

# Traumatic Aortic Injury

Lucas Frickey July 19, 2021

# Focused patient history and workup

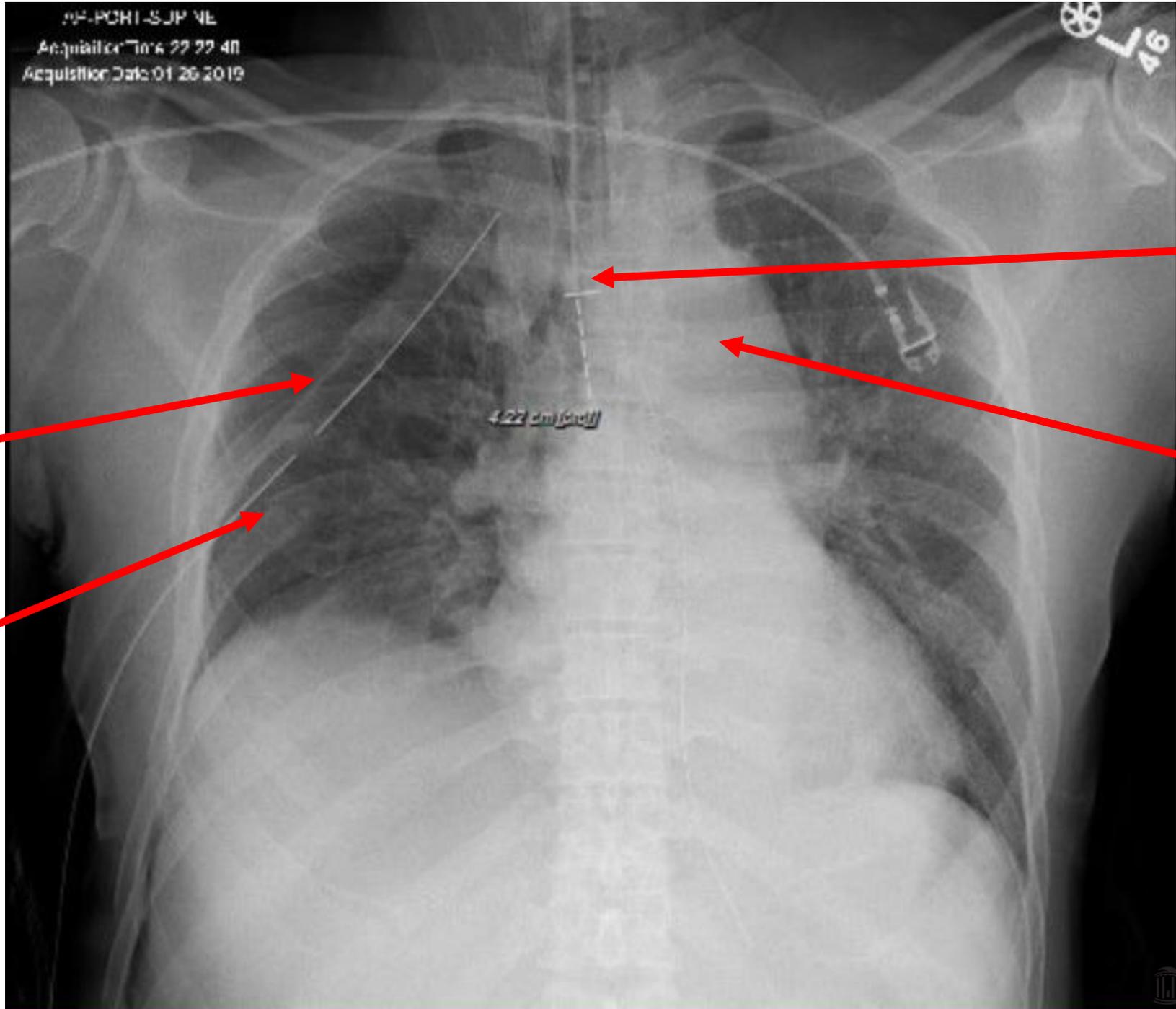
- 63 y/o man who presents to ED as a red trauma transfer from OSH following pedestrian vs. vehicle trauma
- GCS 15 on scene but GCS 7 after arrival at OSH requiring intubation
- CT showed descending aortic injury
- Prior to transfer, OSH placed chest tube and initiated massive transfusion protocol
- Shortly after arrival, patient lost pulse. Return of spontaneous circulation (ROSC) obtained after chest compressions, epinephrine, PRBC's, and FFP
- Received total of 6 units PRBC's, 5 units FFP, and 1 unit platelets before being taken to OR

