# AMSER Case of the Month

## 74-year-old male with bilateral lower abdominal pain

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# Patient Presentation

- HPI
  - A 74-year-old male presents to the ED with a 1-day history of acute onset nausea, vomiting, and bilateral lower abdominal pain that radiates to the back.
- Past Medical History
  - HTN, HLD, colon cancer.
- Past Surgical History
  - Partial colonic resection (>6 years ago) with colostomy.

# Patient Presentation

- Vitals
  - BP: 145/80 mmHg
  - Pulse: 56 bpm
  - Temperature: 36.6 C (97.9 F)
  - Respiratory Rate: 22 breaths/minute
  - SpO2: 100% on room air
- Physical Exam
  - Abdomen – Soft, bilateral lower quadrant tenderness to palpation, bowel sounds present, stoma without prolapse, bloody output from colostomy site.
- Differential diagnosis in the Emergency Department included gastroenteritis, cholecystitis, hepatitis, pancreatitis, or bowel obstruction – with bowel obstruction being the greatest concern.

# Pertinent Labs

- Labs
  - Normal LFTs and lipase
    - AST 29 U/L, ALT 12 U/L, Alk phos 72 U/L, Albumin 3.6 g/dL, Total bilirubin 0.6 mg/dL
    - Lipase 16 U/L
  - Lactate 3.6 mmol/L (normal <2 mmol/L)
  - WBC 16.6 k/uL

# What Imaging Should Be Ordered for Suspected Small-bowel Obstruction?

# ACR Appropriateness Criteria

**Variant 1:** **Suspected small-bowel obstruction. Acute presentation. Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| CT abdomen and pelvis with IV contrast | Usually Appropriate | ☢☢☢ |
| CT abdomen and pelvis without IV contrast | May Be Appropriate | ☢☢☢ |
| MRI abdomen and pelvis without and with IV contrast | May Be Appropriate | O |
| Radiography abdomen and pelvis | May Be Appropriate (Disagreement) | ☢☢☢ |
| Fluoroscopy small bowel follow-through | May Be Appropriate | ☢☢☢ |
| MRI abdomen and pelvis without IV contrast | May Be Appropriate | O |
| CT abdomen and pelvis without and with IV contrast | Usually Not Appropriate | ☢☢☢☢ |
| CT enteroclysis | Usually Not Appropriate | ☢☢☢☢ |
| CT enterography | Usually Not Appropriate | ☢☢☢☢ |
| MR enterography | Usually Not Appropriate | O |
| US abdomen and pelvis | Usually Not Appropriate | O |
| Fluoroscopy small bowel enteroclysis | Usually Not Appropriate | ☢☢☢ |
| MR enteroclysis | Usually Not Appropriate | O |

This is what was ordered. Oral contrast was also given to delineate bowel pathology.

