AMSER Case of the Month: June 2022

76-year-old male with a history of AAA s/p EVAR presents for surveillance imaging of an aortic aneurysmal sac

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Patient Presentation

- HPI: 76-year-old male presents to vascular surgery, for follow-up appointment for surveillance of an abdominal aortic aneurysm status post EVAR. The patient underwent an endovascular repair of a 5.1 cm abdominal aortic aneurysm two years prior. At the time of his last appointment, approximately 1 year ago, ultrasound imaging demonstrated a stable 5.1 cm aortic aneurysm. On presentation today, ultrasound imaging demonstrates a 5.7 cm aneurysmal sac. Patient endorses mild abdominal pain. Denies nausea, vomiting, or shortness of breath. Given the ultrasound findings, interventional radiology was consulted.

- Past medical history: HTN, NSTEMI, Arthritis

- Past surgical history: Cardiac catheterization x2, spinal fusion

Physical Exam/Pertinent Labs

- Physical Exam
  - Abdomen: Gross enlargement, with prominent subxiphoid bulging extending to the umbilicus. Mild tenderness to palpation of the medial aspect of the abdomen. Normal bowel sounds.

- BMP/CBC
  - Hemoglobin: 13.1, Hematocrit: 41.1, Platelets: 161,000. Otherwise within normal limits.

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 2: **Follow-up for postendovascular repair (EVAR) or open repair of AAA.**

Procedure	Appropriateness Category	Relative Radiation Level
CTA abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢☢
MRA abdomen and pelvis without and with IV contrast	Usually Appropriate	O
Aortography abdomen	May Be Appropriate	☢☢☢
CT abdomen and pelvis without and with IV contrast	May Be Appropriate	☢☢☢☢
CT abdomen and pelvis without IV contrast and US aorta abdomen with duplex Doppler	May Be Appropriate	☢☢☢
MRA abdomen and pelvis without IV contrast	May Be Appropriate	O
US aorta abdomen with duplex Doppler	May Be Appropriate	O
CT abdomen and pelvis without IV contrast	May Be Appropriate	☢☢☢
CT abdomen and pelvis with IV contrast	May Be Appropriate (Disagreement)	☢☢☢
X-ray abdomen and pelvis	May Be Appropriate	☢☢☢

This imaging modality was ordered by vascular surgery with concern for a possible graft leak.

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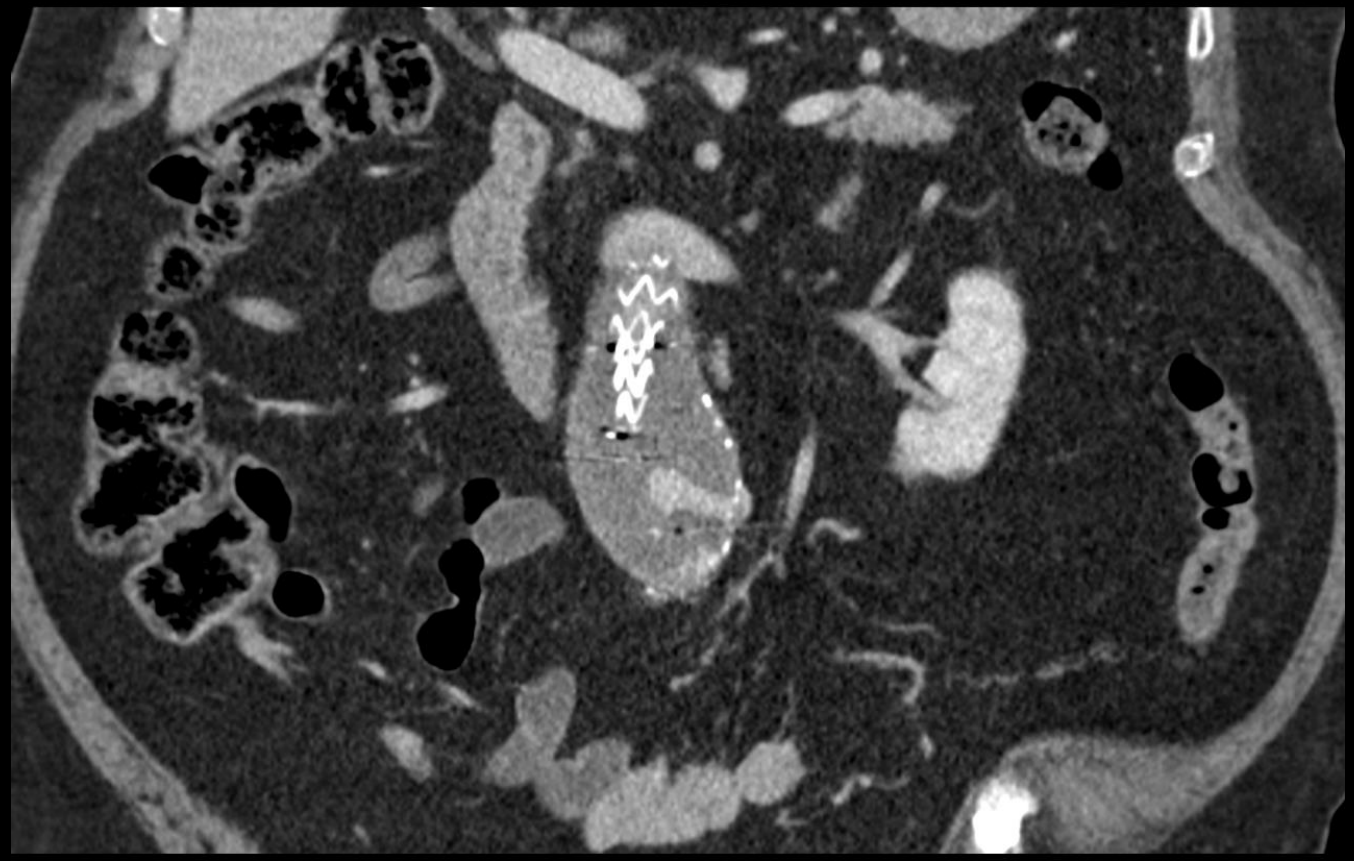
Findings (unlabeled)

