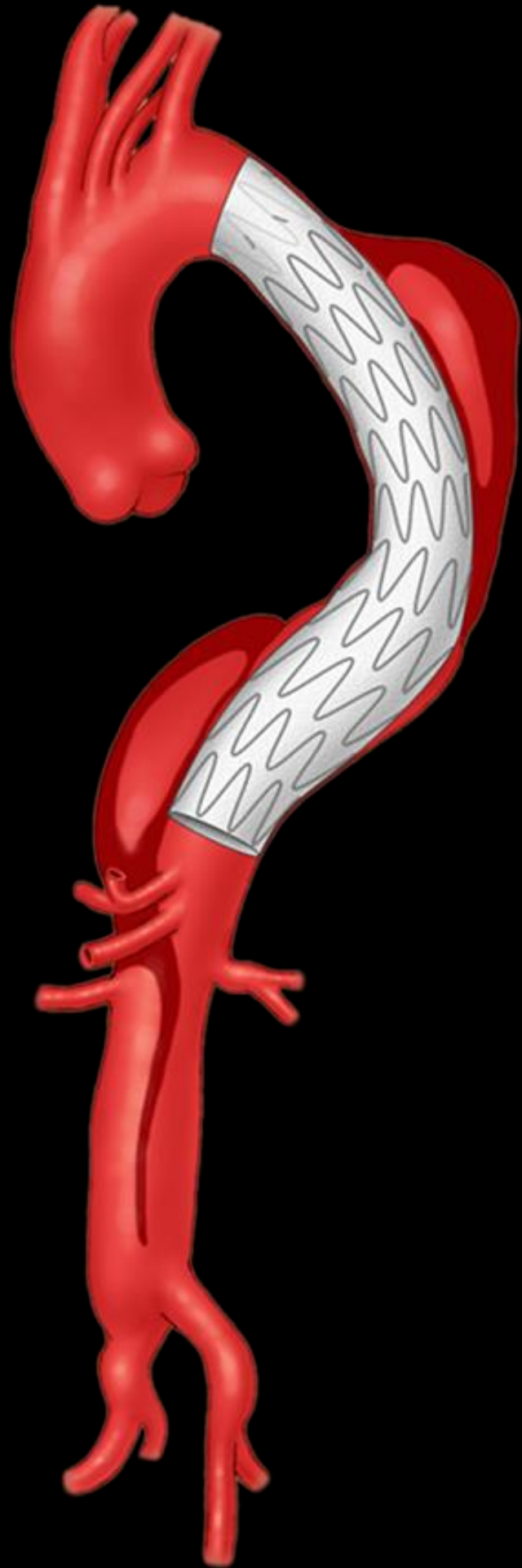


# Retrograde IMH and Dissections: When and How is TEVAR Indicated?



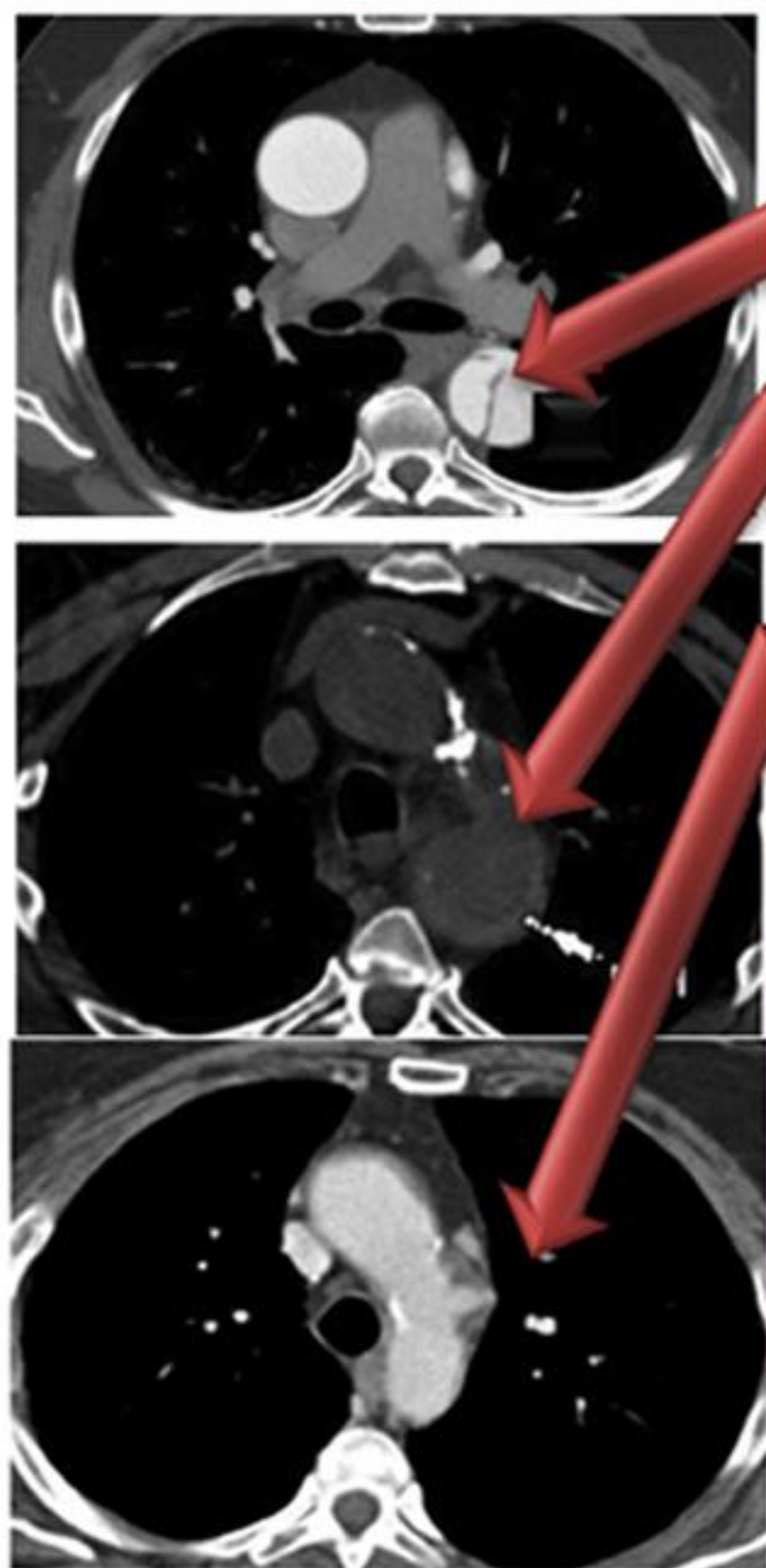
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Professor of Surgery and Radiology  
Director, Aortic Network  
University of North Carolina  
Chapel Hill, NC

