Polymicrobial Emphysematous Gastritis

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INTRODUCTION

Emphysematous gastritis is a rare but dangerous variant of gastric pneumatosis, characterized by systemic toxicity, as well as air within the gastric walls caused by bacterial invasion. This variant of pneumatosis is different from gastric emphysema, which is typically non-life threatening, caused by non-bacterial etiology (often bartotrauma), and self-resolves over time. Emphysematous gastritis is typically found in immunocompromised hosts infected by gram negative gas-forming organisms, such as *C. perfringens, S. aureus, and S. pyogenes*. It carries a 60% estimated mortality rate, making early diagnosis critical. The disease is characterized as air within the gastric wall, accompanied by diffuse abdominal pain and systemic toxicity. Clinically, it can be challenging to differentiate between emphysematous gastritis and gastric emphysema, particularly due to overlap in initial presentation and imaging studies.

Watson et al. recently reported a decrease in mortality rate from emphysematous gastritis after the year 2000, from 60% to 33.3%. This decrease is primarily due to early endoscopic evaluation and limiting surgery to a select cohort of cases. In addition, optimal medical management, such as early antibiotic therapy, will also increase risk of survival in patients with emphysematous gastritis. We present a case of emphysematous gastritis that was successfully treated with antibiotic therapy.

CASE PRESENTATION

A 63 year-old female with past medical history of Type 1 diabetes mellitus, COPD, previous COVID-19 infection, and hypertension presented from her skilled nursing facility with altered mental status and diarrhea. Patient had one episode of vomiting prior to arrival in emergency department. She was chronically incontinent of bowel and had an indwelling Foley catheter. Patient was cool to touch and her blood sugars were noted to be decreasing rather rapidly, from 140s to 70s on repeat prior to EMS arrival. She was found hypotensive per EMS with decreased oxygen saturation of 89%. She is normally oriented x 2-3 at baseline, but was only answering "yes" to questions. Upon arrival to the emergency department, patient was only responsive to pain. History was thusly obtained from chart review and discussion with nursing staff.

Relevant medication regimen included atorvastatin 20mg daily, furosemide 20mg daily, Lantus 16 units at night, and linagliptin 5mg daily.

HOSPITAL COURSE

CT abdominal scan showed emphysematous gastritis, as well as moderate distention of the small bowel and significant portal venous gas within the liver and mesenteric veins. On admission, vitals were BP 70/35, Temperature 96.1F, Heart rate: 98, Oxygen saturation, 94% on room air. Central venous catheter was placed in right internal jugular vein and started on Levophed for hemodynamic support. She was admitted to ICU for close monitoring. Patient had been admitted to various hospitals for sepsis multiple times in the past, thus she was given meropenem based on prior culture susceptibilities. Infectious Disease service was consulted for further input. Given that the patient had a urinary tract infection with heavy Candida Glabrata on her previous admission, decision was made to also treat empirically with Micafungin.

General surgery was consulted, who recommended a conservative approach. A nasogastric tube was placed for gastric decompression, which yielded bloody output. Patient was kept on bowel rest, with strict NPO status. A PICC line was placed on day 2 of hospitalization for delivery of total parenteral nutrition (TPN). Once stabilized, central venous catheter was removed and patient was transferred to general medical floor for further care. Diet was gradually advanced, and the patient was ultimately discharged back to her nursing facility once able to tolerate a regular diet.

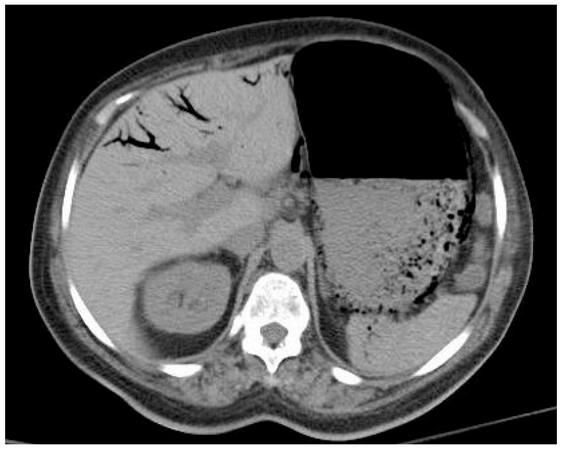

Fig.1: Transverse section of CT Chest/Abdomen/Pelvis without contrast showing portal venous gas and intramural gas in the stomach.