Non-contrast enhanced axial CT

Contrast enhanced axial CT-arterial phase

Contrast enhanced axial CT-portal venous phase

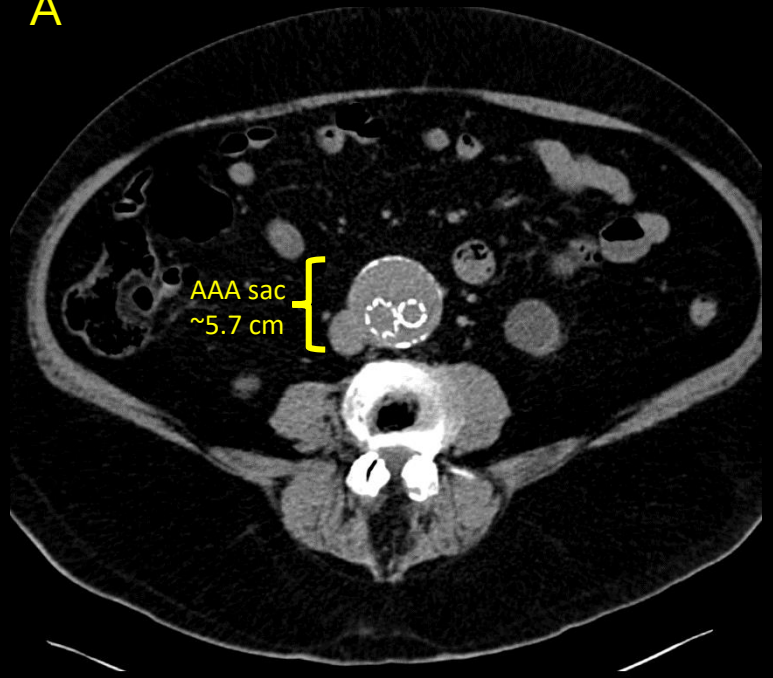
Findings (unlabeled)