# Disclosures

	<b>Cook Medical</b>	<b>WL Gore</b>	<b>Getinge</b>	<b>Centerline Biomedical</b>	<b>ViTTA</b>
<b>Relationship</b>	Research Support, Clinical Trials, Consulting	Clinical Trials, Consulting	Consulting	Consulting	Consulting, Clinical Trials
<b>Received</b>	Grants, Honoraria	Honoraria	Honoraria	Stock Options	Honoraria

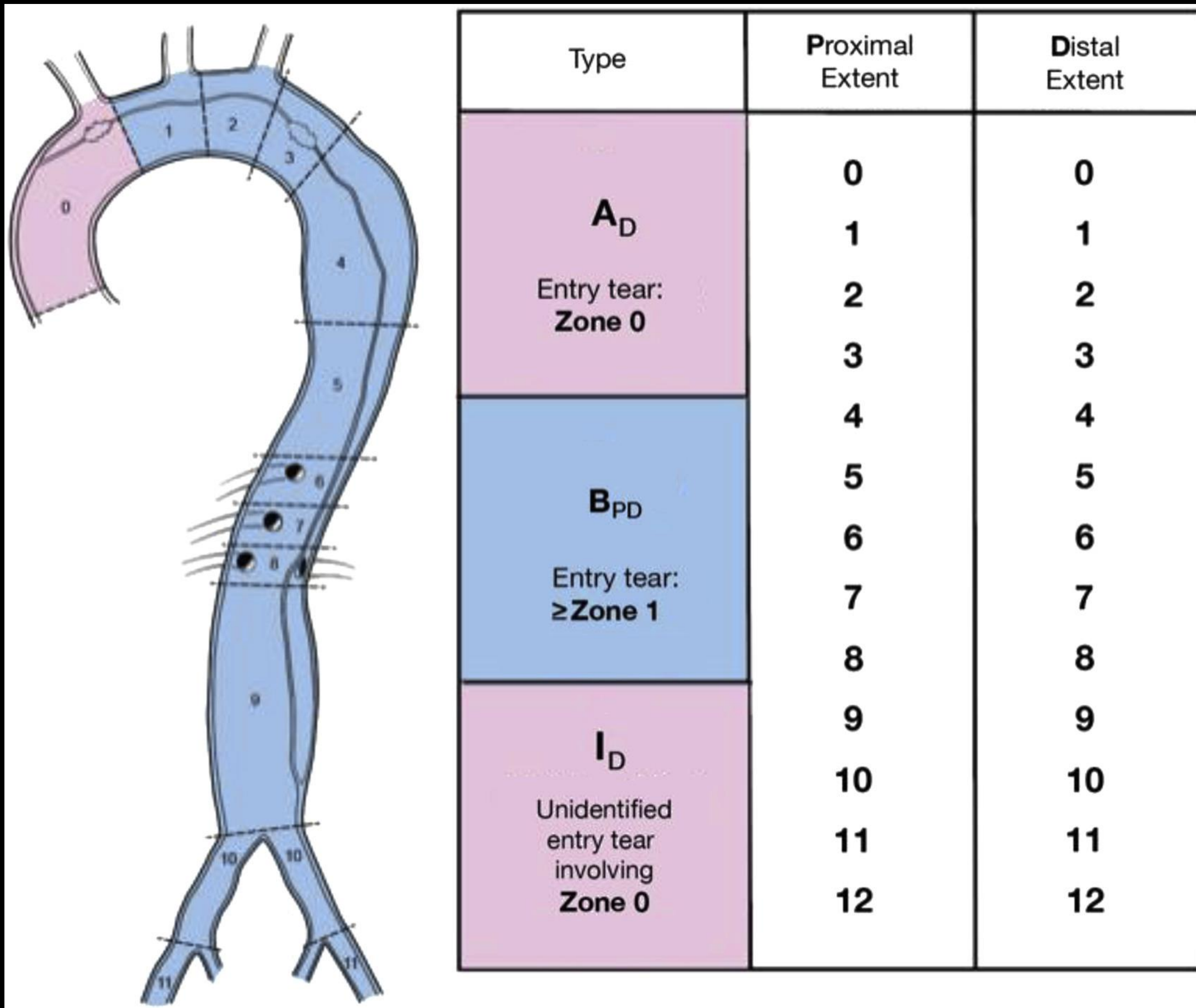
# Classification

## Society for Vascular Surgery and Society of Thoracic Surgery Reporting Standards for Type B Aortic Dissections



DEFINITIONS	
<b>Aortic Dissection</b>	Tear in the intima that results in separation of layers of the media and allows blood to flow through the false lumen
<b>Intramural Hematoma</b>	There is no identifiable direct communication between true and false lumen. Characterized by hyperdense, crescent-shaped hemorrhage within aortic wall
<b>Penetrating Aortic Ulcer</b>	Atherosclerotic lesion that penetrates the internal elastic lamina of the aortic wall. Often diagnosed in presence of intramural hematoma

Aortic Dissection Acuity		CHRONICITY	Time from Onset of Symptoms
<b>High Risk</b>	Refractory pain or HTN Bloody pleural effusion Aortic diameter > 40 mm Radiographic only malperfusion Readmission Entry tear: Lesser curve location False lumen diameter > 22mm	Hyperacute	< 24 hours
		Acute	1-14 days
		Subacute	15-90 days
		Chronic	> 90 days
<b>Complicated</b>	Rupture Malperfusion		



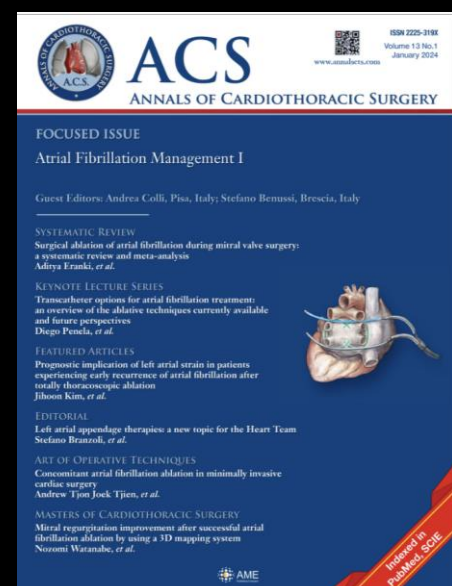
**B<sub>0-x</sub>, B<sub>1-x</sub>, or B<sub>2-x</sub>**

