

March 2026



The University of Texas at Austin
Dell Medical School

The Influence of Thermal Septotomy in Aortic Remodeling: A CT-based Volumetric Analysis

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Ascension
Seton

Thermal Septotomy and Objective

Transcatheter electrosurgical (thermal) septotomy:

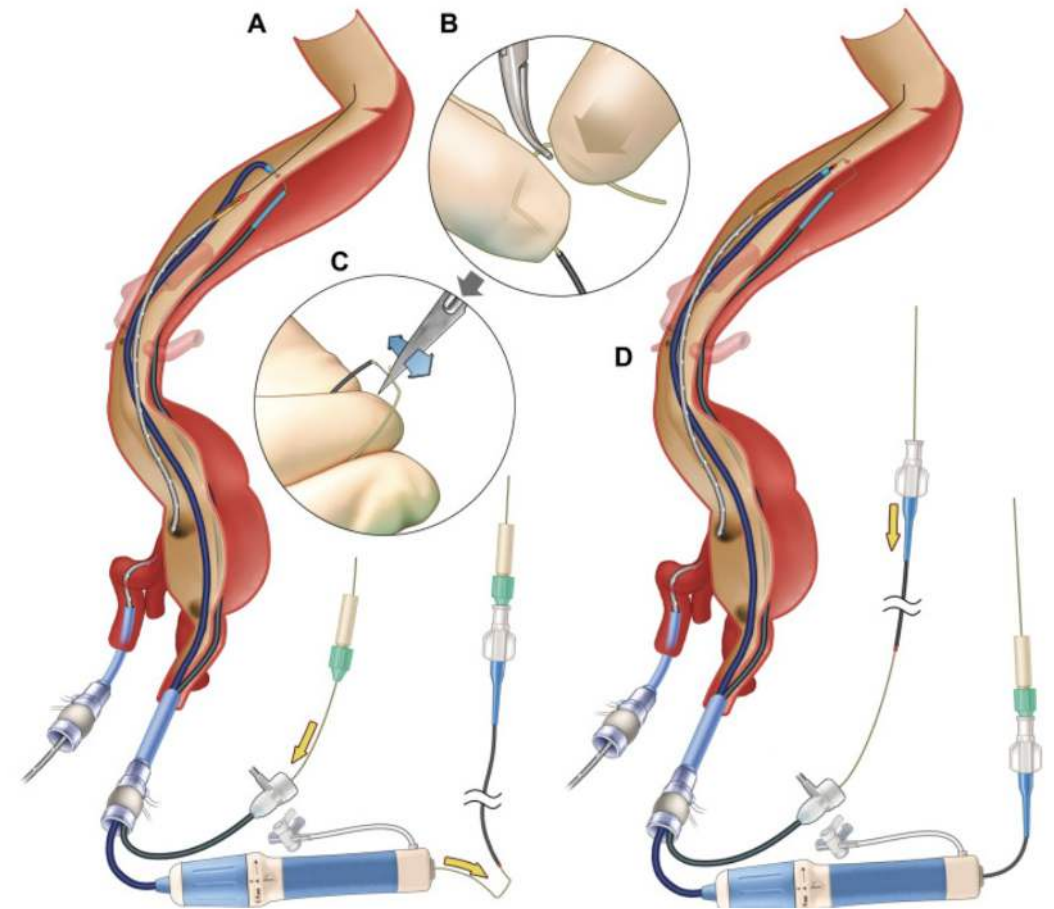
- Create an endovascular landing zone
- Expand true lumen working space
- Access vessels originating from the false lumen
- Induce favorable aortic remodeling

Research Gap Addressed:

