

Integrating Coronary Anastomotic Connectors and Robotics Toward a Totally Endoscopic Beating Heart Approach: Review of 120 Cases

Husam H. Balkhy, MD, L. Samuel Wann, MD, Dorothy Krienbring, RN, and Susan E. Arnsdorf, RN

Center for Robotic and Minimally Invasive Cardiac Surgery, The Wisconsin Heart Hospital, Milwaukee, Wisconsin

Background. Endoscopic coronary bypass has been a difficult procedure to perform. The recent introduction of the Intuitive EndoWrist stabilizer (Intuitive Surgical, Sunnyvale, CA) has facilitated this procedure robotically on the beating heart. The addition of anastomotic connectors allows a significant improvement in the execution of this technically demanding procedure. We report on our first 120 cases of totally endoscopic, beating heart connector coronary artery bypass grafting integrating these technologies.

Methods. From January 2008 to April 2010, 120 patients (age range 43 to 86 years, 72% male) underwent either single or multivessel all arterial, totally endoscopic coronary artery bypass grafting using the da Vinci robot with the aid of the Flex A distal anastomotic device (Cardica, Redwood City, CA). Patients with multivessel disease involving branches of the right coronary and circumflex arteries underwent hybrid revascularization with stents. Early and midterm clinical outcomes were evaluated for all patients. Eighty-five internal mammary artery grafts in 68 patients were evaluated at a mean of 4 months using multidetector computed tomography and formal angiography (in 18 hybrid patients).

Results. Mean hospital stay was 3.3 ± 2.4 days. There was 1 postoperative death (the same patient had a stroke secondary to carotid disease), and 1 postoperative myocardial infarction. Two patients were converted to minithoracotomy and 1 patient was converted to sternotomy. One patient required cardiopulmonary bypass support through the femoral cannulation during the procedure. Mean intraoperative transit time flow in all the internal mammary artery grafts was 76 cc/minute ± 43, and pulsatility index of 1.5 ± 0.5. Of the 85 grafts evaluated angiographically, 80 were patent at a mean of 4 months (94.1%).

Conclusions. Totally endoscopic beating heart connector coronary bypass using the da Vinci robot with the Flex A anastomotic device is a safe and reproducible procedure. A significant learning curve is involved and experience with anastomotic devices in the open setting is necessary. Long-term follow-up of graft patency and patient outcomes is warranted.

(*Ann Thorac Surg* 2011;92:821–8)

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