**Retrograde IMH and Dissection**

# Management of retrograde type A IMH with acute arch tear/type B dissection

Foeke Nauta<sup>1</sup>, Hector de Beaufort<sup>2</sup>, Firas F. Mussa<sup>3</sup>, Carlo De Vincentiis<sup>4</sup>, Atsushi Omura<sup>5</sup>, Hitoshi Matsuda<sup>5</sup>, Santi Trimarchi<sup>6,7</sup>

- IRAD: 6%
- Mortality not different than AD: 12-26%
- Predictors of Regression: Normal aortic diameter at presentation
- Progression to dissection: 16-45%



# Medical versus Surgical Intervention

- Western World
  - Typical approach is surgical repair
    - Emergent if pt is unstable
    - Initial medical mgmt ( $\beta$ -blocker) followed by repair in acute/subacute phase
  - Timing of Repair may vary depending upon patients condition
- Eastern World
  - Trend towards initial medical management
  - Repair in subacute phase with TEVAR in selected case



# When?

## TEVAR

- Symptomatic Patients
  - Treat immediately
- Asymptomatic Patients\*\*
  - Typically during the acute or subacute phase
  - May need to treat earlier if failing medical tx
  - Trend towards treatment < 30d

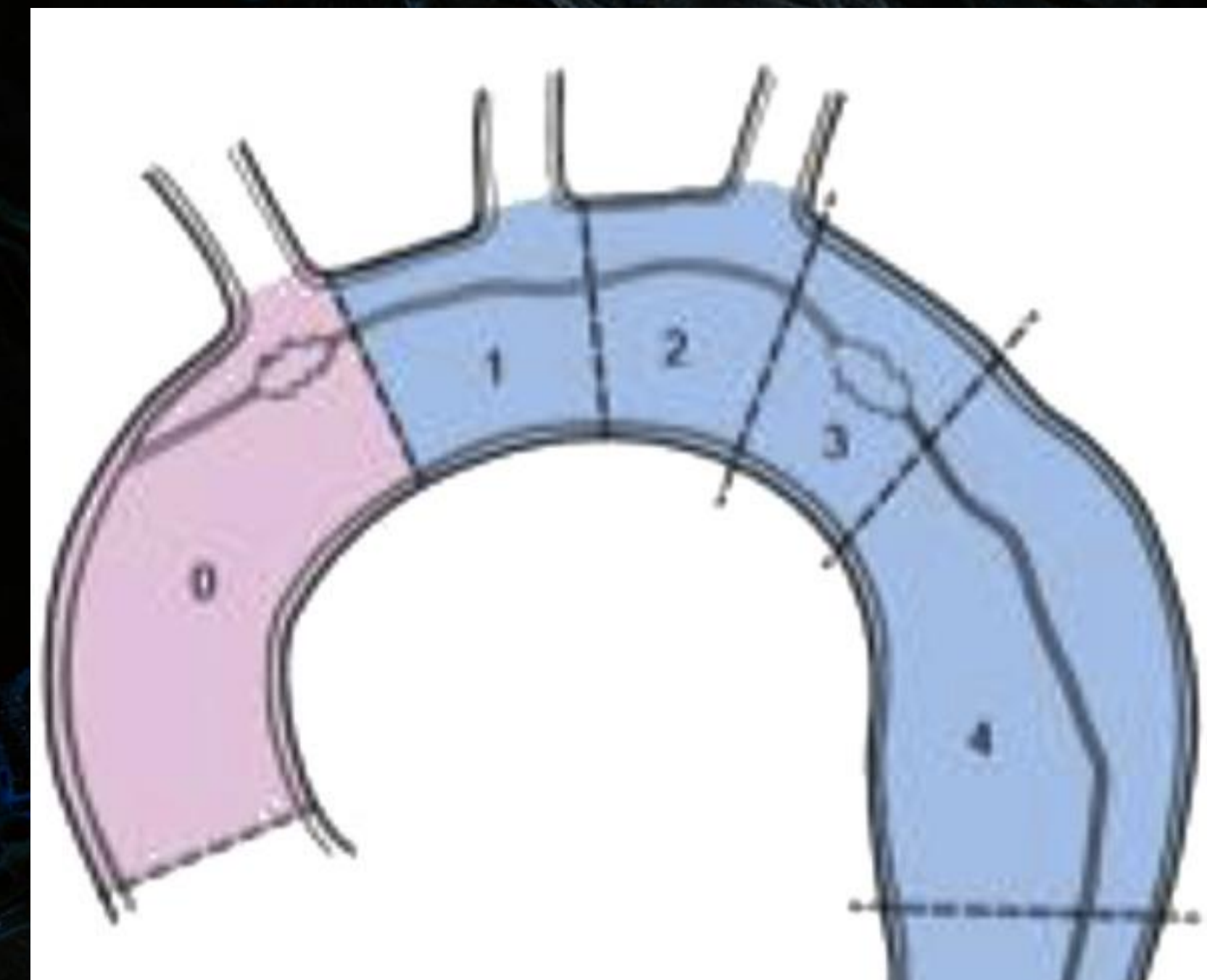
CHRONICITY	Time from Onset of Symptoms
Hyperacute	< 24 hours
Acute	1-14 days
Subacute	15-90 days
Chronic	> 90 days

**\*\*All patients require frequent repeat imaging during initial presentation and while undergoing medical tx**

# Endovascular Repair How?

- TEVAR may be indicated in appropriately selected individuals
  - Proximal extension based approach
- EV principle for dissections/IMH
  - Proximal device should be located in normal aorta
  - Device sizing:  $\leq 10\%$  oversizing
  - Avoid bare metal proximal config?
  - Avoid barbs?
- Procedural Risks:
  - Acute complications
    - Stroke
    - Rupture
    - Great vessel complications
    - RTAAD