# List of imaging studies

- All from OSH
  - CXR
  - X-ray Pelvis
  - CT Chest, Abdomen, and Pelvis
  - CT Face
  - Cervical Spine CT
  - Non-Con Head CT

AP-PORT-SJP-NE  
Acquisition Time: 22:22:40  
Acquisition Date: 01/26/2019

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46

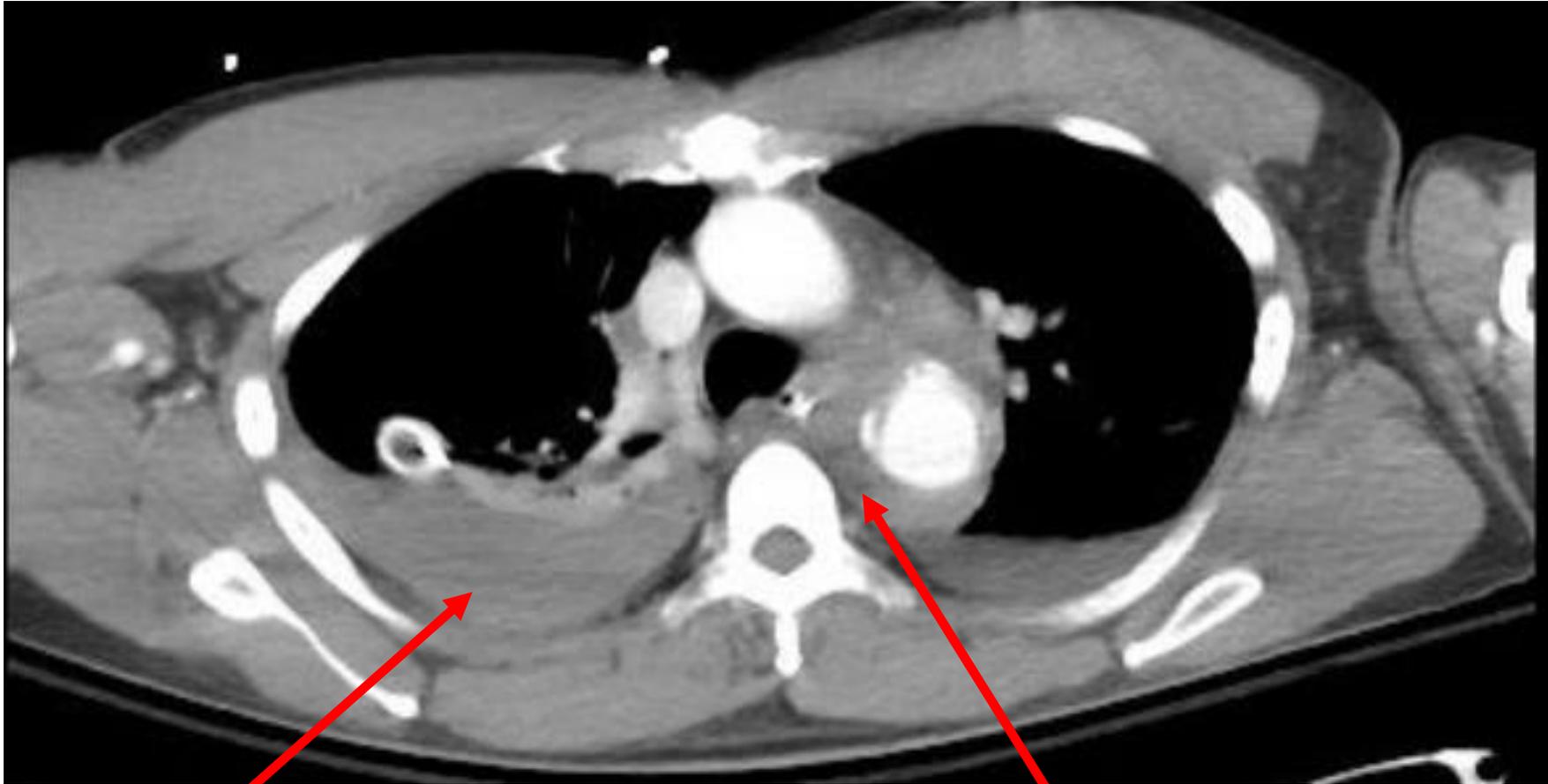


Chest Tube

Fracture

ET Tube

Widened  
Mediastinum

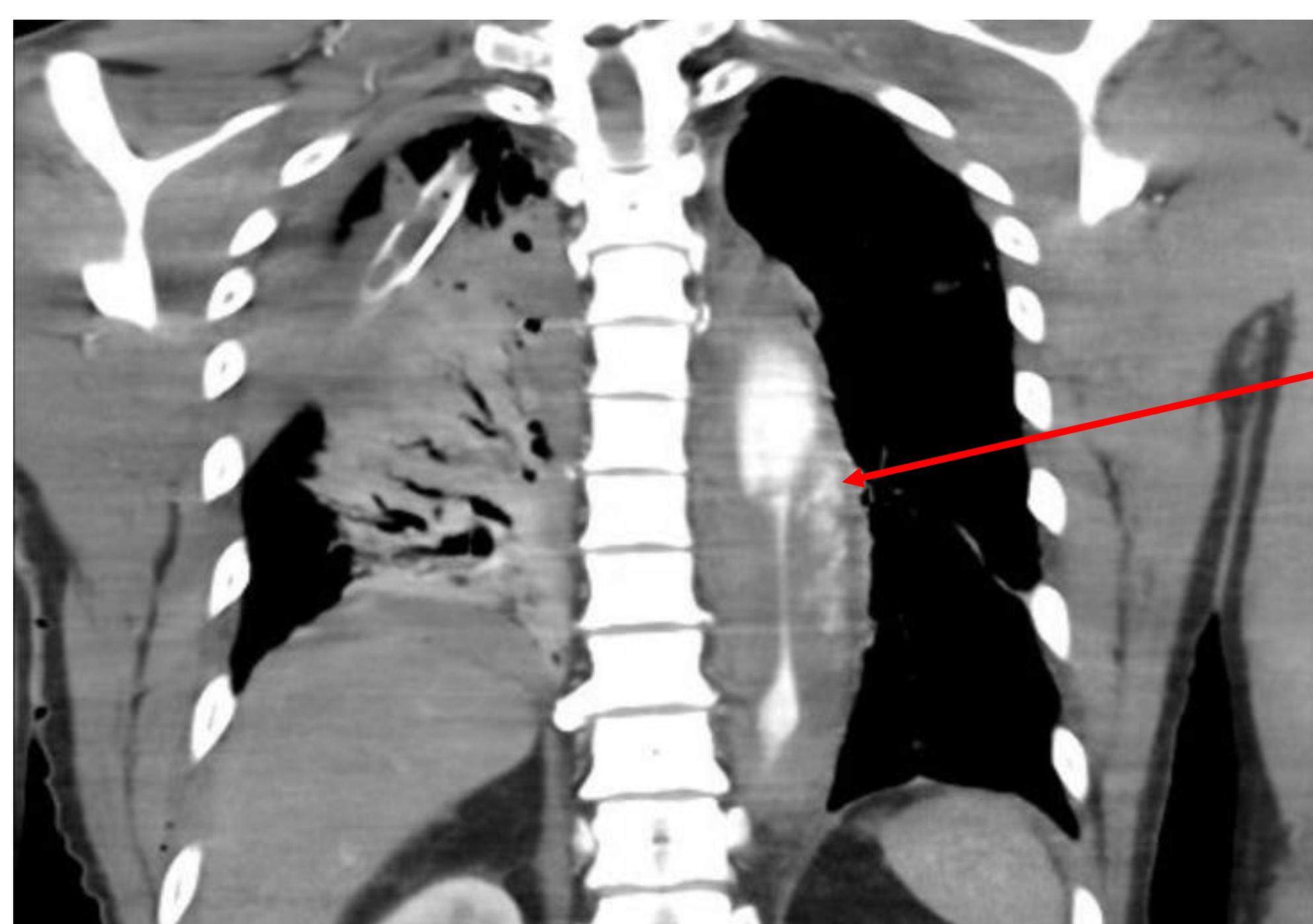


Hemothorax

Periaortic  
Hematoma



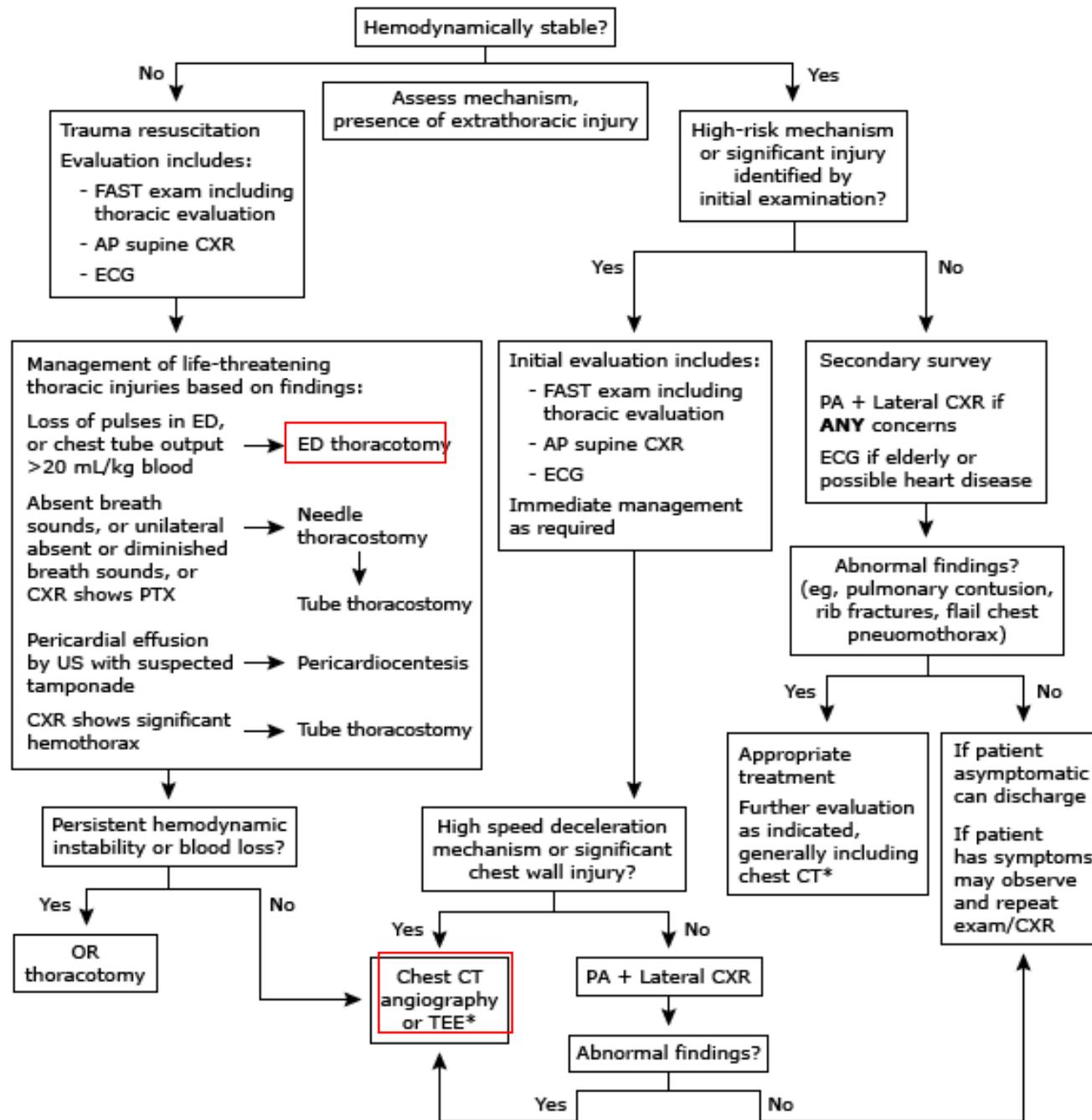
Contrast Extravasation