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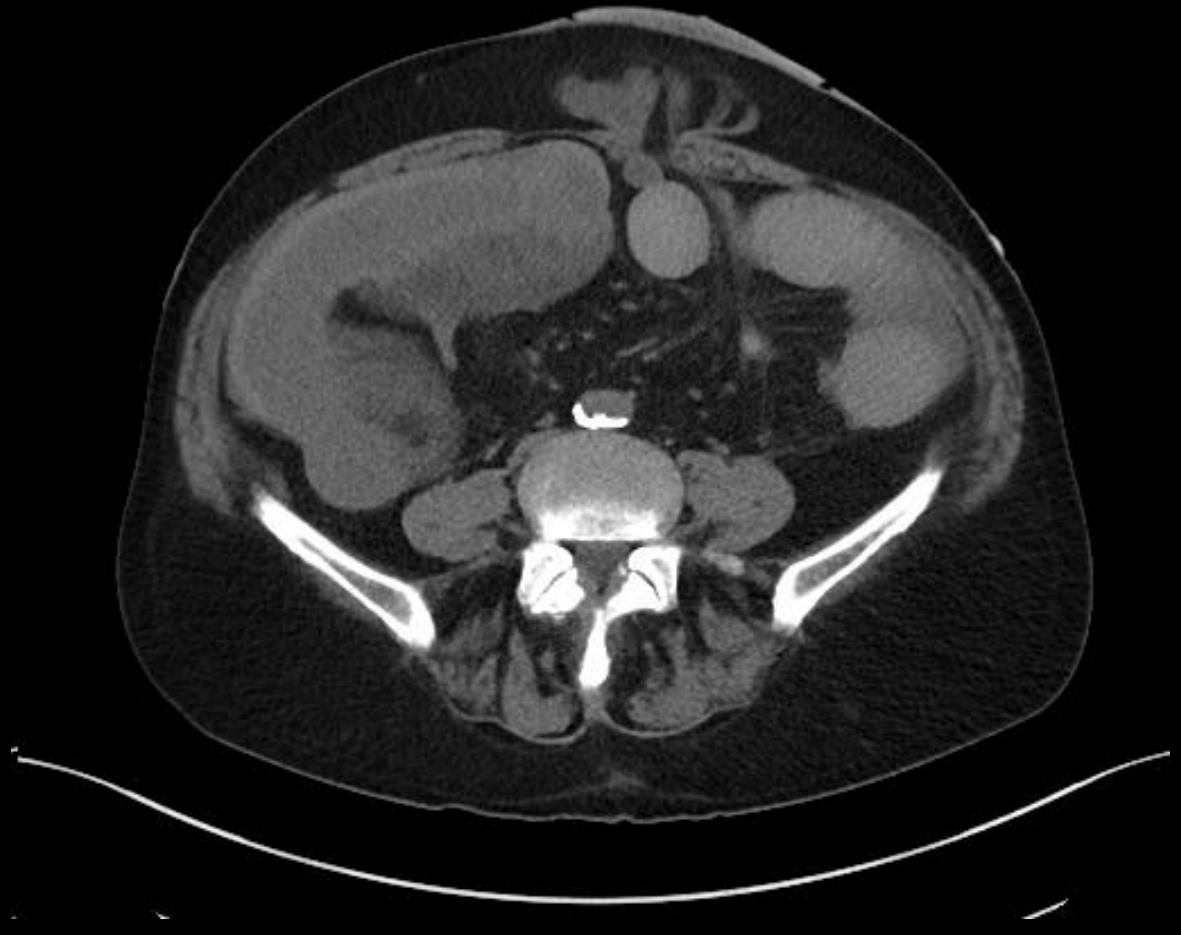
# Findings (unlabeled)

