

ENDOVASCULAR MANAGEMENT OF VISCERAL MALPERFUSION IN ACUTE TYPE I AORTIC DISSECTION

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Disclosure

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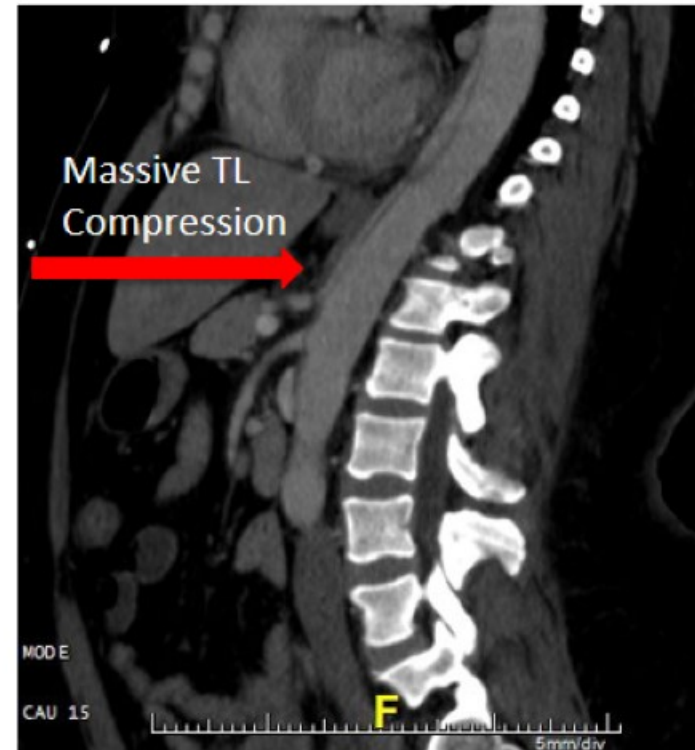
✓ I do not have any potential conflict of interest

Background

- Acute Type A Aortic Dissection complicated by mesenteric malperfusion (ATAMM)
 - Rare: 3-6%
 - High mortality: 38-75%
 - Deeb GM, et al *JTCVS* 2010;140 (Suppl 6): S98-100.
 - Girdauskas E, et al *JTCVS* 2009;138:1363-9.
 - Fann JJ, et al. *Ann Surg* 1990;212(6):705-13.
 - DiEusanio M, et al. *JTCVS* 2013;145:385-90.
 - Independent predictor for mortality (OR 3.0-9.5)
 - Pacini D, et al. *EJCTS* 2013;43(4):820-826.
 - Leontyev S, et al. *Ann Thorac Surg* 2016;101(5): 1700-1706

Acute Type I AD with Mesenteric Malperfusion: Etiology of the Problem

- Massive TL compression in DTA and Abdominal Aorta due to dynamic flap
- Inflow problem to the distal aorta
- Insufficient flow to Celiac and SMA vascular beds
- High association with renal and ileofemoral malperfusion

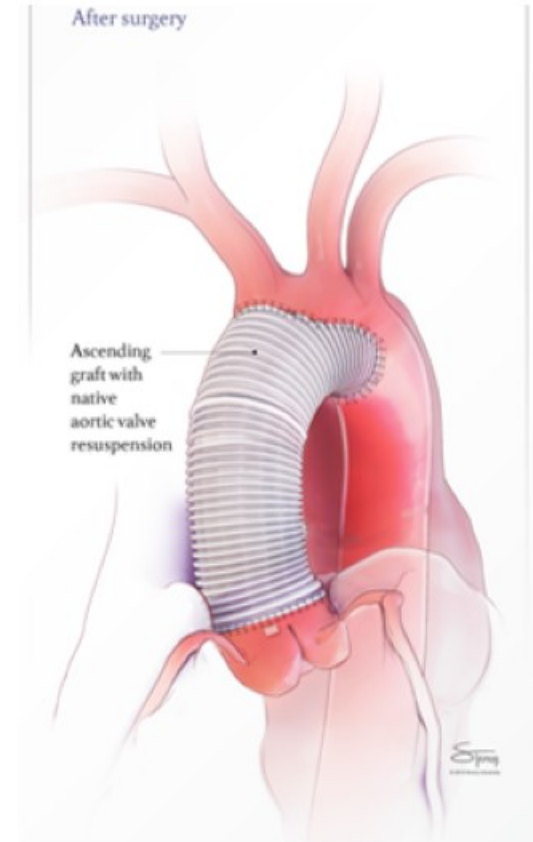


This is a problem....

