Complex Cervical Debranching During Thoracic And Arch Endovascular Aortic Repair Is Associated With Increased Risks Of Local Complications, Major Adverse Events And Mortality

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Background/Objective

- **Cervical debranching (CD)** of supra-aortic trunk (SAT) vessels has been employed to extend the proximal seal zone during TEVAR.
  - Considered "gold standard" by which endovascular incorporation techniques have been evaluated.
- Prior studies have focused on outcomes after CD of the left subclavian artery during Zone 2 TEVAR.
- There are limited data evaluating outcomes of **complex CD** involving multiple SAT vessels and/or aberrant arch anatomy.
- We aimed to provide **a comparative analysis of standard CD** and **complex CD**, with a specific focus on **local complications** associated with CD.

Methods

- **Design:** retrospective cohort analysis
- **Inclusion**: patients who underwent CD of the subclavian, axillary, carotid or vertebral arteries in conjunction with TEVAR at a regional Aortic Center from Jan 2017 - Aug 2023
- **Exclusion:** CD in conjunction with open ascending or aortic arch replacement; TEVAR landing zone > zone 4
- **Definition of Cohorts:**

Standard CD: CD of unilateral subclavian or axillary artery

Complex CD: CD involving multiple SAT vessels and/or aberrant arch anatomy

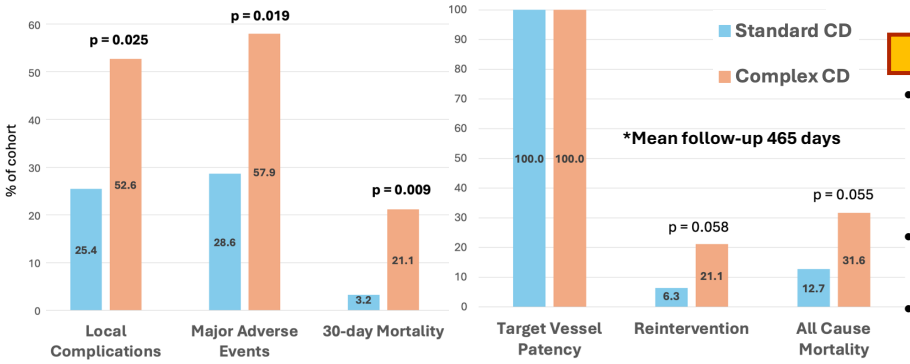
- **Primary endpoint:** local complications within 30 days
  - Nerve injury, wound infection, hematoma, chyle leak, seroma, wound dehiscence
- **Secondary endpoints:** major adverse events within 30 days, loss of graft patency, reintervention, survival
- **Statistical analysis:** Univariate analysis, univariate regression; Kaplan-Meier analysis for survival

Results

Cohorts and Cervical Debranching Types

Standard CD (N=63)	Complex CD (N=19)		
LCA to LSCA bypass	Aberrant LVA to LCA transposition	RCA to LCA to LSCA bypass	LSCA to LCA bypass, LVA to LCA transposition
LSCA to LCA transposition	RCA to aberrant RSCA bypass	RCA to LCA bypass, LSCA to LCA transposition	LVA to LCA transposition, LSCA to LCA transposition
RCA to RSCA bypass	RCA to R axillary bypass with vein	RVA to aberrant RSCA transposition, aberrant RSCA to RCA transposition	LCA to L Axillary bypass, RCA to R Axillary bypass
LCA to L axillary bypass	Aberrant RSCA to RCA transposition	Aberrant LVA to LCA transposition, LSCA to LCA transposition	LSCA to LCA transposition, RCA to RSCA bypass
RCA to R axillary bypass	R ICA to RSCA bypass	Aberrant LVA to LCA transposition, LSCA to LCA bypass	

Short Term and Mid Term Outcomes



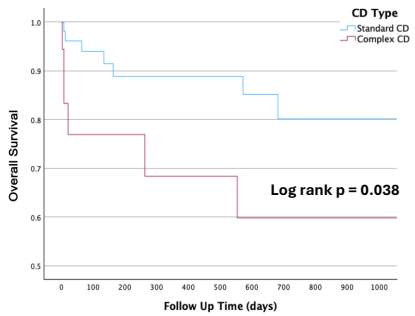
Results (continued)

Outcomes Associated with Local Complications

Variable	OR	95% CI	p-value
Major adverse events	2.0	0.8 – 5.1	0.167
Re-intervention	20.3	2.3 – 175.6	**0.006**
Re-admission	1.7	0.4 – 8.2	0.511
30-day mortality	12.9	1.4 – 116.7	**0.023**
Mortality-to-date	3.7	1.1 – 12.1	**0.031**

Kaplan-Meier Analysis for Survival

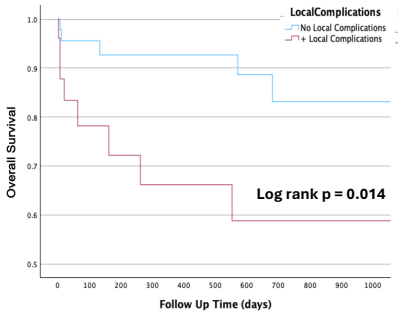
Standard CD vs. Complex CD



Number at Risk

	0	100	200	300	400	500	600	700	800	900	1000
Standard CD	63	41	34	30	27	24	21	15	13	11	10
Complex CD	19	10	9	8	8	8	6	5	5	4	4

+/- Local Complications



Number at Risk

	0	100	200	300	400	500	600	700	800	900	1000
No Local Complications	56	36	31	27	25	23	19	14	12	11	10
+ Local Complications	26	15	12	11	10	9	8	6	6	4	4

Conclusions

- **Complex CD** involving multiple SAT vessels and/or aberrant arch anatomy during TEVAR is associated with increased risk of **local complications**, **major adverse events**, **30d mortality** and **reduced survival.**
- **Local complications** are associated with increased risk of **reintervention, mortality,** and **reduced survival.**
- These results suggest a need for ongoing advancement in SAT incorporation techniques during TEVAR.