

# CIRA Case of the Week

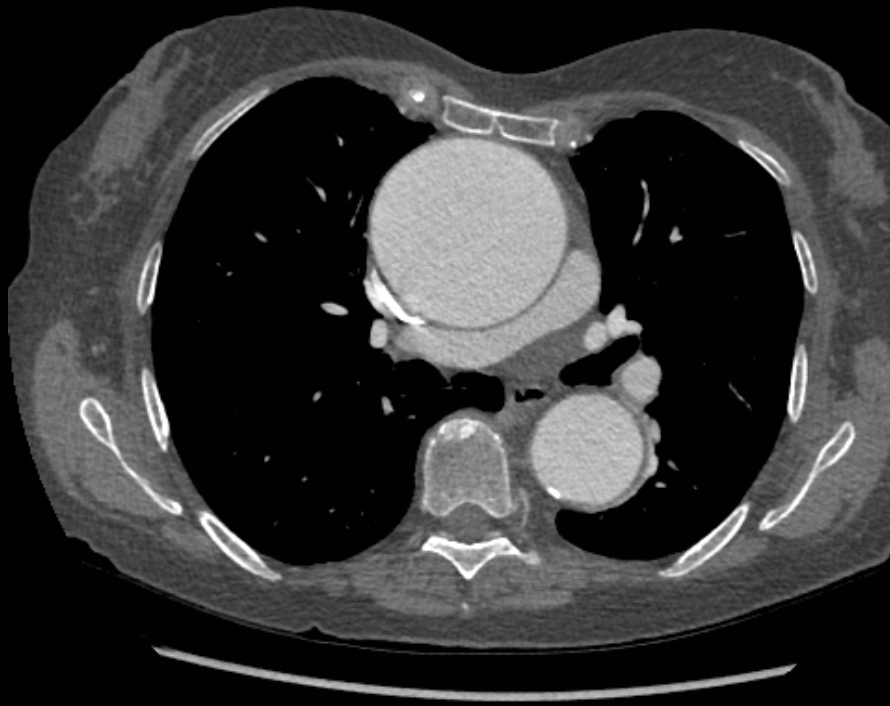
## May 2017

Case courtesy of Drs. Aman Wadhvani,  
Jonathan Farrell, Vamshi Kota and  
Eric Herget