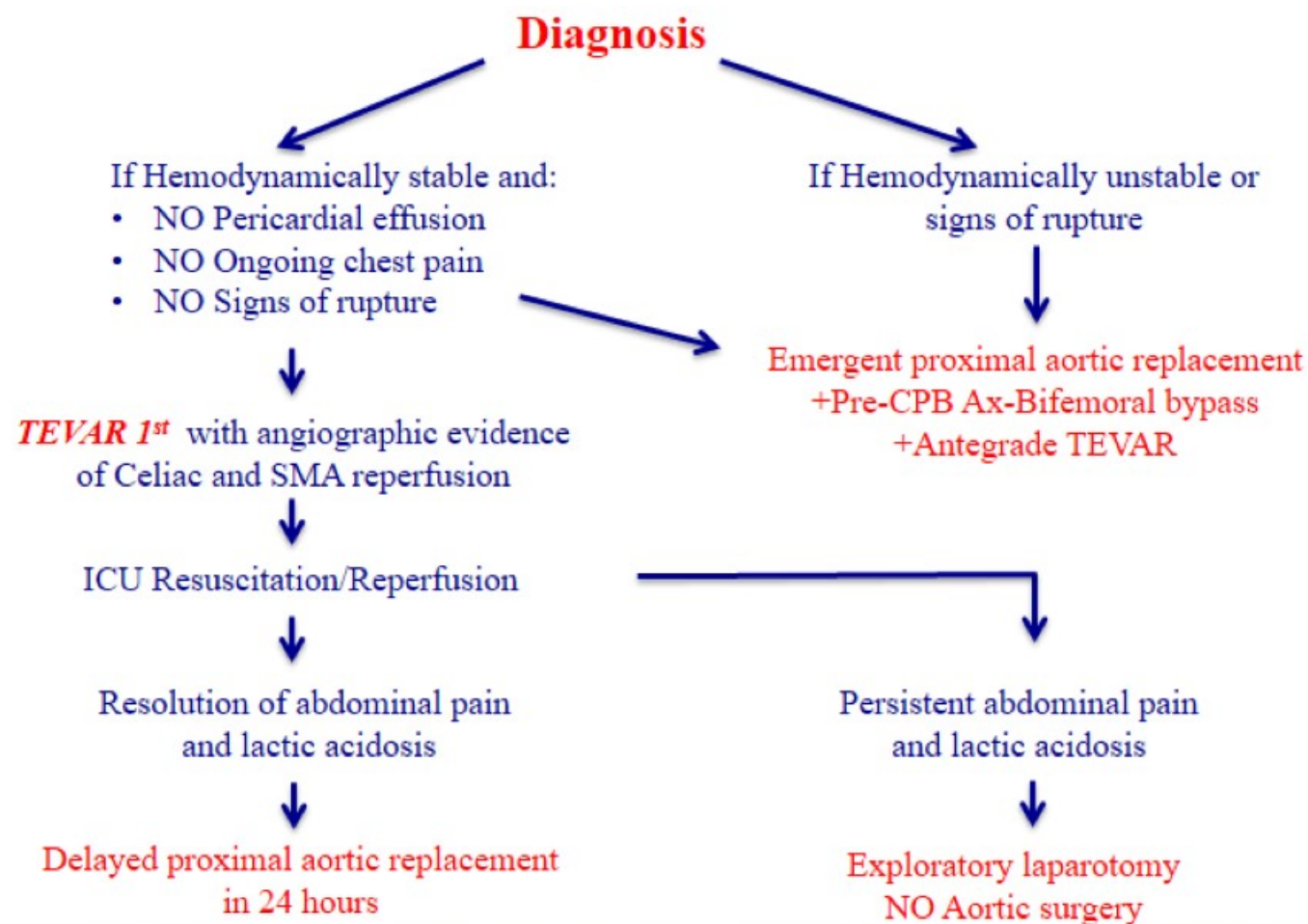


Background

- Traditional Surgical Strategy
 1. Asc/Arch using HCA
 2. Exploratory laparotomy
 - Possible bowel resection

