ROBOTIC-ASSISTED MINIMALLY INVASIVE CORONARY ARTERY BYPASS SURGERY: AN ALTERNATIVE APPROACH FOR SURGICAL REVASCULARISATION

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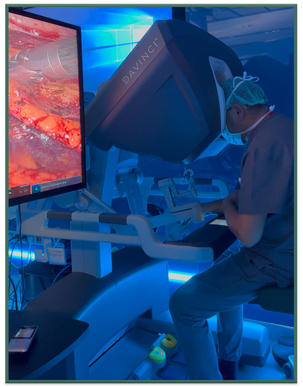
INTRODUCTION

Robotic-assisted minimally invasive multiple vessel coronary bypass surgery is safe and can be performed with excellent results. In our clinic, we have been performing Da Vinci Robot-assisted minimally invasive CABG on suitable and accepted patients, since January 2021. We present our results for robotic-assisted minimally invasive multivessel and coronary artery bypass grafting via a left anterior thoracotomy and compered with standard coronary bypass procedures.



MATERIALS

There was no significant difference in gender and age between the two groups: In the Standard CABG group, 80.72% were male and 19.28% were female; in the Robot CABG group, 83.07% were male and 16.93% were female. The average age was 62.51 years in the Standard CABG group, while it was 61.73 years in the Robot CABG group. There was no significant difference between the two groups in terms of preoperative DM, HT, PDH, CKD, and EF values. Carotid stenosis was significantly higher in the Standard CABG group (13.69% of patients had carotid stenosis in the Standard CABG group, while this rate was 5.29% in the Robot group).

METHODS

Between January 2021 and November 2024, a total of 189 patients underwent Da Vinci robot-assisted minimally invasive CABG. These patients were compared to a total of 555 patients who underwent standard CABG with similar characteristics and no additional pathologies during the same time frame in terms of age, gender, preoperative findings, X-Clamp and CPB duration, number and duration of distal bypasses,postoperative complication rates, hospital stay duration, and mortality rates.
Our aim is to present our clinical outcomes for patients undergoing standard CABG and DaVinci Robot-assisted CABG.
Our technique for robotic-assisted minimally invasive coronary bypass comprises the robotically harvest of the LIMA and complete revascularization via a left thoracotomy using cardiopulmonary bypass (CPB) and cardioplegic arrest.
In the standard CABG group, ascending aorta-right atrial cannulation was performed via median sternotomy, while in the robot CABG group, femoral artery-venous cannulation and right jugular venous cannulation were performed; access to the heart was achieved through a mini anterior thoracotomy from the left third or fourth intercostal space. Chitwood clamp and aortic root vent cannula were used.

RESULTS

The Average X-clamp time and CPB time were found to be significantly shorter in the Standard CABG group compared to the Robot group: The X-clamp time in the Standard CABG group was 46.90 minutes, while in the Robot CABG group it was 57.78 minutes; average CPB time was 68.85 minutes in the Standard CABG group and 94.76 minutes in the Robot CABG group. Similarly, the average distal bypass time was significantly shorter in the Standard CABG group: 12.68 minutes in the Standard CABG group compared to 20.97 minutes in the Robot CABG group.
There was no significant difference between the two groups in terms of early postoperative complications (bleeding, tamponade, low flow, neurological complications, peripheral vascular complications). However, the incisional and mediastinal infection rates were found to be significantly lower in the robot-assisted CABG group: In the Standard CABG group, mediastinitis was detected in 1 patient (0.18%), sternal infection in 6 patients (1.08%), and subcutaneous infection in 11 patients (1.98%). In contrast, only 1 patient (0.52%) in the Robot CABG group was found to have subcutaneous infection.

CONCLUSION

In cardiac surgery, median sternotomy is safely performed by heart surgeons and provides good comfort for the surgeon. Despite the long duration of the surgery, the need for equipment, higher costs, and the necessity of team experience, it can be preferred in patients who wish to have it due to shorter postoperative recovery times, lower infection rates, and better patient comfort.