

AMSER Case of the Month

August 2023

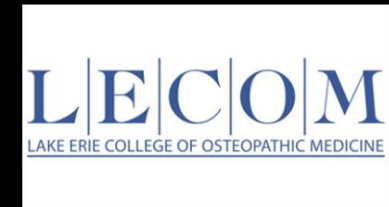
HPI: 48 y.o. male with HTN presenting to the ED with chest pain

Alexander Nguyen MS3 Lake Erie College Of Osteopathic Medicine

Robert Lewis DO, PGY-2, Allegheny Health Network

Anand Rajan MD, PGY-4, Allegheny Health Network

Matthew Hartman MD, Allegheny Health Network



Patient Presentation

- HPI: 48 y.o. male presenting to the ED with sharp chest pain radiating to his right shoulder upon waking.
- Vitals: BP - 250/140, HR - 60 , SaO2 - 96%
- PMHx / PSHx:
 - HTN on multiple medications with poor compliance.
 - Chronic Type B Aortic Dissection s/p TEVAR

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

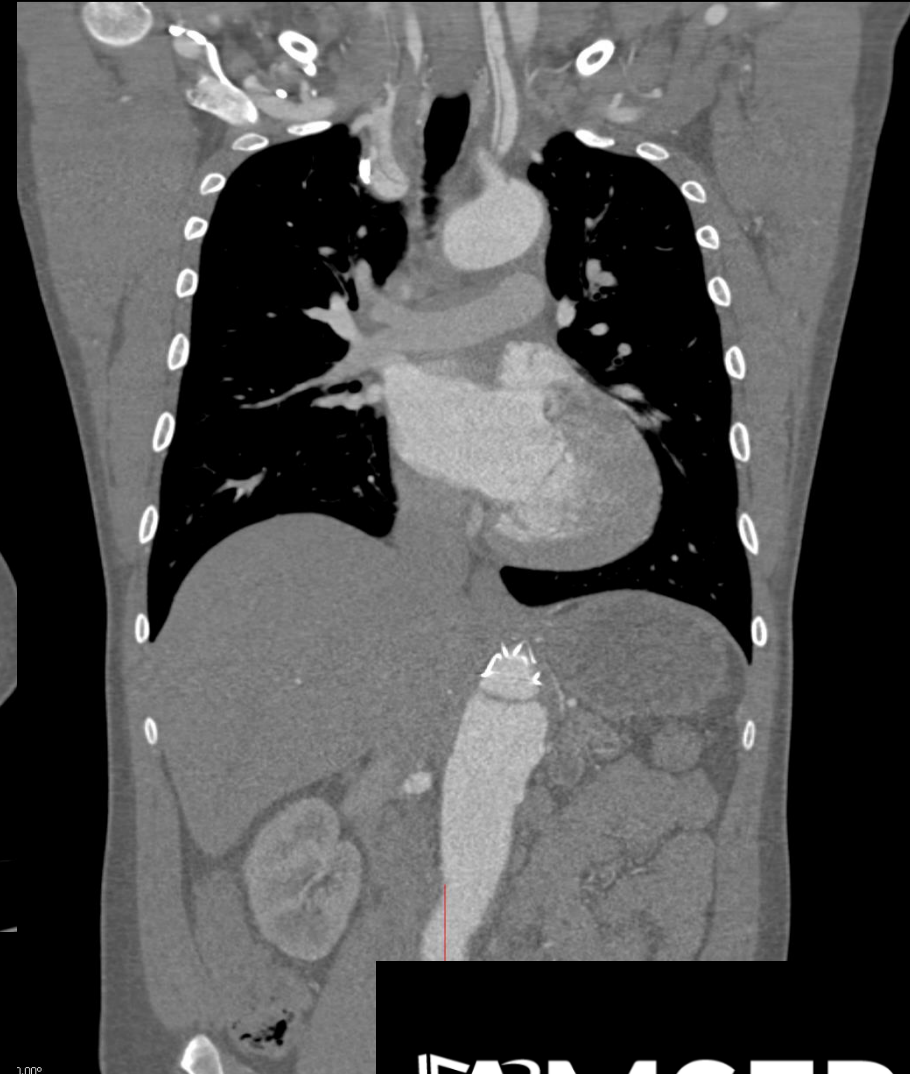
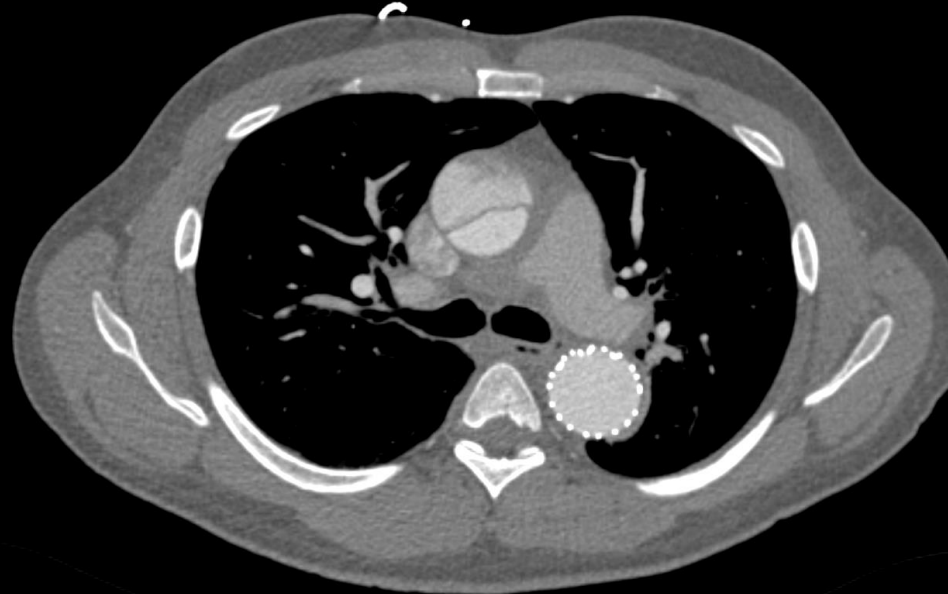
| Scenario | Scenario Id | Procedure | Adult RRL | Peds RRL | Appropriateness Category | |
|--|-------------|---|---------------------|-------------------|--------------------------|---|
| Chest pain, acute aortic syndrome suspected | 3194179 | US echocardiography transesophageal | 0 mSv ○ | 0 mSv [ped] ○ | Usually appropriate | ● |