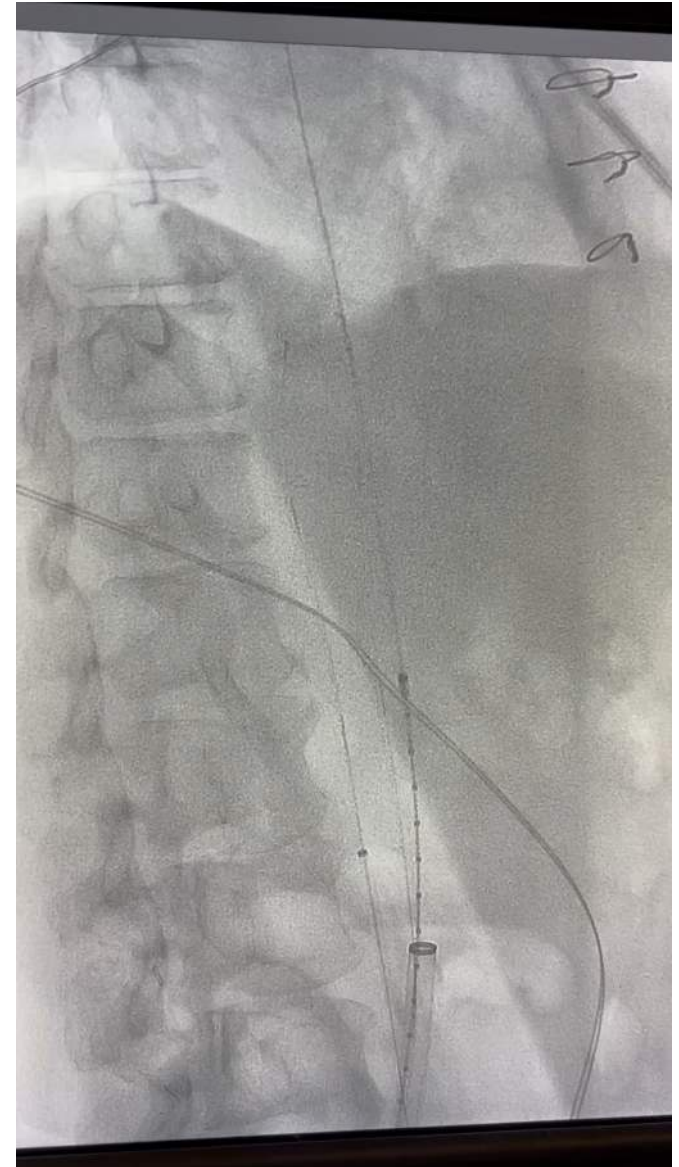
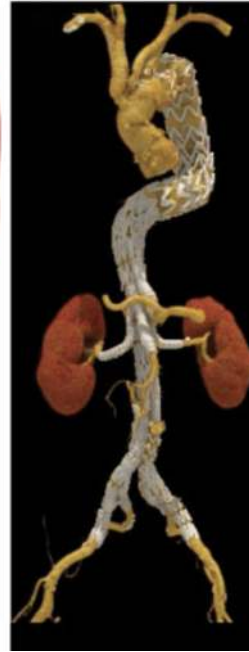
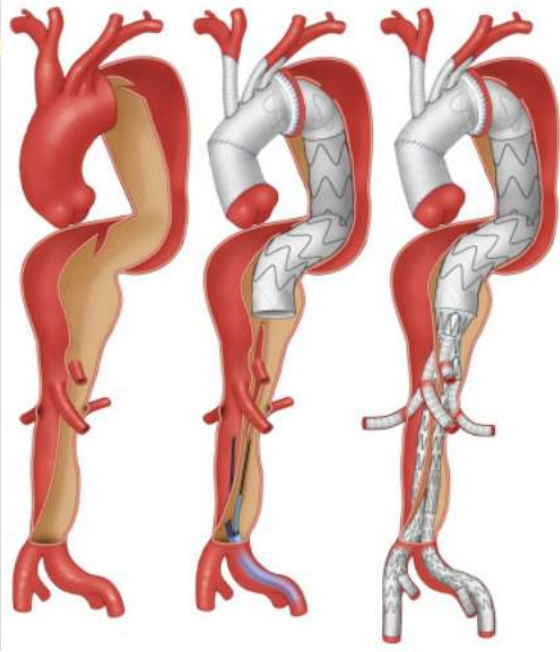
- Quantitative impact on true and false lumen flow volumes remains unknown

