

CIRA Case of the Week

Case Courtesy of Drs. Aman Wadhvani, Yuri Kaitoukov, Vamshi Kotha,
Jehangir J. Appoo, and Eric J. Herget

CALGARY THORACIC AORTIC PROGRAM

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UNIVERSITY OF CALGARY
CUMMING SCHOOL OF MEDICINE

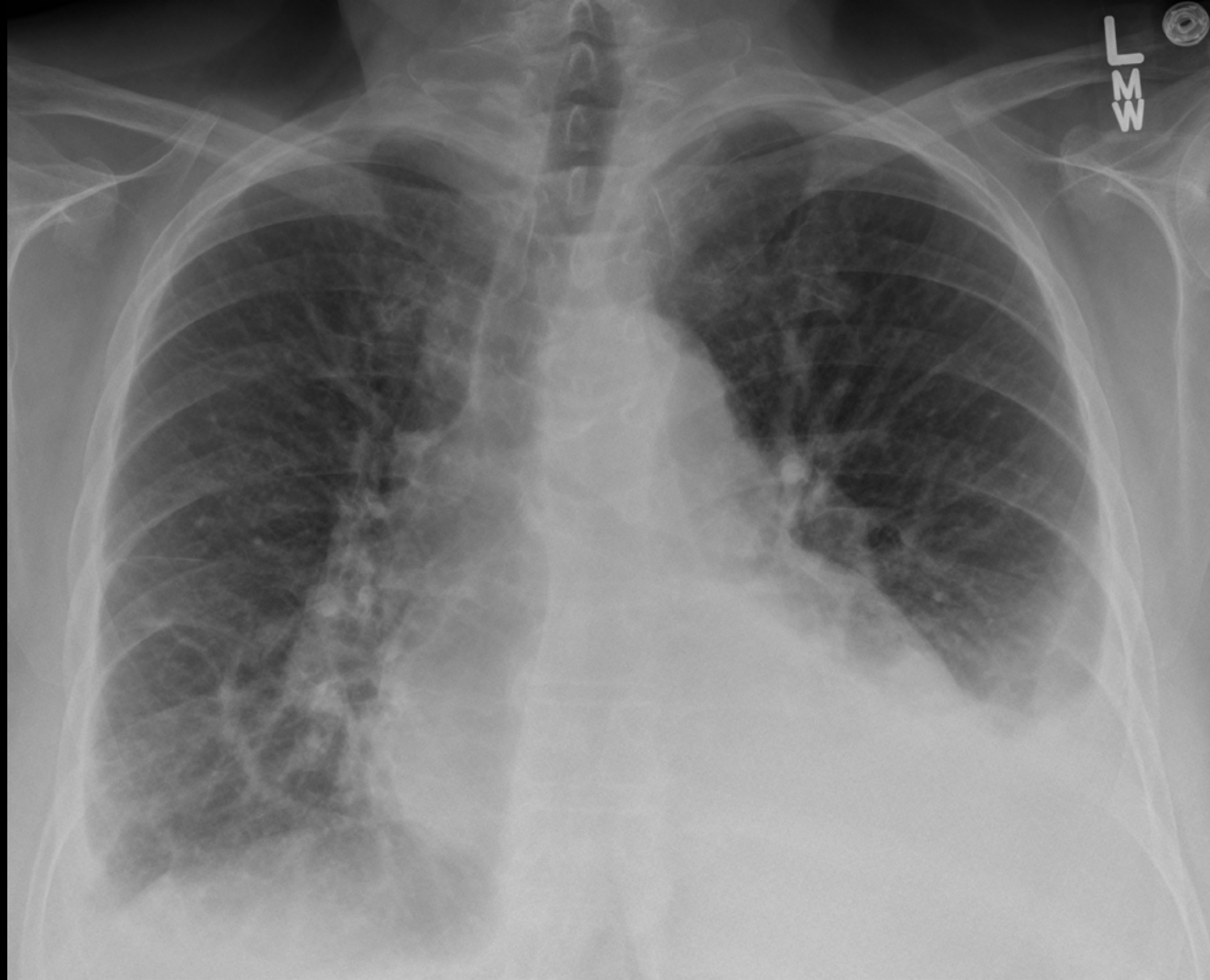


CFW Radiology



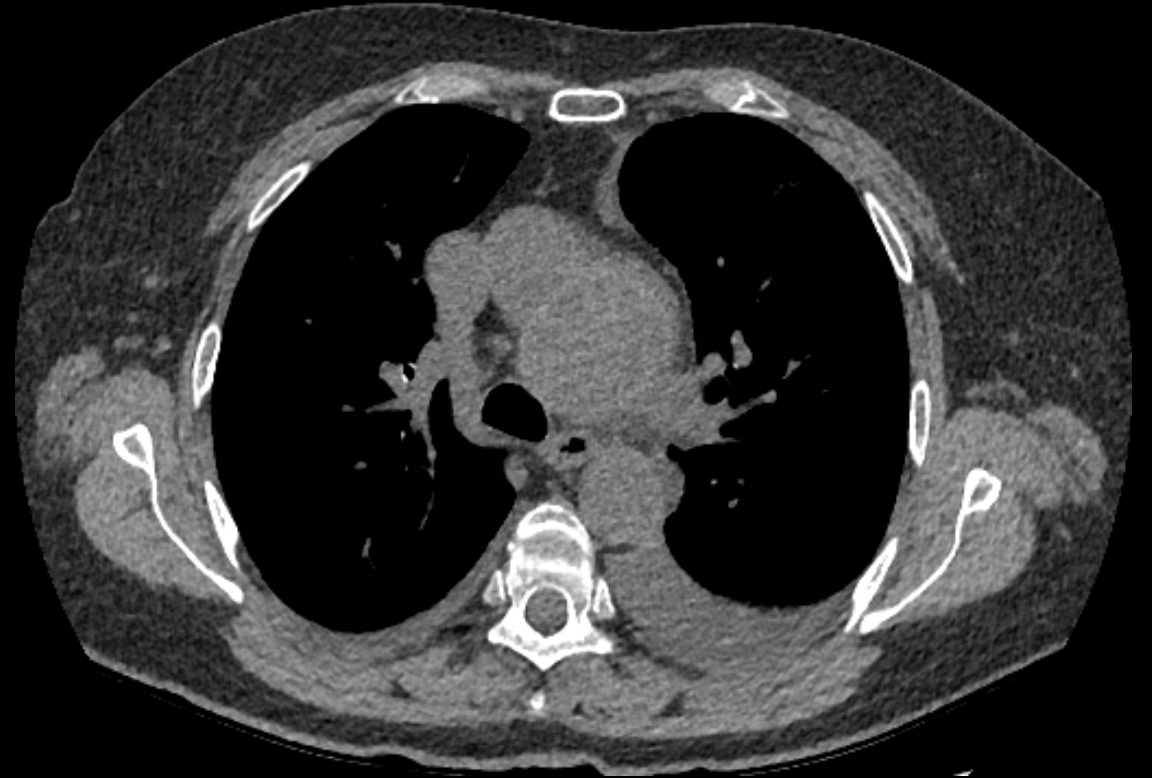
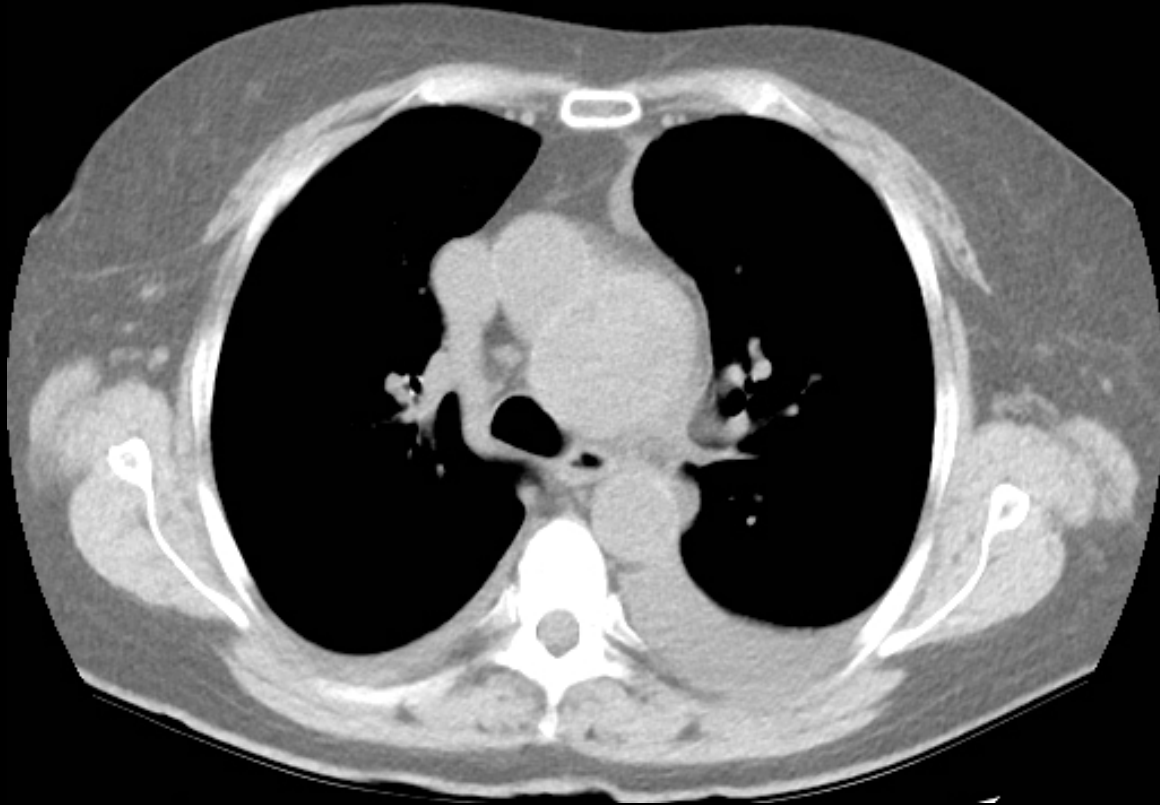
Alberta Health
Services

