

Editorial Commentary I

Yen Chang

Division of Cardiovascular Surgery, Taichung Veteran General Hospital and College of Medicine,
National Yang-Ming University, Taipei, Taiwan

Robotic-assisted coronary artery bypass grafting is newly developing surgery in Taiwan, although it has been utilized for open heart surgery in North America and Europe for some time. There are two types of machine utilized clinically on world market, the Zeus and da Vinci surgical systems. The research and development of the former seems to be ceased since it was merged with the latter in 2003. One Zeus surgical system has been set up in early 2002 at Show-Chwan Memorial Hospital in Chunghua, Taiwan. It was quite often used for general surgery, but no formal report of successful open heart surgery. A da Vinci surgical system was set up at Tri-Service General Hospital, Taipei in 2004, and 10 successful cases performed with it from January to September 2005 are reported in this paper by Dr. Tsai and colleagues.¹ All of the cases were single-vessel disease with left anterior descending coronary arterial lesions. The left internal thoracic artery was taken down through three small ports on the left chest wall by robotic surgical instruments. Then the coronary artery anastomosis was performed by surgeon hands under direct vision thru an extended camera port incision. Two cases were accomplished with another anastomosis to a diagonal branch, bridging with radial artery. The results were good, but the advancement might be pushed with more arduous effort. Clinically, the incidence of pure single-vessel disease of coronary arterial disease needing bypass grafting is very low. If surgeons cannot improve their surgical indications or cooperation with interventional cardiologists for so-called hybrid solution, the utilized field of this robotic system for coronary arterial disease would be very limited.

There are many ways to harvest the internal thoracic arteries, but employing computer-enhanced endoscopic instruments seems the best. The challenging work really begins after the graft vessel is harvested. Totally endoscopic coronary artery bypass grafting (TECAB) under either cardiopulmonary bypass or off-pump is definitely unsuitable for a beginner. A small left anterior thoracotomy

combined with direct one coronary bypass grafting without pump support is the most reasonable initial program.² After this, a sequence for multi-vessel small thoracotomy (MVST) coronary artery bypass grafting could be developed step by step.³ The target vessel other than left anterior descending coronary artery could be grafted with right internal thoracic artery, radial artery, right gastroepiploic artery and great saphenous vein. If arterial conduits are chosen, they could be constructed as a composite graft. If venous conduit is chosen, an aortic connection would not be avoided. It is difficult to perform an anastomosis over the aorta by traditional method thru a small thoracotomy. Several specially designed devices have been used for this purpose, but their short- and long-term results are being investigated. However, the long-term result for a venous conduit has been proven unsatisfied. The whole procedure can be done under with or without the support of cardiopulmonary bypass. Nevertheless, off-pump surgery would markedly decrease the inflammatory response of the patient but increase the technique demands on the surgeons. During these periods, TECAB would be planned and implemented as well.⁴

Although this report reveals robotic-assisted surgery for single-vessel coronary disease was not a complicated procedure, I believed the tension within the surgical team due to risk was extremely enormous. Based on these initial successful cases, I hope to hear good news in the near future.

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