Air in the gastric wall of a patient with AIDS

Jamie Yao BSa,*, Juliet Morgan MDB, Joshua Brotman MDc

a School of Medicine, University of California, 505 Parnassus Ave., San Francisco, San Francisco, CA 94143, USA
b Department of Neurology, University of California, San Francisco, San Francisco, CA, USA
c Division of Hospital Medicine, Sidney Kimmel Medical College of Thomas Jefferson University, Philadelphia, PA, USA

Abstract

Emphysematous gastritis is a rare infection of the gastric wall with 55%-60% mortality. A 44-year-old man with AIDS, hepatitis C, and intravenous drug use presented with a 1-day history of acute-onset abdominal pain, nausea, and nonbloody, nonbilious emesis. On examination, he was afebrile without other vital sign abnormalities. He had epigastric abdominal tenderness without rebound or guarding. The peripheral-blood leukocyte count was elevated to 12.8 with 93.8% neutrophils. The patient’s clinical presentation markedly improved with IV fluids and broad-spectrum antibiotic therapy. His presentation and radiologic findings, including gastric intramural air and air in the portal vein, are consistent with emphysematous gastritis. Conservative management is first-line for milder cases of emphysematous gastritis. Exploratory laparotomy and total gastrectomy are indicated only in severe cases such as transmural ischemia and peritonitis. Immune-compromised status is a predisposing factor and associated with subtler findings than the classic dramatic clinical presentation.

Case Report

A 44-year-old man with AIDS, hepatitis C, and intravenous drug use presented with a 1-day history of acute-onset abdominal pain, nausea, and nonbloody, nonbilious emesis. The patient’s last CD4 count was 219 cells/mm3 5 months before presentation, and he was nonadherent to antiretroviral therapy. Three days before onset of symptoms, he ingested a sandwich he believed to be spoiled. On admission, the patient was afebrile with no other vital sign abnormalities. The physical examination was significant for tenderness localizing to the epigastric area without rebound or guarding. Peripheral-blood leukocyte count was elevated to 12,800/mm3 with 93.8% neutrophils. Computed tomography (CT) of the abdomen revealed gas pockets within the stomach and diffuse gas in the portal vein. A diagnosis of emphysematous gastritis was made, and the patient was treated with IV fluids, broad-spectrum antibiotics, and supportive care. His clinical condition rapidly improved, and he was discharged home after 5 days of hospitalization. He was counseled on the importance of hygiene and adherence to antiretroviral therapy, and he was advised to seek medical attention if he experienced any recurrence of symptoms.
abdomen/pelvis performed at admission is shown in Figure 1. The image revealed gastric wall gas, severe gastric mural thickening with associated mucosal hyperemia, portal venous gas, but with patent gastric vasculature.

The patient’s presentation and radiologic findings, including gastric intramural air and air in the portal vein, were consistent with emphysematous gastritis. Clinical severity varies: this patient presented with moderate abdominal pain and no peritoneal signs; however, patients can also present in septic shock with tender, rigid abdomens.

Conservative management is the first-line treatment for milder cases of emphysematous gastritis, which includes a broad-spectrum antibiotic regimen for both gram-negative and anaerobic organisms and consideration of antifungal therapy. Bowel rest and IV fluids should be administered. Esophagogastroduodenoscopy can be performed to obtain a biopsy for diagnosis and can evaluate for ulcers. Exploratory laparotomy and total gastrectomy are indicated only in severe cases such as transmural ischemia, peritonitis, perforation, strictures, and refractory hemodynamic instability [1]. CT angiography focusing on the celiac trunk and its branches could be used to identify vascular obstruction causing gastric ischemia. Acute gastric ischemia is rare due to the 5 arteries supplying blood flow to the stomach, and these patients are more likely to present with an acute abdomen, diarrhea, or hematemesis [2].

When gastric pneumatosis is found on imaging, emphysematous gastritis must be distinguished from gastric emphysema as the management is very different. Gastric emphysema is a relatively benign condition wherein gas originates in the stomach lumen or peritoneum and enters the gastric wall. This gas arises from barotraumas such as in gastric outlet obstruction, mucosal tears, gastric ulcers, nasogastric tube placement, endoscopy, and cardiopulmonary resuscitation [3,4]. Often, gastric emphysema is associated with mild to no symptoms and gastric linear lucencies on imaging, resolving spontaneously in most cases [5].

The patient was admitted to the hospital medicine service, and treatment with ertapenem and vancomycin was initiated. His reported pain and abdominal examination improved over several days. On hospital day 3, the patient was transitioned to single-agent therapy with ertapenem. Repeat CT on hospital day 4 showed marked improvement in gastric wall thickening with resolution of gastric wall gas (Fig. 2). He was started on thin liquids and transitioned to a full diet. Infectious disease consultants recommended 14 days of broad-spectrum IV antibiotics given the blood cultures remained negative and a causative organism was never identified. The patient preferred to be discharged home, but due to his ongoing IV drug use, discharge with venous access in place was deemed unsafe. Given these limitations, the patient was transitioned to oral levofloxacin and metronidazole to complete 14 days of antibiotic therapy. The patient’s symptoms continued to improve, including absence of abdominal pain at discharge on hospital day 5. Although the initial plan included esophagogastroduodenoscopy, it was deferred during his hospital stay given his marked improvement. The patient has been followed since with his primary care provider without recurrence.

**Discussion**

Emphysematous gastritis is a rare infection of the gastric wall with 55%-60% mortality [5]. Gas-forming organisms such as *Clostridium perfringens*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Escherichia coli*, and *Enterobacter* species are the most common culprits [6], and it is also potentially associated with the rarer bacterium *Sarcina ventriculi* [7]. CT showing gas in the stomach confirms the diagnosis [8].

A review of 39 cases of emphysematous gastritis identified several associated medical conditions: diabetes (25.6%), history of malignancy (12.8%), chronic kidney disease on hemodialysis (17.9%), and history of organ transplantation (7.7%) [1]. Gastric mucosal disruption is also predisposing. Examples include intra-abdominal surgery, ischemia, infarction,
ingestion of corrosive substances, and alcohol intake [9]. Immunosuppression, such as with HIV, corticosteroid use, or diabetes, can facilitate disruption of barrier functions and subsequent microbial translocation [1,10]. One case of emphysematous gastritis in an HIV patient has been reported in the literature. This patient presented in diabetic ketoacidosis and did well with conservative management [3]. Noting immune-compromised status in patients suspected to have emphysematous gastritis is important given its role as a predisposing factor and association with subtler findings than the classic dramatic clinical presentation [9,11].

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