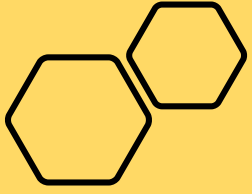


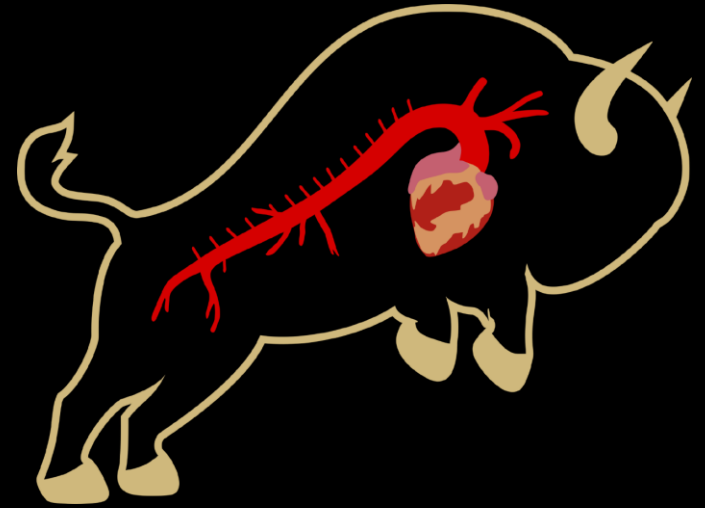
Residual Flow in Covered Area After Elephant Trunk Predicts Unplanned Endovascular Extension

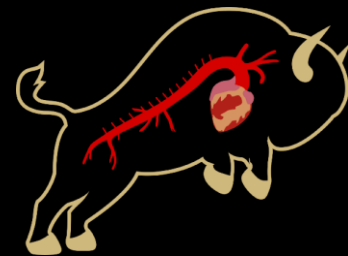
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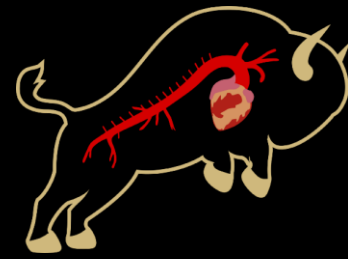
No disclosures





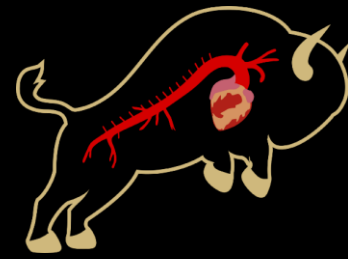
Introduction

- Aortic arch replacement with elephant trunk/frozen elephant trunk (ET/FET) has emerged as a valuable tool to promote distal aortic remodeling
- However, many patients still require unplanned endovascular extension for additional aortic coverage
- It remains unclear if any imaging or radiographic features can be used to identify patients who will require TEVAR extension



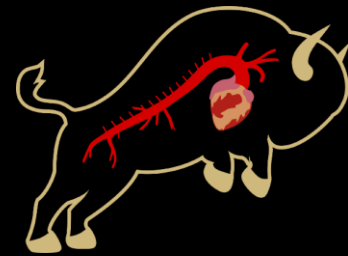
Aim

- We sought to identify any patient characteristics, or imaging features prior to, or after ET/FET can be used to identify those at risk for unplanned extension
- We hypothesized that imaging features related to false lumen flow could be used to predict aortic remodeling, and thus who would require additional unplanned intervention with TEVAR extension



Methods

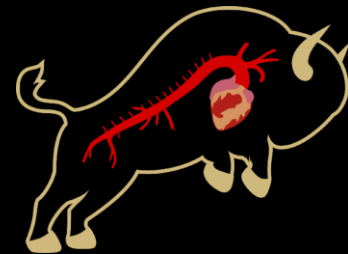
- Retrospective review of institutional aortic surgery database from 2015-2023
 - Included patients who underwent arch replacement with elephant trunk or frozen elephant trunk procedure
 - Excluded isolated aneurysm, non-dissection pathology, connective tissue disease history, absent pre-operative imaging, or absent initial post-operative imaging (within 3 months of index surgery)
- Patients divided into two cohorts: those who required post-operative endovascular extension, those who did not
- Patient computed tomography angiography (CTA) images exported to TeraRecon Aquarius software
- Extensive multiplanar imaging analysis performed for pre-operative and post-operative CTA to assess features related to dissection characteristics.
- Evaluated at multiple anatomical landmarks to evaluate false lumen status, thrombosis and aortic remodeling



Results

- No significant differences in initial dissection on imaging between the two cohorts
- Unplanned extension cohort:
 - Larger maximum aortic diameters in stented area on initial post-operative scan
 - More likely to have partial or incomplete false lumen thrombosis (FLT)
- Patients who did not require TEVAR extension had higher rate of complete FLT in the stented segment, however, they maintained false lumen flow distal to the stent