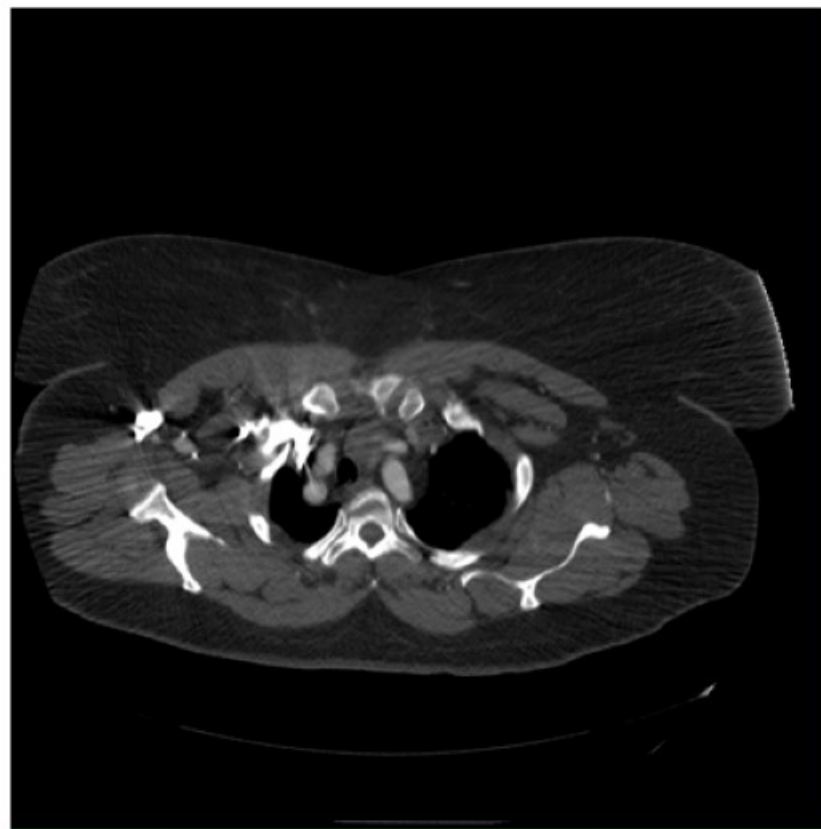


Emory Algorithm for acute Type I AD with Mesenteric Malperfusion



Pre-op CT Scan

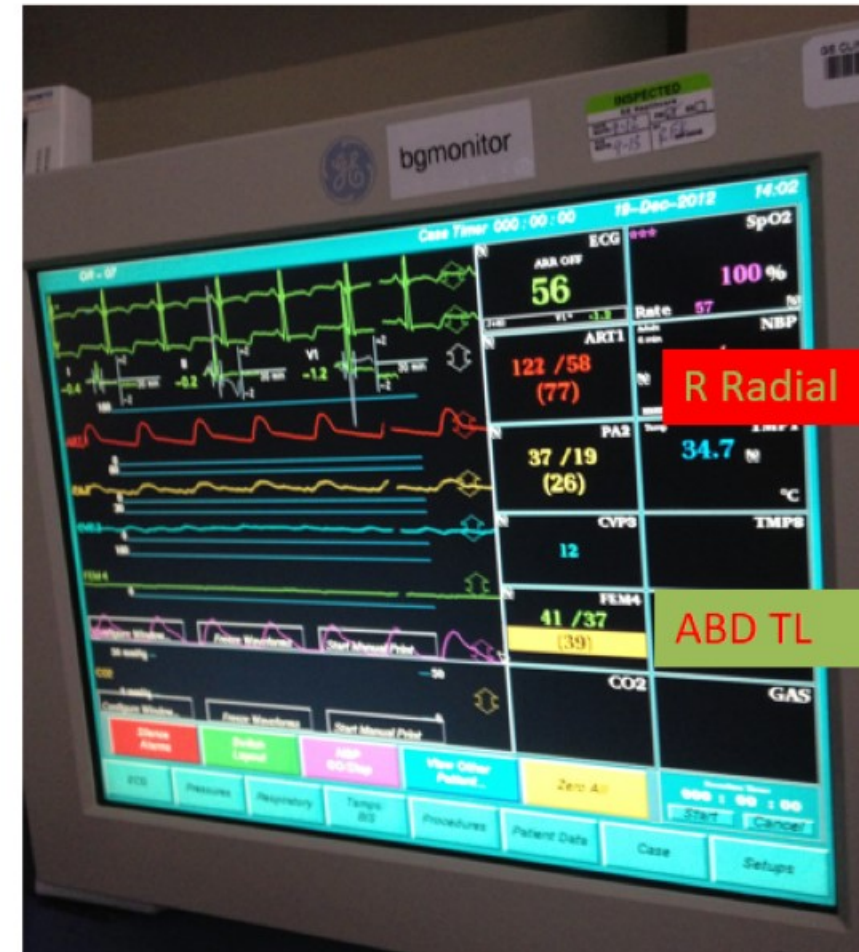
- 53 yo morbidly obese female presents to an OSH with severe abdominal and right leg pain
- Transferred to Emory
- On arrival, complaining of abdominal pain
- PE
 - ABD: Soft, tender to palpation in the epigastrium