| | | Radiography chest | <0.1 mSv ⊕ | <0.03 mSv [ped].. | Usually appropriate | ● |
| | | MRA chest abdomen pelvis without and with IV contrast | 0 mSv ○ | 0 mSv [ped] ○ | Usually appropriate | ● |
| | | CT chest with IV contrast | 1-10 mSv ⊕⊕⊕ | 3-10 mSv [ped].. | Usually appropriate | ● |
| | | MRA chest without and with IV contrast | 0 mSv ○ | 0 mSv [ped] ○ | Usually appropriate | ● |
| | | CT chest without and with IV contrast | 1-10 mSv ⊕⊕⊕ | 3-10 mSv [ped].. | Usually appropriate | ● |
| | | CTA chest with IV contrast | 1-10 mSv ⊕⊕⊕ | 3-10 mSv [ped].. | Usually appropriate | ● |
| | | CTA chest abdomen pelvis with IV contrast | 30-100 mSv ⊕⊕⊕⊕⊕ | Not Assigned | Usually appropriate | ● |
| | | US echocardiography transthoracic resting | 0 mSv ○ | 0 mSv [ped] ○ | May be appropriate | ● |
| | | Aortography chest | 1-10 mSv ⊕⊕⊕ | Not Assigned | May be appropriate | ● |
| MRA chest abdomen pelvis without IV contrast | 0 mSv ○ | 0 mSv [ped] ○ | May be appropriate | ● | | |