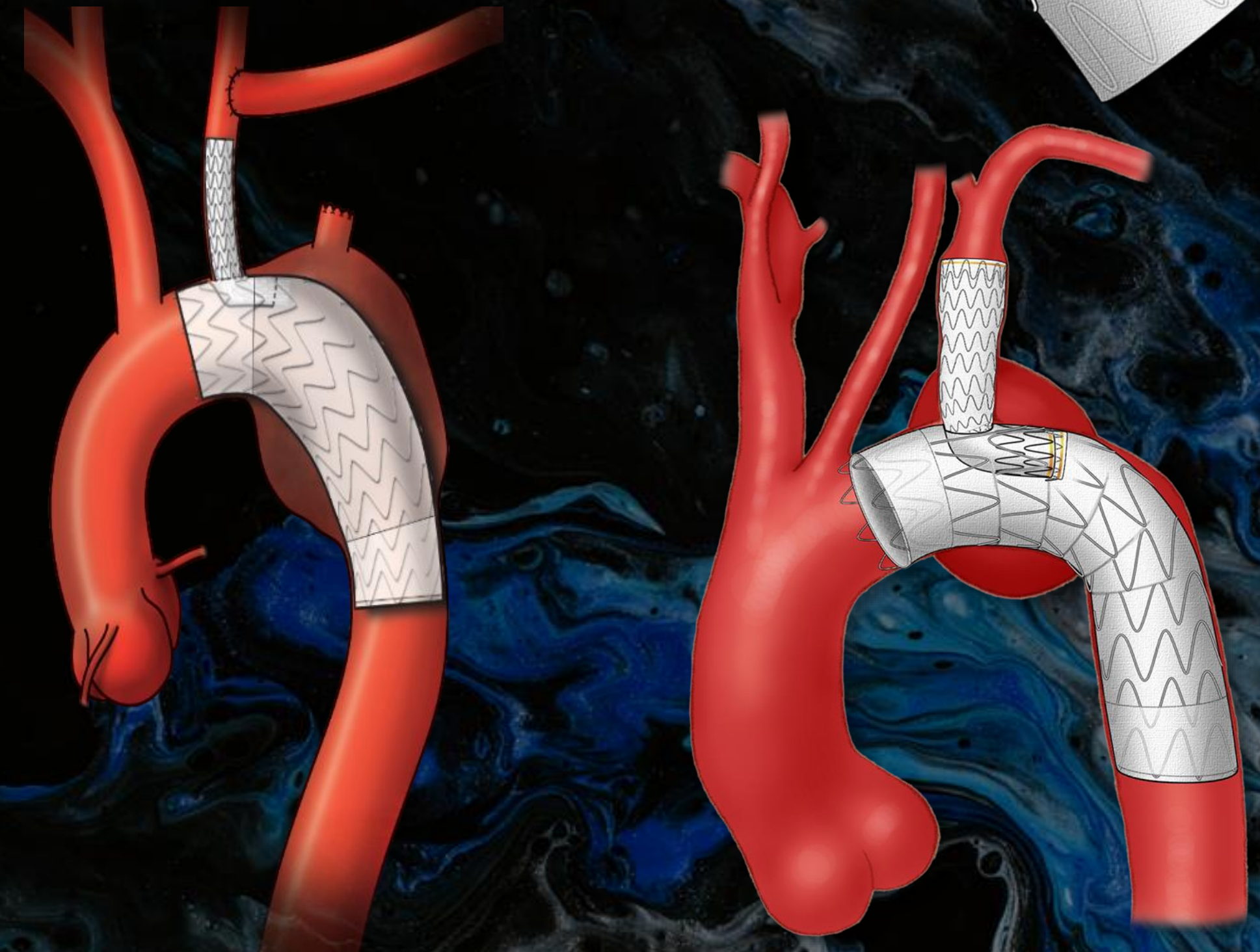
**B<sub>0</sub>, B<sub>1</sub>, or B<sub>2</sub>**





