AMSER Case of the Month:
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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
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
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</thead>
<tbody>
<tr>
<td>CTA abdomen and pelvis with IV contrast</td>
<td>Usually Appropriate</td>
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<tr>
<td>MRA abdomen and pelvis without and with IV contrast</td>
<td>Usually Appropriate</td>
<td>🌟</td>
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<tr>
<td>Aortography abdomen</td>
<td>May Be Appropriate</td>
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<tr>
<td><strong>CT abdomen and pelvis without and with IV contrast</strong></td>
<td>May Be Appropriate</td>
<td>🌟🌟🌟🌟</td>
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<td>CT abdomen and pelvis without IV contrast and US aorta abdomen with duplex Doppler</td>
<td>May Be Appropriate</td>
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<tr>
<td>MRA abdomen and pelvis without IV contrast</td>
<td>May Be Appropriate</td>
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<tr>
<td>US aorta abdomen with duplex Doppler</td>
<td>May Be Appropriate</td>
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<tr>
<td>CT abdomen and pelvis without IV contrast</td>
<td>May Be Appropriate</td>
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<tr>
<td>CT abdomen and pelvis with IV contrast</td>
<td>May Be Appropriate (Disagreement)</td>
<td>🌟🌟🌟🌟</td>
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<td>X-ray abdomen and pelvis</td>
<td>May Be Appropriate</td>
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This imaging modality was ordered by vascular surgery with concern for a possible graft leak.
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)

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.
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
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:

• ACR Appropriateness Criteria® | American College of Radiology (2022)