	Extension (N=25)	No Extension (N=25)	P-value
Pre-Operative Imaging			
Tortuous Aorta	12 (48.0%)	12 (48.0%)	0.99
Maximum Aortic Diameter (cm)	5.73 (5.21-6.33)	4.85 (4.1-5.32)	0.07
Extent of Dissection (Number of Zones)	10 (5-12)	10 (6-11)	0.67
Minimum Axial True Lumen Percent of Total Aortic Cross-Sectional Area (%)	25.8 (18.0-30.7)	22.4 (11.9-28.0)	0.42
Number of Thoracic False Lumen Branches (N)	6 (5-10)	5 (4-7)	0.23
Size of Largest Entry Tear (cm)	2.03 (1.98-2.97)	2.05 (1.43-2.90)	0.62
Number of Thoracic Entry/Re-entry Tears (N)	2 (1.5-3)	2 (2-2.75)	0.52
Dissection of Arch Branch Vessels	9 (36.0%)	8 (32.0%)	0.99
Dissection of Visceral Vessels	7 (28.0%)	7 (28.0%)	0.99
Radiographic Evidence of Malperfusion	7 (28.0%)	8 (32.0%)	0.99
First Post-Operative Imaging (Within 3 months)			
Maximum Aortic Diameter in Covered Area (cm)	4.95 (3.42-5.65)	2.96 (2.52-3.50)	0.05
Length of Stent Coverage on Imaging (cm)	12.1 (8.43-14.0)	13.4 (10.1-14.0)	0.55
False Lumen Flow Distal to Stent (N)	18 (72.0%)	16 (64.0%)	0.699
False Lumen Thrombosis (N)			0.01
Partial	19 (76.0%)	8 (32.0%)	
Complete	6 (24.0%)	17 (68.0%)	
Total Percentage of False Lumen Thrombosis in Covered Area (%)	61.4 (35.4-92.0)	100 (100-100)	0.02
Minimum Axial True Lumen Percent of Total Aortic Cross-Sectional Area (%)	30.1 (24.7-43.3)	28.2 (22.5-58.5)	0.91



Conclusions

- Persistent false lumen flow in stented segment after initial surgery are at risk for unplanned endovascular extension
- Larger aortic diameter in stented segment after ET/FET is a predictor for unplanned TEVAR extension. However, this could be secondary to persistent false lumen flow after stage I ET/FET

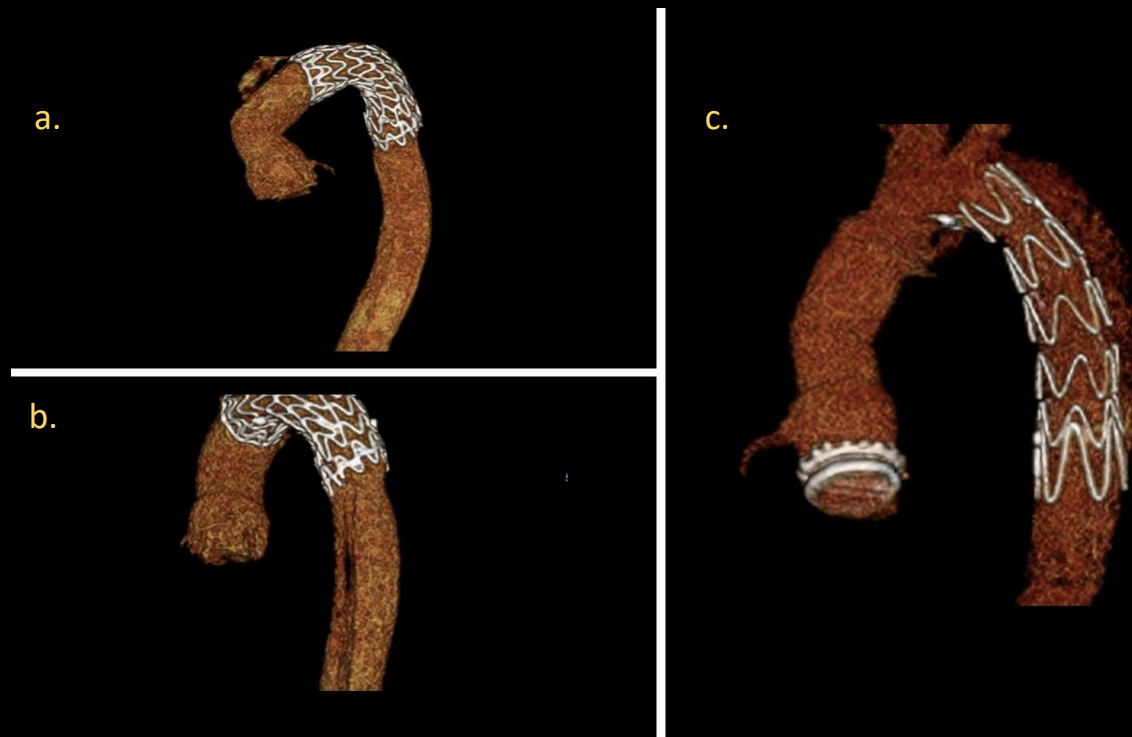


Figure 1. Post frozen elephant trunk for aortic dissection with (a). Complete false lumen thrombosis, (b). Maintenance of distal false lumen perfusion with complete false lumen thrombosis within stented segment , (c.) persistent false lumen flow within stented segment

Questions???

