

Right Axillary Mini-Incision vs. Median Sternotomy for Valve-Sparing Aortic Root and Ascending Aorta Replacement: A Short-Term Comparative Study

A Single-Center Retrospective Study (2019–2024)

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Background & Objective

Ascending aortic aneurysm with aortic valve disease is traditionally treated via median sternotomy. Minimally invasive approaches (e.g., right axillary mini-incision) may offer faster recovery and better cosmesis, but comparative evidence is limited.

Objective: To compare short-term clinical outcomes between right axillary mini-incision and median sternotomy for valve-sparing aortic root and ascending aorta replacement.

Methods

- Design:** Retrospective cohort study (May 2019 – April 2024)
- Inclusion:** 186 consecutive patients undergoing elective concomitant aortic valve + ascending aorta replacement
- Groups:**
 - Right axillary mini-incision: **148 patients**
 - Median sternotomy: **38 patients**
- Exclusion criteria:** Emergency surgery, acute type A dissection, active endocarditis, redo surgery, concomitant other valve/LVAD
- Outcomes:** CPB time, cross-clamp time, chest tube removal time, wound infection, stroke, re-exploration, SCAR scar satisfaction score, follow-up events

Results

Outcome	Right Axillary (n=148)	Sternotomy (n=38)	p-value
CPB time (min)	120±30	110±25	0.08
Cross-clamp time (min)	90±20	85±15	0.12
Chest tube removal (days)	2±1	4±2	<0.001
Wound infection rate	0%	3%	0.04
Stroke rate	1.3%	2.0%	>0.05
Re-exploration for bleeding	2.0%	2.7%	>0.05
SCAR score (lower=better)	2.1±0.5	4.8±0.9	<0.001

Chest Tube Removal: Faster Recovery	SCAR Score: Superior Cosmesis
2.0 days	2.1 pts
Minimally Invasive Group	Excellent Patient Satisfaction
Significant Reduction (p < 0.001)	Major Aesthetic Advantage (p < 0.001)
	4.8 pts

Follow-up Outcome: Over a mean follow-up period of 11.6 ± 5.2 months, there were no reported cases of valvular dysfunction, paravalvular leaks, unplanned rehospitalizations, or mortalities in either cohort. This confirms the procedural safety and sustained clinical benefit of the right axillary approach compared to conventional sternotomy.

Conclusion

- Right axillary mini-incision for valve-sparing aortic root + ascending aorta replacement is **safe and effective** compared with median sternotomy.
- It offers **significantly better cosmetic outcomes** (lower SCAR score), **shorter chest tube duration**, and **lower wound infection rate**.
- No differences in major adverse events (stroke, re-exploration) during short-term follow-up.
- **Limitation:** Single-center, retrospective, small sternotomy group.
- **Next step:** Multicenter prospective studies with longer follow-up are warranted.

