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INTRODUCTION

Specialty under Attack: Where is Cardiac Surgery Heading?

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The year 2003 will be remembered as the year of the war in Iraq, SARS, and realization of how national security, or the lack of it, affects everywhere and everyone. Cardiac surgeons will have one more serious issue to handle; for the first time in many decades, cardiac surgeons are concerned by the palpable decline in the number of surgical revascularization cases. Both percentage and absolute number of coronary artery bypass procedures performed in the US have dropped. Surgeons who additionally practice general thoracic, vascular, or general surgery are likely to heed the wave and survive. Others who do not have a diverse practice seem to have no alternatives and struggle on a daily basis to keep cardiac surgical cases trickling. Some may opt for a radical change in career and seek other businesses and corporate positions.

Is it all doom and gloom? Not likely. As in the past, new technology and innovative cardiac surgery techniques released and presented in more detail at this year's CTT meeting promise a prosperous future for our specialty. Several emerging themes are likely to shape the way we will practice cardiovascular surgery in the next quarter of the century. *These ideas, directions, techniques and technologies will have to be channeled in an effective education, reimbursement, and quality-control path (ERQP) for it to take its essential position in cardiac surgery of the future.*

What is Hot This Year?

So what are the growth areas in cardiovascular disease and where do cardiac surgeons fit?

Heart failure is certainly the hottest area, with the recognition of an ever-expanding pool of patients with bad ventricles. Cardiac surgery will have a role in only a small fraction of this pool, which is guarded heavily by clinical cardiologists and a giant pharmaceutical industry. Devices and procedures for ventricular and valvular remodeling, destination ventricular assist devices, and biotechnology for cell therapy are feasible options, which need to fit into the ERQP as soon as its validity is confirmed. At this year's CTT meeting we saw several powerful presentations on the state of the art of left ventricular support devices. We also heard numerous presentations on left ventricular remodeling techniques by Dor, Menicanti, Califiore, and others. Several innovations in the field of beating heart mitral valve repair prove to be promising as solutions for some heart failure patients. Furthermore, biventricular resynchronization pacing may yet expand the role of surgery in treatment of heart failure by opening the option of thoracoscopic and thoracic access for epicardial lead implantation.

At this year's meeting, **surgical treatment for atrial arrhythmias** was very much a central theme, with 7 symposia and original scientific sessions, more than 40 presentations, and 4 live case transmissions on the topic. This field carries the most promise for rapid adoption and integration in our daily practice. The magnitude of the problem of atrial fibrillation in patients presenting for other cardiac surgical procedures and the simplification of the principle of the Maze procedure with recently introduced surgical ablation devices, should allow every surgeon to routinely attempt adjunct ablation in these patients. More innovative, less invasive access and AF ablation devices will likely permit us to play a more significant role in the treatment of lone AF. Clearly some fine-tuning and long-term experience will likely influence our choices of indications, techniques, devices, and postoperative management.

Role of Surgeons in Catheter Based–Intervention

Unquestionably, the area of technological growth with most significant impact on the treatment of coronary artery disease is currently perceived not to be a surgical one: percutaneous catheter-based intervention (PCI). With 70% of occlusive coronary disease treated today by PCI, no wonder surgeons are feeling despair. Ironically, this was exactly the way vascular surgeons felt when interventional radiologists took over and expanded the utility of endovascular techniques for the treatment of peripheral vascular disease. Fortunately, and despite a delay in start, vascular surgeons were able to regroup, retrain, and get into the endovascular game. Will cardiac surgeons ever be able to practice PCI? I personally believe it is possible.

It is unlikely that we would be welcome in the catheter laboratories. It is also unlikely that cardiologists would willingly offer us training to become interventionalists. In fact, it is likely that regulations and certification to practice PCI will become more challenging and difficult to obtain. It is hence essential that we develop a rational approach for the development of PCI technology essential to our practice today and in the future. Today, for example, it is inconceivable that a vascular surgeon would close an incision after performing a femoro-popleteal bypass without performing an intraoperative completion angiography; yet we, on a daily basis, perform much more delicate coronary artery bypasses without performing completion angiographies! Is it likely that advocating and practicing routine completion angiography could be our way to justify and establish operative angiography suites and hence be our door to an introductory role for surgeons in PCI in addition to surgery? Certainly much of percutaneous catheter technology can readily be adapted to surgical approaches, and unquestionably surgeons are versatile and technically capable of rapidly learning catheter-based skills.