Clinical Presentation



64 year old female presents with new onset chest pain and shortness of breath

Clinical Presentation



Unenhanced CT performed due to chronic kidney disease

Clinical Presentation



Unenhanced CT performed due to chronic kidney disease

TEVAR: Thoracic Endovascular Aortic Repair

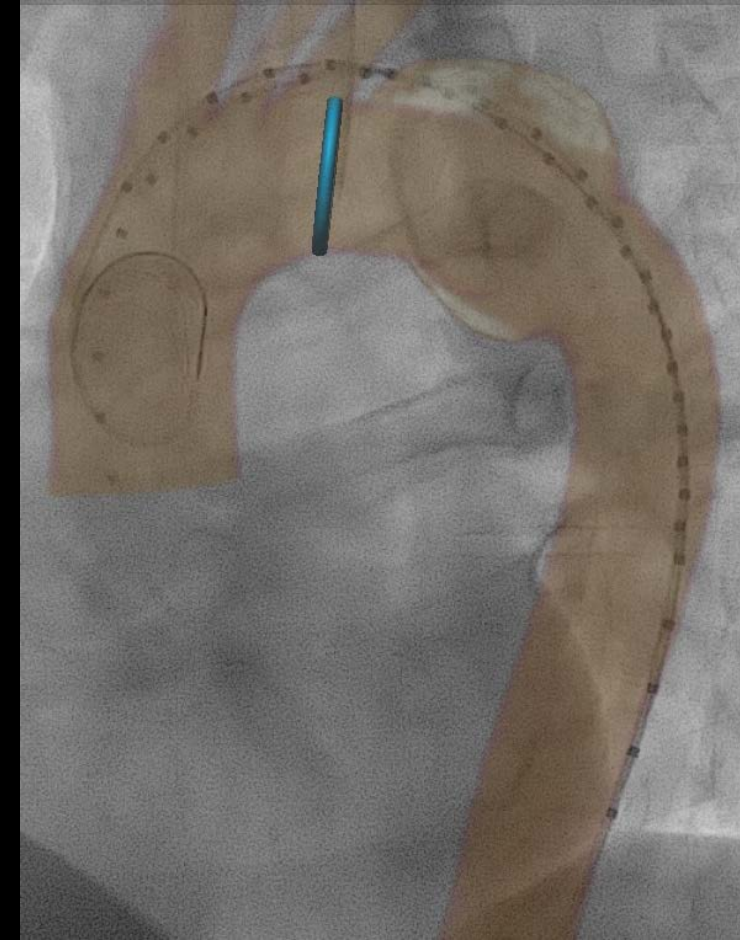
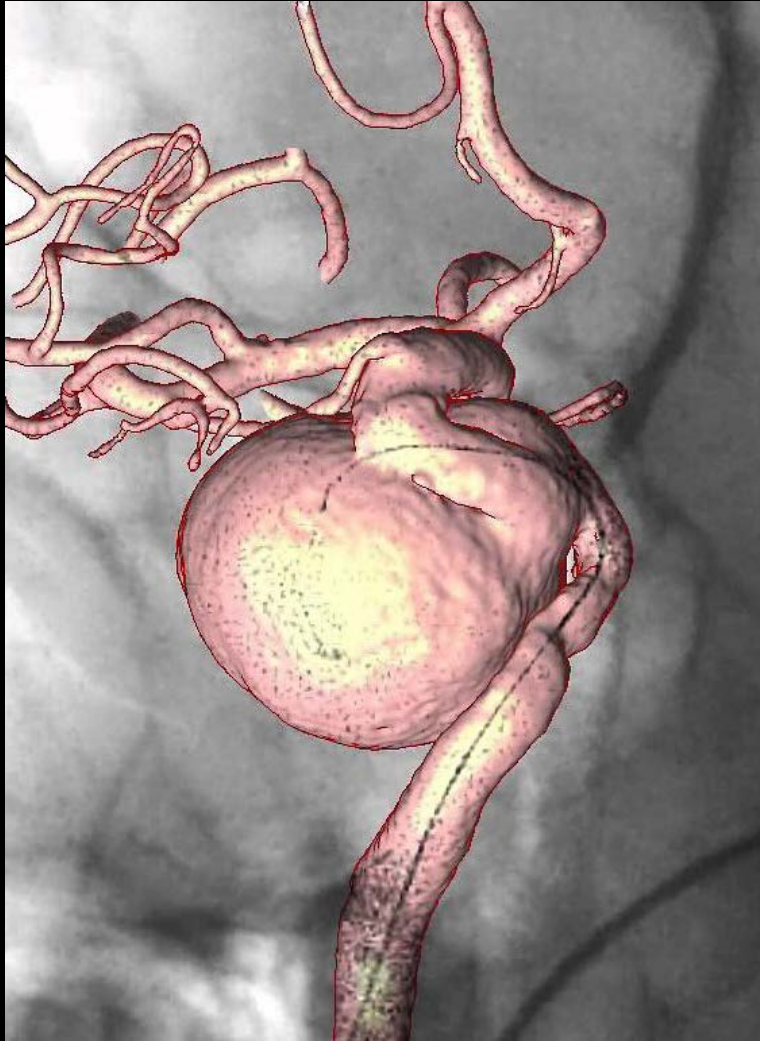
- TEVAR has been established as a reliable alternative to conventional surgical repair
- Pre-op planning
 - CTA
 - 2-D fluoroscopic angiography
- Contrast-less TEVAR
 - **TEVAR with IVUS** (Tozzi P, Marty B, Ruchat P, Ferrari E, Siniscalchi G, von Segesser LK. Endovascular thoracic aortic aneurysm repair without angiography. *Innovations (Phila)*. 2009;4:32–35)
 - **TEVAR with image fusion** (Kobeiter et al. Zero-Contrast Thoracic Endovascular Aortic Repair Using Image Fusion. *Circulation*, 2011. 124:e280-282)