 - Cool, pulseless right leg
- Cr. 2.1
- “Pain out of proportion” to exam



Stage I: TEVAR + Peripheral Stent

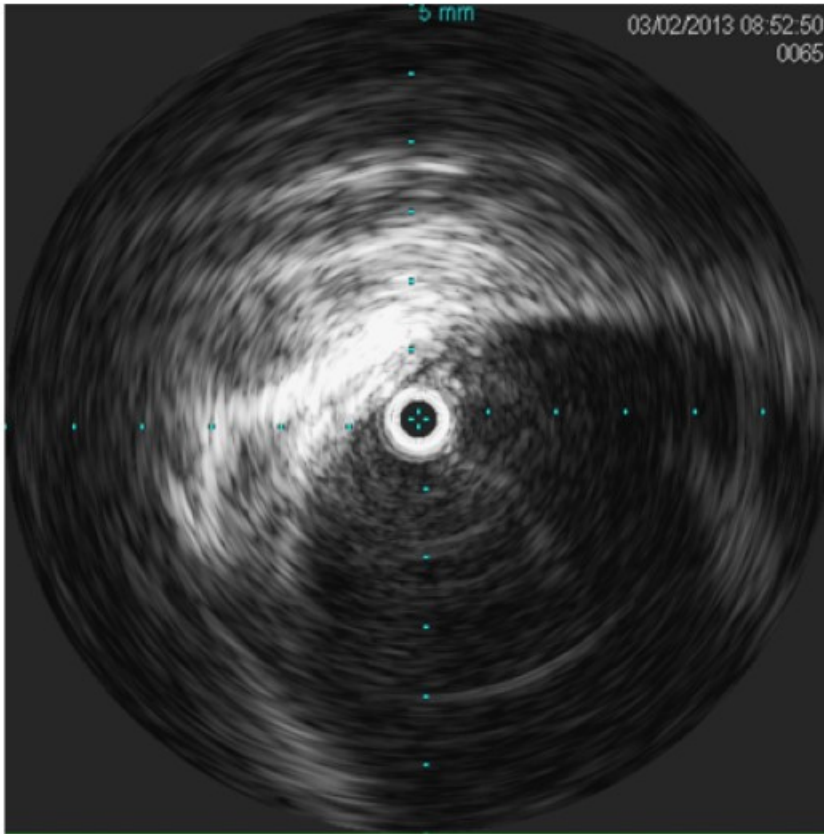
- Hybrid room
- Open exposure of R femoral artery (pulseless)
- 5 Fr Sheath in L CFA
- Pressure Measurements
 - R Radial (Thoracic TL)
 - ABD TL
 - Femoral arteries
 - Right: 45/28 mm Hg
 - Left: 117/60 mm Hg

