESULTS:** In clinical stage I, 70 patients underwent esophagectomy and 146 patients underwent definitive chemoradiation. Surgery cases were significantly better when we compared 5 year survival rate of chemoradiation cases with surgery cases (80.8%, 73.1%, respectively.  $p=0.03$ ). In clinical stage II, 119 patients underwent esophagectomy and 66 patients underwent chemoradiation. There was no statistically significant difference in 5 year survival rate between surgery cases and chemoradiation cases (61.3%, 51.2%, respectively.  $p=0.98$ ). In clinical stage III, 149 patients underwent esophagectomy and 94 patients underwent chemoradiation. Surgery cases were significantly better when we compared 5 year survival rate of surgery cases and chemoradiation cases (46.0%, 19.8%, respectively.  $p=0.00$ ). In clinical stage II and III patients, we compared 5 year survival rates of surgery cases and chemoradiation cases according to their N-status. In N0 cases, there was no statistically significant difference in 5 year survival rate between surgery cases and chemoradiation cases (53.4%, 47.1%, respectively.  $p=0.33$ ). In N1 cases, surgery cases were significantly better than chemoradiation cases (52.9%, 27.2%, respectively.  $p=0.01$ ).

**CONCLUSIONS:** In chemoradiation cases, there were many not only distant metastasis but also local recurrence, and that was why chemoradiation cases had poor prognosis. Esophagectomy with lymph node dissection was a standard therapy in all stages, but definitive chemoradiation seemed to have a

possibility of being an alternative therapy in patients without lymph node metastasis.

### **P-249-NONSURGICAL STRATEGIES FOR ACUTE MESENTERIC ISCHEMIA**

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**BACKGROUND:** Acute mesenteric ischemia (AMI) is rare, and is traditionally treated with emergent laparotomy and restoration of mesenteric blood flow as soon as possible. But surgery carries a very high mortality, especially in patients with high operative risks. For them, alternatives to surgery should be adopted.

**METHODS:** Intra-arterial thrombolytic therapy with urokinase was instituted in two patients with associated severe coronary artery disease and left ventricular dysfunction, right after superior mesenteric artery (SMA) occlusion was confirmed by arteriography. Afterwards, they were kept on anticoagulant therapy with heparin and subsequent warfarin.

**RESULTS:** In both of them, acute abdomen subsided and AMI was mostly relieved on follow-up mesenteric arteriography in 3 days. In patient 1, complete resolution of SMA occlusion was noted by follow-up arteriography 6 months later. In patient 2, as stenosis at proximal SMA was found after thrombolysis, percutaneous transluminal angioplasty (PTA) with stenting was performed later. Both of them are still alive and well without recurrence of AMI.

**CONCLUSIONS:** Intra-arterial thrombolytic therapy is a good initial alternative to surgery for patients of AMI with high surgical risks. PTA with/without stenting can be adopted for residual proximal SMA stenosis.

### **P-250-TRANSTHORACIC VERSUS TRANSHIATAL ESOPHAGECTOMY**

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**INTRODUCTION:** Due to our geographical area of living, esophageal cancer is one of the most common cancers in gastro intestinal system. Treatment of choice in these disease is surgery. Because there are various kinds of surgical techniques, in this study we tried to compare common techniques in these groups of patients.

**MATERIAL & METHOD:** In a retrospective study between 1990 and 2006 all patients with esophageal cancer in middle and distal third of esophagus whom underwent transhiatal or transthoracic esophagectomy, have been studied about age, sex, pathology of tumor and tumor staging. Then in other study, with considering special parameters of two groups (transhiatal or transthoracic) are studied separately about factors such as intraoperative bleeding, operation time, post-operation morbidity, time of hospitalization, mortality still 30 days after surgery, incidence of anastomosis leak and stenosis and survival have been evaluated.

**RESULTS:** 156 patients entered our study with M/F=110/46 ratio. 116 patients with S.C.C and 40 patients with adenocarcinoma. Most of them in stage 2 of disease with in comparing study between transhiatal groups with Ivor Lewis groups (with similarization), intraoperate bleeding, cardiac and pulmonary complications after surgery, mean time of hospitalization, mortality in 30 days after surgery and incidence of late stenosis and survival are similar but the incidence of anastomosis leakage was higher in transhiatal group and mean operation time was longer in Ivor Lewis group. Since the leakage was more common in transhiatal group but mortality rates were the same, it indicates that leaking in neck has a better outcome.

**CONCLUSION:** According to the results of this study, both of these techniques are similar and choosing one of them depends on surgeon's choice and patient's conditions.

### **P-251-THE ANALYSIS OF ECG CHANGES OCCURING AFTER LUNG RESECTIONS DUE TO LUNG CANCER**

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**OBJECTIVE:** Cardiac complications that might occur after lung resections have

always been a challenge for thoracic surgeons because of increasing both morbidity and mortality and also raising the expenses by lengthening hospital stay. The study prospectively analyzed the ECG changes occurring after lung resections due to lung cancer and the factors affecting.

**MATERIALS AND METHODS:** The study included 105 consecutive patients that had undergone lung resections due to lung cancer. Ninety-one of these cases were male and the mean age of all cases was  $55.8 \pm 9.8$  years. All cases had posterolateral thoracotomy under general anesthesia with double lumen endotracheal tube. Seventy-nine patients had lobectomy and the rest (26 cases) had pneumonectomy. Intrapericardial approach needed only in 11 pneumonectomy patients. Diabetes mellitus and hypertension were the leading accompanying diseases present in 21% of the cases. All cases were followed in the intensive care unit after the operation for 24 hours and tramadol and non-steroid anti inflammatory agent were used for analgesia. Only 17 of 105 patients had ECG changes before the operation namely ST segment changes, previous myocardial infarction, and bundle block.

**RESULTS:** Twenty-one out of 105 (20%) patients had some kind of ECG changes and tachycardia and bundle branch blocks were the leading disturbances. In univariate analysis type operation, preoperative ECG finding, electrolyte imbalances, accompanying diseases, or intrapericardial approach had no significant effect on developing postoperative ECG changes.

**CONCLUSION:** This is a prospective preliminary study in a tertiary chest surgery centre to define the ECG changes after lung resections and tries to analyze the factors contributing their development. We think that the rate of ECG changes is much higher than 20% and the continuing study especially with Holter monitor is going to change this figure.

#### **P-252-DOES OSTENE™ IMPROVE BONE HEALING COMPARED WITH BONE WAX AFTER STERNOTOMY?**

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**BACKGROUND:** Bone wax is used in cardiac surgery to reduce intraoperative bleeding by applying it to the spongiosa after sternotomy. However, Bone wax is non-absorbable and stays in the wound, reducing bone healing. To solve this problem a new biocompatible, absorbable hemostatic agent (Ostene™) was introduced, which is claimed not to reduce bone healing Ostene™. The aim of this study was to compare sternal bone healing after sternotomy in pigs treated with Bone wax or Ostene™.

**METHODS:** In total 24 Danish Landrace/Yorkshire pigs a midline sternotomy was performed. The pigs were allocated to three study groups; Bone wax, Ostene™ or Control (no treatment). After one hour of sterile exposure to open air, the sternum was closed using steel wires, a stainless steel screw through the two first costae and finally sub- and intracutaneous skin sutures. Six weeks later the animals were euthanized and their sternum removed for CT-scans to assess bone density (mg/ccm) as a measure of bone healing.

**RESULTS:** Bone density in the Ostene™ group ( $277 \pm 31$  mg/ccm) was significantly higher compared to the Bone wax group ( $122 \pm 36$  mg/ccm), but no statistically significant difference ( $p=0.9$ ) was found between the Ostene™ group and Control group ( $280 \pm 61$  mg/ccm).

**CONCLUSION:** Ostene™ did not reduce bone healing after sternotomy and showed significantly improved bone healing compared to Bone wax.

#### **P-253-AN UNUSUAL ETIOLOGY FOR PNEUMOMEDIASTINUM AND CERVICAL EMPHYSEMA**

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**BACKGROUND:** Pneumomediastinum and cervical emphysema may complicate a pneumothorax due to the spreads of air from the pleural space along the bronchovascular trunks into the hilum and mediastinum according a pressure grading. Evacuation of air from the pleural cavity interrupt the mechanism described above and permit the absorption of air from the mediastinum and cervical tissues. We propose another mechanism of air accumulation in the mediastinum by an unusual pathway of air leakage from the pleural space.

**METHODS:** A 57-year-old man, with a history of heavy smoker and a former worker in a steel factory was admitted in our institution with a left total pneu-

mothorax, a large cervical emphysema and air leaks for 4 days at chest drain

**RESULTS:** At surgery we found a line of small blebs in the apical region and in the superior segment of the lower lobe. At the mediastinal face of the upper lobe we get a large blown-up bullae (over 4 cm in diameter) with their walls in contact with the mediastinum; at the pulmonary bottom of this giant bullae it was a large bronchial fistula and at the the mediastinal face a large destruction of the mediastinal pleura with free contact between the pleural space and the anterior mediastinum. We resect the walls of the bullae, sutured the bronchial fistula and complete a wedge resection of the pulmonary areas with blebs using running sutures. The apical parietal pleura and the mediastinal pleura beneath the tear was abraded with a dry gauze sponge

**CONCLUSIONS:** After the rupture of the bulla the presence of the broncho-pleural fistula cause the accumulation of air in the pleural cavity under pressure determining a tension pneumothorax. We consider that the high pressure initiate the break-down of the tiny mediastinal pleura making possible a communication with the anterior mediastinum thru the bulla. The air flow thru this fistula exceed the capacity of evacuation of the chest tube (the radius of the tube being the most important factor according to Fanning equation) and the drainage device; in this condition the air escape thru the place with minimum resistance in this case the tear in the mediastinal pleura causing the large pneumomediastinum with cervical and subcutaneous emphysema. In case of a persistent pneumothorax -even drained- with a large pneumomediastinum -perforated mediastinal viscus being eliminated- we have to think even to a bulla ruptured in the mediastinum producing a broncho-pleuro-mediastino fistula.

#### **P-254-VIDEO ASSISTED THORACOSCOPIC TALC PLEURODESIS FOR PERSISTENT SYMPTOMATIC PLEURAL EFFUSION FOLLOWING CORONARY BYPASS SURGERY**

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**BACKGROUND:** Purpose of this study is to assess the clinical course of patients with persistent symptomatic pleural effusion following coronary bypass surgery, as well as the efficacy of video assisted thoracoscopic talc pleurodesis as therapeutic treatment.

**METHODS:** This retrospective study included 18 patients who had a persistent pleural effusion following CABG without other identifiable causes. Video assisted thoracoscopic surgery (VATS) was considered when therapeutic thoracenteses and antiinflammatory agents proved unsuccessful. All patients underwent VATS for investigation and management of persistent pleural effusions, including talc pleurodesis.

**RESULTS:** Thirteen male and 5 female patients were included. Median age was 65 years (range, 52 to 73 years) at the time of thoracoscopy. All patients (18/18) complained of dyspnea, 3/18 had persistent cough, 2/18 had fever and 1/18 had pleuritic chest pain. All patients had large (>25% of the hemithorax) effusions on chest x-ray and had internal mammary artery grafting. The pleural effusion was left sided in 12 patients and bilateral in 6 patients. All effusions persisted after three thoracenteses. The median period from CABG to VATS was  $65 \pm 15.4$  days (range, 40 to 125 days). Early effusions (within 30 days of surgery) were bloody exudates with high red blood cells and eosinophil count and contained higher lactic acid dehydrogenase levels, whereas late effusions (>30 days after surgery) were yellow exudates with lymphocyte predominance. Histologic examination of pleural biopsies in early effusions showed a predominance of inflammation with dense infiltrates and little fibrosis. On the contrary, pleural samples of late effusions showed less inflammation and increased fibrosis. Video assisted thoracoscopic talc pleurodesis led to symptomatic and radiologic improvement in all patients with a mean follow-up of  $18.5 \pm 5.6$  months. There were no VATS related complications. No recurrence of pleural effusion has been observed in any patient.

**CONCLUSIONS:** Persistent symptomatic pleural effusion following CABG is not unusual. Pathologic characteristics of early and late effusions are different suggesting a different way of pathogenesis. Video assisted thoracoscopic talc pleurodesis is safe and effective and should be always considered as a permanent solution.

## P-255-ENDOSCOPIC REPAIR OF IATROGENIC ESOPHAGEAL PERFORATION

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**BACKGROUND:** Endoscopic treatment of achalasia is related to iatrogenic esophageal perforation that needs accurate valuation and immediate repair and remains an acceptable alternative when surgery is not feasible.

**METHODS:** We present a case of a 80-year-old woman with history of achalasia that, in the past, underwent to continuous pneumatic dilatations of the LES in our institution. During the last endoscopic treatment with a 40mm balloon dilator, the patient presented bradycardia and epigastric pain. The direct endoscopic control of the procedure demonstrated an about 2cm rupture of the immediately sovradcardial part of the esophagus. We decided to proceed to direct endoscopic repair of the perforation using 6 endoscopic clips. A conservative treatment consisting of a total parenteral nutrition, intravenous antibiotics and observation was followed. Surgery was not recommended because of her high cardiac risk.

**RESULTS:** The apposition of endoscopic clips closed completely the esophageal perforation as the flexible esophagoscopy control confirmed. We performed a computer tomography of the chest 1 hour after the rupture repair that demonstrated the presence of pneumomediastinum with a minimal quantity of bilateral pleural effusion without periesophageal fluid or extra luminal contrast. A week later, a gastografin swallow roentegrage was made and the complete passage of the contrast bolus to the stomach was documented. The patient initiated oral nutrition after 10 days of the perforation without any clinical complication. The day before dismissal (15th day), the chest's CT scan confirmed the complete resolution of the pneumomediastinum and the absence of lung densities or pleural effusion. After 5 months from dismissal, the patient is healthy without dysphagia or other motility disorders' symptoms. At the esophagoscopy control, the point of perforation appeared completely closed, none of the endoscopic clips were in position and no restriction of the esophageal lumen was present.

**CONCLUSIONS:** Iatrogenic causes account for 73% of all esophageal perforations. Previous attempts of pneumatic dilatation for achalasia have increased the risk of esophageal perforation during the procedure at about 2% to 6%. Delay in treatment of more than 24 hours after perforation can result in a doubling of mortality. In the literature, a few cases were treated by only endoscopic approach (clips) with satisfying results. The apposition of endoscopic clips is indicated when the diagnosis of perforation is made during the procedure and surgery is contraindicated. This approach allows a rapid closure of the rupture and prevents from possible leakage of esophageal fluids in mediastinum (high risk of infection - mediastinitis). We believe that the apposition of endoscopic clips remains a safe technique to use for this type of esophageal perforation.

## P-256-STUDY OF PREVALENCE, COMPLICATIONS, IN-HOSPITAL MORTALITY AND SURVIVAL OF TRANS-HIATAL ESOPHAGECTOMY IN 197 ESOPHAGEAL CARCINOMA PATIENTS

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**BACKGROUND:** Esophageal Carcinoma, an invasive tumor with poor prognosis is prevalent in north of Iran, specially at the coastal area of Caspian Sea. Surgical resection is the most effective way of palliative therapy. Trans-hiatal Esophagectomy is the technique with less mortality. We present, in this retrospective study, our surgical experiences, the early and long term results of 197 patients managed by Trans-hiatal Esophagectomy during 11 years period.

**METHODS:** We studied 197 patients of Esophageal Carcinoma who underwent Trans-hiatal Esophagectomy between 1992 and 2002 in major surgical centers of Rasht. We studied the clinical symptoms, para-clinical results, complications, mortality and 1-5 year survival rate of this surgical procedure. Data were collected from retrospective hospital case records and were analyzed using SPSS software EPI-6.

**RESULTS:** 153 (70%) were male and 44 (30%) female patients with mean age of 57 years. 71% were rural were urban stop in all the patients (100%) the first complaint was dysphagia. The most common site of lesion (55.9%) was lower third of esophagus near cardia. 47.1% cases needed post-operative thoracotomy. 9.8% cases needed splenectomy and 3% had involvement of recurrent

laryngeal nerve. 18.4% required mechanical ventilation. Pneumonia, Mediastinitis and Chylothorax appeared in 10%, 2% and 2%, cases respectively. 13% of operated cases showed leakage at the site of anastomosis. 83.8% cases were discharged within two weeks. Mean hospitalization was 9.4± 4.1 days. In-hospital mortality rate was 24.3%. First year to fifth year survival year were 80%, 50%, 40%, 30%, 20% retrospectively.

**CONCLUSION:** Results of present study is compatible with other similar studies. In comparison to Trans-thoracic Esophagectomy, the trans-hiatal Esophagectomy is the preferable way of management and palliative treatment of Esophageal Carcinoma. **KEYWORDS:** Esophageal Carcinoma / Trans-hiatal Esophagectomy / Trans-thoracic Esophagectomy / Mediastinitis / Chylothorax

## P-257-LONG-TERM OUTCOME AFTER PULMONARY SURGERY FOR NON-SMALL CELL LUNG CANCER WITH LIVER CIRRHOSIS

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**BACKGROUND:** Long-term outcome of pulmonary resection for non-small cell lung cancer with comorbid liver cirrhosis is not well known. We aimed to establish the factors influencing long-term survival in such cases.

**METHODS:** We retrospectively reviewed 33 patients that had undergone pulmonary resection for non-small cell lung cancer with comorbid liver cirrhosis. Liver cirrhosis was diagnosed according to clinical features, laboratory data, and findings of ultrasonography and computed tomography by two or more hepatologists who performed observation or treatment of the liver disease before lung surgery in each patient. Clinical features, early outcome, survival time and cause of death were investigated. Five-year survival rates were calculated, for lung cancer death and/or hepatic death by the Kaplan-Meier method. Lung cancer survival censors hepatic death and patients who are still alive or missing at the end of the study period. Survival from hepatic death censors lung cancer death and patients who are still alive or missing at the end of the study period. The log-rank test was used to compare the difference in survival between the groups. Factors influencing survival were estimated by univariate and multivariate analyses.

**RESULTS:** There were two in-hospital deaths (6.5%). Five-year survival rate for lung cancer death (n=9) was 59.7%, whereas for hepatic death (n=6), it was 62.9%. Factors influencing lung cancer death were nodal stage and limited resection (P<0.05 for each) by both univariate and multivariate analysis. Factors influencing hepatic death were serum values of total bilirubin (P<0.0001), cholinesterase (P<0.05), indocyanine green retention rate at 15 min (P<0.0005, n=24), platelet count (P<0.05), and alpha-fetoprotein (P<0.05). Lung disease factors, such as local extensiveness of the tumor and pathological stage, and surgical factors, such as performance of mediastinal dissection and limited surgery, also influenced survival from hepatic death (P<0.05 for each). The patients who experienced early postoperative liver failure survived significantly shorter than those who did not (P<0.0001). Platelet count was the only independent risk factor influencing survival from hepatic death after lung cancer surgery (P<0.05) by multivariate analysis. Only comorbid HCC was an independent risk factor for long-term hepatic death after lung cancer surgery. Its odds ratio was about 65.

**CONCLUSIONS:** Although pulmonary resection invasiveness may have some impact on long-term liver function, the life expectancy of patients with cirrhosis does not seem to be severely affected by pulmonary resection itself. Curative surgery should be performed if possible, even in patients with cirrhosis.

## P-258-CONSERVATIVE MANAGEMENT OF PROLONGED AIR LEAK DUE TO SECONDARY SPONTANEOUS PNEUMOTHORAX

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**BACKGROUND:** Prolonged air leak is a challenging problem for thoracic surgeons. Conservative treatment such as chemical pleurodesis and Heimlich Valve are preferable to avoid complications of surgical interventions. In this study, Heimlich valve and Pezzer Drain combination were used for outpatient management of prolonged air leak due to secondary spontaneous pneumothorax.



**METHODS:** Between 2004 and 2006, 8 patients (8 men; mean age 72; age range 56-88 years) with prolonged air leak instant spontaneous pneumothorax had been treated with Heimlich valve and Pezzer drain application. Initially, chest tube and water seal drainage were carried out as a standard approach for these patients during hospitalization. All of the patients had diagnosis of chronic obstructive pulmonary disease on medical therapy. Surgical approaches such as thoracoscopy or thoracotomy were not preferred because of patient's poor conditions. In 4 of them, talc pleurodesis was carried out for two times however air leak could not be stopped. In remaining 4 patients, the lungs were not fully expanded and pleurodesis could not be applied. Instead of chest tube and water seal drainage, Pezzer drain (20-24 no) and Heimlich valve were inserted before discharged from hospital. The patients were followed at their homes with "outpatients follow up program" includes clinical control once a week and getting daily information by telephone.

**RESULTS:** Mean prolonged air leak time was 25 (range 19-32) days and mean hospitalization time was 14 (range 13-16) days. Two of the patients required surgery (25 %). Empyema was seen one of the surgical patients. Six of them had been treated successfully without any other interventions. Recurrence has been observed in one patient during 12.6 months mean follow up.

**CONCLUSION:** Heimlich valve and Pezzer drain combination is a very useful and safe method for the home-treatment of emphysematous patients with prolonged air leak and it may decrease cost of treatment because of short hospitalization

### **P-259-TRANSSTERNAL MAXIMAL THYMECTOMY IN MYASTHENIA GRAVIS: THE IMPORTANCE OF EXTENSIVE CERVICAL DISSECTION**

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**BACKGROUNDS:** Maximal dissection of cervicomediastinal adipose tissue increases the chance removing ectopic thymic tissue, thus potentially improving the prognosis of myasthenia gravis after thymectomy. We sought to validate the use of transsternal maximal thymectomy and compare the rates of surgical safety and histologic background using this method to transsternal extended thymectomy.

**METHODS:** The surgical outcomes of 24 patients who underwent transsternal maximal thymectomy from July 2006 to June 2007 were compared with 73 patients who underwent transsternal extended thymectomy from January 2004 to May 2006 through a retrospective review. Ectopic thymic tissue in additionally excised cervicomediastinal fat tissue was examined histologically in 14 non-thymomatous patients.

**RESULTS:** In patients who underwent maximal thymectomy, the operation time (137.4/107.9min,  $p=0.00$ ), the amount of cumulative drainage (1123.4/714ml,  $p=0.002$ ) and the duration of drainage (8.3/6.3days,  $p=0.001$ ) were significantly higher than in patients with extended thymectomy. However, difference in hemoglobin count, the amount of transfusion, the duration of intensive care, postoperative hospital stay, and complication rates were not statistically different. There was no operative mortality in either group. Ectopic thymic tissue was found in 50% of patients. All patients had ectopic thymic tissues in the cervical area, two had ectopic tissue in the aortopulmonary window, and one had ectopic tissue posterior to the innominate vein and lateral to the right phrenic nerve.

**CONCLUSION:** Transsternal maximal thymectomy is as safe as transsternal extended thymectomy and can be expected to remove more ectopic thymic tissue, especially in the cervical area.

### **P-260-RESULTS OF THYMECTOMY FOR MYASTHENIA GRAVIS WITH AND WITHOUT THYMOMA**

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**BACKGROUND:** Myasthenia gravis is a auto immune disease with muscular weakness, fatigue. It aggravated by voluntary activity, and improved with resting. Thymus have important role in this disease Thymoma is the primary tumor of thymus that is produced by augmentation of epithelial cells inside of Glands.

Thymectomy can improved myasthenia gravis disease. The main aim of this. Determinant factors for predictability of response to thymectomy for myasthenia gravis vary in the literature. Complete remission rate with medical treatment is 15%. Thymectomy has become increasingly accepted as an efficacious procedure for myasthenia gravis, with high complete clinical remission rates.

**METHODS:** We retrospectively reviewed the clinical records of 70 patients diagnosed with myasthenia gravis in Rasht, Iran from 1993 August to 2004August. The purpose of this investigation was to determine the prognostic factors predicting MG outcome.

**RESULTS:** In 70 thymectomies for myasthenia gravis, including 44 (62.5%)females, with mean age 38 years. Complication occurred in 20% .In-hospital mortality was zero. Complete clinical remission rate was 47% postoperatively. Our results indicate that patients with a length of the disease from onset to operation shorter than one year have the better prognosis; and stages I, IIa, IIb Osserman classification is also associated with higher clinical remission rates. Female patients have mild better prognosis than men, and the younger the patient the more likely is complete clinical remission.

**CONCLUSION:** We concluded that thymectomy is indicated for myasthenia gravis patients as early as possible in the course of disease, because time and medication elapsed from diagnosis to operation is main determinant of the outcome. Keyword: myasthenia gravis- thymectomy - thymoma -anticholinestras - plasmapheresis.

### **P-261-PLEURAL NEUROFIBROMA: THE FIRST TWO CASES OF A RARE PLEURAL TUMOUR**

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**OBJECTIVE:** Pleural tumours are a rare group of thoracic tumours which include solitary fibrous tumours, pleural fibromas etc. We present and describe pleural neurofibroma which has not been described before.

**METHODS:** Two interesting cases of pleural neurofibroma are described here. Case 1 A 78 year old lady presented with shoulder pain and chest radiograph demonstrated a pleural based nodule which was confirmed with a subsequent CT scan .She underwent a video assisted examination a pleural based nodule measuring 2.5 cms by 1.5 cm which was excised completely. She had an uneventful post operative course. Case 2 28 year old female with a known history of Type I neurofibromatosis was found to have malignant nerve sheath tumour in her right calf and underwent wide local excision. Surveillance CT scan showed a 1cm lesion at the posterior border of the left lower lobe and was referred for metastectomy. She underwent a left thoracotomy, which revealed a nodule in the left lower lobe posterior segment and an adjacent pleural nodule both were excised.

**RESULTS:** The neoplasms were composed of a fibrillary background with wisps of collagen surrounded by a myxoid stroma and a uniform population of bland spindle cells. There was central cystic degeneration, the lesions were S100 and CD34 positive which was consistent with neurofibroma which was confirmed by electron microscopy. The second patient had an associated pulmonary secondary from nerve sheath tumour.

**CONCLUSIONS:** Pleural neurofibroma is a very rare entity. Usually pleural neural tumours are associated with intercostals nerve endings. The differential in this case is between a neurofibroma and a solitary fibrous tumour (SFT). A myxoid variant of SFTs has been described, but these tumours are negative for S100 protein. Isolated visceral pleural neurofibroma should be considered when such findings are encountered.

### **P-262-DIAGNOSIS AND TREATMENT OF BALT LYMPHOMA**

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**BACKGROUND:** Baltoma, a low-grade malignant lymphoma originating from bronchus-associated lymphoid tissue (BALT) is very rare, accounting for only 0.4% of all malignant lymphomas. Balt is thought to be acquired as a result of chronic antigenic stimulation such as smoking, autoimmune disease or infection. Although the prognosis is favorable, clinical features, prognostic factors, and patient management have not been clearly defined. This disease tends to be confined to the lung for a long time, without involvement of hilar and mediastinal lymph nodes or other organs. Because of its clinical features and non-



specific radiological findings, Baltoma is sometimes misinterpreted as chronic inflammation and is followed up for a long time. With this case report we want to demonstrate the difficulties of diagnosis of Baltoma during bronchoscopic and computed tomography (CT) examinations as well as the pitfalls of thoracoscopic and hemato-oncological treatments.

**METHODS:** The 66-year-old man was observed 1 year under the diagnosis of organizing pneumonia and chronic inflammatory processes and was sent to our hospital for evaluation of abnormal findings on chest radiographs. He was non smoker and his medical history was unremarkable. An Xray examination of the chest revealed bilateral multiple coin pulmonary lesions.

**RESULTS:** Computed tomography (CT) showed bilateral multiple nodular lesions up to 1.0 cm in diameter, infiltrates with ill-defined margins, ground-glass attenuation, bubble-like radiolucencies and air bronchograms, and bilateral paratracheal lymph nodes up to 1.0 cm in diameter. Bronchoscopy and mediastinoscopy showed no abnormal findings. Because malignancy could not be excluded, thoracotomy and wedge biopsies of nodes on the left side were performed. Intra-operative frozen section and histopathologic examinations of the lung biopsy specimens revealed the organizing pneumonia and lymphoproliferative disorder, respectively. Phenotypic studies including immunohistochemistry and flow cytometry were performed. Molecular genetic and immunohistopathologic analysis indicated low grade BALT extranodal malignant lymphoma (WHO  $\epsilon$ CD 9699/3 ). The postoperative course was uneventful and polychemotherapy was started. Chemotherapy regimen included CEOP (cyclophosphamide 750 mg/m<sup>2</sup>, doxorubicin 50 mg/m<sup>2</sup>, vincristine 1.4 mg/m<sup>2</sup>, prednisone 100 mg/day). The patient received six cycles of the chemotherapy with complete regression of CT findings. Follow-up was 12 months.

**CONCLUSIONS:** For the majority of patients, surgical procedures such as VATS or open thoracotomy are still required to establish definite diagnosis. Correct diagnosis and treatment of Baltoma should be based on cooperation between radiologists, pulmonologists, thoracic surgeons, pathologists, and hematologists. Further clinical experience and long-term follow-up are needed to identify prognostic factors.

### P-263-ROLE OF 'T' AND 'N' ON THE TIME OF DIE IN THE PATIENTS WHO DIED AFTER RADICAL LUNG OPERATIONS

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**OBJECTIVES:** Lung cancer is the leading cause of cancer death in the world, causing more than one million deaths each year. Survival is better in the early stage lung carcinoma. It is unclear whether a similar relation is present for the time of die after the operation.

**METHODS:** We retrospectively investigated 66 consecutive patients who died after the radical lung operation in the last 5 years. 55 patients were underwent pneumonectomy, and 11 were lobectomy. The numbers of patients who were stages Ia, Ib, IIa, IIb, and IIIa were 10, 16, 3, 15, and 22, respectively. All patients died 6 to 52 months after the radical operation.

**RESULTS:** The times of die for stages I, II and IIIa were 22, 18, and 18 months respectively. The patients who were N0 died 21 months after the operation. The patients who were N1 and N2 died postoperative 23 and 20.4 months, respectively. The patients who were T1, T2 and T3 died 23, 21.7 and 19 months after the operation, respectively.

**CONCLUSIONS:** The time of die in the patients, who were stage I or T1 were longer than other stages. However N status is no significant effect on the time of die. Possibly, invasion of the adjacent tissue may show relation with the time of die.

### P-264-A CLINICAL STUDY OF MEDIASTINAL NEOPLASMS-40 CASES ANALYSIS-

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**BACKGROUND:** The mediastinum is the anatomic space which is restricted and the clinical aspect varies according to location, size and type of neoplasm. Diagnostic and therapeutic approaches to mediastinal neoplasms have changed over and over. We presented our recent therapeutic experiences with these neoplasms

**METHODS:** The 40 patients were treated in operation from 2000 until 2007. The male patients were 23 and the female patients were 17. Age of the patients ranged from 5 to 70, and the median age was 46.7 $\pm$ 15.9. The child patients were two.

**RESULTS:** The most prevalent anatomic location of the neoplasm was antero-superior mediastinum. The most common neoplasm was thymoma (N=13), followed by thymic cyst, teratoma, schwannoma. Complete excision of the neoplasm except thymoma was accomplished in 96% of the patient group. Two patients underwent total thymectomy and the other 11 patients underwent extended thymectomy from thymoma patient group. In the malignant neoplasm, 7 patients were received adjuvant treatment. There was short-term death of 1 person and late death of 1 person.

**CONCLUSIONS:** Our results except clinical manifestations are compared favorably with other reports. Surgery is the management of choice for patient with mediastinal neoplasm and early curative resection is considered to optimize clinical outcome for patients.

### P-265-CORRELATION BETWEEN PET/CT AND HISTOPATHOLOGICAL OESOPHAGEAL TUMOUR LENGTHS

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**BACKGROUND:** It has been well documented that CT is a poor assessor of the length of oesophageal lesions and that there is a very poor correlation between CT and PET lengths. There is little published literature linking the PET/CT tumour length with the actual histopathological length.

**METHODS:** We performed a retrospective audit on 49 patients with a histological diagnosis of oesophageal cancer. Each patient received a preoperative staging PET/CT. In each patient the length of tumour was assessed by an experienced nuclear medicine radiologist using the PET/CT data set. Independently the histopathological length of the tumour was measured. The nuclear medicine radiologist and histopathologist were blinded to each others results.

**RESULTS:** We have been able to clearly show that there is a close relationship between the histopathological length and that calculated on the PET/CT scan that has not been previously reported. The 95% confidence interval around the mean difference between histopathological and PET/CT lengths is 0.1663  $\pm$  2.211cm.

**CONCLUSION:** This finding could have significant implications in the planning of radiotherapy fields and in the confidence of delineating surgical resection margins.

### P-266-NEUROENDOCRINE NEOPLASMS OF THE LUNG

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**BACKGROUND:** This retrospective review covers the entire spectrum of neuroendocrine neoplasms of the lung over a seven-year period (August 2000 to May 2007) in Evangelismos hospital setting. Only patients who underwent surgical procedure were included in this review.

**METHODS:** During this period, a total of 73 patients underwent lung resection or surgical biopsy for the following neuroendocrine neoplasms: typical carcinoid (TC), 13 patients; atypical carcinoid (AC), 8 patients; large cell neuroendocrine carcinoma (LCNEC), 16 patients; mixed large-small cell neuroendocrine carcinoma (LSNEC), 16 patients; small cell neuroendocrine carcinoma (SCC), 20 patients. Tumours were classified according the 1999 classification from the WHO and the International Association for the Study of Lung Cancer (IASLC).

**RESULTS:** There were 58 men (79.45%) and 15 women (20.55%) among the patients, with a mean age of 58.90 years (range, 18 to 84 years). Primary surgical resection consisted of the following procedures: 24 lobectomies (32.87%); 11 pneumonectomies (15.06%); 9 limited resections (12.32%) and 1 right main bronchus sleeve resection (1.36%). 7 patients had the following concomitant procedures: pericardiectomy, 1 patient; chest wall resection, 3 patients; stapling blebs, 2 patients; and transdiaphragmatic liver biopsy, 1 patient. 2 patients underwent bilobectomies, and 1 patient underwent multi-

ple wedge resections. Mediastinoscopy was applied in 14 patients and surgical biopsy of the tumour in 11 patients. The hospital mortality rate was 1,36 % (1 of 73 patients). Patient died of haemorrhage. Follow-up was obtained in 13 of 73 patients with TC (17,80%). 59 of the patients were treated by adjuvant chemotherapy. Lymph-node involvement was present in 6 of TC, 5 of AC, 8 of LCNEC, 9 of LSNEC and 13 of SCC. Presenting symptoms were invariably of respiratory-related. None had the carcinoid syndrome.

**CONCLUSIONS:** Lobectomy with radical lymph-node dissection appears the most appropriate surgical treatment in well-differentiated forms because of the high percentage of lymph-node involvement found in our series. Sleeve resection could be performed in central typical and atypical carcinoid tumours, avoiding pneumonectomy. More limited resection appears optimal as diagnostic procedure in selected patients.

## P-267-LUNG CANCER AS A SECOND PRIMARY CANCER

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**BACKGROUND:** Aim of the study is to detect regularity of appearance and features of lung cancer as a second cancer.

**METHODS:** Between 1997 and 2003 5768 patients with lung cancer were treated in our institution, including 111 peoples (1.92%) who had association of lung cancer with cancer at other sites. The criterion of inclusion to detailed study was diagnosis of lung cancer in association with another primary cancer. The criteria of exclusion to the study were as follows: lung cancer with synchronous cancer, association with skin cancer. We did not analyzed the cases of association of lung cancer with cancer at other sites when they were diagnosed less than 4 times. We analyzed all selected cases separately for men and women.

**RESULTS:** We select 46 cases. Association of three cancers were diagnosed in two patients: leukaemia+esophageal+lung cancer (men) and rectal+lung+breast cancer (women). The most frequent sites of primary cancer in men were head and neck cancer - 17 patients (interval between two diseases was 8.2 years; mean survival after lung cancer was 7.4 months), gastrointestinal cancer - 6 patients (interval was 6.8 years; mean survival was 19.1 months), genitourinary cancer - 6 peoples (interval was 4.8 years; mean survival was 3.2 months). The most frequent sites of primary cancer in women were gynecologic cancer - 9 patients (interval between two diseases was 6.875 years; mean survival was 9 months), gastrointestinal cancer - 4 peoples (interval was 6.5 years; mean survival was 7.7 months), breast cancer - 4 patients (interval was 2.3 years; mean survival was 3.6 months).

**CONCLUSIONS:** Lung cancer as a second primary cancer was diagnosed in 41.4% all cases of association lung cancer. In 15.3% cases lung cancer was detect as synchronous cancer. The most frequently lung cancer arises in men after head and neck cancer. Certain specific associations of different cancer with lung cancer exist. Sexual difference of such associations exists. Lung cancer in association is aggressive and survival after there treatment is not long-term. Nevertheless the first cancer is cured during the second cancer management.

## P-268-THE OVEREXPRESSION OF VEGF AND P53 IN CYTOLOGIC SPECIMENS OF LUNG CANCER PATIENTS

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**BACKGROUND:** Lung cancer still remains a major cause of cancer death in the world. Several markers (diagnostic and prognostic) are being used in recent years, in order to investigate the pathogenesis of lung cancer. Angiogenesis-stimulating factor VEGF (Vascular Endothelial Growth Factor) and p53, a tumor cell proliferating parameter, are two very promising markers in cancer research, which are not widely investigated in lung cancer. VEGF is supposed to be over-expressed usually in non small cell lung cancer (NSCLC) but its role as a prognostic factor still remains controversial. P 53 overexpression implies resistance to chemotherapy in NSCLC and a worse prognosis in patients with well differentiated tumors. The purpose of this study is to investigate the expression of VEGF and p53 in cytological material of non small cell lung cancer cases. According to bibliographic data, there is a small number of cytology studies relevant to this subject.

**METHODS:** We examined a total of 50 archival positive for malignancy

bronchial washings, sputum specimens and pleural fluids (adenocarcinomas and squamous cell carcinomas). The material was processed using Liquid Based Cytology (Thin Prep= automated method of processing and smearing of cells on a monolayer) technique and immunostained with mouse monoclonal antibodies for VEGF and p53.

**RESULTS:** Our results suggest that: 1) VEGF was expressed both in adenocarcinomas and in squamous cell carcinomas 2) All patients with VEGF positive staining had moderate-poorly differentiated adenocarcinomas. 3) Most pleural fluids were negative for VEGF immunostaining. 4) P 53 immunodetection was not related to differentiation and to VEGF positivity.

**CONCLUSION:** VEGF seems to be involved in lung tumorigenesis and could serve as an independent prognostic marker useful for targeted therapy in NSCLC. P53 could serve as an independent prognostic factor for poor prognosis with high value for choosing therapeutic management in well differentiated tumors. Developments with antiangiogenesis agents hold promise as new approaches in lung cancer patients.

## P-269-THE SAC OF BRONCHOSCOPY IS REALLY A WASTE OR A NEW METHOD FOR DIAGNOSIS? Dr.ANTZEL JACOB'S NEW METHOD

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**BACKGROUND:** The sac of bronchoscopy is a part of the bronchoscopy equipments, into which all fluids during bronchoscopy are collected and thrown away. So, Dr Antzel Jacob, supervisor of the Bronchoscopy Department, had the idea of keeping and sending this sample for microscopy evaluation and the results were surprising. The aim of our study was to investigate whether the fluid of the sac could be a useful and helpful material and we had to keep this for cytology examination as an additional tool for correct diagnosis.

**METHODS:** We performed 137 fiberoptic bronchoscopies from patients with abnormal findings at their CTs. Then we collected endobronchial biopsies, endobronchial brushings, bronchial washings, and the fluid of the sacs of bronchoscopy for pathology and cytology evaluation.

**RESULTS:** The results revealed that the sac of bronchoscopy was positive for malignancy at 20,44% of all cases. In the cases that we had endobronchial findings (revelative bronchoscopies), the sac of bronchoscopy was positive for malignancy at 21,11%. On the other hand, in the cases without endobronchial findings (non-revelative bronchoscopies), the sac of bronchoscopy was positive for malignancy at 19,15%. In a very high rate (4,25%), the diagnosis was only based on the sac of bronchoscopy. As far as bronchial washing is concerned, in 4,38% of all cases the sac of bronchoscopy was positive for malignancy and the bronchial washing negative. Also, the sac of bronchoscopy seemed to be more effective (20,44% VS 18,25%) ( $p=0,646$ ) than bronchial washing in all cases. From all non-revelative bronchoscopies with positive results for malignancy, the sac of bronchoscopy seemed to be more effective (19,15% VS 14,89%) ( $p=0,583$ ) than bronchial washing. Additionally, from all revelative bronchoscopies with positive results for malignancy, the sac of bronchoscopy seemed to be more effective (21,11% VS 20,00%) ( $p=0,854$ ) than bronchial washing. Finally, from all revelative bronchoscopies with negative nippers or brushings or both, the sac of bronchoscopy seemed to be more effective (8,88% VS 7,77%) ( $p=0,787$ ) than bronchial washing.

**CONCLUSIONS:** Our results suggest that, the fluid of the sac of bronchoscopy is a sample of high value and it could enhance our diagnostic accuracy in lung cancer investigation.

## P-270-USE OF Y-STENT IN THE MANAGEMENT OF INOPERABLE TRACHEAL STENOSES AND TRACHEOESOPHAGEAL FISTULAS

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**BACKGROUND:** The efficacy of Dumon Y-stent to relieve respiratory distress symptoms was tested in patients referred for endoscopic palliation of both benign and malignant tracheobronchial disease.

**METHODS:** The medical records of 48 patients who had undergone the placement of a Dumon Y-stent at our institution from 1999 to 2004, were retro-

spectively reviewed and analyzed. All procedures were performed under general anesthesia with the use of the rigid bronchoscope. The main indication was critical central airway stenosis (n=35/73%), extrinsic compression (n=9/18.7%) and malignant tracheoesophageal fistula (n=4/8.3%), caused by lung cancer (73%), oesophageal cancer (12.5%), other tumors (10.3%) and prolonged intubation (4.2%).

**RESULTS:** We inserted 59 stents (median age, 62 years; 28 men and 20 women). Immediate and lasting relief of dyspnea was achieved in 91.6% of patients. Mechanical dilatation/tumor debulking, laser ablation and diathermy preceded stent placement in 62.5%, 14.5% and 23% of cases respectively. More than one stent simultaneously was required in 4 cases (8.3%). Need for restenting was encountered in 2 patients (4.1%) due to disease progression and in 1 instance (2%) for stent infection. There were no stent-related deaths. The median time of survival following stent insertion for malignant disease was 218 days.

**CONCLUSION:** The Dumon silicone stents are easily inserted and removed, well tolerated and very efficacious in relieving respiratory symptoms. They provide successful palliation in patients with malignant tracheoesophageal fistulas. Dumon stent had excellent long-term results for benign inoperable tracheal stenoses. Stent placement should always be considered as part of the treatment of terminal cancer patients with imminent suffocation.

### P-271-ADENOID CYSTIC CARCINOMA OF TRACHEA

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**INTRODUCTION:** Primary malignant neoplasms of trachea are very rare and there is limited information about them; adenoid cystic carcinoma is a slow-growing malignant tracheal tumor that the best method of treatment is surgical resection. This study was conducted for evaluation of patient with adenoid cystic carcinoma of trachea that was undergone surgical treatment.

**MATERIALS & METHODS:** In this descriptive study all patients treated for adenoid cystic carcinoma between 1995 to 2006 in Mashad Quam hospital and Tehran Imam Khomeini hospital, were analyzed statistically.

**RESULTS:** Of nine patients, M/F=1/2, mean age was (56.3) years, dyspnea and stridor were the most common presenting symptoms (88.8%) and CT scan was the best diagnostic imaging method. All patients underwent rigid bronchoscopy and taking specimens for pathology; the most common site of involvement was in lower third of trachea (44.4%); (77.7%) of patients underwent surgical resection, hospital mortality after tracheal resection occurred in one patient due to complication of aspiration pneumonia (14.2%). In (28.4%) because of positive surgical margin and (22.2%) due to inappropriate location of tumor after bronchoscopic ablation postoperative radiotherapy was performed. During three-year follow up just one patient (11.1%) had tumor recurrence and resection with post operative radiotherapy was performed, and three-year survival was 88.8%.

**CONCLUSION:** Because of the nature of adenoid cystic carcinoma in trachea, surgical resection is the best method of treatment, but if surgical margin is positive post operative radiotherapy will be necessary. In patients who are not candidates for resection, radiotherapy can be an effective alternative treatment. Keywords: Adenoid cystic carcinoma, cylindroma, trachea, treatment

### P-272-A RARE CASE OF A PATIENT WITH THREE DIFFERENT SYNCHRONOUS LUNG TUMORS WHO WERE TREATED SUCCESSFULLY BY SURGERY.

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**BACKGROUND:** Synchronous occurrence of more than one pulmonary carcinomas of different origin is rare and associated with poor prognosis. We present a patient with 3 simultaneous lung tumors, who were treated successfully surgically.

**METHODS:** A 73 years old fisherman, developed signs of chest pain, dyspnea and haemoptysis for three months. CTscan revealed a left lower lung mass. Bronchoscopically, a papillary mass at the entrance of the superior bronchus of the right lower lobe was shown and accidentally removed; also an infiltration

of a squamous cell carcinoma affecting the secondary carina in the left lung. The patient underwent a left pneumonectomy with extended lymphadenectomy. During the operation a small scar-adenocarcinoma was found in the apex. The right lung mass was a granular cell myoblastoma a rare benign tumor with recurrence tendency. There was no evidence of lymph node metastases.

**RESULTS:** His postoperative course was uneventful. Being over-aged with a poor prognosis, adjuvant therapy was not suggested. 42 months later there were no signs of recurrence (CTscans and bronchoscopy every six months).

**CONCLUSION:** Although the co-existence of different malignancies in the same lung is a sign of poor prognosis, in selected cases, a radical surgical excision can be curative and thus it should be offered to the patient.

### P-273-EFFECTIVENESS OF TUMOR MARKERS (CEA,NSE, CYFRA 21-1) IN COMPLETELY RESECTED NON-SMALL CELL LUNG CANCER

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**BACKGROUND:** Lung cancer is the leading cause of cancer-related death in Korea. Serum tumor markers can be used as a diagnostic tool and prognostic predictor. However, the applicability of tumor markers still remains controversial in non-small cell lung cancer (NSCLC) due to its low sensitivity and specificity, and no tumor markers actually have been used as a determining factor in planning the treatment in NSCLC patients.