Vessel Navigator

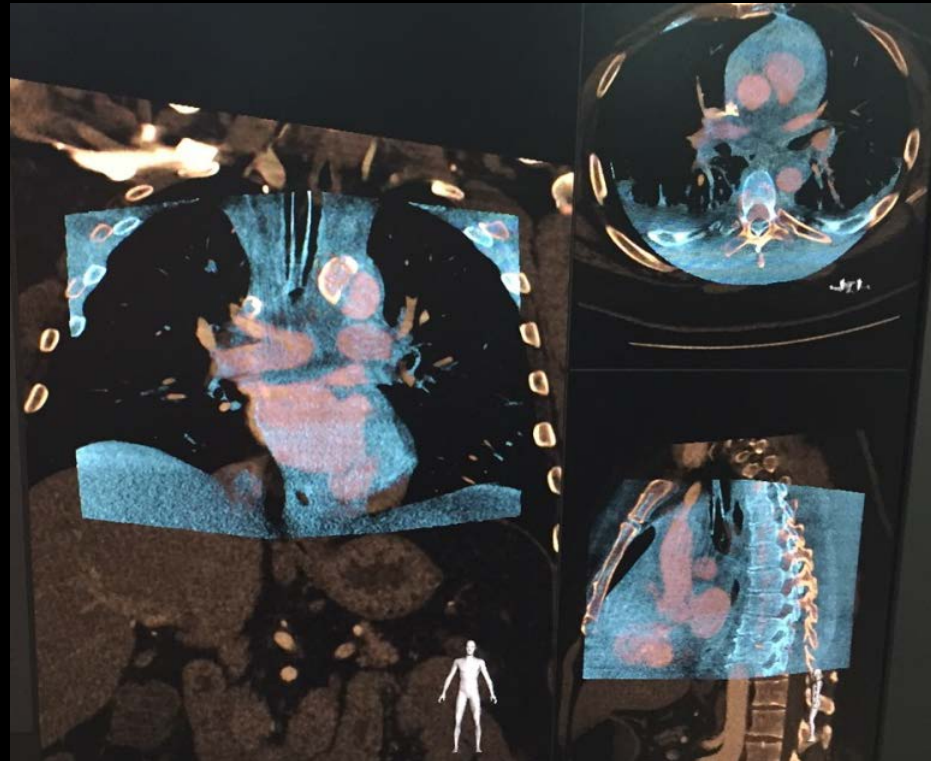
"allows reuse of 3D vascular anatomical information from existing CTA and MRA datasets as a **3D roadmap** overlay on a live X-ray image. With its excellent visualization, Vessel Navigator provides an intuitive and continuous 3D roadmap to guide you through vasculature during the entire procedure."