Physiologic Proof of Mesenteric Malperfusion

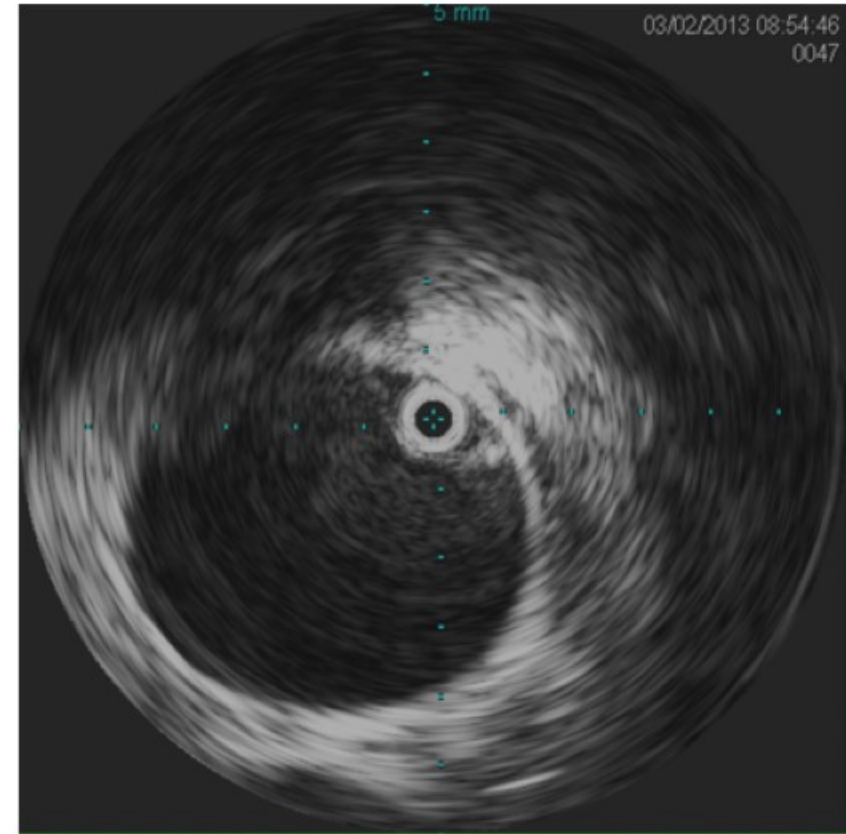


Type A with Mesenteric Malperfusion: IVUS