**METHODS:** In this study, we retrospectively reviewed 64 NSCLC patients who underwent complete resection from April 2002 to October 2005. Preoperative levels of tumor markers (CEA, NSE, Cyfra 21-1) were measured with commercialized kits within one month prior to surgery, and also after a mean 90.3 $\pm$ Y50.8 following surgery, and correlation between the serum levels of tumor markers and prognosis was analyzed.

**RESULTS:** The mean preoperative levels of CEA, NSE, Cyfra21-1 were 10.7 $\pm$ Y27.3ng/ml, 10.3 $\pm$ Y3.2ng/ml, 3.0 $\pm$ Y3.0ng/ml, respectively, and mean postoperative levels of CEA, NSE, Cyfra21-1 were 4.6 $\pm$ Y10.6ng/ml, 12.0 $\pm$ Y14.8ng/ml, and 2.1 $\pm$ Y1.8ng/ml, respectively. Preoperative and postoperative serum levels of tumor markers did not significantly correlate with lung cancer stage and histology. The elevated levels of postoperative CEA (p=0.0142) and Cyfra 21-1 (p=0.0105) was correlated with short survival time. Short disease free survival was significantly associated with the elevated level of postoperative Cyfra 21-1 (p=0.0018). Elevated level of preoperative Cyfra 21-1 (p=0.0566) had a tendency for short survival time although it did not reach statistical significance.

**CONCLUSION:** Serum Cyfra 21-1 may be useful prognostic factor in predicting survival time and recurrence. Further study and longer follow-up period is necessary in order to make conclusion regarding usefulness of CEA and NSE.

### P-274-VIDEO-THORACOSCOPIC PERICARDIAL WINDOW VERSUS SUBXIPHOID PERICARDIOCENTESIS FOR THE MANAGEMENT OF RECURRENT MALIGNANT PERICARDIAL EFFUSIONS

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**BACKGROUND:** Aim of this study is to compare the effectiveness of video-thoracoscopic pericardial window (TPW) versus subxiphoid pericardiocentesis (SP) for recurrent malignant pericardial effusions during a 36-month period (2005-2007).

**METHODS:** Retrospective chart review was performed in 32 patients with recurrent malignant pericardial effusion. Records were reviewed for preoperative and intraoperative variables, procedural morbidity and recurrence of effusion. Clinical and echocardiographic evaluation was performed every month thereafter.

**RESULTS:** Thirteen patients underwent TPW and 19 SP. Echocardiographic evidence of tamponade was present in 9 of 13 TPW (69.2%) and 13 of 19 SP patients (68.4%). Prompt clinical improvement was observed in all cases. Mortality was zero for both groups. Procedural morbidity was higher among TPW patients (atrial fibrillation 3/13 patients, atrial flutter 1/13patients) compared with only one case of atrial fibrillation for SP patients (1/19). Two out of 19 SP



patients relapsed (10.5%) and one developed constrictive pericarditis probably due to intrapericardial instillation of chemotherapeutic agent. The patients who relapsed underwent surgical intervention. On the contrary, none of TPW patients relapsed. Mean survival period was 8,4 months.

**CONCLUSIONS:** Both methods are safe and effective in confronting recurrent malignant pericardial effusions. After pericardiocentesis, intrapericardial chemotherapy according to chemosensitivity of the primary tumor might be the method of choice in critically ill patients without significant side effects. On the other hand thoracoscopic method gives permanent RESULTS and permits concomitant intrapleural procedures.

### **P-275-A PULMONARY ADENOCARCINOMA DEVELOPED IN TUBERCULOSIS CAVITY**

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**BACKGROUND:** We are presenting an adenocarcinoma case developed in tuberculosis cavity which, to the best of our knowledge, is the first in the literature.

**CASE:** A 71 year old female patient was admitted with complaint of bloody sputum expectoration for 2 weeks. Thoracic CT displayed a cavity 4 cm in diameter in upper lobe of right lung and a nodule-like formation 1,5 cm in diameter in the cavity. Acid-resistant-bacillus investigation in sputum were negative for 3 consecutive days. Patient was taken to operation with possible diagnosis including perforated hydatid disease, aspergillom and lung cancer. Rigid bronchoscopy displayed the bleeding coming from right upper lobe and a right thoracotomy was performed. A cavitary lesion of posterior segment of upper lobe which is invading the superior segment of lower lobe was detected and opened by pneumotomy. It is macroscopically thought that the intracavitary nodule may be a tumoral tissue and a biopsy was taken from the nodule. Pathological imprint study displayed the non-small cell lung cancer and "upper lobectomy + superior segmentectomy of lower lobe + lymph node dissection" operation was performed. Any postoperative complication was not encountered. Pathology examination presented the adenocarcinoma developed in a tuberculosis cavity. Patient was staged as T1N2M0, stage IIIA and referred to medical oncology clinic.

**CONCLUSION:** Togetherness of lung cancer and tuberculosis is rare. In our case, despite the lack of history, it is understood with pathology examination that patient had lung tuberculosis and got well in whom tuberculosis cavity got sterility without consolidation. This is a very rare condition. Adenocarcinoma developed in the cavity as a scar cancer. Despite the advanced stage lung cancer, patient had a successful surgery for the diagnosis and the treatment of hemoptysis. We presented the case since we could not find a similar one in the literature.

### **P-276-SPUTUM CYTOLOGIC EXAMINATION AS A FOLLOW-UP CONTROL METHOD FOR OPERATIVELY TREATED LUNG CANCER PATIENTS**

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**BACKGROUND:** In this study we are trying to investigate the role of sputum cytologic examination (SCE) as a diagnostic tool for the follow-up control of operatively treated patients with lung cancer.

**METHODS:** We prospectively included in the study 86 patients operated for lung cancer during the years 1994-2004. The follow up control included a biyearly SCE and thorax radiography and an annual thorax computed tomography control.

**RESULTS:** From the total of 86 patients, 7 patients were diagnosed with relapse of lung cancer based on the SCE. The diagnosis was confirmed with other methods (thorax radiography, CT tomography, surgical biopsy), alone or in combination. No false positive results came up. In addition to the above mentioned results, 7 patients were definitively diagnosed for lung cancer based on the other methods, while SCE was negative. This gives us a 100% specificity and a 50% sensitivity for the method.

**CONCLUSION:** SCE is highly specific but only moderately sensitive method for the detection of lung cancer in already operatively treated patients.

### **P-277-COMBINED SURGERY AND RADIOTHERAPY IN THE MANAGEMENT OF THYMIC TUMORS**

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**BACKGROUND:** Thymic tumors are common neoplasms of the anterior superior mediastinum. Surgery is the treatment of choice in these patients. Adjuvant radiotherapy is necessary in patients with invasive thymomas and thymic carcinomas.

**PATIENTS AND METHODS:** From 1990 to 2005, 29 patients underwent surgery for thymic tumors at the Department of Cardiothoracic Surgery at Patras University. Study group consisted of 20 female and 9 male patients with a mean age of 49,7 years (range from 19 to 75). Collected data included: presence of myasthenia, WHO pathological classification, Masaoka pathological stage, surgical technique, radiotherapy protocol and outcome.

**RESULTS:** All patients underwent modified maximal thymectomy for thymoma (n=23) or thymic carcinoma (n=6). Clinical presentation included myasthenia gravis in 16 patients (55,2%), dry cough in 5 patients (17,2%), dyspnea in 4 patients (13,8%) and hoarseness in 2 patients (6,9%). One patient presented pleural effusion and another one hemoptysis. None of the patients with Masaoka stage I thymoma underwent postoperative radiotherapy. Six out of 15 patients with stage II, 2 patients with stage III and one patient with stage IV invasive thymoma underwent adjuvant radiotherapy. All six patients with thymic carcinoma underwent the same combined treatment. Mean dose of radiation delivered was 5,2Gy. The 5 year actuarial and relapse free survival rate was 100% for stage I thymoma. Stage II patients with postoperative radiotherapy presented 5 year actuarial and relapse free survival rate of 83,3% while the subgroup of thymoma stage II patients treated only by surgery had corresponding values of 100%. One out of 3 patients with stage III and IV thymoma presented a recurrence within 5 years. Five year actuarial and relapse free survival rate was 66,6%. In the subgroup of thymic carcinoma 3 out of 6 patients died because of a recurrence of the disease (n=2) or metastasis (n=1) reducing 5 year actuarial and relapse free survival rate to 50%. Fourteen out of 16 patients with myasthenia gravis presented an improvement of their myasthenic syndrome, 4 of them being in constant stable remission. One patient reported no difference in his myasthenia and another one presented a deterioration of the disease. No severe acute or late toxicity related to radiotherapy was noted.

**CONCLUSIONS:** Thymic tumors have an excellent survival in stages I and II. Adjuvant radiotherapy is necessary in stage III and IV thymomas as well as in thymic carcinomas for local control of the disease. Modified maximal thymectomy has excellent results in the control of myasthenia gravis related to thymic tumors.

### **P-278-THE ROLE OF MEDIASTINAL LYMPHADENECTOMY IN THE TREATMENT OF RESECTABLE LUNG CANCER**

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**BACKGROUND:** The aim of this study was to define the effect of systematic mediastinal lymph node dissection (MLD) and mediastinal lymph node sampling (MLS) on the accuracy of staging and on the prognosis of patients with non-small cell lung cancer (NSCLC) treated surgically.

**METHOD:** From January 1997 to December 2000, 580 patients were subjected to lung resection for bronchogenic carcinoma. Positive lymph nodes were classified according to their stage, level, number of stations involved and skip metastasis occurrence. Survival was studied.

**RESULTS:** Three hundred ninety-five (68%) patients were subjected to MLD and 185 patients (32%) to MLS. Survival analysis showed better results after MLD than after MLS (47.8% vs 35% respectively,  $p<0.001$ ). Cox regression analysis of all cases disclosed favorable factors of survival the following: Male gender ( $p=0.04$ , odds ratio 0.66, 95% CI 0.44-0.99); Peripheral primary tumor location ( $p<0.001$ , odds ratio 57.2, 95% CI 37-88.4); Squamous histology ( $p=0.02$ , odds ratio 2, 95% CI 1.3-3.2); TNM stage I ( $p<0.001$ , odds ratio 0.2,



95% CI 0.13-0.4); One station N2 disease ( $p=0.03$ , odds ratio 1.6, 95% CI 1-2.7); MLD ( $p<0.001$ , odds ratio 2.2, 95% CI 1.6-3.0). Survival according to N status (table IV) revealed comparable results for MLD and MLS groups, except for the subclassifications of pN0, pN1 and one station pN2 nodes where MLD proved to be superior to MLS ( $p<0.05$  for both).

**CONCLUSION:** Radical lymphadenectomy disclosed a clear advantage from the oncologic point of view.

#### P-279-LUNG SIGNET-RING-CELL-ADENOCARCINOMA

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**BACKGROUND:** Signet-Ring-Cell-Adenocarcinoma can be originated in several organs and send metastases to lungs, but primary lung Signet-Ring-Cell-Adenocarcinomas are rare entities. Surgical treatment depends on the primary site: when lung born, lobectomy is performed; if metastatic, only nodulectomy is indicated. Objective: Describe three cases of pulmonary Signet-Ring-Cell-Adenocarcinoma.

**METHODS:** Three adult females with pulmonary nodules without extra pulmonary lesion were submitted to surgical lung nodules biopsies. Intraoperative pathological analysis was performed in all cases, and the diagnosis of a Signet-Ring-Cell-Adenocarcinoma led us to consider it as a metastatic disease, despite no evidence of extra pulmonary disease. In one case, a middle lobectomy was performed due to arterial invasion. Nodulectomy was the immediate procedure in the other two cases. Definitive pathological analysis allied to PET scan led to a diagnosis of a pulmonary pure Signet-Ring-Cell-Adenocarcinoma. There was no other malignant cellular type than Singet Ring Cell Adenocarcinoma in the microscopic analysis. Lobectomy was further performed in one T1N0M0 case, but the other patient had PET scan images at bilateral mediastinal lymph nodes and no surgical resection was proposed.

**RESULTS:** Lobectomy is the treatment of choice for primary early stage lung carcinomas. Metastatic Signet-Ring-Cell-Adenocarcinoma does not require pulmonary lobectomy as treatment. Only a nodulectomy is performed as a diagnostic procedure. This intraoperative pathologic diagnosis for patients without distant lesions is a challenge, because of the choice between lobectomy and nodulectomy.

**CONCLUSIONS:** Pure Signet-Ring-Cell-Adenocarcinoma can be a lung born neoplasia.

#### P-280-LUNG CANCER STAGE IIIA ANALYSIS: MODE OF LYMPHATIC SPREAD AND PROGNOSIS CLASSIFICATION

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**BACKGROUND:** Patients at stage IIIA/N2 is a heterogeneous collection. A study was conducted to define the characteristics and the prognosis of N2 disease subgroups.

**MATERIAL:** From 1997 to 2000, 892 lung resections for NSCLC were performed at our department. The 236 patients (26.5%) at stage IIIA/N2 (pN2+) were grouped according to the site, number of stations and mode of spread of the involved N2 lymph nodes. Age, gender, type of resection, right or left lesion, histology, tumor lobe predilection, mediastinal lymph node dissection (MLD) or sampling (MLS) pathologic results and survival were recorded and analyzed.

**RESULTS:** Right side and T2 status predominated. Non-regional lymphatic spread was more frequently documented at right (66 cases, 28%) and left lower lobe (47 cases, 20%) location of the primary tumor ( $p<0.001$ ). Upper mediastinal lymph nodes were more commonly involved (144 cases, 61%,  $p<0.001$ ), while multiple stations were more frequently detected (175 cases, 74%). Most N2 nodes were recorded at specimens after MLD (151 cases, 64%,  $p<0.001$ ). The overall 3-year survival was 27% (64 patients). Prognosis stratification demonstrated favorable factors to be: a) Left side of the tumor; b) One station involvement; c) Upper mediastinal node metastasis; d) Skip metastasis; e) Regional spread (3-year survival: 32%, 43%, 36% and 35% respectively).

**CONCLUSION:** Stage IIIA/N2 includes multiple subclassifications. Detailed knowledge of their influence on prognosis is a prerequisite for the right treat-

ment. These findings could set new indications for multimodality treatment of NSCLC.

#### P-281-CORRELATION BETWEEN CT MORPHOLOGY AND HISTOLOGY FOR THE DIAGNOSIS OF MEDIASTINAL LYMPH NODE INVOLVEMENT IN NSCLC - A PROSPECTIVE STUDY -

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**BACKGROUND:** The diagnostic value of enlarged mediastinal lymph nodes in preoperative high-resolution CT-scans remains controversial. This prospective study was performed to analyse the correlation of radiological and histological criteria of lymph node staging in patients with non-small-cell-lung-carcinoma (NSCLC).

**METHODS:** Lymph node involvement in 62 patients with NSCLC undergoing surgical resection with radical ipsilateral lymphadenectomy was analysed. Based on their topographical distribution, the preoperative radiological appearance and the postoperative histological findings of the dissected regional lymph nodes were compared by blinded investigators. Radiological diagnosis of cancer infiltration was based on morphology and density pattern in high-resolution (HR) spiral-CT-scans. Lymph nodes with calcification, central fatty degeneration, a size less than 0.5 cm and a density of less than 24 Hounsfield Units were defined as normal. Pathological diagnosis was based on established histological criteria.

**RESULTS:** Radical lymphadenectomy in 62 patients provided 328 regional lymph node specimen suitable for correlation with the preoperative CT-scan. The defined radiological criteria classified 45% of lymph nodes  $> 1$  cm and 25%  $> 2$  cm as not carcinoma infiltrated. Statistical analysis revealed a sensitivity of 87% and a specificity of 79% for the CT-scan diagnosis of carcinoma infiltration. 20.5 % false positive results led to a positive predictive value of 0.49 for the radiological diagnosis of lymph node metastasis. The negative predictive value was 0.96. The positive likelihood ratio was 4.14, the negative likelihood ratio 0.16. The global findings did not differ significantly for subgroup analysis for localisation and size.

**CONCLUSIONS:** HR-CT-scans are very effective in ruling out mediastinal disease in patients with NSCLC, as indicated by a negative predictive value of 0.96 in comparison with histology. In contrast, CT scans revealed only a 49 % positive predictive value for the accurate diagnosis of lymph node involvement in Patients with NSCLC, despite inclusion of morphological criteria for malignant infiltration in addition to size. Therefore, CT-scans are not sufficient for the diagnosis of N2 and N3 disease in NSCLC-Patients with enlarged mediastinal lymph nodes and cannot replace cervical mediastinoscopy or diagnostic thoracoscopy in the staging of NSCLC.

#### P-282-99mTc-DEPREOTIDE AND HYBRID SPECT/CT IMAGING FOR LYMPH NODE STAGING IN OPERATED PATIENTS WITH NSCLC

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**OBJECTIVES:** 99mTc-Depreotide, a radio-labeled Somatostatin analogue, has been used for the assessment of the solitary pulmonary nodule. However, the experience with its implementation in NSCLC staging is limited. In the present work we used depreotide scintigraphy in conjunction with hybrid SPECT/CT technology for the assessment of lymph node (N) status.

**MATERIALS-METHODS:** 51 patients with NSCLC at a potentially operable stage entered the study and underwent scintigraphy 1-2 days before surgery (43 cases) or mediastinoscopy (8 cases). Imaging was performed with a SPECT/low resolution CT system (Hawkeye, GE Medical Systems). Co-registered SPECT-CT slices were scrutinized to determine the exact location of abnormal scintigraphic findings. The concentration of the radioactive agent in the tumor site, as well as in N1 and N2 node stations was evaluated visually and semi-quantitatively. For quantification purposes, normal uptake in sternum and spine served as reference points. Particular lymph node stations as well as the ultimate N status of each patient were reported according to qualitative and quan-

titative scintigraphic findings. Imaging results were compared to the histological features of lymph nodes collected during surgery.

**RESULTS:** In 6 patients histology of the suspected primary was negative for malignancy; depreotide scintigraphy was falsely positive in 4 of these cases. Another five patients were excluded from the final evaluation because of technically inadequate studies. Among the remaining 40 patients with NSCLC, abnormal depreotide uptake was noticed in 37 primary lesions. With reference to 48 N1 and 60 N2 examined node stations, the sensitivity and specificity of visual interpretation was 71% (10/14) and 47% (16/34) respectively for N1 nodes, and 80% (8/10) and 46% (23/50) for N2 nodes. On a patient basis, N1 stage was predicted with an accuracy of 71% (sensitivity 75%, specificity 67%). In assessing N2 stage, there was no false negative case by scintigraphy (sensitivity and negative predictive value 100%); however there were 14 cases falsely classified as N2 positive (specificity 46%, positive predictive value 30%). With regard to the results of quantification, a lesion-to-sternum ratio less than 0.80 was accompanied by a negative predictive value of 97%. However, at this low cut-off the positive predictive value was only 26%. On the other hand, high nodal uptake (lesion-to-sternum ratio >1.5) improved specificity (85%) and positive predictive value (45%), but sensitivity dropped to 50%. Assessment of lesion-to-spine ratios yielded similar results.

**CONCLUSION:** Preliminary results of depreotide SPECT/CT suggest a possible role of this technique as an adjunct method in assessing lymph node involvement in NSCLC, mainly due to its high sensitivity and negative predictive value for mediastinal lymph node involvement. However, specificity is suboptimal. Quantification of nodal uptake can be helpful in supporting visual assessment, although no single uptake ratio cut-off can achieve accurate differentiation between tumor involved and reactive lymph nodes.

### P-283-PRIMARY YOLK SAC TUMOR IN THE THORACIC WALL

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**BACKGROUND:** Malignant extragonadal germ cell tumors primary to the thoracic wall are quite uncommon lesions. This is believed to be the first reported case of yolk sac tumor of the thoracic wall. The primary location of non-metastatic germ cell tumors of the chest is the anterior mediastinal compartment. There is no reported case about primary yolk sac tumor in thoracic wall in the review of the literature. We would like to emphasize; yolk sac tumor could be fitted in thoracic wall.

**METHODS:** A 33-year-old woman admitted to our hospital with palpable thoracic wall mass and symptom of back pain for 3 months. Thorax CT showed the mass; 105x64 mm dimensioned, paravertebral located in right-down the hemithorax, invaded adjacent ribs and muscles, destructioned T8 vertebral corpus. And another 67x62 mm dimensioned mass in liver. Open biopsy to thoracic wall mass was done and reported tumoral tissue with necrosis. Dynamic abdominal CT obtained. It diagnosed liver mass giant hemangioma firstly, other abdominal organs, especially genital organs were normal. Thoracic MRI showed; spinalis cord was compressed by the mass but there was no invasion. Tumor mass and adjacent invaded tissues were extracted with operation. Resection distances were 4 cm in superior, inferior, and lateral dimensions. Resection included vertebral invaded body, and because of the medulla spinalis, resection distances was less than 0.3 cm in medial dimension. Wide surgical resection, and appropriate reconstruction of large chest wall defect were done. Pathological diagnosing of the thoracic wall mass was Yolk Sac Tumor. It was diagnosed by alpha fetoprotein immunohistochemical painting. Sense and motor deficit were been at the 29th day after operation. Thoracolumbar MRI showed; right paravertebral 120x75 mm dimensioned mass, compression of spinal cord, metastasis in T8 vertebral corpus, and compression fracture in T9 vertebral body. Alpha fetoprotein was more than 1210 ng/ml. Adjuvant chemotherapy was planned for patient. After the second cure of chemotherapy thorax and abdominal CT were obtained. These scanings showed multiple metastasis in lungs and liver, and abdominal effusion. And no decreasing at the level of alpha fetoprotein. She died after 5th chemotherapy.

**RESULTS:** Wide surgical resection is the most effective treatment for the majority of chest wall tumors. There has been no reported thoracic wall primary yolk sac tumor case. Recognising such thoracic wall tumors in patients is important because these tumors are sensitive to chemotherapy with increased patient survival.

**CONCLUSIONS:** We do not have alpha fetoprotein level at the time of admitting. Because we did not think the thoracic wall mass could be a yolk sac tumor. Certain pathological diagnosing was done in the post operation period. In spite

of chemotherapy cures, multiple metastasis were seen, and alpha fetoprotein level was still more than 1200. As a result we would like to emphasize that extragonadal germ cell tumors can be fit in the thoracic wall rarely. But it should be thought while pre operation period.

### P-284-ADJUVANT CHEMOTHERAPY WITH UFT(URACIL-TEGAFUR) IN COMPLETELY RESECTED STAGE I NON-SMALL CELL LUNG CANCER(NSCLC): EARLY CLINICAL RESULTS

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**BACKGROUND:** Several previous randomized studies had suggested that a combination of Uracil-tegafur (often referred to as UFT), an oral 5-fluorouracil derivative agent, improved the survival rate for early stage non-small cell lung cancer (NSCLC) patients as postoperative adjuvant therapy. We also administered UFT to the completely resected stage I NSCLC patients and analyzed the early clinical results.

**MATERIALS AND METHODS:** Among 87 patients who underwent complete surgical resection for NSCLC from March, 2003 to April, 2007, pathologic stage turned out to be I in 25 patients. A total of 25 patients were administered UFT 400mg/m<sup>2</sup>/day for 2 years.

**RESULTS:** For all patients, 16(64%) were males. Mean age was 62~78 years ranging from 40-72. Type of operation was as follows: 18 lobectomy (72%), 3 lobectomy plus wedge resection (12%), 2 bilobectomy (8%), 1 pneumonectomy and 1 wedge resection (4%, respectively). 14(56%) cases were adenocarcinoma, histologically, and squamous cell carcinoma patients were 9(36%). There was 1 large cell carcinoma patient. As for the pathologic stage, pT1 and pT2 patients were 6(24%) and 19(76%), respectively. The median follow up duration was 20 months. There was no perioperative mortality. Local recurrence was detected in 4(16%) patients. Among those, two patients died of brain metastasis. Overall 2-year survival rate was 89.2%.

**CONCLUSION:** Many trials on postoperative adjuvant chemotherapy were conducted to improve the survival in early stage NSCLC. Among those trials, noticeable results were accumulated that administration of oral anti-tumor agent, UFT after complete resection did improve the survival rate significantly. The authors also got early clinical results for UFT administration in completely resected stage I NSCLC comparable with the other previous studies. However, late clinical results also should be analyzed through long term follow-up.

### P-285-PNEUMONECTOMY IN NON-SMALL CELL LUNG CANCER - DOES IT WORTH?

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**BACKGROUND:** Pneumonectomy in non-small cell lung cancer (NSCLC) patients is associated with high morbidity and mortality and thus should be performed in limited patients population but due to late diagnosis of NSCLC still consists 10-30% of all operations. The aim of this study was to evaluate short and long-term results of pneumonectomy in NSCLC patients and to predict the model of the best and the worse candidate for this procedure. Material and

**METHODS:** Four hundred forty six (31%) pneumonectomies were performed in 1439 patients operated for NSCLC between 1993 and 2000 in the Department of Thoracic Surgery of Medical University of Gdansk. Median age of 389 men and 57 women was 60 years (36-78 years). In all 194 right (43.5%) and 252 left (56.5%) pneumonectomies complete mediastinal lymph node dissection was performed. Ten patients (2.2%) received neoadjuvant chemotherapy and 20 (4.5%) patients adjuvant oncological treatment (4 patients chemotherapy and 16 patients radiotherapy).

**RESULTS:** Median survival after pneumonectomy was 16 months while 5-year survival was recorded in 116/446 (26%) patients. Thirty patients that received additional oncological treatment had 2.5 months shorter median survival than remaining 416 patients with only surgical treatment. Pathological stage of NSCLC was the strongest negative predictor of survival in the analyzed group (p<0.0001). Median survival in months according to pathological stage was Ib - 41, IIb - 22, IIIa - 14, IIIb - 11. In 27 (6.1%) patients with large cell carcinoma median survival was 6 months, while in 67 (15%) patients with adenocarcino-

ma was 12 months. Three hundred twenty seven patients with squamous cell carcinoma has three times longer survival than patients with large cell pathology (21 months,  $p=0,03$ ). Patients with left pneumonectomy lived longer than those with right sided resection (21 versus 12 months,  $p=0,002$ ). Neither age ( $p=0,44$ ) and additional illness (cardiovascular diseases, COPD, diabetes, obesity etc.,  $p=0,34$ ) nor other risk factors (ie weight loss,  $p=0,35$ ), had no impact on survival but had influence on the rate of postoperative complications ( $p<0,0001$ ). Thirty-days or in-hospital death was recorded in 36/446 patients (8,1%) - 75% after right and 25% after left sided pneumonectomy. In 177 (39,7%) patients with complications arrhythmias (37,8%) and postoperative bleeding (14%) were most common. Bronchial fistula occurred in 3 patients (0,7%).

**CONCLUSIONS:** A man with right sided large cell carcinoma that has IIB or higher stadium of NSCLC, additionally having low haemoglobin and high white blood cell count is the worse candidate for pneumonectomy concerning complications and long term survival. Pneumonectomy is a procedure of a high risk of death and complications in addition to poor long-term survival and thus should be limited to a selected patients population.

#### **P-286-CLINICAL IMPLICATION AND PROGNOSTIC SIGNIFICANCE OF STANDARDIZED UPTAKE VALUE OF PRIMARY NON-SMALL CELL LUNG CANCER ON POSITRON EMISSION TOMOGRAPHY: ANALYSIS OF 176 CASES**

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**OBJECTIVE:** We sought to assess the clinical implication and prognostic significance of standardized uptake value (SUV) of primary non-small cell lung cancer (NSCLC) staged by integrated PET-CT.

**METHODS:** A retrospective review of 176 consecutive patients with histologically proven NSCLC who underwent staging with integrated PET-CT prior to curative intent surgical resection was carried out. Maximum standardized uptake values (SUVmax) of primary NSCLC were measured and correlated with tumour characteristics, lymph node involvement, surgical stage, type of surgical resection and survival.

**RESULTS:** Using univariate analysis, we have identified that SUVmax was significantly higher in centrally located tumours, tumours > 4 cm, squamous cell subtype, advanced T stage, pleural invasion, and patients requiring complex surgical resection. SUVmax value of 15 was the best discriminative cut-off value for survival generated by Log-rank test. When patients were stratified based on this value, those with SUVmax >15 were more likely to have centrally located tumours, squamous cell subtype, advanced T stage, advanced nodal stage, advanced AJCC stage, larger tumour size and required more advanced surgical resections than simple lobectomy. Overall survival was significantly longer for patients with SUVmax < 15 than those with SUVmax > 15. Furthermore, Nodal stage specific survival following resection (i.e. Non-N2 and N2) were significantly better in patients with SUVmax < 15 than SUVmax > 15.

**CONCLUSION:** SUVmax correlates with tumour characteristics, surgical stage and prognosis following resection. SUVmax may be a useful preoperative tool, in addition to other known prognostic markers, in allocating patients with potentially poor prognosis preoperatively to neoadjuvant chemotherapy prior to resection in order to improve their overall survival. Prospective and randomized trials are warranted.

#### **P-287-A CASE OF STERNAL MALIGN FIBROUS HISTIOCYTOMA WHO WAS APPLIED SURGICAL RESECTION AFTER NEOADJUVANT CHEMOTHERAPY**

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**BACKGROUND:** Primary sternum tumors are rare entities, almost all of which have a malign progression. Chondrosarcoma is the most common primary sternum tumor, while malign fibrous histiocytoma (MFH) is highly rare. MFH usually results from radiation scar. Effective treatment modality is surgical resection with wide margins. However, the effects of radiotherapy or chemotherapy has not been clearly defined. This report presents a case of radiation associated pri-

mary sternal MFH, who was applied wide resection and reconstructive surgery after neoadjuvant chemotherapy.

**METHODS:** A 50 years old female patient applied with ulcerated and painful lesion on the sternum. The personal history of the patient revealed that she had undergone total modified radical mastectomy on the left and axillary lymph node dissection for infiltrative ductal breast carcinoma 19 years before and received radiotherapy. Chest computerized tomography and magnetic resonance imaging evaluations indicated a lesion of 5.6cm in size that had caused nodularity on the skin and marked destruction in the sternum. The lesion extended to the perivascular area and invasion of the pericard was observed. The diagnosis based on the incisional biopsy was MFH. A chemotherapy protocol of iphosphamide 2500 mg/m<sup>2</sup> (3 days), mesna 2500 mg/m<sup>2</sup> (3 days), and adriablastin 50 mg/m<sup>2</sup> (1 day) (IMA) was started with 21 day intervals. After two cures of chemotherapy, the size of the lesion was 3.3cm. Repeated thorax CT showed regression of the local invasion, and the tumor was operable. Intraoperatively, the lesion on the corpus stern was totally excised with a 4cm margin along with the health tissue. The manubrium stern was preserved. To provide stabilization, prolen mesh and methyl metachrylate were used. Then the areolar fatty tissue with superior pedicle and skin composite transposition flap was transposed on the prolen mesh. The early postoperative period, recurrence was observed. The patient was applied adjuvant chemotherapy. In the postoperative 11th month, cranial metastasis was detected and the patient died in the postoperative 13th month.

**CONCLUSIONS:** Neoadjuvant chemotherapy is an effective method in management of primary chest wall MFH. In planning the surgical resection of the tumor after neoadjuvant chemotherapy, when possible, the size of the tumor before chemotherapy should be considered as the basal size and surgical margins should be determined accordingly.

#### **P-288-THE EXPRESSION OF ANTI-APOPTOTIC PROTEIN, SURVIVIN, IN NON-SMALL CELL LUNG CANCER**

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**BACKGROUND:** Survivin is a member of Inhibitor of Apoptosis (IAP) family and considered to play a significant role of tumorigenesis and proliferation. Over expression of survivin was reported in several cancers including non-small cell lung cancer (NSCLC), and these reports suggested there is correlation between survivin expression and patient's prognosis. The purpose of this report is to clarify this relationship in NSCLC.

**METHOD:** We examined 100 NSCLC tissues resected from Oct. 2000 to Dec. 2004 in Tohoku University Hospital. The 100 patients consisted of 71 men and 29 women. The median age was 66.2 (range 30-80). The histology and pathological staging were following: adenocarcinoma 71, squamous cell carcinoma 29, IA 35, IB 24, IIA 5, IIB 10, IIIA 16, IIIB 9, IV 1. We assessed the expression of survivin, p53, NF kappa B, and Bcl-2 by immunohistochemistry. These proteins were considered to have correlation with survivin. Moreover mRNA expression of survivin variants was also examined by real time polymerase chain reaction (PCR). PCR primers were set for wild-type survivin, survivin-deltaEx3, survivin-2B, survivin-3B, and survivin-2alpha.

**RESULT:** The number of cytoplasmic survivin-positive tissue was 88, and nuclear survivin-positive tissue was 40 (both positive was 36). We have 57 p53 positive, 67 NF kappa B positive, and 12 Bcl-2 positive tissues. The results for real time PCR will be reported.

**CONCLUSION:** We will analyse these data and show the relationship between expression of apoptosis related proteins including survivin and prognosis or stage.

#### **P-289-GIANT PULMONARY MASS WITHOUT ANY CONSTITUTIONAL SYMPTOMS: CASTLEMAN'S DISEASE**

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**BACKGROUND:** The Castleman Disease, also known, as angiofollicular lymph node hyperplasia is a rare disorder that results in abnormal proliferation of B-lymphocytes and plasma cells in lymphoid organs. The disease has been classi-



fied on clinical grounds (unicentric or multicentric) and by histological appearance (hyaline vascular pattern, plasma cell predominance, or mixed lesions). In more than 70% of cases, Castleman's disease presents as a solitary mediastinal or cervical mass with an indolent course. In this study we present the complete convalescence after excision of unicentric mass in patient with Castleman Disease.

**METHOD:** We present a 19- year old female with a mass on the left site of the chest, that detected unexpected in a routine X-ray of the thorax. The mass had diameter 10 cm and was near to the heart. The patient was symptoms free. We performed a thoracoscopic biopsy and the histological examination revealed a Castleman's tumor. Two months later, the patient underwent left lateral thoracotomy and we found a lymph node, number 11, in the secondary carina.

**RESULTS:** The postoperative course was uneventful and the patient discharged in good condition. During the follow up in the Oncology department she is disease free.

**CONCLUSION:** For patients with this rare and poorly understood disease the optimal therapy is unknown. The treatment of the disease depends mainly on the histological type and the clinical symptoms. Surgery arises as the golden standard of localized disease with curative results in most of the cases.

### **P-290-SOLITARY METASTATIC ADENOCARCINOMA OF THE STERNUM TREATED BY TOTAL STERNECTOMY AND CHEST WALL RECONSTRUCTION USING A CORE-TEX PATCH AND MYOCUTANEOUS FLAP**

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**BACKGROUND:** Bone metastases are a frequent complication of cancer occurring in up to 70% of patients with advanced breast or prostate cancer. The consequences of bone metastasis are often devastating; only 20% of patients with breast cancer are still alive 5 years after the discovery of bone metastasis. Brodin and Linden in 1959, first described total sternectomy due to a chondrosarcoma involving the entire sternum. Partial or total sternectomy plus rib resection is now a common thoracic surgical procedure. It is undertaken for primary and secondary tumors arising from any of the structures forming the chest wall as well as recurrences of breast cancer or lung tumors invading the chest wall. Myocutaneous flaps and prosthetic materials have greatly facilitated reconstruction after massive chest wall resection.

**METHODS:** We report a case of a 70-year old Caucasian female who was referred to the thoracic oncology of our hospital for management of a gigantic retrosternal mediastinal mass. She had been well 8 weeks before admission, when she experienced the sudden onset of sharp left anterior chest pain, which was worse adjacent to the sternum. She had underwent radical mastectomy L. (Halsted) 1999 followed by radiotherapy for adeno-Ca breast carcinoma. Computed tomographic scanning and MRI of the chest revealed a 74.23 x 37.7mm mass in the left anterior mediastinum, adjacent to the main pulmonary artery, the right ventricle and ascends aorta contiguous with pericardium. We performed total sternectomy at all layers encompassing the skin, subcutaneous tissues, pectoralis major muscle, all the costal cartilages and the anterior part of pericardium. Immediate closure of the defect was performed with a single 0.6mm Gore-Tex Cardiovascular patch combined with a serratus anterior muscle flap.

**RESULTS:** Postoperative respiratory function tests gave satisfactory results and the patient could be relieved from endotracheal intubation immediately after the operation and had no problems in activities of daily living or occurrence of chest flailing or paradoxical movement of the chest, no flap infection or detachment. The patient was discharged from hospital 7 days postoperatively. At 16 month follow up, including CT and MRI of the chest, abdomen and brain, the patient remains asymptomatic and the stability of the chest wall is well preserved.

**CONCLUSIONS:** A plethora of studies have reported the usefulness of a radical surgical approach in patients with a single metastasis localized to the chest wall and sternum, because this could improve survival. Reconstruction of the chest wall following radical resection of the sternum is essential. Various techniques have been used to repair the defects in the anterior thoracic wall: the fascia lata, rib grafts, large skin flaps, the contralateral breast, myocutaneous flaps, and various types of prosthetic material (polypropylene and Vicryl nets, Gore-Tex patches). Gore-Tex has the advantage of being impermeable to air and liquids and provides excellent results in terms of stability, intrathoracic organ protection and pulmonary expansion. Evaluation of long term effectiveness needs to be made.

### **P-291-MULTIPLE MYELOMA PRESENTED AS AN ASYMPTOMATIC ANTERIOR MEDIASTINAL TUMOR- A CASE REPORT**

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Multiple myeloma is a malignant proliferation of plasma cells derived from a single clone. It is often found in skull, bones, and spinal column, creating a characteristic "punched out" lesions. The tumor rarely existed in the thoracic cavity or in the mediastinum, only few cases reported in the literatures. We encountered a sixty year-old male who incidentally palpated a right anterior chest wall mass. By referral, the patient came to our hospital and was admitted for further investigations. Radiographic studies revealed a well-defined osteolytic lesion over right radial shaft and Gallium Tumor Scan showed increased uptakes in the anterior mediastinal, right cervical, and right anterior chest wall. Chest CT scan presented multiple nodular tumors in the cervical and mediastinal areas. We performed right cervical and mediastinal tumor excisions. The pathological report, to our surprise, proved the tumor to be Multiple myeloma-Lambda type. Radiation therapy was initiated. However, despite radiation therapy and chemotherapy, the patient developed wide spread bony metastasis and pathological fractures over bilateral humerus and femurs. ARDS with cardiopulmonary failure developed and the patient expired. We reported this case not only for its rarity, but also for its aggressive and highly malignant natures and its poor prognosis.

### **P-292-PRIMARY LYMPHOEPITHELIOMA-LIKE CARCINOMA OF THE LUNG PRESENTED WITH CERVICAL AND MEDIASTINAL LYMPHADENOPATHY IN AN ELDERLY PATIENT: A CASE REPORT**

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Primary Lymphoepithelioma-like carcinoma (LELC) of the lung is a very rare disease. It was first reported on 1987. In the past decades since it was discovered, very little long term follow-up data reported. As from the reported literature, this uncommon disease has a predilection among young Asian nonsmokers without gender distinction. The histological feature of the tumor is indistinguishable from undifferentiated nasopharyngeal carcinoma and the carcinogenic role of latent Epstein-Barr virus infection make this tumor predominantly in Asian population as compare to Caucasians. We encountered a case of a 76 year-old male who was admitted into our service due to dry cough and hypotension for three months. Chest CT showed a numerous lymphadenopathies in the mediastinal and bilateral cervical areas. The patient received surgical biopsy for both mediastinal and right cervical masses. The pathological diagnosis of biopsies confirmed the diagnosis of LELC of the lung. The patient's tumor cells were negative for EBV as examined with immunohistochemical analysis. Postoperatively, the patient received both radiotherapy and chemotherapy. With regular follow-ups, the patient was free from tumor recurrence since the operation. We reported this case for its rarity, untraditional location of presentation, advanced age of onset, rapid tumor remission without recurrence, and the EBV negative nature of the tumor.

### **P-293-TREATMENT OF POST BRONCHOSCOPIC LARYNGEAL EDEMA-THE ROLE OF ADRENALINE NEBULIZATION**

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**BACKGROUND:** Our objective was to study the effect of adrenaline nebulization in preventing the progression of laryngeal edema postbronchoscopy.

**METHODS:** 100 cases performed during the past 2 years were assessed as regards the result of different modalities of therapy for cases with laryngeal edema.

**RESULTS:** The first 72 cases were treated as required with lidocaine spray, bronchodilators, steroids & endotracheal intubation (needed in 4 cases). The next 28 cases had trials with adrenaline nebulization accordingly. None required endotracheal intubation.

**CONCLUSIONS:** Adrenaline nebulization prevents progression of laryngeal edema & hence avoids subsequent morbidity & mortality.



### **P-294-MINI-THORACOTOMY FOR DIAPHRAGMATIC PPLICATION BY TRANS-DIAPHRAGMATIC VIDEOTHORACOSCOPIC ASSISTANCE.**

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**BACKGROUND:** Unilateral diaphragmatic eventration and paralysis require plication in case of progressive dyspnea on exertion and recurrent respiratory infection. Plication of the paralyzed hemidiaphragm may alleviate the symptom of dyspnea by reducing paradoxical movement of the hemidiaphragm. Barriers to diaphragm plication have included the perceived need for thoracotomy and uncertainty of the potential benefits. We describe a technique of mini-thoracotomy to plicate the paralyzed hemidiaphragm with trans-diaphragmatic Videothoroscopic assistance.

**METHODS:** A 44-years-old man with dyspnea on exertion was referred to our clinic. Ten years before he had undergone laparotomy for appendicitis and did not hear about the abnormality on his chest radiograph. Preoperative chest radiographs showed a high position of the left diaphragm. Computed tomography and magnetic resonance of the neck, mediastinum and chest did not show any possible organic lesions compressing the phrenic nerve. His pulmonary functions were : FVC = 2.7, FEV1 = 2.1 and PEF = 5.05. The patient was placed in the right lateral decubitus position. The lungs were isolated with a double-lumen endotracheal tube. A 7 -cm lateral skin incision for the miniature lateral left thoracotomy was made at the level of the xiphoid process posterior to the nipple. The stomach drained with a nasogastric tube. A 0-degree scope was introduced into the pleural cavity without port. The thoracoscopic camera served two purposes: firstly, it illuminated the pleural cavity, enabling the plication of uncut hemidiaphragm through a mini-thoracotomy and secondly, through hole on the diaphragm, visualized the intraabdominal organs (stomach, bowel, spleen) displacement when the uncut diaphragm was plicated with a double series of eight parallel U stitches. Two prophylactic intercostal drains were inserted and the wound was closed. The postoperative hospital stay was 5 days.

**RESULTS:** The postoperative chest roentgenogram showed a flattened diaphragm, confirming successful plication. There was no operative morbidity and no mortality. At t follow-up than 24 months CT chest scan show the integrity of the repaired diaphragm and the patient tolerates exercise well with improvements in pulmonary functions (FVC, from 2.7 to 3.8, FEV1, from 2.1 to 3.4 and PEF, from 5.05 to 8.1).

**CONCLUSIONS:** Using our technique of trans-diaphragmatic Videothoroscopic assistance, operative repair can be accomplished under direct vision through a mini-thoracotomy with the attendant benefits of reduced analgesic requirements, cosmesis and the plication of the left hemidiaphragm is made under maximum tension.

### **P-295-TBC DIAGNOSIS - STILL SERIOUS SURGICAL PROBLEM**

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**BACKGROUND:** Tuberculosis (TBC) was always a serious problem in surgery, not only in its treatment, but also in diagnostics. Surgical approach is sometimes necessary in TBC diagnostics. After discovery of antituberculous remains surgical treatment only for strictly defined cases.

**METHODS:** 26 patients were indicated for biopsy due to lung tumor, infiltrate or fluidothorax from 4/2004 to 10/2007 (43months). They underwent videothoracoscopy (VTS) or video-assisted thoracoscopy (VATS) with lung or pleura biopsy. All 26 samples were sent for histological and bacterial examination. 19 samples for molecular-biologic examination (PCR).

**RESULTS:** In 100% was TBC confirmed by histological examination, in 84% by PCR examination and in 56% by bacterial cultivation.

**CONCLUSION:** Surgical methods as VTS and VATS remain still important techniques in TBC diagnosis. In any lung pathology indicated for biopsy is crucial to think about the possibility of TBC.

### **P-296-SUBXIPHOID PERICARDIECTOMY FOR DIAGNOSIS AND TREATMENT OF PERICARDIAL EFFUSIONS**

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**OBJECTIVE:** Controversy exists about the procedure of choice for management of pericardial effusions, particularly since the advent of video-assisted thoracoscopic pericardiectomy. This study was undertaken to assess the safety and effectiveness of subxiphoid pericardiectomy.

**METHODS:** The medical records of 127 consecutive patients, (age: 13-87, mean: 55.7 yrs), who underwent subxiphoid pericardiectomy from 1990 to 2005, were reviewed. Indications comprised clinically evident or impendent cardiac tamponade in 94 cases (74%) and symptomatic pericardial effusions refractory to medical treatment in 33 patients (26%). The procedure was performed under general anesthesia; a specimen of pericardial fluid was sent for cytologic, biochemical, and bacteriologic examinations. An echocardiogram was performed in all patients one and three months postoperatively. Follow-up was obtained up to November 2007. Seven patients (5.5%) were lost to follow-up; the remainders were followed up for a mean of 32.8 months.

**RESULTS:** Underlying malignancies were present in 69 (54.3%) patients; 52 patients had benign diseases and 6 patients had AIDS. The overall 30-day mortality was 17.2% (32.2% in patients with malignancies, 16.7% in AIDS patients and 6.6% in patients with benign diseases;  $p = 0.01$ ). During follow-up, 3 patients (2.5%) with benign disease developed recurrent effusions requiring reoperation. The surgical procedure provided evidence of the cause of pericardial effusion in 65 (51.2%) patients. In 17 of them the operation established the diagnosis of an unsuspected (10 malignant and 7 benign) disease. In 88 patients the cytological and histological analyses were negative, whereas the histological diagnosis was "non-specific pericarditis" in 62 patients and "normal pericardium" in 6 patients. Only half of these 68 patients had a known history of a benign disease. In the rest 34 patients, the diagnosis of "idiopathic pericarditis" was attributed. Major postoperative complications were noticed in 17 patients (13.4%). Five patients (3.9%) developed postoperative low cardiac output syndrome (PLCOS). Twelve patients presented transient arrhythmias and 1 of them died. The overall 30-day mortality, including the in-hospital mortality, was 16.5% ( $n=21$ ). The 30-day mortality of all patients with underlying malignant diseases was 28.3% differing statistically compared to that of patients with benign disease ( $p<0.001$ ). Sixteen out of the 21 early postoperative deaths were due to the underlying disease. The remaining 5 deaths resulted from complications related to the surgical procedure itself: four patients died of PLCOS and one patient from cardiac arrest during induction to general anesthesia. One-year survival rate, including in-hospital mortality, was 30.6% and 84.1% for patients with malignancies and benign diseases, respectively. Actuarial survival differed significantly between patients with benign and patients with malignant disease or AIDS ( $p < 0.001$ ).