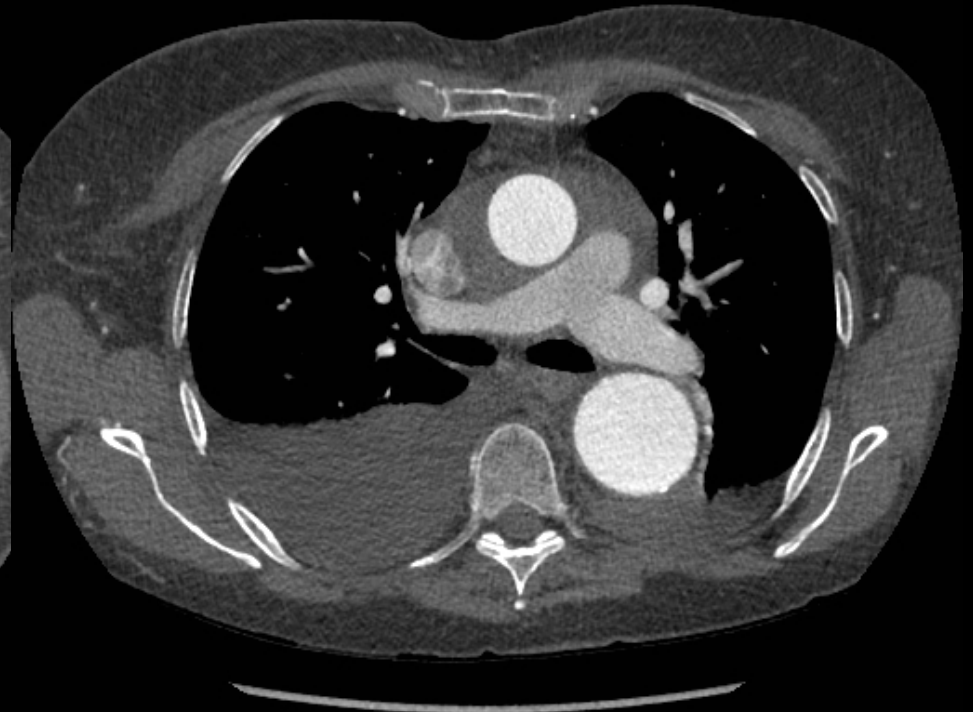


UNIVERSITY OF  
CALGARY

# Clinical Presentation



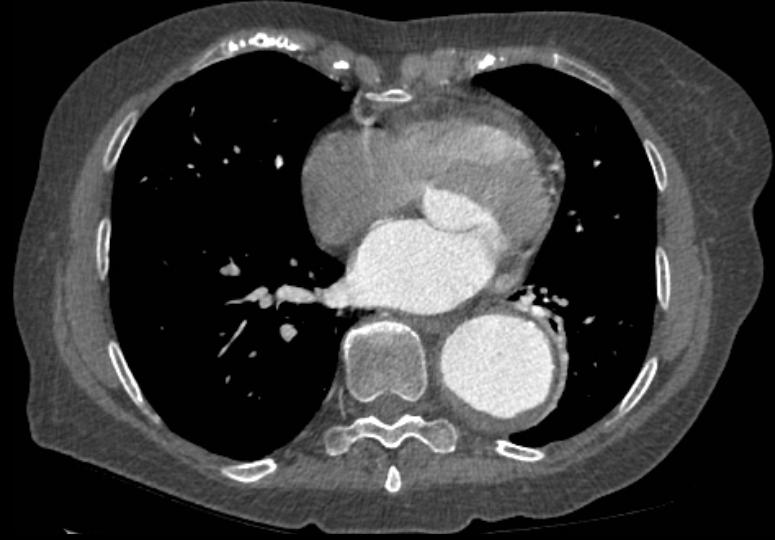
**Pre-surgery**



**Post-surgery**

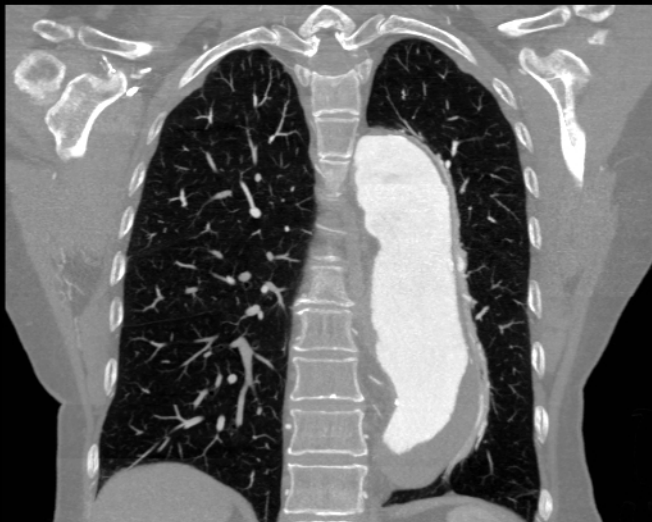
**74-year-old female underwent an uncomplicated ascending aorta and hemi arch replacement of a 7 cm ascending aortic aneurysm in 2012**

# Crawford Type I Descending Thoracic Aorta Aneurysm




Her known descending thoracic and upper abdominal aortic aneurysm was followed medically, until it eventually reached a maximal diameter of 5.6 cm

# Crawford Type I Descending Thoracic Aorta Aneurysm



No good proximal or distal landing zone was identified in this slowly enlarging Crawford Type I descending thoracic aortic aneurysm

# Treatment Options for Thoraco-Abdominal Aortic Aneurysm (TAAA)

- Open surgery
  - Standard TEVAR
  - Complex endovascular techniques:
    - Chimney graft
    - Fenestrated and side-branched modular endograft system
    - Sandwich technique
- 
- Involves simultaneous median sternotomy and left thoracotomy
  - Post-op complications
    - Renal insufficiency
    - Coagulopathy
    - Visceral ischemia
    - Spinal cord Ischemia

# Treatment Options for ThoracoAbdominal Aortic Aneurysm (TAAA)

- Open surgery
- Standard TEVAR →
- Complex endovascular techniques:
  - Chimney graft
  - Fenestrated and side-branched modular endograft system
  - Sandwich technique

- TAAA involves visceral arteries such as:
  - Celiac artery
  - SMA
  - IMA
  - Intercostal
  - Spinal
- Increased risk of spinal cord ischemia

# Treatment Options for ThoracoAbdominal Aortic Aneurysm (TAAA)

- Open surgery
- Standard TEVAR
- Complex endovascular techniques:
  - Chimney graft
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  - Sandwich technique

