

Is minimally invasive approach better than full sternotomy in Acute Type A Aortic Dissection?

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Objectives

In recent years, the use of minimally invasive techniques has gained increasing interest in their potential to improve postoperative outcomes. Consequently, our cardiac surgery center has adopted the technique with partial sternotomy also in cases of acute type A aortic dissection. This study aimed to evaluate the feasibility, safety, and early outcomes of partial sternotomy (PS) compared with full sternotomy (FS) in patients undergoing emergency/urgency ATAAD repair.

Methods

- **Design:** Retrospective study of consecutive patients undergoing emergency/urgency surgery for ATAAD.
- **Timeline:** January 2021 – December 2025.
- **Total Cohort:** 286 patients (24 treated with PS, 262 treated with FS).
- **Statistical Power:** **Propensity score matching** based on baseline clinical variables generated **20 well-balanced patient pairs** (n=40 total).
- **Endpoints:**
 - *Primary:* In-hospital mortality.
 - *Secondary:* Major complications and recovery variables (ICU length of stay).

Surgical Quality

Partial sternotomy did **not** limit the anatomical extent of the aortic repair or compromise clinical effectiveness.

Surgical procedure performed in partial sternotomy	Patients (n)
Ascending aorta replacement	6
Ascending aorta and hemiarch replacement	2
Ascending aorta replacement and aortic valve repair	3
Bentall procedure	1
Ascending aorta and hemiarch replacement with aortic valve repair	2
Ascending aorta and hemiarch replacement with aortic valve replacement	3
Ascending aorta replacement, aortic valve repair, and aortic dissection stent implantation	4
Ascending aorta replacement, aortic valve replacement, and aortic dissection stent implantation	1
Ascending aorta replacement, aortic valve replacement, mitral valve repair, and aortic dissection stent implantation	1
Aortic valve repair and frozen elephant trunk	1
Total	24

Results

Endpoint	Partial Sternotomy (n=20)	Full Sternotomy (n=20)	p-value
In-hospital Mortality	10% (2)	25% (5)	NS
Median ICU-MS Score	4	3	Significant
ICU Length of Stay	Comparable	Comparable	NS
Major Complications	Comparable	Comparable	NS
Median ICU Mobility Scale (ICU-MS)	4	3	Significant

Discussion

- **Feasibility:** PS provides adequate exposure for complex procedures in emergency settings without extending operative times.
- **Mobility Advantage:** The intact lower half of the sternum ensures superior chest wall stability, leading to better **ICU Mobility Scale (ICU-MS)** scores.
- **Safety:** A mortality rate of 10% vs 25% (though not statistically significant due to sample size) strongly supports safety in selected patients.
- **Surgical Completeness:** The technical approach does not force the surgeon to compromise on the radicality of the aortic replacement.
- **Limitations:** Single-center study, small matched sample size (n=40).

Conclusion

In selected patients with acute type A aortic dissection, partial sternotomy is a feasible and safe approach, providing early outcomes comparable to full sternotomy. When performed by experienced teams, it does not compromise surgical repair and may facilitate a minimally invasive strategy even in emergency settings.