The Robotic CAbG
Where are we?
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A minimally invasive cardiac operation is that which can eliminate cardiopulmonary bypass and/or minimizes tissue dissection and incisions. The application of this technique in the field of coronary bypass surgery has been increasing over the last few years. Two main factors control greatly the ease of performance and outcome of any surgical vessel-to-vessel anastomosis, namely, manipulation and visualization. In the endoscopic setting, the situation is rather more complicated, as the currently available endoscopic instruments are crude and difficult to manipulate. The relatively long distance between the surgeon’s hand and tip of instrument performing the procedure in addition to the rigid chest wall decrease dexterity and increase tremors. Also, the routine method of endoscopic visualization using two-dimensional video monitor doesn’t allow for proper depth perception which is important for satisfactory coronary anastomosis. Finally, the anatomical location of coronary arteries adds more to the difficulty.

A major disadvantage of endoscopic surgery is the loss of true three dimensional viewing which is present in conventional surgery. The recent introduction of three-dimensional viewing in surgical practice started to find its logic pathway in the field of cardiothoracic surgery. Its role in improving the depth perception is clear in spite that many systems still need some refinement. Recently, computer-assisted telemanipulation robotic technology has been introduced to abdominal surgical practice. The current pre-clinical studies on vascular anastomosis indicate the possible future prospective of this technology.

Minimally invasive coronary artery bypass grafting (CABG) is ideal when performed totally endoscopic. The timing, quality and patency should be comparable to those attained by conventional techniques.