


Extended Arch Repair Does Not Confer Clinical Benefits in Acute Type A Aortic Dissection for Patients with Dissected Arch Vessels

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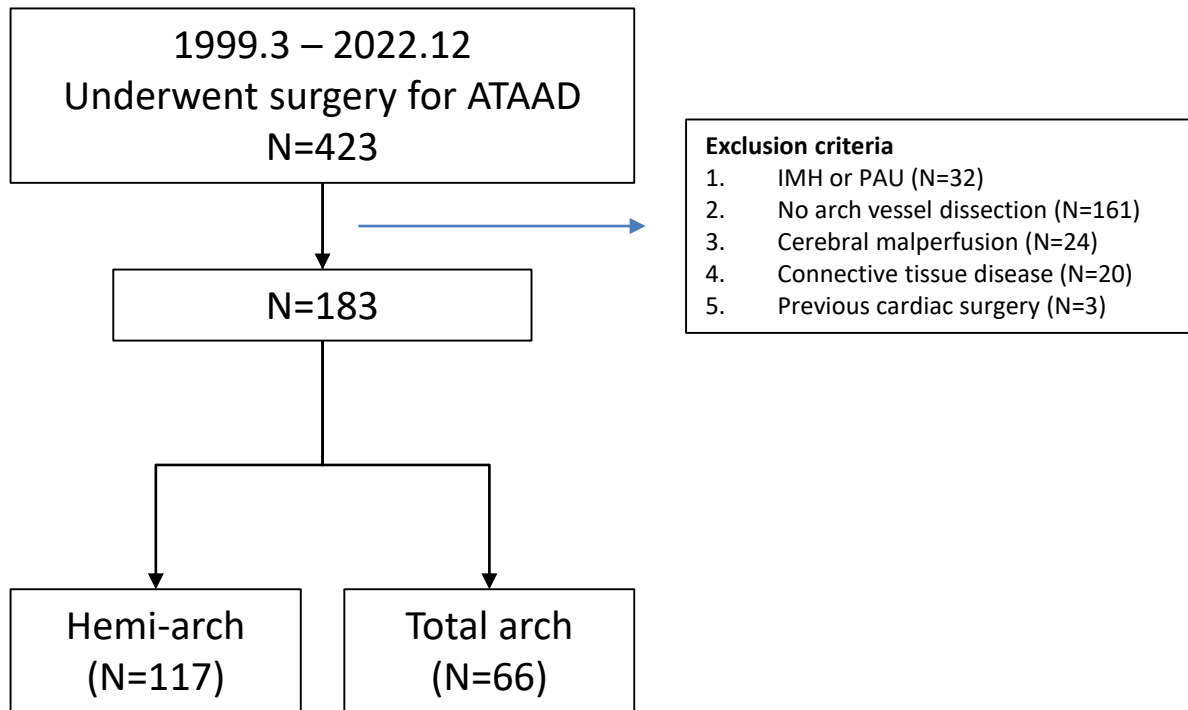
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- The currently accepted guidelines for acute type A aortic dissection (ATAAD) :
 - Preclusion of the primary tear
 - Replacement of the ascending aorta and hemi-arch with distal anastomosis
- There's a debate on  whether to concomitantly replace dissected arch vessels through total-arch replacement (in the absence of cerebral malperfusion)

Are there significant differences in stroke, reoperation, and mortality between hemi-arch and total arch in dissected arch vessels?



