

Robotic Assisted Minimally Invasive Direct Coronary Artery Bypass Surgery: A Decade Of A Single Center Experience Of 638 Consecutive Cases

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Background

- The Robot has been used in cardiac operations for many years. We present a review of our center’s experience combining Robotic Internal Mammary harvest with Minimally Invasive Direct Coronary Artery Bypass (MIDCAB) technique

Methods

- Retrospective analysis using Lumedx data registry and electronic health records
- All patients from January 2012 to March 2022 that had a robotically assisted coronary bypass procedure are included (n=638)
- Continuous measures are reported as mean with standard deviation (SD)
- Categorical variables are reported as counts and percentages
- All analysis is done using Jamovi (Version 2.3)

Characteristics	n=638
Age (years) Mean	67
Male (%)	462 (72)
Postop Bleeding (%)	8 (1.3)
Postop Atrial Fibrillation (%)	119 (18.7)
Prolonged Vent (>24 hours) (%)	25 (4.2)
Postop Acute Kidney Injury (%)	6 (1)
Post op Length of Stay (days) Mean	5.57
30-day mortality (%)	9 (1.4)
Elective cases (%)	338 (53)
Emergent cases (%)	5 (0.8)
Urgent cases (%)	295 (46.2)

Procedure

- Robotically assisted mammary artery harvest was performed with the standard three port approach
- After the left internal mammary artery (LIMA) and/or the right internal mammary artery (RIMA) was taken down, a small left anterior thoracotomy incision about 6 cm long was performed in the fourth or fifth intercostal space to complete the anastomosis on the beating heart under direct vision
- For multiple vessel bypasses, cardiopulmonary bypass support through the femoral artery and vein cannulation was provided without clamping the aorta
- More than a third of the total number of patients underwent multivessel grafting

Results

- Out of 638 patients, 9 (1.4%) died within 30 days, 7 of these patients were urgent, and 2 elective
- 6 patients converted to planned full conventional sternotomy
- Total procedure time was 165 ± 54 minutes.
- Length of stay in the ICU was 72 ± 27 hours
- Postop length of stay was 5.57 days for elective surgeries and 10.79 for urgent

Morbidity included:

- Postoperative atrial fibrillation in 119 patients
- Prolonged vent greater than 24 hours in 25 patients
- Postop bleeding in 8 patients
- Postop renal failure in 6 patients
- Wound infection in 2 patients

Conclusion

- This is one of the largest Robotic Assisted MIDCAB experiences in published literature
- Robotic-assisted MIDCABs can be performed in an experienced robotic surgery center with good outcomes.
- Pump-assisted robotic MIDCAB may be a more reproducible surgery for multiple vessel bypass