Objective:

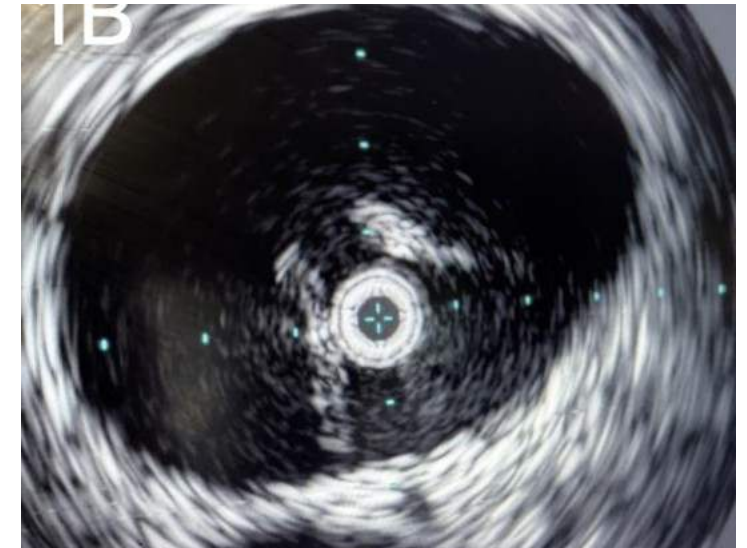
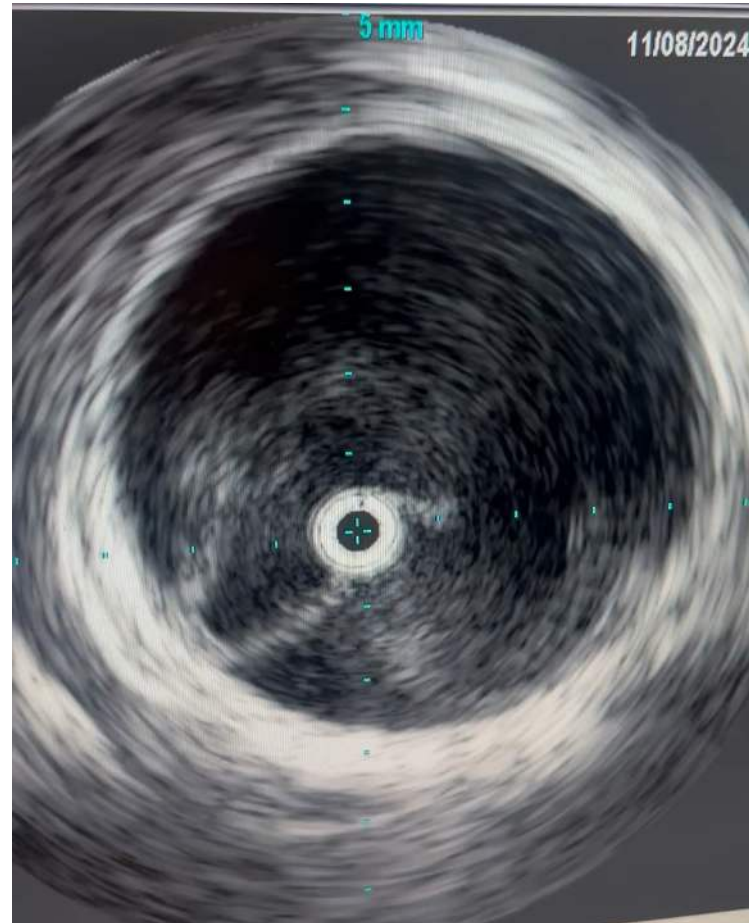
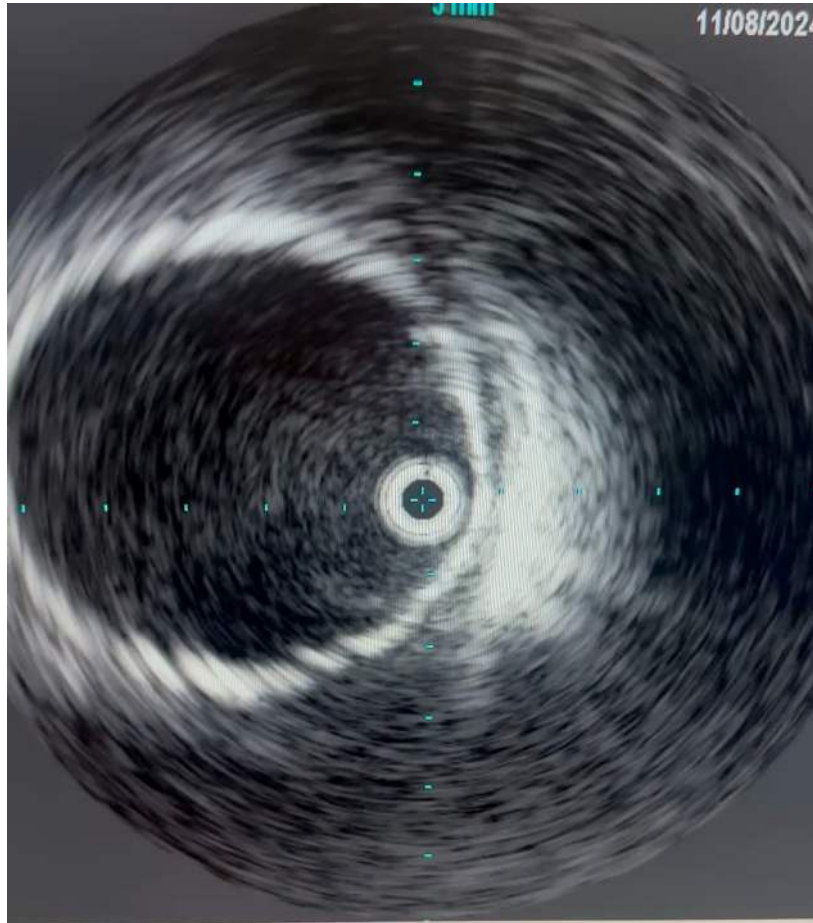
- Comparative volumetric analysis of true/false lumen before and after TEVAR with thermal septotomy