Inverse-probability-of-treatment weighting

Results – Baseline Characteristics

Table 1. Baseline profiles between hemi-arch vs. total-arch group

Variables	Original				IPTW-adjusted			
	Hemi-arch (N=117)	Total-arch (N=66)	P-value	SMD	Hemi-arch (N=117)	Total-arch (N=66)	P-value	SMD
Age (years)	59.6 ± 12.1	54.7 ± 13.8	0.013	38.0%	57.9 ± 12.4	56.7 ± 13.1	0.614	9.2%
Female	56 (47.9)	27 (40.9)	0.452	14.0%	46.9%	45.9%	0.916	2.0%
BMI	24.6 ± 3.6	24.3 ± 3.8	0.623	7.5%	24.4 ± 3.5	24.1 ± 3.8	0.703	7.4%
Current smoker	25 (21.4)	18 (27.3)	0.470	13.8%	24.1%	22.8%	0.859	3.1%
<u>Comorbidities</u>								
Hypertension	77 (65.8)	37 (56.1)	0.251	20.1%	62.6%	64.2%	0.854	3.3%
Diabetes mellitus	13 (11.1)	7 (10.6)	> 0.99	1.6%	9.4%	7.2%	0.583	7.8%
Dyslipidemia	6 (5.1)	2 (3.0)	0.772	10.6%	4.0%	2.5%	0.581	8.4%
CKD	3 (2.6)	3 (4.5)	0.771	10.7%	2.2%	2.3%	0.967	0.5%
Cerebrovascular disease	6 (5.1)	2 (3.0)	0.772	10.6%	4.0%	2.7%	0.626	7.4%
Coronary artery disease	5 (4.3)	4 (6.1)	0.856	8.1%	3.9%	4.0%	0.979	0.4%
eGFR			0.547	17.8%			0.547	21.6%
<30	8 (6.8)	2 (3.0)			6.3%	4.0%		
30-60	37 (31.6)	21 (31.8)			28.7%	38.2%		
>60	72 (61.5)	43 (65.2)			64.9%	57.8%		
Hemoglobin (g/dL)	12.7 ± 2.0	13.0 ± 1.8	0.304	16.1%	12.8 ± 1.9	12.6 ± 2.1	0.718	7.9%

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<i>CT Data</i>								
Primary tear location			0.281	24.0%			0.559	21.3%
Ascending aorta	94 (80.3)	47 (71.2)			72.2%	66.9%		
Aortic arch	12 (10.3)	12 (18.2)			18.5%	16.7%		
DTA	11 (9.4)	7 (10.6)			9.3%	16.4%		
Extent of arch dissection								
Right innominate	90 (76.9)	51 (77.3)	> 0.99	0.8%	75.4%	79.0%	0.622	8.7%
Left common carotid	51 (43.6)	41 (62.1)	0.024	37.8%	52.3%	53.0%	0.941	1.4%
Left subclavian	65 (55.6)	37 (56.1)	> 0.99	1.0%	55.9%	56.8%	0.928	1.7%
Proximal extent of dissection								
Aortic root	83 (70.9)	37 (56.1)	0.061	31.3%	64.3%	62.8%	0.864	3.1%
Coronary artery	17 (14.5)	8 (12.1)	0.817	7.1%	13.9%	12.5%	0.800	4.4%
Distal extent of dissection			0.514	23.2%			0.332	29.9%
DTA	11 (9.4)	4 (6.1)			8.0%	6.9%		
Suprarenal AA	8 (6.8)	3 (4.5)			7.4%	3.9%		
Infrarenal AA	8 (6.8)	8 (12.1)			5.3%	12.8%		
Iliac	90 (76.9)	51 (77.3)			79.4%	76.5%		

Table 2. Operative profiles between hemiarch vs. total-arch group

Variables	Hemi-arch (N=117)	Total-arch (N=66)	P-value
Arterial cannulation site			0.140
Ascending aorta	2 (1.7)	0 (0.0)	
Innominate artery	8 (6.8)	8 (12.1)	
Axillary artery	65 (55.6)	43 (65.2)	
Femoral artery	42 (35.9)	15 (22.7)	
Temperature management			0.006
Deep hypothermia	50 (42.7)	14 (21.2)	
Moderate hypothermia	67 (57.3)	52 (78.8)	
Lowest temperature, °C	20.2 ± 5.1	22.0 ± 3.6	0.013
CPB time, min	196 ± 96	279 ± 110	<0.001
ACC time, min	106 ± 54	189 ± 83	<0.001
Combined procedure			
Aortic valve replacement	19 (16.2)	9 (13.6)	0.798
David procedure	2 (1.7)	7 (10.6)	0.021
Bentall procedure	9 (7.7)	10 (15.2)	0.181
CABG	10 (8.5)	4 (6.1)	0.750
Vascular surgery [†]	3 (2.6)	4 (6.1)	0.434

