UNIQUE CASE OF EMPHYSEMATOUS GASTRITIS IN A PATIENT WITH CONGENITALLY ABSENT CELIAC TRUNK – A CASE REPORT AND REVIEW OF THE LITERATURE

Clarisse S. Muenyi MD PhD[a], Elizabeth Gaudio[b], Erica L Mitchell, MD MEd SE FACS DFSVS[ac], Evan S. Glazer, MD PhD FACS[a,e], Leonard Baidoo, MD FACG AGAF[d], Denis Foretia MD MPH MBA FACS[afg], Nia Zalamea MD FACS[afg]

[a] Department of Surgery, University of Tennessee Health Science Center, Memphis, TN USA
[b] University of Tennessee Health Science Center, College of Medicine, Memphis, TN USA
[C] Division of Vascular and Endovascular Surgery, University of Tennessee Health Science Center, Memphis, TN, USA
[d] Division of Gastroenterology, University of Tennessee Health Science Center, Memphis, TN, USA
[e] Center for Cancer Research, College of Medicine, University of Tennessee Health Science Center, Memphis, TN, USA
[f] Center for Multicultural for Multicultural Institute, University of Tennessee Health Science Center, Memphis, TN, USA
[g] Global Surgery Institute, University of Tennessee Health Science Center, Memphis, TN, USA

THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

SAGES 2023

ABSTRACT

INTRODUCTION:
Emphysematous gastritis (EG) is a highly morbid and lethal condition caused by infection of compromised gastric wall by gas-forming organisms. Radiologic evidence of gas within the gastric wall is a rare finding that poses a diagnostic dilemma as it may represent EG or the more benign gastric emphysema (GE). Aggressive identification and management of EG is critical to survival and may require gastric revascularization. We present a rare case of emphysematous gastritis in a patient with aberrant celiac artery anatomy.

CASE PRESENTATION:
The patient is a 56-year-old male with congenitally absent celiac trunk and remote history of splenectomy and distal pancreatectomy. He presented with left upper quadrant abdominal pain without peritonitis, hematemesis, mild leukocytosis, and tachycardia. A computed tomography (CT) scan of the abdomen revealed air within the gastric wall and portal venous gas (PVG). Esophagogastroduodenoscopy (EGD) revealed mucosal erythema, sloughing and ulceration consistent with EG. The patient was managed non-operatively with nasogastric tube decompression, nil per os (NPO), intravenous (IV) fluid hydration, IV antibiotics (Vancomycin and Zosyn), antifungal therapy (IV fluconazole), IV Protonix and Carafate.

His clinical condition initially improved but subsequently worsened after hospital day (HD) 4. Repeat CT demonstrated resolution of PVG with significantly decreased intramural gastric air and EGD on HD 11 re-demonstrated mucosa erythema and ulceration with new areas of ischemia in the body of the stomach.

Given the congenitally absent celiac trunk and surgical history, the vascular surgery service was consulted. He underwent superior mesenteric artery (SMA) to left gastric artery bypass with vein conduit and feeding jejunostomy tube placement. Post-operatively he tolerated a regular diet and his abdominal pain resolved.

DISCUSSION:
Ischemic gastropathy is a very rare cause of EG. To date, there are only four published case reports of EG associated with gastric ischemia. One patient improved with medical management alone, one required celiac axis and SMA stent placement, and the other two patients died from EG complications. Our patient is a unique case of EG with ischemic gastropathy who improved with medical management and open gastric revascularization.

CONCLUSION:
The diagnosis of EG must be considered for all patients who present with abdominal pain, hematemesis, signs and symptoms of sepsis, and compromised gastric perfusion.