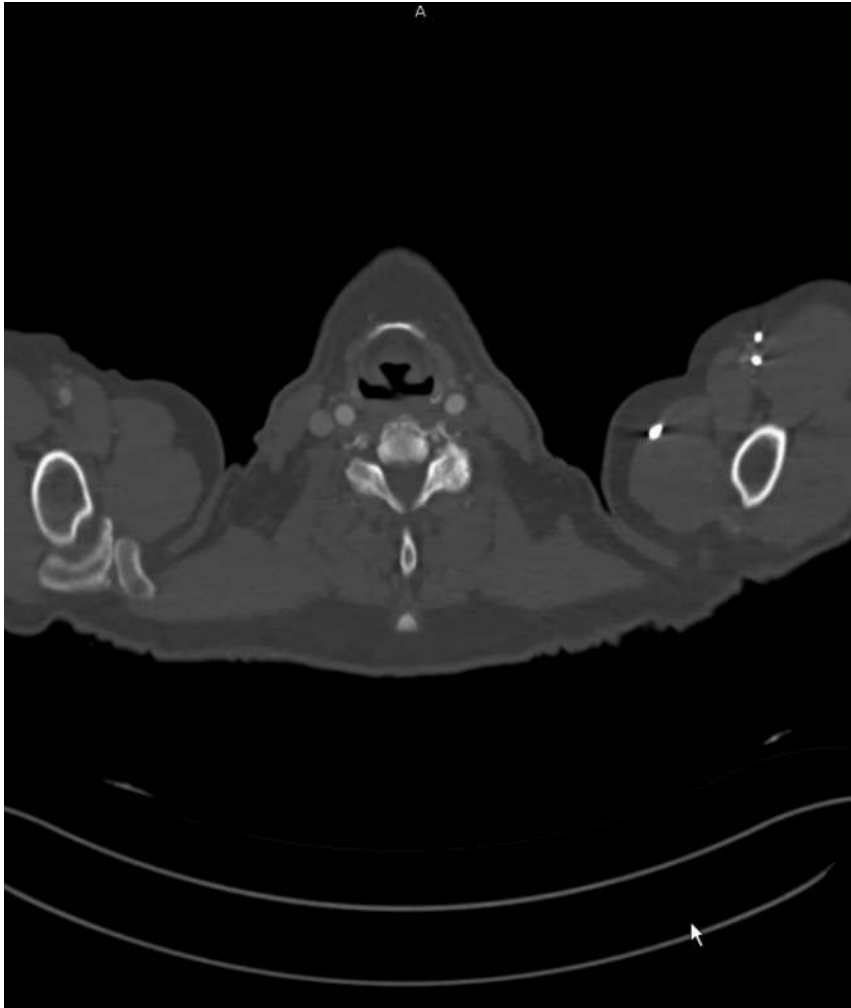
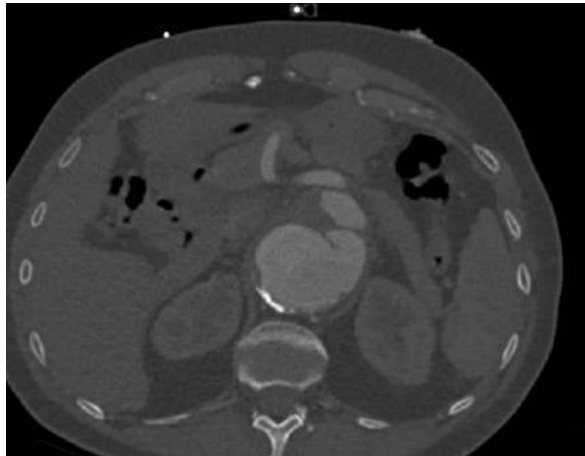
Transcatheter Electrosurgical Septotomy