Results – Early Outcomes

Table 3. Early and overall clinical outcomes of hemi-arch vs. total-arch group

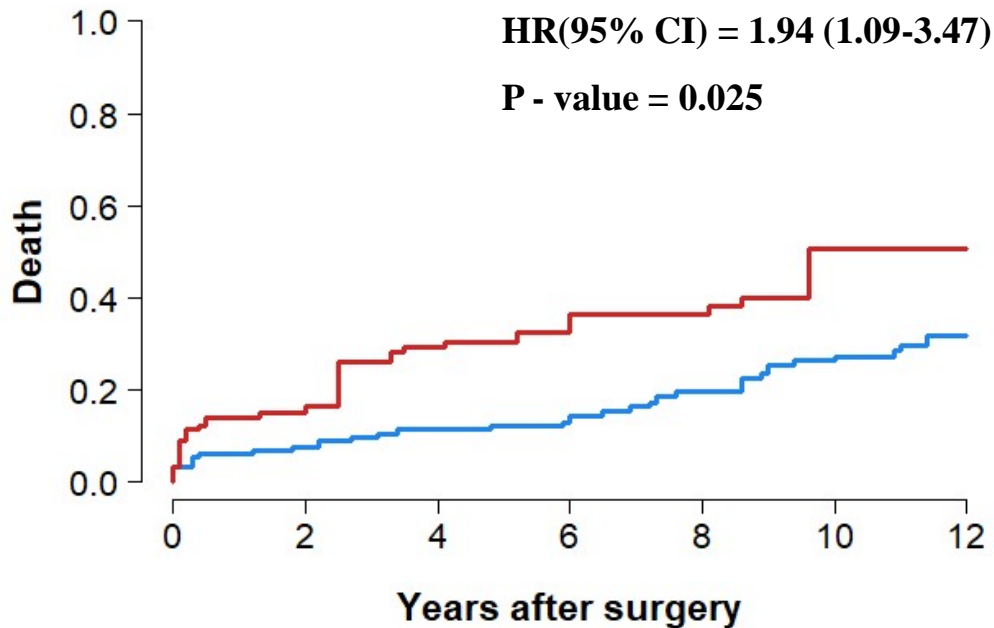
Outcomes	Original				IPTW-adjusted	
	No. of events (rate)		OR or HR/sHR (95% CI)	P-value	OR or HR/sHR (95% CI)	P-value
	Hemi-arch (n=117)	Total-arch (n=66)				
<i>Early Outcomes, n (%)</i>						
Early death	8 (6.8)	8 (12.1)	1.88 (0.66-5.36)	0.230	2.16 (0.67-7.07)	0.190
Bleeding requiring exploration	10 (8.5)	9 (13.6)	1.69 (0.64-4.43)	0.282	1.61 (0.55-4.55)	0.366
LCOS requiring MCS	4 (3.4)	5 (7.6)	2.32 (0.59-9.66)	0.223	2.50 (0.52-13.09)	0.244
Neurologic event	19 (16.2)	14 (21.2)	1.39 (0.64-2.98)	0.402	1.56 (0.71-3.35)	0.260
Ischemic stroke	13 (11.1)	11 (16.7)				
Hemorrhagic stroke	0 (0.0)	1 (1.5)				
TIA or delirium	6 (5.1)	2 (3.0)				
New-onset dialysis	23 (19.7)	16 (24.2)	1.31 (0.63-2.69)	0.468	1.39 (0.67-2.87)	0.370
Bowel ischemia	4 (3.4)	3 (4.5)	1.35 (0.26-6.29)	0.704	0.72 (0.12-2.97)	0.665
Prolonged ventilation (>48 hours)	52 (44.4)	31 (47.0)	1.11 (0.60-2.03)	0.742	1.54 (0.83-2.87)	0.173