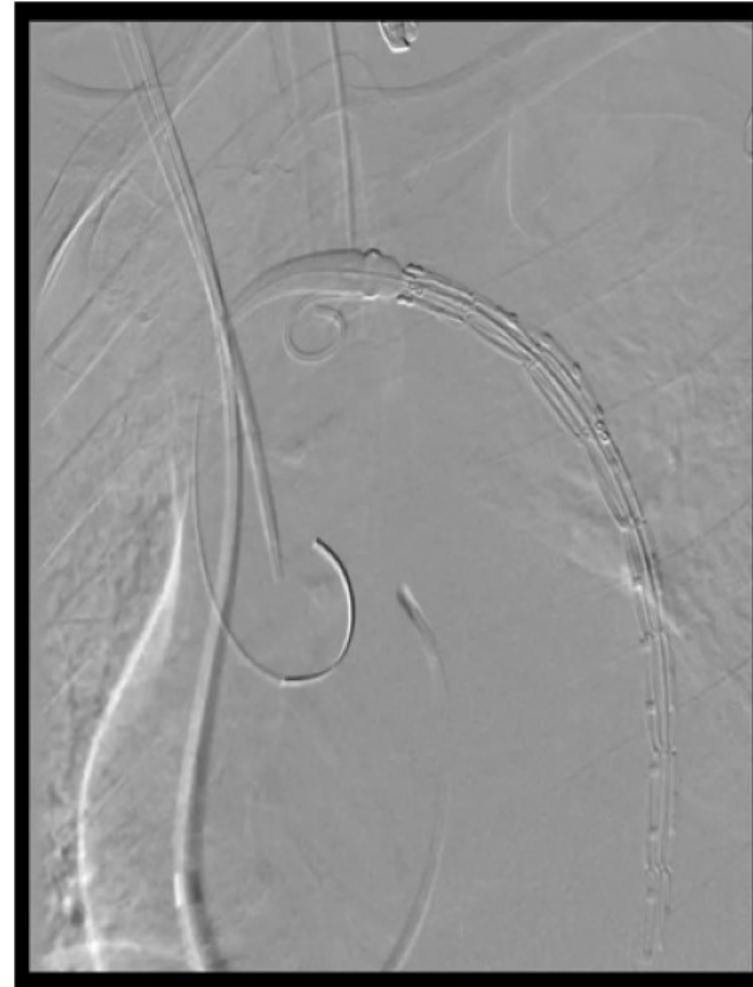
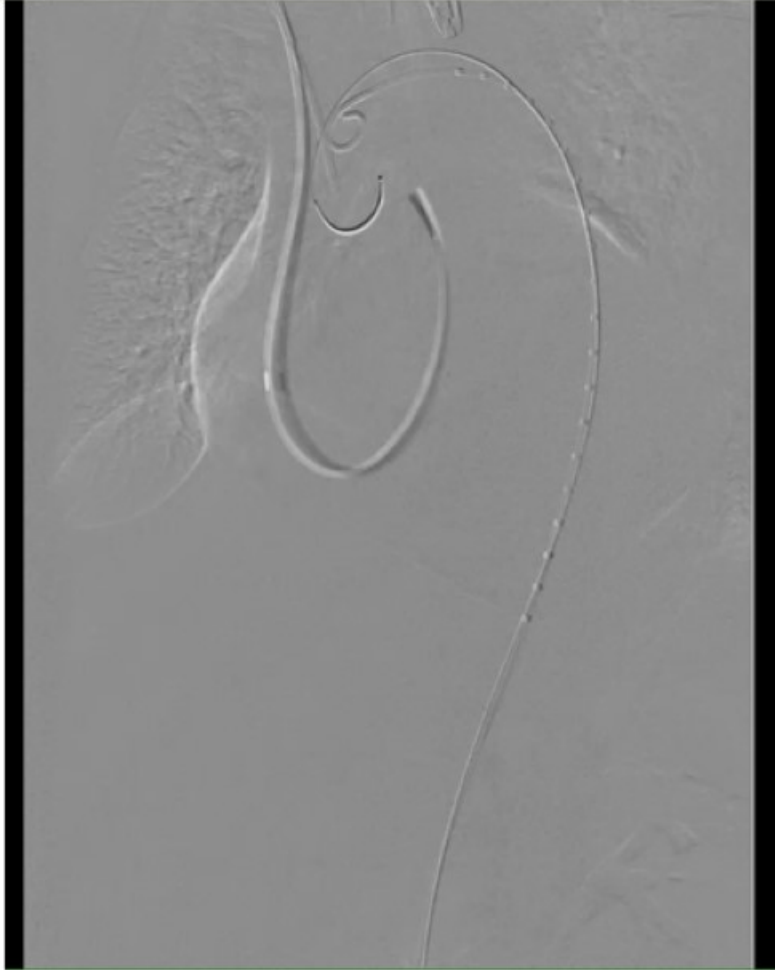
- Thoracic+ABD Aorta