– Phillips website

Vessel Navigator

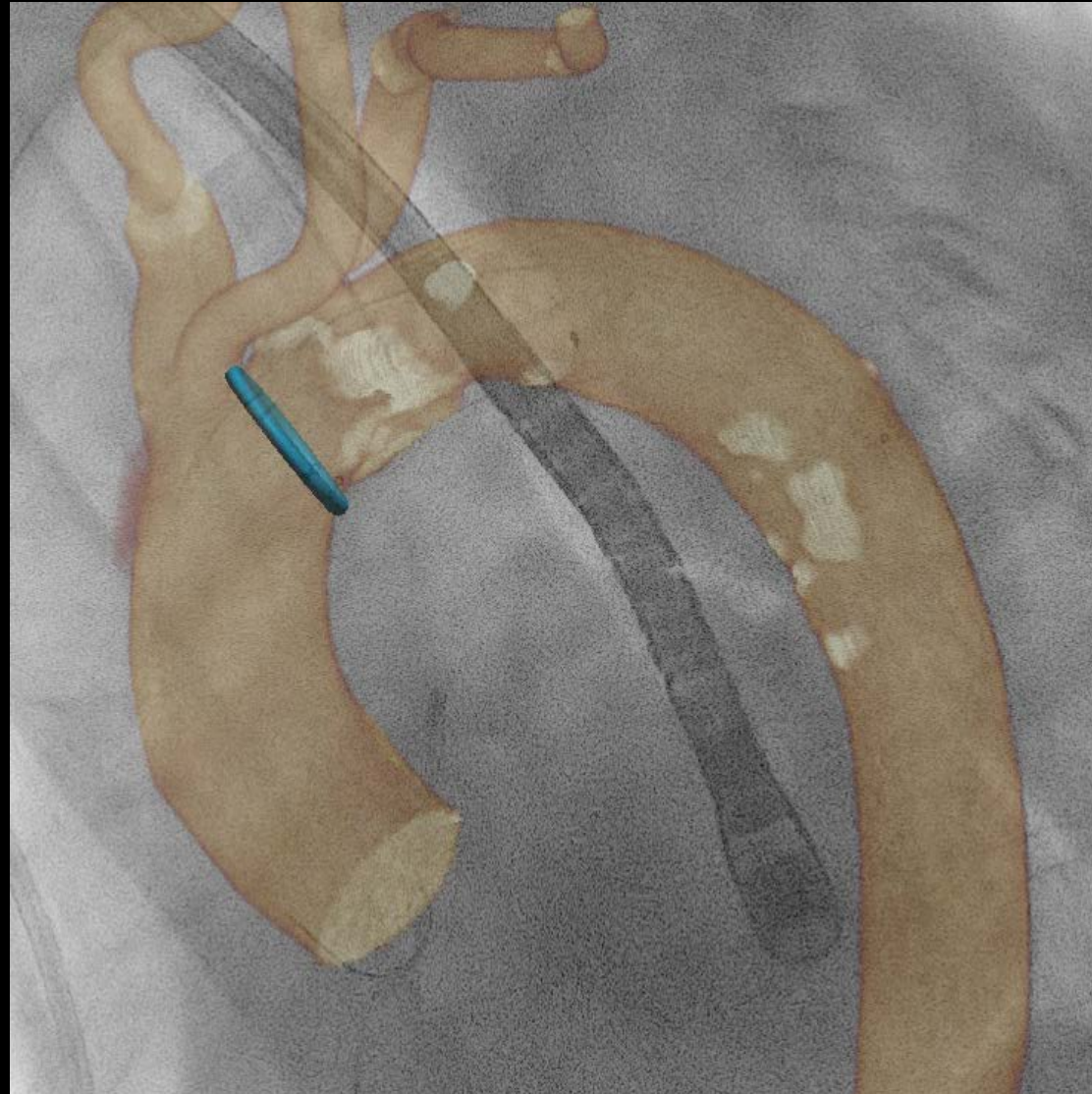


Vessel Navigator



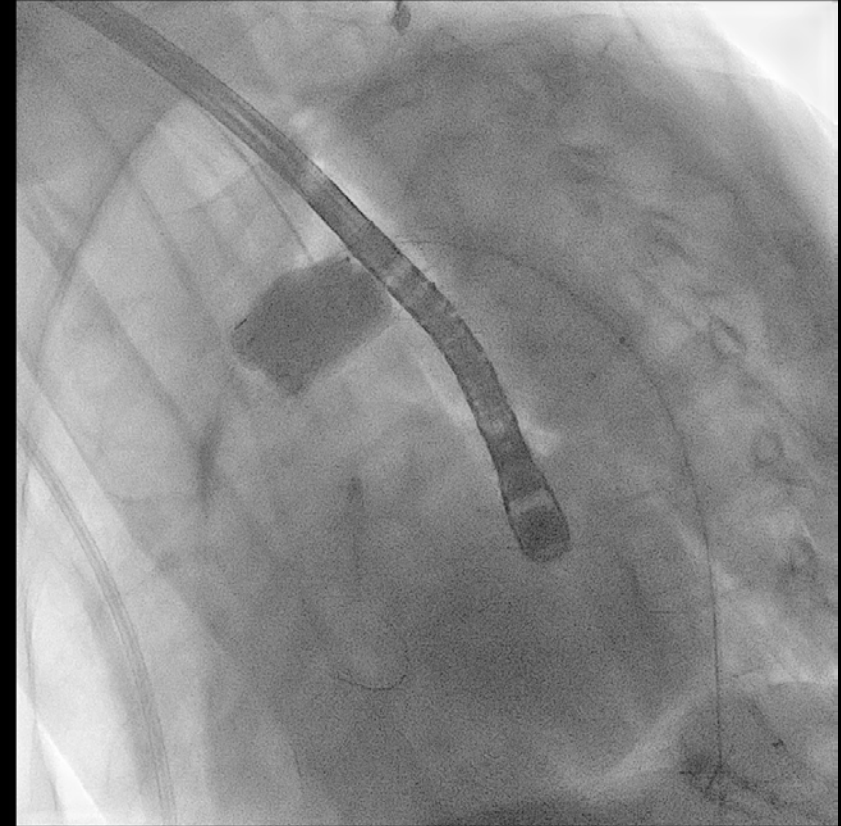
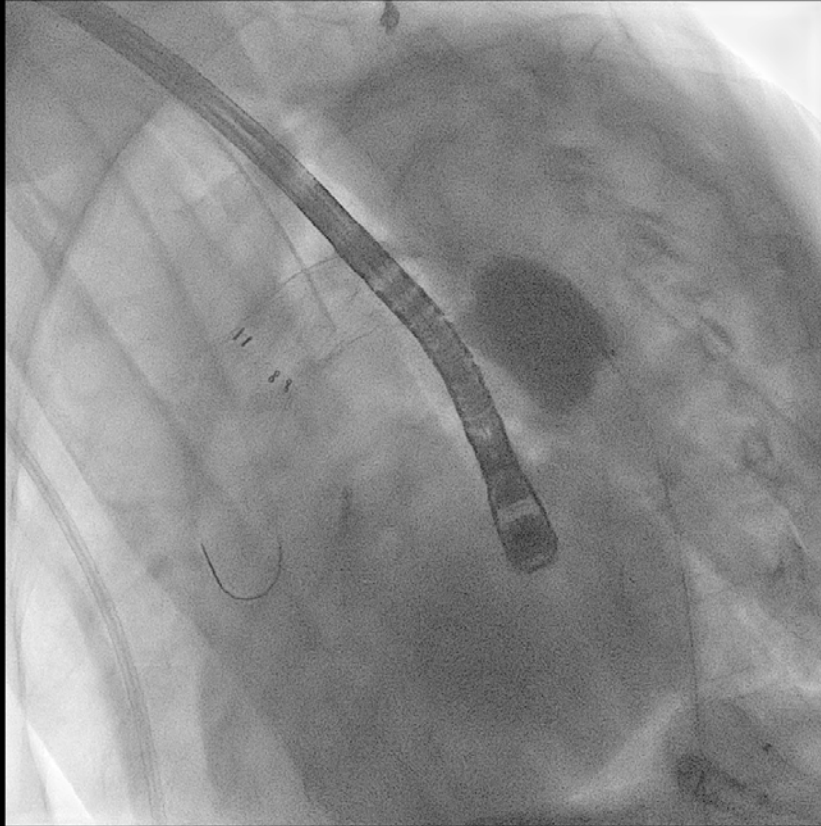
Synchronization of CTA
and fluoroscopy data