INTRODUCTION

- Emphysematous gastritis and gastric emphysema represent two rare conditions with gas in the stomach wall on radiographic imaging
- Gastric emphysema (GE) is a relatively benign, non-infectious process, usually self-limiting with conservative management
- Emphysematous gastritis is a rare, life-threatening infection of compromised gastric wall by gas-forming microorganisms
- Pathophysiology of EG and GE involves weakening of gastric mucosa due to inciting factors such as gastric ulcer, malnutrition, renal disease, alcohol abuse, diabetes, recent abdominal surgery, long-term steroid use, ingestion of corrosive agents and NSAIDs
- Mortality rate for EG is 60 – 80%, thus, early diagnosis and management is crucial
- Non-operative management of EG include antibiotics, fluid hydration, IV Protonix and bowel rest, while surgical intervention is reserved for patients in extremis or those who failed medical management
- Gastric infarct remains a rare cause of EG with only three case reports to date

CASE PRESENTATION

A 56-year-old man with history of peripheral artery disease, gunshot wound to the abdomen status post distal pancreatectomy and splenectomy in the 1990s and occluded celiac trunk who presented to the emergency department with two weeks history of bilateral lower extremity rest pain and left chest pain. In the ED, his vital signs were within normal range and laboratory studies showed hemoglobin of 11.1, hematocrit of 33.8 and normal WBC. Abdominal exam was without tenderness or peritonitis. CT angiogram abdomen showed mildly distended stomach, known occluded celiac trunk, and occluded bilateral lower extremity grafts (Figure 1). He was admitted to the vascular surgery team, heparin drip was started for critical limb ischemia. Cardiology was consulted for work up of chest pain. Echocardiogram showed LVEF 50 - 55%, nuclear medicine stress test showed large inferior wall infarct, age indeterminate.

On hospital day two, he reported acute onset abdominal pain with an episode of coffee-ground emesis. On examination, he was moderately distended and had left upper quadrant abdominal tenderness, no peritonitis. Vital signs were significant for tachycardia to 117, SBP 120, RR 20 and oxygen saturation 97% on room air. Laboratory studies showed an elevated WBC of 11.5 from 9.0, hematocrit 31.2 from 34.3, Platelet 277, INR 0.91, lactate 0.9. Abdominal XR showed ileus, no free air. Nasogastric tube was placed, and STAT CT angiogram abdomen obtained that showed gas in the gastric wall, portal venous gas and periportal edema (Figure 2). This finding was concerning for emphysematous gastritis vs gastric emphysema. General surgery was consulted for surgical evaluation. An emergent upper endoscopy was performed, gastric mucosa erythema, slough-off, and ulceration was seen; there was no frank necrosis or perforation. He was managed non-operative with strict NPO, nasogastric tube decompression, IVF hydration, Vancomycin, Zosyn, IV Fluconazole, IV Protonix, Carafate, and parenteral nutrition.

On hospital day five (HD5), he had worsening abdominal pain with worsening leukocytosis; WBC 17.3 from 16.4 on HD4 and 13.2 on DH3. A repeat CTA abdomen and pelvis showed resolved portal venous gas, and significantly improved emphysema of the gastric wall (Figure 3). Nasogastric tube was removed on HD6, and he was started on clear liquid diet. Repeat upper endoscopy was performed on HD11. Findings of large area of erythema with ulcerations involving the superior half of the anterior wall, greater curvature, and posterior wall of the body of the stomach, concerning for ischemia (Figure 4). Given the evidence of gastric ischemia on endoscopy and his known history of occluded celiac axis and absent short gastric arteries from splenectomy, the vascular team took him to the operation room for gastric revascularization. Intraoperatively he was found to have congenital absent celiac trunk. He underwent superior mesenteric artery to left gastric artery bypass, and placement of feeding jejunostomy tube. Postoperatively, his abdominal pain resolved, and he was tolerating regular diet.

IMAGES

Figure 1: CT scans of abdomen and pelvis (a – axial and b – coronal views) demonstrating subtle air within the wall of a distended stomach and no portal venous gas, absent celiac axis)