**CONCLUSIONS:** Subxiphoid pericardiostomy is a safe, expeditious, easy, inexpensive and effective procedure, which can be applied to a wide spectrum of pericardial effusions. The technique provides accurate diagnosis and effective, durable treatment with a low operation-related mortality and recurrence rate. Perioperative mortality and late survival rates are primarily dependent upon the nature of underlying pathology, while PLCOS is a major risk factor for short-term mortality. Long-term survival differed significantly between patients with benign and those with malignant diseases.

### **P-297-SPONTANEOUS CUTANEOUS FISTULA OF PULMONARY HYDATID CYST: A RARE CASE**

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**BACKGROUND:** Hydatid disease remains a significant health problem in endemic areas where sheep and cattle are raised. The liver is the most frequently involved organ, followed by the lungs. Live hydatid cysts can rupture into physiologic channels, free body cavities, or adjacent organs. There is not any report about cutaneous fistula caused by pulmonary hydatid cyst. We report a 21-year-old woman who is the first case of spontaneous cutaneous fistula of pulmonary hydatid cyst.

**METHODS:** 21-year-old woman admitted to thoracic surgery department with coughing, and lower thoracic pain in the right side for a month. She had been operated for right sided pulmonary hydatid cyst 5 years ago (cystotomy and

capitonage operation had been done for hydatid cyst in the right lower lobe). Right sided posterolateral thoracotomy incision scar, and cutaneous reddish swelling were seen in the physical examination. There was fluid drainage from the cutaneous swelling that located into the old thoracotomy scar. There was no abnormality of complete blood counting and biochemical laboratory analysis. Thoracoabdominal computed tomography was obtained, and it showed multiple pulmonary hydatid cysts in the right side, and liver hydatid cysts. Cystic lesion of the lower lobe was extending to the anterolateral extrathoracic dimension. At the 4th day of the hospital staying, white membrane was protruded out from her skin reddish swelling in the right thoracic wall. The membrane was examined pathologically and reported as hydatid disease's germinal membrane. The drainage stopped spontaneously in 3 days. Swelling area was dressed a wound with iodine solutions daily. Cystotomy and capitonage operation was planned for the multiple pulmonary cysts. Same thoracotomy incision line was used for the rethoracotomy. There were small cysts in the pleural cavity, and the right lower lobe. Cystotomy and capitonage operation was done to all hydatid cysts. Postoperative period was uneventful. She was referred to general surgery department with albendazole therapy (10 mg/kg, divided into two times per a day) at the post operative 7th day. At the 3rd month control; patient was without any symptom, and no radiologic evidence of pulmonary hydatid disease.

**RESULTS:** Spontaneous cutaneous fistulization is very rare complication of pulmonary hydatid cysts. Infection and continued expansion of the cyst causes pressure erosion and adhesion to the adjacent structures. In our case, inflammation or cystic expansion are probably the main factor of the cutaneous fistulization.

**CONCLUSIONS:** We reported the first case of spontaneous cutaneous fistula of the pulmonary hydatid cyst. It should be kept in mind that pulmonary hydatid cysts can cause such a rare complication.

#### **P-298-RETROSTERNAL GOITER; WHEN IS TRANSTHORACIC APPROACHE INDICATED?**

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**BACKGROUND:** Substernal or intrathoracic thyroid gland pathologies are important because different surgical approaches such as median sternotomy and thoracotomy may be indicated together with cervical incision for treatment. Thoracic approaches provide adequate exposure for surgery and complete removal of the mass with a low morbidity and mortality ratio.

**METHODS:** Ten cases of thyroid pathologies undergoing thoracic incisions with or without a cervical incision for varying indications between March 2003 and Jan 2007 were reviewed. Thyroidal masses were removed via a median sternotomy in eight patients and thoracotomy in two patients. Cervical incision was added in six patients.

**RESULTS:** Pathologic examination revealed thyroid carcinoma in 4 patients, multinodular goiter in 4 patients, reidel thyroiditis in 1 patient and adenoma in 1 patient. All of the patients were extubated in the early postoperative period. There were no postoperative mortality and morbidity. Mean hospital stay was 9.6 days (range, 5-11 days). Mean follow-up was 13 months (range, 1-23 months).

**CONCLUSIONS:** We recommend use of the transthoracic approaches such as median sternotomy and thoracotomy for retrosternal goiter for surgical exposure as it provides wide exposure and facilitates removal of the mass. By using median sternotomy and thoracotomy catastrophic results as haemorrhage can be avoided also complete removal of the malignancies can be provided.

#### **P-299-MANAGEMENT OF DESCENDING MEDIASTINAL INFECTIOUS OF THE UNUSUAL ETIOLOGIES**

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**BACKGROUND:** Mediastinal infectious is a life treating a distinctly rare event, related to its underlying foreign body without esophageal perforation and dental abscess. We evaluated that how can we approach to descending mediastinal infectious due to unusual etiologies.

**METHODS:** We report the three cases of mediastinal infectious with secondary

to dental abscess (2 cases, 45 and 80 years-old women) and penetrating foreign body injury "pieces of glass" of the retropharyngeal wall (1 case, 62 year-old woman), two cases had retropharyngeal abscess and descending necrotizing mediastinitis. Mediastinal abscess was detected by computed tomography scanning, does not occur much worse prognosis. The all patient was successfully treated with cervical, retrosternal and thoracic abscess drained via cervicotomy and thoracotomy

**RESULTS:** All patients' postoperative course were uneventful at 7, 16 and 19 months follow-up

**CONCLUSIONS:** Mediastinal abscess can be a serious complication. "Mediastinitis" has a high mortality rate if the diagnosis is not quickly established and adequate therapy not performed. In this report, we discuss that management and the possible pathophysiological mechanisms underlying descending mediastinal infectious secondary to unusual etiologies. Clinicians should be aware of the possibility of descending mediastinal infectious in patients with retropharyngeal abscess, dental abscess associated with persistent symptomatology such as persistent fever. Imaging modalities must be utilized as soon as possible for early diagnosis and aggressive treatment includes surgical drainage and medical management in intensive care unit may prevent worse prognosis and catastrophic results.

#### **P-300-WHEN IS SURGICAL TRACHEOSTOMY INDICATED? COMPARISON OF SURGICAL "U SHAPED" AND PERCUTANEOUS TRACHEOSTOMY**

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**BACKGROUND:** Tracheostomy is one of the most frequent interventions for intensive care unit (ICU) patients. Usually, two methods has been compared, which one is superior; percutaneous tracheostomy (PT) or surgical tracheostomy (ST)? The surgeon's training and experience, the patient's condition, neck anatomy, and stability should dictate the choice of PT or ST for transfer to the operating room.

**METHODS:** We performed U shaped ST in 121 patients ( ) and PT in 85 patients ( ) between March 2003 and December 2006. All the ST was opened U shaped (U-ST). After providing clear appearance of tracheal rings, it was hanged with a 2/0 silk suture from middle of 2nd or 3rd cartilage rings as a guide. Instead of resecting and removing the tracheal ring, it was used to create a flap, which was attached to the skin. A sharp semicircular incision of the second or third tracheal ring was completed, and a cuffed tracheostomy was inserted.

**RESULTS:** In our series post-operative bleeding is the most frequent complication that occurs after not only U-ST but also PT. PT and ST patients had similar complication rates: 4.1% for ST [bleeding in 2 (1.7%), stenosis in 2 (1.7%), stomal infection in 1 (0.8%) patients] versus 3.6% for PT [bleeding in 2 (2.4%), pneumothorax in 1 (1.2%) patients]

**CONCLUSIONS:** U-ST has similar results with PT on complications. There are three superiority of PT to ST; Time, staff utilization and cost effectivity. The major advantages of ST can be seen in selected patients with thyroid hyperplasia, short neck, trachea-malacia, and obesity. Also, children are appropriate for ST because of touchy structure of tracheal rings and neck anatomy. The patients who had neck operation history such as tracheostomy, thyroidectomy etc. are candidates for ST. We conclude that U-ST is a safe, rapid and easy technique. Even if, cost and time seems like the disadvantages of ST, advantages in selected patients make this technique superior.

#### **P-301-TRACHEAL LEIOMYOMA A RARE CASE REPORT**

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**BACKGROUND:** Malignant tumors of the trachea are more common than benign tumors. The trachea leiomyoma rare seen benign tumor and it occurs in the distal one-third of the trachea

**METHODS:** A 53 years-old woman with dyspnea in one month was admitted to our hospital. Physical examination revealed decreased breath sounds at bilateral and ronsus. The smooth and 2x2.5 diameter solid mass which contain calcification was detected on the thorax tomography in section T1-T3. In bron-

choscopy was seen in the middle one-third of the trachea posterior wall closing up the tracheal lumen by the mass. We performed cervical incision with tracheotomy and extirpation of tumor and tracheoplasty on the patient. The lumen and anastomosis was seen normally in postoperatively bronchoscopy. The histopathological examination was reported leiomyoma. The patient was controlled twenty-six months after operation and was asymptomatic.

**RESULTS:** A case of the trachea leiomyoma was occasionally seen presented with the review of the literature.

### P-302-THORACOSCOPIC RESECTION OF ANTERIOR MEDIASTINAL TUMORS: EXPLORE A NEW METHOD OF STERNUM LIFTING

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**BACKGROUND:** Video assisted thoracic surgery (VATS) has been a useful method for resection of mediastinal tumors, as well as lung resection and lobectomy. On another front, median sternotomy is often required for the resection of anterior mediastinal tumors because of its difficulty in dissecting lesions just beneath sternum or in handling vessels when approached by ordinary thoracoscopic manipulation. VATS with sternum lifting approach has reported to be useful for anterior mediastinal tumors, solving these issues. Many of them use LaparoLift system which requires bulky expensive device. We attempted to apply a simple instrument to VATS field that was originally developed for laparoscopic surgery. Here we report 5 cases of anterior mediastinal tumor resection with the sternum lifting method.

**METHODS:** Patients with anterior mediastinal tumor were operated on the sternum lifting approach. Either longitudinal or transverse incision of 6 to 8 cm was placed at subxiphoid region, and then backside of the sternum was dissected. Nishii type abdominal wall lifting bar, which has originally intended for laparoscopic surgery, was inserted into substernal space. The bar was connected with Kent type wire retractor which is often used in abdominal surgery, then pulled upward. Additional port was placed in thoracic and/or subxiphoid region for instruments or thoracoscopic use. A thymus tissue including tumor was excised via subxiphoid wound.

**RESULTS:** Five patients (male 1, female 4) with anterior mediastinal tumor of 3 cm or less in size without invasion were operated on this procedure. Average operation time was 173\_57 minutes, and average amount of bleeding was 96\_48 ml. No complication was experienced.

**CONCLUSIONS:** Although indication must be considered, VATS resection with sternum lifting approach was safe and useful for the resection of anterior mediastinal tumor. The use of Nishii type lifting bar with Kent type retractor enables sternum lifting approach in a simple way.

### P-303-CENTRAL-LOCATED PULMONARY SCLEROSING HEMANGIOMA MIMICKING LUNG CANCER ON FDG-PET SCAN

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**INTRODUCTION:** Sclerosing hemangioma is an uncommon lung neoplasm. On radiographic study, it is typically solitary nodule found more often at the peripheral part of lower lobes. The report of FDG-PET scan findings on sclerosing hemangioma is limited. Here we report our experience of FDG-PET scan in sclerosing hemangioma.

**CASE 1:** The first case is a 50-year-old male with one 3.6 cm solitary mass lesion near the left hilum on CT scan. Whole body PET revealed one hypermetabolic lesion with standard uptake value (SUV) of 2.72. Microscopic examination of the surgically-resected lesion showed proliferation of round stromal cells and surface cells in papillary, sclerotic, solid and hemorrhagic patterns, which was typical sclerosing hemangioma.

**CASE 2:** The second case is a 32-year-old female with one 5.2 cm central-located mass lesion at right lower lobe on CT scan. Whole body PET revealed one hypermetabolic lesion with SUV of 3.93. Lobectomy was performed. Microscopically, the four typical patterns were observed. The stromal cells and surface cells were both positive for EMA and TTF-1 stains, whereas the cytokeratin stain was positive for surface cells only, which is characteristic of sclerosing hemangioma.

**CONCLUSION:** Central-located large sclerosing hemangioma may be avid on FDG-PET scan and complicating preoperative workup when evaluating solitary

pulmonary nodules. Familiarity with this false positive finding helps in interpreting FDG-PET scan results.

### P-304-SOLITARY NODULAR PULMONARY AMYLOIDOSIS IN A PATIENT WITH SJOGREN'S SYNDROME

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**INTRODUCTION:** Pulmonary manifestations of Sjogren's syndrome encompass a variety of presentations ranging from benign lesions to malignant lymphocytic lymphoma. Most cases present as multiple nodules or diffuse reticulonodular infiltrates. Here we present a case of solitary nodular pulmonary amyloidosis in a patient with Sjogren's syndrome, which is a very rare condition.

**CASE REPORT:** A 41-year-old woman was admitted with history of generalized skin itch, dry eye and dry mouth for ten months. The rheumatologist recognized the diagnosis of Sjogren's syndrome. However, one solitary pulmonary nodule was incidentally found on routine chest radiography. On computed tomography, the lesion was well-defined, homogenous and 1.3 cm in size. To ascertain the pulmonary pathology, wedge resection of the right lower lobe was performed. Microscopically, the lesion exhibited eosinophilic amorphous substance deposition, which showed green birefringence when staining with Congo Red. The diagnosis of pulmonary amyloidosis with Sjogren's syndrome was made.

**DISCUSSION:** Amyloidosis is characterized by deposition of extracellular insoluble amyloid fibrils, which contain a cross- $\beta$  structure. Sjogren's syndrome is both an inflammatory condition and an immunological disorder. The nature of disease may be the possible explanation that links Sjogren's syndrome and amyloidosis, which is caused by accumulation of misfolded acute phase protein or immunoglobulin fragments. Pulmonary amyloidosis in patients with Sjogren's syndrome is rare and most cases present as multiple nodules or diffuse reticulonodular infiltrates. Solitary nodular pulmonary amyloidosis in a patient with Sjogren's syndrome is very rare. Surgical resection of the pulmonary nodule not only confirms the diagnosis but also excludes the existence of malignancy.

### P-305-THE CASE AND EMERGENT TREATMENT OF EPIDURAL PNEUMATOSIS AND PNEUMOMEDIASTINUM DUE TO TRACHEAL INJURY

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A 16 year old male patient was applied due to swelling on face and body, eyelids, neck, chest and abdomen after a traffic accident. In physical examination, extensive subcutaneous emphysema on face, eyelids, neck, chest and abdomen was detected. Any traumatic lesion except an ecchymosis 2 cm superior to jugulum, was not detected. Arterial blood pressure, heart rate and breath rate were 104/65 mm-hg, 91 per second, 23 per second respectively. Thoracic computed tomography displayed left pneumothorax, subcutaneous emphysema and air in epidural space (epidural pneumatosis). Urgent left tube thoracostomy and pretracheal fasciotomy were performed. Patient was consulted to neurosurgery and any epidural decompression intervention was not performed since the patient did not have any neurological deficit. After preoperative preparation patient was taken to the operation room and a rigid bronchoscopy showed a 1 cm defect on left lateral wall of trachea 3 cm distal to vocal cords. After the bronchoscopy, a collar incision was performed and the defect was repaired by primary suture technique. Any postoperative complication was not encountered and patient was discharged on postoperative 7th day. Complete resolution of epidural pneumatosis was seen on control computed tomography on postoperative 10th day.

### P-306-SURGICAL TREATMENT OF BENIGN TRACHEAL STENOSIS

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**BACKGROUND:** Benign tracheal stenosis is a relatively infrequent problem presenting a common indication for tracheal resection. Tracheal trauma, usually



related to endotracheal intubation, is the most frequent cause. We present our experience with this rare entity focusing on surgical management and outcome.

**PATIENTS AND METHODS:** From 1996 to 2006 there have been 8 patients with benign tracheal stenosis treated surgically at the Department of Cardio-thoracic Surgery at the University of Patras. Study group consisted of 5 male and 3 female patients with a mean age of 40,3 years (range from 27 to 67). We retrospectively analyzed the following data: clinical features and etiology, diagnosis, surgical treatment and outcome.

**RESULTS:** All patients presented stridor and dyspnea during common physical activities. Two patients referred previous trauma and 6 a recent ICU recovery. Diagnosis was confirmed at CT imaging of the neck and chest. In the operation room tracheal dilations up to 24 Fr were undertaken immediately before endotracheal intubation and general anesthesia were established. All patients were operated through a collar incision with partial sternotomy. Surgery consisted in tracheal resection followed by end to end tracheotracheal or cricoidtracheal anastomosis with Vicryl 4/0 sutures. The length of tracheal resection ranged from 1,5 cm to 5 cm (mean 2,9 cm) and the number of tracheal rings removed ranged from 2 to 7 (mean 4). Mobilization of the carina was carried out in 4 patients with extent of the stenosis > 3 cm. Seven out of 8 patients were extubated immediately after surgery with the neck sutured in flexion position. One patient was transferred to the ICU and was extubated 12 hour later. There was no perioperative mortality. Morbidity was 37,5% (3/8 patients) and consisted in: lung atelectasis and pneumothorax (n=1), anastomotic stenosis (n=1) and anastomotic dehiscence with trauma infection (n=1). Anastomotic stenosis was treated with tracheal dilations. Seven patients achieved good to excellent results without signs of stenosis at the bronchoscopic follow up and without phonation problems. One female patient has a permanent tracheostomy with a Montgomery T tube that was recently replaced after a long period of 9 years.

**CONCLUSIONS:** Benign tracheal stenosis is usually related to tracheal trauma. Most often this is the result of prolonged endotracheal intubation. Tracheal resection is a well established approach for the management of these patients. A meticulous preoperative assessment of the patient and a perfectly standardized surgical technique are required in order to achieve excellent results with minimal sequelae.

### P-307-MDCT ANGIOGRAPHY: EVALUATION OF THORACIC OUTLET SYNDROME

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**OBJECTIVE:** To assess the role of MDCT angiography of the evaluation of thoracic outlet syndrome

**METHODS:** Twenty symptomatic patients (18 female and 2 male, mean age 34.8yrs) underwent MDCT angiography for the evaluation of thoracic outlet syndrome. Scans of the thoracic apices were obtained in the neutral position and after postural maneuver of the ipsilateral arm. Axial scans, sagittal - coronal reformations and 3D-VRT images from both acquisitions, were evaluated for each patient. Images were evaluated for the presence of skeletal and soft tissue abnormalities, subclavian and axillary artery stenosis (percentage of reduction of cross sectional diameter) as well as subclavian and axillary vein patency.

**RESULTS:** Subclavian artery stenosis after postural maneuver was observed in 9 patients, located in the costoclavicular space (n=6) and at the level of interscalene triangle (n=3). Cervical rib was observed in 3 patients (bilateral in one) and three patients presented with subclavian vein thrombosis. Tumor invasion in the costoclavicular space infiltrating the brachial plexus due to sarcoma local recurrence, was depicted in another patient. In 4 cases no abnormalities were observed.

**CONCLUSIONS:** MDCT angiography can depict the regional anatomy of thoracic outlet and evaluate any vessel abnormality related to it, thus helping to plan the optimal surgical treatment.

### P-308-MEDIASTINAL HYDATID CYSTS TWO CASES

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Hydatid cyst may affect several organs, but mediastinal localization is excep-

tional. It is still an important clinical problem in mediterranean region. We present two cases of unusual localization of hydatid disease. Female patient was 37 years old with chest pain and performed right thoracotomy. The other one was 25 years old and admitted with hemoptysis and performed median sternotomy because of bilaterality. The histopathology confirmed the diagnosis of echinococcosis. In endemic countries although uncommon mediastinal cystic masses should be considered hydatid disease.

### P-309-LEFT-UPPER-LOBE-PULMONARY-SEQUESTRATION

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**BACKGROUND:** Pulmonary-sequestration is a no functional lung with an anomalous systemic arterial blood supply, without normal communication with bronchial tree. It's discussed if all the pulmonary sequestrations are congenital or if there are acquired cases too. Some authors believe that in some cases, pulmonary sequestration is an acquired lesion due to chronic inflammatory processes; Pulmonary-sequestration is usually localized in left lower posterior thorax. Left-upper-lobe-pulmonary-sequestration is rare and its diagnosis can require microscopic studies.

**OBJECTIVE:** Report a of left-upper-lobe-pulmonary-sequestration and discuss its systemic/pulmonary arterial supply and its congenital/acquired origin for this patient.

**METHODS:** Analysis of hospital chart and pathological specimen. A 56-years old not smoker asymptomatic female had a chest RX and CT with a left-upper pulmonary opacity. VATS excisional biopsy was performed. Macroscopic features showed a round lesion confined to the upper lobe. Along the stapler suture, no important arterial branch was noted. Frozen-section analysis didn't show signs of malignancy. Definitive pathologic showed large arterial branches, with systemic pattern of elastic-wall layers. Immunohistochemistry with CD34 antibodies showed the non inflammatory origin of these vessels. There was no communication with the normal bronchial tree. Nor clinical and images features, neither intraoperative features target us to the pulmonary-sequestration hypothesis. Pulmonary-sequestration diagnosis was established only by microscopic and immunohistochemical studies of its arterial vessels. Arterial-walls elastic layers had a systemic pattern and immunohistochemical endothelial features showed a non inflammatory pattern.

**CONCLUSIONS:** Pulmonary-sequestrations can occur in left-upper lobe. Arterial-walls studies can elucidate systemic and non inflammatory origin of these vessels and confirm diagnosis.

### P-310-ANTERIOR MEDIASTINUM HEMANGIOMA: THE RISK OF PERFORMING NEEDLE BIOPSY

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**INTRODUCTION:** The most common Anterior Mediastinal Masses in adults are thymoma, lymphoma, germ cell tumors and goiter. Sarcomas, other carcinomas, benign tumors and infectious lesions as tuberculosis were also described. We report a case of one anterior mediastinal hemangioma.

**CASE REPORT:** A 34-years-old asymptomatic male patient had an incidental diagnosis of a mediastinal tumor during a routine X-ray. Computed Tomography images showed a well capsulated lesion anterior to the ascending aorta. Thymoma without myasthenia or lymphoma was the first two most probable diagnoses. Needle core biopsy was considered but the mass had an extremely developed vascularization. Open biopsy through a sternotomy was performed as a diagnostic (and perhaps therapeutic) procedure. Intraoperative macroscopic findings confirmed a well encapsulated tumor, in a dark reddish and lobulated presentation. Tumor was enucleated and sent to frozen section microscopic analysis. Hemangioma was the intraoperative and definitive diagnosis. Anterior mediastinum tumors comprise several different diseases. Some of them require surgical and other clinical treatment. Needle biopsy can be used as a diagnostic tool in order to target surgical or clinical treatment. Vascular tumors in the anterior mediastinum are not common, but they have to be considered before needle biopsy, because of the risk of threatening bleeding. Chest Tomography findings can suggest vascular lesions.

**CONCLUSION:** Vascular Tumors of the mediastinum should be considered before needle biopsy in order to avoid threatening bleeding.



### P-311-INTRATHORACIC ABERRANT THYROID AS A RARE CAUSE OF MEDIASTINAL MASS

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**BACKGROUND:** Ectopic intrathoracic thyroid is a rare presentation of thyroid disease and comprises about 1% of all mediastinal tumors. A case of a patient with ectopic intrathoracic thyroid that was removed through a right posterolateral thoracotomy is presented.

**CASE PRESENTATION:** A 65-year-old man was presented with mild shortness of breath and a recent onset of chest pain of 5 months duration. Chest x-ray revealed a mass in the superior mediastinum. Chest computed tomography showed a mass behind the great vessels at the right side of the posterior mediastinum. Bronchoscopy revealed compression effects but no evidence of intraluminal tumor. Preoperative staging (brain, abdominal CTs and bone scan) was negative for metastatic disease. Therefore surgical intervention was proposed. The mass was easily removed through a right posterolateral thoracotomy and frozen section was consistent with multinodular goiter. The mass was not connected to the cervical thyroid and received its blood supply from intrathoracic vessels. Postoperative period was uneventful.

**CONCLUSION:** Ectopic intrathoracic thyroid is a rare cause of mediastinal mass. It is often asymptomatic and when growing to large size the presenting symptoms are related to compression of adjacent thoracic organs. Prognosis is excellent following a complete surgical excision.

### P-312-INCISIONAL INTERCOSTAL SPLEEN HERNIA AFTER OPEN WINDOW THORACOSTOMY (COSTA-CASTELLANI HERNIA) - AN UNIQUE CASE REPORT

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The Intercostal hernia is a rare disease that requires operation because of the possibility of incarceration. Operations involving the implantation of surgical mesh are a routine procedure for the treatment. The aim of this report is to present the diagnostic and therapeutic challenge of intercostal spleen hernia after open window thoracostomy, for postpneumectomy empyema with bronchopleural fistula. Method We report a 65 years old, male patient, with a squamous cell carcinoma of the left lung, submitted a pneumonectomy tree years ago with another thoracic surgeon. The patient had unfortunately a bronchopleural fistula and empyema at the 20th post-operative. It was performed the bronchial resection and suture followed by an open window thoracostomy. One year of lavage and curative bound, the thoracostomy closed spontaneously. After another two years, the patient refereed a left abdominal protrusion, chest/abdominal pain and looked for our thoracic surgery team. At physical examination, we found an incisional intercostal hernia between the ninth and tenth ribs due to preceding open window thoracostomy.

**RESULTS:** Dispite its infrequency, the diagnosis of hernia was established with a simple clinical examination and thoracic ultrasound/tomography investigation. For our surprise we found an intercostal spleen hernia. At thoracotomy, an 8 cm<sup>2</sup> intercostal defect with a spleen sliding hernia was found. The hernia repair was made using permanent polypropylene mesh reinforcement of the chest wall.

**CONCLUSION:** Incisional hernia in the intercostal region is rare, therefore easily overlooked, but never related with the spleen ( first report). As with other incisional hernias, the repair using polypropylene mesh implantation is technically feasible and represents the treatment of choice. 1. Filomeno, L. T., J. M. de Campos, et al. (1997). "A dedicated prosthesis for open thoracostomy." *Ann Thorac Surg* 63(5): 1494-6. 2. Hollaus, P. H., F. Lax, et al. (1997). "Natural history of bronchopleural fistula after pneumonectomy: a review of 96 cases." *Ann Thorac Surg* 63(5): 1391-6; discussion 1396-7 3. Rosch, R., K. Junge, et al. (2006). "Incisional intercostal hernia after a nephrectomy." *Hernia* 10(1): 97-9. 4. Szentkereszty, Z., M. Boros, et al. (2006). "Surgical treatment of intercostal hernia with implantation of polypropylene mesh." *Hernia* 10(4): 354-6 5. Shapiro, M. P., M. E. Gale, et al. (1988). "Eloesser window thoracostomy for treatment of empyema: radiographic appearance." *AJR Am J Roentgenol* 150(3): 549-52.

### P-313-CONTRACTILITY OF THE MYOCARDIUM BEFORE AND AFTER CARDIAC SURGERY

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**BACKGROUND:** There are several parameters describing ventricular function such as cardiac output or ejection fraction. But the aspect of the force of the myocardial contraction is not reflected within these parameters. By means of impedance cardiography the velocity of myocardial contraction can be measured non-invasively. The derivative of the thoracic impedance represents the index of contractility of the myocardium.

**METHODS:** 22 adult patients underwent coronary artery bypass grafting or valve surgery. Before surgery and on postoperative days 3 and 6 systolic the indices of contractility were measured. Four electrodes of the impedance-cardiography device were placed on the patients' cervices and thoraces. Simultaneously transthoracic echocardiography was performed to measure the ejection fraction.

**RESULTS:** The index of contractility was  $43.9 \pm 11.8$  before and  $36.6 \pm 10.3$  after surgery (postoperative day 3). On postoperative day 3 there was a significant decrease of the index of contractility ( $p=0.033$ ) whereas on postoperative day 6 the values almost reached baseline data. There was no significant change of ejection fraction between the different time points.

**CONCLUSION:** The index of contractility obtained by impedance echocardiography reflects well the change of the velocity of myocardial contraction before and after cardiac surgery. With this parameter we have a good tool to investigate the effect of different cardioplegic solutions on oedema of the myocardium. There is also the possibility to measure in a very subtle way the reduction of contractility e.g. caused by patient prosthesis mismatch after valve replacement.

### P-314-SURGICAL TREATMENT OF SYMPTOMATIC KINKED INTERNAL CAROTID ARTERY

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**BACKGROUND:** Cerebro-vascular insufficiency is rarely caused by kinking of the internal carotid artery. The etiology of these peculiar arterial modifications seems to be related to a congenital basis which may become exaggerated with aging of the artery. The aim of this study was to analyse our experience in the surgical treatment of symptomatic internal carotid artery kinking.

**METHODS:** Between March 2001 and November 2007, 2 patients underwent surgery in our department for symptomatic internal carotid artery kinking. One of these patients was a 46-year-old male, and the other was a 53-year-old female. These two patients were admitted to the Department of Neurology, one suffering from paresthesia of the right arm and speech disturbances, whereas the other from weakness of the left half of the body and speech disturbances. One of these patients was diagnosed via MR angiography where the other was diagnosed by conventional selective carotid arteriography. Both patients were operated under general anesthesia with endotracheal intubation. The kinked segment of the carotid artery was resected. One patient underwent end-to-end anastomosis of internal carotid artery. The other patient underwent end-to-side anastomosis of internal carotid artery to common carotid artery below the level of bifurcation.

**RESULTS:** None of the patients experienced any peri- or postoperative complications. One patient was discharged on the 4th postoperative day whereas the other on the 5th.

**CONCLUSIONS:** Our results indicate that surgical correction of symptomatic internal carotid artery kinking can be performed with excellent postoperative relief of signs and symptoms.

### **P-315-RARE GIANT MEDIASTINAL THYMOLIPOMA:A CASE REPORT**

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Thymolipoma (or lipothymoma) is a benign tumour of the thymus gland consisting of fat and thymic tissue. The only symptoms it produces, if any, are the results of pressure on surrounding structures. Clinical symptoms results from oppression of larger lesions are chest tightness, dyspnoea and other symptoms. More unilateral pleural protruding cases reported in the world, however, bilateral pleural protruding thymolipoma cases are extremely rare. With successful excision of one bilateral pleural protruding mediastinal thymolipoma which weighting about 4.95 kg, we will report the case as follows.

### **P-316-TOPOGRAPHIC RELATIONSHIP BETWEEN THE SYMPATHETIC TRUNK AND INTERCOSTAL VEIN IN THE 3RD AND 4TH INTERCOSTAL SPACE UNDER THORACOSCOPY**

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**BACKGROUND:** The dissection of the right 3rd and 4th sympathetic ganglion is more difficult than left side in thoracic sympathetic surgery due to complex topographic relationships between sympathetic trunk and intercostal veins. And the incidence of bleeding in the right 3rd and 4th intercostal space is higher than left due to larger size of intercostal vein. The purpose of this study is to investigate the anatomical variations of the 3rd and 4th intercostal veins and to decrease the incidence of operative bleeding.

**METHODS:** Forty four patients with palmar hyperhidrosis were analyzed the size and crossing type of intercostals vein in the 3rd, 4th intercostals space under thoracoscopy. We classified and analysed the 3rd and 4th intercostals veins by the size; small, medium and large and by the crossing type; anterior, posterior type.

**RESULTS:** A large intercostal vein which is able to develop major bleeding at the right 3rd and 4th intercostal space was found in 36.4%, and 68.2% respectively, in 2.3%, and 4.5% on the left respectively. More than 80% of the 3rd, 4th left intercostals veins are small size vein. The anterior crossing type intercostals vein which is difficult to make progress of operation due to high probability of bleeding at the 3rd, 4th right intercostal space was founded in 27.3% and 15.9% respectively, however, there were only 2 cases of anterior crossing type on the left side. Especially, the anterior crossing and large size vein was only found in the right.

**CONCLUSION:** The 3rd, 4th right sympathetic ganglion surgery is more difficult and risky than left side due to large size and anterior crossing of intercostal veins. Careful dissection and caution are necessary to decrease the incidence of intraoperative or postoperative bleeding

### **P-317-GIANT PNEUMOMEDIASTINUM ON MYASTHENIA GRAVIS CRISISo CASE REPORT**

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We present the use of conservative management as a treatment for giant pneumomediastinum, path produced for a Myasthenia Gravis crisis in an 18 years old female, who showed severe respiratory failure. Clinical Summary The patient in study was initially treated in a local General Hospital where she got first able showing cough and shortness of breath. The initial treatment for her on that time was pyridostigmine. However, initial symptoms progressed and the patient began to develop respiratory failure and mechanical ventilation was eventually needed to keep her safe. When we received the patient at our facilities, she was already using an oxygen mask and a handbag. We began performing an X- ray Chest analysis, which results showed canula in the right bronchus. This finding suggested that repositioning was needed. She was then connected to the mechanical ventilator and entered into the ICU, where subcutaneous emphysema was detected, embracing half part of the neck, and up to 1 cm below both clavicles. Evolution during day was random, with bordering oxygen saturations and characteristic changes in the chest X- ray. A Chest

Computer Tomography was performed, revealing a giant pneumomediastinum and Macklin effect. Both these explained patient's breathing situation. These findings were then valued by the Cardiothoracic Surgeon who decided conservative management and keep the patient under surveillance. Four days later, a new Chest Computer Tomography showed a 95% resolution of the pneumomediastinum. Our conclusion here is that pneumomediastinum was produced by the use of the airway using an oxygen mask and a handbag. Macklin effect was the result of the last. Conservative management of a giant pneumomediastinum is an appropriate treatment for this disease in spite of the size of it.

### **P-318-ONE YEAR PAEDIATRIC THORACIC SURGERY AUDIT AT LADY READING HOSPITAL PESHAWAR**

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**AIMS:** The aim of the study was to audit all admissions for significant adverse events of paediatric thoracic procedures done.

**DESIGN:** A descriptive audit comprising of surgical aspects.

**PLACE AND DURATION:** Department of Cardiothoracic Surgery, Postgraduate Medical Institute, Lady Reading Hospital Peshawar from Jan 2004 to December 2004.

**MATERIAL AND METHODS:** Data comprising of patient demographics, number and type of various paediatric thoracic surgical procedures, belonging area, various complications and number of deaths that occurred were entered into database. Data base analysis was carried out for determining morbidity and mortality.

**RESULTS:** Analysis of Paediatric Thoracic surgical audit showed total 240 admissions out of 1510 admissions in one year. Out of these 240 admissions 90 were from OPD, 85 from Casualty and 65 were shifted from other Units in this hospital or from other hospitals. Total out of 1120 procedures performed 190 procedures were of Paediatric age group. In 101 patients tube thoracostomy was performed and in 89 patients elective thoracic procedures were performed. The various procedures performed include, Decortication 21, Exploratory thoracotomies 13, Scopy & Dilatation 9, Hydatid cystectomies 05, Mediastinotomies 05, Bullectomy / Pleurectomy 3, Diaphragmatic Hernia 3, Lobectomies 2, Pneumonectomies 2, Chest Wall Sinus Excision 2, Bronchoscopy 2, Thymectomy 1, Wound Closure 1, Partial Thoracoplasty 1, Achalasia 1, FNAC 1, Closed Mitral Valvotomy 1, PDA Ligations 13, Closed Pericardectomy 1 and Pericardial Intubation 2. Overall mortality was 01 and morbidity was 03.

**CONCLUSION:** Paediatric cases comprise 240 / 1510 admissions 15.8% and 89/532 elective procedures 16.7%. Morbidity of 3.37% and mortality of 1.12% are quite acceptable. Highest priority should be accorded to surgical audit to determine various risk factors for mortality and morbidity and ultimately to improve patient care. Accountability of the medical profession can only be achieved through surgical audit. It is high time that this becomes a part of our ward routine and teaching programmes.

### **P-319-LEVOBUPIVACAINE 0,375% AND FENTATIENYL IN THORACIC SURGERY**

*Bruno, Katia; Daniele, I. Carlo; Di Lorenzo, Carlo; De Napoli, Stefano; Scesi, Michele*

*Anesthesia and Intensive Care Department, "SS Annunziata", Chieti, Italy*

**BACKGROUND:** By previous agreement 19 patients ASA II/III have been enrolled in our studio with ages between 42 and 78 years old (12 males and 7 females) and undergone a thoracic operation. The patients have been pre-medicated in the operating room with Atropina 0,01 mg/ Kg i.v. and Fentatietyl 0,07 gamma/Kg i.v.

**METHODS:** In the peridural catheter (Thouy 18G) positioned in the somatic interspace T4/T5 making the tip proceed 3 cm a test dose has been administered: 2ml of Lidocaina 2% followed by dose with a mixture of 8 ml (Bupivacaina 0,375% and Fentatietyl 0,4 gamma/Kg). An added dose of 3-4 ml of Levobupivacaina 0,375% have been added in a few patients for the recruitment of dermatomery not covered by initial bolus. The induction occurred with Propofol 2 mg/Kg, Fentatietyl 0,15 gamma /Kg, Atracurium 0,6 mg/Kg and the maintainance with O2, Air and Sevofluorane. In order to control pain post surgery an elastometer 5 ml/h with Ropivacaina 1,6 mg/ml e Fentatietyl 0,8 gamma/ml has been prepared.

**RESULTS:** The slight hypotension linked to the sympathetic block has been controlled only with the refilling i.v. of ringer lactate 7ml/kg and no significant hemodynamic variations occurred except for an episode of bradycardia due to the block of the thoracic myocardial fibres, caused by atropine. The sensitive onset and off-set has been valued with both results of  $\pm 6$  min e 150/ 180 min.

**CONCLUSIONS:** The control of the pain post surgery valued with the VAS scale has evidenced a score not higher than 3 and the PONV occurred in 80% of the patients is the main cause of discomfort.

### P-320-DIFFICULT AIRWAYS IN THORACIC SURGERY. A CASE REPORT

*Di Marzio, Massimo; De Napoli, Stefano; Di Lorenzo, Carlo; Bruno, Katia; Pennacchione, Valentina; Albanese, Daniela; Petrini, Flavia; Scesi, Michele "SS. Annunziata" Chieti, Italy*

**BACKGROUND:** The anesthesiological management of patients undergoing thoracic surgery often needed one-lung ventilation (OLV). The OLV can be achieved using, in the vast majority of cases, a double-lumen endotracheal tube (DTL). However, there are some cases wherein OLV with DTL can be difficult or even impossible. In case of difficult airways, the employing of a single-lumen endotracheal tube would be more desirable. After the intubation, a DLT or an endobronchial blocker can be used. SIAARTI guidelines suggest about airways management provide enough indications to plane a safety course; but their application struggles to find a wide spreading. Moreover, it is very difficult to obtain devices able to improve the management of high-risk patients, and that can be helpful for younger operators.

**CASE REPORT:** A 65-years male was candidate for a right thoracotomy. The anamnesis showed: diabetes type-II, systemic hypertension, smoke-addiction, right condyle-mandibular fracture outcome due to car accident. Preoperative evaluation of anthropometric data, using the evaluation protocol of difficult airways: lateral mandibular deviation with maximum mouth opening of 2.5cm, Mallampati III (unchanged on phonation), thyro-mental distance was 7 cm, mental-jugular distance was 13 cm. Therefore, we decided to perform a fiberoptic bronchoscope (FBS) intubation via right nostril. A local anesthesia (lidocaine 2% with MADO $\frac{1}{2}$ ) and conscious sedation (Ipnovel 1 mg ev and Remifentanyl 0,15 mcg/kg/min) were performed. The latter allowed us to keep patient collaborating and this resulted very useful when the tracheal tube (TT size 7.5mm) run along the FBS (3,7 mm on Storz videoscropy). After anesthetic induction, the Cohen Flexitip endobronchial blocker (Cook Critical Care) was positioned in right main bronchus under fiberoptic vision; then, the patient was positioned and the tube functioning was verified. At the end of the operation, the extubation was performed under fiberoptic guide when the patient was completely awaked with spontaneous breathing.

**CONCLUSIONS:** This procedure is routine in our Department and was performed by young anesthetists. Videoscopic device is at the basis of several learning process together with audits and guidelines implementation. Difficulties and risks in our job are often due to difficult management of airways. In this elective cases, the employment of the algorithm proposed by SIAARTI should be mandatory. It is very important to dispose of adequate fiberoptic bronchoscope, and it was better a video fiberoptic bronchoscope. In this case it resulted easier to teach to anesthetists, who haven't no experience in Thoracic Anesthesia, advanced manoeuvres, such as the use of endobronchial blocker. Hagihira S, Takashina M, Mori T, Yoshiya I. One-lung ventilation in patients with difficult airways. J Cardiothorac Vasc Anesth 1998;12:186-188. Benumof JL. Difficult tubes and difficult airways. J Cardiothorac Vasc Anesth 1998;12:131-132 Gruppo di Studio SIAARTI of Vie Aeree Difficili Recommendations for airway control and difficult airway management Minerva Anestesiologica 2005;71:617-57

### P-321-LONG TERM EVALUATION OF LASER-TREATED SILICONE (LTC) MEMBRANE AS A PERICARDIAL SUBSTITUTE: AN EXPERIMENTAL STUDY.

*Kamangari, Arash; Azad, Behzad  
THC, Tehran, Iran*

**OBJECTIVE:** Evaluation of efficacy and safety of LTC membrane as a new pericardial substitute in sheep model.

**METHODS:** 30 ewes (35-45 kg) were used and categorized into two groups

including test and control groups. In group one (n=18) pericardium was excised and the LTC membrane implanted as a pericardial substitute. In control group (n=12) the pericardium was excised without LTC membrane implantation. During follow up ranging from 3-24 months, sheep were observed for any clinical sign of post-operation problems. Reoperation were done in all animals of test and control group to evaluate adhesions formation.

**RESULTS:** In the control group dense adhesions were observed, while in the study group adhesions formation was reduced at all sites covered by LTC membrane and no infection or other complications were observed.

**CONCLUSIONS:** The LTC membranes were safe and efficacious in the reduction of pericardial adhesions formation and might be used in patient undergoing Cardiac Surgery and may need re-operation.

### P-322-ANGIOGRAPHIC FINDINGS IN 401 VERY PREMATURE CAD PATIENTS (AGE<40)

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**BACKGROUND:** premature atherosclerosis in IRAN had more prevalence than industrial countries. This study answered to this question that did the angiographic findings in very premature patients (age<40) different from general CAD?

**METHODS:** From 14000 angiography in two years (2004-2006) 401 patients was under 40 years old (%3) that 329(%82) male and 72 (%18) female. prevalence based on age was 36-40 (%60) and 31-35 (%30) and 26-30 (%7) and 21-25 (%1.5) and age <20 (%1.5). There was 128 (%32) normal coronary angiography despite one positive non-invasive test (ETT or scan) and 43 (%11) had no significant CAD that named minimal CAD. From 228 significant CAD 105 (%44) had SVD and 66 (%29) 2VD and 47 (%17) had 3VD. Target vessel in 5 (%2.2) was left main and %52 LAD-D1 and %27 RCA-PDA and %21 Lx-OM. Two had had X-syndrome and 3 had ectasia and two had myocardial bridging. Recommendation in %55 were medical treatment, in %27 was CABG and in %18 was PCI. Location of disease in LAD vessel was %71 proximal and %24 in mid and %5 in distal portion and D1 in %20. In Lx vessel %69 proximal and %16 mid and %15 distal and OM in %30. In RCA %60 proximal and %29 mid and %11 distal. LVEF in %65 was >%50 and in %28 was %35<EF

### P-323-STEAL PHENOMENA FROM MAMMARY SIDE BRANCHES, REAL OR IMAGINARY?

*Kamangari, Arash; Marzban, Mehrab  
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**BACKGROUND:** The Clinical significance of Mammary side branches is still controversial. This study was designed to show the potential phenomena in two different situations of Distal resistance to Mammary flow.

**METHOD:** Mammary Artery flow measurement was done in four different situations (with and without distal resistance producing by partial occlusion of its lumen by Clip, and with patent or occluded side branch) in 31 patients undergoing elective CABG at end of harvest by ejection of blood to a Syringe.

**RESULTS:** There was significant difference (0.001) in Mammary flow with patent or occluded side branch only when there is significant distal resistance.

**CONCLUSION:** Steal Phenomena from Mammary side branch although infrequent but is a potential risk when there is significant distal resistance.

### P-324-EFFECTS OF ORAL PENTOXYPHYLLINE IN CARDIOPULMONARY BYPASS SURGERIES

*Kamangari, Arash; Abbasi, Kiomars; Khameneiian, Salar  
THC, Tehran, Iran*

**BACKGROUND:** The aim of the presented study was to evaluate the preservative effect of the pentoxifylline on enzymatic raise after the cardiopulmonary bypass surgery.

**METHODS:** 60 patients undergoing cardiopulmonary bypass surgeries in Tehran Heart Center in 1381-82 were entered in a prospective placebo controlled clinical trial and randomly divided to control (placebo) and case (oral pentoxifylline 400mg tds preoperative and 400mg bd in early postoperative period) groups. Plasma concentration of creatine phosphokinase (CK), creatine phosphokinase MB (CK-MB) and lactate dehydrogenase (LDH) were recorded



immediately, 4, 6 and 24 hours after the cardiopulmonary bypass and preoperative ejection fraction were measured.