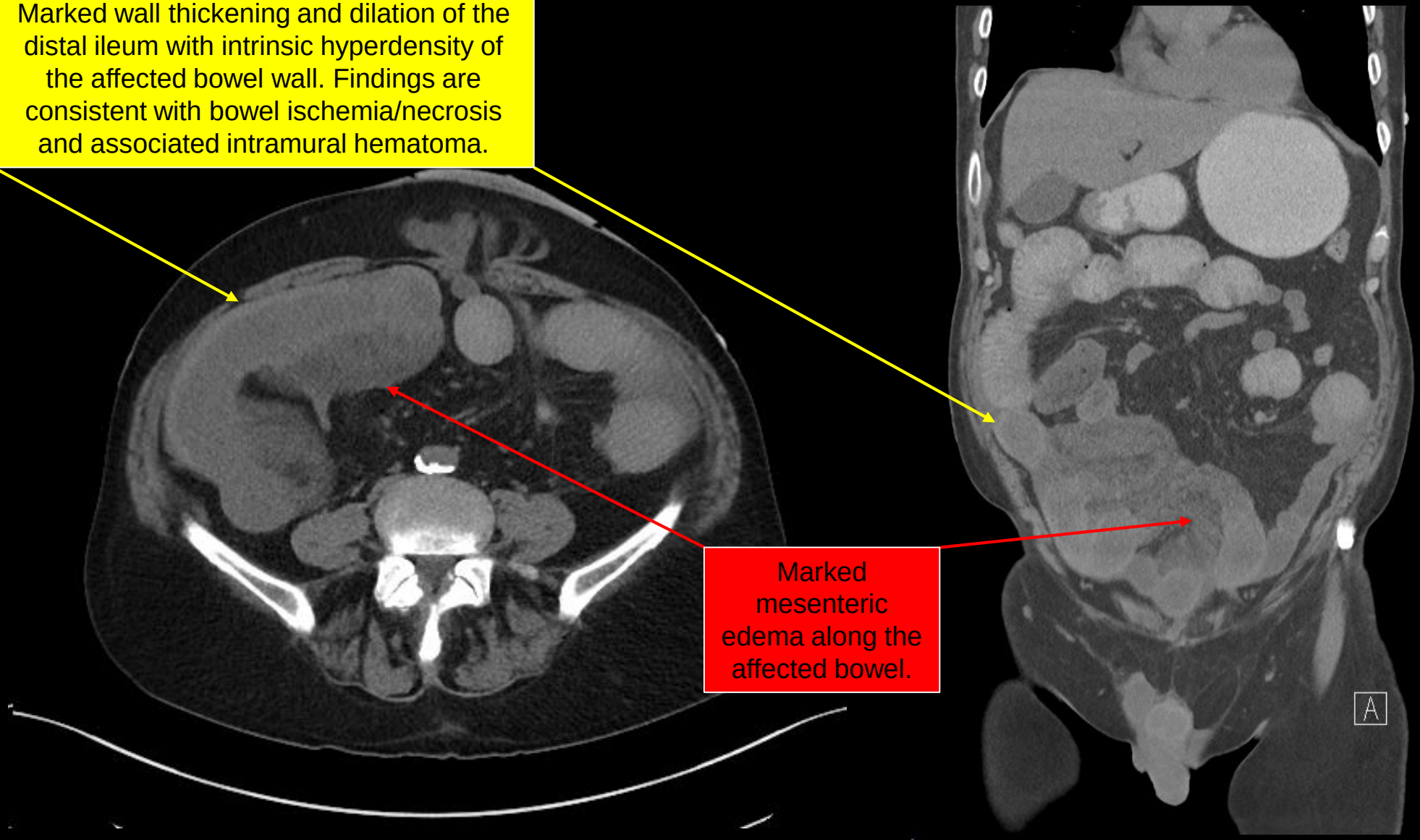
**CT abdomen and pelvis w/o IV contrast and w/oral contrast**



# Findings (labeled)

**CT abdomen and pelvis w/o IV contrast and w/oral contrast**

Marked wall thickening and dilation of the distal ileum with intrinsic hyperdensity of the affected bowel wall. Findings are consistent with bowel ischemia/necrosis and associated intramural hematoma.



Marked mesenteric edema along the affected bowel.

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# Patient Progress

- No obvious bowel obstruction transition point was identified on imaging.
- The general surgeon and radiologist raised concerns for acute mesenteric ischemia.

# What Imaging Should Be Ordered for Suspected Acute Mesenteric Ischemia?

# Select the applicable ACR Appropriateness Criteria

**Variant 1:** **Suspected acute mesenteric ischemia. Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|---|---|---|
| CTA abdomen and pelvis with IV contrast | Usually Appropriate | ☢☢☢☢ |
| CT abdomen and pelvis with IV contrast | May Be Appropriate | ☢☢☢ |
| Arteriography abdomen | May Be Appropriate (Disagreement) | ☢☢☢ |
| MRA abdomen and pelvis without and with IV contrast | May Be Appropriate (Disagreement) | O |
| Radiography abdomen | May Be Appropriate | ☢☢ |
| US duplex Doppler abdomen | May Be Appropriate | O |
| CT abdomen and pelvis without and with IV contrast | Usually Not Appropriate | ☢☢☢☢ |
| CT abdomen and pelvis without IV contrast | Usually Not Appropriate | ☢☢☢ |
| MRA abdomen and pelvis without IV contrast | Usually Not Appropriate | O |

This imaging modality was ordered.