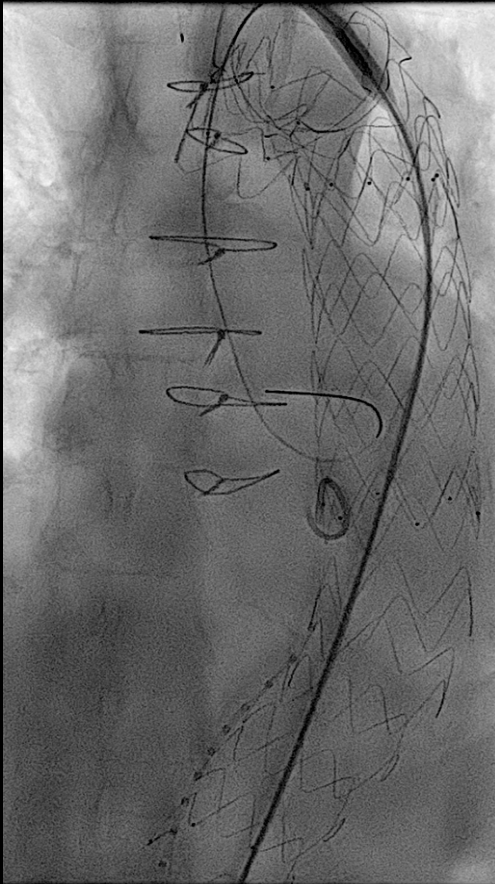
Not applicable to types I, II, III, and IV TAAA, or to type B aortic dissection with progressive expansion at the level of the visceral arteries

# Treatment Options for ThoracoAbdominal Aortic Aneurysm (TAAA)

- Open surgery
  - Standard TEVAR
  - Complex endovascular techniques:
    - Chimney graft,
    - Fenestrated and side-branched modular endograft system →
    - Sandwich technique
- Results of branched and fenestrated grafts are mixed
  - Custom-made devices are subject to a manufacturing delay of 6 to 8 weeks, during which time the aneurysm might rupture

Reference: Lobato et al. A New Technique to Enhance Endovascular Thoracoabdominal Aortic Aneurysm Therapy—The Sandwich Procedure. *Seminars in Vascular Surgery*; 2012;25:3

# Sandwich Technique for TAAA Repair



**Cook Zenith Alpha stent graft placed into the aortic arch extending from just distal to the left subclavian artery into the mid-thoracic descending aorta**