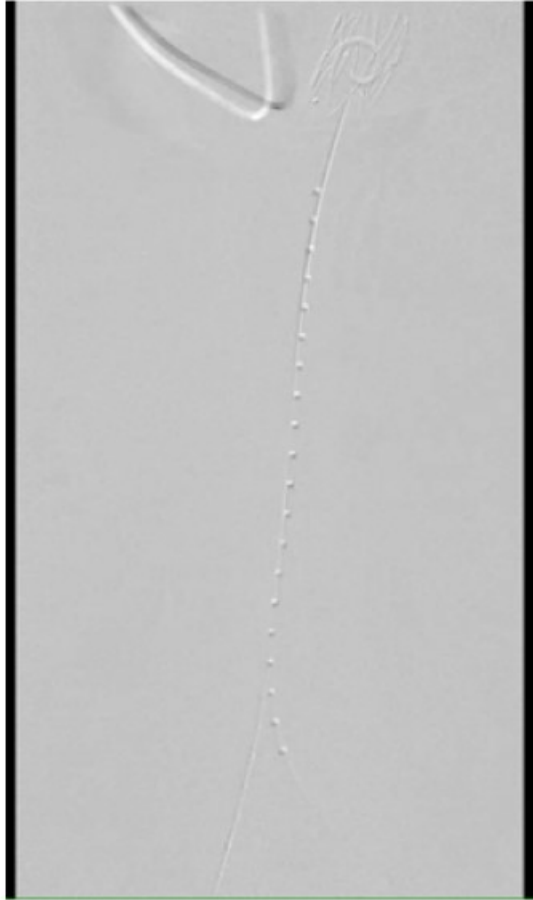
- Visceral segment



Type A with Mesenteric Malperfusion: Aortograms

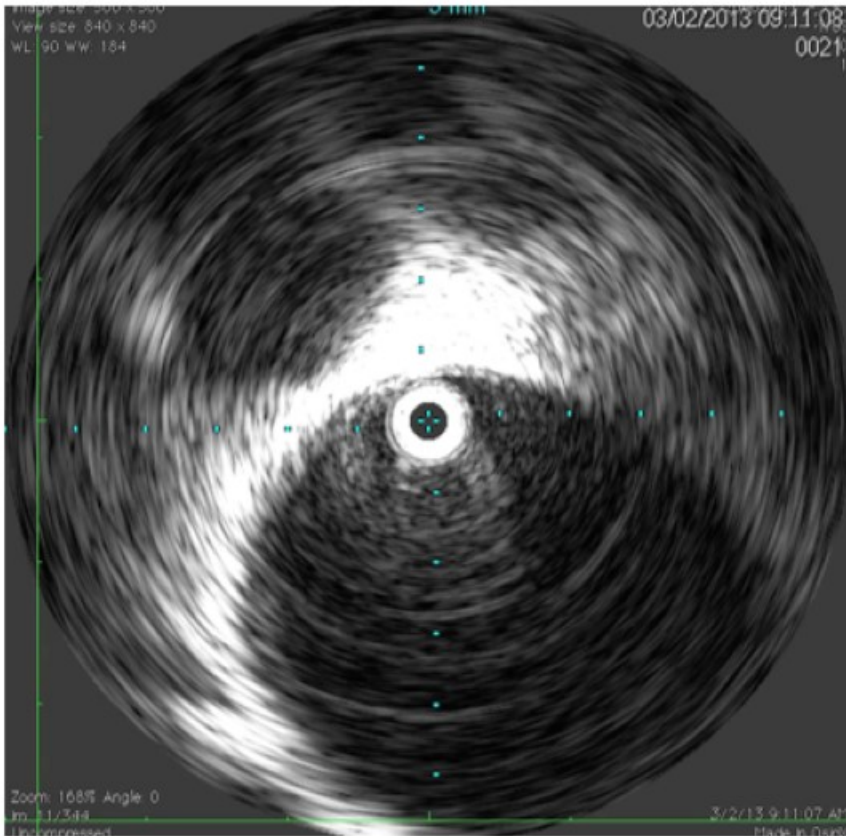


Post-TEVAR Angiograms: Robust visceral perfusion/right renal malperfusion

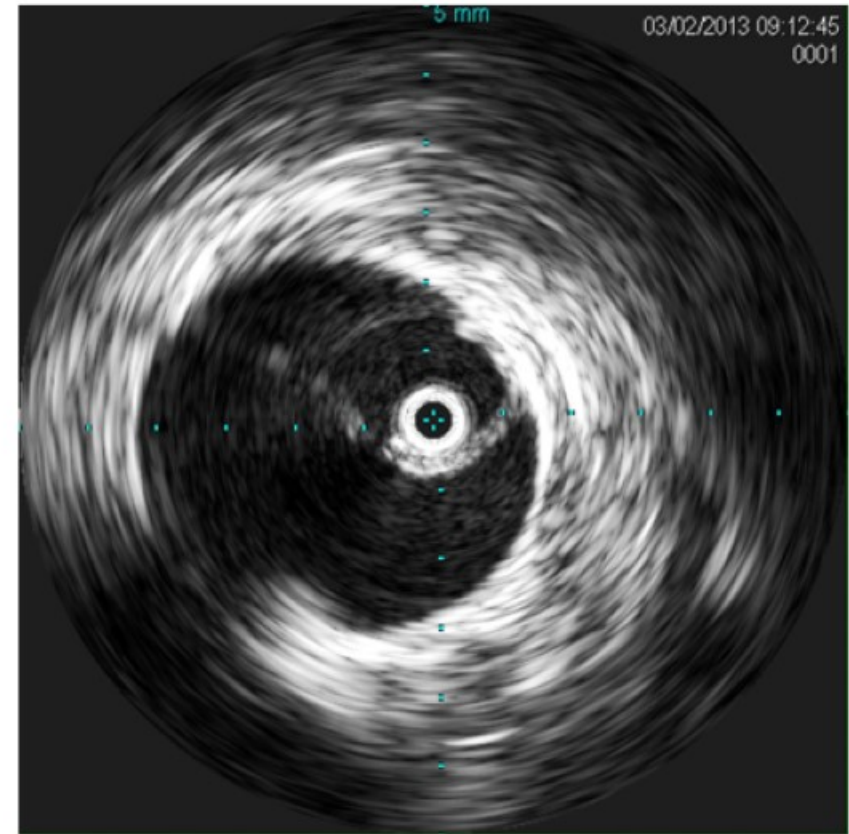


Type A with Mesenteric Malperfusion: Post-TEVAR IVUS

- Thoracic + ABD Aorta



- Visceral Segment



Post-TEVAR Hemodynamics

- ABD TL: 101/52 mmHg
- R femoral
 - Palpable pulse
 - Pressure: 101/52 mm Hg

*Malperfusion Resolved:
Angiographic and Physiologic*



Stage II: ICU Resuscitation and Reperfusion

- Extubated
- Neurologically intact
- 6 liters of IV fluid
 - Normalization of Lactate level
- 24 hours later, Proximal aortic replacement
 - Anxious time period
 - Keep pain free
 - SBP<120-140 mm Hg

Stage III: Proximal aortic replacement

- Aortic root replacement
 - 6cm root aneurysm
- Ascending aortic replacement
- Subtotal arch replacement
 - Large arch tear in Zone 2
 - Distal anastomosis at LSA
