AMSER Case of the Month August 2024

HPI:
77 y.o. male admitted for chest pain

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Patient Presentation

- 77 y.o. M with atrial fibrillation, aortic root aneurysm s/p mechanical aortic valve replacement which was complicated by aortic valve endocarditis requiring redo sternotomy and aortic root repair
- Patient presents to ED with acute onset chest pain radiating to back and abdomen.

Patient Presentation

- In the ED, vitals were as below:
  - Temp: 36.3 C | BP: 128/70 | HR: 81| Resp: 13| SpO2: 91%
- Pertinent PMH:
  - Hypertension, recent treatment for aortic valve endocarditis
- PSH:
  - Mechanical aortic valve replacement and re-do aortic root repair for treatment of endocarditis
- Social Hx:
  - Former smoker. No smokeless tobacco, alcohol, or drugs.

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

American College of Radiology
ACR Appropriateness Criteria®
Suspected Acute Aortic Syndrome

Variant 1: **Acute chest pain; suspected acute aortic syndrome.**

Procedure	Appropriateness Category	Relative Radiation Level
US echocardiography transesophageal	Usually Appropriate	O
Radiography chest	Usually Appropriate	☢
MRA chest abdomen pelvis without and with IV contrast	Usually Appropriate	O
MRA chest without and with IV contrast	Usually Appropriate	O
CT chest with IV contrast	Usually Appropriate	☢☢☢
CT chest without and with IV contrast	Usually Appropriate	☢☢☢
CTA chest with IV contrast	Usually Appropriate	☢☢☢
CTA chest abdomen pelvis with IV contrast	Usually Appropriate	☢☢☢☢☢
US echocardiography transthoracic resting	May Be Appropriate	O
Aortography chest	May Be Appropriate	☢☢☢
MRA chest abdomen pelvis without IV contrast	May Be Appropriate	O
MRA chest without IV contrast	May Be Appropriate	O
MRI chest abdomen pelvis without IV contrast	May Be Appropriate	O
CT chest without IV contrast	May Be Appropriate	☢☢☢
CTA coronary arteries with IV contrast	May Be Appropriate	☢☢☢
MRI chest abdomen pelvis without and with IV contrast	Usually Not Appropriate	O

This imaging modality was ordered by the ER physician.

[1] Acute Chest Pain; Suspect Acute Aortic Syndrome. ACR AC Portal. https://acsearch.acr.org/docs/69402/Narrative/. Revised 2021. Accessed June 12, 2024.