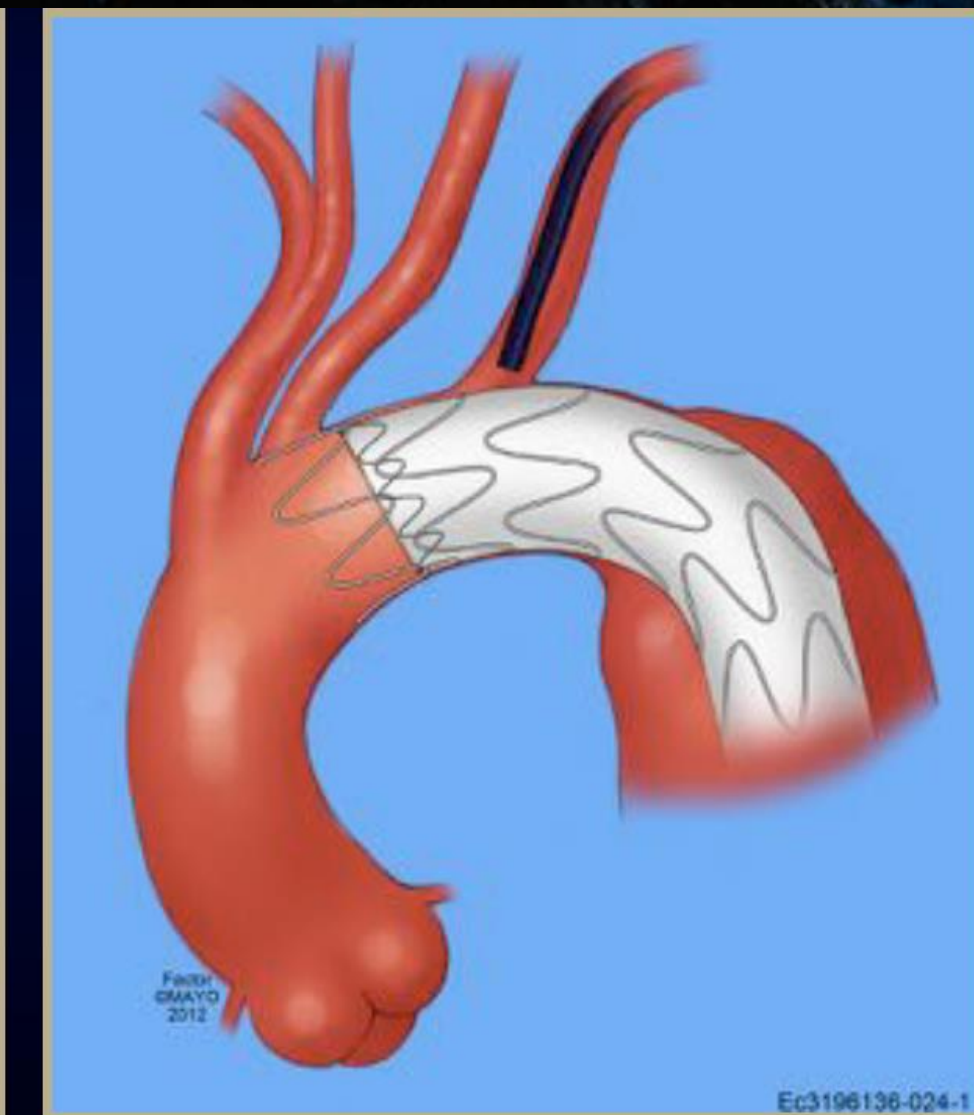
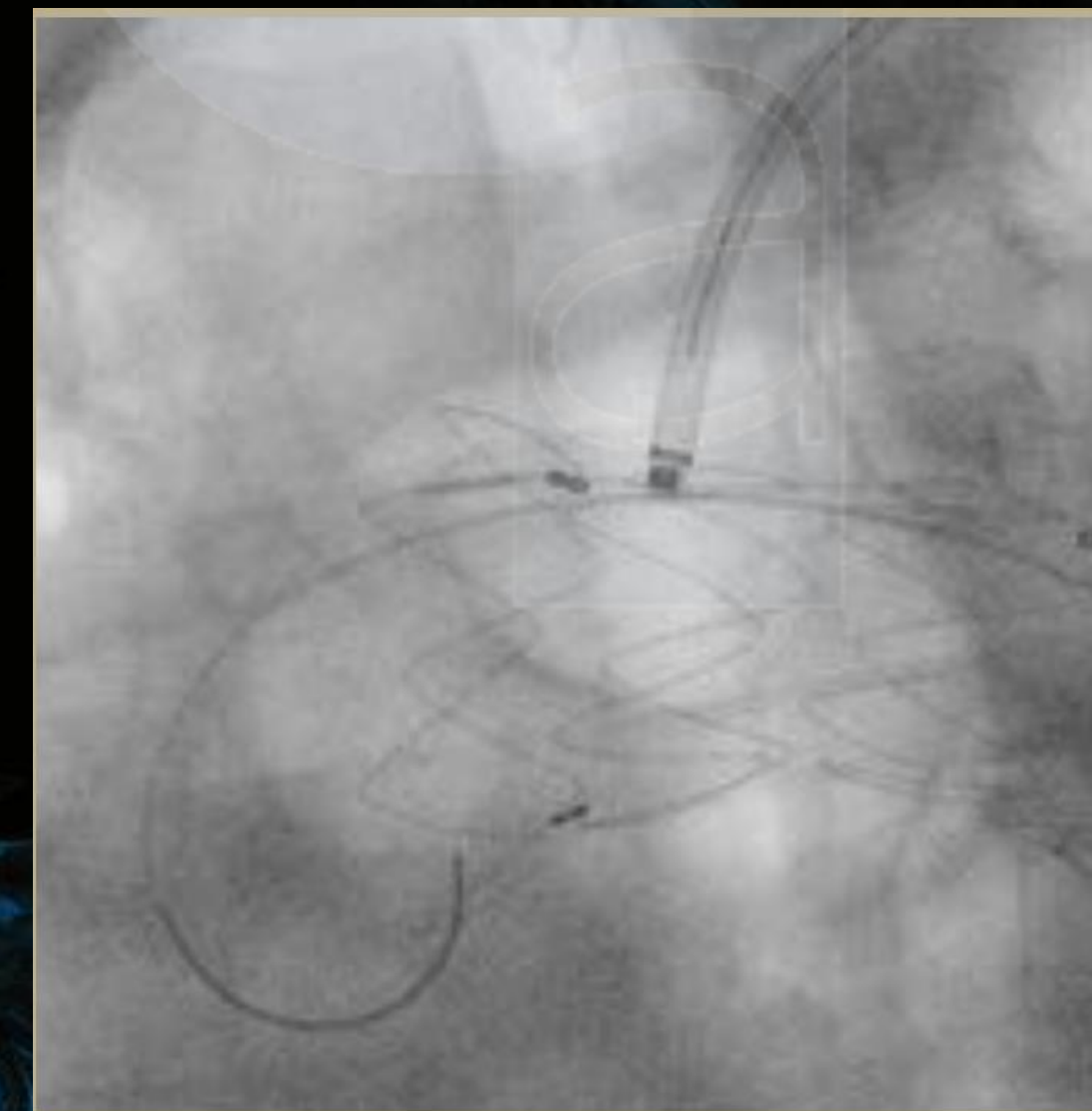
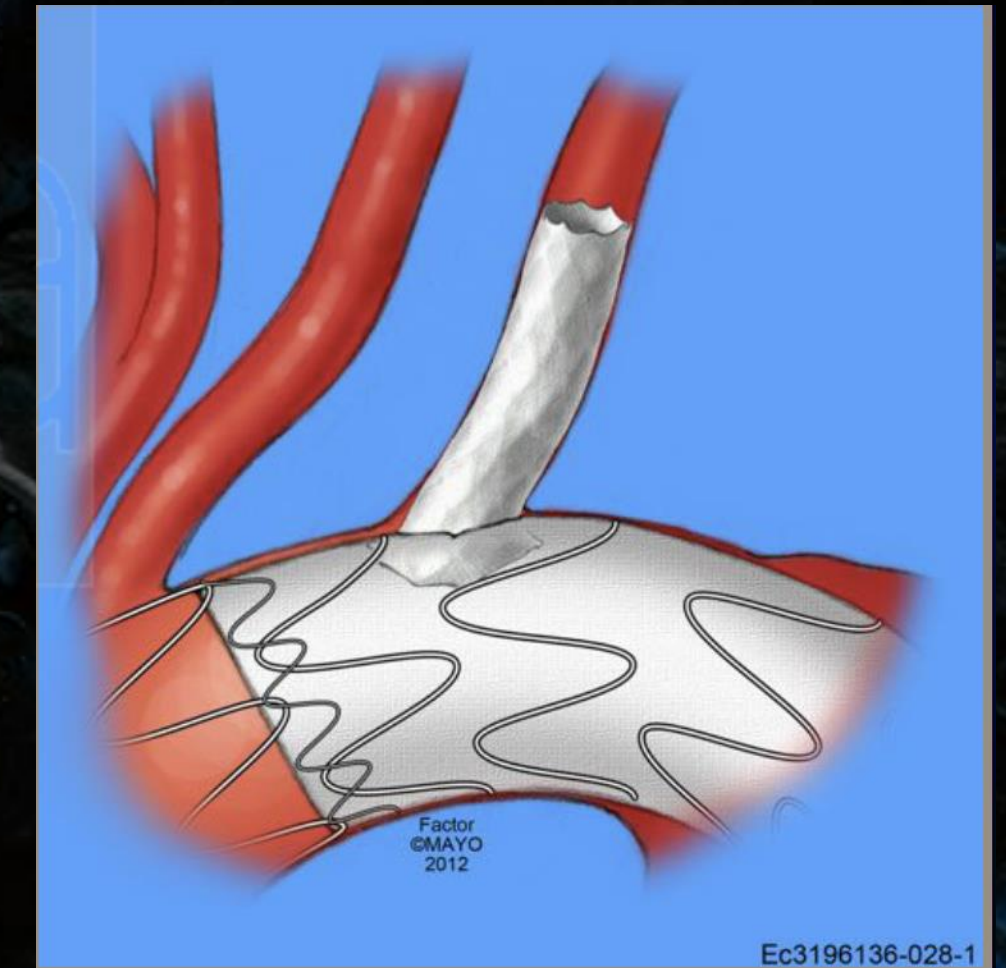
# Zone 2 Extension

