

AMSER Case of the Month

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56 y/o F With an Uncommon Complication of Acute
Sigmoid Diverticulitis

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Patient Presentation

- **HPI:** 56 y/o female with 4-day history of fever, chills, myalgias, and confusion and one day history of lower abdominal pain and diarrhea presented to the ED with AMS/lethargy. Broad workup initiated due to concerns for sepsis.
- Patient endorses social alcohol use and remote smoking history. Denies any vomiting, hematochezia/melena or history of abdominal surgeries or chronic NSAID/steroid use.
- **PMHx:** HTN, hypothyroidism, BCC, anxiety.
- **Vitals:** BP 116/62 **P 145** **T 103.8 F** SpO2 96% **RR 22**
- **Physical Exam:** RRR. CTABL. Bowel sounds present. Abdomen soft, nondistended, nontender without rebound or guarding.

Pertinent Labs

- CBC: Unremarkable. No leukocytosis.
- CMP: **Bicarb 17, anion gap of 16.** ALT 20. AST 32. T. Bili 0.6. Lytes WNL.
- Lactate: **3.7**
- Troponin: **13,000** at peak, determined to be type 2 NSTEMI.
- UA: **High specific gravity, +2 protein, +2 ketones, +2 bacteria, hyaline casts**

What Imaging Should We Order?

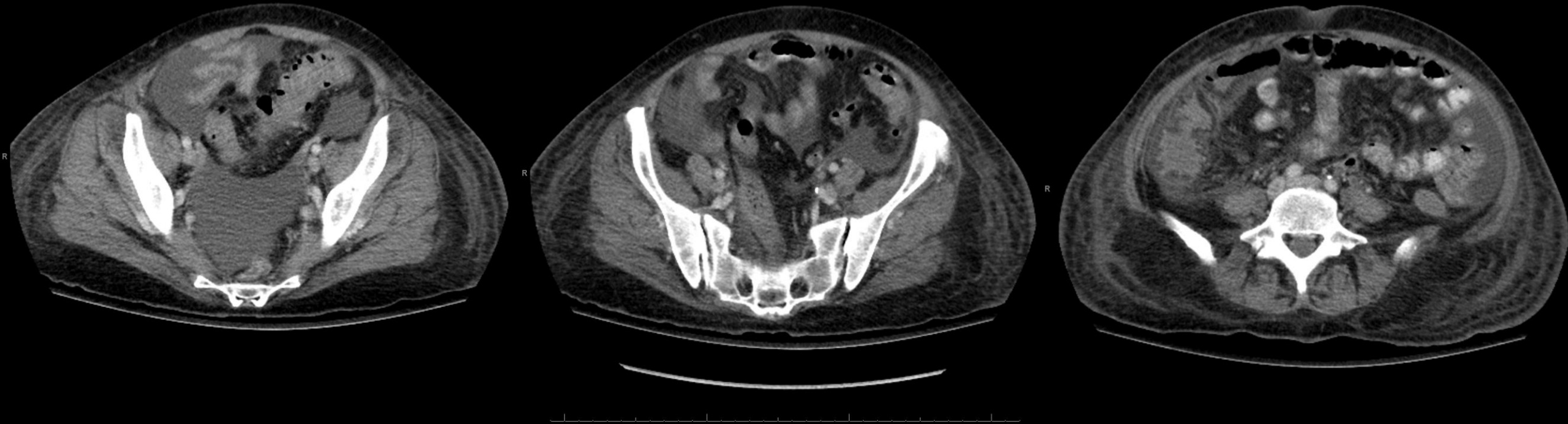
Sepsis Suspected, Abdominal Pain, Initial Imaging