Contrast enhanced coronal CT-portal venous phase

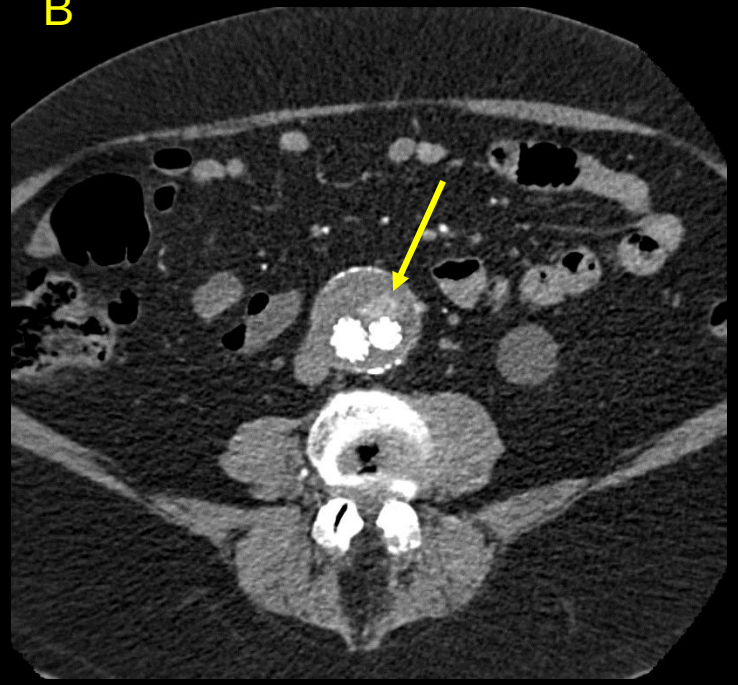
Findings (labeled)

A



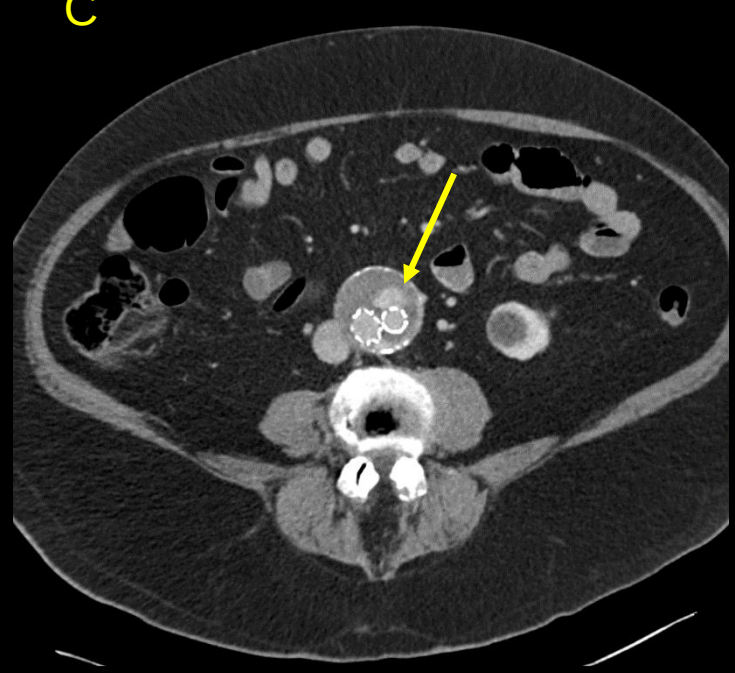
Non-contrast enhanced axial CT

B



Contrast enhanced axial CT-arterial phase

C



Contrast enhanced axial CT-portal venous phase

Hyper-density (contrast) in the left anterior portion of the aneurysmal sac becomes evident in image B (arterial phase) and becomes more conspicuous in image C (portal venous). Note the absence of hyper-density in image A.