Results – Overall Outcomes

Table 3. Early and overall clinical outcomes of hemi-arch vs. total-arch group

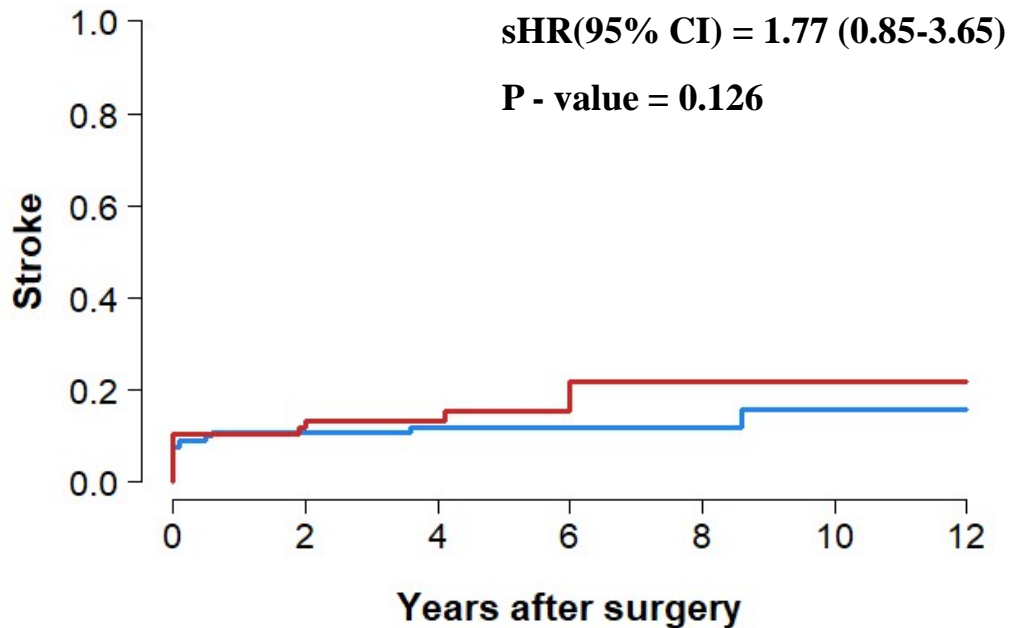
Outcomes	Original				IPTW-adjusted	
	No. of events (rate)				OR or HR/sHR (95% CI)	P-value
	Hemi-arch (n=117)	Total-arch (n=66)	OR or HR/sHR (95% CI)	P-value		
<i>Overall Outcomes, n (%/PY)</i>						
All-cause death	44 (4.0)	25 (5.9)	1.47 (0.89-2.42)	0.132	1.94 (1.09-3.47)	0.025
Stroke	14 (1.0)	13 (2.8)	1.74 (0.83-3.68)	0.150	1.77 (0.85-3.65)	0.126
Reoperation	26 (3.3)	14 (4.7)	1.11 (0.59-2.12)	0.740	1.20 (0.69-2.09)	0.517
Aortic root	4	0				
Aortic arch	7	0				
DTA	8	4				
TAA	5	7				
TEVAR	0	2				
Peripheral vascular surgery	9	1				
Reoperation for distal aorta [†]	12 (1.4)	13 (4.3)	2.27 (1.05-4.90)	0.037	2.16 (1.11-4.19)	0.023