**RESULTS:** There were no significant difference between demographic factors (age and gender) and operation duration and ejection fraction in control and case groups (51.50 Vs. 54.80 yr; 63.64 vs. 70% male and 192.23 vs. 176.38 min. and 40.50% vs. 48.80% respectively .CK means in immediately, 4, 6 and 24 hours after operation were significantly higher in control group (156.6 vs. 131.02 and 921.10 vs. 343.43 and 316.70 vs. 287.30 IU/L; respectively  $p < 0.05$ ); but there was no significant difference between groups in preoperative CK means. Also there were a significant differences between CK-MB means in 4 , 6 and 24 hrs after operation in control and case groups (207.14 vs. 171.22 and 174.39 vs. 162.80 IU/L; respectively.  $P < 0.05$ ) except between pre-operative and immediately postoperative. There were no significant differences between pre. And postoperative ejection fraction and there was no side effect in case group.

**CONCLUSION:** Oral pentoxifylline usage may reduce the myocardial injury and post operative complications after cardiopulmonary bypass surgery.

### P-325-GASTRIC MESH EROSION FOLLOWING LAPAROSCOPIC REPAIR OF PARAESOPHAGEAL HERNIA

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**BACKGROUND:** Laparoscopic repair of large paraesophageal hernias (PEH) with mesh reinforcement is gaining wider acceptance as a viable treatment option. However much is not known regarding the safety of this procedure. We report gastric erosion of mesh presenting as early dumping syndrome in a 79-year-old female three weeks status post laparoscopic repair of a large type IV PEH.

**INTRODUCTION:** PEHs account for 0.7% to 10% of all hiatal hernias. The overwhelming majority of PEHs are type III. Much less commonly, type IV PEHs are due to a large defect in the phrenoesophageal membrane allowing other organs to enter the hernia sac. Increasingly repair of symptomatic PEHs is occurring with mesh reinforcement at the hiatus to prevent recurrence.

**CASE PRESENTATION:** A 79-year-old female with GERD was worked up with EGD, CT scan and esophagram which revealed a large type IV PEH. In OR the hernia sac was reduced, diaphragm reinforced with kaloderm and fundoplication performed. She was discharged home two days later. Three weeks post-operatively she was readmitted for dumping. She underwent upper endoscopy which revealed mesh eroding into GE junction. We found the hernia sac intact, stomach incarcerated into left chest and mesh eroded into GE junction. The hernia sac, mesh and GE junction were resected and an esophago-gastric anastomosis with pyloromyotomy was performed. The patient had an uneventful recovery.

**DISCUSSION:** Laparoscopic repair of large PEHs with mesh reinforcement is gaining wider acceptance as a viable treatment option. Here we report gastric erosion of prosthetic mesh presenting as early dumping syndrome. Recurrence of hiatal hernias after primary laparoscopic repair is estimated at 6% - 13%. Overall, hiatal hernia repairs are more susceptible to disruption when compared to other hernia repairs due to constant motion of diaphragm and stress of positive intraabdominal pressure and negative intrathoracic pressure. Another contributing factor is lack of strong fascia immediately adjacent to the hiatal aperture. Frantzides et al evaluated 72 patients with large sliding and PEHs who underwent laparoscopic repair with polytetrafluoroethylene (PTFE) mesh vs. primary closure. There were no recurrences in the mesh group. In contrast, there were eight recurrences (22%) in the group without mesh. The authors concluded that due to proved risk of recurrence without reinforcement in large hiatal hernias, use of mesh is recommended. Carlson et al found that patients with large PEHs who underwent mesh repair had no mesh-related complications or sequelae in their follow-up period. There has been one previous report of mesh erosion following PEH repair. This patient developed refractory dysphagia after mesh closure of the hiatus and during exploratory laparotomy scar tissue was found encircling distal esophagus related to mesh used for closure of hiatus. The striking aspect of our case is the immediacy of symptoms and erosion of mesh into GE junction. While some may suggest the use of mesh repair, there is debate as to what type of mesh to use. Older mesh repairs utilized either marlex or polypropylene, however, there was concerns of excessive adhesion formation and possible erosion into esophagus with respiratory motions. While others have advocated for the use of polytetrafluoroethylene mesh because it allows tissue ingrowth without stimulating excessive adhesion

formation. Despite the complication incurred in this case, repair of large PEHs with mesh is still a safe and viable option and seems to reduce recurrence rate. The optimal type of mesh remains still unclear. Patients should have these types of repairs at large-volume centers with surgeons that have extensive experience in laparoscopy.

### P-326-ESOPHAGEAL PYOMYOSITIS

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**BACKGROUND:** Inflammations of the esophagus are very common such as in the gastro-esophageal reflux disease. But abscesses of the esophageal wall are rare and mostly caused by damage of the esophageal mucosa.

**CASE PRESENTATION:** We present a 46-year-old male with heroin abuse and occasional entero-cutaneous fistula. He had abscesses in the entire muscular layer of thoracic esophagus with intact mucosa. He was treated with antibiotics and adequate surgical drainage, and survived with his esophagus preserved.

**CONCLUSIONS:** Abscesses of muscular layer of esophagus with intact mucosa are very rare. Direct extension from entero-cutaneous fistula or hematogenous spread from heroin injection were two possible routes in this patient. Patient's life can be saved without sacrificing the esophagus.

### P-327-THE ROLE OF VIDEO ASSISTED THORACIC SURGERY IN THE EVALUATION OF PATIENTS WITH UNDIAGNOSED EXUDATIVE PLEURAL EFFUSION

Bagheri, Reza; Haghi, Ziaollah  
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**BACKGROUND:** Video assisted thoracic surgery (VATS) is a minimal invasive diagnostic and therapeutic method in lung diseases that provides us a perfect view of pleura and pericardium to perform a diagnostic biopsy from the pathologic site. We aimed to evaluate the diagnostic value of VATS in pleural effusion with unknown cause.

**MATERIALS AND METHOD:** We have studied the results of VATS in patients who were suffered from exudative pleural effusion with unknown cause in thoracic surgery department of Ghaem hospital from 1998 to 2006.

**RESULTS:** Among 65 patients, 33.8% were female and 66.2% were male. Mean age was  $58.90 \pm 14.57$  years. The most common clinical symptom was dyspnea which was seen in 87.7%. Pleural effusion was clear yellow in 55.4% and bloody in 44.6%. Malignant cytology was reported only in one case (1.5%). Transthoracic needle biopsy showed pleuritis in 86.2%, fibrosis in 10.8% and it was suspicious in 3.1%. VATS was diagnostic in 95.4% and exact diagnosis wasn't obtained only in 3 cases (4.6%). Open biopsy was performed in these cases that indicated Mesotelioma in two cases, another case with the history of CABG was treated after 6 month follow up. The most common diagnosis was metastatic carcinoma that was seen in 37 cases (56.9%). VATS diagnostic accuracy rate in this study is 95.4%. Any complication wasn't seen in 98.5% and the only one case was bleeding (1.5%). Mortality rate because of VATS complications was zero.

**CONCLUSION:** According to safety, high sensitivity and specificity of VATS we suggest it as a good diagnostic method in pleural effusion with unknown cause. Keywords: Video- assisted thoracic surgery(VATS) - Pleural effusion - Exudative

### P-328-TRACHEAL DIVERTICULUM: A Rare Cause of Dysphagia

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**BACKGROUND:** Tracheal diverticulum is a rarely encountered entity. Most cases are asymptomatic, but when symptoms are present they are usually non-specific. We report a new case who presented with cervical dysphagia.

**METHOD AND PATIENT:** The patient is a 50-year-old man who reports no significant medical history. He reports no history of smoking and denies taking any oral medications. He complains of episodic cervical dysphagia with change in swallowing, for which no clear etiology has been established.

**RESULTS:** Physical examination of patient was normal. Esophagography was



normal. Laboratory tests were normal. The CT scan of the chest and neck showed a 3x3 cm tubular air-filled structure on the right side of the thoracic inlet, posterior and lateral to the trachea (figure 1). No calcification was noted within this lesion and there was no evidence of wall thickening. No connection was noted between the lesion and the trachea on axial images. Coronal reformations demonstrate a 4-mm wide connection between the trachea and this air collection in a plane not readily visualized on axial images. The lungs were clear with no gross evidence of parenchymal destruction, infiltrate, or effusions. Bronchoscopy was normal. The patient was operated by right semicollar incision, and diverticulum of trachea was resected totally (figure 2,3). Histopathologic examination of this material was reported as a diverticulum of trachea.

**CONCLUSIONS:** Tracheal diverticulum is a rarely encountered entity. A tracheal diverticulum is a paratracheal air cyst representing an outpouching of the tracheal wall. A tracheal diverticulum is frequently an incidental finding in a post-mortum examination, reported in 1% of patients in an autopsy series. Usually asymptomatic, but if it is symptomatic, it should be resected.

### **P-329-PRIMARY THORACIC HEMANGIOSARCOMA: BREAST MASS IN A FILIPINO MALE**

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*Philippine General Hospital, Thoracic and Cardiovascular Surgery, Manila, Philippines*

**BACKGROUND:** Primary thoracic angiosarcomas are rarely reported in literature. There has not been any reported cases yet in Philippine literature. Our objective is to present a case of primary thoracic hemangiosarcoma and discuss the management

**METHODS:** A 39 year-old male sought consult for enlarging right breast mass. He had previous treatment for Tuberculous effusion 8 years ago and for hemoptysis 2 years ago. Radiograph studies then showed a large loculated effusion with thickening and plaque formation. CT scan showed large loculated fluid with solid components and thickening calcifications and was treated as empyema and fibrothorax. He underwent multiple biopsies of the 10x18cm right chest wall mass, subsequently requiring a thoracotomy for tissue biopsy of the intrathoracic 13x13cm component. The compressed right lung was unexpanding. Histopathology was hemangioendothelioma. A staged en bloc excision of intrathoracic mass with wide excision of chest wall was done involving excision of the anterior 3rd-7th ribs. The 20x25cm chest wall defect was closed with harvested viable omentum and fasciocutaneous skin flaps.

**RESULTS:** The patient was discharged. After immune-staining with CD 34/factor 8 the final histopathology was hemangiosarcoma. It is a rare malignant vascular tumor, accounting for 1-2% of all sarcomas. Present literature shows only 31 cases of pleural hemangiosarcoma reported in literature: Western (22) Eastern (9-Japan). Surgery is mainstay of treatment. Longest disease-free duration on follow-up - 3yrs, with a 5 year survival rate of 38%.

**CONCLUSION:** A 39 male presented with breast mass was diagnosed to have primary thoracic hemangiosarcoma which was treated with en bloc excision of intrathoracic component with wide excision of the chest wall. Reconstruction was done with fasciocutaneous flaps. Patient is doing well up to 3 months.

### **P-330-AORTIC DISSECTION TYPE I IN A WEIGHTLIFTER WITH HYPERTENSION**

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Acute aortic dissection can occur at the time of intense physical exertion in strength-trained athletes like weightlifters, bodybuilders, throwers, and wrestlers. Rapid rise in blood pressure and history of hypertension are the most common causes of aortic dissection in athletes. It is a very tragic event because of its high mortality rate of about 32% in young patients. We report a case of aortic dissection in a young weightlifter with history of hypertension. There was an extensive intimal tear of the aorta, from the sinus of Valsalva to the abdominal aorta.

## POSTER SESSION IV

### P-331-TYPE A AORTIC DISSECTION: LONG TERM OUTCOMES IN AN ACADEMIC HOSPITAL IN ARGENTINA

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*Dept. of Cardiovascular Surgery, Hospital Italiano de Buenos Aires, Argentina*

**BACKGROUND:** Aortic dissection type A is a serious disease and its consequences could appear long after the initial admission. Data on long term outcome of patients with aortic dissection type A in Argentina are scarce. Thus, we sought to assess the long term outcome in a cohort of patients treated in an academic hospital.

**MATERIALS AND METHODS:** This is a descriptive study that included 155 patients treated for aortic dissection type A in Hospital Italiano de Buenos Aires between 1972 and 2006. Clinical outcome was defined as the occurrence death, development of new aneurisms or dissections, re operation, or major vascular events (MI and stroke).

**RESULTS:** Median age was 55 years  $\pm$  14.5. Most of the patients were male (71%), 68.4 % (n) had history of hypertension, and 68.4% (24) of the patients suffered from Marfan syndrome. Survival (Kaplan Meier) was 91% (IC 95:84 - 95%) at 5 years, 65% (IC 95: 52-75% ) at 10 years, and 54% (37 - 70%) at 15 years. Survival free from events (Kaplan Meier) was 86.5% (IC 95:79 - 91%) at 5 years, 55% (IC 95: 43-65% ) at 10 years, and 31% (20 - 44%) at 15 years. Presence of aneurism ( $x_2 = 9.59$ ,  $p = 0.002$ ), re operations ( $x_2 = 6.35$ ,  $p = 0.01$ ), and rupture (test de fisher 0.0000....) were associated with mortality during long term follow up. In a multivariate analysis (Cox regression), rupture (HR 14.25), and re operation (HR 2.36) were found as independent predictors of death.

**CONCLUSION:** In Argentina, long term survival and occurrence of events in patients treated for aortic dissection type A are acceptable and similar to the rates reported in the literature. The follow up should include imaging of the remaining aorta and the aortic valve to detect at an early stage the appearance of predictor of mortality.

### P-332-RETROGRADE CEREBRAL PERFUSION IS STILL SAFE FOR SURGICAL TREATMENT OF ACUTE AORTIC DISSECTION

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**BACKGROUND:** Either selective antegrade cerebral perfusion or retrograde cerebral perfusion is used for cerebral protection in surgical treatment of acute aortic dissection. The aim of this study is to report our surgical results for acute aortic dissection with deep hypothermic circulatory arrest and retrograde cerebral perfusion.

**METHODS:** From October 2000 to March 2007, 47 patients (age  $56.4 \pm 14.8$  years old, range: 26.7-86.9 years old, 42 Stanford type A, 5 Stanford type B) underwent operation for acute aortic dissection. Four patients were Marfan syndrome. All the patients were operated emergently. All the cases except five were operated under DHCA (deep hypothermic circulatory arrest) with retrograde perfusion. Surgical strategies included ascending aortic grafting (AAG) only (12/47, 25.5%), AAG with AVR (1/47, 2.1%), AAG with aortic valve resuspension (20/47, 42.6%), AAG and total arch replacement (3/47, 6.4%), Bentall operation (5/47, 10.6%), and descending aortic grafting (6/47, 12.8%).

**RESULTS:** There was 3 operative mortality (3/47, 6.4%). Cerebral ischemic infarction was found in 2 patients. Paraplegia also occurred in 1 patients. Range of follow-up time was 6 to 83 months. All the survived patients had clear consciousness during the follow up. There were 5 late deaths. One-year survival rate was 90.6% and six-year survival rate was 87.4%.

**CONCLUSIONS:** Good results and acceptable morbidities could be achieved under profound hypothermic circulatory arrest with retrograde perfusion.

### P-333-TREATMENT EXPERIENCE OF NON-SPECIFIC AORTIC ARTERITIS IN A CHILD AGED 3 YEARS

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Treatment of non-specific aortic arteritis (NAA) and its complications in infants is severe clinical task. We offer the description of clinical case of NAA which manifested in a child aged 3 years. Follow-up period was 5 years.

**DIAGNOSIS:** Non-specific aortic arteritis with injured abdominal aortic segment (stenosis of celiac trunk ostia, mesenchimal and renal arteries, aorta). Symptomatic arterial hypertension (AH), II-III stage, NYHA II. The patient had malignant course of AH to 210/120 mmHg accompanied by marked "Cerebral" symptoms, circulatory insufficiency. She received baseline therapy (metatrexat, metipred), hypotensive therapy which had no effect. In 2003, because of significant stenosis of right renal artery and abdominal aortic segment, the patient underwent angioplasty of abdominal aortic segment, stenting of the right renal artery, the stent ("Sypher", Cordis, USA) was set in. As a result, her condition became stable: AP 130/80 - 110/60 mmHg. Two years later, her condition aggravated: stent restenosis 70%, advancing the process as occlusion of left renal artery, stable non-controllable AH. In 2005, based upon vital indications, splenectomy and splenorenal anastomosis were performed. One year later, computer tomography of abdominal aortic segment and renal arteries revealed stent restenosis in the right renal artery up to 70%, splenorenal anastomosis is open, filtrational and excretory function of both kidneys are preserved. NAA signs were revealed in ostia of right subclavian artery, vertebral artery, celiac trunk, common hepatic artery. The changes were manifested less than in renal arteries. Good collateral blood flow throughout intercostal and vertebral arteries was noted. Currently, in the setting of permanent hypotensive and baseline therapies, stabilization of AP is noted, signs of circulatory insufficiency are absent. Thus, timely diagnosis and treatment of NAA are serious problem in pediatrics. Especially, it applies to infants, reconstructive surgery in whom is a step of despair. If injury of renal arteries is complicated by malignant AH, balloon angioplasty and stenting of renal artery or palliative shunting surgery are an alternative to the reconstructive surgery. Stenting of renal arteries is less invasive and allows to arrest for some time main clinical manifestations and complications of NAA associated with AH.

### P-334-PROTECTIVE EFFECTS OF LEVOSIMENDAN AND ILOPROST ON LUNG INJURY INDUCED BY LIMB ISCHEMIA-REPERFUSION: A RABBIT MODEL

*Yasa, Haydar; Yakut, Necmettin; Emrehan, Bilgin; Ergunes, Kazım; Ortac, Ragıp; Karahan, Nagehan; Ozbek, Cengiz; Gurbuz, Ali*  
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**BACKGROUND:** The aim of this study was to clarify whether levosimendan could prevent lung tissue injury from limb ischemia/reperfusion.

**METHODS:** The common femoral artery of the 50 New Zealand white rabbits of both sexes, each weighing about 3 kg were clamped and 1 hours of ischemia followed by 4 hour of reperfusion was applied. In an attempt to decrease reperfusion injury, the rats were given levosimendan in group A. In group B, iloprost was infused at the same period. A similar value of saline solution was given in the control group, group C correspondingly. Levosimendan and iloprost were given together the Group E, and Group D was sham group with did not had any medication and ischemia. Blood pH, pO<sub>2</sub>, pCO<sub>2</sub>, HCO<sub>3</sub>, Na, K, creatine kinase (CPK), lactate dehydrogenase (LDH) values were determined at the end of the reperfusion period. Malondialdehyde (MDA) was measured in plasma and lung as an indicator of free radicals. Hemodynamics parameters were noted for each group. After the procedure left lung tissues were taken for histopathologic study.

**RESULTS:** Blood PO<sub>2</sub> and HCO<sub>3</sub> levels were significantly higher ( $p < 0.05$ ), CPK, LDH and MDA levels were significantly lower ( $p < 0.05$ ) in Groups A, B, D, E when compared with Group C. Similarly, the MDA levels in the lung tissue and plasma levels were significantly lower in the treatments groups when compared to the control group ( $p < 0.05$ ). Lung damage was significantly higher in Group C. There was no significant difference between groups in other parameters.

**CONCLUSIONS:** The results suggest that levosimendan and iloprost are useful for attenuating oxidative lung damage occurring after a period of limb ischemia/reperfusion.

### P-335-ABDOMINAL AORTIC ANEURYSM: A 5 YEARS EXPERIENCE IN THE NORTHWEST OF IRAN

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**BACKGROUND:** Abdominal aortic aneurysm (AAA) occurs as a result of degenerative change in arterial wall. We evaluated prospectively multifarious signs and feature in prognosis of 31 patients with AAA in Imam Hospital from 2000 to 2005.

**METHODS:** In this analytic-descriptive study, patients categorized into 3 groups; unruptured (10), unstable ruptured (9) and stable ruptured (12). All patients operated transperitoneally. Early postoperative mortality, morbidity and other prognostic factors were documented.

**RESULTS:** Mean age was  $67.1 \pm 8.9$  years. Early mortality was 77% of unstable ruptured, 25% of stable ruptured and 10% of unruptured group. Significant relation found between mortality and systolic blood pressure in admission and presence of dysfunction. Mean hospital and ICU stay were  $9.1 \pm 5.6$  and  $4.1 \pm 2$ , respectively. Distal embolization and renal failure were the main postoperative complications.

**CONCLUSION:** Incidence of AAA has been increases. Mortality increases with ruptured aneurysms. It seems evaluation for early detection and operation to be an extremity.

### P-336-SURGERY FOR RUPTURED NONDISSECTING THORACIC AORTIC ANEURYSMS

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**BACKGROUND:** Emergent surgery for ruptured thoracic aortic aneurysm is frequently associated with a high rate of mortality and morbidity. It was our objective to assess the recent outcome of patients with ruptured thoracic aneurysms undergoing surgical repair.

**METHODS:** Between 2001 and 2007, 15 consecutive patients (13 men and 2 women) aged 46 to 86 years (mean: 68.2 years) underwent surgery for rupture of the thoracic aortic aneurysm. Computed tomographic scan was diagnostic in all patients. The rupture occurred in pericardial cavity in 4 patients, the mediastinal space in 7 patients, and the left pleural cavity in 4 patients. Thirteen patients (86%) underwent repair within 12 hours after the onset of symptoms. Ascending aorta repair was conducted in 2, aortic arch repair in 11, descending aorta repair in one, and thoracoabdominal aorta repair in one. We used hypothermic selective antegrade cerebral perfusion, and open distal anastomosis in case of aortic arch replacement. Femoro-femoral partial bypass was used for descending and thoracoabdominal aorta repair.

**RESULTS:** Only One (6.7%) patient died in hospital. The cause of death was MRSA mediastinitis. However major complications were present in 7 of 15 (46.7%) patients (prolonged mechanical ventilation 7, tracheostomy 7, renal failure 2, cholecystitis 1, and mediastinitis 2). Fourteen survivors were followed up for an average of 31 months (2 months to 5 years). There were two late deaths. The cause of late death was pneumonia in one patient, and the other was aneurysm rupture. There were no reoperation and the actuarial survival rate at 3 year was 80%.

**CONCLUSION:** Our recent experience shows that the emergent repair of ruptured thoracic aortic aneurysm can be achieved with low mortality and acceptable late results. However the incidence of postoperative complication was high. We should consider to use a less-invasive thoracic aortic endgraft repair for selected cases.

### P-337-EMERGENT OPERATION FOR ACUTE TYPE A AORTIC DISSECTION IN PATIENTS AGED 80 YEARS AND OLDER

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**BACKGROUND:** With the general increase in human life-span, cardiac surgeons are faced with treating an increasing number of acute type A aortic dissection in octogenarians. Some groups reported that surgical outcomes of acute

type A aortic dissection in octogenarians were unsatisfactory because mortality and morbidity in octogenarians were higher than younger patients. It is possible that emergent operation were not performed in consideration of quality of life (QOL) and life expectancy of octogenarians. But if the operation is not performed, the patient will die of cardiac tamponade or rupture. We reviewed surgical outcomes of acute type A aortic dissection (operation within 24 hours after admission) in patients aged 80 years and older.

**METHODS:** Between 1997 and 2007, 122 patients underwent emergency operation for acute type A aortic dissection in our institution. Thirteen patients were aged 80 years and older (mean age 83 years, range 80-89 years). Four patients were men. Eight patients had cardiac tamponade and two patients had rupture.

**RESULTS:** The surgical procedure consisted of median sternotomy with standard cardiopulmonary bypass (CPB). A femoral artery was used for cannulation and the right atrium was cannulated with double atriocaval cannula. Myocardial protection was obtained in all cases with antegrade (selectively) infusion of cold blood cardioplegic solution. Two patients underwent antegrade (selective) cerebral perfusion and eleven patients underwent retrograde cerebral perfusion. All patients underwent ascending aorta replacement because an intimal tear could be identified in the ascending aorta. The operative time was  $349 \pm 55$  minutes, the CPB time was  $177 \pm 28$  minutes, aortic crossclamping time was  $98 \pm 20$  minutes, the time of cerebral perfusion was  $27 \pm 7$  minutes. CPB was weaned easily without percutaneous cardiopulmonary system or intraaortic balloon pumping in all patients. The hospital mortality rates were 7.7% (1 of 13 complicated hemorrhagic cerebral infarction on the 7th postoperative day and died on the 10th postoperative day). Postoperative complications were: hemorrhagic cerebral infarction in 1 patient, osteomyelitis in 1 patient, respiratory trouble in 2 patients (one patient received tracheotomy), hemorrhagic gastric ulcer in 1 patient, liver damage in one patient, renal dysfunction in two patients. ICU stay was  $13 \pm 21$  days and hospital stay was  $36 \pm 43$  days.

**CONCLUSIONS:** The surgical outcomes of acute type A aortic dissection in octogenarians in our institution were satisfactory because there was no operative death and we did not use circulatory support for weaning of CPB. But there were various severe postoperative complications and there were the patients whose postoperative QOL was unsatisfactory. These findings support that it is important not only to consider a countermeasure against the complications but also to inform the risk of operation.

### P-338-ARCH REPLACEMENT FIRST USING A HAND-MADE BIFURCATED OR TRIFURCATED ARCH GRAFT FOR STANFORD TYPE A ACUTE AORTIC DISSECTION

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**BACKGROUND:** We reviewed our clinical experience of aortic arch repair first using a hand-made bifurcated or trifurcated arch graft with selective antegrade cerebral perfusion (SACP) in conjunction with hypothermic circulatory arrest (HCA) and right axillary artery (RAA) perfusion for acute type A aortic dissection patients. We also assessed the outcomes to clarify whether our aggressive operative strategy is justified in this group of emergency patients.

**METHODS:** We studied 23 consecutive acute type A aortic dissection patients (18 men; mean age,  $54 \pm 15$  years; range, 26 to 77) who underwent aortic arch repair using SACP with or without HCA between July 2005 and October 2007. The RAA was used for cannulation and selective antegrade brain protection. In all the operations, arch repair was done first while the patient was under deep hypothermia ( $20^\circ\text{C}$ ). We used SACP during the bifurcated or trifurcated arch graft sewing to the arch vessels, distal arch repair, and trifurcated graft sewing to the arch graft. The concomitant reconstruction procedures included ascending aortic replacement in all 23 patients, aortic root replacement in 3, distal aorta enforcement with elephant trunk in 3, femoral-to-femoral artery bypass in 1, aortic valve replacement in 1, and coronary bypass grafting in 1. The mean duration of HCA was  $23 \pm 13$  minutes, of SACP was  $125 \pm 41$  minutes, of aortic cross clamp was  $219 \pm 53$  minutes, and of pump time was  $357 \pm 95$  minutes.

**RESULTS:** One patient (4.3%), in whom brain ischemia had developed preoperatively owing to bilateral carotid artery malperfusion, died of permanent stroke and central failure two months after surgery. Two patients developed a temporary neurologic dysfunction, and 1 patient developed renal failure that required dialysis. There were no late deaths during follow-up (mean,  $14 \pm 9$

months; range, 2 to 29). Only 1 patient, whose inlet tear had not been completely resected in the initial surgery, required a second surgery of the descending thoracic aorta two years after the initial surgery.

**CONCLUSIONS:** Aortic arch repair first using a bi- or trifurcated arch graft with the aid of SACP from RAA with or without HCA permitted immediate and mid-term survival without evident permanent organ failure, and is justified in emergency patients with acute type A aortic dissection.

### P-339-AORTIC ROOT SURGERY IN MARFAN SYNDROME

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**OBJECTIVE:** The study examines the results of aortic root surgery in patients with Marfan syndrome.

**METHODS:** From March 1994 to September 2007, 220 patients underwent aortic valve sparing surgery - 20 were Marfan patients (group 1) who were compared with another 20 Marfan patients undergoing composite aortic root replacement (group 2). 14 patients had aortic dissection, 26 patients had thoracic aortic aneurysm. Mean age was  $37.9 \pm 13.8$  years. There were 31 males and 9 females. In group 1, reimplantation technique was used in 13, remodeling technique in 4, and AV repair with STJ replacement in 3. In group 2, a mechanical valve conduit was used. Mean logistic Euroscore was  $12.27 \pm 14.6\%$  for the whole group where five were emergent.

**RESULTS:** Group 2 had more previous cardiac procedures compared to group 1 (9 vs. 2,  $p = 0.03$ ) and shorter cross clamp time ( $122 \pm 27.1$  vs  $153.9 \pm 23.7$ ,  $p = 0.0004$ ). Overall mortality was 10%. Early mortality was 10% in group 2 and 5% in group 1 ( $p = NS$ ). Mean follow up time was 25 months for group 2 and 53 months for group 1. Three patients were reoperated, all had undergone the remodeling. 5 year freedom from reoperation and death was 86% and 90% in group 2 and 70% and 95% in group 1 ( $P = 0.6$ ;  $P = 0.6$ ), respectively.

**CONCLUSIONS:** Late survival of patients with the Marfan syndrome is similar in both groups. Root reconstruction trends towards a higher incidence of late reoperations if the remodeling technique is used. We now prefer to use the reimplantation technique.

### P-340-REOPERATIONS AFTER ASCENDING AORTA AND AORTIC VALVE RECONSTRUCTION

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**BACKGROUND:** All mechanisms weakening the aorta's media layers via micro apoplexy of the vessel wall lead to higher wall stress, which can induce aortic dilatation and aneurysm formation, eventually resulting in intramural hemorrhage, aortic dissection, or rupture. Based on the most current data, approximately 60% of thoracic aneurysms involve the ascending aorta, 10% involve the arch, 40% involve the descending aorta, and 10% involve the thoracoabdominal aorta. There are well known a number of procedures according to each case to repair. But up to date it still remains the most dangerous possible complication with also relatively high recurrence after surgery. The aim of report is to overview our redo cases and results in aortic aneurysm treatment.

**METHODS:** 312 patients (pts) with ascending aortic aneurysm and aortic valve incompetence underwent surgery in Heart Surgery Center of Vilnius University. Data about patients were obtained from case histories and prospectively followed up. 257 patients were followed up. Reoperation rate was 3.9%.

**RESULTS:** During late postoperative period there were performed 12 reoperations. The reasons for reoperations were: persistent Cabrol anastomosis (2 pts), dysfunction of conduit (5 pts), dissection extended to abdominal aorta (2 pts), prosthetic endocarditis (2 pts), mitral valve incompetence (1 pts). In total there were 10 patients to whom were performed 12 reoperations. Two patients had reimplantation of valved conduit in complex with abdominal aneurysm repair with prosthesis. It is important to remark mostly these were patients with Marfan syndrome. Procedures made in redo cases included: closure of Cabrol anastomosis - 2 pts, reimplantation of prosthetic conduit - 4 pts, abdominal aorta surgery due to extending dissection 2 pts, reimplantation of whole valved conduit in case of prosthetic endocarditis - 1 pts, closure of paraprosthesis fistula due to prosthetic endocarditis 1 pts, implantation of mitral pro-

thesis 1 pts. Survival more than 1 month after reoperations was 50% (5 pts).

**CONCLUSIONS:** From all data we may conclude the most dangerous and the most risky reoperations are associated with reimplantation of valved conduit. All patients who died were from this group.

### P-341-ACUTE UPPER EXTREMITY ISCHEMIA DUE TO FIBRIN GLUE EMBOLIZATION AFTER AORTIC DISSECTION REPAIR

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**BACKGROUND:** Fibrin-based surgical adhesives have been used as sealants for suture-line hemostasis and vascular anastomoses for several decades. More recently, fibrin glue has become widely used in aortic dissection repair for the re-approximation of aortic wall layers. Despite the widespread success with fibrin glue, several reports are emerging of embolization of glue particles when used too generously or due to leaking into the intravascular space. This report describes the case of a patient who developed acute limb ischemia due to embolization of fibrin glue particles six weeks following aortic dissection repair.

**METHODS:** A 55-year old gentleman was taken to the operating suite emergently for an ascending aortic dissection with severe aortic valve insufficiency. During surgery the existing aortic valve was replaced with a St. Jude mechanical valved conduit and reimplantation of the coronary arteries into the graft. Bioglu was then used to re-approximate the dissected aortic tissues at the level of the innominate artery takeoff. The surgery was well-tolerated and the patient was discharged in stable condition with anticoagulation for his new mechanical valve.

**RESULTS:** Approximately five weeks post-operatively, the patient returned with sharp left upper extremity pain. On exam he had absent radial and ulnar pulses despite a strong palpable brachial pulse. CT-angiogram showed findings consistent with embolus in the distal brachial artery. The patient underwent a brachial thromboembolectomy. Upon arteriotomy, clots as well as pieces of fibrin glue were retrieved from the lumen. However, the sharp fibrin glue emboli caused arterial wall damage necessitating an extensive bypass procedure of the distal brachial and radial arteries and a patch angioplasty of the distal radial artery. This procedure was successful and the patient's distal pulses were restored.

**CONCLUSIONS:** While fibrin glue has been used successfully for anastomotic and tissue repair, care must be taken not to allow the glue to leak into the vessel resulting in distal embolization. Several techniques have been described to minimize the risk of intravascular migration of fibrin glue. In summary, any signs of distal ischemia after the use of fibrin glue, even several weeks to months following its use, should raise the clinical suspicion for fibrin glue embolization and immediate angiography along with surgical evaluation should be sought.

### P-342-A NEW SURGICAL APPROACH FOR AORTIC ARCH REPLACEMENT: ARCH REPLACEMENT WITH TRIFURCATED GRAFT PRIOR TO CARDIOPULMONARY BYPASS

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**BACKGROUND:** The techniques used for the replacement of the aortic arch are in debate. Total circulatory arrest, retrograde cerebral perfusion, antegrade cerebral perfusion and bilateral cerebral perfusion can be used during the operation. These techniques possess various advantages and disadvantages over each other.

**METHODS:** Five patients underwent ascending and aortic arch aneurysm repair with the use of trifurcated graft at our institution. Aortic arch and branches were prepared extensively in this technique and branches of the trifurcated graft were anastomosed to the aortic arch branches with the use of lateral clamps prior to cardiopulmonary bypass. Then cardiopulmonary bypass was initiated via cannulation of femoral artery, perfusion branch of the trifurcated graft. The patients were cooled to 30 C and ascending aorta was replaced with another dacron tube graft distally anastomosed to the descending aorta. Following cessation of cardiac arrest the trifurcated graft was anastomosed to the straight tube graft with the help of a lateral clamp on beating heart.



**RESULTS:** Postoperatively one patient died due to cardiac failure on the fourth day. The remaining patients were followed and discharged without adverse events on day 7.

**CONCLUSION:** This technique has advantages such as shorter cardiac ischemic time, shorter cardiopulmonary bypass time and no interruption to cerebral perfusion during the operation.

### **P-343-A CASE WITH LERICHE SYNDROME AND LEFT RENAL ARTERY DUPLICATION ANOMALY WITH SUBTOTAL OSTEOAL STENOSIS IN BOTH**

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**BACKGROUND:** In 71 % of the population renal artery inserts to renal hilus as a single vessel. In 15-20% of the population there are multiple renal arteries. Two hilar arteries are seen in 10%, they arise from aorta as two separate branches and insert into renal hilus. One hilar artery and lower pole renal artery rate is 6.9%.

**METHODS:** Our patient was a 45 years old man. He had hypertension, which responded partially to triple antihypertensives, claudication under 100 meters and occasionally rest pain at both feet. Further investigations were performed because of the negative pulses at femoral arteries and the ASO anamnesis.

**RESULTS:** Terminal aortography showed Leriche syndrome beside the left renal artery duplication anomaly. At left accessory renal artery and main renal artery level, high-grade stenoses of ostial parts were found. TTE and coronary angiography results were normal. Left renal artery PTA+stent procedure was unsuccessful. Bypass with aortobifemoral Y graft and from the graft to left renal artery a bypass with saphenous graft were performed simultaneously.

**CONCLUSION:** Our case had a hilar artery inserting from two different parts. Severe stenosis of both is very rare. Surgery is planned for the cases unresponsive to medical therapy and with symptomatic renovascular hypertension. Also combined treatments including percutaneous transluminal angioplasty can be used.

### **P-344-MASHHAD OPERATION "A NEW SURGICAL STRATEGY FOR MANAGEMENT OF ASCENDING AORTA / VALVE AND COARCTATION"**

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**BACKGROUND:** Previously reported surgical treatment of combined aortic valve/ascending aorta pathology and aortic coarctation include correction of anterior pathology and (Extra anatomic) ascending to abdominal, lower descending aortic bypass. We have used a more convenient operation in Mashhad in five consecutive patients with excellent outcome. To differentiate this from other available operations we call this Mashhad operation.

**METHODS:** The aortic valve and ascending aortic pathology are managed in the usual fashion. The descending aorta is exposed by retracting the pericardium, which is released from the diaphragm till the apex, to the right. This shifts the mediastinum and brings the upper descending aorta to view. Under hypothermic circulatory arrest the graft is securely sewn to an aortotomy beyond coarctation. The circulation is restarted and during rewarming the anterior operation is completed. The graft is brought to the front over the left hilum, parallel to the aortic arch, to be sewn to the ascending aorta or graft. The circulatory arrest time is less than 20 minutes. 5 patients managed this way. Ages were 8-55 years. The anterior pathologies include ascending aneurysm, Ascending aneurysm + Sub AS, Acute dissection and ascending aneurysm with previous AVR. In one patient a complex preductal coarctation with distal arch hypoplasia was managed this way.

**RESULTS:** All of the patients are alive and well. There was one postoperation bleeding requiring reexploration (Acute dissection). At follow up 6 months to 4 years, all are doing well. F/U echocardiography has shown a well finding graft. We will show a video of operation.

**CONCLUSION:** Mashhad method of managing ascending aortic or cardiac pathology with coarctation through median sternotomy is a convenient and safe.

### **P-345-USE OF PLEXUS VASCUTEK PROSTHESIS IN PATIENTS WITH PROXIMAL AORTIC DISSECTION**

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**BACKGROUND:** To evaluate the results of using Plexus Vascutek prosthesis in patients with proximal aortic dissection with brachiocephal vessels involvement.

**METHODS:** From January 2004 to October 2007 in the "Academician E. Meshalkin Novosibirsk State Research Institute of Circulation Pathology" High medical technologies Federal Agency, 20 patients with proximal aortic dissection have been operated. The mean age was 46.9 SE 7 years, (from 34 to 65 years). There were 17 (85%) men, and 3 (15%) women. Among these, 3 (15%) patients had acute aortic dissection, 3 (15%) patients had subacute dissection, and 14 (70%) had chronic aortic dissection. All patients had dissection and blood flow disorder in brachiocephal vessels on Doppler echocardiography and on Multislice tomography.

**RESULTS:** In postoperative period we registered on Doppler echocardiography laminar flow with sufficient linear speed. The hospital mortality was 1% (2 patients). These patients died in early postoperative period from progressive heart failure.

**CONCLUSIONS:** The results of this study can provide safety and effectiveness of using Plexus Vascutek prosthesis in patients with proximal aortic dissection with brachiocephal vessels involvement.

### **P-346-DESCENDING THORACAL AORTAFEMORAL BYPASS GRAFTING FOR THE TREATMENT OF THE COMPLETE JUXTARENAL AORTIC OCCLUSION**

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Complete obstruction of the abdominal aorta at the renal artery level is often a difficult surgical problem in case of long standing thrombosis, short suprarenal aortic space, and extensive periaortic inflammatory reaction. Bypass grafts that originate from descending thoracic aorta to the femoral arteries are well described but are not commonly used as primary procedures, and the long term results remain unknown. In our study, we have evaluated short and long term results of this method on our cases. Descending thoracic aorta to femoral artery bypass grafting has excellent overall long term results for patients with complete juxtarenal aortic occlusion.

### **P-347-MODIFIED ARCH FIRST TECHNIQUE USING A TRIFURCATED GRAFT**

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**OBJECTIVE:** The arch first technique in the operation of total arch replacement for aortic arch aneurysms is advantageous to avoid neurological complication. We developed a Modified Arch First Technique using a hand-made and compact trifurcated graft. A four-branched graft is commercially available but when reconstruction of arch vessels preceded, it is in the way to distal anastomotic site. We evaluated the surgical results of this method.

**METHODS:** Eighteen patients (mean age 75 yr) were enrolled. A graft for reconstruction of arch vessels was prepared, which consisted of a trunk (GelweaveR 10mm) and two branches (GelweaveR 10mm and 8mm). Core cooling with cardiopulmonary bypass reached to 25°C. The left subclavian artery, the left carotid artery and the brachiocephalic artery serially reconstructed under unilateral cerebral perfusion through the right axillary artery before incising an aortic arch aneurysm. The antegrade cerebral perfusion was resumed through the trifurcated graft. Distal anastomosis was performed with another graft using elephant trunk technique. A trifurcated graft was connected and finally proximal anastomosis was completed.

**RESULTS:** Adverse outcome occurred in 1 case: there was 1 hospital death because of a residual thoraco-abdominal aortic aneurysm rupture. Morbidities were: reoperation for bleeding in 2 cases, respiratory failure requiring tracheostomy in 1 case and acute renal failure requiring hemodialysis in 2 cases,

but no stroke occurred.

**CONCLUSIONS:** The modified arch first technique allows a simple and safe aortic arch replacement. A hand-made trifurcated graft for arch vessel reconstruction is compact and offers a better operative field for distal anastomosis. It can minimize the risk of cerebral embolism by isolation of arch vessels from atheromas in aneurysm and reduction in cerebral ischemic time.

### **P-348-LONE DEEP HYPOTHERMIC CIRCULATORY ARREST FOR TYPE-A AORTIC DISSECTION REPAIR. A SINGLE CENTRE EXPERIENCE**

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**BACKGROUND:** This retrospective single-centre study was aimed to evaluate the effectiveness of lone deep hypothermic circulatory arrest (DHCA) to provide an optimal cerebral protection in type-A aortic dissection repair.

**METHODS:** From October 1998 to September 2007, 100 patients with type-A aortic dissection underwent emergent ascending aorta replacement (AAR) in DHCA without both retrograde and antegrade cerebral protection. Average age was 63±12 years; gender ratio was 67male/33female. At the hospital admission, 14 patients were shocked and 3 showed neurological dysfunction. Isolated total AAR was performed in 59 cases; in 30 patients aortic arch replacement had to be added (hemiarth in 29 and total arch in 1) and aortic valve replacement was performed in 5 cases. Average DHCA time was 27.4±10.5 minutes. The aortic root replacement (Bentall technique) was mandatory in 6 cases.

**RESULTS:** In-hospital mortality was 15%. No patients experienced cerebrovascular accident (stroke or TIA). Temporary neurological dysfunction (TND) occurred in 11 cases. The latter group showed a DHCA time significantly longer than the patients having normal neurological course (35±10 vs 24±8, p=0.0006). Receiver operating characteristic (ROC) curve analysis demonstrated that DHCA time was a good predictor for higher TND rate (area under curve=0.84±0.08, p=0.001). Moreover a cut-off value (curves crossing point method) was identified by ROC curve: DHCA time > 27 minutes (sensitivity and specificity=72.7%). Stepwise logistic regression found that both continuous DHCA time (OR=1.1, p<0.001) and DHCA>27minutes (OR=12, p=0.003) were independent risk factors for higher TND rate.

**CONCLUSIONS:** Our experience without any cerebral protection confirmed the importance to keep the DHCA shorter than roughly 30 minutes.

### **P-349-THE ANATOMY OF THE AORTIC ROOT IN KOREANS**

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**BACKGROUND:** It is very important to know about the surgical anatomy of aortic root in recently spreading aortic root preserving procedures in heart surgery. This study focuses on the surgical aspect of the aortic root anatomy by dissection of cadavers for the landmark of diagnosis and treatment on aortic root diseases.

**METHODS:** The subjects are 52 cadavers which did not died of cardiovascular disease, excluded one case with the bicuspid aortic valve. We measured the intercommisural distances, heights of sinuses, the circumference of the sinotubular junction(STJ) and the aortic annulus. Statistical analysis was done using the non-parametric ANOVA test, the t-test, and linear regression with SPSSWIN 12.0.

**RESULTS:** The mean age of death was 61.1(19-88) years, with 33 male and 18 female cadavers. All measured parameters were averaged and the standard deviation(mm) was calculated. The intercommisural distance for the RCS was 20.73~Y2.23, the NCS 19.32~Y2.05, and the LCS 18.67~Y2.13. The height of sinus was 20.63~Y2.47 for the RCS, 18.63~Y2.23 for the NCS, and 17.95~Y2.17 for the LCS. The circumference of the STJ was 71.13~Y5.82, and the aortic annulus 76.83~Y6.44.

**CONCLUSION:** The analysis with the non-parametric ANOVA test showed the intercommisural distance and the height of the sinus were largest in the RCS, with NCS and LCS following (p=0.00). The length of the STJ is shorter than that of the aortic annulus by 7.4%. The relationship between age and ratio of the STJ/aortic annulus showed no positive correlation.

### **P-350-FIRST EXPERIENCE OF AORTIC VALVE-SPARING OPERATIONS FOR TREATMENT OF AORTIC ROOT ANEURYSMS COMBINED WITH AORTIC REGURGITATION**

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**BACKGROUND:** Aortic root aneurysms in many cases combine with aortic valve insufficiency. Aortic regurgitation may come out from both morphological changes of aortic valve leaflets and dilatation of aortic valve ring, sinuses of Valsalva and sino-tubular junction. In 1992 David and Feindel proposed valve-sparing operations for treatment of patients with dilated aortic valve ring, sinuses of Valsalva, sino-tubular junction and safe aortic valve leaflets. This method consists of aortic root prosthesis and reimplantation of aortic valve into vascular graft. Advantages of this method are low incidence of prosthetic valve-related complications.

**METHODS:** Since March, 2006 to August, 2007, in our center have been performed ten David I operations. Age of patients ranged from 22 to 64 years (mean age 49,5 years). All patients had aortic root aneurysm with dilatation of aortic valve ring, sinuses of Valsalva and sino-tubular junction combined with severe aortic regurgitation and safe aortic valve leaflets; in two cases there was acute aortic dissection type A. In addition to David I procedure in two cases has been performed mitral annuloplasty, in one case has been made CABG of LAD artery.

**RESULTS:** All patients survived. Mean CPB time was 235 and 186 minutes in groups with and without aortic dissection, respectively, mean aortic cross-clamp time was 212 and 164 minutes, respectively. In one case reoperation required owing to bleeding in early postoperative period; in two cases Q-MI of LV lower wall has been diagnosed postoperatively. Further period in all patients has been without peculiarities, except one female patient with bad wound healing which required vacuum drainage of soft tissues, secondary stitches have been put later. Before discharge every patient underwent ultrasound examination which showed no aortic regurgitation (AR) in 3 patients, trace AR in 5 cases and 2 patients had mild AR; LV volume decreased significantly.

