The Heart Surgery Forum®

# KEY REFERENCES

## MIDCAB, Endo ACAB, and Hybrid Coronary Revascularization

Minimally invasive direct coronary artery bypass (MIDCAB) via a left anterior small thoracotomy without cardiopulmonary bypass (CPB) was popularized by Benetti et al in 1995. Since then, large series have been performed in many centers around the world with excellent angiographic patency rates of the left internal mammary artery (LIMA) to the left anterior descending coronary artery (LAD) anastomosis at midterm follow-up. The procedure has since been modified to make it even "less invasive" by using 2 to 3 5-mm port incisions to harvest the LIMA via (1) standard hand held thoracoscopic techniques, (2) with a voice-activated robotic camera system (AESOP), or (3) using full robotic technology (Zeus or DaVinci). The endoscopic atraumatic coronary artery bypass graft (CABG) is a modification of the MIDCAB procedure that avoids rib spreading, using an intercostal muscle incision to perform the LIMA to LAD anastomosis on the beating heart. The widespread acceptance of these procedures has been limited by the number of patients with single vessel coronary artery disease limited to the LAD. The concept of "hybrid" or "integrated" coronary revascularization is the combination of minimally invasive coronary artery bypass grafting (such as MIDCAB or Endo ACAB) of the LAD using the LIMA combined with percutaneous coronary intervention (PCI) of other diseased vessels. The rationale of a hybrid technique is to take advantage of the best of both surgical and interventional approaches for revascularization of the ischemic myocardium in suitable patients. The LAD is the most important vessel of the heart, supplying up to 70% of the left ventricular muscle mass; patency of the LIMA to LAD bypass graft is a major determinant of survival. There is wide consensus, among both cardiac surgeons and interventional cardiologists, that the best revascularization modality for the LAD is a surgical bypass using the LIMA. As such, the current composition of KEY REFERENCES provides scientific contributions to the advancement of this nascent field of integrated coronary revascularization, namely MIDCAB with PCI, Endo ACAB with PCI, and in the future, robotic endoscopic CABG combined with PCI (the "robo" hybrid procedure).

### *Review Chapter*


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### *Thoracoscopic Internal Mammary Harvesting*


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### *Hybrid Revascularization (MIDCAB with Angioplasty/Stent)*


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