CASE REPORT

Role Of Conservative Management In Emphysematous Gastritis

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SUMMARY

Emphysematous gastritis (EG) is a rare disease of the stomach that is caused by gas-forming bacteria, and it can be lethal. There have been <70 reported cases in the English literature of this disease which carries a mortality rate up to 60%. Early recognition and treatment through conservative management have been a popular and successful choice in today's medicine. Studies have shown that surgical intervention does not confer a statistical benefit on mortality in this condition. We present another case of EG in a 33-year-old woman who was successfully managed conservatively.

BACKGROUND

Emphysematous gastritis (EG) is a rare, lethal infection of the gastric wall that is caused by gas-forming bacteria. It was first described by Fraenkel in 1889, and since then, there have been <70 reported cases in the English literature through 2014.¹ This rare disease carries a mortality rate up to 60%.² Early recognition and treatment through conservative management have been a popular and successful choice in today's medicine.

CASE PRESENTATION

A 33-year-old woman with medical history of type 1 diabetes mellitus with gastroparesis and anaemia presented with infected external fixation hardware of her left ankle. Three days after admission, the patient complained of sudden onset sharp, diffuse, left upper quadrant abdominal pain, associated with bilious, non-bloody emesis. The pain radiated to the back and bilateral shoulders. She had a surgical history of appendectomy 5 years prior. She had no history of tobacco or alcohol use. She had not used any non-steroidal anti-inflammatory medications recently. She does not have any known allergies.

INVESTIGATIONS

The patient's vitals showed a pulse of 105 beats per minute, blood pressure of 97/54 mm Hg and she was afebrile with temperature of 99.1°F. On physical exam, bowel sounds were normal on auscultation, the abdomen was distended, tender to palpation in the epigastric and left upper quadrant of the abdomen, and there was associated guarding and rigidity. Tympany was elicited on percussion of the abdomen. Labs were remarkable for leucocytosis with white blood cell count of $15.5 \times 10^9/L$ with left shift. Abdominal X-ray showed a gas pattern

in the wall of the stomach (figure 1), and CT scan of abdomen/pelvis with contrast showed extensive pneumatosis of the gastric wall (figures 2 and 3).

DIFFERENTIAL DIAGNOSIS

1. EG

Figure 1 An abdominal X-ray showing gas in the wall of the stomach. The arrows show the gas pattern in the wall of the stomach.

Figure 2 A sagittal plane CT scan showing gas in the wall of the stomach.

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Figure 3 A transverse plane CT scan showing emphysematous gastritis.

2. gastric emphysema (GE)

TREATMENT

The patient was transferred to the intensive care unit and managed with intravenous fluid resuscitation, nothing by mouth and broad-spectrum antibiotics (vancomycin and piperacillin-tazobactam). Blood cultures were obtained prior to initiation of antibiotics which showed no growth. Esophagogastroduodenoscopy (EGD) was not performed

OUTCOME AND FOLLOW-UP

General surgery was consulted for recommendations, and they suggested non-operative management. The patient was managed conservatively and was stable for discharge on day 7 of admission. The patient was discharged with intravenous nafcillin, based on *Staphylococcus aureus* growing on culture from the external fixation hardware. She was followed up outpatient with gastroenterology 2 weeks after when outpatient EGD was negative for any evidence of inflammation, erosion or necrosis.

DISCUSSION

EG is characterised by presence of air within the gastric wall due to invasion of gastric mucosa perhaps by gas-forming organisms and presence of signs of systemic toxicity.^{3,4} The gastric mucosal barrier has a rich blood supply and acid pH which makes it fairly resistant to infection.⁵ However, the ingestion of corrosives, non-steroidal anti-inflammatory drugs, alcohol abuse and recent abdominal surgery can disrupt this barrier.⁵ There seems to be an association with chronic diseases such as diabetes, use of steroids, cytotoxins, rheumatic diseases and previous abdominal surgeries.⁵ Bacteria can invade the gastric wall via this ulceration or through haematogenous spread.⁵ The most common organisms include *Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumonia* and *Enterococcus* spp.⁵

In our case, the working diagnosis included EG and GE. Both are characterised by presence of gas within the stomach wall. The main difference is that GE occurs due to entry of air into the stomach wall from barotraumas and in patients with GE do not show systemic toxicity or bacterial infection.^{6,7} Radiologically GE is characterised by a much more

Figure 4 A flow chart demonstrating the management of emphysematous gastritis when a patient presents with pertaining signs and symptoms. EGD, esophagogastroduodenoscopy.

linear distribution of gas in the gastric wall.⁸ EGD shows inflamed, erosive mucosa with necrosis of stomach wall more commonly in EG compared with GE.⁵ The outpatient EGD which was performed 8 weeks later did not show any evidence of inflammation, erosion or necrosis. Thus, GE was excluded and the diagnosis of EG was established.

The clinical presentation typically includes abdominal pain, emesis, fever, diarrhoea and shock.⁹ The pathognomonic finding is emesis of a necrotic mucosal clot in the shape of the gastric wall.⁹ However, immunocompromised patients can have a less dramatic appearance. The definitive diagnosis of EG is made by intraluminal gas seen on radiographic imaging in the presence of signs of systemic toxicity. CT scan is extremely sensitive and specific and typically shows cystic pockets or streaks of air within the gastric wall and thickened mucosal folds.^{6-8,10}

Based on the culture and sensitivity results of the gastric fluid culture, antibiotics need to be tailored.⁶ In acute settings, the role of surgery has not been well defined. Surgery is reserved for patients who deteriorate despite optimal medical management, when there is evidence of involvement of a large portion of stomach, gastric infarction or perforation.^{8,11} The morbidity among patients with EG is

Learning points

- Early recognition and treatment of emphysematous gastritis are imperative to improve survival from this rare condition.
- The use of esophagogastroduodenoscopy to identify the need for surgical intervention has lowered mortality compared with directly starting with surgical intervention.
- Surgical intervention should only be reserved for select cases, such as life-threatening strictures or perforations.

21%, and the mortality rate is about 60%. To conclude, the prognosis for patients with EG is poor.¹²

Management is outlined by the flow chart in figure 4.^{5 13}

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