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Sepsis suspected, acute abdominal pain, initial imaging	3196674	● CT abdomen and pelvis with IV contrast	1-10 mSv ⊕⊕⊕⊕	3-10 mSv [ped] ⊕⊕⊕⊕⊕	Usually appropriate
		● US abdomen	0 mSv ○	0 mSv [ped] ○	May be appropriate
		● CT abdomen and pelvis without IV contrast	1-10 mSv ⊕⊕⊕⊕	3-10 mSv [ped] ⊕⊕⊕⊕⊕	May be appropriate (Disagreement)
		● Radiography abdomen	0.1-1mSv ⊕⊕	0.03-0.3 mSv [ped] ⊕⊕	Usually not appropriate
		● Fluoroscopy contrast enema	1-10 mSv ⊕⊕⊕⊕	3-10 mSv [ped] ⊕⊕⊕⊕⊕	Usually not appropriate
		● Fluoroscopy upper GI series with small bowel follow-through	1-10 mSv ⊕⊕⊕⊕	3-10 mSv [ped] ⊕⊕⊕⊕⊕	Usually not appropriate
		● MRI abdomen and pelvis without and with IV contrast	0 mSv ○	0 mSv [ped] ○	Usually not appropriate
		● MRI abdomen and pelvis without IV contrast	0 mSv ○	0 mSv [ped] ○	Usually not appropriate
		● Nuclear medicine scan gallbladder	0.1-1mSv ⊕⊕		Usually not appropriate
		● CT abdomen and pelvis without and with IV contrast	10-30 mSv ⊕⊕⊕⊕⊕	10-30 mSv [ped] ⊕⊕⊕⊕⊕⊕	Usually not appropriate
		● FDG-PET/CT skull base to mid-thigh	10-30 mSv ⊕⊕⊕⊕⊕	3-10 mSv [ped] ⊕⊕⊕⊕⊕	Usually not appropriate
		● WBC scan abdomen and pelvis	10-30 mSv ⊕⊕⊕⊕⊕		Usually not appropriate