Contrast  
Extravasation  
from Aortic  
Rupture

## Patient treatment or outcome

- Upon ROSC, he was immediately taken to OR for exploratory thoracotomy and TEVAR by Vascular Surgery. Left sided chest tube was also placed
- Bilateral renal infarcts resulting in acute renal failure and continuous renal replacement therapy
- Discharged to rehab facility after ~2 months



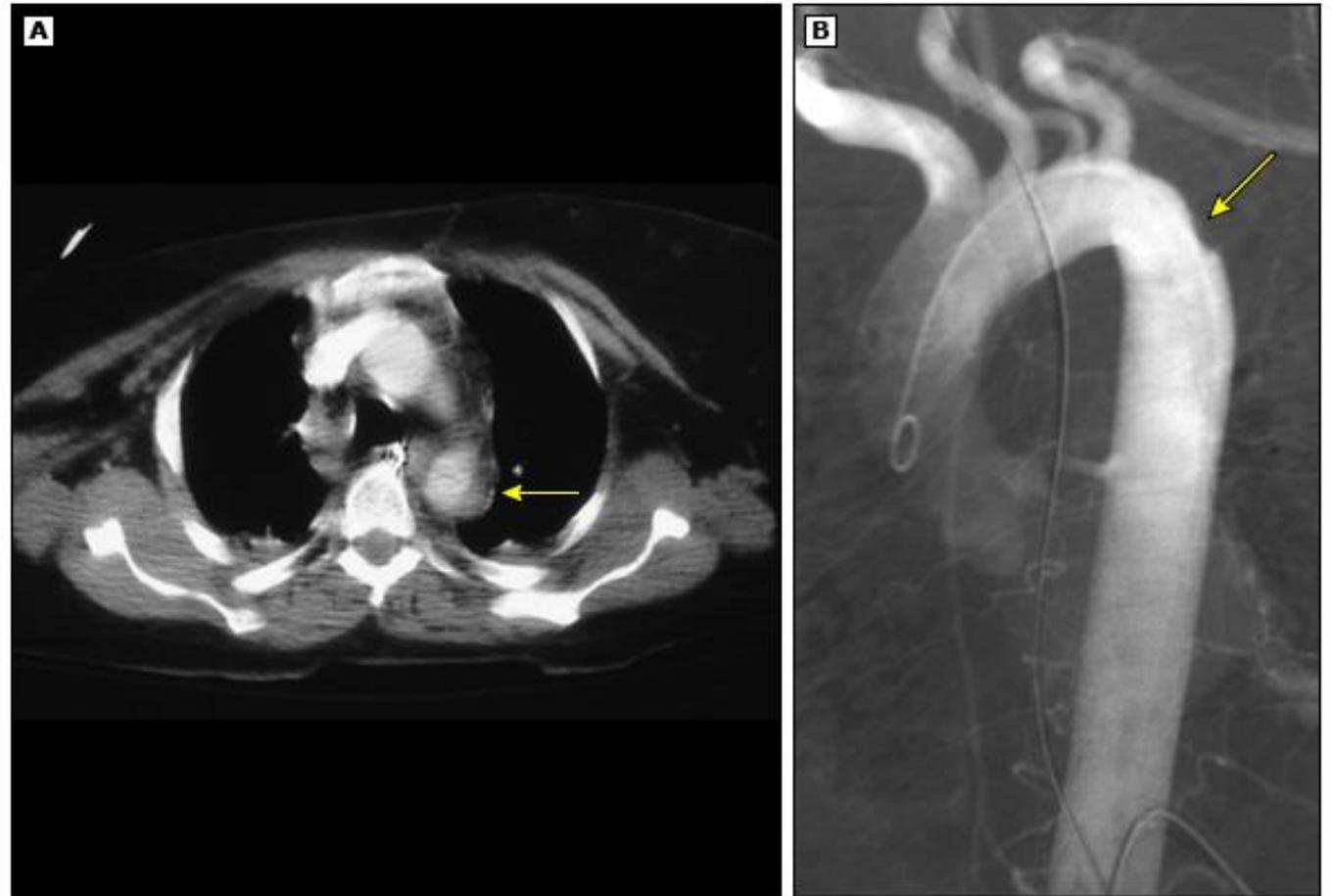
From "Initial evaluation and management of blunt thoracic trauma in adults". Up to Date. Accessed July 16, 2021.