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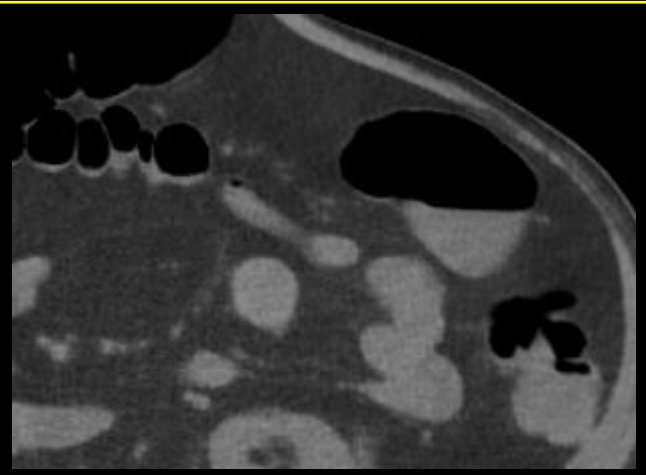
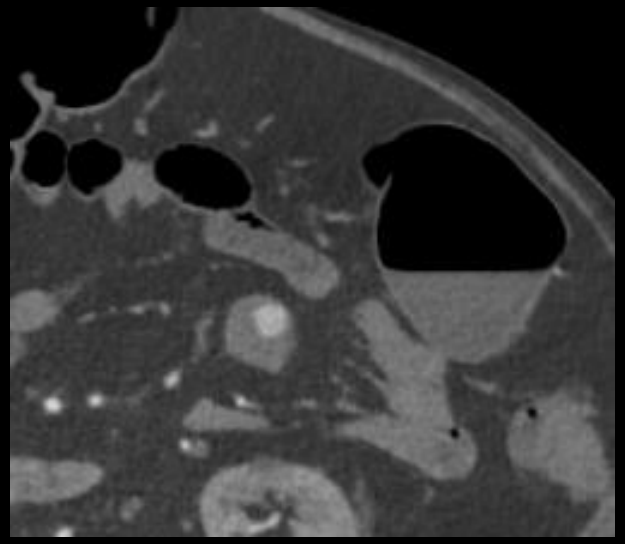
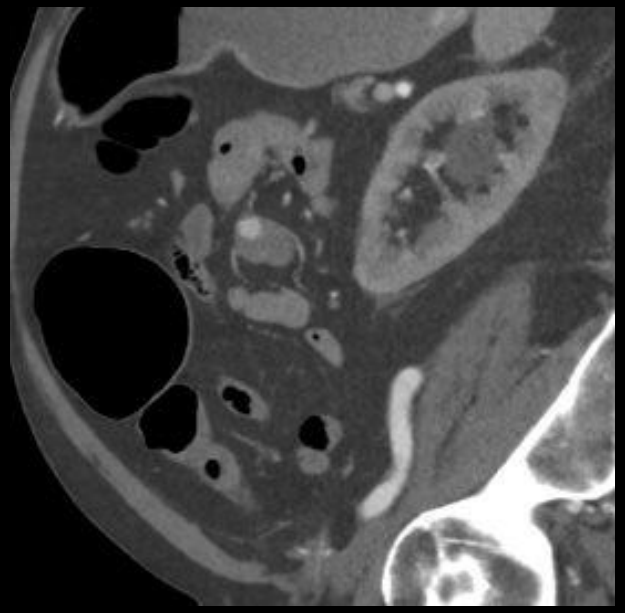
Findings (unlabeled)