Stent Graft Placement



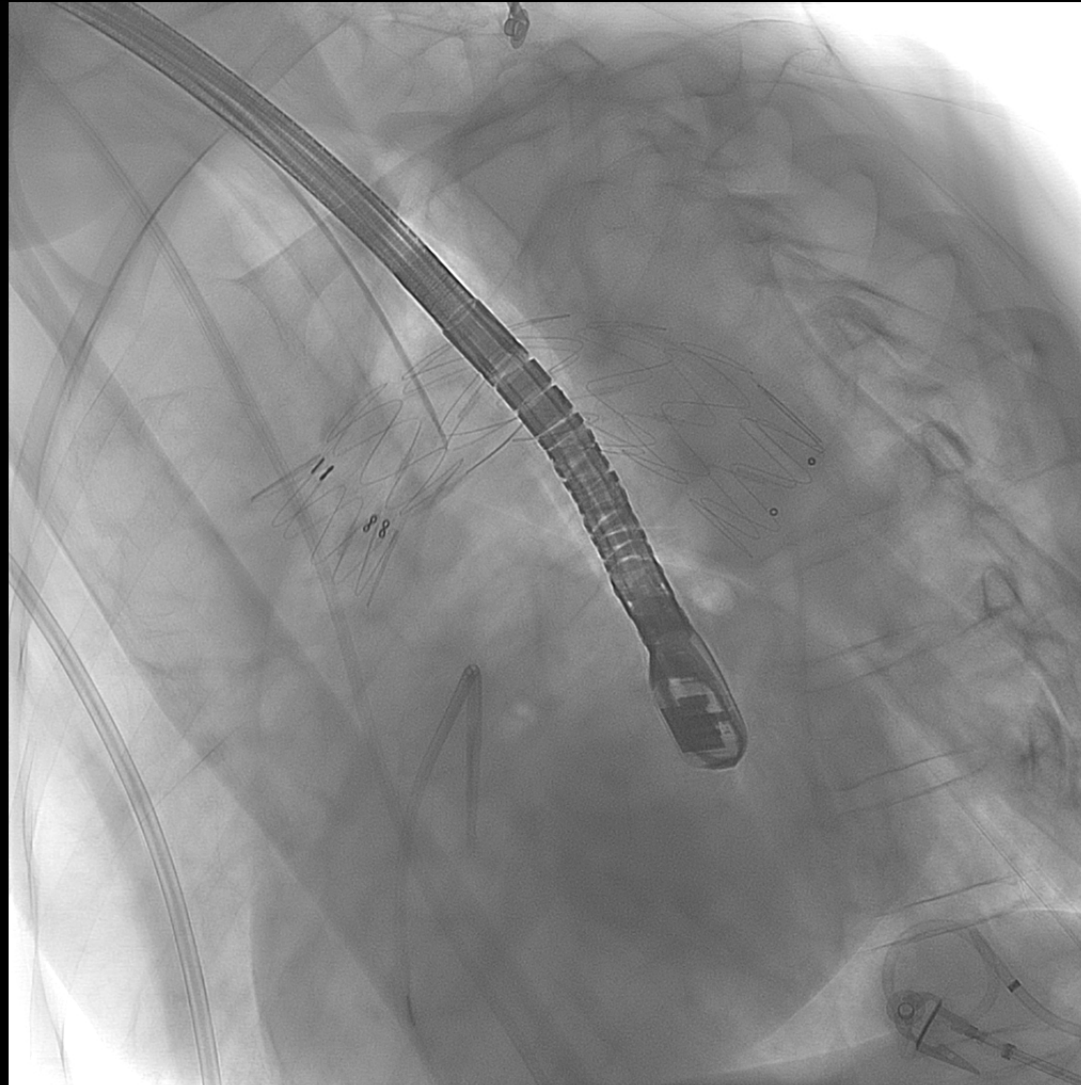
Intraoperative overlay of CTA data on fluoroscopic image

Stent Graft Placement



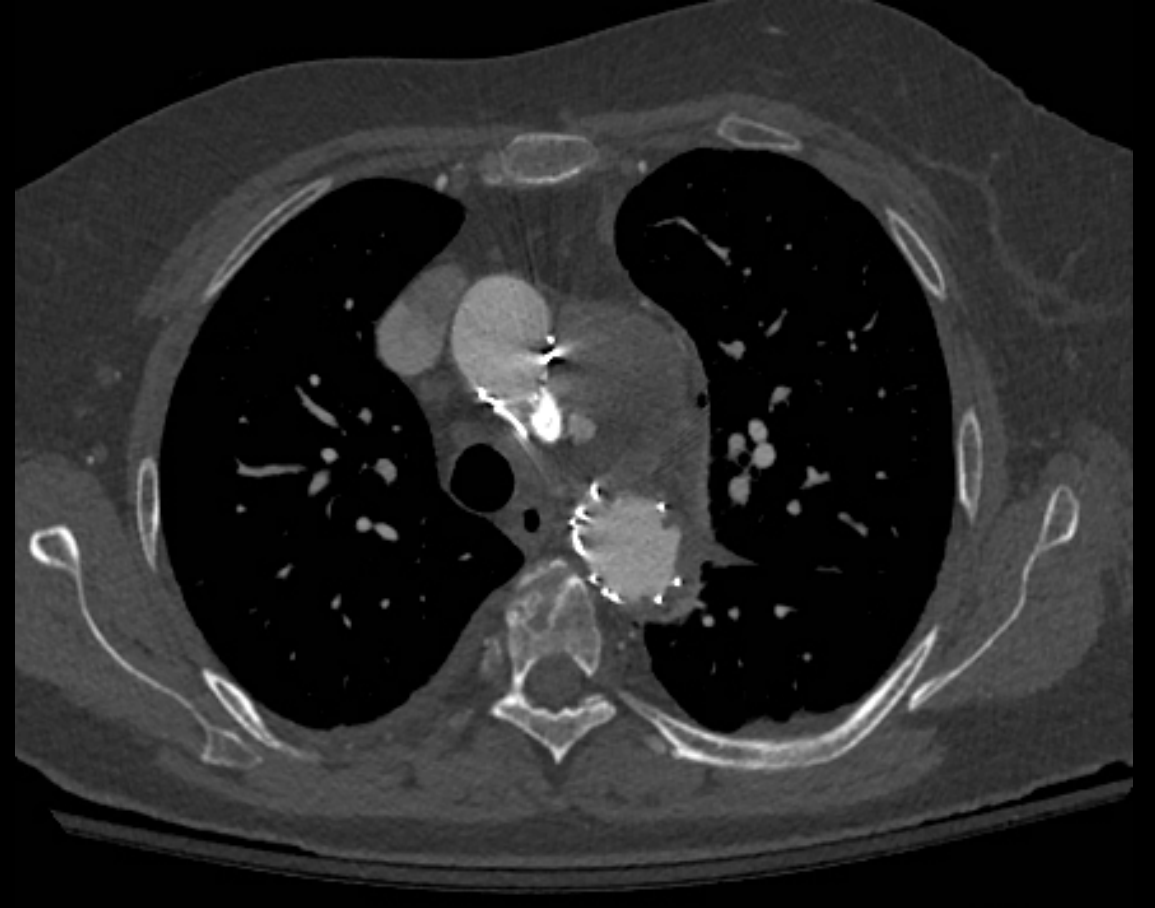
Deployment of trilobed balloon along the proximal and distal margins of the device