Such transformation will require willingness by surgeons and industry to take this necessary step and to promptly

develop programs geared toward making available new surgeon-friendly intraoperative diagnostic and intervention catheters. We must also make the case to our hospital administrators that we need better imaging technology in the operating rooms and that it would be inconsistent with good modern practice not to have proper angiographic capabilities for completion angiography. It is hoped that, once this becomes standard practice, we could expand the utility of intraoperative imaging technology to other catheter-based interventions.

Anastomotic Devices: They Are Here To Stay!

This year we have seen a continuous growth in the development and validation of innovative proximal anastomotic tools. The impetus is on avoiding aortic manipulation and hence reducing associated morbidity such as stroke and aortic dissection and at the same time possibly reducing anastomotic time and enabling less invasive access.

It was interesting to see the St. Jude aortic connector, currently the leading anastomotic device, enter the fourth phase of its technology life. In this phase, pessimists often jump their guns and assume that a technical limitation is indication that the technology is doomed, but this phase serves to stimulate the development of a better product and ultimately force itself as a mature, well established, and accepted technology. There were anecdotal reports of events such as bleeding, graft thrombosis, and early occlusion in association with using the St. Jude anastomotic device. Yet the overwhelming number of devices used worldwide and the minuscule incidence of major events registered and reported by the company continue to give it necessary credibility and acknowledgment as the only proximal anastomotic device with continuous good track record available in the market. However, this lead may not last, and new anastomotic devices such as the one developed by Cardica is just about to be introduced to European markets after a successful clinical trial, data of which were presented at this year's CTT meeting.

Certainly the vision of applying distal anastomotic platforms soon remains illusive despite several promising animal experimental studies and some interesting yet protracted preliminary clinical trials. Attendees were left with an uncertain outlook on the current positions of the Solem-Jomed distal anastomotic connector and where, in its laboratory and clinical trials, technologies developed by CardioVations, Ventrica, Percardia, Vasconnect, and others exist. It is most likely that many of the corporate technology developmental decisions are currently influenced by today's cautious and hostile anti-surgery venture capital environment.

How Will We Pay for New Cardiac Surgery Technology?

During the last day of CTT 2003, we were privileged to hear key surgeons and industrialists share their views on the magnitude of the problem of "Our Specialty Under Attack" and "Where it is heading?" We learned that the erosion of surgical revascularization by PCI is acute, chronic, and severe. We also learned that competitiveness among surgeons and surgical programs for a shrinking share of the pie is devastating. A more productive action for surgeons would be to make adjustments in their skills and type of practice and to espouse new and less invasive cardiovascular techniques and technologies and endovascular procedures. Development of new patient/surgeon–friendly procedures such as surgical ablation for atrial fibrillation, resynchronized biventricular pacing, and new simple and elegant surgical solutions to remodel failing hearts and valves can in time, with proper ERQP, become an important platform for most cardiovascular surgeons.

A major lingering question is how, once new cardiac surgery technology is introduced clinically, will it be paid for and through which reimbursement path? In fact, one should ask if reimbursement itself would be a reason d'etre for a stronger adoption by cardiac surgeons of an efficacious technology. It is hence unlikely that new technology will be readily acceptable unless this key question is addressed with a good understanding of the powers that influence it.

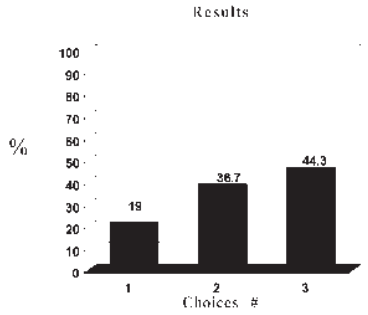
This question will most likely become a key subject to be addressed at next year's CTT forum and will need the professional advice of experts who have had significant experience in this area.

