Efficient Robotic Resection of Cardiac Tumors: A Single-Center Experience

Single-center experience in robotic cardiac tumor surgery

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Background & Objective

Background

Surgical resection is the standard treatment for cardiac tumors. In Japan, robot-assisted cardiac tumor resection is not reimbursed, partly because of concerns about prolonged CPB and ACC times[1,2].

Objective

To evaluate perioperative outcomes—especially CPB and ACC times—after robotic cardiac tumor resection using a standardized intraoperative workflow.

Study Design

Consecutive patients undergoing robot-assisted intracardiac tumor resection
- Single institution
- April 2021–October 2025
- Retrospective review of demographic, tumor, perioperative, and early follow-up data

Patient Cohort

18 patients	17 / 18 myxoma (94%)	4 / 18 emergency (22%)

All procedures were performed robotically with a workflow designed to minimize ischemic and bypass time.

Standardized Intraoperative Workflow

1 3D-CT port planning
Optimize trajectory to the left atrium before surgery.

2 Docking before cross-clamp

Initiate ACC and cardioplegia after robotic docking.
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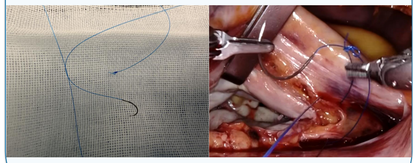
Less aortic cross-clamp time

3 Double wound retractors
Prevent vent tubes, cardioplegia lines, and aortic clamps from obscuring the field.

4 “Nagenawa” technique
Rapid and secure left atrial closure.



Operative Outcomes

155 min	92 min	44 min
Mean operative time	Mean CPB time	Mean ACC time

Safety & Early Follow-up

Outcome	Value
No transfusion	6 (33%)
Postoperative atrial fibrillation	5 (28%)
In-hospital / 30-day death	0
Stroke	0
Reoperation for bleeding	0
Residual tumor / recurrence	0

No major perioperative complications were observed.

Postoperative Course

7.1 h	1.7 d	5.1 d
Ventilation time	ICU stay	Hospital stay

Conclusions

- Robotic cardiac tumor resection was feasible with favorable early outcomes.
- Mean CPB and ACC times were comparable to—or shorter than—prior robotic series.[1,2]
- A standardized workflow and specific technical refinements may support broader adoption.
- This approach may be practical even in selected emergency cases.

Clinical Implication

Cardiac tumor resection achieved favorable perioperative and early outcomes even when performed with robot-assisted surgery.

Key Message

Short CPB and ACC times were achieved despite robotic tumor resection, including emergency cases.

1. Saiydoun, Gabriel, Saadé Saade, Costin Radu, Eric Bergoend, and Thierry Folliguet. 2025. “Robotic versus Sternotomy Approach for Left Atrial Myxoma Resection: A Retrospective Single-Center Study.” *Journal of Clinical Medicine* 14 (22): 8220.
2. Khawar, Mirza Muhammad Hadeed, Hooria Ejaz, Muhammad Soban Jaffar, Muhammad Kashif, Mavia Habib, Absar Mukhtar, Hafsa Riaz, et al. 2025. “Comparative Outcomes of Robotic Surgery vs Conventional Sternotomy for Cardiac Myxoma Excision: A Meta-Analysis.” World Journal of Cardiology 17 (8): 111159.
3. Mendyka, Dominik, Tomasz Płonek, Tomasz Jędrasek, Adrian Korman, Aleksandra Złotowska, Aleksandra Jędrasek, Robert Skalik, and Wojciech Kustrzycki. 2024. “The Therapeutic Potential of Different Surgical Approaches in the Management of Cardiac Myxoma: A Systematic Review.” Journal of Clinical Medicine 14 (1): 121.