**CONCLUSIONS:** According to our data, valve-sparing method Tirone David I is useful in treatment of patients with aortic root aneurysm combined with aortic regurgitation and safe aortic valve leaflets; subsequent research is necessary.

### **P-351-LONG TERM OUTCOMES AND MORTALITY RATE AFTER ACUTE ASCENDING AORTA DISSECTION SURGERY**

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**BACKGROUND:** Aneurysms of the ascending aorta of various genesis and the ascending aorta dilatation, especially associated with arterial hypertension, should be operated prior to the development of dissection.

**METHODS:** The aim of study is to show early and long-term results after surgery for acute ascending aorta dissection (AAAD). During the period of 8 years there were 47 patients, 33 males (70%) and 14 females (30%), who underwent surgery for AAAD (De Bakey type I 23 pts and type II 24 pts) at our Clinic. The most frequent clinical sign at the time prior to surgery was arterial hypertension (AH). The average systolic pressure was 165 mmHg (105-220). The tubus graft interposition was performed in 27 pts (with the suspension of aortic commissures in 8 cases). Our modified Bentall's procedure, Swenson/Crawford's operation and button technique were performed in 16,2 and 2 pts respectively. The pathohistological findings confirmed cystic medionecrosis in 68% (32/47), arteriosclerosis in 23,5% (11/47) and mucoid degeneration in 8,5% (4/47).

**RESULTS:** The thirty days postoperative mortality was 14,9% (7/47). The mean follow-up time was 2,25±2,22 years. The eight year survival is 49,3±13,3%.

**CONCLUSION:** Our results show acceptable operative risk and good long term survival after surgery for the acute ascending aorta dissection.

### P-352-CEREBRAL PERFUSION DURING SURGERY FOR ASCENDING AORTA AND AORTIC ARCH

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**BACKGROUND:** Performing axillary artery cannulation in patients with an atherosclerotic ascending aorta or acute aortic dissection of the ascending aorta and arch is of growing interest. Our aim is to present our experience and to describe the possible complications.

**METHODS:** We used the axillary artery cannulation technique in 15 patients. Emergency operation underwent 6 patients because of acute dissection. Males where (93,3 %) and females (6,66 %). Their age ranged from 50 to 77 years old. We expose the right axillary artery and after heparinization we connect it with a Gore-Tex vascular graft (SRRT080700702 from ePTFE 8 mm) and then to a 20-F straight arterial cannula. Care was taken to identify and isolate the brachial plexus. The arch branches is carefully occluded (temperature 24o) and arch reconstruction with open anastomoses is performed. We record infections, bleeding, cyst or fistula formation, renal or hepatic dysfunction, compartment syndrome, limb ischemia, stroke and peripheral neuropathy.

**RESULTS:** EuroSCORE was between 24,35% and 40,98 %. Two patients with ruptured dissection of thoracoabdominal aorta died intraoperatively. The 30,7% of the 13 patients who survived the operation had the following complications: 1 artery infection, 1 cyst formation, 1 hepatic dysfunction and 1 stroke.

**CONCLUSIONS:** Antegrate cerebral perfusion is of paramount importance in cases of aortic atherosclerosis or aortic dissection. The subclavian artery provides an excellent site for safe antegrate perfusion, which may play a role in preventing stroke.

### P-353-ALTERNATIVE CANNULATION SITE FOR ACUTE AORTIC DISSECTION

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Acute proximal aortic dissection is devastating disease. Often finding is cardiac tamponade, severe aortic insufficiency, dissection of right coronary artery and homodynamic instability. During last ten years we operated on 110 pts for acute aortic dissections. In majority of cases we used femoral cannulation. 3 pts. had severe neurological deficit and failed to wake up after operation. Most probably because of brain malperfusion. Recently we started to use heart apex as inflow site. In 19 cases we didn't have any neurological or other problems with this strategy. Our approach was to use this site for quick, easy but at the same time reliable way for establishing CPB. Having physiological blood flow, we believe, will minimize possibility of malperfusion syndrome. We believe that heart apical cannulation is safe, reliable and efficient method and advantageous compared to others especially in avoiding malperfusion phenomenon.

### P-354-ACUTE AND CRONIC AORTIC PATOLOGY COMPLICATIONS

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**OBJECTIVE:** The objective of this paper is to analyze the prevalence of this disease in a Cardiovascular Surgery Department, its complications and the security of its surgical treatment.

**MATERIALS AND METHODS:** We examined 2,257 heart surgeries performed from 1 January 2004 until August 31, 2007, among which 85 patients (3.76%) had disease of the aorta. Of these, 44 cases were acute (51.76%). Male 70 patients (3.10%). Average age: 55 years.

**RESULTS:** Of the operated cases of urgency, 9 patients were admitted in poor condition (20.45%) and 20 in regular state general (45,45%). PATOLOGIA AORTICA ACUTE ARM 8 FAILURE TO PUMP 15 6 RENAL FAILURE FAILURE NEUROLOGIC 5 SPILL PERICARDICO 19 TAPONAMIENTO CARDIACO 3 SPILL PLEURAL 13 CEREBROVASCULAR MEMBER OF 5 CEREBROVASCULAR MESENTERICA 2 Preoperative Diagnosis: 23 cases of chronic aneurysms of the

aorta 2 cases of breast Valsalva aneurysm 42 cases of aortic dissections and hematomas 14 cases of endocarditis and pseudoaneurysms aortic 4 cases of valvulopatias Surgical procedures: . Operation Bentall tube valvulado: 17 . Operation Bentall tube valvulado CRM +: 3 . Operation Bentall with another valve tube valvulado +: 4 . fistula closure VD with a Teflon patch + resuspension valvular: 2 . Closing transection and aortoplastia: 1 . Shoulder in descending aorta: 5 . Shoulder in aorta desc. + Bypass aortocarotideo-subclavio left: 1 . Shoulder in aorta desc. + Bypass femorofemoral: 1 . Homoinjerto aortic: 10 . Homoinjerto aortic + closing CIV: 1 . Homoinjerto aortic CRM +: 1 . Homoinjerto + other aortic valve: 4 . Replacing ascending aorta and resuspension valvular cayado +: 4 . Replacing ascending aorta and cayado: 4 . Replacing ascending aorta CRM +: 2 . Replacing ascending aorta: 6 . Replacing resuspension + ascending aorta valve: 6 . Replacing ascending aorta valve resuspension + + bypass femorofemoral: 1 . Replacing aorta ascending and descending cayado + + bypass valve resuspension axiloaortico right: 1 . Replacing ascending aorta and cayado CRM +: 1 . Replacing ascending and descending aorta: 1 . Replacing descending aorta: 1 . Replacing thoracoabdominal aorta bypass femorofemoral +: 1 . RSV + aortoplastia: 3 . RSV RVM with biological + + homoinjerto lung CRM: 1 . Aortoplastia: 2 . Aortoplastia + bypass femorofemoral: 1. The disease was of 38.82% (33 patients), of which 19 were emergencies (43.18%). COMPLICATIONS Hemodinamicas 18 Respiratory 4 Renal 5 Neurological 9 Bleeding 5 Mortality was of 18.82% (16 patients). In urgent cases died 12 patients (27.27%).

**DISCUSSION IN CONCLUSION:** Understand that this is complex diseases with high morbidity and mortality and that the emphasis should be placed on improving as much as possible the state of income, especially in cases in the acute or chronic going to a second cardiac operation.

### P-355-IMPACT OF SIMULTANEOUS ASCENDING AORTA AND ARCH REPLACEMENT ON THE SURGICAL TREATMENT OF TYPE A AORTIC DISSECTION

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**INTRODUCTION:** Surgical treatment of Type A aortic dissection can prevent fatal complications and reduce early mortality rates. The aim of our study was to analyze outcome after operation for Type A aortic dissection with (group I) and without (group II) concomitant arch replacement.

**MATERIAL AND METHOD:** We retrospectively reviewed 151 patients who underwent surgery for Type A aortic dissection from September 1992 to February 2006.

**RESULTS:** In 58 cases (38.4%) the surgical strategy included replacement of the aortic arch and in 93 patients (61.6%) only the ascending aorta was replaced. The mean follow up time was 47.8±28 months (range, 2-132 months). Duration of circulatory arrest was longer in group I compared to group II (46.2 ± 23 and 30.7 ± 9.9 respectively (p≤0.0001)). In group I, neurological complications were higher (6.7% and 4.3% respectively p= ns). Early mortality in group I was 8.6% and in group II 11.8% (p= ns). Long-term follow-up revealed that 24.1% of patients in group I developed false lumen thrombus formation in the unresected aorta compared to 3.2% of patients in group II (14 and 3 patients respectively (p≤0.001)). Also, in group I surgical interventions for unreplaced part of dissected aorta were performed less frequently compared to group II (p≤0.05).

**CONCLUSION:** Our long-term results demonstrates that the use of aortic arch replacement in the management of Type A aortic dissection increases the chances of false lumen thrombus formation and decreases the requirements for surgical intervention on the unresected aorta.

### P-356-EFFECTS OF SIVELSTAT SODIUM HYDRATE ON RESPIRATORY FAILURE AFTER THORACIC AORTIC SURGERY WITH DEEP HYPOTHERMIA

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**BACKGROUND:** Patients who undergo thoracic aortic surgery with deep hypothermia frequently complicate with postoperative respiratory failure asso-



ciated with systemic inflammatory response syndrome (SIRS). A specific neutrophil elastase inhibitor, sivelestat sodium hydrate (SSH), has been reported as an innovative therapeutic drug for acute lung injury. In this study, we evaluated the protective effects of SSH on lung injury after thoracic aortic surgery with deep hypothermia.

**METHODS:** From January 2002 to July 2007, 71 consecutive patients underwent thoracic aortic surgery with deep hypothermia in our hospital. Among these patients, 22 had postoperative respiratory failure with PaO<sub>2</sub>/FiO<sub>2</sub> (P/F) ratios of less than 150; these cases included 17 of Stanford type A aortic dissection and 5 of thoracic aortic aneurysm. The patients were randomly assigned to two groups: in the first group SSH was administered continuously at 0.2 mg/kg/hr until weaning from a respirator (Group S, n=10); and in the second group non-SSH therapies were performed (Group C, n=12). The groups were comparable with respect to clinical data.

**RESULTS:** There were no significant differences in age, operation time, total cardiopulmonary bypass time, circulatory arrest time, cardiac arrest time, intraoperative blood loss, and total transfusion volume between the two groups. The P/F ratios directly after surgery were 96.22(mean<sub>SD</sub>) and 93.26 in Group S and C, respectively (not significantly different). The P/F ratios at 12, 24, 48, and 72 hours postoperatively were 140.53, 159.53, 188.86 and 191.49, respectively, in Group S, and 122.60, 107.45, 121.42 and 145.55, respectively, in Group C (p<0.05 between groups at each time point). The improvement of pulmonary function was marked in Group S, and the change in P/F ratio at 24 hours after surgery in Group S was significantly higher than that in Group C (59.10% vs. 18.10%, p=0.02). The duration of mechanical ventilation, length of stay in the intensive care unit (ICU), and length of hospital stay were 174.141 hours, 18.17 days and 56.42 days, respectively, in Group S, and 224.247 hours, 39.41 days and 90.65 days, respectively, in Group C; all these periods were shorter in Group S.

**CONCLUSIONS:** SSH is a specific neutrophil elastase inhibitor that improves pulmonary function in patients with complicating postoperative respiratory failure following thoracic aortic surgery with deep hypothermia. Treatment with SSH may reduce the period of mechanical ventilation, the ICU stay, and the hospital stay.

### P-357-ENDOVASCULAR ANEURYSM REPAIR vs OPEN ABDOMINAL AORTIC ANEURYSM REPAIR: COMPARISON AT A COMMUNITY HOSPITAL PERFORMED BY CARDIO-THORACIC SURGEONS

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**BACKGROUND:** Since the advent of endovascular repair (EVAR) for abdominal aortic aneurysm (AAA), open aneurysm repair (OAR) has been shown to have higher morbidity and peri-operative mortality than the less invasive EVAR. With the introduction of new technology, it often takes time for the large institution procedure to filter down to the community hospital. Furthermore, there is a learning curve associated with any new procedure.

**METHODS:** We examined the first 31 EVAR procedures completed at our small community hospital (less than 250 beds) with the charts of the last 30 OAR procedures. We compared length of stay, transfusions, and organ complications (renal, cardiac, pulmonary, and gastrointestinal).

**RESULTS:** We found that the patients who had an EVAR at our institution were discharged from the hospital earlier, had shorter intensive care stays, had less time on the mechanical ventilator, and suffered less severe peri-operative complications. We were concerned with the potential renal complications associated with the potentially high dye load of an EVAR but we found that the worst renal impairment was actually seen in the OAR patients who suffered multi-system organ failure secondary to ischemic colitis. The most striking difference between the groups, however, was in the blood products used. OAR patients received large auto transfusions as well as banked blood products, which has been shown repeatedly in other studies to increase peri-operative morbidity.

**CONCLUSION:** Our series suggests that EVAR in a small community hospital is a suitable option for infra-renal AAA when anatomy is favorable. Estimated blood loss and overall length of hospital stay were significantly less in the EVAR group. Less morbidity was identified in cardiac, pulmonary, renal, and gastrointestinal aspects, thus leading to a more rapid return to pre-operative level of function. The next step is a prospective randomized series with a greater

number of patients and a longer follow-up time to assess long-term performance. We hope to see an increase in the number of EVARs being performed at the community hospital setting by cardio-thoracic surgeons.

### P-358-SUCCESSFUL SURGICAL MANAGEMENT OF GIANT AORTIC PSEUDOANEURYSM COMPLICATING PRIMARY AORTIC ROOT REPLACEMENT WITH COMPOSITE TUBULAR VALVED GRAFT

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**BACKGROUND:** The development of giant aortic pseudoaneurysm after primary replacement of the aortic root and the ascending aorta with modified Bentall-type operation secondary to advanced prosthetic valve endocarditis remains uncommon. The surgical treatment of such complication represents formidable technical challenges. We report herein on a surgical management of giant aortic pseudoaneurysm complicating primary modified Bentall operation.

**METHODS:** A 67 years old male patient was admitted at our department primarily for surgical treatment of aneurysm of the ascending aorta combined with severe aortic valve stenosis. This operation was performed in June 2005 with SJM composite tubular valved graft. Six months later, in December 2005, he was admitted again because of sternum instability, which was also surgically corrected. In August 2006 he was re-admitted urgently because of rapid clinical deterioration due to systemic infection and congestive heart failure. This clinical feature was due to advanced aortic prosthetic valve endocarditis caused by *Staphylococcus aureus*. A CT scan and transesophageal echocardiogram (ECHO) were performed. Both these diagnostic tools revealed a giant circular pseudoaneurysm of the ascending aorta, paravalvular leak, large periannular abscess cavity and dehiscence of the proximal graft anastomosis. Prompt reoperation was done on 29. August 2006. Medtronic Freestyle stentless aortic root bioprosthesis was used to replace the composite tubular valved conduit. The buttons of the coronary arteries were re-implanted on the stentless biological prosthesis. The ascending aorta was re-replaced again through Dacron prosthesis.

**RESULTS:** The patient was weaned from the cardiopulmonary bypass under low dosage of catecholamines. The postoperative course was complicated with complete atrioventricular block and transient asystole, which required the implantation of dual chamber modus (DDD) pacemaker. A repeated transthoracic ECHO done in October 2007 showed satisfactory function of the Freestyle aortic root bioprosthesis without evidence of paravalvular leak. The pacemaker functioned properly and the patient recovered clinically very well.

**CONCLUSIONS:** Re-root replacement after primary Bentall-type operation with Freestyle aortic root bioprosthesis in a setting of giant aortic pseudoaneurysm is demanding but offers an alternative surgical option. The differential diagnosis of aortic pseudoaneurysm formation should be suspected in a setting of hemodynamic deterioration with systemic symptoms and signs of endocarditis after primary modified Bentall-type operation. Prophylactical efforts and measurements to avoid prosthetic valve endocarditis after primary Bentall procedure should not be underestimated. Long-term clinical follow-up and echocardiographical control are mandatory.

### P-359-SUCCESSFUL EMERGENCY RESUSCITATIVE THORACOTOMY AND THORACOSCOPY IN AN INJURED PATIENT WITH IMPENDING DEATH

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**BACKGROUND:** Video-assisted thoracoscopic surgery (VATS) has been used mostly in elective trauma cases such as evacuation of clotted hemothorax, examining the pericardium, lung parenchyma, diaphragm and the internal side of the chest wall for any lesion of the intercostal or internal mammary vessels. However, the role of VATS in cases with emergency resuscitative thoracotomy (ERT) has not been evaluated.

**METHODS & RESULTS:** This presentation is based on a 23-year-old man who was bilaterally stabbed with knife creating 10-cm wide wounds. Initially, the patient had no cardiac or respiratory activity. ERT was hastily performed on the right side. An immediate manual occlusion of the pulmonary hilum as damage



control was done. A pneumonorrhaphy was performed and the bleeding was completely stopped. The patient was stabilized and to avoid another thoracotomy on the left side, VATS was performed. The lesion was explored, hemothorax was evacuated, and a superficial non-bleeding parenchymal pulmonary laceration was discovered. The postoperative course was uneventful and the patient was discharged home 10 days later.

**CONCLUSIONS:** VATS could be used with caution in patients undergoing ERT after hemodynamic stabilization. To the best of the author's knowledge, this is the first reported survival of an injured patient in extremis following bilateral extensive knife stabs and who underwent ERT on the right side combined with VATS on the left side.

### **P-360-CARDIAC BYPASS TO PREVENT PARAPLEGIA IN THORACIC AORTIC RUPTURE**

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**BACKGROUND:** Successful management of traumatic rupture of the thoracic aorta is one of the most challenging and rewarding tasks in cardiothoracic and trauma surgery.

**METHODS:** We provide our results with partial or total cardiac bypass during surgery for traumatic aortic injuries treated at Denmark's busiest medical center (Rigshospitalet) during a five-year-period.

**RESULTS:** We found 10 patients with thoracic aortic injuries, 1 was iatrogenic and excluded. The remaining 9 patients (mean age 50 years, range 31-69) were meticulously analyzed. All patients with aortic lesions were operated on between 2-24 hours following trauma, and the tear was in the classic position in the descending aorta. No lesions were found in the ascending aorta or the arch. A partial left heart bypass was used in 7 patients of whom 6 had left atrial-aortic and one had left atrial-left femoral bypass. Two patients were placed on a total cardiopulmonary bypass and died. One patient had postoperative renal failure, but no incidence of paraplegia or cardiac failure.

**CONCLUSIONS:** We do believe that some sort of bypass for such a lethal injury is recommended if paraplegia is to be prevented. The bypass ensures adequate perfusion and protection to the spinal cord, kidneys, and bowel and relieves the heart from failure. Despite this limited experience, our results are excellent compared with major trauma centers in the United States.

### **P-361-THORACIC AND MEDIASTINAL GREAT VESSEL TRAUMA: A SINGLE CENTER EXPERIENCE**

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**BACKGROUND:** Thoracic and mediastinal great vessel injury resulting from blunt and penetrating trauma is usually fatal if untreated. Appropriate diagnosis and surgical repair are crucial for patients' survival. We present our experience with thoracic and mediastinal vascular injury focusing on surgical treatment and outcome.

**PATIENTS & METHODS:** During the past decade (1997 to 2006) 33 patients with arterial injuries to the ascending aorta, aortic arch, descending aorta and great vessels have been treated at our department. There were 20 male and 9 female patients with a mean age of 49 (range from 19 to 69). All patients had evaluated with CTscan immediate after their admission. Patient's data were obtained by reviewing their medical and operative records.

**RESULTS:** Thirteen patients presented aortic injuries. There was one ascending aorta injury after gunshot trauma of the chest treated successfully with direct suture (partial clump and sew) through sternotomy and a case of aortic arch injury after nephrologic central catheter placement treated also with direct suture through left thoracotomy. One female patient with mediastinal hematoma at chest CT and suspicion of aortic isthmus rupture presented transection of intercostal arteries without any further damage to the aorta and underwent ligation of the bleeding vessels. There was also a case of traumatic pseudoaneurysm of the ascending aorta shortly after mediastinoscopy and biopsy was performed in a male patient with mediastinal mass. Median sternotomy was followed by opening of the aneurysm sack, clots evacuation and

direct suture of the aortic injury. The rest of the patients suffered of aortic isthmus rupture secondary to blunt trauma. An open approach through left posterolateral thoracotomy was carried out in 7 patients. Direct suture was used in one patient. The rest of them underwent descending aorta replacement with a synthetic graft. CPB was used only in 2 patient while in the others the clump and sew technique was applied. Stent graft placement was used in 2 patients. Three patients were operated due to significant hemothorax and were found to suffer of main pulmonary artery injury. Direct suture was used in 2 of them (blunt chest trauma) and pneumonectomy in the last one (gunshot wound). There were also 4 patients with iatrogenic injury to the superior vena cava and one patient with injury to the inferior vena cava after blunt trauma. Sternotomy followed by pericardial evacuation and direct suture of the vascular injury was carried out in all of them. One patient with hemothorax was found to have subclavian vena injury that was sutured through thoracotomy. Finally there were 11 cases of subclavian and innominate artery injury, 2 after stab wound and 9 after blunt trauma with clavicle fracture. Direct suture was applied in all of them. Overall mortality was 15% (5 out of 33 patients).

**CONCLUSION:** Early diagnosis and emergency surgical treatment, in patients with intrathoracic great vessel injury, can be carried out with excellent results.

### **P-362-PENETRATING PERICARDIAL TRAUMA DUE TO GUNSHOT WITHOUT ANY ASSOCIATED CARDIAC TRAUMA**

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**BACKGROUND:** The penetrating pericardial trauma is described in the literature as an individual entity due to the increase of the thoracic trauma. We describe a case of a penetrating trauma of the pericardium due to a gunshot, without any associated cardiac trauma.

**METHODS:** A 35 years old Caucasian male was transferred to our hospital after a gunshot at the left side of the thorax. The patient, after stabilization, underwent a computed tomography (CT) of the thorax and the abdomen, which revealed a left hemopneumothorax, lung injury of the left lower lobe and the presence of the bullet at the pelvic bones.

**RESULTS:** The patient underwent an emergent left thoracotomy, which revealed lung injury of the left lower lobe and a penetrating trauma of the pericardium. The pericardium was opened in order to examine the heart, but no cardiac injury was present. The bullet entered the peritoneal cavity through the diaphragm, causing no injury to any of the organs of the abdomen. The patient was treated with tractotomy of the lung and hemostasis.

**CONCLUSIONS:** The penetrating injury of the pericardium without any associated injury of the heart is an extremely rare entity, which can only be explained considering that during the gunshot the heart was at the systolic phase.

### **P-363-COMPARATIVE STUDY OF 214 PEASETIME GUNSHOT WOUNDS OF THE CHEST**

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**BACKGROUND:** The rising numbers of violent crimes and the latest international military partnership with the Peace Keeping Forces have increased our experience with the treatment of gunshot wounds of the chest (GWCh).

**METHODS:** We have analyzed our experience with the treatment of 214 patients with penetrating GWCh. They were inflicted by various types of firearms: from AK machine guns - 52 cases and from handguns - 162 cases. Adequate ventilation, volume replenishment with hypertonic solutions and treatment of traumatic shock precede the usual diagnostic procedures (X-rays, CT Scan, needle chest decompression, tube thoracostomy, ECG, Bronchoscopy, Esophagoscopy). The most frequent injuries are haemothorax, haemopneumothorax, lung contusion and rib fractures. The clinical outcome depends on the mechanism of the injury and the location. Tube thoracostomy with 2 drains was performed in 164 patients (76%). Emergency thoracotomy was performed in 50 patients (24%). The indications were: a) Massive haemothorax: more than 1000ml evacuated upon insertion of chest drain - 16 patients. b) Hemor-

rhage of more than 200 ml/h for more than 4 hours \_y 22 patients. In 9 of the operated patients suture of lung parenchyma was performed. In 16 \_y lung resection (12 lobectomies and 4 wedge resections) was carried out.

**RESULTS:** The results of the surgical treatment are in direct correlation with the mechanism of the injuries. Good and excellent results were obtained in the operated patients with isolated chest wall and lung injuries. The mortality rate of 29% (62 patients) was due to the severity of the multiple and associated injuries.

**CONCLUSIONS:** The knowledge and understanding of the biophysical parameters (oscillation, gravity rotation, mechanical resistance and tumbling) helps the understanding of the morphogenesis of GWCh and the indications for emergency surgical treatment.

### P-364-TREATMENT OF HARD OSSEOUS CHEST FRAME TRAUMA

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**BACKGROUND:** The authors report on their experience with 2027 patients suffering from chest trauma. The patients were treated in the Faculty Surgery Clinic of K.T.Ovnatanyan, Donetsk State Medical University during the years 1997-2007. 381 patients (18.6%) had a severe chest trauma. Of these 381 patients 165 (42%) were injured during transportation, while 139 (37%) were work related and 77 (20.3%) domestic. In 93 (24%) of the patients the breast bone and ribs were fractured at multiple sites. The clinical course severity of the mentioned above was determined by the amplitude of flotation and unstable fragments area of the chest. It conditioned the haemodynamic violations expression and the shock severity, going with the direct heart bruise and other organs and systems damage.

**METHODS:** Medical treatment included restoration of breathing, pleura cavity drainage, cardiovascular support and osseous chest frame stabilization. Intrapleural osteosynthesis was applied in 38 cases when numerous ribs and breast bone fractures were combined with intrathoracic organ damage requiring immediate surgical intervention. Metal osteosynthesis of the ribs were applied in 26 cases, ribs and breast bone combined in 8, and breast bone only in 4 patients. Extrapleural panel fixations of numerous fractures were performed in 42 patients, according to the authors Methods as shown in the picture (patent Russia 204234).

**RESULTS:** Of 91 patients, 86 patients with fragmental ribs and breast bone got better while 5 (5.5%) died.

**CONCLUSION:** Of 91 patients, 86 patients with fragmental ribs and breast bone got better while 5 (5.5%) died.

### P-365-A VERY UNUSUAL CASE WITH INJURY TO RIGHT LUNG, INFERIORCAVAE ATRIAL JUNCTION CAUSED BY A PENETRATING STAB INJURY TO THE RIGHT PARAVERTEBRAL THORACIC REGION

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Penetrating thoracic injuries can damage more than one intrathoracic structure and frequently requires urgent surgical intervention due to life-threatening consequences that demand extreme awareness. We report an unusual case with right lung, right atrium and inferior vena cava injury caused by a knife penetrating the right paravertebral region of thorax that was successfully treated by immediate surgical repair. Right posterolateral thoracotomy was employed and cardiopulmonary bypass was achieved by cannulation of femoral artery and superior vena cava. The injury of the right atrium was close to the interatrial groove extending 2 cm through the inferior vena cava. The patient was discharged uneventfully. It should be kept in mind that right chest paravertebral penetrating injuries may possibly cause cardiac injuries that may necessitate cardiopulmonary bypass.

### P-366-LEFT VENTRICULAR PSEUDOANEURYSM ACROSS THE CHEST WALL AS A LATE GUN SHOT COMPLICATION: CASE REPORT

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**BACKGROUND:** We report a case of a patient who develops a left ventricular pseudoaneurysm across the chest wall secondary of a gun shot.

**METHODS:** A 49 years old female received a gun shot in the left thorax four years ago. She underwent chest surgery without evidence of heart injury. A few months later she notice intermittent left chest pain and the presence of pulsate mass. Clinical examination demonstrates a pulsate mass above the left breast in the 4th intercostals space. MRI showed the presence of a left ventricular pseudoaneurysm 7x5x7cm and penetrates the chest wall with a secondary component 10x8x5cm. She underwent surgery.

**RESULTS:** We found a left ventricular pseudoaneurysm that penetrates the chest wall between the 3rd and 4th ribs generating an extra component. A complete pseudoaneurysm resection, thrombus extraction and Dor's procedure were done successfully.

**CONCLUSION:** A little percentage of left ventricular aneurysm and pseudoaneurysm have their origin because of direct myocardial contusion and rarely secondary of a gun shot. This report demonstrates that the expansive wave can cause myocardial damage and pseudoaneurysm formation.

### P-367-EFFECTIVENESS OF THE ANTIBIOTICS FOR PATIENTS SUBMITTED TO A CLOSED TUBE THORACOSTOMY AFTER A THORACIC TRAUMA SYSTEMATIC REVIEW

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**BACKGROUND:** About a third of patients with thoracic trauma need hospitalization, the majority of them are treated by a chest tube insertion. The main morbidity associated to this procedure is the pleural empyema and this complication is related to the length of hospital stay, permanent impairment or even mortality. The irrational use of antibiotics is a real problem, and there is a controversy about the benefit of antibiotic administrations to these patients.

**OBJECTIVE:** It was to evaluate if antibiotics are effective to decrease the incidence of pleural empyema in patients submitted to a closed tube thoracostomy after a thoracic trauma. Method: Systematic review of the literature and a meta-analysis based on the Cochrane methodology, including only randomized control trials. The data bases searched were: MEDLINE, EMBASE, LILACS and Cochrane Library.

**RESULTS:** Six studies fulfill the inclusion criteria and were considered to the meta-analysis; they totalized 753 patients with isolated thoracic trauma and submitted to closed tube thoracostomy (antibiotic group 422 patients, placebo group 331 patients). For the outcome empyema the meta-analysis shows a RR=0.18 (95% CI 0.07 to 0.46) favoring the antibiotic group. And the number needed to treat NNT=16, for each sixteen patients who have received antibiotics one empyema was reduced. For outcome pneumonia (antibiotic group 365 patients, placebo group 275 patients) a RR = 0.43 (IC 95% 0.23 to 0.82) favoring the antibiotic group, NNT=18. In the sensibility analysis when were included only patients with penetrating thoracic trauma, for outcome empyema (antibiotic group 215 patients, placebo group 172 patients) a RR = 0.10 (IC95% 0.03 a 0.33) favoring the antibiotic group and the NNT=7, and for outcome pneumonia (antibiotic group 158 patients, placebo group 116 patients) a RR = 0,30 (IC95% 0.12 a 0.75) favoring the antibiotic group, NNT=9. When only patients with not penetrating thoracic trauma (antibiotic group 100 patients, placebo group 48 patients) were considered, there was not significant statistics for the both outcomes (empyema and pneumonia).

**CONCLUSIONS:** Antibiotics are effective to reduce the pneumonia and empyema incidence in patients with trauma of isolated thorax submitted to closed tube thoracostomy. Patients with penetrating thoracic trauma are the most benefited by the use of antibiotics for both studied outcomes, empyema and pneumonia.

### P-368-BLUNT CARDIAC INJURY: DIAGNOSIS AND SURGICAL TREATMENT

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**BACKGROUND:** Diagnosis and management blunt cardiac injury has challenged clinicians. The purpose of this study was review our experience with diagnosis and treatment for blunt cardiac injuries.

**METHODS:** Evaluate the clinical characteristics, causes of injuries. Suspected cardiac rupture underwent chest X-ray, EKG, Echocardiography. Operation were indicated for cardiac tamponade, suspected cardiac rupture. Sternotomy should be done in cases of cardiac rupture. Thoracotomy were done for patients who suspected myocardial contusion.

**RESULTS:** During 5 years between 8 / 1996 and 12 / 2001, 20 patients with blunt cardiac injuries were treated in Choray hospital. Atrial rupture were found in 11 cases, 2 patients have rupture of ventricle and 7 cases had myocardial contusion with hemopericardium. Traffic accident is the main cause of these injuries (16/20). 13 cases had hypovolemic shock at admission, cardiac tamponade were found in 5 cases. Diagnosis based on Chest X ray, Echocardiography. Most of cases had rib fracture with or without sternum fracture. CTR > 0.55 were found only in 8 cases; Pericardial effusion were found in 17 of 18 cases. 19 of 20 patients were operated, sternotomy were done in 12 cases, right thoracotomy in 2 cases and left thoracotomy in 5 cases. Suture the ruptured myocardium were performed in 13 patients, pericardiectomy and hemostated the bleeding pericardium in 6 cases. The mortality rate was 10% (2 patients).

**CONCLUSIONS:** Blunt cardiac injury are still a severe injury with high mortality. Early diagnosis and treatment will take good result for this injury. Most of patients had hypovolemic shock and cardiac tamponade. Echocardiography is very important and useful for diagnosis. Sternotomy should be done to manage traumatic cardiac rupture.

### P-369-ESOPHAGEAL PERFORATIONS

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**BACKGROUND:** The problem of diagnostics and treatment of esophageal perforations and their complications remains actual. This is confirmed by increasing number of the patients with the this pathology and the development of different kinds of complications.

**METHODS:** From 1981 to 2001 there were 133 patients with esophageal perforations. Instrumental injuries were the cause of esophageal perforations in 53 (39,8%) cases, foreign bodies in 43 (32,3%). Spontaneous ruptures of the esophagus were diagnosed in 25 (18,8%) cases. There were other kinds of injuries in 11 (8,3%) cases. 1 (0,8%) patient had the inflammation process. The esophageal defect was localized in the thoracic part in 73 (54,8%) cases, in the cervical part in 56 (42,1%) cases, in the abdominal part of the esophagus in 4 (3,1%) cases. The esophagus was cicatricially constricted in 22 (16,5%) cases. 16 (12,1%) patients were hospitalized over 24 hours period, 32 (24,1%) over two days, 85 (63,8%) more than two days after beginning of the disease. 29 (22,3%) patients had neck phlegmon, 79 (60,8%) had mediastinitis.

**RESULTS:** 104 (78,2%) patients were operated. Transdiaphragmatic mediastinotomy was performed in 7 (6,7%) cases. In 34 (32,7%) cases cervical mediastinotomy were carried out. Thoracotomy was done in 63 (60,6%) cases. The suturing of the esophageal defect was made in 30 (28,8%) cases. 10 (33,3%) patients had the partial insufficiency of the sutures 6-8 days later. 7 (6,7%) patients with extensive purulent septic complications died in the first hour after hospitalization. Postsurgical treatment included clinical and roentgenological monitoring, sanation of the mediastinum with active aspiration, antibacterial and desintoxication therapy. The nutrition support was fulfilled through nasogastric tube in 125 (93,9%) cases and through the gastrotomy in 8 (6,1%) cases due cicatricial changes of the esophagus. The conservative treatment of the esophageal perforation is limited. It was used in 22 (16,5%) cases of small injuries of the cervical and upper thoracic parts of the esophagus which can be successfully drained into esophagus. Active surgical tactics led to reducing the mortality rate in 2.9 times, from 62,9% (1981-1995 years) to 20,3% (1996-2007 years).

**CONCLUSIONS:** The surgical treatment is the main way of esophageal perforation managing. Conservative treatment is possible in a limited number of cases. Results of treatment of penetrated injuries depend on the timely diag-

nostics, hospitalizing the patients in the specialized hospital department and active surgical tactics.

### P-370-PENETRATING CARDIAC TRAUMA IN CHILDREN

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**OBJECTIVE:** Penetrating cardiac traumas in children are dramatic and fatal. Many of the patients are admitted to hospital either in a state of shock or are dead at presentation. Hemodynamic decompensation may develop rapidly in these cases. Early diagnosis and surgery determine the prognosis.

**METHODS:** 17 pediatric cases of penetrating cardiac trauma were retrospectively evaluated. The effects on the results of the demographic characteristics of patients, etiology of penetrating trauma, time of presentation to the hospital, physical examination findings in the emergency department, diagnostic methods used, and the surgical techniques applied were evaluated.

**RESULTS:** The male to female ratio of the 17 retrospectively evaluated cases was 16:1, with an age range of 3-15 years. The patients' mean age was  $12.94 \pm 3.52$  years. In all patients, the penetrating cardiac trauma was due to incise/penetrating tools. The mean Ivatuty physiologic index score was  $8.23 \pm 0.78$ , whereas the mean cardiac injury organ scale score was  $5.00 \pm 0.00$ . The hospital mortality rate was 5.9% due to the loss of one patient.

**CONCLUSIONS:** Shock may develop in pediatric penetrating cardiac trauma in a short time due to hemorrhage and/or cardiac tamponade. The prime factors for patient survival are early diagnosis and emergency thoracotomy.

### P-371-ISOLATED RIGHT ATRIAL RUPTURE AFTER EXTERNAL CARDIAC MASSAGE IN A PATIENT UNDERWENT CORONARY ARTERY BYPASS SURGERY

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**BACKGROUND:** Isolated right atrial rupture is a very rare catastrophic complication of cardiopulmonary resuscitation.

**CASE REPORT:** We report a case of 62-year-old male patient who developed excessive bleeding following external cardiac massage for sudden unknown cardiac arrest in the intensive care unit after coronary artery bypass surgery. He underwent successful emergency repair of the tear of the right atrium without using cardiopulmonary bypass.

**CONCLUSIONS:** Early detection of traumatic cardiac injury, prompting early operative exploration, bleeding control with finger or clamp, and repair increases the success in cardiac trauma. In such a complicated patient, we think that the need for a high index of suspicion and rapid therapeutic intervention is also highlighted.

### P-372-USE OF ENDOBRONCHIAL BLOCKERS IN EMERGENCY SITUATIONS IN THORACIC SURGERY AT CHILDREN AND ADULTS

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**BACKGROUND:** Good surgical exposure is one of the most important factors influencing surgical result in classic thoracic surgery. Establishing of one-lung ventilation and effective lung separation is one of the contributing factors for patient's safety. Acute thoracic injuries are accompanied by high morbidity and lethality of involved patients.

**METHODS:** We report our experience with the use of endobronchial blockers in one adult and one child. 40 y.o. man was admitted to emergency department after motorcycle traffic accident. Patient's shocked conditions were secondary to blunt chest trauma, head and spinal injury, multiple face bone's fractures. An 11 y.o boy was involved in a boat accident. He was admitted to a primary hospital and was transferred to special department later.

**RESULTS:** In an adult case patient was intubated on the place of accident by emergency team. Patient was admitted to X-ray discovered multiple costae fractures, multiple unstable column fractures, bilateral pleural drainage uncovered 1200 ml of bleeding on the right side. Patients condition was deteriorated by bleeding from the endotracheal tube highly resistant to suction and connect-



ed with its insufficiency of artificial ventilation. Despite on Level 1 infusion patient remained unstable and right anterior thoracotomy was performed. Pleural cavity contained 2000 ml of blood. Multiple rib fractures, intensive intrapulmonary bleeding because of expressed lung contusion, multiple lung lesions. Surgical field view was exceptionally poor. Because of expressed ventilation trouble and bad surgical field view decision of use of bronchial blocker was made. Arndt endobronchial blocker linked to bronchoscope by wire-guided loop was successfully placed in the right main bronchus. Large mediastinum haematoma, bleeding from the top of the lower lobe, bleeding from column on TH5 level was found and stopped by surgical tamponade, oversewing and sealing. Intraoperative TEE found no aorta lesion. Chest was fully closed 2 days later. The boy was intubated in the primary hospital, an enlarged mediastinum shadow and free liquid in abdomen was disclosed by X-ray. Trauma CT-scanning of chest and abdomen demonstrated haematoma around aorta arcus and descendent aorta. Approach through left thoracotomy via ICS disclosed aorta rupture in ductus ligament area. Wire guided endobronchial blocker was placed in left main bronchus after bronchoscopy. Anesthesia and monitoring involved left ventricle assist device from left atrium to distal aorta, aortic cross clamp 40 min. Gore-Tex tube graft was inserted. 92 min. of one-lung ventilation was well tolerated.

**CONCLUSIONS:** Use of wire guided bronchial blockers in emergency settings where patients are intubated or too small for double lumen tube allows efficiently perform one-lung ventilation and remove perioperative difficulties in surgical field exposure thereby helps to improve the result of patient's treatment.

### P-373-CARDIAC INJURIES IN ADANA PROVINCE AND IN TURKEY

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**BACKGROUND:** Formerly ,cardiac injuries were frequent due to the wars and, seldom due to homicide and suicide, but gradually increasing in civil area in 20 th century.

**METHODS:** Eight hundred and twenty one cases of cardiac injury from 73 provinces in Turkey were reported in between 1933-2007. Only 2 % (15/821) of cases were seen within first 20 years (1933-1954) while 98% (806) of subjects occurred within the 50 years .This indicates 22 fold increase of these cases for the last half century. In our Department of Cardiovascular Surgery, Cukurova University , Faculty of Medicine, in Adana ,Turkey, we examined and treated 74 stab wounds, 12 gunshot wound, 3 blunt trauma and 15 iatrogenic cardiac injuries. This indicates a total of 104 subjects. When they were examined in emergency room 14 cases were in terminal stage, 62 were in shock state and 26 were in stable condition. Out of 62 subjects in shock state, 39 were showing cardiac tamponade and 23 had hypovolemic shock due to bleeding. Urgently, thoracotomy and cardiography were done in all of these cases.

**RESULTS:** Overall mortality rate in this series was 12.5% (13/104 pts). The mortality rates of stab wound, gunshot wound, iatrogenic trauma were 8, 41.6 and 6.6%, respectively. The mortality rate for the subjects at the terminal stage was 36% while it is only 9.6% of patients in shock stage. Again, the mortality rate of cardiac tamponade is 7.6% and in hemorrhagic shock was 30.6%.

**CONCLUSIONS:** Our data indicate that the early thoracotomy is lifesaving intervention.

### P-374-STABILIZING THE CHEST WALL AFTER OPERATIONS OF THE STERNUM

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**BACKGROUND:** Operative treatment of tumors and osteomyelitis of the sternum can lead to cutting a part of or even the whole sternum, together with parts of the ribs and the soft tissues. The restoration of the stability of the chest wall is a serious surgical problem.

**METHOD:** A retrospective analysis of the results, achieved in the department after the application of the four operative techniques with patients with large postoperative sternum defect was done. From October 1987 to September 2007 23 patients with big tumors in the sternum and 6 patients with

osteomyelitis of the sternum were operated. The bone defect was repaired with an autograft in 6 cases, steel device in 11 cases, polyamide meshes in 2 cases and titanium device in 4 cases. With 6 patients a combination of the first three methods of stabilizing was used.

**RESULTS:** For 10 years, we performed stabilization of the chest wall after resection of the sternum in 29 patients in total. 6 of them were after a previous sternotomy and osteomyelitis of the sternum. We evaluated the postoperative stabilization of the chest wall subjectively, based on how the patients felt, and objectively, before dehospitalization, on the basis of the lung function examination. One patient died with massive myocardial infarction 24 hours after the operation.

**CONCLUSIONS:** Stabilizing the chest wall after broad resection of the sternum continues to be a serious problem. The best results, achieved so far, are the titanium device implants. Patients after osteomyelitis have the most favorable prognosis.

### P-375-ACUTE HEART FAILURE WITH SEVERE MITRAL REGURGITATION FOLLOWING BLUNT CHEST TRAUMA

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**BACKGROUND:** Blunt chest trauma accounts for less than 10% of all cardiac trauma. There are few reports in the literature of myocardial infarction and coronary occlusion following blunt chest trauma. The left anterior descending coronary artery is involved in the majority of the cases followed by the right circumflex artery, and left main coronary artery. Patients may present acutely with the myocardial ischemia, or later with the left ventricular dysfunction, coronary artery aneurysm or valve damage. Difficulty and variety of heart injury diagnosis after blunt chest trauma are illustrated by the following case.

**METHODS:** We report a case of total occlusion of the obtuse marginal branch of the circumflex coronary artery and consequent delayed severe mitral regurgitation from posteromedial papillary muscle rupture discovered upon investigation for acute heart failure following six weeks after motor-vehicle accident.

**RESULTS:** A 49-year-old previously healthy man had a frontal high-velocity car accident during the race. He didn't undergo any medical investigation, due to absence of any serious health troubles ( whereas he went on holiday with his family ). Six weeks after the injury, he was admitted to a district general hospital suffering from shortness of breath, hemoptysis. Transoesophageal echocardiography showed complete rupture of the papillary muscle causing massive mitral regurgitation, he was transferred to the Cardiothoracic Center of the Faculty Hospital, Ostrava. Coronarography demonstrated occlusion of the obtuse marginal branch of the circumflex coronary artery, CT scans revealed intramural haematoma of the aortic arch, sternal fracture, pleural effusion, pulmonary contusion, fracture of the thoracic vertebra. The patient underwent surgery with valve repair (quadrangular resection, sliding plasty, ring anuloplasty) and coronary artery bypass grafting. He was discharged three weeks after the surgery procedure.

**CONCLUSIONS:** Coronary artery occlusion and acute myocardial infarction secondary to blunt chest trauma have been assumed to be a rare occurrence. Presented case is very atypical, because rupture of the papillary muscle, leading to the severe mitral regurgitation, was the first sign of the coronary artery occlusion due to blunt chest trauma six weeks ago. We suppose that, central artery of the posteromedial papillary muscle was affected by the occlusion of the left obtuse marginal branch of the circumflex coronary artery and this ischemia and subsequent infarction resulted in the delayed rupture

### P-376-HEART TRANSPLANTATION IN THE CASE OF ISOLATED VENTRICULAR NON-COMPACTION

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**BACKGROUND:** Until now, only few cases of isolated ventricular non-compaction (IVNC) leading to cardiac transplantation have been published to date. IVNC of the myocardium in adults is defined as cardiomyopathy caused by intrauterine arrest of compaction of the myocardial fibers and meshwork, an



important process in myocardial development. A lot of controversies exist about diagnostic criteria, nomenclature, prognosis, origin, pathogenesis and treatment of this disease. Here, we present a case of IVNC, diagnosed using multi-modality imaging and successfully treated with heart transplantation.

**METHODS:** A 35-year-old white male was referred to the cardiac intensive care unit because of fever, dyspnoea and cough. The patient had a history of non-defined asymptomatic heart disease from the childhood (pathological heart murmur was heard from the age of 7). The diagnosis of isolated LV noncompaction with possible embolisation of ventricular thrombi, causing lung, spleen and myocardial infarctions was established on the basis of clinical, laboratory, and radiological (MRI, CT) findings. On subsequent outpatient follow-up visits patient complained of frequent palpitations, increasing dyspnoea and reduced exercise tolerance despite adequate heart failure treatment. On follow-up ECG multiple episodes of paroxysmal self-limiting atrial fibrillation and couplets of ventricular premature beats were registered. During ambulatory treatment despite adequate anticoagulation patient experienced cerebral infarction with left hemiparesis, which regressed partially. The patient was admitted to the heart surgery center for repeated examination and for assessment of indications for heart transplantation because of refractory congestive heart failure and cerebral embolisation despite adequate anticoagulation four months after establishment of diagnosis. An 2D, 3D TTE and cardiac MRI displayed negative dynamics. The left ventricle remained slightly dilated, although left ventricle ejection fraction reduced from 30% to 20%, multiple thrombi were seen in both ventricles, dilation of both atria have progressively increased, signs of pulmonary hypertension were observed. The patient was placed on emergency waiting list for heart transplantation.