# Chest CT vs Transesophageal Echocardiography (TEE)

- Both are highly sensitive for aortic injury
- CT
  - Requires contrast
  - Equivocal study necessitates angiography
  - Scanner availability
- TEE
  - Can be performed at bedside
  - May be preferred in hemodynamically unstable patient who is intubated
  - No radiation
  - Limited in proximal ruptures

# Imaging Findings of Traumatic Aortic Injury (w contrast)

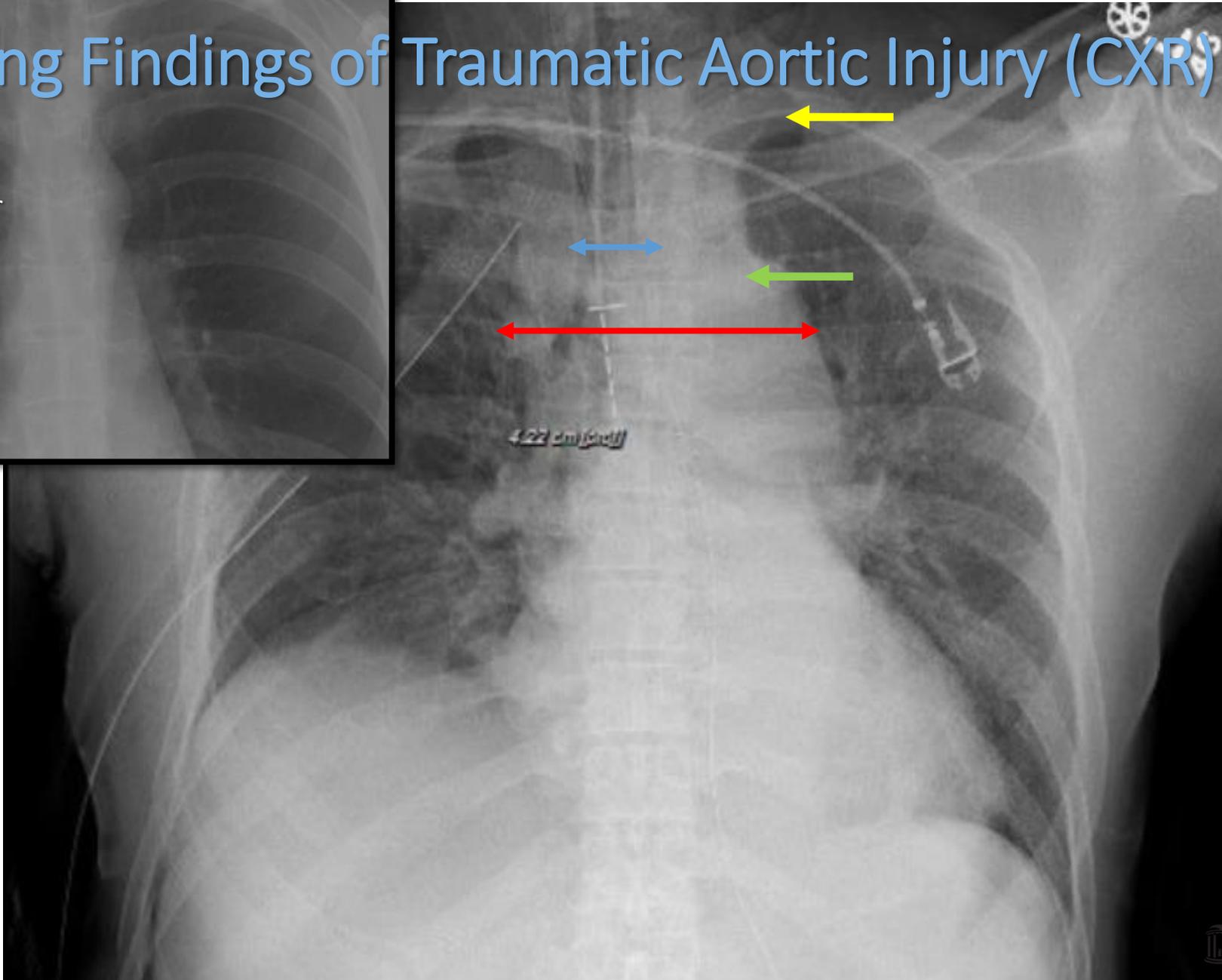
- Intimal flap
- Periaortic hematoma
- Intramural hematoma (seen in image A)
- Luminal filling defect
- Aortic contour abnormality (seen in image B)
- Pseudoaneurysm
- Vessel wall disruption
- Active extravasation



From "Clinical features and diagnosis of blunt thoracic aortic injury." Up to Date. Accessed July 16, 2021.

# Imaging Findings of Traumatic Aortic Injury (CXR)

Normal trauma  
mediastinum for  
comparison



Widened  
mediastinum (>8cm  
level arch)