This imaging modality was ordered by the ER physician

CT AP w Contrast; Findings



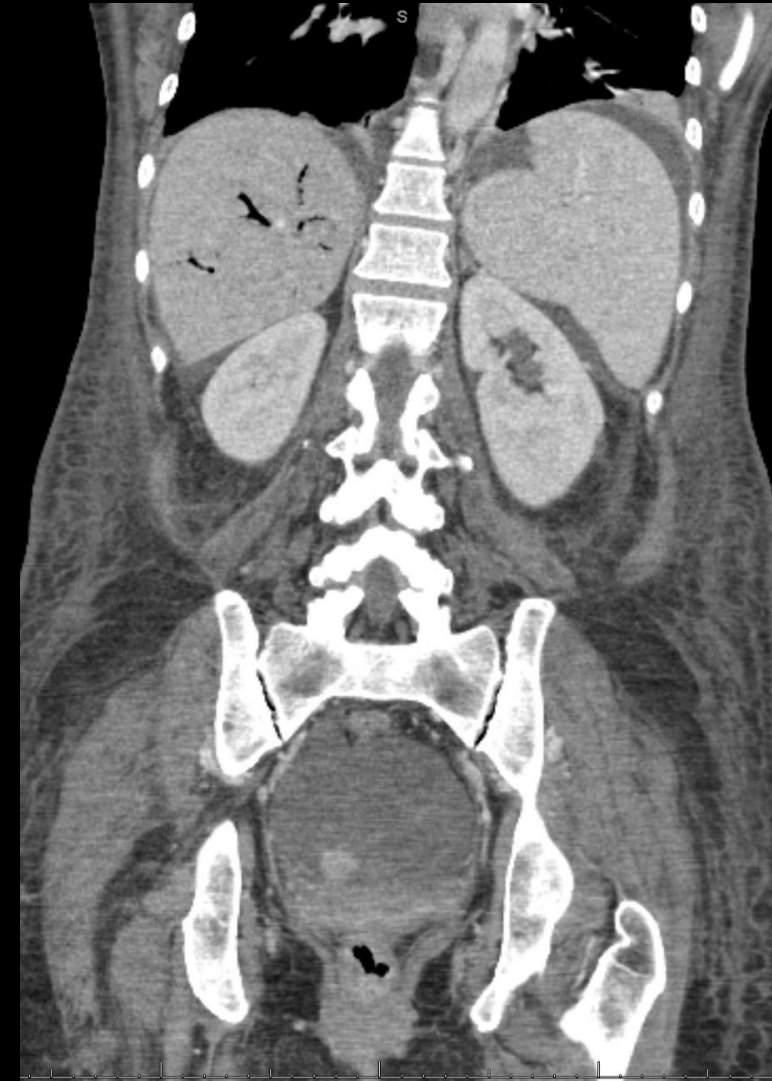
CT AP w Contrast; Findings



1

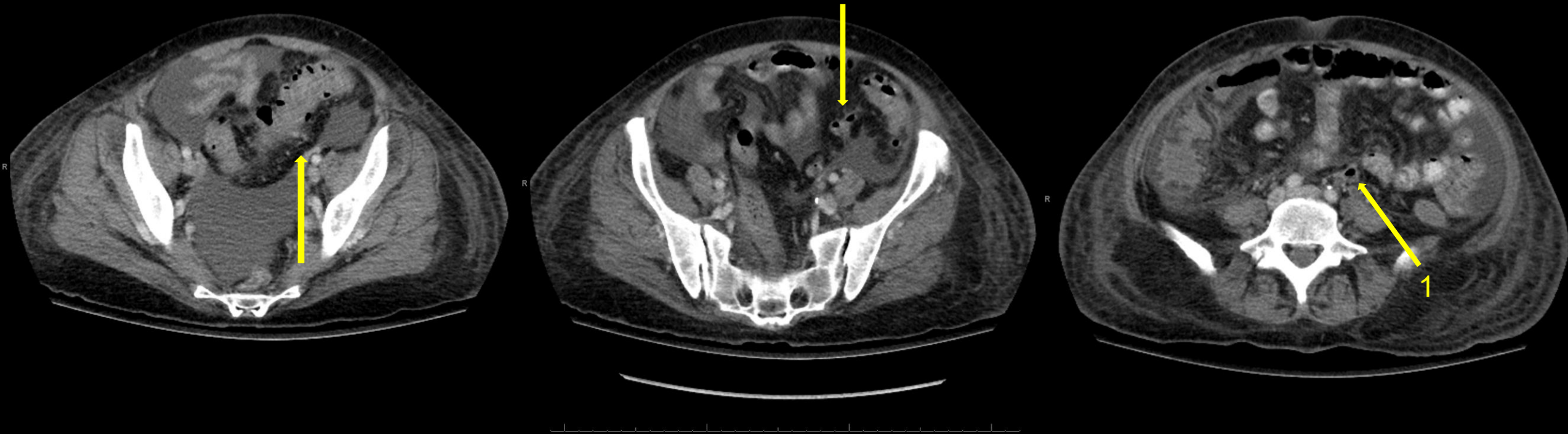


2



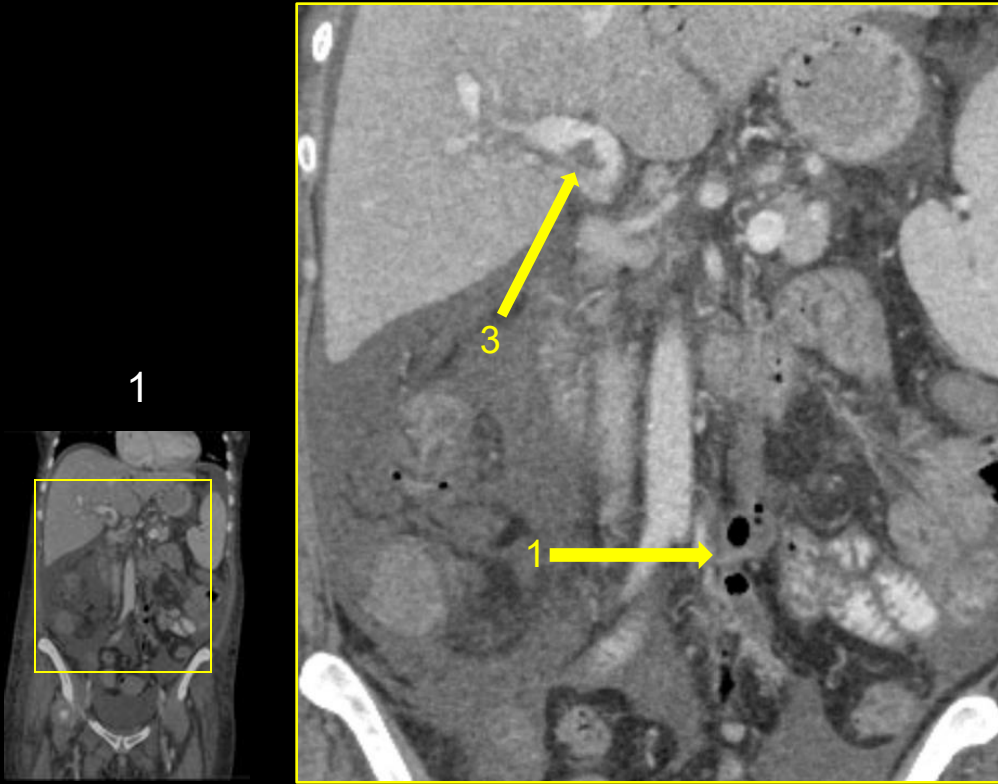
3

CT AP w Contrast; (labeled)



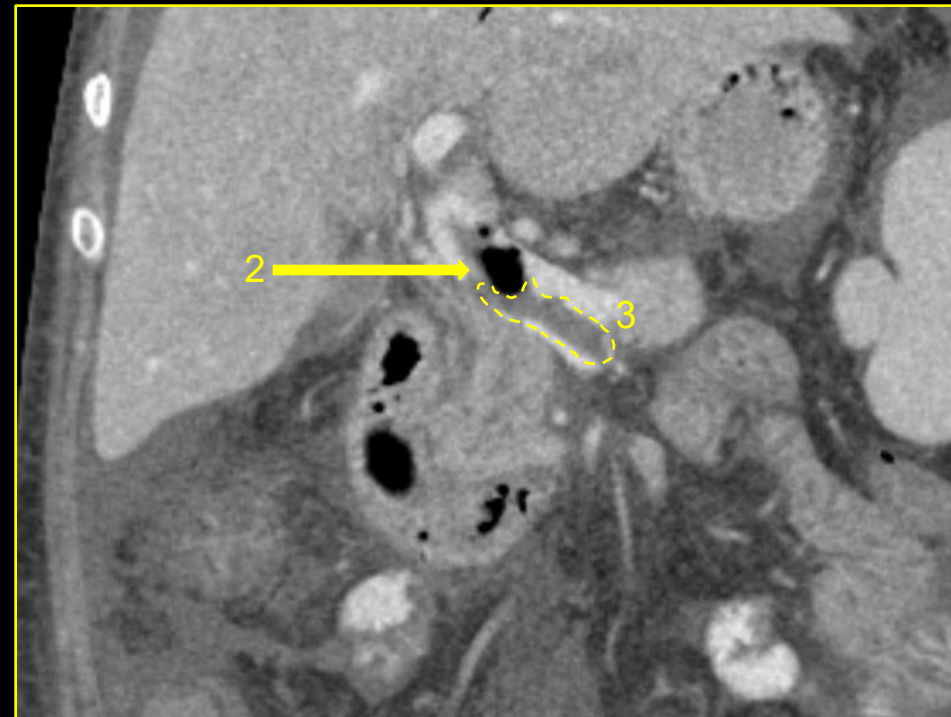
There is a fistulous tract extending from a single posterior mid-sigmoid diverticulum into the inferior mesenteric vein (IMV) which extends cranially. Visible as intravascular gas (hypodense) (1) that is in continuity with a diverticular fistulous tract and tracks cranially along the venous course.