- Goals
  - Proximal device should be implanted into non-diseased aorta (Zone 1)
  - Avoid bare stents if possible?
- Options
  - TBE into L CCA
    - Revascularization of the L SCA
  - Cook single branch device
  - TEVAR with revascularization of the L SCA
  - Laser Fenestration of LSCA  $\pm$  L CCA



# Zone 2 Extension

- Goals
  - Proximal device should be implanted into non-diseased aorta (Zone 1)
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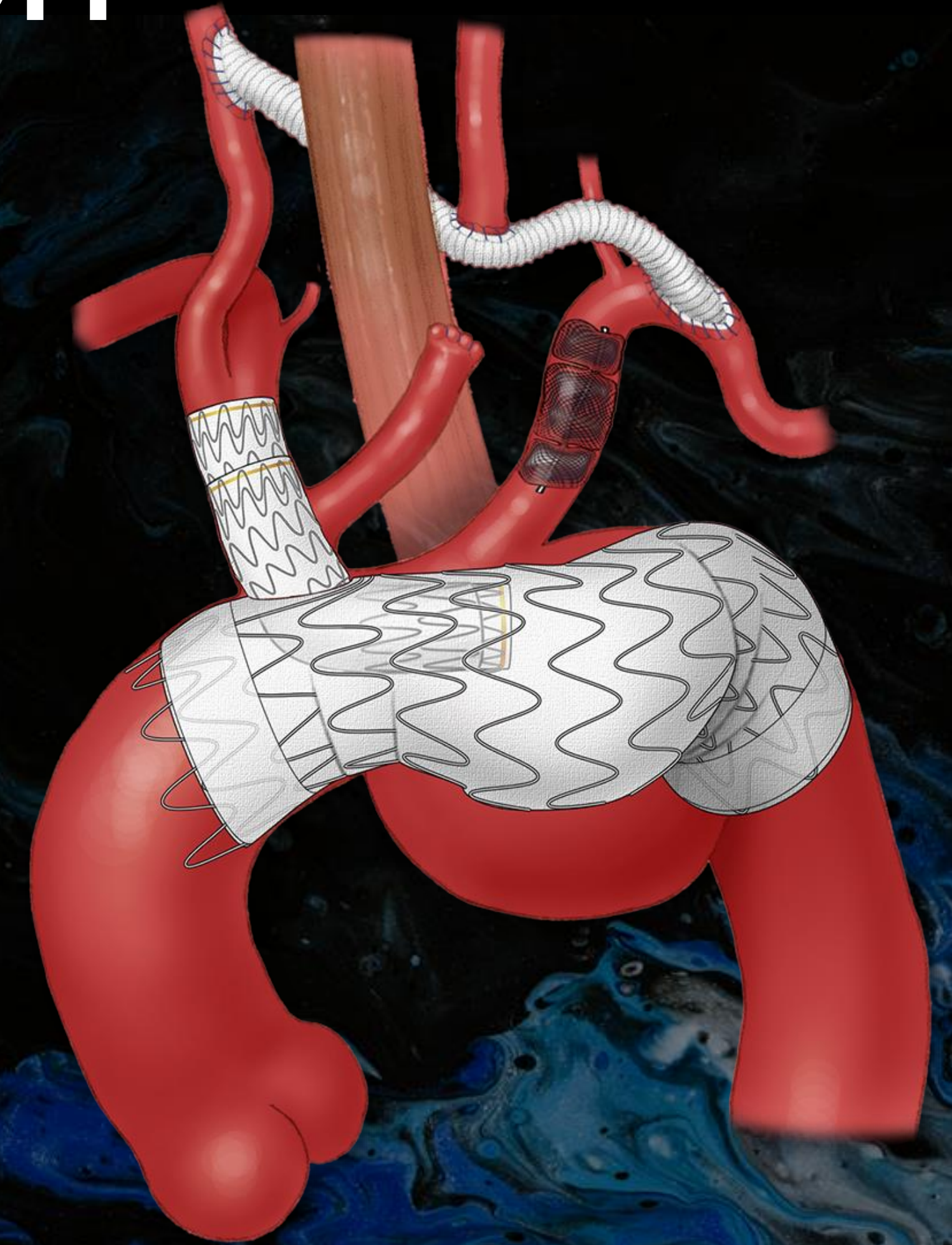
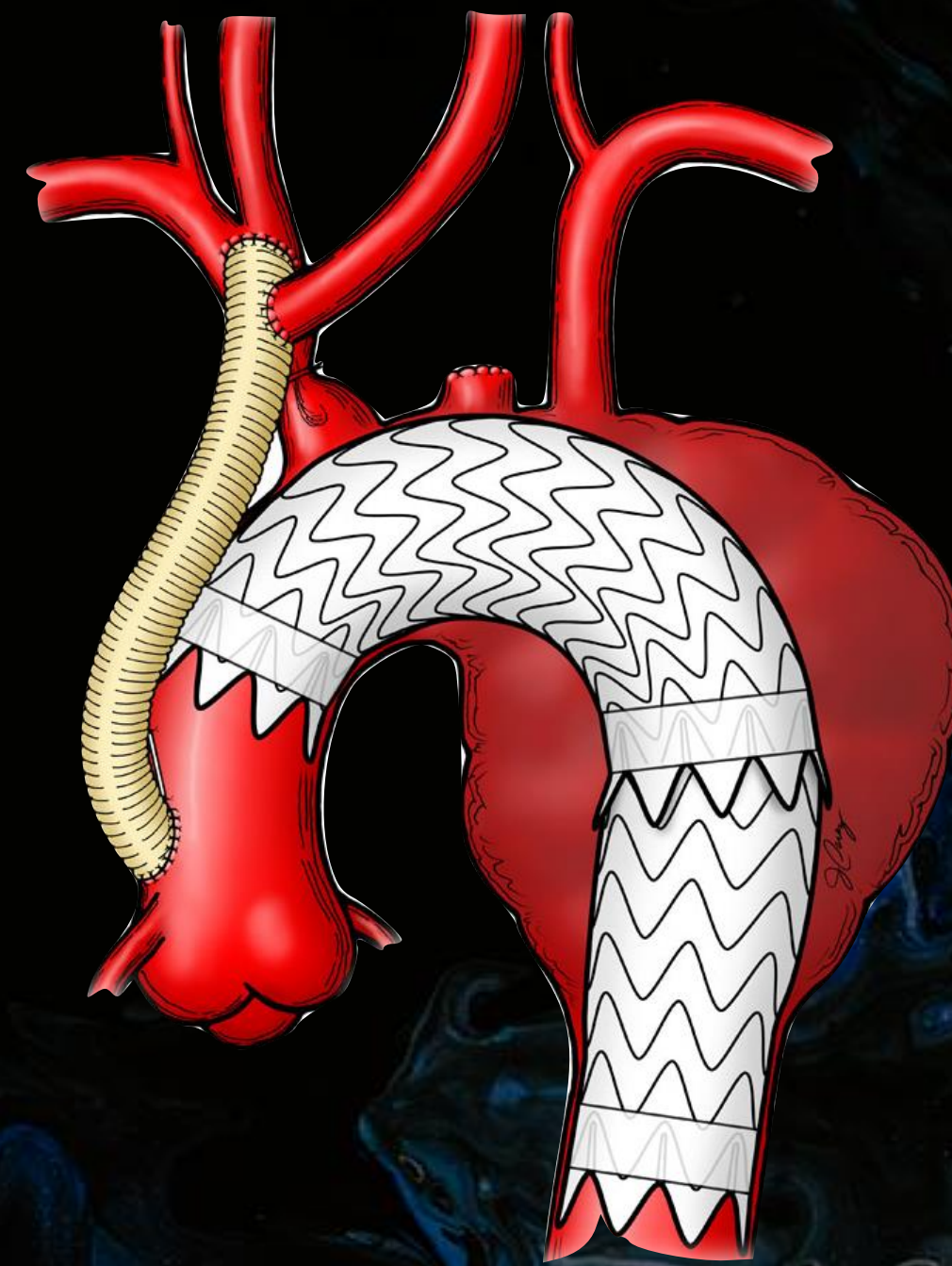