Successful Aortic Arch Stent Graft Placement



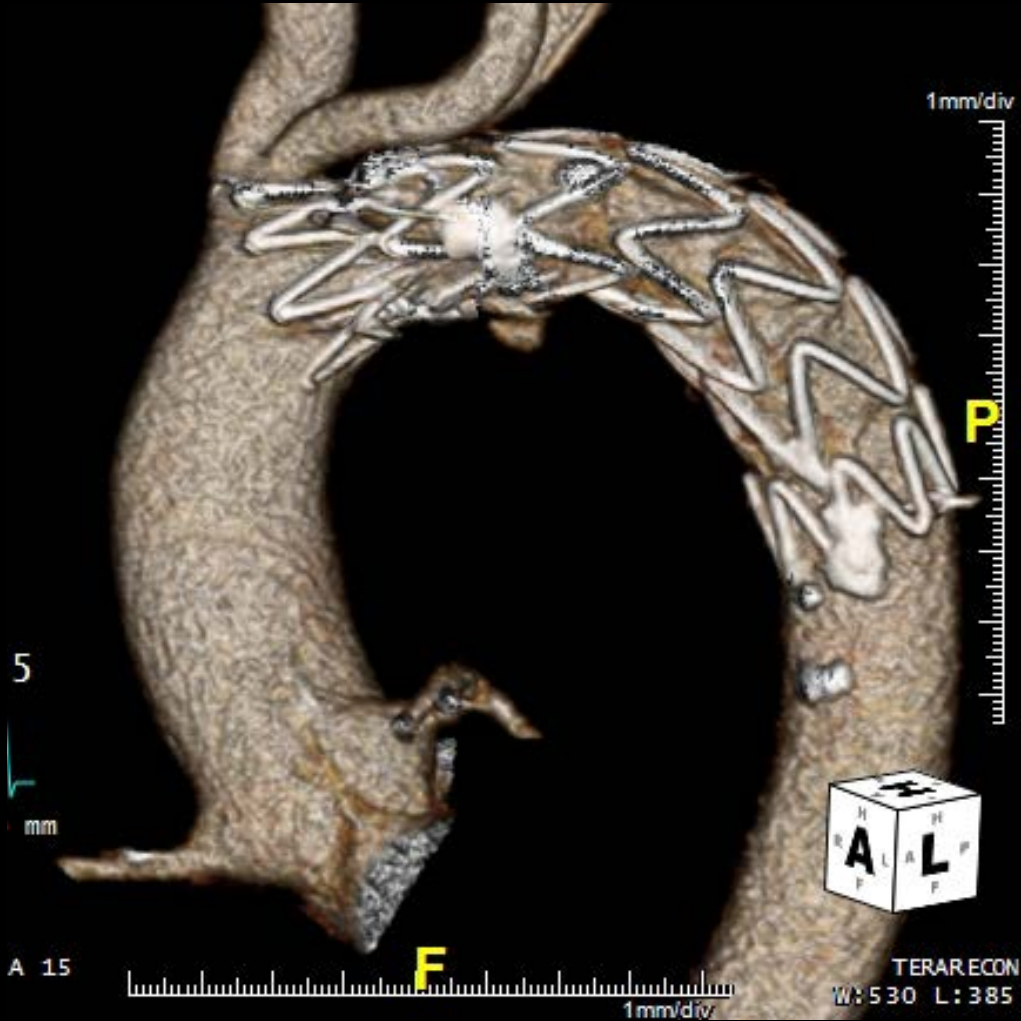
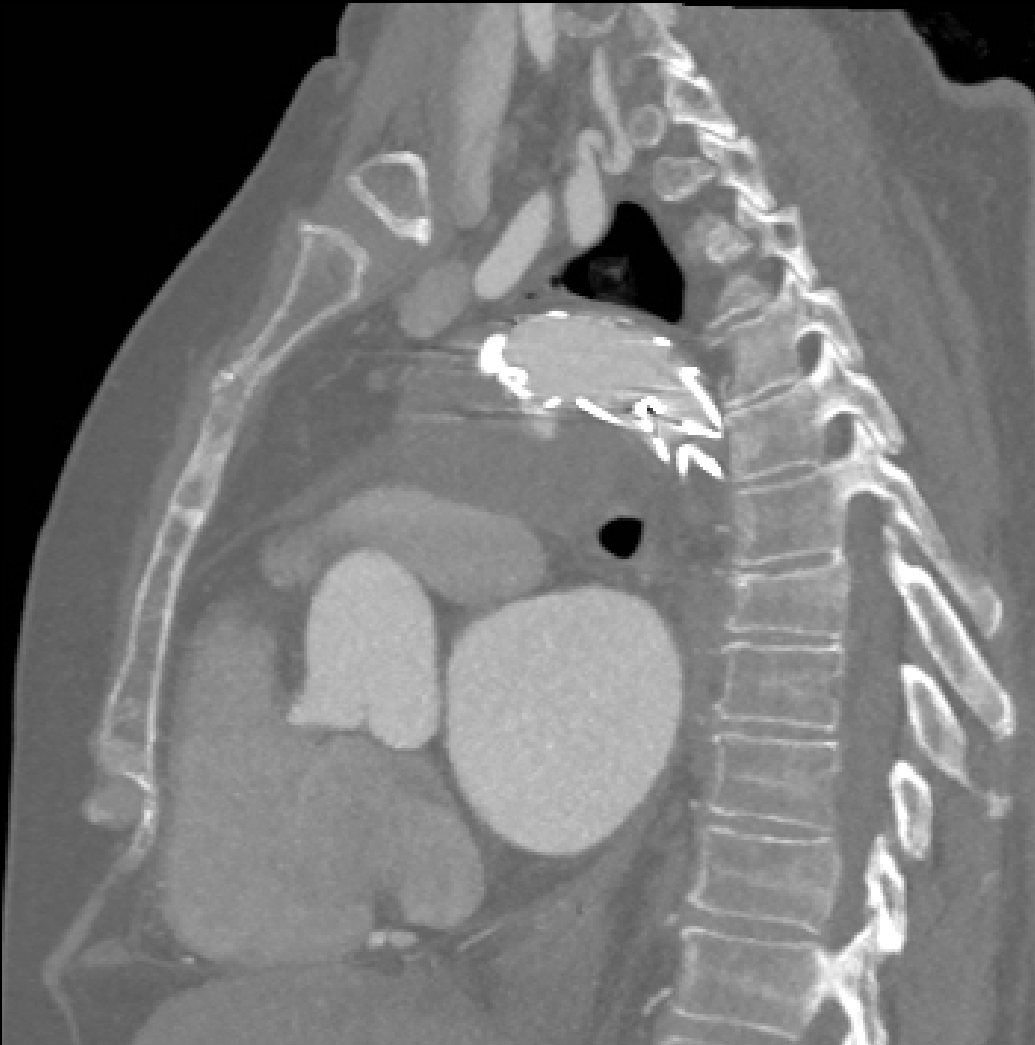
Successful deployment of stent graft in the aortic arch without use of any contrast fluoroscopy