CT AP w Contrast; (labeled)

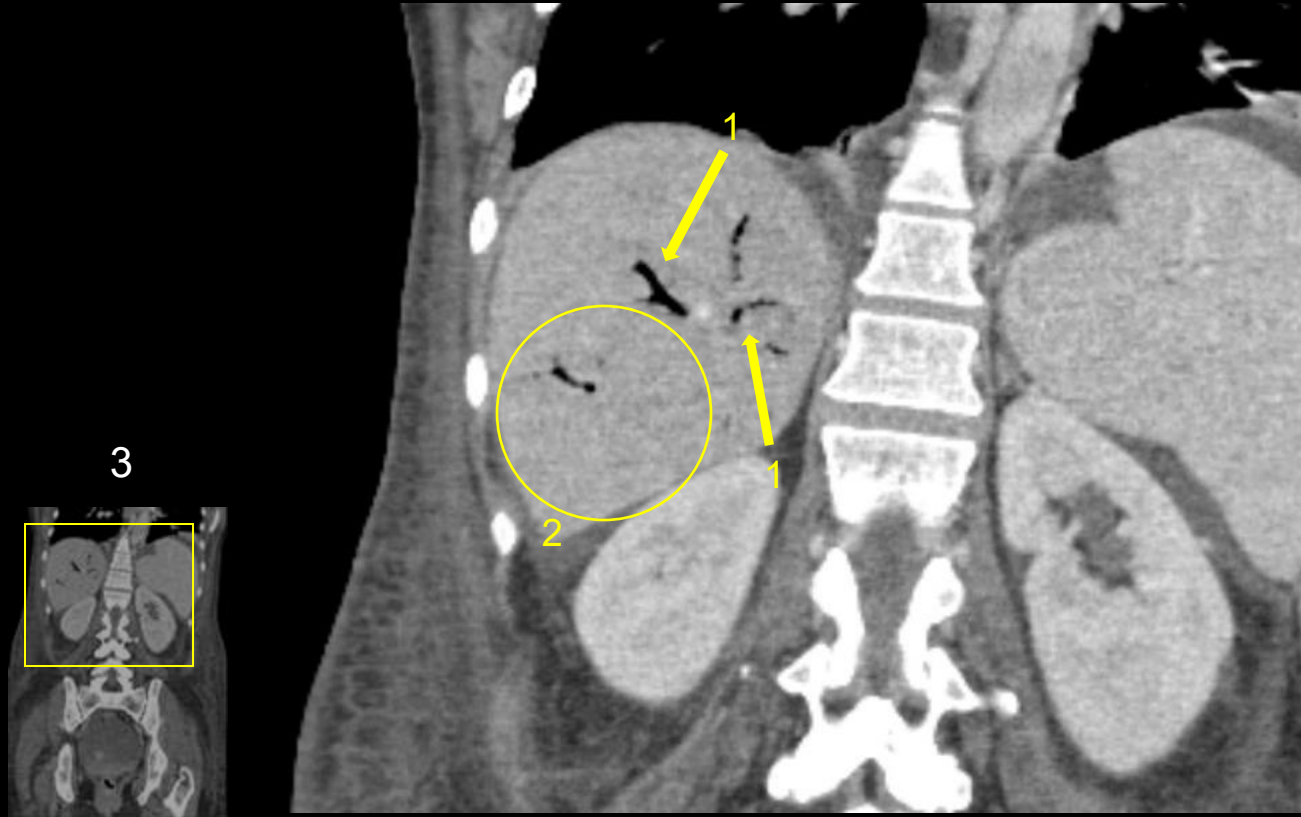


Foci of air visible in the IMV (1) and SMV (2). There is a hypodense intraluminal contrast filling defect (3) suggestive of a thrombus. Nonocclusive to near occlusive thrombus extends from distal SMV to portal vein bifurcation and into the proximal right portal vein.