RESULTS

Initial antibiotic coverage was based on prior susceptibilities. Patient screened positive for methicillin-resistant staphylococcus aureus (MRSA). Candida glabrata was not seen on fungal culture, however antifungal had already been administered for some time before sample was collected for testing. Stool studies were positive for Campylobacter jejuni antigen. Overall, patient's antibiotic regimen included 7 days of meropenem 100mg twice daily, 100mg micafungin daily, and 3 days of azithromycin (to address C. jejuni).

CT Angiogram of abdomen was performed to investigate possible occlusive disease of visceral arteries; this study was largely unremarkable.

Resolution of intra-abdominal gas was monitored by daily abdominal x-rays and serial abdominal exams. CT abdomen and pelvis was repeated every 4 days for better visualization. Total hospitalization lasted 12 days.

Gastroenterology was also consulted, who stated inpatient endoscopy would not be advised given increased risk of perforation. Outpatient endoscopy was recommended, however patient lost to follow up.

During a subsequent admission 2 months later, follow up CT showed patient's emphysematous gastritis had fully resolved.

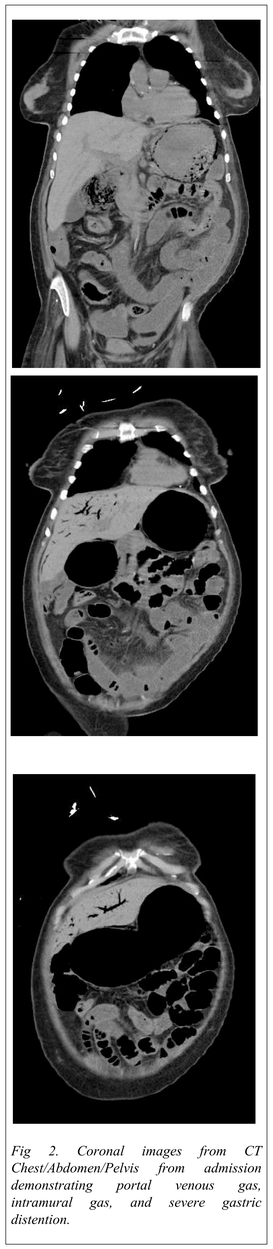

Fig 2. Coronal images from CT Chest/Abdomen/Pelvis from admission demonstrating portal venous gas, intramural gas, and severe gastric distention.

DISCUSSION

Emphysematous gastritis is a life-threatening disease seen in immunocompromised individuals. Typically, this is seen with gas-forming organisms such as *C. perfringens, S. aureus, and S. pyogenes*. Emphysematous gastritis differs from other forms of gastric pneumatosis by its clinical symptoms. Whereas patients with gastric emphysema tend to have minimal symptoms and do not require significant treatment, patients with emphysematous gastritis present toxic-appearing, with abdominal pain, tachycardia, and vomiting.

In our patient, despite screening positive for MRSA, there was no evidence of MRSA in blood culture. Campylobacter jejuni was present, however this is not a gas-forming organism that would typically be associated with emphysematous gastritis. There have been reported cases of emphysematous gastritis related to Candida species, but prior candida glabrata was not observed during this hospitalization.

Even if the insulting organism cannot be readily identified, surgical intervention can be avoided if diagnosis is recognized early and treatment with empiric antibiotics is initiated. Surgery should be reserved for cases complicated by gastric perforation as surgical intervention could increase further complications.

CONCLUSIONS

- Emphysematous gastritis is a potentially fatal disease process.
- Diagnosis can be made quickly via CT scan.
- Empiric antibiotics and gastric decompression are mainstays of conservative management.
- Surgery is indicated when case is complicated by peritonitis, gastric perforation, and strictures.

REFERENCES

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