**RESULTS:** Heart transplantation was performed without significant complications. Histological examination of the explanted heart revealed deep intertrabecular recesses and prominent trabeculations with multiple thrombi. With signs of minimal heart transplant rejection reaction on biopsy and without any clinical symptoms patients was referred to the further ambulatory treatment after 30 days.

**CONCLUSIONS:** The present case suggests that diagnosis of IVNC is often challenging and missed. Multimodality imaging helps in most cases to establish proper diagnosis. Cardiac transplantation could be the best solution for those patients who have refractory congestive heart failure due to IVNC.

### P-377-THE INTERVENTIONAL LUNG ASSIST DEVICE -NOVALUNG FOR RESPIRATORY FAILURE PATIENTS AWAITING LUNG TRANSPLANTATION

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**BACKGROUND:** NovaLung (iLA-interventional lung assist device) is a pumpless device with a low resistance diffusion membrane that can remove accumulated carbon dioxide in respiratory failure. This therapy was primary used for ventilated patients with permissive hypercapnia. The indications included trauma, lung infection, ARDS or as bridge to lung transplantation. Mechanical ventilation in end stage respiratory diseases is associated with high mortality and represents significant risk factor for lung transplantation (LTx). We present 2 patients treated with this novel therapy as a bridge for lung transplantation to avoid mechanical ventilation. First self ventilated patient with 140 days support with NovaLung and finally transplanted is currently the longest know survivor on this therapy.

**METHODS:** Between June and November 2007 -2 patients (1 men/1 female) was treated with NovaLung. 50 years old female with bronchiolitis obliterans and 53 years old men with COPD were admitted to the hospital with respiratory failure, both awaiting lung transplantation. Indication for NovaLung support was carbon dioxide retention. Baseline blood gases indicated a pH 7.26 and pCO<sub>2</sub> 10.26 kPa in first patient and pH 7.22 with pCO<sub>2</sub> 13.14 kPa in second patient. Novalung supports were established to prevent mechanical ventilation. Two cannulae were inserted in the left femoral artery and right femoral vein respectively. Initial blood flow of 1.38 l/min and 1.12 l/min were established. Carbon dioxide was removed by diffuse membrane. Anticoagulation was achieved with intravenous Heparin with a target APTT 80-100 seconds

**RESULTS:** After 2 hour the blood gases indicated a pH of 7.33 and pCO<sub>2</sub> of 7.39 kPa in first patient and pH 7.386 and pCO<sub>2</sub> 7.55 kPa in second patient. Respiratory rates dropped to 28 and 14 per minutes. The filter required replacement under aseptic condition on every 10 days in first patient due to long-term support. This was event when blood flow dropped below 0.7 l/min or an ele-

vation in pCO<sub>2</sub> was observed. This was associated with thrombus formation in filters. Second patient with 5 days support didn't need filter replacement. Complications during the hospital course included an episode of enterococcal septicemia and vancomycin induced neutropenia. Second patient had transient haematuria which settled after decreased heparin dose. First patient after 140 days support was successfully transplanted. The second patient was weaned off after 5 days NovaLung support.

**CONCLUSIONS:** NovaLung is unique in being pumpless and has ability to effectively remove carbon dioxide, which was confirmed in our results. Mechanical ventilation or ECMO were previously the only available options for terminally ill patients with end stage respiratory failure. Both are associated with poor outcome post LTx. Our initial experience demonstrates NovaLung to be safe as a bridge to LTx as short or long-term support for self-ventilating patients.

### P-378-SKIN CANCER IN HEART TRANSPLANT RECIPIENTS IN THE CICLOSPORINE AREA: INCIDENCE AND RISK FACTORS AFTER 15 YEARS FOLLOW-UP

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**BACKGROUND:** to determine the frequency of skin tumors in patients who underwent heart transplantation 15 to 20 years ago in the cyclosporine era and identify risk factors.

**METHODS:** A retrospective analysis of 131 patients (age 49.3 ± 12 years, 117 men, mean follow-up 12.3 ± 5.7 years) who had undergone heart transplantation between 1985 and 1991 at a single center in a region of moderate sun exposure. Patients were receiving standard triple (cyclosporin plus azathioprine plus prednisone) therapy for more than 3 months. Multivariate analysis included: age at transplant, the cumulative doses of each immunosuppressive agent, the blood level of cyclosporin during the 3 first years of transplantation and creatinine clearance.

**RESULTS:** A total of 68 tumors were diagnosed in 31 patients (23.6%) at a mean time of 6.6 ± 4 years after HTx and at the age of 63.9 ± 8.2 years. Most lesions were squamous cell carcinoma in 19 patients or basal cell carcinoma in 10 patients. Three patients had both tumors and a Bowen's disease was diagnosed in 15 patients. The incidence of skin cancer of all types was 20.3% at 10 years and 29.1% at 15 years. Skin cancer accounted for 2 deaths occurring during the follow-up. None patients developed melanoma. By multivariate analysis, age at transplant (p<10<sup>-4</sup> OR = 1,11 [1.053- 1.188]) was the only significant risk factor.

**CONCLUSION:** Global incidence of skin cancer over 15 years follow-up after heart transplantation is acceptable in a region of moderate sun exposure. No correlation was found between the level of immunosuppression and risk of skin cancer.

### P-379-INTERSTITIAL LEUKOCYTES IN RIGHT VENTRICULAR ENDOMYOCARDIAL BIOPSIES AFTER HEART TRANSPLANTATION IN PATIENTS WITH COMPLICATED VERSUS UNEVENTFUL POSTOPERATIVE COURSE

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**BACKGROUND:** Infections and rejections play a key role in morbidity and mortality in the early postoperative period after orthotopic heart transplantation. The aim of this study was therefore to evaluate if qualitative and quantitative analysis of different interstitial leukocytes in endomyocardial biopsies during the first two weeks after HTx might provide early information on these complications.

**PATIENT AND METHODS:** During and after HTx endomyocardial biopsies were obtained in 51 patients. immunohistochemically CD 3, CD 4, CD 8, CD 15, CD 20, CD 57 and CD 68 positive cells were determined, the cell numbers counted and projected to the planimetrically measured area. To compare the morbidity in the postoperative course the patients were subdivided after three months into two groups: complicated and uncomplicated.

**RESULTS:** In the uncomplicated group the numbers of CD 3, CD 8, CD 57 and CD 68 positive cells were significantly lower than in the complicated group. CD

3, CD 4 and CD 8 positive cell numbers showed a significant decrease in the first week in the uncomplicated group. In the complicated group the cell counts increased significantly in the second week. The numbers of the CD 57 positive cells were significantly lower during the first and the second week in the uncomplicated group.

**CONCLUSIONS:** Increased T-lymphocytes, natural killer cells and macrophages in the second week after heart transplantation indicated an increased morbidity. A reduction in CD 3 positive cells in the first week indicated a low morbidity risk; an increase indicated a higher risk.

### **P-380-THE FUTURE ROLE OF EARLY MYOCARDIAL BIOPSY AFTER HEART TRANSPLANTATIONS: DETECTION OF REJECTION OR ASSESSMENT OF ORGAN DAMAGE.**

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**BACKGROUND:** Due to excellent immunosuppression, the incidence of early rejection episodes early after heart transplantation is very low. The role of early endomyocardial biopsy seems to be questionable. However, besides rejection, cardiac transplantation is associated with ischemia and reperfusion. The early organ damage might have a major influence on activation of different immunological cascades, e.g. innate immunology, and therefore a major impact on postoperative complications can be assumed. One of the major proteins which play a key role in this particular context are the heat shock proteins. These proteins (HSP) have a variety of different effects. Therefore, the aim of our study was the investigation of different families of these proteins in relation to the postoperative course following Htx. The endomyocardial biopsy is therefore mandatory.

**METHODS:** In 46 patients (age between 15 and 70 years) 114 right ventricular biopsies were harvested prior to HTx and one week and two weeks after implantation. By means of immunohistologic methods five HSP-families were quantified: HSP27, HSP60, HSP70, HSP72/73 and HSP 90. The degree of protein expression was correlated to the postoperative course under the major aspects of "uncomplicated course", "infection" and "rejection".

**RESULTS:** Four of the five HSP's were already significantly expressed prior to implantation, thus reflecting the cardiac stress to brain death and catecholamines. In patients were expressed and HSP90±with uncomplicated post-operative course, only HSP90 to an higher degree. These patients had an uneventful course without rejection or infection over the first year post HTx. Significant differences in HSP expression could be observed in patients with late infections or repetitive rejection episodes. Expression of HSP27, HSP60 was significantly higher within the "infection" group, expression of HSP 27, HSP 72/73 and HSP90 was significantly higher in patients with multiple rejection episodes.

**CONCLUSION:** The expression of HSP's is also a significant trigger of activation of innate immunology (DAMP's). The activation of this immuno-pathway might lead to a higher incidence of rejection episodes. The early expression of different HSP families and the detection of this activities might be a diagnostic tool for early identification of a patient subgroup with a higher risk for postoperative complications after HTx. Individual tailoring of immunosuppression might be possible according to HSP expression profile. The role of early endomyocardial biopsy might shift from diagnosis of rejection to prospective analysis of future cardiac events.

### **P-381-INFLUENCE OF ABO-COMPATIBLE TRANSPLANTATION ON LONG-TERM OUTCOME IN CARDIAC TRANSPLANT RECIPIENTS**

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**BACKGROUND:** Cardiac transplantation is best therapeutical option for end-stage heart disease. Previous reports on the influence of the ABO system on cardiac transplant outcome indicate that blood group identical transplants have a better outcome than blood group compatible transplants. As the demand for donor organs largely exceeds the supply, it is our policy to use blood group compatible local donors for transplantation if no suitable ABO identical recipient is available. The aim of this study was to determine outcome after blood

group compatible transplants.

**PATIENTS & METHODS:** Between 1984-2003 a total of 915 cardiac transplants have been performed at our center. Median follow-up was 127 months. Patients were analyzed according blood group matching (ABO identical (I) vs. ABO compatible(C)). Moreover subgroup analyses within the different groups were made to identify potential differences. Groups were analyzed for survival, graft rejection and graftvasculopathy (CAD). Kaplan-Meier analysis was used and log-rank test was performed to detect differences.

**RESULTS:** A total of 81 transplants (8.9%) were blood group compatible. The majority (n=32) were OA transplants (40%) followed by OB (n=19; 23%), AAB (n=17; 21%), BAB (n=7; 9%) and OAB (n=6; 7%). Overall survival comparison showed no significant difference in long-term survival (10-year) between the two groups (I: 52.2% vs. C: 42.1%; p: n.s.). Yet there was a clear trend towards lower survival within the C group. (10a survival: OB: 73.3%, AAB:58.8%, BAB:32.1%, OA:27.6%; p = 0.0568). In contrast, Freedom from acute rejection was significantly different between I and C groups (71.4% vs. 49.9%; p<0.0001). There was no difference in incidence of CAD (62.5% vs. 60.3%) as well as severe CAD (76.8% vs. 77.9%).

**CONCLUSION:** The results of our analysis show that ABO blood group compatible transplants have similar outcomes in behalf of survival and CAD as ABO identical transplant. Yet rejection rates are significantly higher in ABO compatible transplants. This finding needs further investigation.

### **P-382-MOBILE SKIN GRAFT EXTENSION FOR VENTRICULAR ASSIST DEVICE DRIVELINE EXITE SITE**

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**BACKGROUND:** Mechanical cardiac support is an established therapy for a variety of clinical scenarios. Patients are discharge home with the devices to await transplantation or for chronic support. Better and faster recovery is associated with increased patient activity and more driveline mobility, causing continuous skin trauma at the exit site with tissue inflammation, infection and even necrosis. We propose the creation of a full thickness skin extension or "nipple" at the driveline exit site that will allow adequate fixation and full line mobilization without the classic skin trauma and erosion.

**METHODS:** The technique was developed at the experimental lab in a pig model following all the international criteria of human care. The exist site is marked and a full thickness skin pediculated rectangular flap is created, having the base of the pedicle where the exit needs to be. Figures 1 - 2 The driveline is then exited at the base of the flap and fully surrounded by the tissue.

**RESULTS:** The full thickness flap was easily done, with adequate adherence to the driveline and free movement. No skin ischemia or necrosis developed.

**CONCLUSION:** VAD technology still requires patients to be connected to external control and power systems. The longer the support period, the more wearable the system and the more unrestricted ambulation of the patient, the more trauma to the skin at the exit site by the driveline, with the increased risk for infection and necrosis. The described techynique could be an alternative to reduce driveline exite site morbidity.

### **P-383-DESCENDENT NECROTIZING MEDIASTITIS: THE VALUE OF THE TRANSPLEURAL MEDIASTINAL DRAINAGE**

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**BACKGROUND:** Descendent necrotizing mediastinitis

**RESULTS:** in high mortality rates if not treated early and effectually. Cervicotomy alone is advocated by most authors in order to avoid the contamination of the pleural cavity. The role of the transpleural drainage is investigated.

**METHODS:** Records of 10 patients observed between 1992 and 2006 were reviewed.

**RESULTS:** Five males and 5 females with a mean age of 49 years (20-84 years) were observed. Mediastinitis was secondary to: odontogenous infection (4), tonsillar abscess (3), post-traumatic cervical sepsis (1), perforation of cervical esophagus (1), unknown origin (1). The CT scan showed the involvement of two or more mediastinal spaces in 9 cases with the infection spreading below the carinal plane in 5 cases. Thoracotomy alone was performed in one case.

Combined treatment by cervicotomy and thoracotomy was performed in 4 cases. Cervicotomy alone was performed in the last five patients with infections not spreading below the carinal plane. Cervicotomy was left open in all cases. The infection spread to the lower mediastinum in 3 out of five last patients in spite of daily mediastinal irrigation and revision through the cervicotomy. Transpleural mediastinal drainage was needed after 1, 6 and 11 days. It was accomplished by videothoracoscopy in the last 2 patients. An 84 years-old lady died of multiorgan failure after cervicotomy alone.

**CONCLUSIONS:** Descendent necrotizing mediastinitis is likely to spread to the lower mediastinum and to the pleura in spite of wide transcervical drainage. Transpleural mediastinal drainage, possibly by videothoracoscopy, should be always performed as part of a combined treatment.

### P-384-THE APPLICATION OF PLATELET RICH PLASMA ON STERNAL WOUNDS FOR CABG PATIENTS

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**OBJECTIVES:** Sternal wound healing disorders are present in 3-6% of all open heart surgeries performed. Disturbances range from mild postoperative skin lesion infection to deep sternal wound infection and mediastinitis. The aim of our study was to evaluate the use of high concentrated platelets plasma rich in growth factors on the sternal lesions.

**METHODS:** Method: A retrospective study of 720 CABGs divided in 2 groups was conducted. Group A consisted of 350 cases using the PRP (Platelet Rich Plasma) and group B as a control study group of 370 CABGs. In group A, 60 ml of autologous blood was centrifuged for 15 min at 3200 rpm with the GPS system, creating a 10 ml plasma fraction of high concentrated platelets, rich in growth factors. The PRP was sprayed on the sternum immediately before sternal closure. The surgical wounds were observed with daily dressing changes and with laboratory inflammation control examinations (WBC and CRP).

**RESULTS:** Operative techniques were similar in both groups LIMA was used in all cases. The incidence of superficial wound infections was lower in group A, 4 patients (0.01%) in comparison to group B 13 (0.035%). Similar results were recorded for deep sternal wound infections 1pt (0.003%) and 4 pts (0.01%) and for mediastinitis with 1 pt (0.0028%) and 3 cases (0.008%).

**CONCLUSIONS:** The application of PRP, rich in growth factors (PDGF, TGF- $\beta$ , VEGF, FGF and EGF), appear to enhance the healing of postoperative sternal wounds and decline infection rates of these lesions. A randomized study trial is warranted to confirm our results.

### P-385-THE RESULTS OF SURGICAL TREATMENT OF DESCENDING MEDIASTITIS

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**BACKGROUND:** Despite considerable success in improvement of surgical technology and highly informative diagnostic equipment, appearance of powerful antibacterial drugs, treatment of descending mediastinitis is still one of the complex parts of thoracic surgery and characterized by a very high percentage of complications and high level of mortality.

**METHODS:** From January 2001 to November 2007 there were 77 patients with neck phlegmon. There were 51 men (66,2%) aged 43,4 $\pm$ 16,2 years and 26 women (33,8%) aged 38,3 $\pm$ 12,1. The cause of neck phlegmon was odontogenic factor in 13 (16,8%) cases; tonsilogenic - 27 (35,1%); acute epiglottitis - 11 (14,3%); adenogenic - 14 (18,2%); 12 (15,6%) patients had neck phlegmon as a result of injury. 13 (16,8%) patients had diabetes mellitus. Neck phlegmon was complicated by mediastinitis of different localization in 49 (63,6%) cases.

**RESULTS:** Average duration from the beginning of disease up to hospitalization was 6,8 $\pm$ 2,1 days. The clinical picture of mediastinitis was characterized by combination of local and general symptoms. However there was no statistic significance of clinical symptoms. Roentgenologic investigation confirmed the diagnosis of mediastinitis in 33 (67,3%) cases, and computed tomography - in 16 (32,75%) cases before operations. Upper mediastinitis was revealed in 27 (55,1%) cases, total anterior - in 5 (10,2%), total posterior - in 2 (4,1%), total - in 15 (30,6%) cases. Patient must be operated urgently in case of verified diag-

nosis. Surgical approach depends on localization of purulent process. Cervical mediastinotomy was fulfilled in 49 (100%) cases when there was only upper mediastinitis. Thoracotomy was done in 22 (44,9%) cases when the process spread into inferior part of mediastinum. Surgical tactics include head and neck spaces debridement and debridement of mediastinum, adequate drainage of the mediastinum and the pleural cavity. Thoracotomy created conditions, which provided the full outflow of purulent detritus from mediastinum into pleural cavity. Complex therapy, including permanent sanitation and aspiration treatment of suppurative focus, antibacterial therapy, correction of hydro-electrolytic and protein balance was carried out during post-operative period. The dynamic clinical - roentgenologic control including monitoring of basic physiological functions and additional diagnostic measures aimed at the earliest detection of local and common complications of mediastinitis and proper correction of treatment were fulfilled. As for complications we recorded empyema of pleura in 11 (22,4%) cases, gastroenteric hemorrhage in 8 (16,3%), pericarditis in 7 (14,3%), hemorrhage from neck vessels in 6 (12,3 %), sepsis in 14 (28,5%) cases. 15 (30,6%) patients died. Death reasons were: 4 (26,6%) cases of hemorrhage from neck vessels and mediastinum, 10 (66,7%) cases of sepsis, 1 (6,7%) case of pulmonary thromboembolism.

**CONCLUSIONS:** The only method of treatment of descending mediastinitis is surgical one. Early debridement and draining of the suppurative focus facilitate successful treatment of patients with mediastinitis. Localization of the process in inferior mediastinum serves as indication for thoracotomy. Basic principle of treatment is broad mediastinotomy which provided the adequate drainage of exudates into pleural cavity.

### P-386-THE RESULTS OF TREATMENT OF THE PATIENTS WITH DESCENDING MEDIASTITIS

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*Faculty Surgery, Donetsk National Medical University, Donetsk, Ukraine*

**BACKGROUND:** Treatment of descending mediastinitis is still one of the complex parts of thoracic surgery and is characterized by a very high percentage of complications development and is accompanied by a high mortality.

**METHODS:** From January 2001 to November 2007 there were 77 patients with neck phlegmon. There were 51 men (66,2 %) aged 43,4  $\pm$  16,2 years and 26 women (33,8%) aged 38,3  $\pm$  12,1. The reason of development of neck phlegmon was odontogenic factor in 13 (16,8%) cases; tonsilogenic - in 27 (35,1%); acute epiglottitis - in 11 (14,3%) cases; adenogenic - in 14 (18,2%); 12 (15,6%) patients had neck phlegmon as a result of injury. 13 (16,8%) patients had diabetes mellitus. Neck phlegmon was complicated by mediastinitis of different localization in 49 (63,6%) cases.

**RESULTS:** Average duration from the beginning of disease up to hospitalization composed 6,8  $\pm$  2,1 days. Clinical picture of mediastinitis was characterized by combination of local and general symptoms. However statistic significance of clinical symptoms was not found. Chest X-Ray confirmed the diagnosis of mediastinitis in 33 (67,3%) cases, and the computed tomography - in 16 (32,75%) cases before operations. Upper mediastinitis was revealed in 27 (55,1%) cases, total anterior - in 5 (10,2%), total posterior - in 2 (4,1%), total - in 15 (30,6%) cases. Patient must be operated urgently in the case of verified diagnosis. Surgical approach depends on localization of the purulent process. Cervical mediastinotomy was fulfilled in 49 (100%) cases when there was only upper mediastinitis. Thoracotomy was done in 22 (44,9%) cases when the process spread into inferior part of mediastinum. Surgical tactics include the head and neck spaces debridement and debridement of mediastinum; excision of necrotic tissues, adequate drainage of mediastinum and pleural cavity. Thoracotomy created conditions, which provided full outflow of purulent detritus from mediastinum into pleural cavity. Complex therapy, including permanent sanitation and aspiration treatment of suppurative focus, antibacterial therapy, correction of hydro-electrolytic and protein balance was carried out during post-operative period. Dynamic clinical - roentgenologic control including monitoring of basic physiological functions and additional diagnostic measures aimed at earliest detection of local and common complications of mediastinitis and proper correction of the treatment were fulfilled. As for complications we recorded empyema of pleura in 11 (22,4%) cases, gastroenteric hemorrhage in 8 (16,3%), pericarditis in 7 (14,3%), hemorrhage from the neck vessels in 6 (12,3 %), sepsis in 14 (28,5%) cases. 15 (30,6%) patients died. The death reasons were: 4 (26,6%) cases of hemorrhage from the neck vessels and mediastinum, 10 (66,7%) cases of sepsis, 1 (6,7%) case of thromboembolism of pulmonary artery.



**CONCLUSIONS:** The only method of treatment of descending mediastinitis is surgical one. Early debridement and draining of suppurative focus facilitate successful treatment of the patients with mediastinitis. Localization of the process in the lower part of mediastinum serves as indication for thoracotomy. The basic principle of treatment is broad mediastinotomy, provided with outflow (drainage) of exudates into pleural cavity.

### **P-387-RISK ANALYSIS & OUTCOME OF STERNAL WOUND AND DEEP STERNAL WOUND INFECTIONS (DSWI)**

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**BACKGROUND:** Although the incidence of mediastinal wound infection is low, its associated morbidity, mortality, and "cost" remain unacceptably high. There is considerable lack of consensus regarding the ideal operative treatment of DSWI.

**METHODS:** From Feb 2000 to October 2007, out of 3896 cardiac surgery patients (prospective data collection) 118 pts (3.02%) developed sternal wound infections. There were 102 males & 16 females; (73.7%) were CABG, (13.5%) Valves & (9.32%) CABG and Valve.

**RESULTS:** Superficial sternal wound infection detected in 69 patients (1.7%), Sternal dehiscence & re-suturing 11 patients (0.28%) & omental flaps for DSWI, 19 patients (0.4%). Blood cultures were positive in 30% of the cases. Wound microbiology revealed *S. aureus* (35%), Coag Negative Staph (33%), MRSA (1.3%), Cram negative (14.5%) & other 17% (Anaerobes 1.2%, Fungal 4%). Incremental risk factors for the development of DSWI were COAD, use of IMA/BIMAs & preop use of IABP. Overall mortality was 9.3%. Risk factors for adverse outcome were: septicemia, preop MI/ IABP. Wound complications (19%): hematoma 6%, partial flap loss 3.0 %, wound dehiscence 5.3%. Mean Hospital Stay: 20±8 days. Long term

**RESULTS:** Healed wounds (99%), persistent pain and discomfort (45%), paresthesia/numbness (38%), sternal instability (40%).

**CONCLUSION:** Post cardiac surgery sternal wound complications remain challenging. The role of multidisciplinary approach is fundamental, as is the importance of an aggressive early wound exploration especially for DSWI.

### **P-388-DELAYED STERNAL CLOSURE AFTER CARDIAC SURGERY AND RISK OF DEEP INFECTION**

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**BACKGROUND:** Delayed sternal closure (DSC) is a useful surgical technique frequently used to avoid cardiac compression in some open heart surgery patients. Little is known about the risk of surgical site infection related to this procedure.

**METHODS:** Retrospective study of left open sternotomies after cardiac surgery and DSC between 1994 and 2006. Characteristics of patients, surgery, and postoperative complications were recorded.

**RESULTS:** There were 37 (61%) men and 24 (39%) women. Mean age was 67.5 (9.1). Indications for cardiac surgery were: valve replacement 21 (34.4%), myocardial revascularization 14 (23%), both procedures 11 (18%) and other 15 (24.4%). Mean (SD) surgery duration was 298.4 (144) minutes. 60 (98.3%) patients received antibiotic prophylaxis, 24 (43%) of them during more than 1 day. Indications for DSC were: uncontrollable haemorrhage 35 (57.4%), cardiac compression 23 (38%) and arrhythmia 3 (5%). Sternotomy remained opened 1.7 (1) days. Among patients with DSC (61), there were 1 (1.6%) deep surgical site infection (mediastinitis) and 2 (3.3%) superficial surgical site infections. Mean days of hospitalization was 35 (36) days. Global in-hospital mortality was 23 (39%). Death occurred in a mean (SD) time of 19 (35) days. 9 (15%) patients died during the period of sternotomy opened. Causes of death were: cardiogenic shock 16 (69.6%), septic shock 4 (17.3%), anoxic encephalopathy 2 (8.7%) and hypovolemic shock 1 (4.3%).

**CONCLUSIONS:** The risk of developing surgical site infection after DSC is low. However, mortality rate remains high, mainly due to non-infectious complications.

### **P-389-EXTRACARDIAC-INTRAPERICARDIAL HYDATIC CYST ACTING LIKE CONSTRUCTIVE PERICARDITIS**

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65 years old male patient admitted us with dyspnea and fatigue. With the telecardiography, transthoracic 2D echocardiography, computed chest tomography and ELISA we diagnosed the extracardiac intrapericardial cyst hydatid disease. The surgery was planned and in the operation day, after the Swan Ganz catheterisation of the heart we proved that the cyst was causing constructive pericarditis. We performed the surgery under general anesthesia via midsternal sternotomy. The cyst was excised. The patient was surgically revised in the postoperative day 9 because of the cardiac tamponade. In the postoperative follow up the clinical, biochemical, hematological and the hemodynamic values improved and the patient was discharged in the postoperative day 16. The cyst hydatid involving the heart is not common. In the literature there were some types of cyst hydatids involving in different parts of the mediastinum and the heart. As we explored the literature we realised that the clinical features vary due to the localisation of the cysts. Furthermore the localisation of the cyst determines the morbidity and mortality rates. We decided to report this case because of its uncommon clinical consequences.

### **P-390-RESECTION THE BULLAE OF PULMONARY EMPHYSEMA IS IT A GOOD SOLUTION IN THE EVENT OF CARDIAC SURGERY COMBINED? (ABOUT TWO CASE)**

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**INTRODUCTION:** The combined surgery involving, the cardiac surgery with heart open, to bullectomie, can it avoid respiratory and hemodynamic complications, that can be particularly important in this context ?

**OBSERVATIONS:** We report two cases, the first has a 54old years and presented an aortic valve disease, associated with lung emphysematous bullae, the second patient has 40 old years and presented a mitro-tricuspid valve disease, in surgical stage, associated with lung emphysema and large emphysematous bullae 2cm diameter, at the upper right lobe, clinically suspected and confirmed in intraoperative. The attitude was an aortic valve replacement without resection emphysematous bullae, for the first patient, while the second patient, received a combined surgery enjoying the median sternotomy, associated a mitral valve replacement and bullectomie. after operation, the first patient died by hypoxia, following a pneumothorax abundant and diffuse pulmonary emphysema, while the second patient has good evolved.

**DISCUSSION:** Interest preoperative diagnosis, of morphological and topographical emphysematous bullae, by Scanner or Magnetic resonance imaging MRI, for to plan a operative strategy, combined cardiac surgery and bullectomie, enjoying the median sternotomy. The importance of extended the surgical treatment indications of emphysematous bullae in the event of association with heart surgery. the small bullae remaining after surgery, sometimes contradicted improved therapeutique obtained.as has been described in literature, for this the postoperative follow-up must be maintained during time.

**CONCLUSION:** The combined surgical, associated resection of bullae pulmonary emphysema same little giant, and heart surgery with a heart open, may be a good solution for avoids complications originally a considerable postoperative morbimortality.

### **P-391-ROUTINE AND ON CALL PERICARDOSCOPIC IMPLANTATION OF PACEMAKER ELECTRODES**

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**BACKGROUND:** Sometimes the needs of vast developing country as e.g. Ukraine dictate the changes in generally accepted practice.

**METHODS:** Since 1985 we installed implantation of pacemaker electrodes by means of a simple rigid pericardoscope. The latter was advanced into the pericardium under general anesthesia using middle short subxyphoid incision. It



was possible to implant screw-in electrodes in the walls of each heart chamber [both atriums, right ventricle and recently left ventricle]. The pacemaker itself was placed into M. rectus abdominis. As we have a big region [about 11 million population] with lack of patient transportation by air a team of experienced specialists was organized for on call pacemaker implantation in local hospitals. **RESULTS:** In the period 1987-2007 one thousand two hundred twelve [1212] patients were operated upon. Mean age was 67,3 years. Right chambers were stimulated in 1164 patients, left chambers 37 patients, resynchronization therapy was performed in 11 patients. 143 patients [11.8%] were operated by the team on call in hospitals of the region. There were no fatal complications directly related to the method of pacemaker implantation. Function and position of all electrodes were remarkably stable.

**CONCLUSIONS:** Direct implantation of electrodes could be a real alternative in difficult or non-standard situations. The pericardoscopic subxyphoidal placing of electrodes could be of general interest for cardiac resynchronization therapy.

### P-392-CARDIAC TAMPONADE DUE TO LYMPHOMA : CASE REPORT

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**BACKGROUND:** Cardiac tamponade may be secondary to different diseases. Idiopathic or viral pericarditis, uremia and neoplasms are most frequent causes. In this report a case of pericardial tamponade related to mediastinal malignant non-Hodgkin lymphoma is presented.

**METHOD:** A 20 year-old male was admitted with dyspnea and chest pain for 15 days. His blood pressure was 100/60 mmHg. Pulsus was 133 and rhythmic. Telecardiography showed bilateral pleural effusion, mediastinal enlargement. Echocardiographic investigation disclosed pericardial effusions lodged on the right ventricle (anterior) 34 mm, at the apex 30 mm and on the left ventricle (posterior) 10mm. Thorax CT showed a mass filling upper and anterior mediastinum and bilateral pleural fluid. During the operation there was a mass from the anterior mediastinum to the apex of the left lung. (The frozen section diagnosis of the material is malignant).

**RESULT:** Because of the mediastinal lymph node and local vascular invasions the mass was accepted as unresectable and incurable. The patient died 2 days post-operative day of operation. The pathologic investigation of the specimen was revealed "large B cell malignant non-Hodgkin's lymphoma."

**CONCLUSION:** There are some kind of cardiac tamponades that surgery can not help to.

### P-393-CONGENITAL COMPLETE ABSENCE OF THE PERICARDIUM WITH ESOPHAGEAL LEIOMYOMA; AN UNIQUE PRESENTATION

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Complete absence of pericardium is a very rarely seen congenital malformation with less than 500 cases reported in the literature. Predominantly pericardial defects appear partially on the left thoracic pleuropericardium. Electrocardiography (ECG), plain chest X-ray, echocardiography, CT scan, and magnetic resonance imaging (MRI) may aid in the diagnosis. The congenital absence of pericardium is usually asymptomatic. None of signs is pathognomonic for absence of the pericardium. Surgical treatment is controversial. It is probably not necessary to operate complete defects. Benign tumors of the esophagus are rare lesions that constitute less than 1% of esophageal neoplasms. Leiomyomas are the commonest benign mesenchymal tumors of the esophagus and easily treated with enucleation. A 48-year-old man was admitted for dysphagia and dyspepsia. His physical examination was normal. Diagnostic studies before surgery included endoscopy and endoscopic ultrasonography, barium swallow and CT scan. The mesenchymal tumor was established intramurally and approximately 38 cm of the thoracic esophagus. The patient underwent total enucleation of the intramurally mass through left posterior thoracotomy. At the same time we experienced total complete absence of the pericardium. We know that our is an unusual and unique case.

### P-394-CARDIAC TAMPONADE AS THE FIRST CLINICAL PRESENTATION OF MALIGNANCY

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**BACKGROUND:** Malign pericardial effusion is a common complication of malignancies but this condition is rarely seen as the initial presentation. It occurs mainly due to the neoplasms of lung, breast and the lymphoreticular system. We would like to report on the cases with cardiac tamponade as the first clinical symptom of malignancy.

**MATERIAL AND METHOD:** Between October 2002 and November 2007, a total of 68 cases were referred to our Cardiovascular Surgery Clinic and Thoracic Surgery Unit due to pericardial tamponade. The most common presenting symptoms were dyspnea, palpitations, fatigue and chest pain. Pericardial tamponade was documented with clinical, electrocardiographical, echocardiographical, and radiological findings. Biopsies were taken using either left thoracotomy with pericardial window and drainage or using subxyphoidal approach with pericardial window and drainage. Malignant pericardial effusion was documented in 3 (0.044 %) of the patients with no previous medical problems. There were 2 men and 1 woman, with a mean age of  $46.7 \pm 5.6$  years (range 42-53 years). The surgical approach was left thoracotomy in 2 patients and subxyphoidal in the remaining one.

**RESULTS:** The reason was lung cancer in 2 patients and breast cancer in one. The patients were referred to the local Hospital of Oncology for further chemotherapy and/or radiotherapy. The mean life span was  $5.3 \pm 1.5$  months (range 4-7 months) despite maximal medical treatment.

**CONCLUSIONS:** Although rare, malignancies may cause pericardial effusions and cardiac tamponade. The malignant origin must be kept in mind when treating such patients.

### P-395-SIMULTANEOUS PECTUS CORRECTION AND VALVE REPLACEMENT IN TWO CASES

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**BACKGROUND:** Simultaneous operation for correction of coexisting pectus excavatum deformity and valvular disease is challenging. Even when performed alone, both operations are complex and the duration is rather long. We would like to report on two cases on which we performed simultaneous correction of pectus deformity and valvular disease.

**CASE CHARACTERISTICS:** Between 2002 and 2006, of the cases operated on for valvular replacement, the cases with coexisting pectus deformity were reviewed from the files. The underlying cause, the operational technique, operation duration, length of stay, and outcome were noted. Within the aforementioned period, two male cases were operated on for coexisting pectus deformity and aortic valve disease due to Marfan's syndrome. One was 25 and the other was 23 years old. Following median sternotomy, the valvular replacement was performed as the first stage using mechanical valve prosthesis. Pectus deformity was then corrected as described by Ravitch. A Kirschner's rod was left horizontally in the posterior of sternum as a mechanical support.

**RESULTS:** There was no operative death or serious complication. The operation duration was 327 min in the 1st patient, and 365 min in the 2nd. In one patient local infection and in the other transient segmentary atelectasis were seen. Other than that, the patients recovered uneventfully and were discharged from hospital on the 7th and 8th days, respectively. The rods were removed on the 21st postoperative day. Routine control examinations for radiological evaluation of corrected pectus deformity and echocardiographic evaluation of the prosthetic valve and ventricle dimensions were made on the 10th day, the 1st, the 3rd, the 6th, and the 12th months following discharge with no problems.

**CONCLUSION:** Although we have operated on only two cases, we believe that simultaneous operation for correction of pectus deformity and valve replacement may be preferred in such cases with acceptable operation duration and satisfying outcome. The cost, surgical burden, and patient discomfort should be kept in mind in this challenging group of patients when deciding whether to operate in single session or not.

### **P-396-AGGRESSIVE MANAGEMENT OF THORACIC OUTLET SYNDROME WITH ARTERIAL OCCLUSION**

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**BACKGROUND:** Vascular TOS, especially with complicated critical limb ischemia is seen less frequently than the neurogenic form. In an effort to decrease morbidity associated with arterial thoracic outlet syndrome, we have used an aggressive surgical and medical treatment approach.

**METHODS:** A 13 year-old-girl was referred with a three-week history of numbness, pain, and discoloration in the left forearm, extensive hand ischemia and gangrene of the distal phalanx of three fingers. The patient's radial, ulnar or brachial pulses were absent on doppler ultrasound. Chest X-ray showed a cervical rib on the left. Magnetic resonance imaging identified the left axillary artery occlusion. Although, the patient had anticoagulant therapy, the symptoms progressed.

**RESULTS:** The patient underwent transaxillary thoracic outlet decompression that included removal of the cervical rib and the first rib, sympathectomy for ischemic causalgia and transbrachial thoromboembolectomy in the same session. Further embolectomy was needed for three times, since ischemic symptoms reoccurred despite heparin and aspirin therapy. To prevent critical limb ischemia as a result of recurrent arterial occlusion, we added tirofiban infusion, a glycoprotein IIb/IIIa inhibitor, for 24 hours to previous medications. At the end of the tirofiban infusion we continued anticoagulant therapy. After these procedures, the patient had significant improvement of her symptoms. The distal phalanx of the fifth finger was auto-amputated. She is well under follow-up for nine months.

**CONCLUSION:** A combined approach of anticoagulant therapy, surgical decompression and, if necessary, repetitive embolectomy and tirofiban infusion provide a satisfactory outcome in thoracic outlet syndrome with arterial occlusion.

### **P-397-STERNUM OSTEOSYNTHESIS WITH SUTURE SURGICAL MATERIAL "MedEng"**

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**BACKGROUND:** Median sternotomy is the most frequent surgical access for performing of cardiosurgical operations. Surgical steel wire is the main material for comparison and fixing of sternum fragments after sternotomy in many clinics in Russia and all over the world. The estimation of using of suture material "MedEng" for sternum osteosynthesis after cardiosurgical operations.

**METHODS:** In the our clinic for many years sternum osteosynthesis has been performing with kapron string in pair with cutting muscular type needles. Since 2004 for these purposes we successfully use seam surgical material "MedCapron", which is the joint development product of Research and Production Enterprise "MedEng" and heart valve disease and biotechnology laboratory. Material is single or double capron monostring 0,75 meters in length on atraumatic needle ½R - 48 mm, sterilized with ethylene oxide.

**RESULTS:** For the period 2004-2006 in the heart valve disease department of our clinic 1367 operations of valve correction with circulation bypass were performed. Median sternotomy was applied. In all cases fixation of right and left sternum fragments had been carrying out with Polispast sutures, which were spended through bone. The amount of strings varied from 5 to 8. The quantity of time (time period) for osteosynthesis was 7,5 minutes and was depend on section length, bone fragments condition and surgeon qualification. It is need to be noted about good properties of "MedEng" material when double polispast suture is used and convenience of application compare with traditional tantal or steel wire. The possibility of suture cutting of sternum cortical layers with followed pathologic mobility of sternum fragments is excluded. Except for that we noted low percent of complications connected with sternum divergence and postoperative sutures suppuration. It can be explained by low adhesion and antigen properties of material. 29 (2,1%) reoperations were performed in occasion of serous and purulent mediastinitis. There were only 4 (0,29%) cases of sternum osteomyelitis. The average time of hospitalization was 28,1 days. The period after operation was 20,1 days.

**CONCLUSIONS:** Use of suture material "MedEng" for sternum osteosynthesis

after cardiosurgical operations allows to achieve adequate sternum edge comparison and low percent of infectious complications, simplify and accelerate osteosynthesis performing.

### **P-398-ADENOCARCINOMA METASTASIS TO INTERNAL JUGULAR VEIN : REPORT OF A CASE**

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**BACKGROUND:** Trombosis of internal jugular vein due to distant neoplasm is seen rarely. There are only a few reports about it in english literature. In the reported cases primer origin of the neoplasms are adescens organs such as thyroid gland, larynx and distant organs such as colorectal, ovarian structures (neuroendocrine tumours). We review a case of 39-year old male with left internal jugular vein tumour without trombosis, who presented with left neck mass and tenderness.

**METHODS:** A 39-year old previously healthy male patient admitted to local hospital with painful left neck swelling for 2 months. It had been gradually growing in dimentions. Doppler ultrasonography obtained, and it showed suspicious trombosis in left internal jugular vein. Later computed tomography with contrast agent confirmed a mass in the wall of jugular vein, neither trombosis in lumen nor a regional mass pressing to the vein. Then the patient was referred to our department. Examination of his neck showed swelling and tenderness along the anterior border of the right sternocleidomastoid muscle. We consulted the patient with oncology department and finally agreed to remove the mass by operation as the mass had been making pressure upon left carotid artery and also to take a biopsy. In operation we saw a 10 cm. segment of the jugular vein had been distended fusiformly, maximum diameter of the mass was approximately 7 cm. No lymph node was found. That region of internal jugular vein was removed with 2 cm. tumour-free segment at both edges, edges of the vein were ligaturated. In the same operation thyroglossal ductus was removed. Postoperative period was uneventful. The biopsy of the removed specimen reported an adenocarcinoma metastasis (mucinous carcinoma with neuroendocrine differentiation). Ultrasonography and positron emission tomography (PET) of whole body was made but the primer origin of the metastasis couldn't be found. At the 3rd month follow up, there was no evidence of radiological primer origin, and the patient was healthy.

**RESULTS:** In literature trombosis of internal jugular vein was reported a potentially serious pathology that can be spontaneous or secondary to head and neck infections, surgery, venous catheterization, intravenous drug abuse and also neoplasms most of the which are regional. But also distant neoplasms may cause trombosis secondary to metastatic lymphadenopathy or especially neuroendocrine tumours by creating coagulopathy (Trousseau's syndrome). Trombosis of internal jugular vein may be treated with heparin, but not with warfarin sodium. This patient is different from all reported cases by huge metastatic mass of the wall of internal jugular vein macroscopically without trombosis. The pathology wasn't trombosis. The pathology was tumour metastasis itself. Because of this anticoagulation wouldn't give any advantage. As the primer origin couldn't be found, no surgical or radiotherapeutic attempt for primer origin wasn't made.

**CONCLUSIONS:** A very small adenocarcinoma which can't be found by all diagnostic techniques may cause a huge mass in the internal jugular vein by metastasis. Surgeons should be aware that this type of jugular masses could be tumoral tissue.

### **P-399-IMPACTS OF JUVENILE AGE ON THE ACCELERATION OF VASCULAR ALLOGRAFT CALCIFICATION: IMMUNOREACTION DID NOT MATTER**

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**BACKGROUND:** Calcification of cardiovascular allograft aggravates graft dysfunction especially in juvenile age, however, the influences of donor and recipient ages on the graft calcification has not been elucidated enough. The purpose of this study was to examine the effects of age and allogeneity on allograft calcification by rat aortic subdermal transplant model.

**METHODS:** To examine the effects of donor and recipient ages, syngeneic aor-

tific transplant model with Lewis rats were used to rule out immunoreaction. Fresh descending aortas of donors were transplanted subcutaneously in recipients, and were explanted 7, 14, 28, and 56 days later. Three-week-old juvenile (J) and 10-week-old adult (A) rats were defined and transplantation was performed from adult to adult (A-A), from adult to juvenile (A-J), from juvenile to adult (J-A), and from juvenile to juvenile (J-J). Pre-transplanted grafts of adult and juvenile rats were defined as Preope group. Next, to examine the effect of immunoreaction on the graft calcification, 14-day allogeneic transplants of A-A (A-allo) and J-J (J-allo) from Brown-Norway to Lewis rats were compared with 14-day syngeneic grafts of A-A (A-syn) and J-J (J-syn). Calcification of all explants were analysed qualitatively by von Kossa staining and quantitatively by atomic absorption spectroscopy. In addition, microstructure of explants of Preope, A-A, and J-J groups were compared by transmission electron microscopy.

**RESULTS:** In von Kossa staining of syngeneic groups, calcification along with graft media appeared severely in J-J, and mildly in A-J; no calcification was observed, however, in Preope, A-A, and J-A groups. In Preope group, calcium contents were 1.5 times higher in juvenile than in adult aortas (not statistically significant; N.S.). In the comparison of recipient ages, calcium contents were significantly higher in A-J than in A-A ( $p < 0.05$ ), higher in J-J than in J-A ( $p < 0.05$ ). In the comparison of donor ages, calcium contents were similar between A-A and J-A (N.S.), whereas 1.5 to 1.8 times higher in J-J than in A-J (N.S.). In the analysis of allogeneicity, the calcification of J-allo appeared as well as J-syn by von Kossa staining, and calcium contents of the J-allo and J-syn were almost the same (N.S.). On the other hand, A-allo showed only a little calcification by von Kossa staining, and calcium contents of A-allo and A-syn were not significantly different (N.S.). Electron microscopy revealed smooth muscle cells (SMCs) in graft media showed phenotype change from contractile to synthetic type in both of A-A and J-J groups. Hydroxyapatite densely deposited only in J-J.

**CONCLUSIONS:** The results of this study showed as follows: First, juvenile recipient is considered as a major promoting factor of graft calcification, and juvenile donor might have additive effects on it. Second, accelerated graft calcification in juvenile age might not be associated with allogeneic immunoreaction, although allogeneicity slightly induces calcification on adult grafts. Third, phenotypic modulation of medial SMCs is triggered by transplantation regardless of age, whereas calcification of matrix appeared only in juvenile graft. These data suggests accelerated allograft calcification in juvenile recipients might be due to specific intrinsic factors in juvenile recipients rather than immunoreaction.

#### **P-400-INTRA-AORTIC BALLOON PUMP PLACEMENT IN OPEN HEART SURGERY: OUR 8-YEARS EXPERIENCE**

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**BACKGROUND:** The intra-aortic balloon pump (IABP) is the most widely applied mechanical circulatory assist method to pharmacologic treatment of the failing heart after myocardial infarction, unstable angina and open heart surgery. The increased coronary perfusion and the decreased left ventricular outflow impedance are the major effects of the device improving the outcome of these patients. In this study, we evaluate the effect of perioperative IABP placement, review the results of our 8-years experience and discuss the complications related to the IABP insertion and weaning.