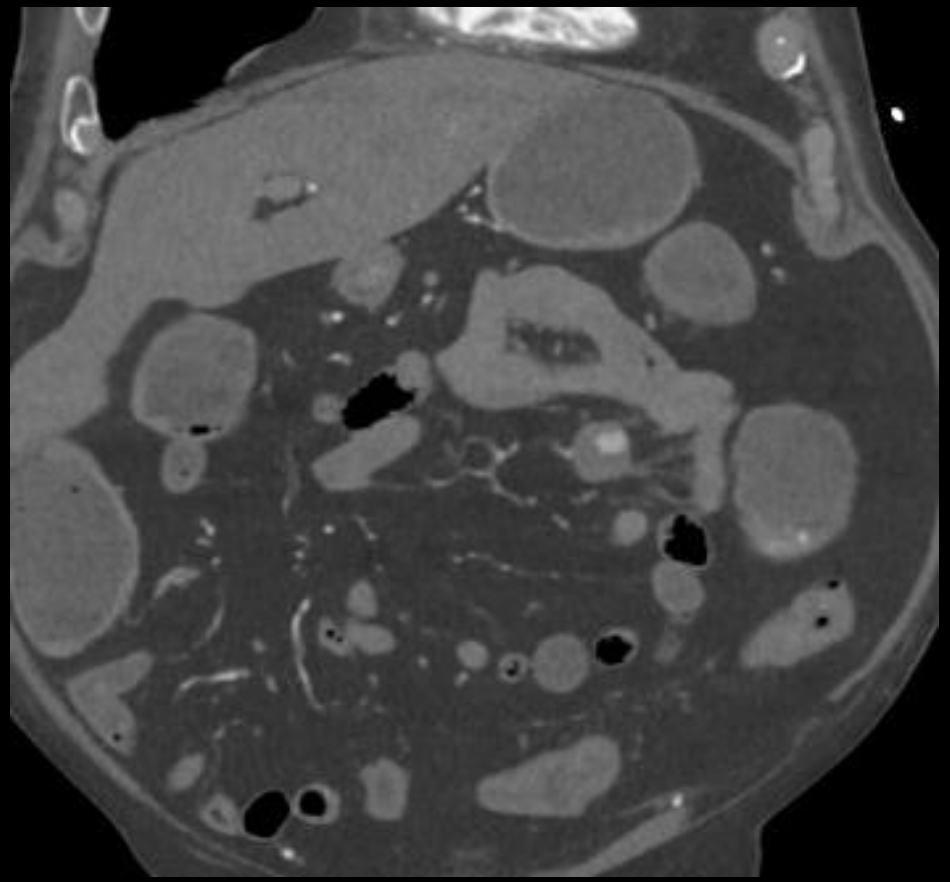
Pre- Contrast



Post Contrast





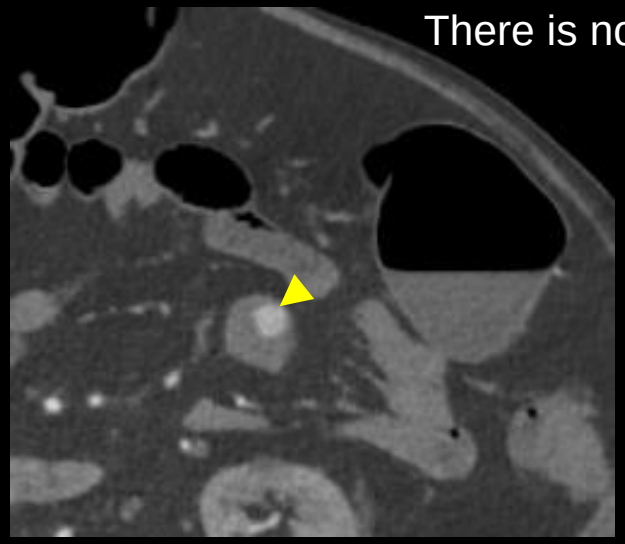


Findings (labeled)