Results – Cumulative Incidence of All Cause Death



117 100 92 77 63 52 40 Hemi-arch
62 46 36 31 23 15 12 Total-arch

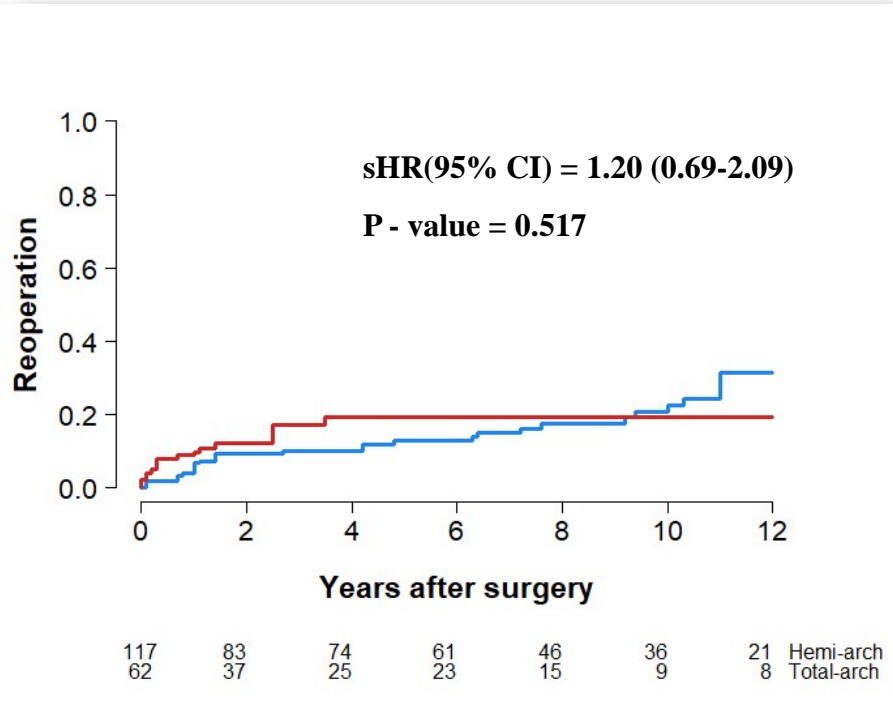
Results – Cumulative Incidence of Stroke



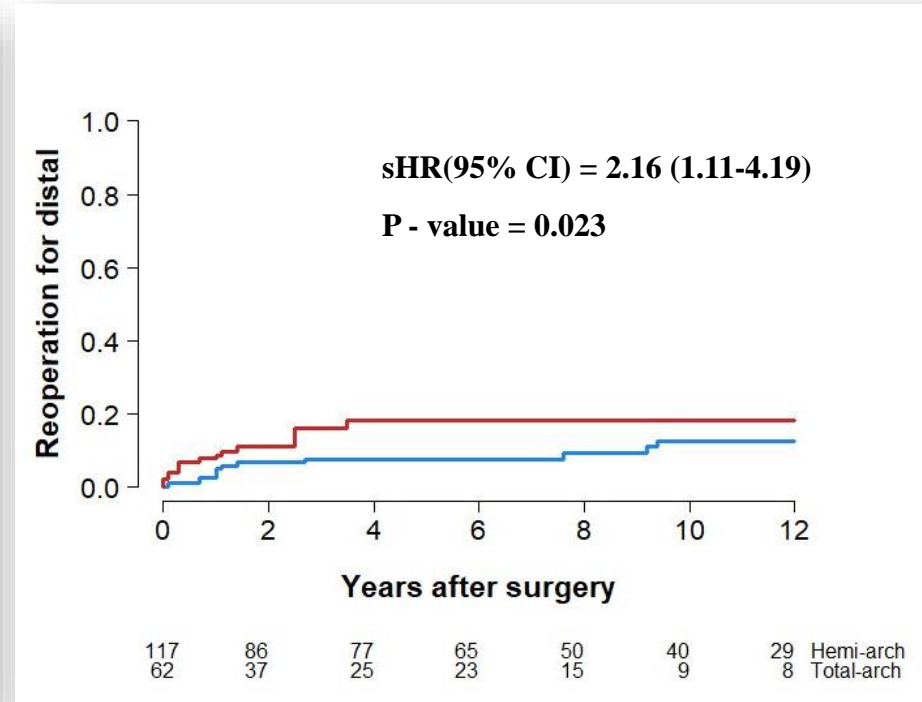
117	86	78	67	52	39	28	Hemi-arch
62	38	29	23	16	9	8	Total-arch

Results – Cumulative Incidence of Reoperation

Cumulative Incidence of Reoperation for All-cause



Cumulative Incidence of Reoperation for Distal Aorta



- Hemi-arch replacement **shows no significant difference** in stroke
- Hemi-arch replacement **shows significant difference in reop for distal aorta**

Hemi-arch replacement may be considered a favorable strategy in ATAAD with dissected arch vessels without cerebral malperfusion, but it is associated with a higher risk of reoperation for distal aorta