Foci of air in conjunction with thrombus is suggestive of septic thrombophlebitis.



CT AP w Contrast; (labeled)



Portal venous gas is visible as hypodense branching gaseous foci which extends peripherally (1). There is heterogenous enhancement of the liver (regional differences in parenchymal attenuation due to uneven perfusion) (2). These findings likely reflect a combination of hepatitis and perfusional changes related to portal vein thrombus visible in previous slide.

Final Dx:

Ascending Septic Thrombophlebitis s/t
Diverticulum Fistula

Septic Thrombophlebitis of Portal System – Radiographic Findings

- Sonography + Color Doppler:
 - Useful as initial screening exam but operator dependent and often cannot assess underlying pathology ¹
 - Flow defect on color duplex ⁶
 - Dilation or absent compressibility of portal venous system ⁶
 - Highly echogenic particles (within portal vein) or patches (within hepatic parenchyma). Color flow may reveal hyperechogenic foci moving within the lumen of the portal vein ¹
- CT:
 - More helpful for determining underlying cause (bowel ischemia or abscess). In one study, infectious gastrointestinal source was found in 82% of cases of septic thrombophlebitis of portal venous system ^{1, 2, 6}
 - Endoluminal thrombus w/filling defect is diagnostic ⁶
 - Transient hepatic attenuation difference ²
 - Peripheral gas lucencies which branch out and may be noted within 2 cm of liver capsule ¹

Hepatic Portal Venous Gas

- Etiologies: Intestinal ischemia, severe enteritis/intestinal perforation/fistula, gastric disease, intestinal obstruction, abdominal infection/intraabdominal sepsis, IBD ^{2, 4, 5}
- Mechanism may include escape of gas from bowel lumen (direct communication) or presence of gas-forming organisms in the venous system itself ¹
- Gas distribution is typically peripheral due to flow of blood into liver which helps to distinguish HPVG from pneumobilia which tends to be centrally located due to direction of bile flow ^{1, 4}
- Interface between vessel-gas may cause streak artifact ⁴
- Significant morbidity and mortality but this largely depends on etiology ^{1, 3, 5}
- HPVG alone is not an indication for surgery; treatment approach is dependent on underlying cause. For example, HPVG s/t intestinal necrosis requires surgery. Use of other findings can help to determine need for surgery such as free air, lack of contrast enhancement of bowel wall, or intestinal pneumatosis ^{1, 3}

References:

1. Abboud B, El Hachem J, Yazbeck T, Doumit C. Hepatic portal venous gas: physiopathology, etiology, prognosis and treatment. *World J Gastroenterol*. 2009;15(29):3585-3590. doi:10.3748/wjg.15.3585
2. Ames, J.T., Federle, M.P. Septic Thrombophlebitis of the Portal Venous System: Clinical and Imaging Findings in Thirty-Three Patients. *Dig Dis Sci* 56, 2179–2184 (2011). <https://doi.org/10.1007/s10620-010-1533-6>
3. Gonda M, Osuga T, Ikura Y, Hasegawa K, Kawasaki K, Nakashima T. Optimal treatment strategies for hepatic portal venous gas: A retrospective assessment. *World J Gastroenterol*. 2020;26(14):1628-1637. doi:10.3748/wjg.v26.i14.1628
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6. Pérez M, Bell D, Hooi Hooi T, et al. Pylephlebitis. Reference article, Radiopaedia.org (Accessed on 19 May 2026) <https://doi.org/10.53347/rID-16036>