

AMSER Case of the Month

June 2023

18-year-old male with hematemesis and abdominal pain

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Inland Imaging



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Patient Presentation

- **HPI:** 18 y/o male with history of substance abuse presents via ambulance with hematemesis and abdominal pain of approximately 8 hours. Patient notes black stools and reports detoxing from fentanyl for the past 5 days.
- **PMHx:** Varicocele—laparoscopic varicocelectomy performed in 2022
- **Vitals:** Temp: 37.4 C, Pulse: 140, Resp: 27, SpO2: 96%, BP: 121/69
- **Physical Exam:** Very pale, alert but uncomfortable, bowel sounds severely decreased, distended, diffuse abdominal tenderness.
- **Diagnostics:** SIRS criteria met with fever, tachycardia, leukocytosis and lactic acidosis

Pertinent Labs

- **Positive for:** methamphetamines, amphetamines and cannabinoids
- **Lactate:** 13.25 (H)
- **Creatinine:** 1.56 (H)
- **BUN:** 25
- **POC glucose:** 304 (H)
- **Hgb:** 17.3
- **K:** 3.8
- **Ca:** 11.2 (H)
- **Na:** 140
- **WBC:** 26.3 (H)
- **Platelets:** 546 (H)
- **Lipase:** 100 (H)

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 4: Acute nonlocalized abdominal pain. Not otherwise specified. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	⊕⊕⊕
CT abdomen and pelvis without IV contrast	Usually Appropriate	⊕⊕⊕
MRI abdomen and pelvis without and with IV contrast	Usually Appropriate	○
US abdomen	May Be Appropriate	○
MRI abdomen and pelvis without IV contrast	May Be Appropriate	○
CT abdomen and pelvis without and with IV contrast	May Be Appropriate	⊕⊕⊕⊕
Radiography abdomen	May Be Appropriate	⊕⊕
FDG-PET/CT skull base to mid-thigh	Usually Not Appropriate	⊕⊕⊕⊕
WBC scan abdomen and pelvis	Usually Not Appropriate	⊕⊕⊕⊕
Nuclear medicine scan gallbladder	Usually Not Appropriate	⊕⊕
Fluoroscopy upper GI series with small bowel follow-through	Usually Not Appropriate	⊕⊕⊕
Fluoroscopy contrast enema	Usually Not Appropriate	⊕⊕⊕