# Zone 1 Extension

- Goals
  - Proximal device should be implanted into non-diseased aorta
  - Avoid bare stents if possible?
- Options
  - TBE into L CCA
    - Revascularization of the L SCA via transposition or bypass
  - Cook single branch device into the L CCA with L SCA revascularization
  - TEVAR with cervical debranching (C-C Bypass and L C-SCA bypass)
  - Multi-brach arch repair (Cook, or Terumo)
  - Single branch Endospan Repair
  - Laser Fenestration of L CCA and L SCA

# Zone 0 Extension

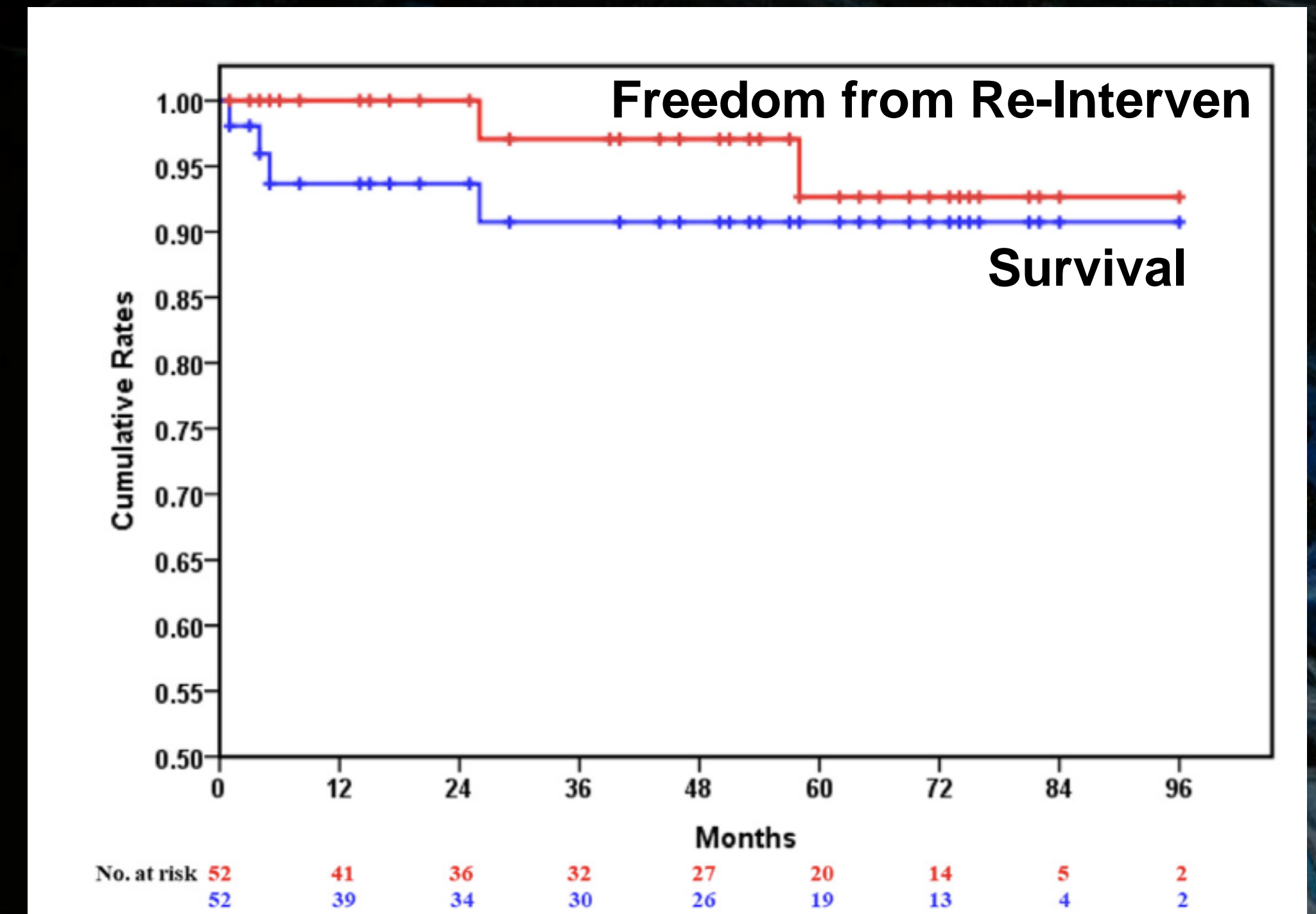
- Proximal extent of TEVAR - ascending aorta
  - Asc. aortic diameter < 38 mm
  - Hybrid debranching
    - Gore TBE
    - Endospan
  - Multi-branched endograft
    - Cook
    - Endospan
    - Terumo Arch Branch
  - Ascending bypass and TEVAR



# Safety and efficacy of thoracic endovascular aortic repair for acute Stanford type B aortic dissection with retrograde type A intramural hematoma