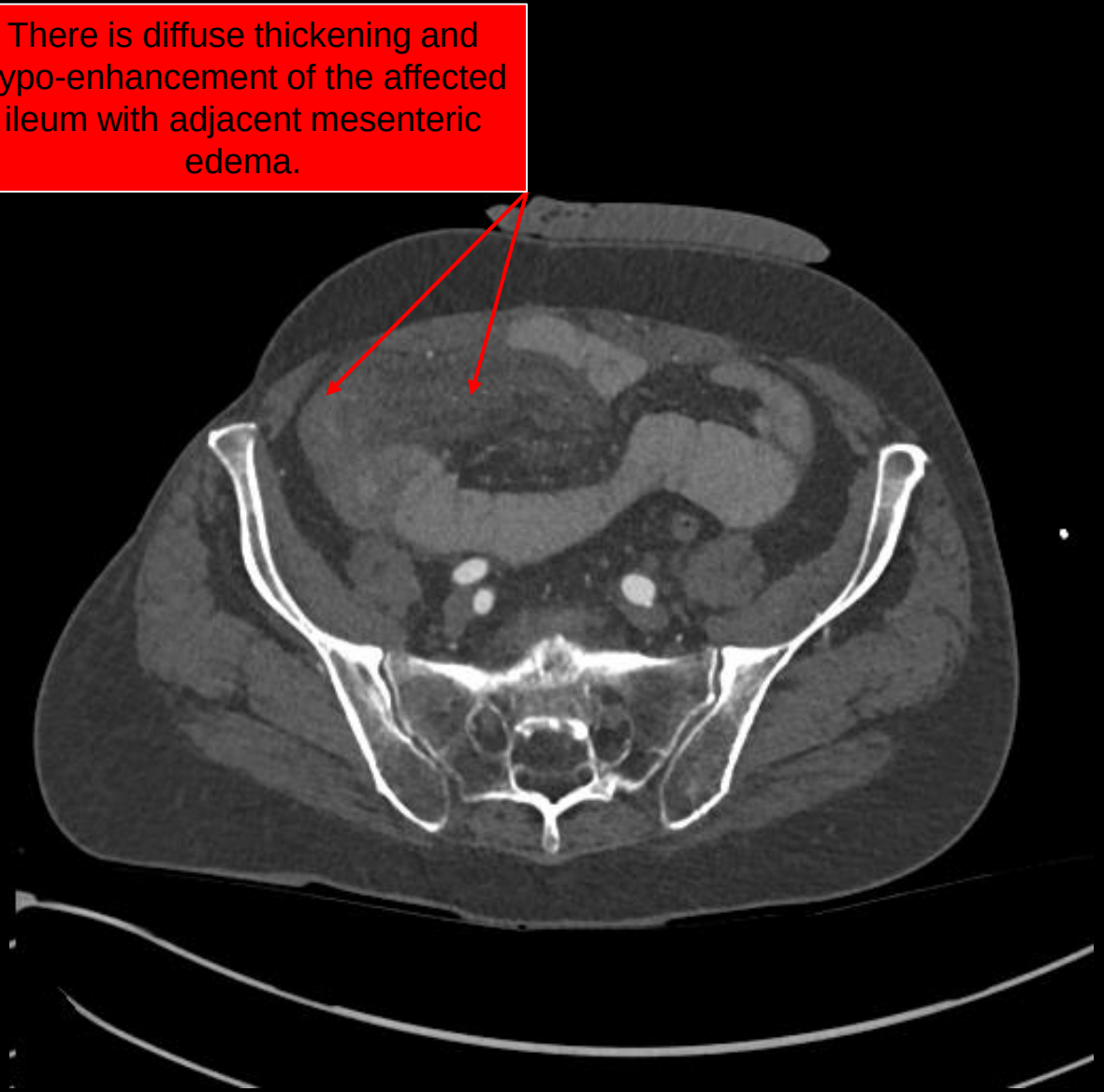
# Findings (unlabeled)

**CTA abdomen and pelvis with IV contrast – arterial phase**

# Findings (labeled)

**CTA abdomen and pelvis with IV contrast – arterial phase**

There is diffuse thickening and hypo-enhancement of the affected ileum with adjacent mesenteric edema.



The arterial branches of the superior mesenteric artery that supply the affected bowel are patent and without high-grade stenosis.