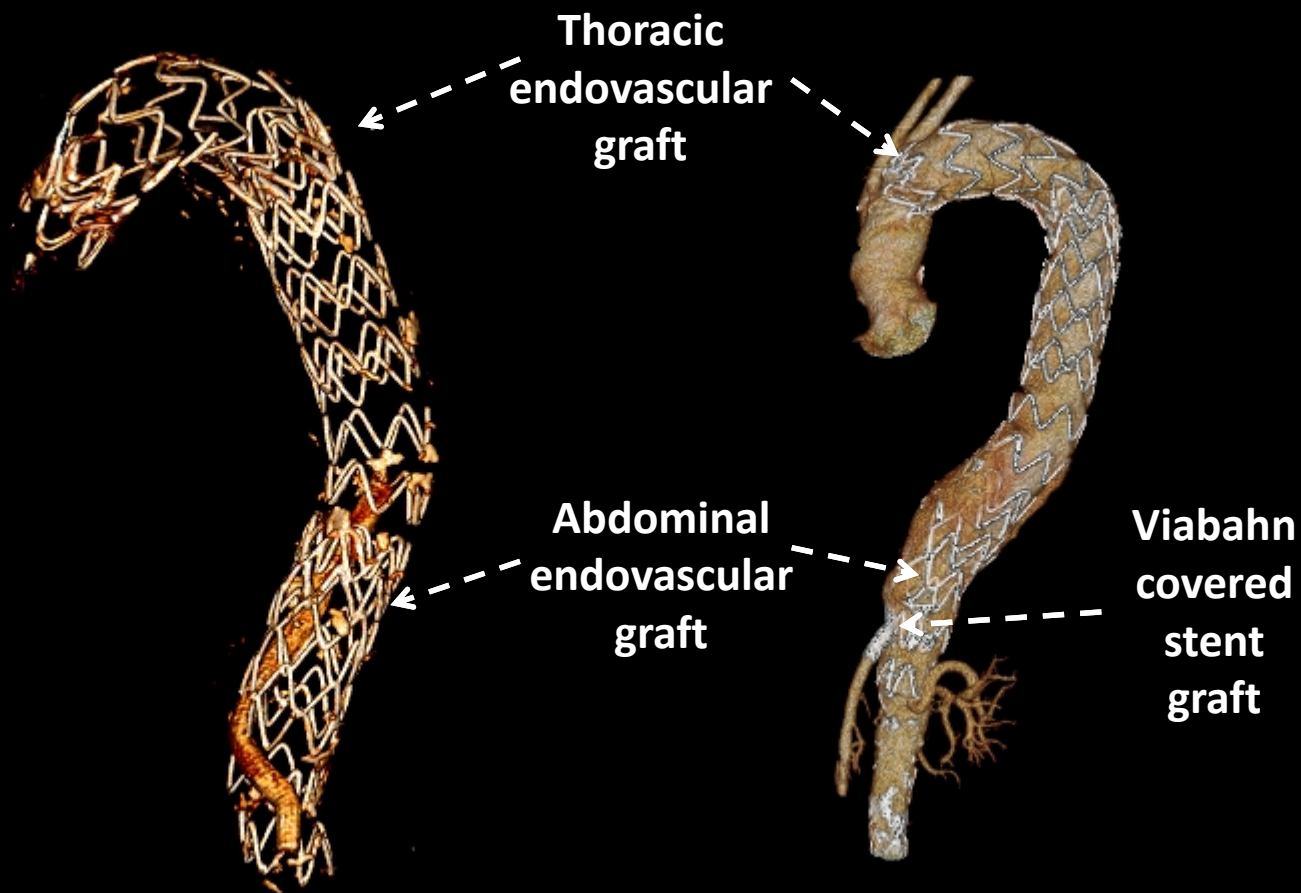


**Sim 1 catheter was advanced from the left vascular sheath adjacent to the pigtail catheter and used to engage the SMA**



**Second aortic stent graft overlapping superiorly placed stent graft with the distal end above the origin of the SMA, which was subsequently stented with a Viabahn stent graft**

# Sandwich Technique for TAAA Repair



**Aortic reconstructions post-TEVAR showing thoracic and abdominal endovascular grafts with Viabahn covered stents in situ**

# Type II Endoleak



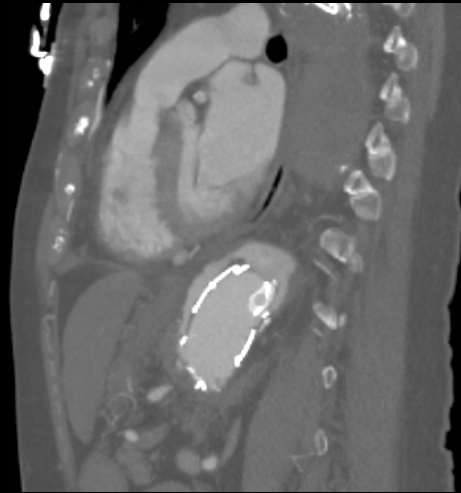
Unenhanced CT Abdomen



Axial CTA Abdomen



Coronal CTA Abdomen



Sagittal CTA Abdomen

Type II gutter endoleak into the aneurysm sac due to retrograde perfusion from celiac artery trunk

# Endoleak Repair



**H1 catheter was used to select the TEVAR stent graft and descending thoracic aorta. The SMA snorkel was selected with the H1 catheter and a selective SMA angiogram performed**



**A Renegade STC microcatheter was used to select a proximal SMA branch supplying the GDA arcade. The H1 catheter was advanced down to the ostium of this side branch vessel**

# Endoleak Repair

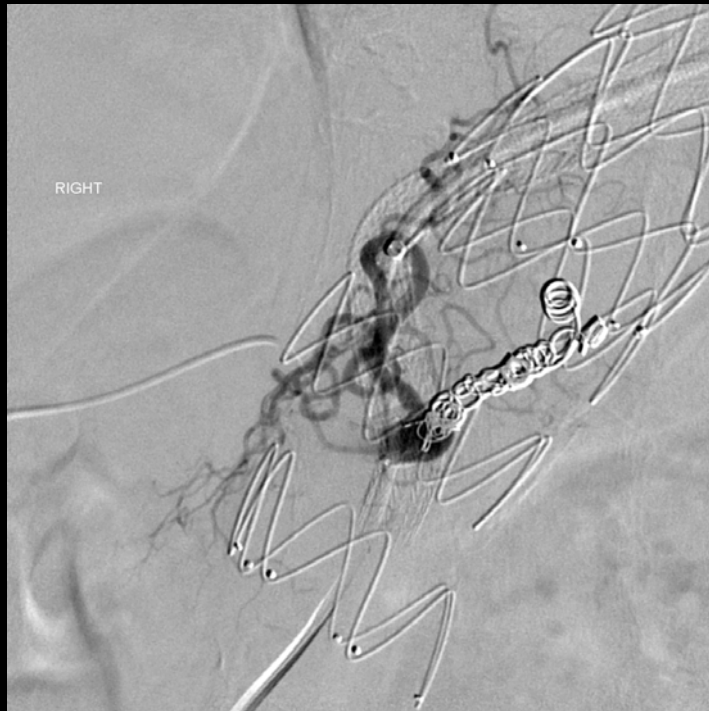


The gastroduodenal, common hepatic and celiac arteries were subsequently selected



IDC microcoils were deployed through the celiac origin into the celiac trunk, with the distal most coil proximal to the left gastric artery origin. The left gastric artery was preserved

# Successful Repair of Type II Endoleak



Check angiogram reveals occlusion of the celiac trunk with no filling of the previously noted type II gutter endoleak