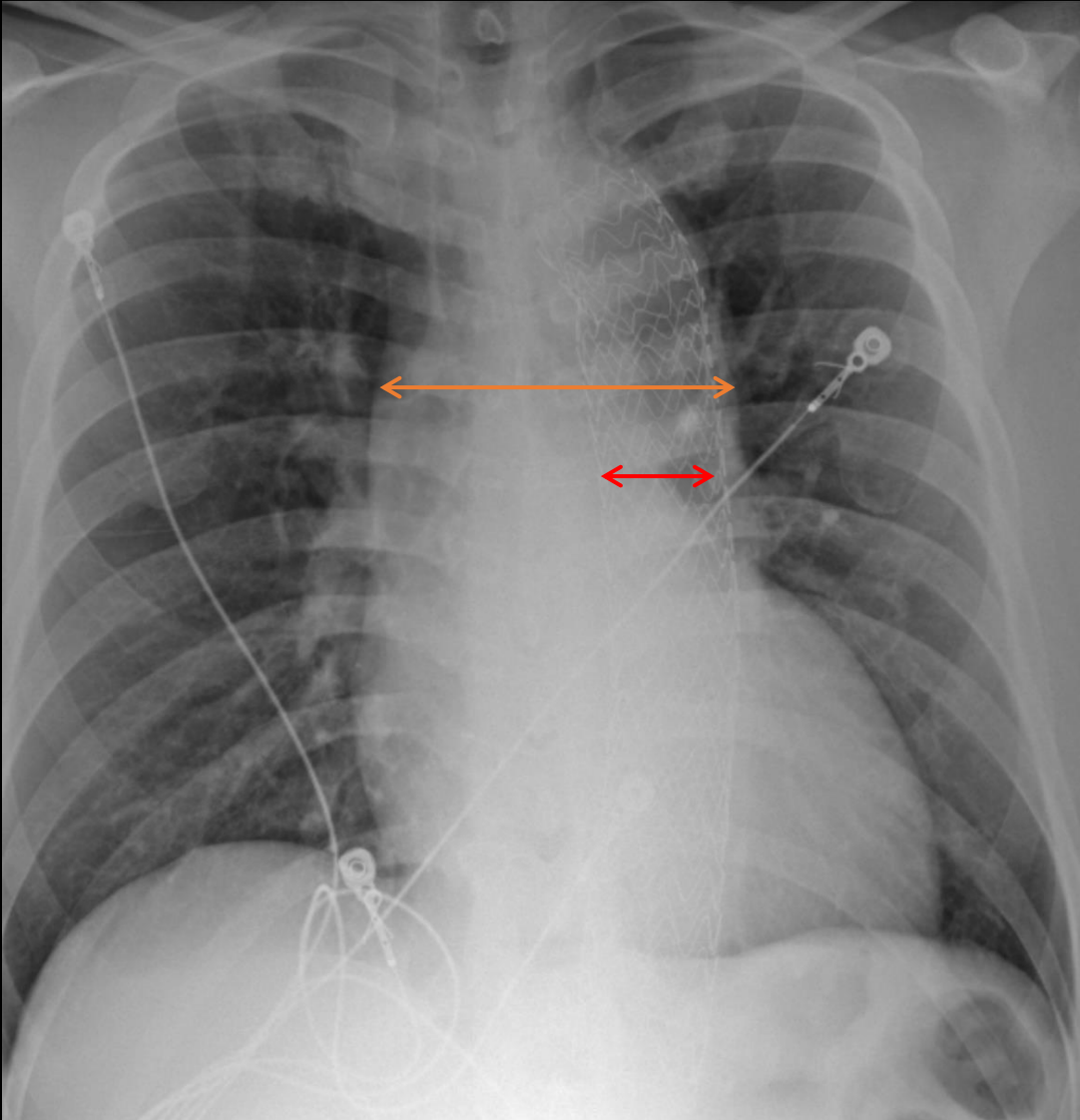
AP Radiograph (unlabeled)



CTA TAP (unlabeled)



AP Radiograph Findings: (labeled)