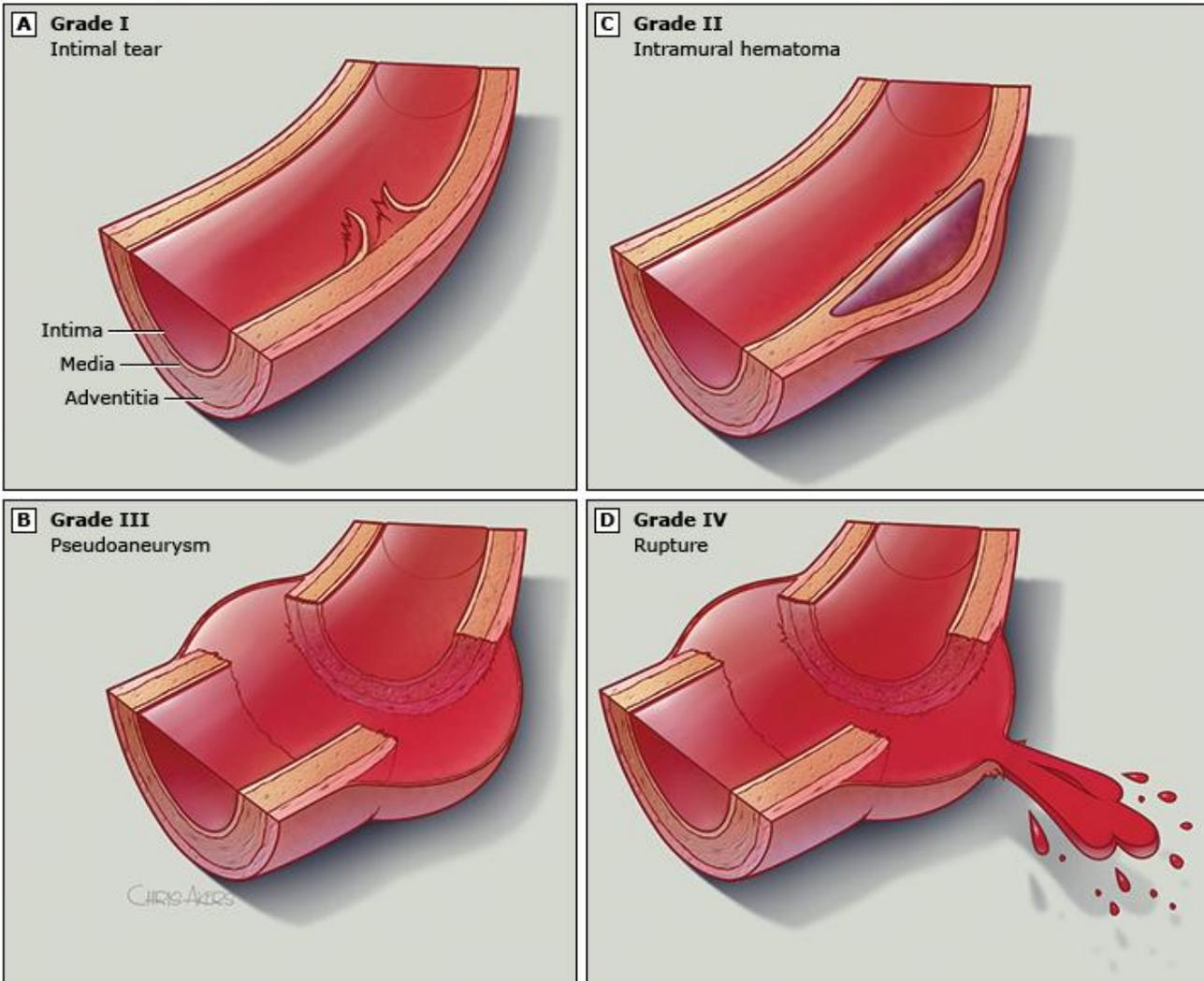
Obscured irregular  
aortic arch

Deviation of the  
trachea to right of  
T4 spinous process

Deviation of NGT to  
right of T4 spinous  
process

Left apical cap

# Aortic Injury Grading



In a study of 332 patients with blunt thoracic aortic injuries:

- Aortic related mortality for Grades I & II = 0%
- Aortic related mortality for Grade III = 1.6%
- Aortic related mortality for Grade IV = 37.5%

\*\*However, 86 patients excluded from study d/t death prior to CT scan

From "Clinical features and diagnosis of blunt thoracic aortic injury." Up to Date. Accessed July 16, 2021.

# Take Away Points

1. CT and TEE are preferred tests when there is concern for aortic injury
2. Very low mortality for grade I and II aortic injuries, but they may progress to higher grades
3. The (literal) downstream effects of aortic injury result from ischemia, as in this case

# References

- Fortuna Jr, Gerald R., et al. "Injury grade is a predictor of aortic-related death among patients with blunt thoracic aortic injury." *Journal of vascular surgery* 63.5 (2016): 1225-1231.
- Legome. Initial evaluation and management of blunt thoracic trauma in adults. Up to Date. Updated May 21, 2021. Accessed July 16, 2021.
- Neschis et al. Clinical features and diagnosis of blunt thoracic aortic injury. Up to Date. Updated November 30, 2020. Accessed July 16, 2021.
- Neschis. Management of blunt thoracic aortic injury. Up to Date. Updated October 07, 2020. Accessed July 16, 2021.