**METHODS:** From 1999 to 2007, 1945 patients were operated for open-heart surgery at our department. The IABP was inserted in 87 patients (4.47%). Of them, the IABP was placed preoperatively in 43 patients (49.4%) and perioperatively (during the procedure and postoperatively) the IABP was used in 45 patients (50.6%). Indications for IABP therapy were (a) preoperatively: the low Left Ventricular Ejection Fraction (LVEF  $\leq 30\%$ ) and the urgent operation because of combined unstable angina and severe left main stenosis ( $\geq 70\%$ ), (b) intraoperatively: the failure to wean from cardiopulmonary bypass (CPB) despite maximal dose pharmacological support and (c) postoperatively: the development of low cardiac output syndrome.

**RESULTS:** IABP was placed in 67 men (77%) and in 20 women (30%). The mean age was  $67.1 \pm 8.3$  years (Range: 39-80 years). IABPs were used in 71 Coronary Artery Bypass Grafting (CABG) procedures, 4 valve operations, 7 combined CABG and valve procedures, 1 operation for restrictive pericarditis and 2 cases of combined CABG with plastic reconstruction of Left Ventricle (LV) for LV aneurysm. Of them, Extracorporeal circulation (ECC) was used in 71 cases (81.6%) and beating heart cardiac surgery was performed in 16 cases

(18.4%). The mean standard euroscore was  $14.25 \pm 14.04$  (Range: 0.87-78.8). The overall mortality was 11.49% (10 patients), the intraoperative mortality was zero (no one patient died during the operation) and 30-day mortality was also 11.49% (10 patients). Complications were noticed in 6 cases (6.9%) and included: Dissection of descending thoracic aorta, ischemia of the lower limb (2 cases) because of obstruction by the balloon or embolus, suppuration of the IABP insertion femoral area, obstruction of the right internal iliac artery and unsuccessful removal of balloon after surgical insertion leading to bleeding and surgical control of hemorrhage.

**CONCLUSIONS:** Our data suggest that the use of IABP in perioperative period of cardiac surgery is significantly effective, reducing the morbidity and mortality of high-risk patients. Careful selection of candidate for IABP therapy patients is necessary, agreeing with the indications of the current literature. The correct identification of appropriate patients (e.g. EuroSCORE criterion) for IABP insertion is of great importance for this specific category of patients. The prevention of complications caused by the use of IABP could offer an improved outcome.

#### **P-401-LEFT OUT: ARE WE IGNORING OUR NON-DOMINANT HAND?**

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**OBJECTIVES:** To determine the extent to which the practicing surgeons can use the non-dominant hand with equal confidence as their dominant one. Also, to determine whether simple modifications in life style can improve ambidexterity. **METHODS:** Ambidexterity of 26 surgeons, recruited in the study was assessed by performing a simple Circle-Dot Test. All the participants were then requested to perform a simple exercise with their non-dominant hand. The test was repeated after one week.

**RESULTS:** The Mean Dot Speed (MDS) of the non-dominant hand when compared to that of the dominant hand in Test 1, was significantly lower (5.25/s Vs 8.00/s;  $P < 0.0001$ , 95% CI -3.99569 to -1.51849, SE=0.614). MDS of non-dominant hand showed significant improvement in Test 2 (5.25/second Vs 8.61/second,  $P < 0.0001$ , 95% CI -4.56957 to -2.15116 SED=0.581). MDS of dominant hand also showed an improvement in Test 2 (8.00/s Vs 10.44/s;  $P < 0.0001$ , 95% CI -3.40613 to -1.46360, SE=0.467).

**CONCLUSION:** MDS of the non-dominant hand was significantly lower than that of the dominant hand, implying that the volunteers used dominant hand more efficiently than their non-dominant hand. Performing simple tasks could increase the MDS of the non-dominant hand significantly and improve ambidexterity.

#### **P-402-CONCOMITANT AORTASUBCLAVIAN BYPASS AND CORONARY ARTERY BYPASS GRAFTING**

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The optimal revascularization strategy for patient with subclavian and coronary artery disease has not been established. A few reports exist regarding the management of patients who have both occlusive disease of the subclavian arteries and coronary artery disease. We have presented a case simultaneously treated with CABG and subclavian artery revascularization. The prosthetic graft was led to the distal segment of the subclavian artery through the clavicle while keeping pleura intact and anastomosed to the superior surface of the artery. Aorta-subclavian bypass with coronary artery bypass may be an effective option for patients with co-existing subclavian and coronary artery disease.

#### **P-403-BRONCHOPERICARDIAL FISTULA AN UNUSUAL COMPLICATION OF OXYTETRACYCLINE SCLEROSIS THERAPY**

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Here we reported a rare case of bronchopercardial fistula following intrapericardial instillation of oxytetracycline. 63 years old female patient admitted for management of malignant pericardial effusion secondary to right sided bron-



chogenic carcinoma. Medical therapy and recurrent percutaneous catheter drainage failed in resolving the problem so subxiphoid pericardiostomy and drainage tube insertion was performed. There was no decrease in the drainage so we decided to perform pericardial sclerosis by intrapericardial tetracycline instillation. After the second time oxytetracycline instillation, the patient developed respiratory arrest with hemodynamic instability. Huge amount of yellow frothy secretion aspirated through the endotracheal tube. The presence of tetracycline in the bronchial secretion proved by microbiological methods. The hemodynamic status of the patient deteriorated rapidly and despite all resuscitation measures we lost the patient within few hours

#### **P-404-PROGNOSTIC SIGNIFICANCE OF EXERCISE STRESS ECHOCARDIOGRAPHY IN THE ERA OF AGGRESSIVE REVASCULARIZATION**

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**BACKGROUND:** Although the accuracy of exercise stress testing echocardiography (ESTE) for detecting coronary artery disease (CAD) has been established, its contemporary role in determining prognosis is less well defined in the era of aggressive revascularization. This reassessment of the prognostic value of ESTE is important since the profile of the patients referred for stress echocardiography has changed to a lower risk population in recent years, because patients with elevated troponin levels or other high risk features are more likely than before to go directly to the catheterization laboratory without further stratification. We aimed to evaluate the prognostic significance of ESTE for cardiac events in patients with known or suspected CAD.

**METHODS:** A review of our institution's database was conducted to identify patients who underwent ESTE between 1/2004 and 12/2006. Patients were referred by their treating physicians for known or suspected CAD. Data was collected by chart review and a follow-up questionnaire by telephone 12 months after ESTE. Follow-up was complete in 89% of patients. All patients underwent ESTE using the standard Bruce protocol and clinical cardiac evaluation. ESTE was defined as positive in the presence of new or worsening regional wall motion abnormality immediately post exercise. The primary end point was major cardiac events at 12 months. Cardiac events were defined as cardiac death, hospitalization due to a cardiovascular cause, nonfatal myocardial infarction and coronary revascularization (percutaneous coronary intervention or coronary artery bypass graft surgery). For univariate predictors of cardiac events, a multivariate analysis was performed to determine independence.

**RESULTS:** We identified 930 patients (55% males) with a mean age of 56.5 ± 10.8 years, 190 (20%) had a history of CAD. Risk factors for CAD included dyslipidemia in 481 (52%), hypertension in 453 (49%), family history of CAD in 384 (41%), smoking in 230 (25%) and diabetes mellitus in 111 (21%) patients. Two hundred twenty one (24%) had positive and 709 (76%) patients had negative ESTE. Major cardiac events developed in 84 (12%) patients with negative and 113 (51%) patients with positive ESTE over 12 months ( $p < 0.0001$ ). The group with positive ESTE had higher rates of revascularization ( $n = 82$ , 37% vs.  $n = 34$ , 5%,  $p = 0.0008$ , respectively) and hospitalization due to a cardiovascular cause ( $n = 31$ , 14% vs.  $n = 50$ , 7%,  $p = 0.001$ , respectively). There was no cardiac death in either group. There was only 1 death in the negative ESTE group due to end stage lung cancer and no death in the positive ESTE group. By multivariate regression analysis, positive results on ESTE remained independently predictive of cardiac events after clinical variables were accounted for.

**CONCLUSION:** In a large cohort of patients, positive ESTE has an incremental value over clinical variables for predicting cardiac events at one year, differentiating high from low risk patients, even in the era of aggressive revascularization.

#### **P-405-PROGNOSTIC VALUE OF DOBUTAMINE STRESS ECHOCARDIOGRAPHY IN THE ERA OF AGGRESSIVE REVASCULARIZATION**

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**BACKGROUND:** Although the accuracy of dobutamine stress echocardiography (DSE) for detecting coronary artery disease (CAD) has been established, its contemporary role in determining prognosis is less well defined in the era of aggressive revascularization. This reassessment of the prognostic value of DSE is important since the profile of the patients referred for stress echocardiography has changed to a lower risk population in recent years, because patients

with elevated troponin levels or other high risk features are more likely than before to go directly to the catheterization laboratory without further stratification. We aimed to evaluate the prognostic significance of DSE for cardiac events in patients with known or suspected CAD.

**METHODS:** A review of our institution's database was conducted to identify patients who underwent DSE between 1/2004 and 12/2006. Patients were referred by their treating physicians for known or suspected CAD. Data was collected by chart review and a follow-up questionnaire by telephone 12 months after DSE. Follow-up was complete in 87% of patients. All patients underwent DSE (incremental dobutamine infusion: 5 to 50 micrograms/kg/minute, continued with atropine 0.4 to 2 mg intravenously if necessary to achieve 85% of the age predicted maximal heart rate, without symptoms or signs of ischemia) and clinical cardiac evaluation. DSE was defined as positive in the presence of new or worsening regional wall motion abnormality with dobutamine. The primary end point was major cardiac events at 12 months. Cardiac events were defined as cardiac death, hospitalization due to a cardiovascular cause, nonfatal myocardial infarction and coronary revascularization (percutaneous coronary intervention or coronary artery bypass graft surgery). For univariate predictors of cardiac events, a multivariate analysis was performed to determine independence.

**RESULTS:** We identified 611 patients (47% males) with a mean age of 65.9 ± 10.4 years; 110 (18%) had a history of CAD. Risk factors for CAD included hypertension in 444 (73%), dyslipidemia in 384 (63%), family history of CAD in 195 (32%), diabetes mellitus in 179 (29%) and smoking in 165 (27%) patients. One hundred ninety three (32%) had positive and 418 (68%) patients had negative DSE. Major cardiac events developed in 44 (11%) patients with negative and 114 (59%) patients with positive DSE over 12 months ( $p < 0.0001$ ). The group with positive DSE had higher rates of revascularization ( $n = 87$ , 45% vs.  $n = 19$ , 5%,  $p < 0.0001$ , respectively) and hospitalization due to a cardiovascular cause ( $n = 27$ , 14% vs.  $n = 25$ , 6%,  $p = 0.001$ , respectively). There were no cardiac deaths in either group. There were 17 deaths in both groups, all due to non-cardiac causes. By multivariate regression analysis, positive results on DSE remained independently predictive of cardiac events after clinical variables were accounted for.

**CONCLUSION:** In a large cohort of patients, positive DSE has an incremental value over clinical variables for predicting cardiac events at one year, differentiating high from low risk patients, even in the era of aggressive revascularization.

#### **P-406-SHOULD WE IMPLANT TEMPORARY PACEMAKER LEADS ON THE RIGHT OR LEFT VENTRICLE IN CABG PATIENTS WITH LEFT VENTRICULAR DYSFUNCTION**

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**INTRODUCTION:** Resynchronisation therapy has been proven to benefit a subset of patients with left ventricular (LV) dysfunction. Traditionally temporary pacemaker leads are positioned on the right ventricle (RV) during cardiac surgery. Objective: We hypothesized that postoperative LV pacing in patients with LV dysfunction could increase stroke volume.

**METHODS:** Twenty-two patients with an ejection fraction (EF) < 35% underwent CABG and temporary pacing wires on the right atrium, the inferior wall of the RV and the low-lateral LV wall. Following an initial stabilization period in the intensive care unit of 2 hours, patients were assessed by echocardiography for stroke volume either in an intrinsic sinus rhythm (SR), a DDD-RV mode (RV), a DDD-LV mode (LV) or a biventricular mode (BiV) (AV delay 120msec; 70bpm or sensing intrinsic sinus rate) in a sequential fashion. Stroke volume was determined by echocardiography by recording a pulsed wave Doppler signal at the level of the aortic annulus and by performing volumetric analysis using the time velocity integral and left ventricular outflow tract diameter. All echocardiography evaluations were performed by the same operator blinded to the pacing mode.

**RESULTS:** Only four patients (18,2%) demonstrated evidence of ventricular asynchrony. Stroke volume assessment showed a strong trend towards increased stroke volume with an LV compared to an RV pacing (SR: 50,±2,1; RV: 47,6±2,6\*; LV: 53,9±2,6\*; BiV: 51,8±2,5; \* $p < 0.09$ ).

**CONCLUSION:** In CABG patients with an EF < 35%, strong consideration should be given to position temporary pacemaker leads on the low-posterior LV wall to enhance postoperative hemodynamics when ventricular pacing is required.



#### **P-407-TRANSCRANIAL DOPPLER AND HEMODYNAMICS IN CORONARY ARTERY BYPASS SURGERY**

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**BACKGROUND:** The aim of this study was to evaluate the effects of coronary artery bypass surgery (CABG) on middle cerebral arterial (MCA) blood flow velocity measured with Transcranial doppler (TCD) under total intravenous anesthesia (TIVA), and the relationship between MCA flow velocity and hemodynamic parameters.

**METHODS:** Twenty two patients undergoing CABG on cardiopulmonary bypass (CPB) aged 45 to 64 years, were enrolled. The patients received 0,15-0,30 µg/kg/dk fentanyl, 2-4 µg/kg/dk midazolam and neuromuscular block was achieved with pancuronium. TIVA infusion rates were titrated according to bispectral index (BIS) values, kepted between 40-60. MCA blood flow velocities were measured by TCD, and hemodynamics were measured by radial arter monitoring. In ten different times of CABG the measurments were performed and were compared istatisticaly with ANOVA and posthoc tests. This times were: before induction (I); before surgical incision (II); after sternotomy (III); during left internal mammarian arter dissection (IV); on cooling period of CPB in 34°C (V), 33°C (VI), 32 °C (VII) respectively; on warming period of CPB in 33°C (VIII); in partial CPB (IX); at the and of surgery (X).

**RESULTS:** We found that mean arterial pressure (MAP) changes were closely related with MCA maximum velocity changes in the periods of CABG ( $p < 0,05$ ). We detected no relationship between MAP and mean velocity of MCA ( $p > 0,05$ ).

**CONCLUSIONS:** The detection of close relationship between TCD measurments and MAP suggested us that cerebral blood flow is changing related to MAP. Under TIVA, MAP and TCD maximum velocity measerments might be essential in neurologic monitoring of CABG.

#### **P-408-TIMING OF LEVOSIMENDAN USE IN CARDIAC SURGERY**

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**OBJECTIVE:** Levosimendan (LS) is a new inodilator agent that increases cardiac contractility by raising the sensitivity of troponin C to calcium. Currently it is more widely used in cardiac surgery. In this study, determination of the optimal timing of perioperative LS use among 15 high risk patients undergoing cardiac surgery is targeted.

**MATERIAL AND METHODS:** We investigated 15 cases undergoing open heart surgery at Cardiovascular Surgery Department between October 2005 and march 2007 that received levosimendan at various times throughout the procedure. Five patients received LS infusion after induction of anaesthesia (LS Group I), 5 patients after weaning of cardiopulmonary bypass (LS Group II) and 5 patients during the postoperative period (LS Group III). All of the patients received LS infusion at a rate of 0.1 µg/kg/min without a loading dose.

**RESULTS:** All of the patients in 3 groups had limited left ventricular function. At the end of levosimendan infusion, all 3 groups demonstrated a significant rise in urine output and cardiac index values, but a fall in pulmonary arterial pressure. After 24 hours, administration of all of the inotropic agents could have been stopped in LS Groups I and II. In Group III inotropic agents could not have been weaned except in one patient. During postoperative period, one patient in each for Groups I and II needed intraaortic balloon counterpulsation, whereas in Group III 4 patients needed this support.

**CONCLUSION:** Our experiences lead us to a conclusion that in cardiac surgery, LS use is particularly effective and life saving when administered intraoperatively and after weaning of cardiopulmonary bypass in high risk patients. But its postoperative use is not that satisfactory. Therefore, selection of cases and timing of LS use should be made carefully.

#### **P-409-RISK FACTORS FOR FAILING "FAST-TRACKING" AFTER CARDIAC SURGERY IN PATIENTS AGED 70 YEARS AND OLDER**

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**BACKGROUND:** In recent years, the number of elderly people has grown at twice the rate of the general population. A continuing increase in the number of old patients referred for cardiac surgery has been observed. "Fast-track" pathway has already been successfully applied in low-risk, relatively young patients to expedite recovery and thus efficiently utilize limited facilities and resources. The present study sought to identify the determinants of failure of "Fast-track" pathway in elderly patients.

**METHODS:** We performed a retrospective observational study of all patients aged 70 years or more who underwent cardiac surgery between January 2004 and June 2007. The patients were divided by age into septuagenarians and octogenarians.

**RESULTS:** During the 42-month study period, 2272 patients underwent cardiac surgery. Of them, 860(37.9%) open-heart operations were performed in 576 septuagenarians and 284 octogenarians. "Fast-track" pathway was successful in 54.5% and 37.3%, respectively. On multiple logistic regression analysis, stroke, renal failure and procedure other than first isolated coronary artery bypass graft were independently associated with failed early extubation, delayed intensive care unit discharge and delayed hospital discharge in both groups. Infections and atrial fibrillation were independent risk factors for delayed hospital discharge in both groups and delayed intensive care unit discharge in the octogenarians. In the octogenarians only, congestive heart failure was an independent risk factor for failed early extubation, delayed intensive care unit discharge and delayed hospital discharge.

**CONCLUSIONS:** "Fast-track" pathway may be safely applied in selected septuagenarians and octogenarians. Age alone should not exclude otherwise qualified candidates from consideration for "Fast-track" pathway.

#### **P-410-EARLIER APPLICATION OF PERCUTANEOUS CARDIOPULMONARY SUPPORT RESCUES PATIENTS FROM SEVERE CARDIOPULMONARY FAILURE °C USING APACHE III SCORING SYSTEM Running Head: Earlier Application of Percutaneous Cardiopulmonary Support**

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**BACKGROUNDS:** Percutaneous cardiopulmonary support (PCPS) is widely accepted for the treatment of patients with severe cardiopulmonary failure. This system, which uses a percutaneous approach and preassembled, heparin-coated, autopriming devices, can be rapidly applied in emergency situations. We sought to identify the risk factors predicting in-hospital mortality, to establish the proper timing of PCPS, and to assess its outcomes in survivors.

**METHODS:** From November 2005 to April 2007, 23 patients (15 men), of mean age 65 years (range, 46 to 92 years), underwent PCPS for the treatment of severe cardiopulmonary failure; of these, 13 (56.5%) were classified as survivors and 10 (43.5%) as non-survivors. We compared the 2 groups for risk factors predicting in-hospital mortality and to establish the proper timing of PCPS.

**RESULTS:** Of the 23 patients, 14 underwent PCPS for acute myocardial infarction, 6 for severe cardiopulmonary failure after cardiac surgery, 2 for acute respiratory distress syndrome, and 1 for acute myocarditis. The mean duration of PCPS was 29.1 ± 33.0 hours (range, 18 minutes to 126.2 hours). Survivors and non-survivors differed significantly in APACHE III scores before PCPS, initial pump flows, and total bypass time ( $p < 0.05$  each). Multivariate logistic regression analysis showed that APACHE III score  $\geq 50$  prior to PCPS was the only significant predictor of in-hospital mortality ( $p = 0.005$ ). Overall 18-month survival was 54.1%. Cox analysis showed that patients with APACHE III score  $\geq 50$  had a poor prognosis (12-month survival rate, 28.8%) ( $p = 0.002$ ).

**CONCLUSIONS:** Earlier application of PCPS to lower initial APACHE III score, and other preemptive strategies designed to optimize high-risk patients, may improve patient outcomes. Identification of patients with high APACHE scores at the beginning of PCPS may predict in-hospital mortality. Survivors from PCPS, particularly those with higher APACHE scores, may require more careful and frequent short-term follow-up to improve overall survival.

#### **P-411-WOUND INFECTION AFTER CORONARY ARTERY BYPASS GRAFTING IN DIABETIC PATIENTS**

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**BACKGROUND:** Diabetes mellitus is a major independent risk factor for the development of coronary artery disease. Arterial revascularization with the use of at least one internal thoracic artery is believed to be related with improved survival of diabetics. The aim of this study was to compare the rates of sternal wound complications in diabetic patients who received single internal thoracic artery during successive time periods with two different strategies of prophylactic antibiotics in our institution.

**METHODS:** Between January 2003 and August 2006, a total of 1518 consecutive patients undergoing coronary artery bypass grafting with the use of internal thoracic artery in our institution were included in this retrospective study. Standard prophylactic antibiotics for all patients before November 2004 ( $n = 696$ ) were intravenous Cefuroxime (1,5 g) on induction of anesthesia and during intensive care unit stay (750mg tid). After this period ( $n = 822$ ) we changed our policy of prophylactic antibiotics only for diabetic patients: intravenous Ciprofloxacin (400mg) was administered on induction of anesthesia and during intensive care unit stay (400mg tid) and oral Ciprofloxacin (1,5g daily) during the rest of hospitalization.

**RESULTS:** The incidence of diabetes mellitus during study period was 18.9% ( $n = 298$ ), from which 18.2% ( $n = 127$ ) in pre 2004 period and 20.8% ( $n = 171$ ) in post 2004 period ( $p = 0.211$ ). Overall infection rate in diabetics was 8.7% ( $n = 26$ ) and 2.7% in non-diabetics. Diabetic patients undergoing coronary artery bypass surgery before November 2004 had significantly higher incidence of sternal infection compared with diabetics operated after this period (12.6% ( $n=16$ ) and 5.8% ( $n=10$ ), respectively,  $p = 0.041$ ).

**CONCLUSIONS:** Diabetics are specific subgroup in general population of patients undergoing coronary artery bypass grafting. These patients are more prone to infection and poorer healing. In conclusion, the incidence of sternal wound infection in diabetics had reduced significantly after changing the prophylactic antibiotic strategy, nevertheless, it remains higher in comparison with non-diabetic patients.

#### **P-412-CLINICAL OUTCOME AND MEDIASTINAL BLOOD REINFUSION IN CARDIAC SURGERY**

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**BACKGROUND:** Haemotransfusion is the actual matter in the field of cardiac surgery. Transfusion reactions, infection risk and cost should stimulate us to decrease this transfusion rate. The aim of study was to evaluate effects of collected, centrifuged and reinfused autologous shed mediastinal blood on clinical outcome in patients during the early postoperative period.

**METHODS:** We have analysed the data of 98 pts, who had been subjected to cardiac surgical procedures on cardiopulmonary bypass (CPB): there are 45 pts in Group I, who were reinfused with the centrifuged autologous mediastinal blood 4 hours after the end of surgery and 53 pts in Group II, whose shed mediastinal blood was not reinfused (control group). There was applied the system of two sterile, together joined plastic pouches intended for the collection of the autologous blood that through drains has exuded into cardiosternal reservoir. Blood was collected into one of pouches containing preservative-anticoagulant CPDA (citrate, phosphate, dextrose, adenine). The second pouch was applied later. The collected blood was processed in centrifuge 2600 turns in 15 minutes. Plasma out of erythrocytes remaining after this process was completed into empty pouch using plasma extractor and egested. Autologous erythrocytes immediately were reinfused to the patient through the disposable intravenous infusion system designed for the transfusion of the blood components. We have estimated the amount of the blood that patient has lost through drains after 20 hours at the end of surgery. Preoperative patient conditions, intraoperative and postoperative periods, were recorded. Statistical significance was accepted at a level of  $P<0.05$ .

**RESULTS:** In Group I, pts who were reinfused with the centrifuged autologous shed mediastinal blood, requirement for the allogenic blood transfusion procedures was significantly lower (14.6% vs 38.8%,  $P<0.05$ ). The C-reactive protein

(CRP) concentration was greater, but there were no significant differences between the groups in all postoperative periods. At 20 hours after the end of surgery and the second postoperative day, the increase of procalcitonin (PCT) concentration was significant and often observed in Group II (33.3% vs 58.3%), where there were significantly more complications of infection (2.4% vs 10.2%  $P<0.05$ ) and a significantly longer length of postoperative hospital stay ( $9.32 \pm 2.55$  vs  $14.38 \pm 4.27$  days,  $P<0.05$ ).

**CONCLUSIONS:** Our findings showed that the early reinfusion of autologous shed mediastinal blood reduced the requirement of allogenic blood transfusion procedures and the number of infection complication. This is safe, simple and not expensive method, that helps to reduce the number of allogenic blood transfusions.

#### **P-413-LOW MOLECULAR WEIGHT HEPARIN AS EARLY ANTICOAGULATION SCHEME IN MECHANICAL VALVULAR REPLACEMENT**

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**OBJECTIVES:** Verify security and effectiveness of low molecular weight heparin (LMWH) in reduced doses in the early postsurgical period in patients with mechanical valvular replacement, like bridge for oral anticoagulation without the anti Xa-activity measurement.

**MATERIAL AND METHOD:** Experimental, prospective, comparative, randomized balanced blocks study. We analyze patients with mechanical valvular replacement (mitral, aortic and/or tricuspidal) in the first postsurgical 24 hours. The LMWH Group received Enoxaparin 0.8mg/kg (bid) and oral Coumadin (4 mg first day, 2 mg the second and later was readjusted according to INR in the third day), enoxaparin was suspended once the INR was appropriate for the type of implanted valve. The control Group received conventional heparin 8000 units (SC) every 8 hours and Coumadin (4 mg first day, 2 mg the second and later was readjusted according to INR in the third day), heparin was also suspended once the INR was optimal. Intra-hospital mortality, prosthesis dysfunction, cardiac tamponade, central or peripheral embolism and major or smaller bleeding were evaluated before the hospital discharge.

**RESULTS:** Fifty nine patients were included, twenty nine patients in the LMWH Group and thirty in the control Group, were not significant differences in the basal clinical characteristics, only a tendency, the LMWH Group had more prothrombotic factors (LVEF < 30%, left atrial dilatation, atrial fibrillation, and stroke). There was one stroke in the Heparin Group, in each groups existed four lesser bleeding event, and in the clexane Group there was a major bleeding (cardiac tamponade).

**CONCLUSIONS:** Both analyzed schemes show equal postsurgical complications (thrombosis and bleeding), and a smaller rate than the reported in the literature. Significant differences between both groups were not demonstrated. The security profile/effectiveness in the reduced enoxaparin doses scheme allows to use it without anti-Xa levels measurements.

#### **P-414-THE CLINICAL AND ECHOCARDIOGRAPHIC FEATURES OF OUR PATIENTS WHO UNDERWENT UNILATERAL URGENT FEMORAL EMBOLCTOMY**

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**OBJECTIVE:** The determination of the source of embolism in patients with lower extremity arterial emboli is a major problem. A review of the literature focusing on large patient series showed that the heart is the embolic source in 78% of these patients.

**MATERIALS AND METHODS:** 51 patients who underwent urgent femoral embolctomies between January 2001 and January 2006 with the preliminary diagnosis of acute peripheral arterial occlusion were included in this prospective, single-center study. In order to investigate the origin of the arterial occlusion, all patients were examined via transthoracic echocardiography in the first 24 hours following the embolctomy.

**RESULTS:** The mean age of our 51 patients undergoing urgent femoral

embolectomy was 65.9 (ranging from 38 to 98). In 28 (55%) of these patients serious cardiac pathologies were determined. After the required examinations were completed the required open-heart surgery interventions were applied.

**CONCLUSION:** The development in the diagnosis and treatment methods and the prolongation of survival in patients with progressed heart diseases increase the incidence of arterial embolism. Since thromboemboli mostly originate from the heart, the cardiac status of the patients becomes much more important.

#### **P-415-DETERMINATION RATIO OF ATRIAL FIBRILLATION AND SPONTANEOUS ECHO CONTRAST IN URGENT FEMORAL EMBOLECTOMY CASES**

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**BACKGROUND:** Left atrial SEC is seen in 80% of the patients with a history of mitral stenosis and embolus and in 48% of the patients with no history of emboli. The presence of SEC in mitral stenosis is an indicator of hypercoagulation. Stasis and the development of AF mutually increase their effects in thrombosis formation.

**METHODS:** 57 patients who underwent 63 urgent femoral embolectomies between January 2001 and January 2006 with the preliminary diagnosis of acute peripheral arterial occlusion were included in this prospective, single-center study. All patients underwent urgent femoral embolectomy for the first time and bilateral femoral embolectomy was performed in 6 (15%) patients. All patients were examined via transthoracic echocardiography in the first 24 hours following the embolectomy.

**RESULTS:** In 4 (66%) of our 6 patients who underwent bilateral femoral embolectomy atrial fibrillation (AF) was dominant. In 28 (55%) of our 51 patients undergoing urgent femoral embolectomy serious cardiac pathologies were determined. In 24 (85%) of these 28 patients AF, and in 22 (79%) spontaneous echo contrast (SEC) were determined. After the required examinations were completed the required open-heart surgery interventions were applied.

**CONCLUSION:** Regardless of whether the interventions are bilateral or unilateral, we believe that echocardiographic investigation should be performed in all patients during the early postoperative period in order to prevent recurrence by the determination of the thromboembolus source. Thus, accompanying serious intracardiac pathologies can be treated and the development of additional peripheral emboli can be prevented.

#### **P-416-USE OF RECOMBINANT ACTIVATED FACTOR VIIA AFTER CARDIAC SURGERY WITH REFRACTORY BLEEDING**

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**BACKGROUND:** Major bleeding occurs frequently in cardiac surgery. Patients with significant bleeding often require reoperation; rates of reoperation for bleeding vary between 5-10%. Bleeding and surgical re-exploration are both independent predictors of an adverse outcome. Factor VIIa recombinant is indicated for the treatment of bleeding episodes in patients with hemophilia A or B with high levels of inhibitors. We present our initial experience with rFVIIa, as a salvage use after inadequate response to conventional therapy in patients with major bleeding in the post bypass coagulopathy period.

**METHODS:** Eight consecutive patients with excessive bleeding after cardiac surgery with cardiopulmonary bypass, met the criteria and did not respond to optimal treatment. FG, rFVIIa was given as a bolus injection a dose of 80 g/kg was used, the same dose was repeated 2 hours after the previous injection if the bleeding had not decreased. A control of 8 cases with out rFVIIa was compared, registering transfusion of packed red blood cells, fresh frozen plasma and platelet concentrates, postoperative blood loss, bleeding abnormalities and reexploration. Nonparametric statistics were used, McNemar test for paired groups and Fisher's exact test for independent group, for continuous variables, Wilcoxon's paired signed rank test, for intergroup analyses the Mann-Whitney U test ( $p < 0.05$ ).

**RESULTS:** From January to June 2007, eight continuous patients had excessive refractory bleeding after cardiac surgery, this patients receive rFVIIa, group A and were comparative analyzing with a control group B. Blood loss ( $p = 0.021$ ),

reexploration ( $p = 0.039$ ), and INR ( $p = 0.010$ ) were significantly reduced in the period after the administration of rFVIIa, there were no differences in the transfusion requirements and the other bleeding abnormalities. There were 3 thrombotic events in 2 patients.

**CONCLUSIONS:** The rFVIIa might be useful has a rescue therapy, uncontrolled postoperative bleeding in patients undergoing cardiac surgery with cardiopulmonary bypass. There is some probability that rFVIIa could cause those thrombotic events.

#### **P-417-TRANSIENT BILATERAL CORTICAL VISUAL LOSS AFTER CABG IN A NORMOTENSIVE RISK-FREE PATIENT**

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**BACKGROUND:** Postoperative blindness has been mentioned as a rare complication of heart surgery. Main portion of reported cases are caused by retinal artery occlusion or ischemic optic neuropathy. We report a case of transient visual loss due to cortical ischemia after coronary artery bypass graft (CABG).

**METHODS:** LIMA on LAD operation was performed at our university hospital. All consultations and imaging were done by academic faculty.

**RESULTS:** A 52-year-old non-diabetic man developed complete bilateral visual loss right after CABG. He had been normotensive throughout the operation. Ophthalmologic exam detected no causative ocular damage. Doppler study of carotid, vertebral and ophthalmic arteries was totally normal, and there was no LV clot in echocardiography, while brain MRI showed several ischemic plaques in water-shed areas and a small subacute infarct in occipital lobe. Recovery began on post-op day 4, leading to a restored vision in 6 months.

**CONCLUSIONS:** Although most cases of visual loss after open heart surgery have been resulted from injuries to peripheral optic system, cortical blindness may occur following open heart surgery in absence of any preexisting risk factor. Fortunately the recovery course is promising, as it was for our patient.

#### **P-418-EARLY TRACHEOSTOMY AFTER MEDIAN STERNOTOMY**

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**BACKGROUND:** Tracheostomy offers significant advantages in patients requiring long-term assisted ventilation. Percutaneous tracheostomy offers technical advantages since it can be easily performed on the ICU. There is still concern, whether cardiac surgical patients are at increased risk for developing mediastinitis, especially if tracheostomy is performed early (within 14 days) after a sternotomy.

**METHODS:** We reviewed charts from patients operated at our institution with median sternotomy between January 2002 and June 2007. Patients requiring tracheostomy, the day of tracheostomy after median sternotomy and the patients developing mediastinitis were identified and analyzed.

**RESULTS:** During this time period, we operated upon 4572 patients through a median sternotomy. 146 patients (3.2%) received tracheostomy due to prolonged or expected prolonged assisted ventilation, 130 patients (2.8%) had the procedure performed within 14 days (mean  $8.2 \pm 2.78$ ) after median sternotomy. In 120 patients (93.0%), tracheostomy was performed percutaneously with no major complication (bleeding, tracheal injury). 9 patients (7.0%) who were not suited for the percutaneous approach (anatomical reasons) underwent surgical tracheostomy in the OR. Deep sternal wound infection developed in 1 patient, but the identified microbes (staph. aureus) were different to those cultured from the trachea, excluding cross-contamination. Survivors (110/130, 84.6%) were successfully weaned after  $11.7 \pm 9.4$  days (2-58).

**CONCLUSIONS:** Our data show, that percutaneous tracheostomy can be performed safely with a very low perioperative complication rate and without increased incidence of mediastinitis during the first 14 days after median sternotomy. It is therefore well suited for patients who are long term dependent on assisted ventilation after median sternotomy.



#### P-419-MULTIDISCIPLINARY REHABILITATION AFTER LUNG CANCER OPERATION

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**BACKGROUND:** Patients radically operated for lung cancer report functional deficits as well as poor quality of life. This study investigates short and long term effects of a 3 month rehabilitation programme, consisting of exercise training and dyspnoea counselling, on quality of life and physical performance in patients who are radically operated for lung cancer.

**METHODS:** A prospective, randomised, stratified, single-blinded intervention, including 70 patients. Intervention is based on aerobic exercises, resistance training and dyspnoea management in groups. Target intensity is 60- 80% of work capacity (BORG scale 11 - 13). Participants are urged to exercise at home for at least twice a week. Control group receives one instruction in exercise training and dyspnoea management. All participants receive up to 3 individual counselling sessions with a nurse. **MEASUREMENTS:** HRQOL (SF-36), physical capacity (6MWT) and lung function (FEV1, FVC and FEV1/FVC) at inclusion, 4 months and 1 year. **ANALYSIS:** Variables between groups are analysed using one-sided t- test, explanatory variables using ANOVA. Missing values are handled on an intention-to-treat basis with a last-value-carry-forward approach. P less or equal .05 is considered statistically significant. **RESEARCH STATUS:** Ongoing research, started February 2006. Inclusion will be completed during 2009.

**RESULTS:** We expect to present short term results for the first 25 patients at the WSCTS World Con-gress

**CLINICAL IMPLICATIONS:** As survival rate and survival time for cancer patients increase, the issues of post operative interventions targeting the individual as a whole and improving quality of life arise. This study will provide knowledge on the impact of rehabilitation programmes, on physical functioning and on the well being of cancer survivors.

**ACKNOWLEDGMENTS:** This study is financed by the Danish Cancer Society's research Unit Northern Region, Danish Cancer Research Foundation, Aalborg University Hospital and various private foundations

#### P-420-SUBPLEURAL ADMINISTRATION OF ROPIVACAINE AND MUSCLE SPARING THORACOTOMY IMPROVES EARLY POST-THORACOTOMY OUTCOME

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**BACKGROUND:** Insufficient pain management after thoracotomy is associated with negative impact on pulmonary function and increased patient morbidity. As an approach to improve care we evaluated the effect of continuous subpleural administration of ropivacaine on patient recovery and postoperative pain relief.

**METHODS:** After ethical committee approval, 37 patients scheduled for elective sparing the latissimus dorsi muscle anterolateral thoracotomy, were randomly assigned in two groups: In Group A (n=17), a multihole wound catheter for continuous local anesthetic infusion was placed, before thoracotomy closure, into the paravertebral subpleural space through the chest wall. The catheter was connected with an infusion device providing 0.6 % ropivacaine at a rate 0.1 ml/kg/h for 48h. In group B (n=20) the catheter was not inserted. All patients receive 40mg of parecoxib 20 min before extubation and 40 mg of parecoxib 12 h postoperatively. All patients also had access to intravenous patient-controlled morphine analgesia. Demographic data, duration and type of procedure, duration of anesthesia, length of stay in Intensive Care Unit (LOS), time to mobilization and clinical signs of drug-related toxicity were recorded in all patients. Pain was assessed on the basis of PCA morphine requirements and by using visual analog pain scores. To analyze differences between groups, ANOVA test corrected for multiple comparisons at p<0.05 was used.

**RESULTS:** Demographic and all preoperative and intraoperative data were similar between groups. Significant difference between group A and group B was found concerning VAS scores ( $3.2 \pm 1.1$  versus  $4.8 \pm 1.8$ , p<0.05) and morphine consumption ( $14.6 \pm 3.8$  mg versus  $46.4 \pm 4.6$  mg, p<0.01). Group A also showed improved recovery characteristics when compared with

group B concerning time to mobilization ( $14 \pm 2.7$  versus  $20 \pm 3.2$  hours, p<0.05) and LOS ICU ( $1.1 \pm 0.4$  versus  $1.86 \pm 0.7$  days, p<0.05).

**CONCLUSIONS:** Continuous paravertebral subpleural administration of ropivacaine provides an efficient post-thoracotomy pain management which also accelerates patient recovery.

#### P-421-DEEP STERNAL WOUND INFECTION AFTER CARDIAC SURGERY

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**OBJECTS:** Deep sternal wound infection (DSWI) is one of the most serious complications after the open heart cardiac surgery via a median sternotomy. To explore the predisposing risk factors and the appropriate treatment method, we performed this retro study.

**METHODS:** Between January 2001 and January 2006, 1123 patients underwent various cardiac surgical procedures via a median sternotomy in the cardiac department of cardiovascular center of Beijing Tongren Hospital. These patients were divided to two groups by whether suffered from DSWI. Univariate analysis was carried out for possible risk factors respectively and logistic regression was used in multivariate analysis.

**RESULTS:** 8 among the 1123 (0.71%) patients suffered from DSWI. No one died from wound infection. Results from both single variate analysis and multivariate analysis showed that only age significantly associated with DSWI.  $OR=1.56$  [1.05, 1.27], p=0.003. No other independent risk factors were found to have a statistically significant association with DSWI. When DSWI patients were classified into two categories, acute and chronic, it was found that blood culture in acute groups tended to be positive, while in chronic group blood culture tended to be negative. All patients with DSWI were finally cured.

**DISCUSSION:** Age is an independent risk factor for DSWI. Early debridement with closed chest catheter irrigation and antibiotics using are strongly recommended as an easy and effective way to treat DSWI. Multicenter study is useful to determine reliable risk factors for deep sternal wound infection.

#### P-422-ISSUE QUESTIONS OF THROMBOELASTOGRAPHY RESULTS INTERPRETATION AT CARDIOSURGICAL PATIENTS

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For differential diagnostics of hypocoagulation, caused heparin excess, thromboelastography (TEG) records with the heparinase cups. It is considered, that heparinase does not change parameters the TEG in tests of the whole blood which is not heparin containing. By results of researches the TEG at cardiosurgical patients received during operation 2.000.000 KIE of aprotinin, after CPB and full heparin neutralization we had been obtained other results. TEG on standard and heparinase cups did not differ on parameters R, K, angle alpha. Values LY30 and LY60 at measurement on standard cups doubtfully increased in comparison with before operation values whereas lysis a clot practically was absent on heparinase cups. Heparinase in vitro completely broken of fibrinolysis and platelets activated, that was expressed in increase Mf. In vitro at addition of streptase in the whole blood which is not heparin containing, according to the TEG on standard cups were registered significant lengthening time K, decrease Mf and angle alpha. Heparinase led to authentic shortening of time K, to increase Mf and angle alpha.

**CONCLUSION:** Despite of administration of aprotinin 2.000.000 KIE, after CPB fibrinolysis activation according to the TEG was registered at all patients. The estimation the TEG on standard and heparinase cups for diagnostics of coagulopathy can lead to the erroneous conclusion about presence in blood heparin excess and to wrong protamine administration, that can aggravate coagulation infringements.



#### **P-423-THE UTILITY OF RADIOGRAPHIC VASCULAR PEDICLE MEASUREMENTS IN ASSESSING THE HEMODYNAMIC STATUS OF PATIENTS WHO RECENTLY UNDERWENT CORONARY ARTERY BYPASS GRAFT SURGERY**

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**BACKGROUND:** The role of portable, anteroposterior, supine chest radiographs (CXRs) in evaluating the hemodynamic status of post-surgical cardiac patients is controversial.

**METHODS:** We retrospectively evaluated such CXRs in 162 recent post-coronary artery bypass grafting (CABG) patients with pulmonary artery catheters. Three radiologists independently reviewed the CXRs without clinical and hemodynamic information and recorded the Vascular Pedicle Width (VPW) and Vascular Pedicle - Thoracic (VT) Ratio. The averages of the three radiologists' measurements were computed and were correlated with pulmonary capillary wedge pressure (PCWP).

**RESULTS:** Overall mean (+/- SD) VPW and VT ratio are 7.1 +/- 0.7 cm and 0.25 +/- 0.02, respectively. Of the 162 patients, 96 (59%) had low-to-normal PCWP (< 18 mmHg), whereas 66 (41%) had high PCWP ( $\geq$  18 mmHg). SD VPW of 6.9 +/- 0.7 cm. The low-to-normal PCWP and high PCWP groups had mean (cm) and 7.3 +/- 0.6 cm, respectively ( $p = 0.000$ ). The mean (+/- SD) VT ratio of the low-to-normal PCWP group was 0.24 +/- 0.02 while that of the high PCWP group was 0.27 +/- 0.02 ( $p = 0.000$ ). VPW and PCWP showed weak correlation ( $r = 0.257$ ;  $p = 0.001$ ) whereas VT ratio and PCWP showed good correlation ( $r = 0.620$ ;  $p = 0.000$ ). Optimal cut-off points in differentiating low-to-normal and high PCWP for VPW and VT ratio are 7.0 cm (sensitivity = 77.3 %; specificity = 51.0 %;  $\kappa = 0.263$ ;  $p = 0.000$ ) and 0.26 (sensitivity = 89.4 %; specificity = 87.5 %;  $\kappa = 0.760$ ;  $p = 0.000$ ), respectively.

**CONCLUSIONS:** Measurements of VPW in portable, anteroposterior, supine CXRs may correlate weakly with PCWP but may be improved by computing for the VT ratio. Radiologic assessment of the vascular pedicle adds clinically useful dimension to CXRs in the evaluation of hemodynamic status of cardiac patients.

#### **P-424-THE VALIDITY OF PORTABLE CHEST RADIOGRAPH FINDINGS IN APPRAISING INTRAVASCULAR VOLUME STATUS OF PATIENTS WHO RECENTLY UNDERWENT CORONARY ARTERY BYPASS GRAFT SURGERY**

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**BACKGROUND:** The role of portable, anteroposterior, supine, chest radiographs (CXRs) in evaluating the hemodynamic status of post-surgical cardiac patients remains underappreciated.

**METHODS:** We prospectively evaluated CXRs in 222 recent post-CABG patients with pulmonary artery catheters. Three radiologists independently reviewed the CXRs without clinical and hemodynamic information. The radiologists' findings were compared with pulmonary capillary wedge pressure (PCWP) recordings.

**RESULTS:** The intrareader and inter-reader correlation coefficients were high indicating strong positive correlations between readings. Cardiothoracic (CT) ratio  $\geq 0.55$ , vascular pedicle width (VPW)  $\geq 7.0$  cm, vascular pedicle - thoracic (VT) ratio  $\geq 0.26$ , pulmonary blood flow redistribution, interstitial and alveolar edemas, and pleural effusions are more frequently observed in patients with PCWP  $\geq 18$  mmHg. VT ratio is the most sensitive and specific radiographic parameter in distinguishing PCWP  $\geq 18$  mmHg and PCWP < 18 mmHg (sensitivity = 84.5%; specificity = 91.3%;  $\kappa = 0.752$ ;  $p < 0.001$ ). CT ratio has a sensitivity of 78.6% and specificity of 72.5% ( $\kappa = 0.488$ ;  $p < 0.001$ ) while VPW has a sensitivity of 75.0% and specificity of 65.9% ( $\kappa = 0.386$ ;  $p < 0.001$ ). Pulmonary blood flow pattern is 76.2% sensitive and 76.8% specific ( $\kappa = 0.516$ ;  $p < 0.001$ ) in differentiating patients with high and low-to-normal PCWP. Sensitivity and specificity of interstitial edema were 45.2% and 94.2%, respectively ( $\kappa = 0.433$ ;  $p < 0.001$ ). Alveolar edema has low sensitivity (8.3%) and relatively high specificity (98.6%) in the diagnosis ( $\kappa = 0.083$ ;  $p = 0.006$ ). Presence of pleural effusions was found to have a diagnostic specificity of 98.6% but has a sensitivity of only 15.5% ( $\kappa = 0.167$ ;  $p < 0.001$ ).