These imaging modalities were ordered by the ER physician

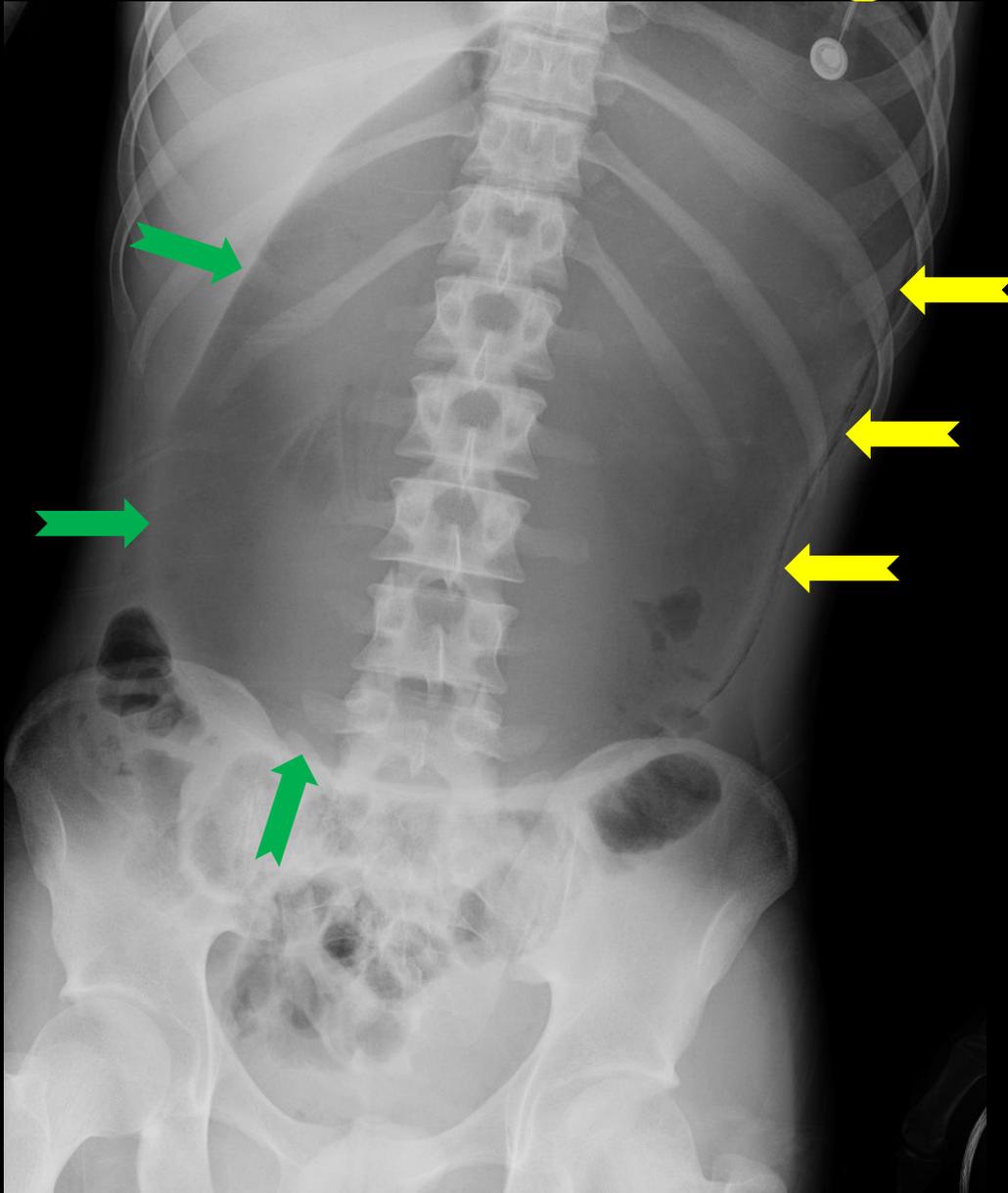
CT with contrast subsequently ordered



Findings: Initial Abdomen XR (Unlabeled)



Findings: Initial Abdomen XR



Green Arrows: Severely distended stomach
Yellow Arrows: Gastric pneumatosis

Findings: Initial axial CT without contrast
(Unlabeled)



Findings: Initial axial CT without contrast

Yellow Arrows: Massive gastric distention. Gastric pneumatosis findings most consistent with gastric ischemia