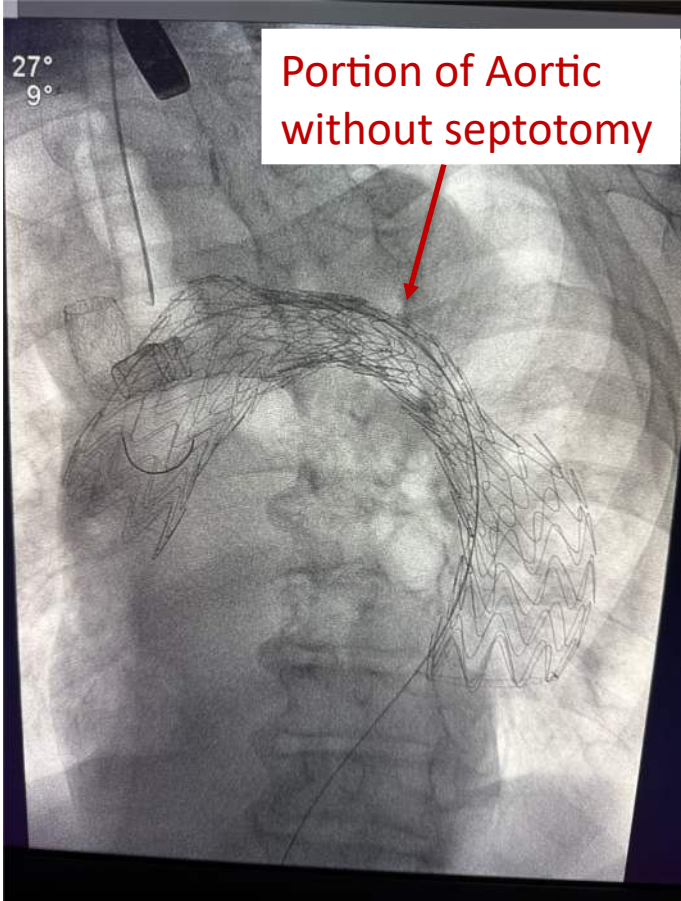
Transcatheter Electrosurgical Septotomy



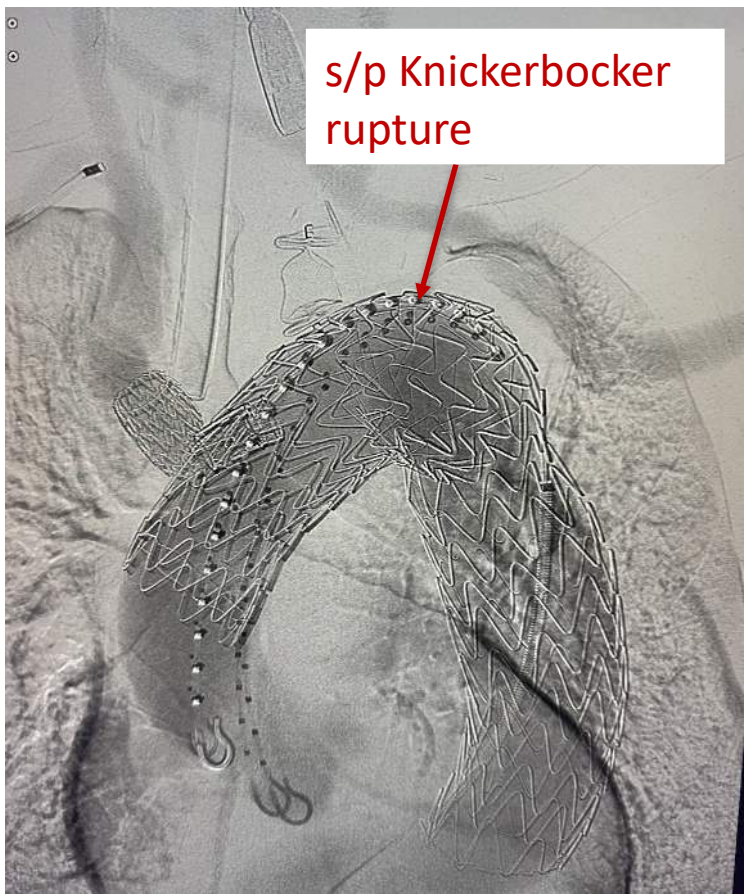
Transcatheter Electrosurgical Septotomy



Zone 0 TEVAR with Carotid-Carotid and Carotid-Subclavian Bypasses



Zone 0 TEVAR with Carotid-Carotid and Carotid-Subclavian Bypasses



Methods

- Design: Single-institution retrospective review (Nov 2024 – Dec 2025)
- Population: Patients undergoing thermal septotomy with prior proximal aortic repair
- Imaging: Pre- and post-procedural CT angiography
- Volumetric analysis: Zone 3–5 true/false lumen volumes Aquarius iNtuition (TeraRecon Inc. Version 4.9) 3D reconstruction
- Baseline demographics, comorbidities, anatomy, and adverse events captured

**Thermal septotomy +
TEVAR**



Pre/Post CTA



3D volumetrics (Zones 3–5)

Cohort

Complex chronic post-repair dissections

Patients
n = 12

Prior open arch
repair
11 / 12
91.6%

Frozen elephant
trunk
6 / 12
50%

Chronic phase at TEVAR
11 / 12
mean 344 days

- Persistent false lumen flow in all patients
- 16.7% of visceral vessels originated from the false lumen (8/48)
- Septotomy extent: isolated thoracic (n=6), thoracic-pararenal (n=2), thoracic-infrarenal (n=4)
- 3 patients required selective visceral stenting after septotomy