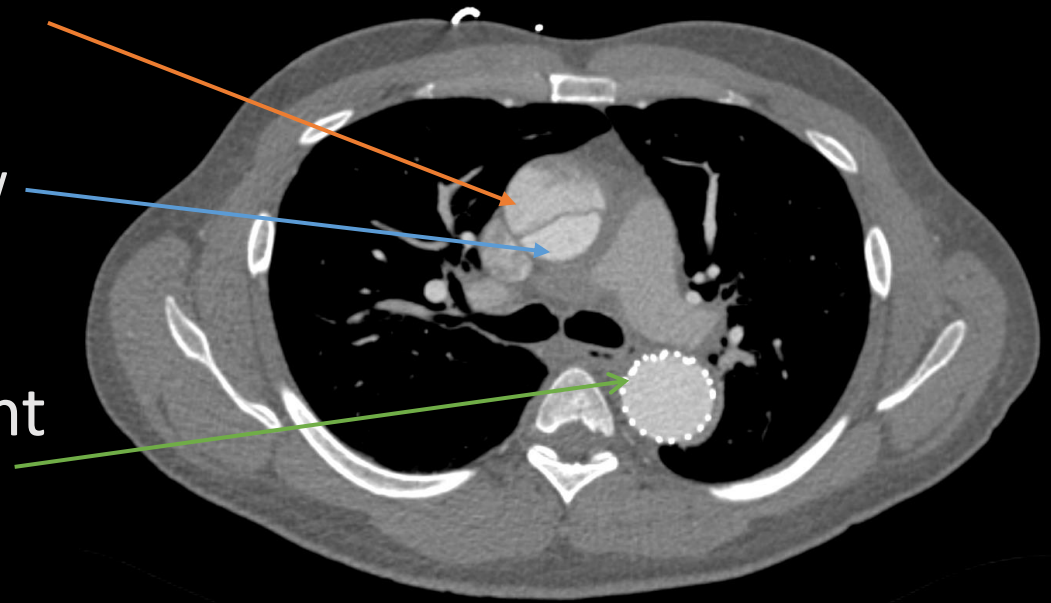
- Initial CXR demonstrating mild widening of mediastinum (orange arrow)
- TEVAR stent graft in place (red arrow)

CTA TAP sagittal and axial (labeled)



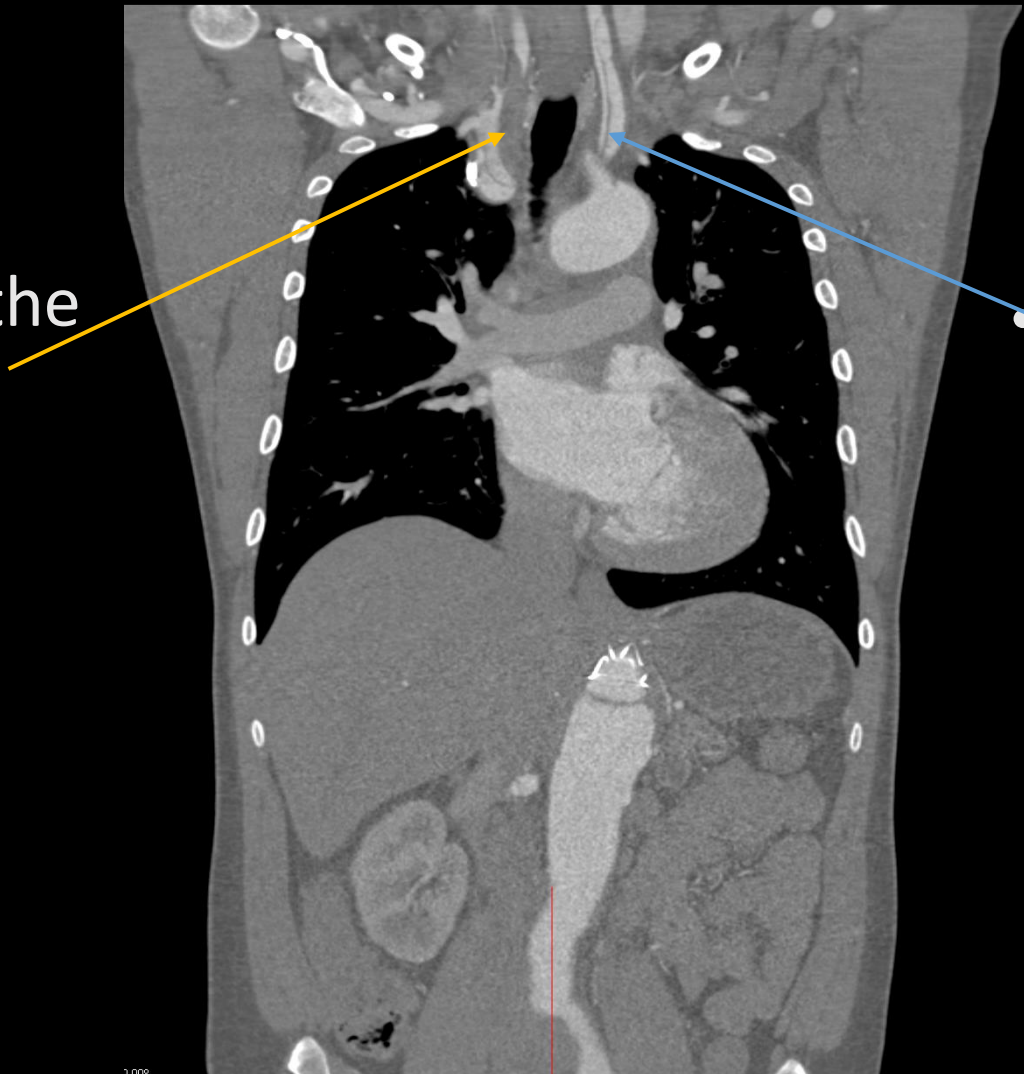
- Acute Type A aortic dissection
 - False lumen = orange arrow
 - True lumen = blue arrow
 - Smaller lumen size and higher contrast density