**CONCLUSIONS:** CT ratio, VPW, VT ratio, and pulmonary blood flow pattern are found to be useful in radiologic appraisal of intravascular volume status of patients. Signs of interstitial edema, alveolar edema, and pleural effusion are not as useful. In the absence of modalities that are less invasive, the CXR can serve as a good alternative for assessing volume status of patients. Accordingly,

optimizing the use of portable CXRs is imperative.

#### **P-425-OUR CLINICAL EXPERIENCES RELATED TO POLITETRA-FLORETIEN GRAFT USING FOR PERFORMING ARTERIOVENOUS FISTULA IN THE PATIENTS WITH CHRONIC RENAL FAILURE REQUIRING HEMODIALYSIS**

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Our clinical experiences related to politetrafloretien graft using for performing arteriovenous fistula in the patients with chronic renal failure requiring hemodialysis

**BACKGROUND:** The polytetrafluoroethylene (PTFE) arteriovenous fistula allows vascular access for hemodialysis where a primary fistula is not possible. We aimed to evaluate our clinical experience related to this prosthetic graft.

**METHODS:** We performed arteriovenous fistula using PTFE graft in the 35 patients with end-stage renal failure requiring hemodialysis. The mean age of patients were 55.09 $\pm$ 12.2 (range, 23 to 74). There were 16 women and 19 men. Beforehand in all patients were performed direct arteriovenous fistula in the upper extremity and these arteriovenous fistulas wasn't functional. The patients were used PTFE graft 7 mm in diameter tapered to 4mm at the arterial site.

**RESULTS:** Between brachial artery and axillary vein in 24 patients (68.6%), between radial artery and antecubital vein in 6 patients (17.1%), between femoral artery and femoral vein in 5 patients (14.3%) were performed arteriovenous fistula. In all patients primary patency rate were 81.9%, 66.6%, and 26.6% at 6, 12, and 24 months. Secondary patency rates at 6, 12, and 24 months were 78.2%, 33.3%, and 0%. There were no perioperative morbidity and mortality.

**CONCLUSION:** PTFE grafts provide satisfactory patency rate. Preoperative doppler ultrasonography and venography examination are important for showing of probable graft configurations. Thrombosis is the most complication. Keywords: Arteriovenous fistula, PTFE graft, primary and secondary graft survival rate.

#### **P-426-BYPASS SURGERY FOR INFRAPOPLEATEAL OCCLUSIVE DISEASE WITH POOR DISTAL FLOW ON ANGIOGRAPHY.**

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**AIMS:** We aimed to investigate whether limb salvage bypass operation improves outcomes in patients with critical infrapopliteal ischemia who has poor or no distal arterial flow on angiography.

**PATIENTS AND METHODS:** Between January 2000 and May 2007 42 patients with severe tibial and peroneal occlusive disease and poor distal arterial flow on angiography were included. Patients had class IIB, III or IV disease according to Fontaine classification. Ongoing rest pain, ischemic ulceration, or gangrene limited to the forefoot or heel after a two week medical therapy were indications for surgical operation. 19 patients (15 males and 4 females) underwent distal bypass operation. Other 23 patients (17 males and 6 females) were followed with medical therapy. The age ranged from 57 to 82 years in the surgical group and 63 to 85 in the medical group. Selective operative arteriography was used to more clearly define outflow vessels in the foot. The graft material was only autogenesis vein in 16 patients. Prosthetic graft was used additionally in three patients. The outflow distal anastomosis was performed on tibialis posterior, dorsalis pedis, anterior tibial, peroneal, medial plantar, lateral plantar arteries. Regional anesthesia was used in all cases.

**RESULTS:** There were 3 (15.8%) early and 2 (10.5 %) late graft failures. Limb salvage rates were 84%, 84.1%, 73.5 % in the surgical group, and 77.3%, 65.7, 55.9% in the medical group respectively in 6 months, 1 year, and 3 years. Limb loss was occurred 26.3 % of the surgical group, and 34.7 % of the medical group ( $p < .05$ ). The levels of the amputations tend to be lower in the surgical group than the medical group but it was not significant statistically ( $p < .07$ ). One patient (5.3%) died because of myocardial infarction in seventh month in the surgical group and one patient (4.3%) died because of cerebrovascular hemoraghy in eleventh month in the medical group. ( $P = ns$ ). Medi-

an hospital stay was 10.5 days (range, 3- 37 days). No differences in patency or limb salvage rates were demonstrated between ATP, ADP, and ATA, medial plantar and lateral tarsal arteries.

**CONCLUSION:** We think that limb salvage bypass operation may be preferred for patients with critical limb ischemia and poor distal flow on angiography. Infrapopliteal bypass will provide limb salvage and a functional extremity.

#### **P-427-RARE CARDIAC TUMOR SIMULATING ACUTE PERICARDITIS**

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**BACKGROUND:** Synovial sarcoma is a rare cause of pericardial tumor. We present a case where this malignant disease presented mimicking pericarditis and surgery was performed to diagnose and treat the patient

**METHODS:** A 54 year old female with the only know medical condition of hypertension and working in a retirement home presented to the emergency department for a 21 days low-grade fever with musculoskeletal pain and oppressive retrosternal pain. She had previously received NSAID, broad spectrum antibiotics. In the physical examination a pericardial rub was noted. High levels of acute reactant phase proteins were found, with negative autoantibodies, rheumatic factor. In a CT scan a tumor 85x96 mm was found in the left side of the pericardium with displacement of the pulmonary trunk, left atrium and left atrial appendage, and no intrabdominal pathological findings

**RESULTS:** The mass was confirmed by MNR and the patient taken to the OR where a median sternotomy was performed, and a jelly like material found in the pericardial sac. Once confirmed by intraoperative biopsy the diagnoses of malignancy, the tumor was excised as far as technically feasible and the patient discharged uneventfully. The diagnosis was made in the pathology department of Synovial Sarcoma with t(18,X) and the patient is actually receiving chemotherapy with complete remission

**CONCLUSIONS:** Synovial sarcoma is a rare cardiac tumor, sometimes mimicking acute pericarditis and a high degree of clinical suspicion is needed to diagnose it and treat it

#### **P-428-A GLOMUS CAROTICUM CASE ACCOMPANIED BY A GIANT THYROIDAL NODULE**

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**BACKGROUND:** The glomus caroticum tumor is the most common paraganglioma in the head and neck, and its special anatomical position imposes great difficulty during surgery.

**METHODS:** We report a case retrospectively that is a left glomus caroticum tumor complicated with giant thyroidal nodule. In this study, we review the epidemiology, microbiology, clinical presentation and our successful radical surgical therapy of the glomus caroticum tumor due to its significant morbidity and mortality rates.

**RESULTS:** The mainstay of treatment for glomus caroticum tumors is surgical excision. We believe that in head and neck paragangliomas surgical treatment provides excellent tumor control with low postoperative morbidity.

#### **P-429-VASCULAR COMPLICATIONS ASSOCIATED TO PERCUTANEOUS FEMORAL ARTERY CLOSURE WITH ANGIO-SEAL**

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**BACKGROUND:** Femoral artery closure with Angio-Seal is an extended procedure but not innocuous. We describe our most recent experience.

**METHODS:** Between 2005 and 2007, 2000 coronary artery angiographies has been done and Angio-Seal has been used in all of them. Fourteen patients developed ischemic complications early or late after femoral artery closure. A patients developed an infected pseudoaneurysm of the common femoral artery, 5 presented a pseudoaneurysm of the common femoral artery, 3 a

femoral haematoma, 3 suffered an acute limb ischemia, and 2 patients had a subacute limb ischemia

**RESULTS:** All the patients required a vascular surgical intervention. Direct repair was done in 7 patients and arterial reconstruction in 7 by means of Goretex bypass (n: 4) or saphenous vein bypass (n: 3). In all the patients the operation resolved the Angio-Seal complications without consequences.

**CONCLUSIONS:** The incidence of complications associated to the percutaneous closure of the femoral artery with Angio-Seal is low but always required surgical intervention that can be done with satisfactory results.

#### **P-430-COILING OF EXTRACRANIAL INTERNAL CAROTID ARTERY AS A CAUSE OF NEUROLOGIC DEFICITS**

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**BACKGROUND:** Coiling (or looping) of the artery is a rare morphologic entity, most frequently described in the internal carotid artery.

**METHODS:** In this study, we aimed to report our successful surgical approach to a patient diagnosed as coiling of the left internal carotid artery after arteriograms.

**RESULTS:** He was investigated due to symptoms of speech disturbance increasing in degree for 2 months and sequela of monoparesia after cerebrovascular accident developed 3 years ago.

**CONCLUSION:** We think that this condition can be easily surgically treated, thus eliminating further neurologic symptoms in affected patients. And also in cases with associated occlusion, transection of internal carotid artery at its origin and re-implantation in the lateral aspect of the common carotid, was the remedy of choice.

#### **P-431-A LATE VASCULAR COMPLICATION OF CARDIAC CATHETERIZATION**

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**BACKGROUND:** Diagnostic and therapeutic cardiac interventions have been performed in expanding numbers during last years. Femoral and iliac arteries thromboembolisms are most often seen in the setting of previous femoral artery catheterization.

**METHODS:** In this study, we aim to declare our approach to a case under the light of literature. Our case suffered from claudication of the right lower extremity after walking a distance of 10 meters following a diagnostic coronary arteriography carried out through her right femoral artery 20 days ago. After the investigations, revascularization was planned.

**RESULTS:** Early definition and early treatment are very important in thromboembolisms.

**CONCLUSION:** Even if the treatment time delays, it is getting much harder that treatment and complication risks are increasing, also the extremity and/or loss risk is increasing.

#### **P-432-PRIMARY PULMONARY LYMPHOMA: A RARE CASE REPORT**

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**BACKGROUND:** Primary pulmonary lymphoma is rare seen (0.4 %). These tumors are clinical nonspecific. It is detected in x-ray films by chance generally.

**METHODS:** A 57 year-old woman with dyspnea in two years was admitted to our hospital. Physical examination revealed decreased breath sounds at left lung. Thorax CT (tomography) showed pleural effusion in left pleura and masses of soft tissue to posterior. The patient was admitted to our clinic and was performed explorative thoracotomy and biopsy for diagnose and treatment. The histopathological examination of the pleural effusion and soft tissue biopsy

were reported indifferant malign tumor and non hodgkin lymphoma. The patient in postoperatively was discharged to the hematology clinic and was performed six cure chemotherapy. The patient was controlled twenty-four months after operation and was asymptomatic.

**RESULTS:** Thoracotomy is best resulted for diagnose and treatment. Histopathologic type is the major effect on prognosis. Lenfomas have best prognosis and good survival. A case of the primary pulmonary lymphoma was occasionally seen presented with the review of the literature.

### P-433-HEPARIN MISUSE CRIPPLES A PATIENT (CASE REPORT)

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Heparin-Induced Thrombocytopenia & Thrombosis Syndrome (HITS) ME is 50 year old male, driver, married has one son. He is IDDM, HT, Hyperlipidemic & heavy smoker (for 20 years). His story started since the beginning of 2005 as intermittent claudication of right lower limb associated with numbness & paresthesia. These symptoms progress to become distance claudication (20 meters) in spite of anticoagulant, stop smoking, controlling of DM, HT & hyperlipidemia. He consults many doctors & advised to do angiogram which done at the beginning of Feb. 2006 & the results were:- Total occlusion of the Rt. CIA extended to the CFA. Occlusion at the Lt. mid SFA extended to the femoro-popliteal junction with sufficient collateral branches. One week later, he became unable to walk few meters so admitted to the hospital & laboratory tests were done with no abnormalities (platelets count was 195,000). Heparin was started 30,000 i.u./day i.v. for ten days with little response. After that he can not tolerate his rest pain & became wheel chair related for this reason emergency bypass surgery was decided but postponed because our patient had thrombocytopenia (45,000) which discovered during preparation for surgery & for this result he considered unfit for surgery. He took nine units (1800ml) conc. platelets which increase the count to (81,000) for two days then surgery started, we surprised there was no oozing or bleeding as we expected but the reverse was happened, clots in the field, graft & the native vessels, the explanation was thrombotic phase of DIC so the intraoperative heparin increased to 10,000 i.u. with no any response. What happened & What is the solution??? We complete the surgical procedures & the graft end with inconvenient flow while the limb remains with the same changes. Blood analysis showed positive D-dimer, serum fibrinogen within normal level, PTT not prolong in spite of heavy dose heparin & platelets count 41,000. The hematologist explained what happened due to chronic DIC & advised to replace the heparin by LMW heparin. At the postoperative midnight, both lower limbs became paralyzed, cold, mottling & pulseless. Fogarty catheter was inserted in both CFA with extraction of massive fresh clots extended from the aorta to the CFA which immediately recur again & these procedures repeated four times with no response. Our aim & efforts directed to save his life not his limbs when we discovered that his tragedy story due to HITS. THE PATIENT STILL A LIFE BUT WITHOUT HIS LOWER LIMBS.

### P-434-TRANSVENOUS PACEMAKER IMPLANTATION IN THE PRESENCE OF PERSISTENT LEFT SUPERIOR VENA CAVA

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Since its inception, pacemaker therapy has been a useful tool in the management of some forms of cardiac dysrhythmias. Electrode implantation may be accomplished using either a transvenous approach or an epicardial approach. The transvenous approach is preferred in adults because of superior lead performance and battery longevity. Besides, the procedure can be accomplished under a local anaesthetic with a very low morbidity. Any of a number of venous access routes may be used to gain entry into the central venous channel to place the electrode in the right ventricular endocardium. The left subclavian approach is the favoured technique in many centres. Occasionally however, a venous anomaly such as a persistent left superior vena cava complicates electrode placement using this approach. This report focuses on such a case in which the diagnosis was made intra-operatively. A right-sided approach was adopted with success after repeated attempts at electrode placement failed using the left subclavian route. The post-operative left-arm contrast venogram

confirmed a persistent left superior vena cava draining into the right atrium via the coronary sinus.

### P-435-HEARTMATE II AND QUALITY OF LIFE: ELECTROMAGNETIC FIELD AND PRECAUTIONS AT WORK

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**BACKGROUND:** Many patients with a HeartMate II (HMII), as Bridge To Transplantation or Destination Therapy, are living at home and are trying to resume their normal lifestyle. We describe the precautions that have been taken at work of a 44 years old male HM II patient in a car repair workshop.

**METHODS:** Since the HM II is an electromagnetically driven axial flow pump, and some equipment used in a car repair workshop do need high electrical power, a VAD Coordinator visited the workshop to determine which equipment was used and if special precautions would be necessary. It was found spot-welding equipment is in use, that operates with alternating currents up to 8700 A/50Hz. This high electrical current creates an ElectroMagnetic (EM) field up to 140 A/m at a distance of 1 m. Since the operation of the HM II might be affected by an EM field exceeding 30 A/m, the EM field of spot-welding equipment can impede the operation of the HM II with serious consequences for the patient.

**RESULTS:** Calculations were performed and it appeared at a distance from 1,8 m of the spot-welding equipment, the EM field would not have an impact on the HM II. For safety precautions, patient was strongly recommended to observe a distance of at least 5 m.

**CONCLUSIONS:** Several studies show the improved Quality of Life (QoL) of patients at home on VAD support. An important issue in QoL is recurrence to daily activities, like normal labour. This is encouraged by hospital staff. Therefore, hospital staff is compelled to be aware of the characteristics of the LVAD in use and the surroundings and work situation of the patient. This makes it possible to provide patients with well-considered advice that might contribute to the safety of the patient in his own environment.

### P-436-A DIAGNOSTIC CONUNDRUM - ATRIAL SEPTAL DEFECT COEXISTING WITH CHRONIC CONSTRICTIVE PERICARDITIS

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The combination of atrial septal defect and chronic constrictive pericarditis is very rare and poses diagnostic challenges because one tends to mask the clinical features of the other. We report such a case in which the initial diagnosis was suspected to be chronic constrictive pericarditis; this was however discarded in favour of secundum atrial septal defect after transthoracic echocardiography. The final and complete diagnosis was made intra-operatively and the patient was relieved of both pathologies surgically.

### P-437-NORMOTHERMIC BYPASS IN PEDIATRIC CARDIAC SURGERY : EXPERIENCE WITH 1200 CASES

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**BACKGROUND:** We analyzed our experience with warm perfusion and blood cardioplegia in pediatric surgery. We applied this technique in our institution since 2002.

**METHODS:** The blood prime was warmed to 37 °C and this temperature maintained during all the bypass time. Warm blood injection add with potassium, magnesium and procaine with reinjections every 15 minutes was performed in 1200 patients. Arterial flow was maintained normothermic (37°C) at 150 ml/Kg/min. Venous drainage aspiration was used in the vast majority of cases. Analyzed parameters were: incidence of supraventricular arrhythmias (SVT),



delayed sternal closure, lactates level, right and left ventricular functions, duration of mechanical ventilation, and duration of intensive care unit (ICU) stay. The results were retrospectively compared with those obtained in patients operated on with cold blood cardioplegia with hypothermic bypass (28-30°C).

**RESULTS:** Normothermic bypass is associated with shorter bypass time  $p=0.0001$ . Lactate levels increased to a similar extent in both groups, but their normalization is faster in postoperative in group with normothermic bypass  $p=0.021$ . There were no differences in occurrence of SVT, duration of inotropic support, ventilation time, intensive care unit stay, and mortality in the two groups.

**CONCLUSION:** In our experience, normothermic bypass for open heart surgery in a pediatric population is as safe as hypothermic bypass. More refine studies should unravel subtle differences.

#### **P-438-MID-TERM RESULTS OF HANCOCK II AND CARPENTIER EDWARD PERIMOUNT VALVE AT PULMONIC PORTION.**

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**BACKGROUND:** Cases of artificial pulmonary valve implantation have been increased as young adult or adolescent congenital heart disease patients increased. In this study, we reviewed mid-term outcomes of bioprosthetic pulmonary valve implantation, especially Hancock II and Carpentier-Edward valve (CE), in our institution.

**METHODS:** Between December 2000 and October 2007, 146 artificial bioprosthetic valves were implanted at pulmonic portion to 132 patients. Including re-implantation, Carpentier Edward perimount(71), Hancock II(43), St.Jude Biocor(27) and homograft(4), handmade Gore-Tex vascular graft and membrane(1) were used for pulmonic valve. Among these patients, CE and Hancock II valve implantation patients (108) were reviewed. Underlying disease included tetralogy of Fallot(79), double outlet right ventricle(8), pulmonary atresia with ventricular septal defect(6), transposition of great arteries with pulmonary stenosis(4), critical pulmonary stenosis(3), pulmonary atresia with intact ventricular septum(3), absent pulmonary valve syndrome(2), truncus arteriosus(2) and pulmonary valve vegetation after correction of coarctation of aorta(1). The mean age was 12.8~Y6.6years at first pulmonic valve implantation. Pulmonic valve re-implantation was undergone 5.3~Y2.9years after first pulmonic valve implantation in 14 patients. Overall follow up duration was 36.0~Y24.2 months.

**RESULTS:** There was 1 operative mortality due to severe preoperative right ventricle failure and intractable ventricular arrhythmia. Three late mortality cases were due to progressive right ventricular failure, dilated cardiomyopathy and infective endocarditis. Overall survival rate and reoperation free rate were 96.3% and 89.8% respectively. Eight out of 65 CE patients(12.3%) were performed re-implantation for 49.2~Y25.2 months~ follow up duration. Reoperation free rate of CE valve were 97.7%, 93.4%, 87.7% and 50% at 1, 2, 3 and 5 years respectively. None of 40 Hancock II patients were performed re-implantation for 18.0~Y10.8 months. However, there was no statistical significance( $p$ -value=0.51) in reoperation free rate between these 2 kinds of valve. Six CE, 3 Hancock II and 5 Biocor valves were used in second operation. Main cause of reoperation was pulmonary stenosis insufficiency due to previous bioprosthetic valve leaflet~s severe calcification.

**CONCLUSIONS:** Overall survival rate of bioprosthetic valve implantation at pulmonic portion seemed tolerable. Carpentier Edward valve showed high reoperation rate rather than Hancock II valve, however, considering follow up duration, there was no difference in between valve types. However, bioprosthetic valves seemed to show relatively high reoperation rate at pulmonic portion in this adolescent patients rather than in adult acquired cardiac patients. It will be needed long term follow up for collecting more data.

#### **P-439-DIGIVENT - A NEW RESEARCH TOOL FOR AIR LEAKAGE IN LUNG SURGERY**

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**BACKGROUND:** Air leakage after lung surgery often prolongs hospital stay and increases morbidity and the cost of hospital care. There are many ways to minimize the risk of leakage, i.e. mechanical staplers and different kinds of glues or

adhesive patches. When comparative studies are performed, the investigators are forced to relay on soft data such as the time for removal of drains or length of hospital stay. Many confounding factors come into play. There is a need for a system capable of exactly measuring the air leaks day by day or even hour by hour. The recently developed DigiVent is such a system.

**METHODS:** We made the first tests with DigiVent in clinical practice. DigiVent is a disposable pleural drainage system equipped with an electronic chip that gives us continuous information of air leakage in ml/hour together with pressure readings from the pleura. All information is recorded and can be retrieved at any moment to facilitate decisions to remove the tube. The chip can be saved and the stored information can be presented as curves of leakage and pressures after the end of the treatment. The 70 first units were followed closely to find out the clinical reliability and the capability of data storage.

**RESULTS:** We found technical malfunctions in four units, necessitating their exchange. This was apparent at the latest on the first postoperative day and after this no units were changed, and the patients had perfectly functioning systems for the remainder of the time. All the chips were analysed and curves of air leakages could be retrieved in 100 % of cases. Several different patterns of leakage could be identified. No harm occurred to any patient due to the few deficient systems.

**CONCLUSIONS:** The malfunctions may be due to the fact that the drainage systems were the first from the manufacturing line. Many steps in the manufacturing process have now been corrected. In clinical practice the data from the chips were clearly presented to the satisfaction of the surgeons. It was possible to go back 1-6 hours to see the accumulated values of leakage. The stored curves may be filtered to be easily read and printed. The total amount of air leakage can be accurately calculated for each patient. This system will now increase the precision in all types of research where air leakage from the lung must be taken into account. In later versions the sum of the amount of leakage will be calculated automatically for the whole treatment episode.

#### **P-440-LEVELS OF TNF-ALPHA, INTERLEUKIN-6 AND OTHER BIOMARKERS IN NSCLC PATIENT'S PLASMA BEFORE AND AFTER RADICAL SURGERY**

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**BACKGROUNDS:** Recent studies suggest that interleukin (IL)-6 and tumor necrosis factor (TNF)-alpha are directly produced by the tumor cells and involved in the development of lung cancer. The aim of this study was to investigate the concentration of TNF-alpha and IL-6 in the blood of non-small cell lung cancer (NSCLC) patients before and after treatment.

**METHODS:** With Ethics Committee approval and written informed consent we enrolled 15 patients with histological evidence of NSCLC (11 men and 4 women, age 60+/-12 years) and 15 controls with non-malignant lung disease (9 men and 6 women, age 57+/-8 years). Adiponectin, leptin, plasminogen activator inhibitor-1 (PAI-1), IL6 and TNF-alpha were measured in both patients group at the beginning of the study, and in NSCLC patient group also 1 month after radical surgery- lobectomy or pneumonectomy.

**RESULTS:** In control group patients TNF-alpha was 3+/-0.6pg/ml and IL-6 was 1.1+/-0.4 pg/ml. In NSCLC patients group before surgery TNF-alpha was 4.87+/- 1.2 pg/ml and IL-6 was 1.17+/-0.44 pg/ml and after surgery TNF-alpha was 2.38 +/- 0.9 pg/ml and IL-6 was 1.26+/-0.6 pg/ml. In adiponectin, leptin, PAI-1 plasma level we did not find significant difference between both groups of patients.

**CONCLUSION:** Higher concentrations of TNF-alpha and IL-6 were found in plasma of NSCLC patients compared to healthy subjects. One month after surgery TNF- alpha level in NSCLC patients group decreased to control group level, but IL-6 level stay higher, than normal. These findings suggest that the measurement of TNF-alpha and IL-6 in plasma of NSCLC patients could be used for the diagnosis and the monitoring of evolution of this disease. **DISCUSSION:** we explain increased IL-6 level in NSCLC patients group after radical surgery as response to surgical trauma. Higher concentrations of TNF-alpha indicate presence of NSCLC (not treated or not radically resected NSCLC). This study was supported in part by European Social Foundation (ESF).



#### **P-441-OUTCOMES OF SURGICAL TREATMENT OF MALIGNANT AND NONMALIGNANT PERICARDIAL TAMPONADE WITH CANCER PATIENTS**

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**BACKGROUND:** The development of a pericardial tamponade in patients with cancer is becoming a more frequent emergency in thoracic surgery. Pericardial tamponade should be treated aggressively by open surgical drainage so that continuation of therapy for the primary malignancy would be possible. We aimed to evaluate the clinical features of acute malignant and nonmalignant pericardial tamponade with cancer patients and investigate risk factors affecting long-term survival.

**METHODS:** We studied 44 patients with concurrent malignancy who underwent pericardial surgery for pericardial tamponade between March 2001 to July 2007 at our cardiothoracic research hospital. The operation consisted of a small left anterior minithoracotomy with formation of a pericardial window in all patients. Most of our patients (82%) were submitted to an initial pericardiocentesis to relieve the symptoms before definitive surgery. Patients were classified into two groups: 23 patients with malignant pericardial tamponade proven by biopsy or cytology (Group 1) and 21 patients with nonmalignant pericardial tamponade (Group 2). Clinical outcomes, complications, hospital stay, recurrence of symptomatic pericardial effusions and reoperation rate were recorded. Patients were follow-up until time of last clinical examination or death. Overall survival was calculated from date of operation. Kaplan-Meier survival estimates were tested using the log-rank test. Multivariate Cox Regression Analysis was used to test the relationship of long-term postoperative survival to age, sex, type of malignancy, malignant or nonmalignant pericardial characteristic, pericardial tamponade free interval (time from primary cancer diagnosis to pericardial surgery), distant metastasis, Karnofsky performance status scale, previous chemotherapy or mediastinal radiotherapy, concurrent malignant pleural effusion. Statistical differences were considered significant if the p value was less than 0.05.

**RESULTS:** 23 patients; 17 male and 6 female (mean age, 57; range, 39-78 years) in group 1. 21 patients; 13 male and 8 female (mean age, 51; range, 22-83 years) in group 2. There is significantly differences in survival time between Group 1 and Group 2. The median survival time was 10.1 months (range, 2 to 47 months) in Group 1 versus 22.1 months (range, 2-75 months) in Group 2. One-year, 2-year survival rates were 46.5 %, 17.7 %, for patients group 1 and 66.6 %, 47.6 % for patients group 2. (p less than 0.0001). The 30-day mortality was 19.3 % for Group 1 versus 9.5 % for Group 2. (p less than 0.05). There were no deaths related to the operation. There were significantly higher postoperative complications in Group 1. Three of them experienced sepsis to leading respiratory insufficiency and pneumonia, two of them experienced left ventricular insufficiency and cardiac arrest. The postoperative hospital stay was longer in group 1 averaged 9.2 days (range, 5 to 22 days) whereas it was averaged 8.3 days (5 to 18 days). However, no statistical significance was observed between group 1 and group 2. Late constriction and recurrent pericardial effusion requiring reoperation were found 4.3 % in group 1, 4.7 % group 2. Long-term survival differed significantly between group 1 and group 2. (p less than 0.0001). Patients with breast cancer and lymphoma had significantly longer survival compared to patients with lung cancer in both groups. (p<0.05). Multivariate Cox Regression Analysis showed that age, sex, distant metastasis, performance status were not determinants of long-term survival. On the other hand, type of cancer, the presence of malignant tamponade and pericardial effusion free interval were predictors of long-term survival (p<0.0001).

**CONCLUSION:** Left anterior minithoracotomy is a safe method for surgical treatment of malignant and nonmalignant pericardial tamponade in patients with cancer and it ensures accurate diagnosis. The type of cancer, malignant pericardial tamponade (group 1) and pericardial effusion free interval, previous or present chemotherapy, previous or present mediastinal radiotherapy, concurrent malignant pleural effusion are major determinants of prognosis and long-term survival. Patients with breast cancer and lymphoma had significantly longer survival compared to patients with lung cancer in malignant and nonmalignant groups.

#### **P-442-OPEN THORACOTOMY AND DECORTICATION FOR CHRONIC EMPYEMA**

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**BACKGROUND:** Traditionally, chronic empyema has been treated by thoracotomy and decortication. Some recent reports claim videothoracoscopy has similar results in the treatment of chronic empyema but with less morbidity and mortality than open procedures. Experiences with the use of thoracotomy and decortication as treatment for chronic empyema at the Santo Tomas Hospital are reviewed.

**METHODS:** This is a retrospective, descriptive and observational study. We present a series of 33 patients with chronic empyema who were treated at Santo Tomas Hospital from March 1992 to June 2006. Information gathered from the charts include: sex; age; habits; duration of symptoms; co-morbidity; etiology of empyema. Diagnosis was made based on duration of signs and symptoms before definitive treatment, culture of pleural fluid, determination of biochemical parameters and image studies. The latter included chest roentgenograms, computed tomography and ultrasonography. All patients underwent open thoracotomy and decortication. The duration of operation, blood losses, duration of post-operative chest drains, complications, mortality, post-operative stay and follow up was recorded.

**RESULTS:** Twenty seven patients (82%) were male. The average age was 34 y/o. Nineteen (57.5%) were referred from outside Panama City. Etiology was pneumonia in 26 patients (78.8%) and trauma in 7 (21.2%). In all cases, image studies consisted of chest roentgenograms, with chest computed tomography in 21 (63.6%) and ultrasonography in 15 (45.5%). The length of symptoms and signs before definitive treatment was an average of 37 days. Surgical approach was postero-lateral thoracotomy and limited thoracotomy based on findings from chest computed tomography. Surgery lasted an average of 139 min (range, 60-225 min) and the average blood loss was 531 ml. The first chest drain was removed on day 4 (range 2-11 days) and the second one on post-operative day 5 (range 3-17 days). There were 3 (9%) complications: Two prolonged air leaks and one patient required an empyema tube for 4 weeks—there was no mortality. The post-operative length of stay was an average of 10 days and patients resumed daily activities by week 4 post-operative. Follow up examinations averaged 6 months and there were no recurrences of empyema.

**CONCLUSIONS:** Open thoracotomy and decortication can be achieved with low morbidity and mortality. It is very effective in the treatment of chronic empyema. Functional results in the long term are especially promising. This operation continues to be the standard in the management of chronic empyema. Validation of other surgical approaches should be based in comparative, prospective and controlled studies.

#### **P-443-MANAGEMENT OF BULLOUS LUNG DISEASE**

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**AIMS:** To assess results of surgical management of Bullous Lung Disease at Peshawar.

**METHOD:** From June 2002 to December 2005 36 patients with Bullae presented to Cardiothoracic Unit LRH. M: F ratio was 20: 16. Age range was from 3 months to 42 years with a mean age of 27.3 years. Out of 36 patients 24 presented with recurrent pneumothorax while 12 presented with dyspnea & chest pain and large bullae on CXR & CT Thorax. CXR was done in all cases while CT Thorax was done in 12 cases. Sizes of bullae were < 1cm in 4 cases, 1 -3cm in 6 cases, 3-5cm in 10 cases, 5 -7cm in 12 cases & >7cm in 4 cases. Twelve patients had already been intubated and were referred with non-resolving air leaks. Procedures done were Bullectomy 24, Lobectomy 9, Bilobectomy 2 and Pneumonectomy 1.

**RESULTS:** Morbidity was 3/36 in the form of air leak 1 & wound infection 2, which were old intubation side wounds. There was no mortality.

**CONCLUSION:** Bullous Lung Disease can present either acutely as pneumothorax, or progressively worsening dyspnea. It is important to distinguish between bulla & pneumothorax. Simple pneumothorax requires evacuation (either needle aspiration or chest intubation) with / without suction. Intubation of Bullae would result in bronchopleural fistulae. Bullae require surgical excision, the result of which with morbidity of 3/36 and no mortality are quite good. Young patients with short history of dyspnea, no sputum production, nonsmoker with optimal PFTs and localized single bulla have excellent surgical outcome.

#### **P-444-MANAGEMENT OF EMPYEMA THORACIS PESHAWAR - EXPERIENCE OF 450 PATIENTS**

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**AIMS:** To observe the various clinical presentations of Empyema Thoracis and evaluate its management and outcome. Study Design: An observational descriptive study Place and Duration: Department of Cardiothoracic Surgery, Postgraduate Medical Institute, Lady Reading Hospital from June 2002 to June 2007.

**MATERIALS AND METHODS:** Clinical record of 450 patients who underwent various surgical procedures during 3 years were retrospectively analyzed. Detailed scrutiny of record was carried out to analyze the clinical presentation; various surgical procedures and outcome.

**RESULTS:** There were 270 (60%) male and 180 (40%) female patients. Majority of the patients 310 (68.8%) were in the age range of 20 - 40 years. Common presentation was fever (62%); cough (26%) and chest pain (11%). The duration of symptoms was less than 8 weeks in 57 % and more than 8 weeks in 42% cases. Common etiologies were pneumonia (31%), post tuberculosis (37.7%), traumatic (24%) and iatrogenic (6.6%). Tube thoracostomy was the initial line of management in 200 patients. Decortication was required in 200 patients while 50 patients needed thoracoplasty to obliterate persistent residual pleural space. The mortality was 4% (18/450). Thirty one (7%) had wound infection, air leak in 18 (4%), wound dehiscence in 9 (2%) and septicemia in 14 (3%) cases.

**CONCLUSION:** Depending upon the stage, various surgical options exist for the treatment of thoracic Empyema. Selection of the most appropriate procedure must be individualized but the basic principle is evacuation of pus from the pleural space, appropriate antibiotic therapy and obliteration of Empyema cavity.

#### **P-445-EARLY SURGERY FOR PULMONARY TUBERCULOSIS**

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**AIM:** The purpose of our study was to analyze current indications for surgery in tuberculosis and evaluate the outcome of early surgical intervention.

**METHOD:** Total number of cases was 132; M: F 105: 27. Age range was 20 to 79 years. Mean age was 48.4 years. The indications for surgical intervention included 5 cases of pulmonary Aspergilloma, 9 cases of Pneumothorax; 3 cases of pulmonary nodes and masses without histological diagnosis, 15 cases bronchiectasis, 12 cases of massive Hemoptysis and 82 cases of pleural Empyema while six patients with multi drug-resistant tuberculosis required surgical intervention. Out of 132 cases, 54 were sputum severe +ive pre-op.

**RESULTS:** The surgical procedures performed are Lobectomy in 45 cases, pleural drainage in 20 cases, segmented pulmonary resection in 32 cases, surgical procedures on the chest wall in 17 cases, Pneumonectomy in 10 cases, Decortication in 8 cases. In 22 cases two or more procedures were performed on the same patient. In 26 (19.6%) cases various complications were noted of which wound infection was the most frequent (11 cases). Post-op out of 67 sputum positive cases, 42 became sputum negative. There was a mortality rate of 3.3% (4 cases).

**CONCLUSION:** Surgical treatment is indicated for the complication of TB and management of MDR TB. Early surgery is beneficial in patients whose disease is still localized and who can tolerate resection surgery; of particular importance is a healthy opposite lung, on which the patient would be dependent during and immediately after surgery.

#### **P-446-SURGICAL MANAGEMENT OF BRONCHIECTASIS AN EXPERIENCE OF 100 CASES**

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**AIMS:** To observe the various clinical presentations of bronchiectasis and evaluate its surgical management and outcome.

**METHOD:** Computerized clinical data of 100 patients surgically managed during two and a half years was retrospectively analyzed. Detailed scrutiny of the record was carried out to determine various procedures done and analyze the clinical outcome.

**RESULTS:** A total of 100 patients underwent various surgical procedures. Male: Female ratio was 78: 22; age range was 15 - 48 years with a mean age of 23.7 years. The predominant clinical presentations were productive cough in 55 (55%); recurrent chest infections in 30 (30%) and Hemoptysis in 15 (15%) patients. The mean operative time was 68 (40 ±) minutes. Seventy two (72%) patients underwent Lobectomy, in 18 cases (18%) Pneumonectomy, in 6 cases (06%) Bilobectomy and lingulectomy in 4 cases (04%). Postoperative morbidity was 6 (6%). Three patients required ventilatory support postoperatively; prolonged air leak was noted in 2 cases and post-resection empyema in one patient. There was one mortality due to ventilatory failure. This was a 45 years old male patient who developed respiratory distress postoperatively and could not come off ventilator. Seventy two (72%) patients were asymptomatic in the follow-up, 24 (24%) experienced improvement in symptoms and in 4 (4%) patients symptoms were unchanged.

**CONCLUSION:** Surgical resection for bronchiectasis can be performed with acceptable morbidity and mortality at any age. The involved bronchiectasis sites should be resected completely for the optimal control of symptoms.

#### **P-447-ESTIMATION OF LIPID METABOLISM OF ATHEROSCLEROTIC CORONARY ARTERIES AT PATIENTS WITH UNSTABLE ANGINA**

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Nowadays dislipidemia remains as an important risk factor at the development of cardiovascular diseases. Several trials showed that the decreasing total level of cholesterol to the 10% decreases cardiovascular death rate to the 15% and the total death rate to the 11%.

**BACKGROUND:** estimation of lipid spectrum at patients with unstable angina at the preoperative and postoperative periods.

**METHODS:** 30 patients with unstable angina who had a multivessel coronary disease were operated at department of coronary surgery in 2006 year. All patients took a lipimar (atherovastatin) 10 mg daily during the 6 months after operation. 28 patients were male (93,3%) and 2 female (6,7%).

**RESULTS:** We have estimated lipid spectrum in all patients before and after coronary artery bypass operations. Initially there were an elevation of the cholesteroline, common lipoproteids and free lipid acid levels to the 5%, 20% and 8% respectively. Pre- and postoperatively we have revealed the increased means of total cholesteroline and low density lipoproteids (before operation - 6,8 mmol/l and 4,8 gr/l; after operation 5,74 mmol/l and 3,78 gr/l, while the normal means are 5,2 mmol/l and 3,4 gr/l for each respectively). The level of high density lipoproteids decreased to the 25% after operation. 6 months follow-up after operation with using lipimar in the 10 mg daily dosage showed decreasing level of total cholesteroline to 6% and low density lipoproteids to 11%. The level of high density lipoproteids increased to 6%.

**CONCLUSION:** management of patients with unstable angina in the postoperative period should include statine drugs.

#### **P-448-NEONATE AND PEDIATRIC CARDIOPULMONARY BY-PASS: EXPERIENCE IN QUEEN SIRIKIT NATIONAL INSTITUTE OF CHILD HEALTH**

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The open heart surgery in Queen Sirikit National Institute of Child Health has been organized since 1992. We have operated 4-5 cases per week. The most common cases are 1.Ventricular septal defect 2. Tetralogy of Fallot 3.Atrial septal defect. The patient's weight ranged between 1.8 - 65 kilograms. We have used 6 pump heads: 1 for the arterial pump, 1 for vent and 4 for suction pump. The oxygenator's surface area is about 0.5 - 2.5 square meter and integrated with the arterial filter and the hemoconcentrator. There are 4 types of the circuit, depend on the patient's body weight. The myocardium was protected by using St.Thomas formula crystalloid solution and 1:1 blood cardioplegic solution. The conventional ultrafiltration was performed in all patients and the veno-venous modified ultrafiltration was performed in lesser than 10 kilograms body weight children.

#### **P-450-A NEW APPROACH FOR A HYPOTHERMIA TREATMENT WITH LESS INVASIVE CARDIOPULMONARY BYPASS CIRCUIT FOR CARDIOPULMONARY ARREST PATIENTS**

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**BACKGROUND:** Hypothermia therapy for return of spontaneous circulation (ROSC) patients was recommended on the AHA/ACC Guidelines 2005. Rapid and stable cooling is very important, but the method for cooling is controversial. We introduce our novel and safety hypothermia procedure with less invasive cardiopulmonary bypass (CPB) circuit for ROSC patients. Induction of hypothermia with CPB was very faster than other method. In addition, children's use bypass circuit has some benefit compare with adult circuit.

**METHODS:** This procedure is indicated for unconscious ROSC patients under 75 years old after cardiogenic cardiopulmonary arrest (CPA) with witness, and excluded with brain hemorrhage, traumatic CPA, and easily bleeding patients. This CPB was established immediately with children's size perfusion cannula tubes were inserted via femoral artery and vein. Hypothermia was induced with heatexchanger within 10~15 minutes, and target temperature was 34~35 degrees Celsius at deep body temperature. The centrifugal pump was set at 1~1.5 L / min, and hypothermia was kept for 36~48 hours with sedations. Both catheters were removed after weaning CPB by surgical method. The patient was rewarmed 1 degrees Celsius a day, and extubated after verification their consciousness.

**RESULTS:** 6 of 7 cases were recovered and conscious and they could return home on their foot. And deep body temperature were stable during hypothermia therapy. Some bleeding, hemolysis, and lymphorrhea were seen, but any major complication was not seen.

**CONCLUSION:** Our less invasive hypothermia CPB therapy was safety and easy. This procedure had potential for good outcome for ROSC patient.

#### **P-451-REVIEW OF CARDIOTOMY TRIAL THE EFFECT OF PROCESSING OF SHED BLOOD DURING CARDIOPULMONARY BYPASS ON TRANSFUSION AND NEUROCOGNITIVE FUNCTION**

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**BACKGROUND:** Reinfusion of unprocessed cardiomy blood may contribute to post operative neurocognitive dysfunction. While processing of cardiomy blood may potentially contribute to coagulopathy. During this trial we assess the effect of processed and unprocessed cardiomy blood on transfusion rates, post operative coagulopathy and neurocognitive functions.

**METHODS:** 266 patients undergoing coronary and /or Aortic Valve Surgery using cardiopulmonary bypass were randomized into CONTROL GROUP (n=134) to receive unprocessed cardiomy blood and TREATMENT GROUP (n=132) to get processed cardiomy blood. Patients and physicians were blinded to treatment assignment. A strict transfusion protocol was followed and data were analyzed using Poisson regression. Patients were monitored intraoperatively by Transcranial Doppler and underwent Neuropsychometric Testing.

**RESULTS:** The treatment group have higher intraoperative red blood cell transfusions, and have higher postoperative bleeding rates. There was no difference in the incidence of postoperative cognitive dysfunction.

**CONCLUSIONS:** Reinfusion of processed cardiomy blood results in higher transfusion rates and greater postoperative bleeding. There is no clinical evidence of neurological benefit with processing cardiomy blood during cardiopulmonary bypass.

#### **P-452-PROGNOSTIC FACTORS AND RESULTS IN 18 SURGICALLY TREATED PATIENTS WITH PRIMARY SARCOMAS OF THE HEART AND GREAT VESSELS**

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**BACKGROUND:** Primary sarcomas of the heart and great vessels (PSHG) are

very rare.

**STUDIES:** including large series are correspondingly scarce, so that in the absence of data from clinical trials, treatment has to rely on data from case reports, and personal experience. We report on one of the largest series of PSGH, studying tumor (Tm) distribution and extent, the feasibility of surgical resection, and survival after resection.

**METHODS:** Between 1988 and 2005, 18 patients (mean age 52 + 15 yrs, m: n=10) with PSHG were treated surgically at our institute. A retrospective descriptive study of the data is presented.

**RESULTS:** Tumors affected the pulmonary artery (n=6), the inferior and superior vena cava (2 each), pericardium/ascending aorta (n=1), the left side (n=5), the right side (n=8) and both sides (n=5) of the heart. The most frequently encountered histologic subtypes were angiosarcoma (n=5), malignant histiocytoma (n=3), fibrosarcoma (n=3), leiomyosarcoma (n=3) and other sarcomas (n=4). Three patients presented with distant metastases. Total resection was possible in 5 patients with leiomyosarcoma (n=2), malignant histiocytoma (n=2) and angiosarcoma (n=1) (group I), and in 10 others tumor reduction was performed (group 2). In 3 patients no resection was possible (group III), as the tumor had completely infiltrated the heart in two patients and in one patient the operation was interrupted because of perforation of the left ventricle. The affected structures were reconstructed whenever possible. In one patient a pneumectomy was additionally performed. In five cases the operation was performed as an emergency because of acute hemodynamic deterioration. In one patient the diagnosis of angiosarcoma was made accidentally, because the tumor was mimicking an acute lung embolism. The total follow-up time was 28.9 patient years (median 0.67, range 0 - 13.9). The actuarial survival after 30 days, 1 year 1.5 years and 2 years was 83.5 + 8.8%, 84.2 + 12.9%, 24.2 + 10.4% and 18.1 + 9.4%. Survival in group I (median 22, range 13.6-162 months) was higher than in group II (median 5.5, range 0.03-27 months). One patient in group II died 4 months postoperatively of cerebral ischemia. Postoperatively in four cases local recurrences and/or distant metastases occurred.

**CONCLUSIONS:** Complete resection of primary sarcoma of the heart and great vessels, when feasible, can achieve prolonged survival. The prognosis correlates mainly to the extent of the tumor and the feasibility of complete resection. Despite the advances in diagnostic and operative technique as well as the improved chemotherapeutic agents, the results remain in many cases modest. In young patients without distant metastases and where complete resection is not possible due to local extension of the tumor into intracardiac vital structures, the implantation of a total artificial heart as a bridge to heart transplantation should be discussed.

#### **P-453-MANAGEMENT OF TRACHEAL INJURY DURING TRANSHIATAL ESOPHAGECTOMY**

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There is a variety of surgical approaches for esophageal resection. Although, transthoracic esophagectomy is one of the most common approaches to esophageal resection, transhiatal esophagectomy has been widely accepted as an alternative approach with potentially less risk and morbidity than the more traditional transthoracic resection. (1) Membranous tracheal and bronchial injuries are potentially lethal complications of blunt transhiatal mobilization of esophagus. (2,3) The incidence of tracheal injuries has fallen to less than 10% as experience was gained with the procedure. (4,5,6) Various methods of repairing tracheal lacerations have been described. Many of them involve a thoracotomy, but some do not. We describe herein a transcervical-transsternal repair of membranous tracheal lacerations during transhiatal esophagectomy in two of our patients.

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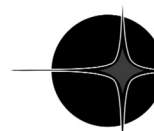
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