Junwei Wang, MD,<sup>a,b</sup> Ming Li, MD,<sup>a,b</sup> Jiehua Li, MD,<sup>a,b</sup> Hao He, MD,<sup>a,b</sup> Yang Zhou, MD,<sup>a,b</sup> Xin Li, MD,<sup>a,b</sup> Quanming Li, MD,<sup>a,b</sup> Feng Gu, MD,<sup>a,b</sup> Zijian Ye, MM,<sup>a,b</sup> Alan Dardik, MD, PhD,<sup>d</sup> and Chang Shu, MD, PhD,<sup>a,b,c</sup>  
Changsha and Beijing, China; and New Haven, CT

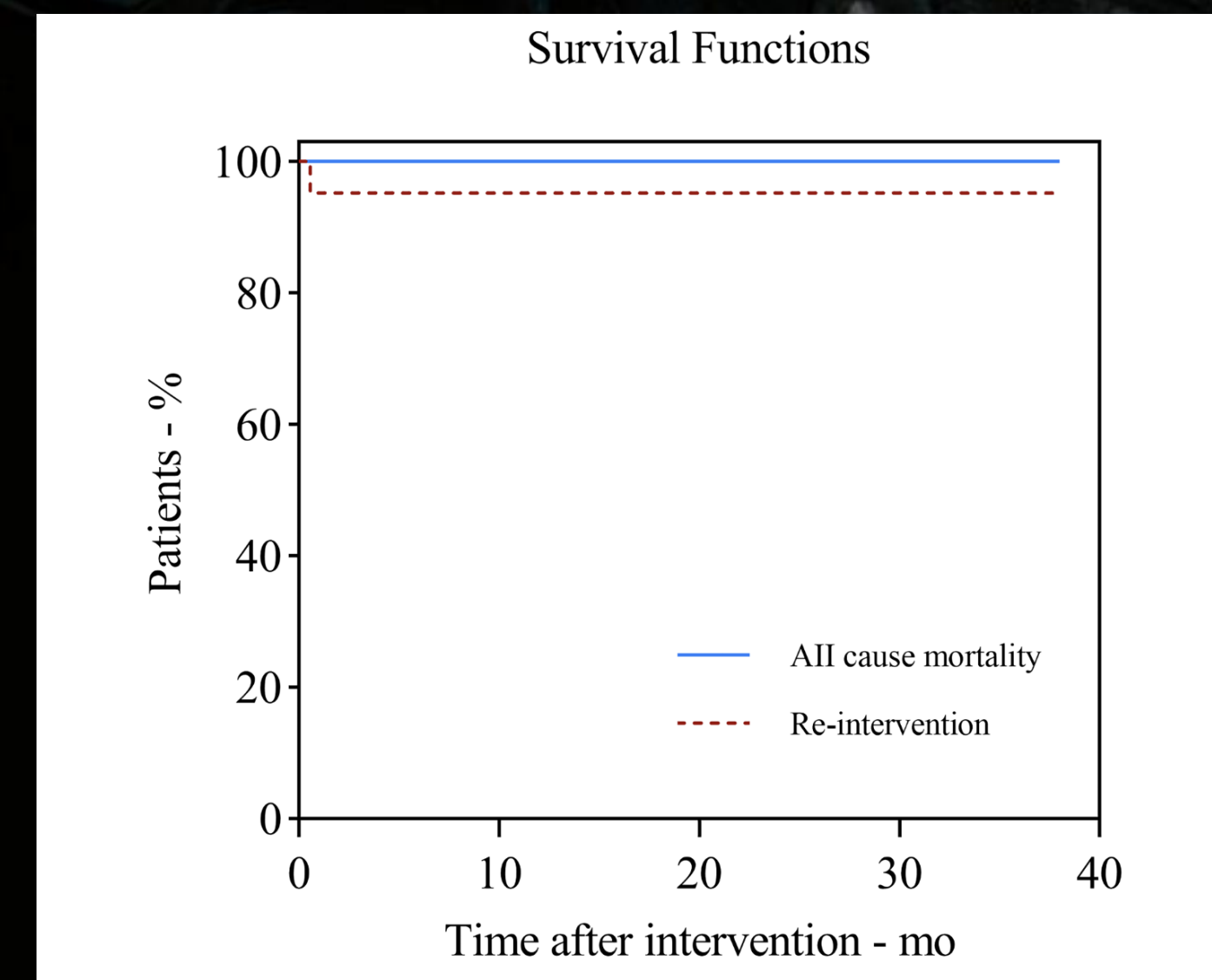
- N=52
- Mean sx duration to tx: 11 days
- Uncomplicated IMH < 10 mm
- Exclusions (surgical repair):
  - IMH  $\geq$  11 mm
  - Ascending aortic diameter  $\geq$  50 mm
- Mortality 30d: 30%
- Complications: 11.5%
  - RTAAD: 7.7% (10d - 4 months)
  - Isolated ascending dissection: 1.9 %



# Efficacy of endovascular repair in the treatment of retrograde ascending aortic intramural haematoma

Bailang Chen<sup>1</sup>, Rui Zhang<sup>1</sup>, Haibing Liu<sup>1</sup>, Yao Chen<sup>1</sup>, Zanxin Wang<sup>1\*</sup> and Minxin Wei<sup>1\*</sup>

- N=21, mean age 53
- Timing:
  - <14 d: 10
  - > 14 d: 11
- Device:
  - Single Branch 10
  - Fenestrated: 9
  - TEVAR: 2
- Technical Success: 100%
- Stroke: 0%
- Conversion to open repair: 1 (> 14 days post-op)



# Outcome Comparison Between Open and Endovascular Aortic Repair for Retrograde Type A Intramural Hematoma With Intimal Tear in the Descending Thoracic Aorta: A Retrospective Observational Study

*Kelvin Jeason Yang<sup>1</sup>, Nai-Hsin Chi<sup>1,2</sup>, Hsi-Yu Yu<sup>1,2</sup>, Yih-Sharnng Chen<sup>1,2</sup>,  
Shoei-Shen Wang<sup>1,3</sup> and I-Hui Wu<sup>1,2\*</sup>*

- OR: 33, TEVAR: 13
  - 46% TEVAR within 24 hrs of presentation
- Mortality (30d): OR 39.4%, TEVAR 7.7%;  $p=0.037$
- No difference in 5 yr
  - All Cause Mortality: 82.1 vs 87.8%
  - Reintervention: 82.5% vs 93.8%
  - Aortic Related Mortality: 88.9% vs 90.9%
- TEVAR had significantly better resolution if IMH or FL in descending thoracic aorta: 14 mm vs 5 mm

Oct 2021



# Conclusion

- TEVAR for TAIMH is feasible in selected patients
- Treatment during the late acute or subacute phase does not appear to have significant increased risks
  - Minimal oversizing (~10%)
  - Thickness of the IMH (<10 mm) may have a role in pt selection?
  - Ascending aortic diameter limitations (<38mm?)
  - Reported series are small
  - Follow-up is short