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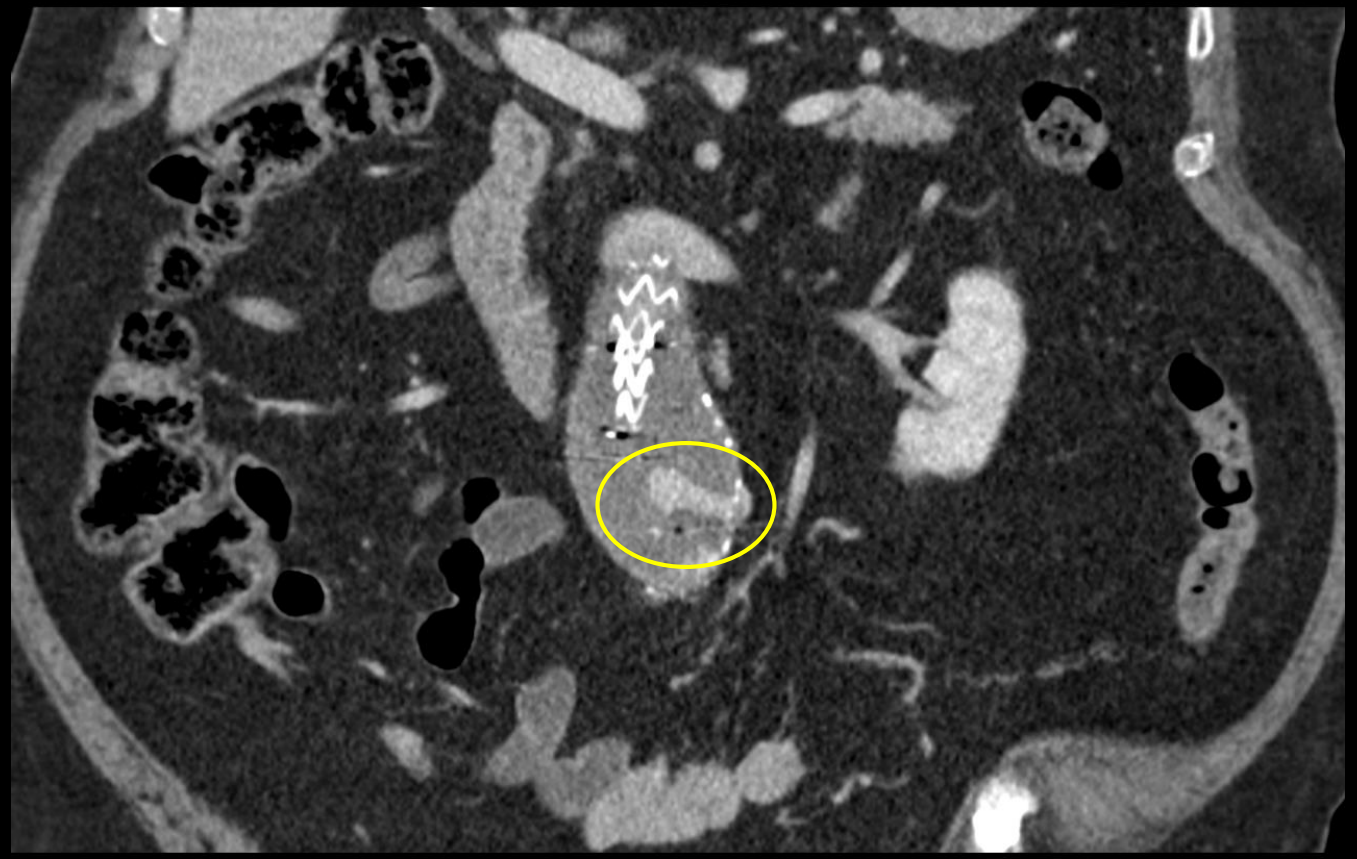
Findings (labeled)



Coronal view CT in portal venous phase demonstrating contrast in the aneurysm sac

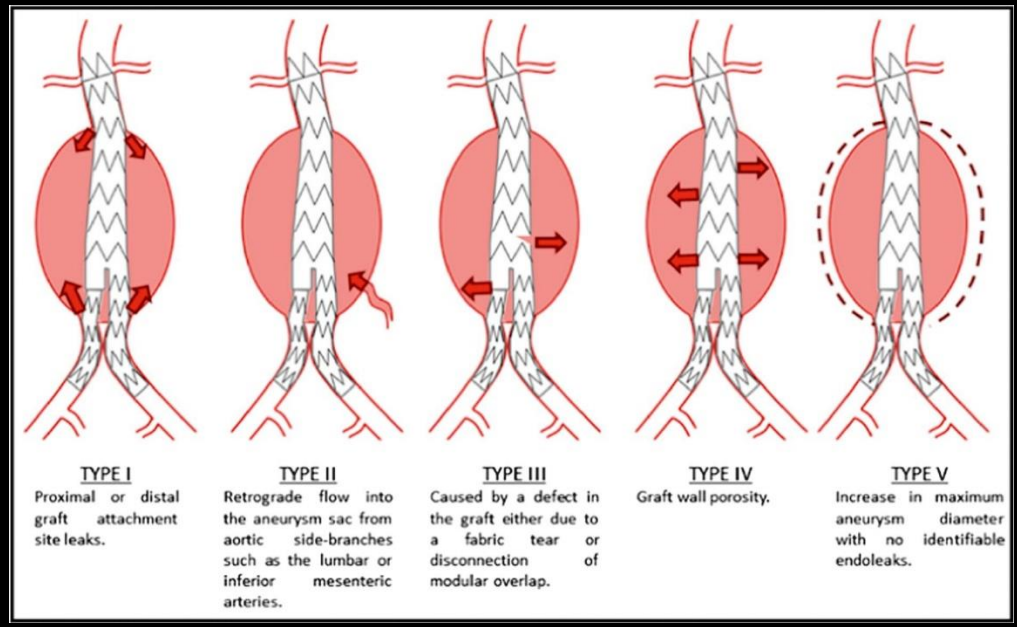
Final Dx:

Type II endovascular graft leak via inferior mesenteric artery

Endovascular Graft Leaks

- Endoleak: Persistent blood flow within the aneurysm sac following endovascular aneurysm repair (EVAR)
    - Normally, the stent-graft excludes the aneurysm from circulation by providing a passage for blood to bypass the sac.
  - Epidemiology
    - Common complication of EVAR found in 20-40% of patients during follow-up.
  - Risks
    - Most are asymptomatic; however, if untreated, the aneurysm may expand and poses a risk of rupture.
      - Significant enlargement **(>5mm)** warrants intervention

- Classifications
  - Type I → Leak at graft attachment site
  - Type II → Retrograde filling of the aneurysm sac via branch vessel(s)
  - Type III → Leak through defect in graft
  - Type IV → Leak through graft fabric as a result of graft porosity
  - Type V → Continued expansion without demonstrable leak on imaging



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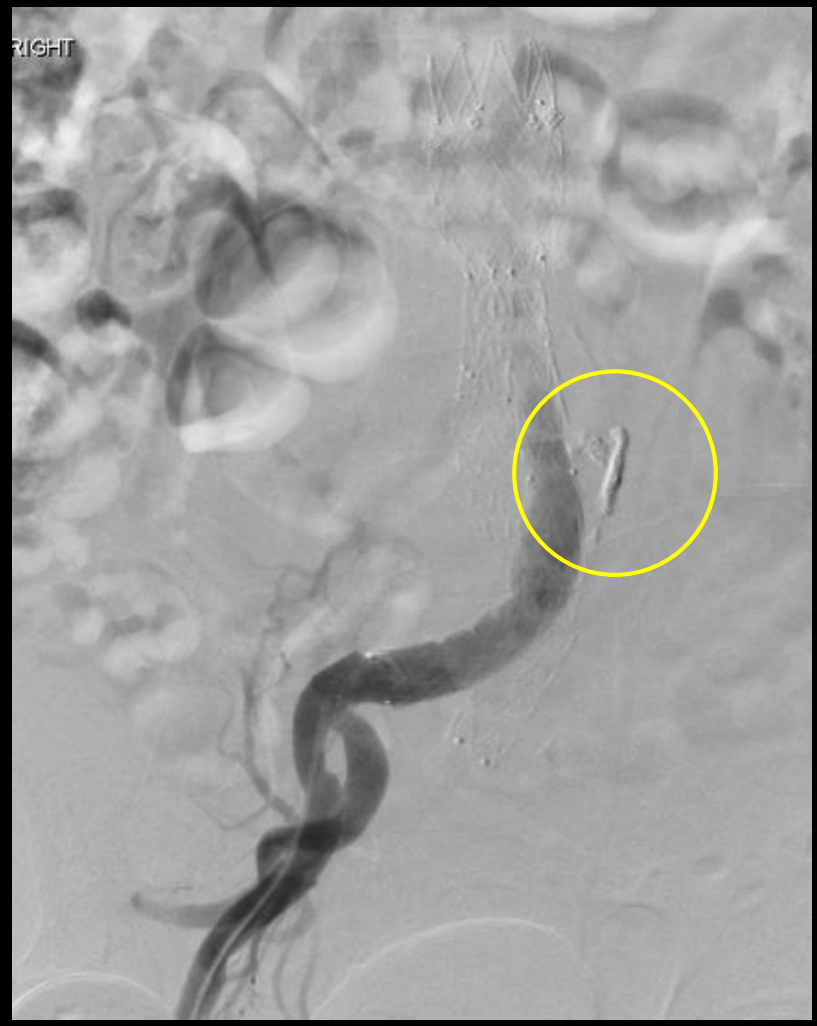
Endoleak localization w/ DSA

The origin of the IMA was not accessible due to the aortic stent-graft occluding the origin of the IMA, thus the SMA was used to access the endoleak site via the Arc of Riolan.

Treatment

- Onyx™ liquid embolic system (LES) was injected into the IMA branch supplying the aneurysm.
- Repeat digital subtraction angiography demonstrated successful embolization of the blood supply to the aneurysm.



References:

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