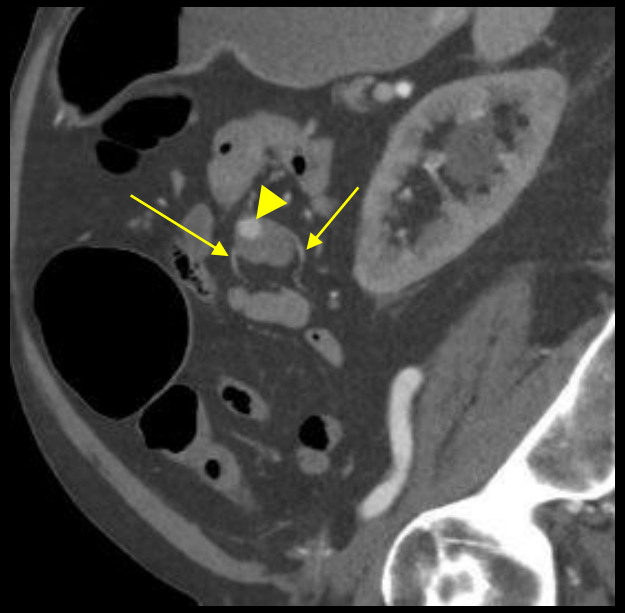
Pre- Contrast

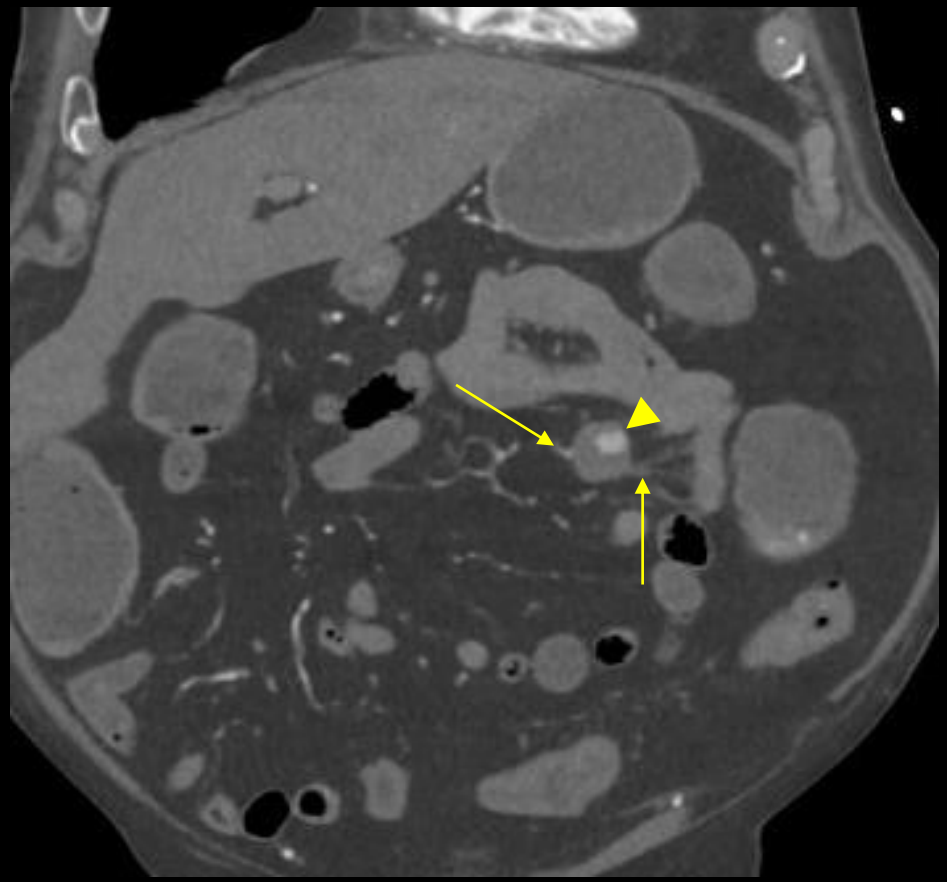
High density abnormality in the mesentery (arrow).

Post Contrast



There is nodular enhancement in the abnormality (arrowheads).





The abnormality communicates with a jejunal branch the superior mesenteric artery (SMA; arrows).

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Final Dx:

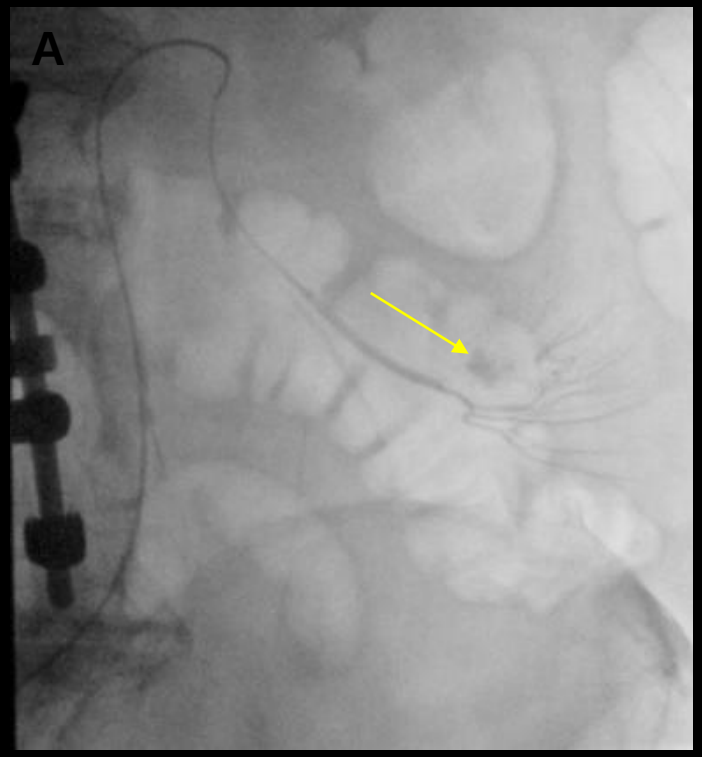
Pseudoaneurysm of a jejunal branch of the SMA