- Chronic Type B with stent graft in place (green arrow)
- Chronic dissection of common iliac (yellow arrow)



CTA TAP coronal (labeled)

- Flap occlusion of the right common carotid (orange arrow)



- Dissection extending up the left common carotid (blue arrow)

Final Dx:

Type A Aortic Dissection

Case Discussion: Type A Aortic Dissection

- **Epidemiology / Risk Factors**

- Classically seen in elderly (>60 y.o.) hypertensive patients or underlying connective tissue disease (i.e: Marfan / Ehlers-Danlos)
 - Increased risk with:
 - HTN
 - Atherosclerosis, vasculitis
 - Pregnancy

- **Pathogenesis**

- Excessive stress on the aortic wall resulting in tearing of the intimal wall, creating both a true and false lumen.

- **Clinical Presentation**

- Hypertensive with possible discrepancies in left vs right UE blood pressures
- Sudden severe chest pain with tearing quality.
 - Radiation to the neck, jaw or back

Case Discussion: Type A Aortic Dissection

- Dx

- Imaging of choice = CTA
 - Should include chest, abdomen and pelvis to assess mesenteric and iliac involvement
- Stanford Classification
 - Type A – Proximal to the left subclavian origin
 - Type B – Distal to the left subclavian origin

- Imaging

- Plain Radiographs: Widened mediastinum / mediastinal shifting / irregular aortic contours
- CT:
 - True Lumen: Smaller in size due to compression and will likely have outer wall calcifications
 - False Lumen: Larger in size with lower contrast density.
 - Typically located anterolateral to the true lumen in Type A
 - Typically located posterolateral in Type B

Case Discussion: Type A Aortic Dissection

- **Treatment**

- Type A Dissection = surgical emergencies
 - Aggressive reduction in HR and blood pressures with BB, nitroprusside, or CCB to prevent further dissection
- This patient was immediately transferred for urgent surgery with Cardene drip. He underwent sternotomy with graft placement.

- **Prevention**

- Blood pressure control and regular surveillance with imaging

References:

- Harris, C., Croce, B., & Cao, C. (2016). Type A aortic dissection. *Annals of cardiothoracic surgery*, 5(3), 256. <https://doi.org/10.21037/acs.2016.05.04>
- Gaillard F, Worsley C, Rasuli B, et al. *Aortic dissection*. Reference article, Radiopaedia.org (Accessed on 24 Apr 2023) <https://doi.org/10.53347/rID-918>
- D'Souza D, Bell D, Hacking C, et al. *DeBakey classification*. Reference article, Radiopaedia.org (Accessed on 24 Apr 2023) <https://doi.org/10.53347/rID-1203>
- D'Souza D, Rasuli B, Feger J, et al. *Stanford classification of aortic dissection*. Reference article, Radiopaedia.org (Accessed on 24 Apr 2023) <https://doi.org/10.53347/rID-2081>