



**Twenty-five years of open type a  
dissection surgery in 500 patients –  
Has a change in surgical technique led to  
a change in outcome ?**

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# Background

- **Type A aortic dissection presents with a high mortality when left untreated and requires immediate surgical repair**
- **Continuous adaptations of surgical technique have been implemented, however, reported short term outcomes seemed to stagnate over the last decades**
- **We investigated operative mortality and adverse outcomes after surgery for type a dissection (ATAAD) over the course of 25 years span**

# Study Design

- **Between 1998-2022, more than 500 patients underwent open surgical repair for type a dissection in a tertiary reference center.**
- **500 patients (with sufficient documentation) were included in the retrospective single study cohort**
- **Retro- and prospective (telephone, family physician) follow up was performed**
- **Comparison between two surgical eras (Era I 1998-2009, Era II 2010-2022) will be performed via subgroup analysis**

# Endpoint Definitions

- **Operative mortality (consisting of 30-day and in-hospital mortality)**
- **Major adverse outcome (defined after the Aortic Arch Surgery Group consensus statement by Yan et al )**
  - Neurological System
  - Cardiovascular System
  - Respiratory System
  - Renal System
  - Gastrointestinal System
  - Other Systems

Variables	Overall cohort (n=500)	1998-2010 (n=203)	2011-2022 (n=297)	p-value
<b>Root procedure (498/500)</b>				
Supracomissural repair	68.8% (344)	74.6% (151)	65% (193)	0.003
Selective Non-Coronary Sinus replacement	4.2% (21)	6% (12)	3% (9)	0.11
<b>Composite valve graft replacement</b>				
mechanical	15% (75)	14.9% (30)	15.2% (45)	0.95
biological	8.2% (41)	1.5% (3)	12.8% (38)	<0.001
Valve sparing root replacement	3.4% (17)	2.5% (5)	4% (12)	0.35
<b>Arch procedure (497/500)</b>				
Open distal/ Hemiarch	82.4% (412)	89.6% (180)	78.4% (232)	0.001
Partial arch	6.4% (32)	3.5% (7)	8.4% (25)	0.03
Total arch	5.4% (27)	5% (10)	5.7% (17)	0.71
Elephant trunk	0.8% (4)	1% (2)	0.7% (2)	0.67
Frozen elephant trunk	3.2% (16)	0	5.4% (16)	<0.001
none	1.2% (6)	1% (2)	1.4% (4)	0.72

<b>Variables</b>	<b>Overall cohort (n=500)</b>	<b>1998-2010 (n=203)</b>	<b>2011-2022 (n=297)</b>	<b>p-value</b>
<b>Arterial cannulation (493/500)</b>				
<b>Ascending aorta</b>	0.6% (3)	0	1% (3)	0.25
<b>Aortic arch</b>	1% (5)	0.5% (1)	1.4% (4)	0.45
<b>Axillary artery</b>	66.8% (334)	42.3% (85)	85.3% (249)	<0.001
<b>Brachiocephalic trunc</b>	0.8% (4)	0.5% (1)	1% (3)	0.57
<b>Femoral artery</b>	29.2% (147)	56.7% (114)	11.2% (33)	<0.001
<b>Cerebral perfusion (CP) (492/500)</b>				
<b>No CP</b>	12.4% (62)	27.1% (54)	2.7% (8)	<0.001
<b>Antegrade CP</b>	73.6% (368)	43.2% (86)	96.2% (282)	<0.001
<b>Retrograde CP</b>	12.4% (62)	29.6% (59)	1% (3)	<0.001

**Table 2: Procedural specifics stratified after time period**

# Results 1

- **Operative Mortality in the overall cohort was 14.2% (n=71)**  
**(30 Day Mortality=11.8% [n=59], In-Hospital Mortality 14.2% [n=71])**
- **A multivariate regression analysis revealed age (OR 1.01, 95% CI 1.00-1.03) and cardiopulmonary bypass time (OR 1.004, 95% CI 1.00-1.01) as independent predictors of operative mortality (mode of cerebral perfusion or arterial cannulation were no predictors)**

## Results 2

- **Surgical volume has significantly increased (46% increase) between surgical era I (1998-2010, n=203, age 58±14 years) and era II (2011-2022, n=297, age 60±14 years) from 203 to 297 cases**
- **Axillary artery cannulation (era I 42.3% vs era II 85.3%, p<0.001) and antegrade cerebral perfusion (era I 43.2% vs era II 96.2%, p<0.001) were performed more frequently in era II (2010-2022)**
- **No significant differences in operative mortality (era I 15.7% vs era II 14.2%, p=0.66) or neurological endpoints (era I 23.2% vs era II 28.3%, p=0.219) were observed between those periods**



# Conclusion

- **Surgical technique for operative repair of ATAAD has undergone relevant changes with regards to performed procedures, cannulation sites and cerebral perfusion modes**
- **No statistically significant difference of operative mortality was observed between the first and second era of a 25-year time span**
- **A significant increase in surgical volume (146%) was observed between the first and the second period, which might reflect that nowadays more patients receive surgical treatment for ATAAD with steady operative outcomes**