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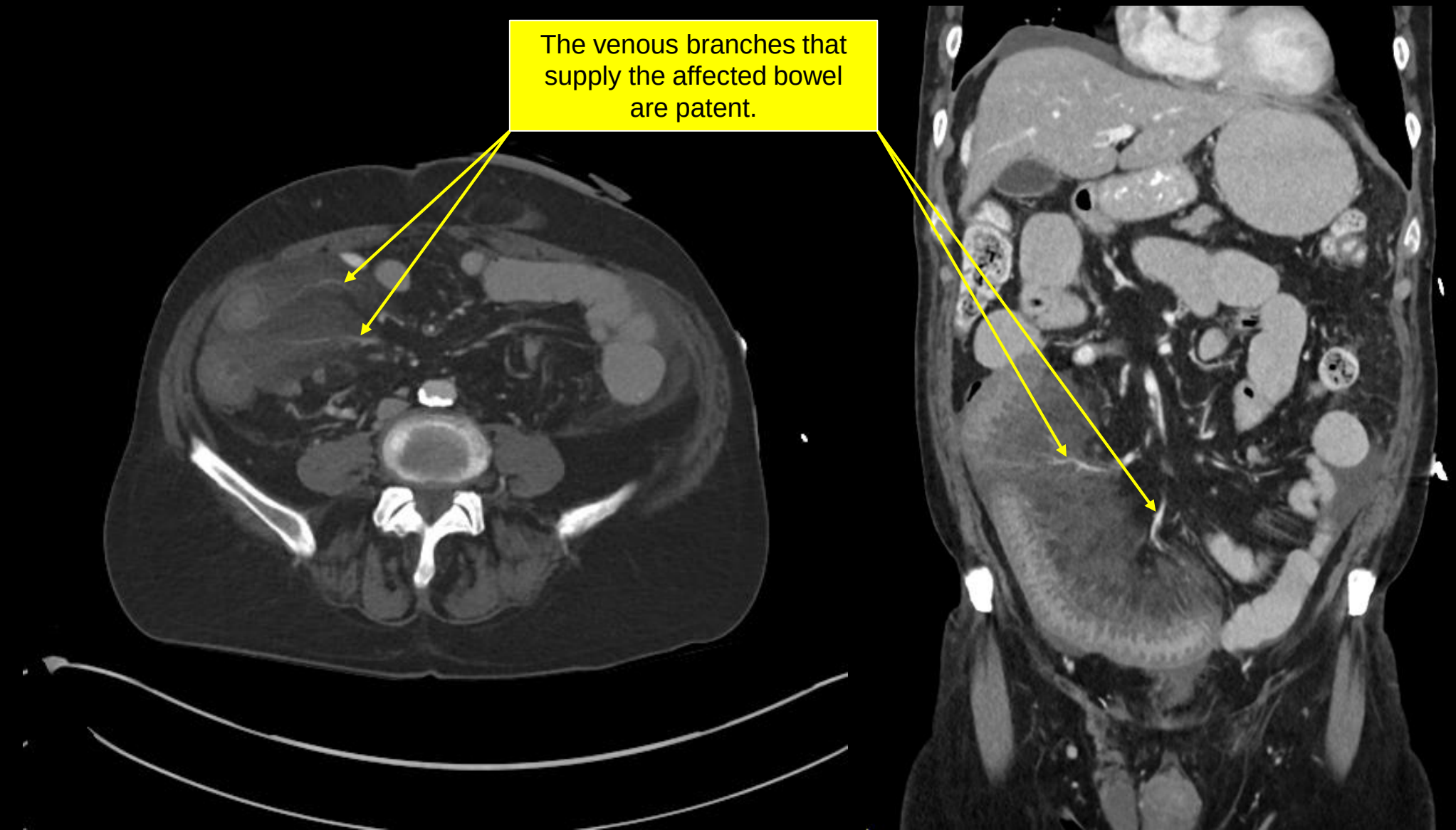
# Findings (unlabeled)

**CTA abdomen and pelvis with IV contrast – venous phase**

# Findings (unlabeled)

**CTA abdomen and pelvis with IV contrast – venous phase**



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# Patient Progress

- Patient was taken to the OR.
- 70 cm (~2.3 feet) of necrotic bowel was resected.
- Intraoperative TEE identified no cardiac thrombus.
- No apparent etiology was found.

