AMSER Case of the Month
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18-year-old male with hematemesis and abdominal pain

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Inland Imaging
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

<table>
<thead>
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<tbody>
<tr>
<td>Procedure</td>
<td>Appropriateness Category</td>
</tr>
<tr>
<td>CT abdomen and pelvis with IV contrast</td>
<td>Usually Appropriate</td>
</tr>
<tr>
<td>CT abdomen and pelvis without IV contrast</td>
<td>Usually Appropriate</td>
</tr>
<tr>
<td>MRI abdomen and pelvis without and with IV contrast</td>
<td>Usually Appropriate</td>
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<tr>
<td>US abdomen</td>
<td>May Be Appropriate</td>
</tr>
<tr>
<td>MRI abdomen and pelvis without IV contrast</td>
<td>May Be Appropriate</td>
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<td>CT abdomen and pelvis with and with IV contrast</td>
<td>May Be Appropriate</td>
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<tr>
<td>Radiography abdomen</td>
<td>May Be Appropriate</td>
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<tr>
<td>FDG-PET/CT skull base to mid-thigh</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>WBC scan abdomen and pelvis</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>Nuclear medicine scan gallbladder</td>
<td>Usually Not Appropriate</td>
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<td>Fluoroscopy upper GI series with small bowel</td>
<td>Usually Not Appropriate</td>
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<td>follow-through</td>
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<tr>
<td>Fluoroscopy contrast enema</td>
<td>Usually Not Appropriate</td>
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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