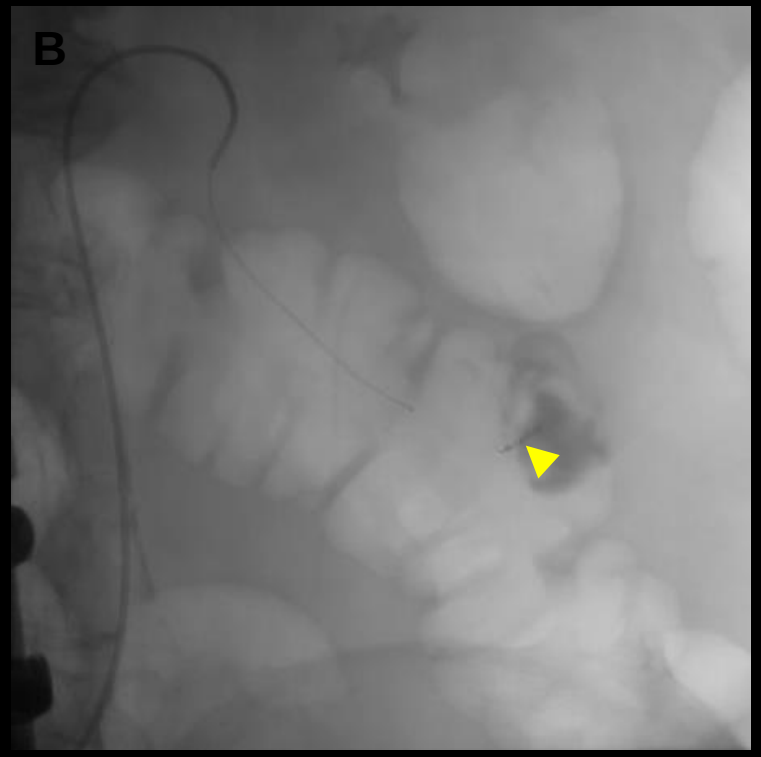
Case Discussion

- Pathophysiology: True aneurysm vs. Pseudoaneurysm
  - **True aneurysm** → involves all three layers of the blood vessel wall (intima, media, and adventitia) bulging outward, maintaining the continuity of the vessel wall[2,3]
  - **Pseudoaneurysm** → blood escapes through tears in the vessel wall and is contained by surrounding tissue, forming a sac that does not involve the full vessel wall layers[2,3]
- Risk factors for pseudoaneurysms:
  - Iatrogenic injury from instrumentation[4]
  - Blunt/penetrating abdominal trauma[4]
  - Inflammation or infection[5]
- Clinical Features:
  - Generally asymptomatic and typically identified as incidental findings [6]

Case Discussion

- Management:
  - Pseudoaneurysms have a higher rate of rupture compared to aneurysms and require treatment
    - Reported rates of visceral artery aneurysm bleeding leading to death between 25-80% [7]





The patient underwent successful embolization. Initial angiographic image (A) confirms the presence of the pseudoaneurysm (arrow) which underwent coil embolization (B, arrowhead).

References:

1. Acute Chest Pain; Suspect Acute Aortic Syndrome. ACR AC Portal. https://acsearch.acr.org/docs/69402/Narrative/. Revised 2021. Accessed June 12, 2024.
2. Management and urgent repair of ruptured visceral artery aneurysms. Ann Vasc Surg. 2024;58:13-20. doi:10.1016/j.avsg.2024.01.005.
3. Endovascular treatment of visceral and renal artery aneurysms. J Vasc Surg. 2024;60(3):575-583. doi:10.1016/j.jvs.2024.03.014.
4. Visceral artery aneurysms: diagnosis, surveillance, and treatment. Cardiovasc Intervent Radiol. 2024;47(2):289-298. doi:10.1007/s00270-024-03108-6.
5. Management of the Diseases of the Mesenteric Arteries and Veins. Clinical Practice Guidelines of the European Society of Vascular Surgery. 2017;53(4):460-510.
6. Overview of visceral artery aneurysm and pseudoaneurysm. UpToDate. https://www.uptodate.com/contents/overview-of-visceral-artery-aneurysm-and-pseudoaneurysm?search=jejunal%20pseudoaneurysm%20&source=search_result&selectedTitle=1%7E150&usage_type=default&display_rank=1#H1307281181. Accessed May 30, 2024.
7. Superior Mesenteric Artery Pseudoaneurysm Induced by Accidental Ingestion of a Foreign Body: Case Report. EJVES Vascular Forum. 2022;54:36-39.

Questions?