 - Reimplanted Innominate and LCCA
 - DID NOT SEW to TEVAR graft



Operative Results

	<i>Asc/Lap</i> (n=13)	<i>Ax-Bifem/Asc</i> (n=3)	<i>Asc/TEVAR</i> (n=5)	<i>TEVAR-1st</i> (n=10)	<i>P*</i>
<i>CPB (min)</i>	151±32 ^{†‡}	208±37	214±71 [†]	263±98 [‡]	0.046*
<i>X Clamp (min)</i>	90±20	131±82	144±55	178±78	0.056
<i>HCA (min)</i>	33±10	36±7	37±18	43±15	0.530
<i>Bladder temp at HCA (°C)</i>	25±4.4	25±3.5	26±4.2	27±1.6	0.510
<i>Hemiarch</i>	13 (100)	2 (100)	4 (80)	8 (80)	0.355
<i>Root replacement</i>	0	1 (33)	1 (20)	2 (20)	0.083
<i>Length of TEVAR (mm)</i>	n/a	n/a	150±32	211±55	0.028*
<i>Renal failure</i>	8 (62)	2 (67)	4 (80)	2 (20)	0.059
<i>Bowel necrosis/resection or postoperative acidosis</i>	10 (77) [†]	0	4 (80)	0 [†]	< 0.001*
<i>Mortality</i>	9 (69%)	0	4 (80)	3 (30%)	0.108

“TEVAR-First” Approach to Type A with Mesenteric Malperfusion

- Avoidance of circulatory arrest to ischemic visceral organs!!
- Bridge to decision making
- Improved outcomes in early experience