Follow-up CTA: Type 1A Endoleak



POD#2 follow-up CTA shows a type 1A endoleak

Follow-up CTA: Type 1A Endoleak



POD#2 follow-up CTA shows a type 1A endoleak

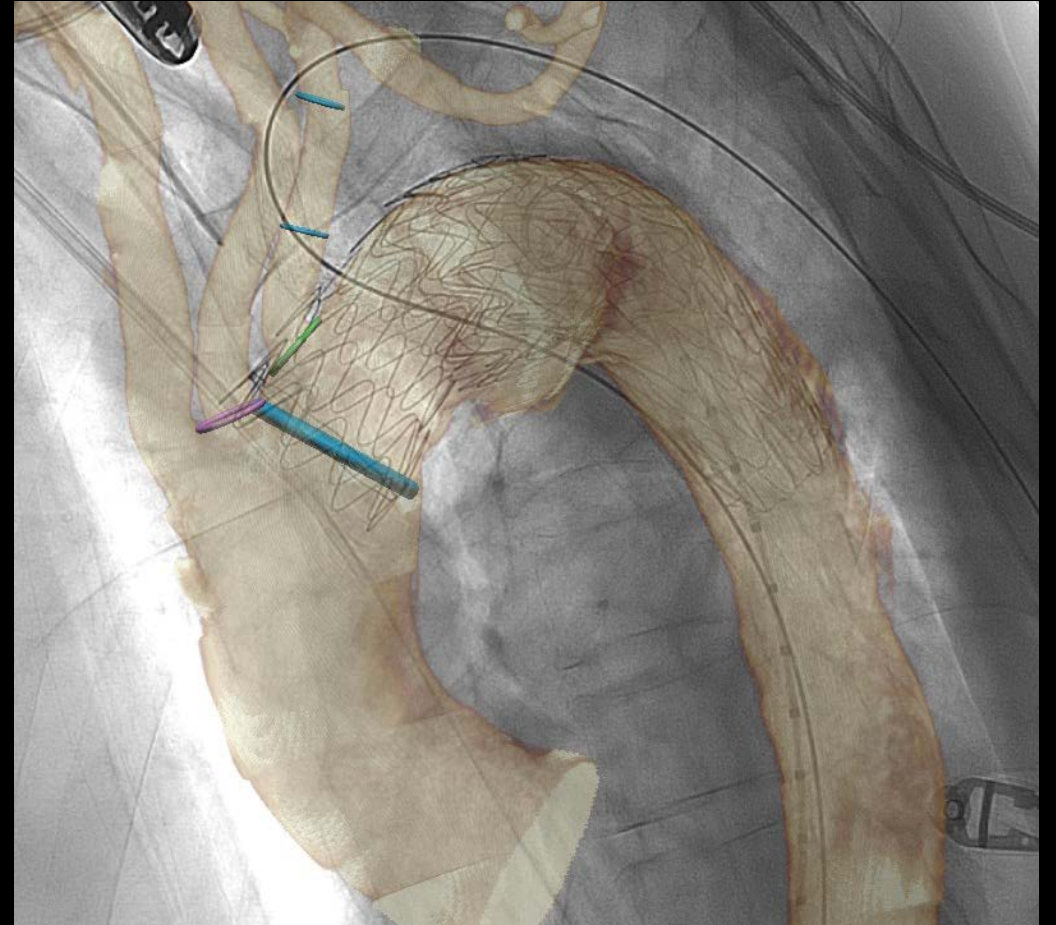
Successful Endoleak Coiling



Successful coiling of type 1A endoleak

Limitation

- Data Misregistration
 - Software unable to account for anatomical distortion due to delivery system and stiff wire



Summary

- Successful TEVAR of aortic arch aneurysm using 3-D vessel navigation system
 - One off case
 - Software routinely used to minimize the number of intraoperative TEVAR angiograms
 - Data misregistration limits routine use of software without any contrast administration
- Type 1A endoleak treated with minimal contrast use