# Final Dx:

Non-occlusive mesenteric ischemia

# Case Discussion

- Definition
  - Non-occlusive mesenteric ischemia includes any form of mesenteric ischemia with patent mesenteric vasculature.

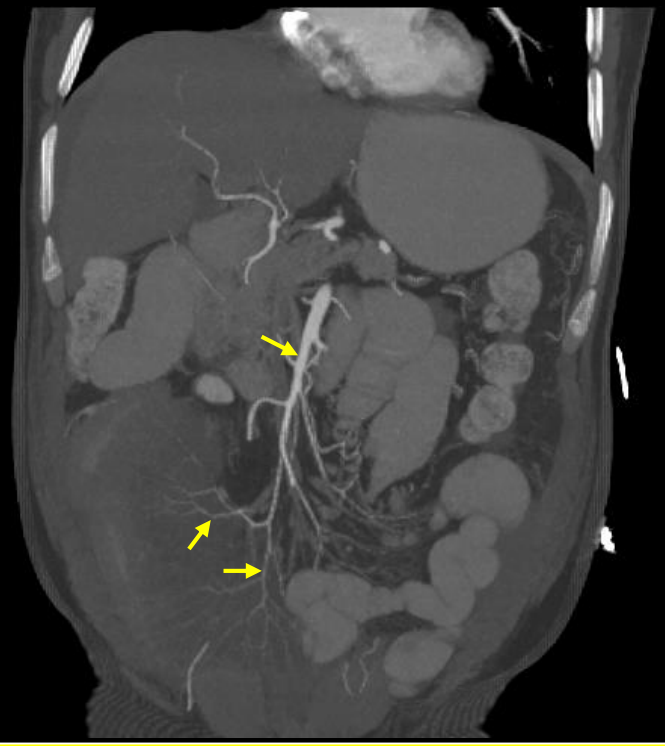
- Etiology
  - Mesenteric arterial hypoperfusion (e.g., hypovolemia, hypotension, vasoconstrictors, heart failure, shock, severe liver/renal disease).[1]

- Epidemiology
  - Acute mesenteric ischemia has a prevalence of ~1/1000 hospital admissions.
  - NOMI accounts for ~20% of all cases of acute mesenteric ischemia.[1,2]

# Case Discussion

- Clinical features
  - Severe abdominal pain (often sudden)
  - Post-prandial pain
  - Bloody stools
  - Diarrhea
  - Abdominal distension

- Imaging features
  - Bowel wall thickening and dilation
  - Mesenteric edema
  - Non/hypo-enhancing bowel wall
  - Non-occluded mesenteric vasculature (yellow arrows in the images to the right)
  - Pneumatosis intestinalis
  - Pneumatosis portalis



Coronal maximum intensity projection (MIP) reconstruction of the superior mesenteric artery in the **arterial phase** of contrast demonstrates patency throughout its course including the branch vessels supplying the affected loop of ileum.

CTA abdomen and pelvis in the **venous phase** of contrast. The venous branches that supply the affected bowel also demonstrate patency throughout their course.

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# Case Discussion

- Treatment
  - Fluid resuscitation, electrolyte replacement, immediate surgery.[2]
  - If identified, treat the underlying condition.
- Prognosis
  - NOMI has an estimated mortality rate of 70-90%.[1,3]

# References:


1. Farooq U, Alcantar D, Ahmed Z, Abegunde AT. Outcomes of Vasoconstrictor-Induced Non-Occlusive Mesenteric Ischemia of Colon: A Systematic Review. Clin Med Res. Published online June 8, 2022. doi:10.3121/cmr.2022.1726
2. Monita MM, Gonzalez L. Acute Mesenteric Ischemia. [Updated 2023 Jun 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK431068/
3. Mitsuyoshi A, Obama K, Shinkura N, Ito T, Zaima M. Survival in nonocclusive mesenteric ischemia: early diagnosis by multidetector row computed tomography and early treatment with continuous intravenous high-dose prostaglandin E(1). Ann Surg. 2007;246(2):229-235. doi:10.1097/01.sla.0000263157.59422.76


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