This year as in previous ones, we generated data from our audience response questions. I have included some of the more interesting ones on the following pages. You may access all of the survey by clicking into our Web site www.cttweb.net.

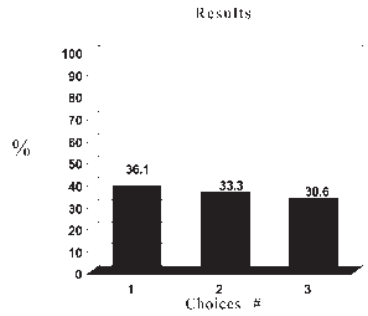
Next year is a special one for CTT as we enter our tenth year with a special anniversary meeting. We will have the opportunity to examine what we have accomplished in the last ten years in the field of cardiothoracic techniques and technology. What has been accepted and what has failed the test of time and the rigor of surgical evaluation? We will review the facts and myths in innovative procedures and devices and will explore the future of our specialty and what lies on the horizon for us. As expected, we promise to bring you the most comprehensive educational program on new cardiac surgery techniques and technology. I invite you to join us. Please plan to be with us on this special tenth anniversary meeting March 10-13, 2004, in Miami Beach, Florida.

Sample Meeting Audience Responses

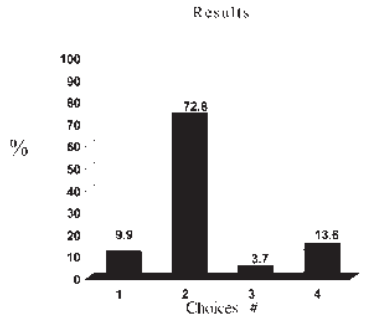
1. In the last 6 months, has the number of cases referred to you for CABG?
   (1) Increased.
   (2) Decreased.
   (3) Remained the same.



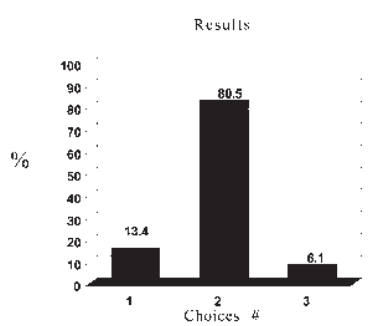
2. How would you best describe the referral pattern to you for CABG?
   (1) It takes a lot more effort and networking with cardiologists to maintain the same case load.
   (2) Despite increasing efforts and networking with cardiologists our case load has gone down.
   (3) I practice in a protected environment and our case load has not changed.



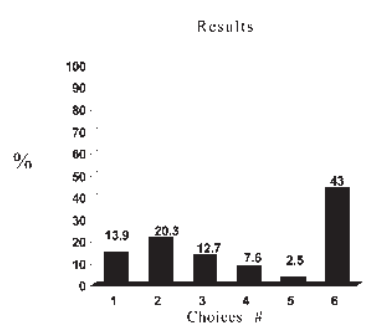
3. What is the principal cause of declining referrals to cardiac surgery?
   (1) Competitiveness among cardiac surgeons and groups.
   (2) Exponential growth of interventional cardiology.
   (3) Patients choosing not to undergo surgery.
   (4) There is no decline in referral to cardiac surgery.



4. In your opinion, do you believe that the decline in referral for CABG has or will secondarily drop the referral for valve surgery?
   (1) Yes.
   (2) No.
   (3) Not sure.

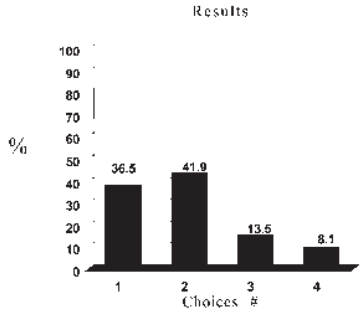


5. In your hospital, what was the percentage decline in the number of CABG procedures performed in the year 2002?
   (1) Less than 5%.
   (2) 5%-10%.
   (3) 11%-20%.
   (4) 21%-30%.
   (5) More than 30%.
   (6) Do not have a decline.