Main Result: Early Volumetric Remodeling

Thermal septotomy + TEVAR → true lumen ↑,
false lumen ↓

True lumen
volume

+144.5
cm³

mean ± SD: 144.5 ±
12

False lumen
volume

-55.0
cm³

mean ± SD: 55.0 ±
39.5

False lumen
Exclusion

100%

Max thoracic aortic diameter

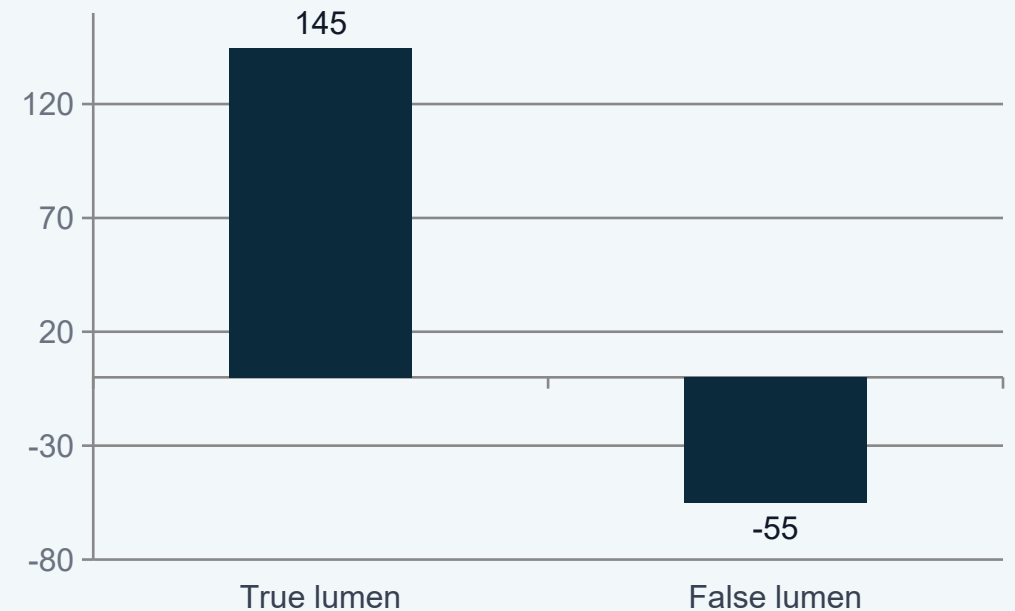
54.9 mm → 45.8 mm

Pre vs Post TEVAR

Max aortic diameter change at Celiac Axis

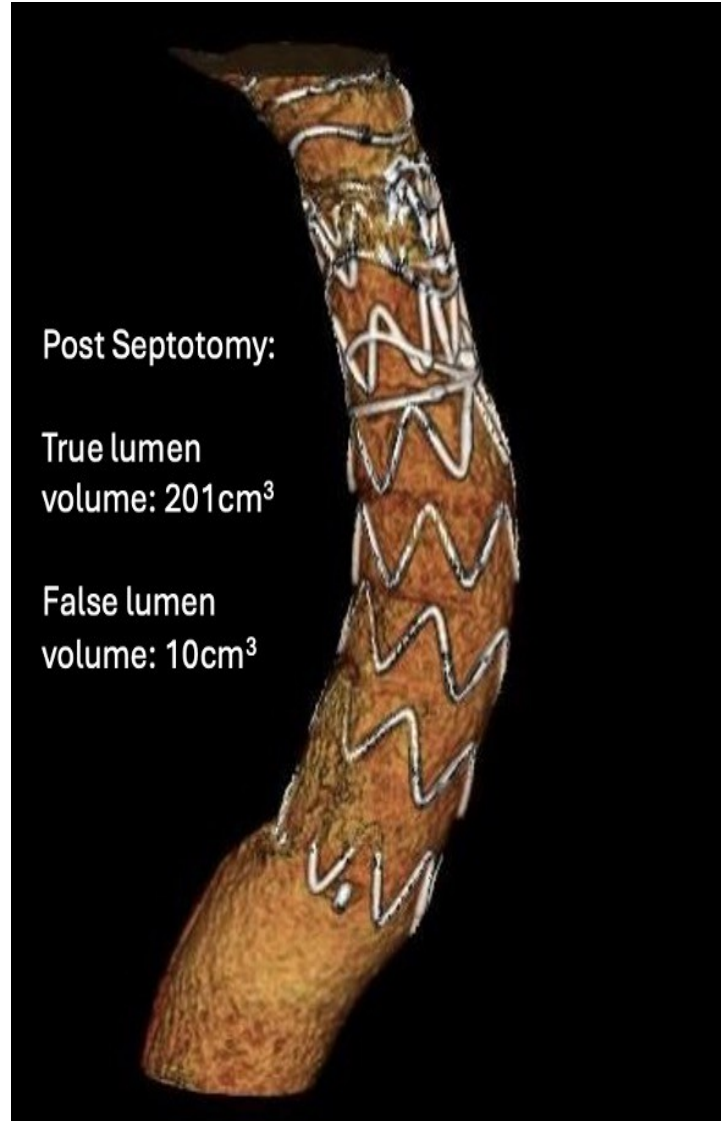
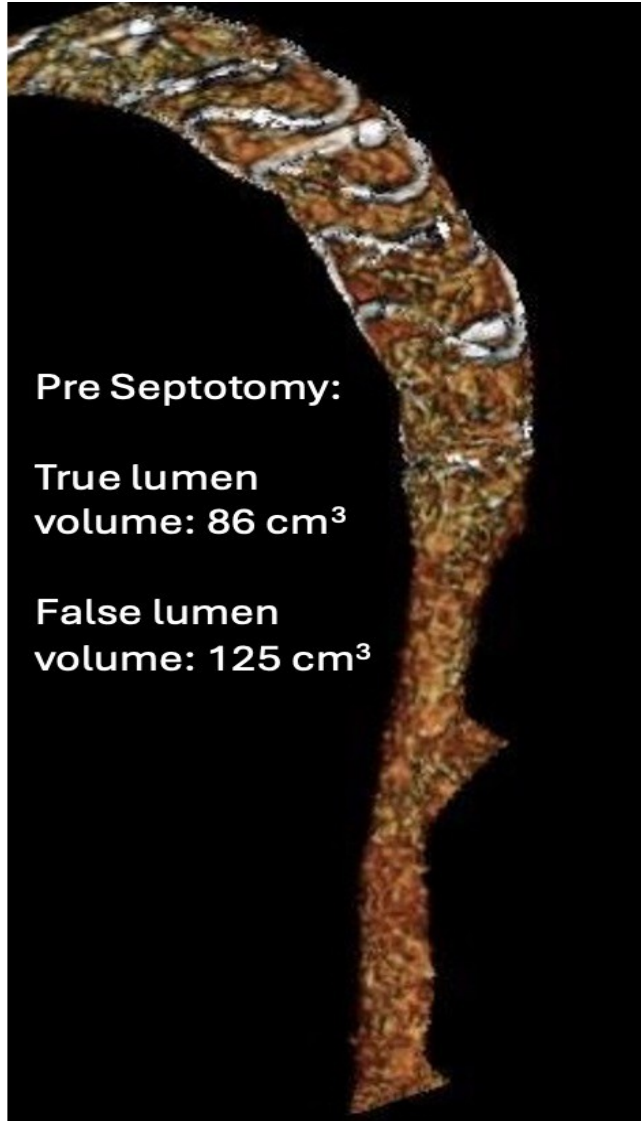
-5mm

Pre vs Post TEVAR



**Volume Pre vs Post TES +
TEVAR**

3D Reconstruction Volumetric Analysis



- 100% of patients had complete resolution of life-style limiting claudication secondary to true lumen compression
- 0% new entry tears identified or DTA endoleaks
- Zero late complications related to septum modeling
- Zero mesenteric or renal artery occlusion during aortic remodeling

Conclusions

- Thermal septotomy showing promise as a safe and effective adjunct in the endovascular management of chronic thoracic and thoracoabdominal aortic dissections
- Short-term volumetric analysis demonstrates:
 - Significant true lumen expansion
 - Meaningful false lumen volume reduction
 - Evidence of positive aortic remodeling
- No in-hospital mortality supports procedural safety

**Early CTA
volumetrics support
favorable remodeling
after TEVAR with
thermal septotomy**

**True lumen
expansion**

**False lumen
reduction**

Symptom resolution

Thank you. Questions?