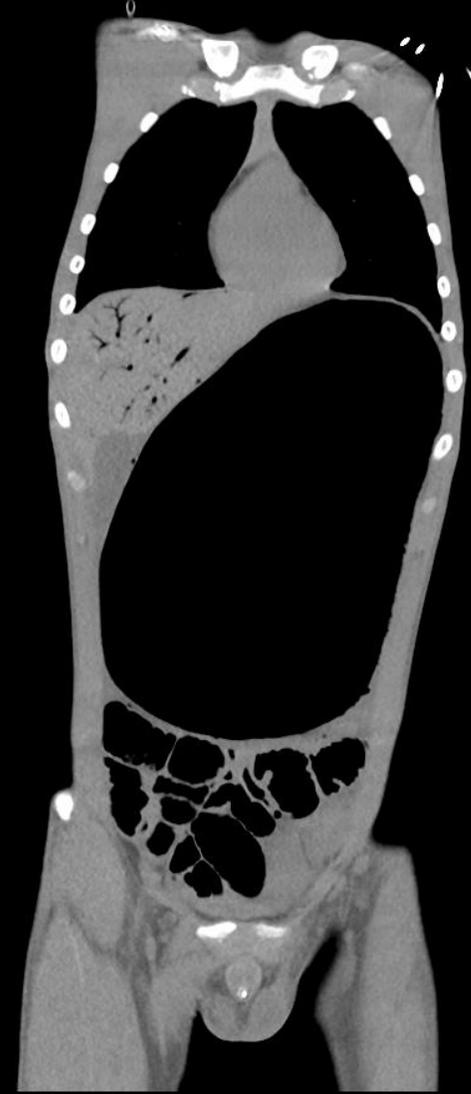


Green Arrow: Portal venous gas in anterior aspect of left hepatic lobe

Red Arrows: Fluid level in stomach

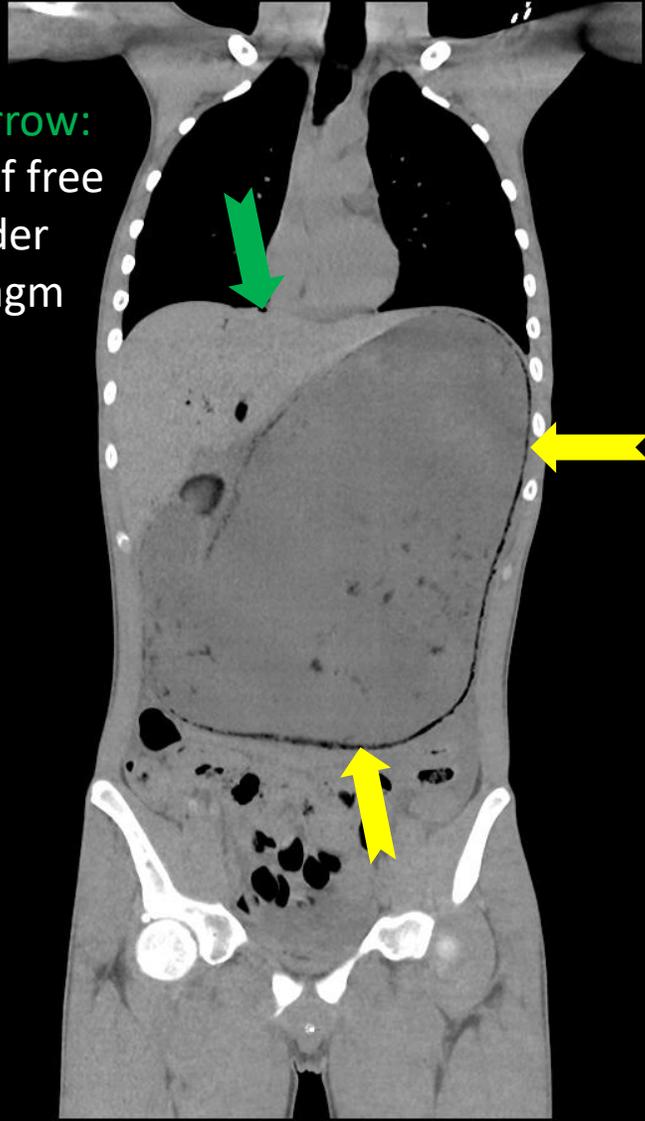


Findings: Initial coronal CT without contrast (Unlabeled)



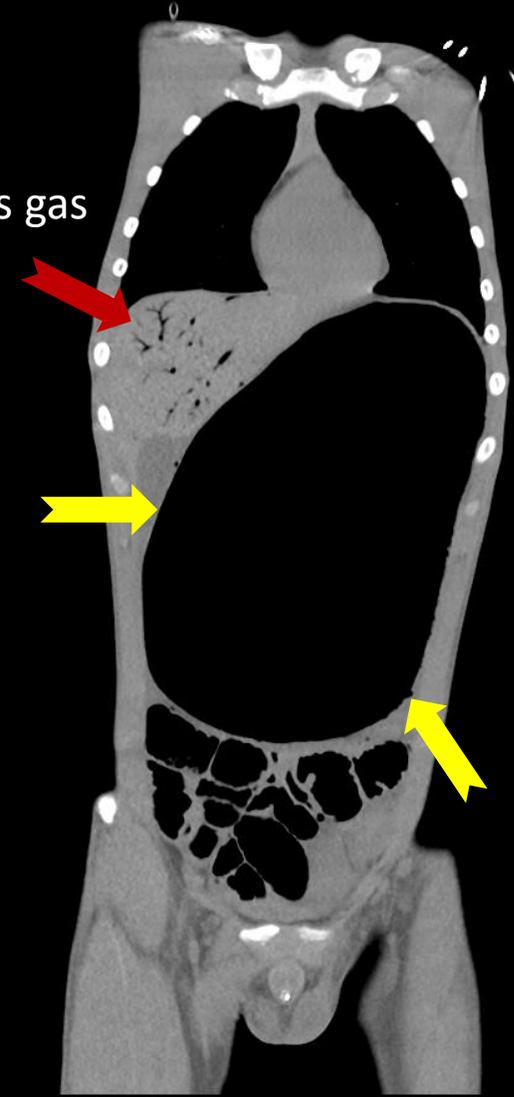
Findings: Initial coronal CT without contrast

Green Arrow:
Droplet of free
air under
diaphragm



Red Arrow: Portal venous gas

Yellow Arrows: Massive gastric
distention and pneumatosis



Final Dx:

Emphysematous Gastritis

Case Discussion: Emphysematous Gastritis

- **Epidemiology**

- Rare entity with 59 cases reported in English language literature
- High mortality rate of 55-61%

Case Discussion: Emphysematous Gastritis

- **Presentation**

- Abdominal pain, nausea, vomiting, diarrhea, hematemesis, sepsis

- **Diagnostic imaging**

- CT is preferred imaging modality
 - Characterized by gastric distention, thickened mucosal folds, intramural gas, portal vein gas, and pneumoperitoneum

- **Management**

- NPO, PPIs, IV fluid resuscitation, antibiotics
- Most cases are managed medically, with surgical intervention reserved for patients with gastric perforation or failed standard medical management

Case Discussion: Emphysematous Gastritis

- **Pathophysiology**

- Disruption of gastric wall integrity due to
 - Caustic ingestion, alcohol, malignancy, recent surgery, bowel obstruction, gastric distention, emesis, steroids, immunosuppressive meds, chemotherapy, NSAIDs
- Intramural gas formation within gastric wall and signs of systemic toxicity
 - Pneumatosis appears as linear foci of gas in bowel wall
 - Optimally visualized by CT, which has excellent sensitivity and specificity for detection of pneumatosis
- Intrahepatic portal venous gas formation, as seen in this case (doesn't always occur)
 - Air in the gastric wall circulates into portal system
 - Peripheral gas distribution in the liver, as opposed to more centrally located gas in the setting of pneumobilia

References

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3. Nasser H, Ivanics T, Leonard-Murali S, Shakaroun D, Woodward A. Emphysematous gastritis: A case series of three patients managed conservatively. *International Journal of Surgery Case Reports*. 2019;64:80-84. doi:10.1016/j.ijscr.2019.09.046
4. Riaz S, Kudaravalli P, Saleem SA, Sapkota B. Emphysematous gastritis: A real indication for emergent surgical intervention? *Cureus*. 2020. doi:10.7759/cureus.8106