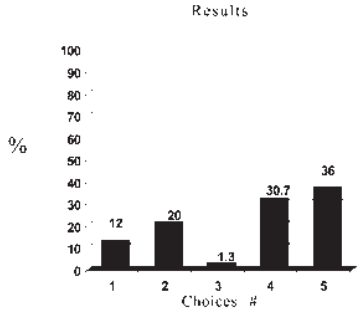


Sample Meeting Audience Responses

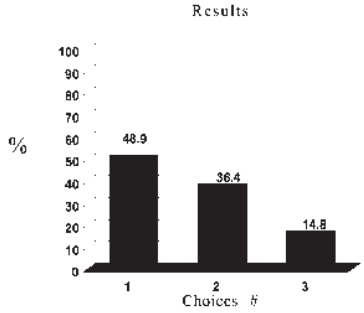
6. Based on what you have observed last year and in the first 2 months of this year, do you expect the number of CABG procedure to:
   (1) Continue to decline further?
   (2) Remain the same as last year?
   (3) Increase?
   (4) Not sure.



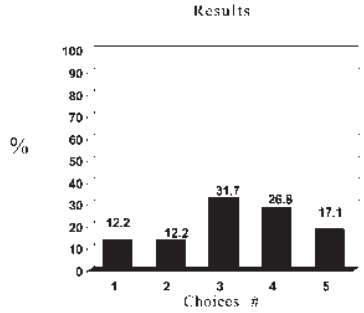
7. If CABG procedures performed by you in the next 12 months continue to decline, what other professional options do you have?
   (1) Do more general thoracic surgery.
   (2) Do more vascular surgery.
   (3) Do more general surgery.
   (4) Retire and do business administration.
   (5) Do not have any options.



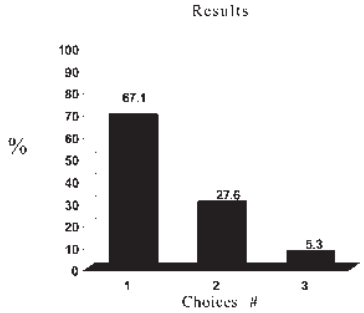
8. In the past, the specialty of vascular surgery went through a similar crisis when interventional radiologists started performing endovascular therapy. Vascular surgeons thereafter adopted these techniques and survived. Do you think cardiac surgeons can and should be involved in catheter-based therapy (PTCA)?
   (1) Yes.
   (2) No.
   (3) Not sure.



9. Assuming that interventional cardiologists will not allow cardiac surgeons to perform PTCA, what venue do you think will most likely allow cardiac surgeons to gradually be involved?
   (1) Apply and lobby for a pathway for cardiac surgeons and residents to train and certify in the catheter laboratory.
   (2) Start performing routine completion coronary angiography after CABG.
   (3) Start performing intra-operative hybrid CABG-PTCA.
   (4) All of the above technology.
   (5) Do not have a venue. We lost the battle!

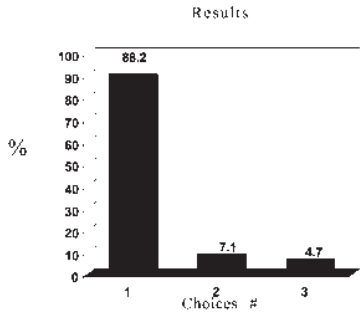


10. If you were offered a training program that would lead to certification in interventional cardiology techniques, would you take it?
    (1) Yes.
    (2) No.
    (3) Not sure.



Sample Meeting Audience Responses

11. Do you think that many interventional cardiologists overstate the success of their coronary intervention (angioplasty and stenting)?
    (1) Yes.
    (2) No.
    (3) Not sure.



12. Do you think it is time to start having hospital-based, regional or national audits of results of coronary angioplasty and stenting?
    (1) Yes.
    (2) No.
    (3) Not sure.