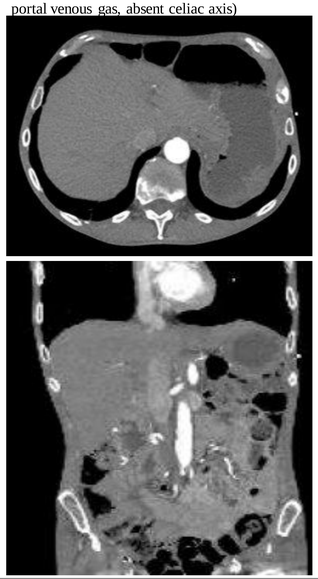
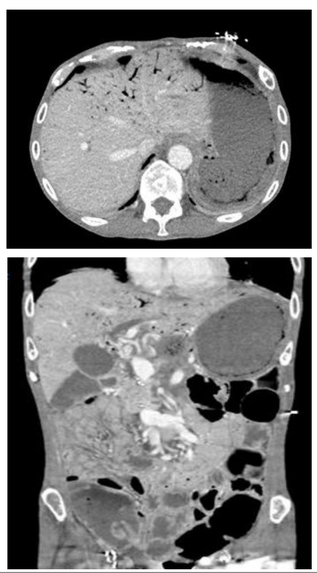


Figure 2: CT scans of abdomen and pelvis (a – axial and b – coronal views) demonstrating portal venous gas and air within the wall of a distended stomach)



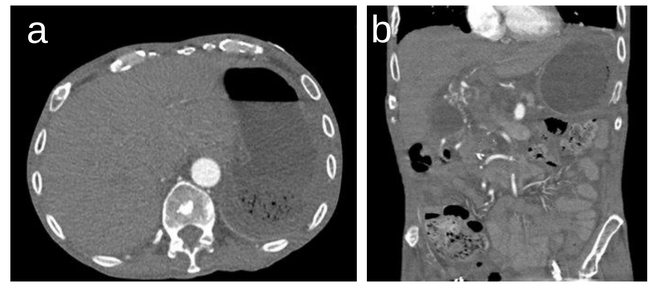


Figure 3: CT scans of abdomen and pelvis (a – axial and b – coronal views) demonstrating resolved portal venous gas and significantly improved air within the wall of a distended stomach)



Figure 4: Upper endoscopic of stomach mucosa shows areas of erythema (a), ulceration (b), and ischemia ©

DISCUSSION

- EG is a rare and lethal cause of abdominal pain in which rapid evaluation, distinction from gastric emphysema and treatment is critical to survival
- Rare causes of EG include ischemic gastropathy, or vascular insufficiency causing hypoxic injury to the gastric mucosa, thus predisposing the stomach wall to injury and infection.
- There are only three published case reports of EG associated with gastric infarct. Nair et al reported a case of spontaneous resolution of EG with medical management in a patient with gastric infarct secondary to vaso-occlusive disease of the celiac axis (6). Two case reports by Binmoellar et al and Wong et al report mortality from EG secondary to gastric infarct resulting from atherosclerotic disease and thrombus of the celiac axis (5; 7).
- Here, we present a case of a patient with EG associated with gastric infarct secondary to congenital absent celiac trunk and iatrogenic short gastric artery ligation.
- Non-operative management remains the treatment of choice and gastrectomy is reserved for patients in extremis or failed medical management (3; 6)

CONCLUSION

- Ischemic gastropathy is a rare cause of EG
- A high index of suspicion should be maintained in patients with compromised blood flow to the stomach who present with abdominal pain and signs of sepsis.
- A multidisciplinary team approach including non-operative management of with revascularization of the stomach should be considered.

REFERENCES

1. Matsushima K, Won EJ, Tangel MR, Enomoto LM, Avella DM, Soybel DI. 2015. Emphysematous gastritis and gastric emphysema: similar radiographic findings, distinct clinical entities. *World J Surg* 39:1008-17
2. Takase R, Fukuda N, Sui O, Hagiya H. 2021. Emphysematous gastritis. *Clin Case Rep* 9:e05094
3. Dweik A, Rasheed W, Mohammed BU, Ebrahim MW, Bazzaz O. 2022. A Case Report of Successful Medical Management of Emphysematous Gastritis With Portal Venous Air. *Cureus* 14:e25095
4. Shami A, Singhania R. 2021. Emphysematous gastritis: a case series and review of the current trend favoring conservative management. *Clin J Gastroenterol* 14:1042-5
5. Binmoeller KF, Benner KG. 1992. Emphysematous gastritis secondary to gastric infarction. *Am J Gastroenterol* 87:526-9
6. Nair R, Agrawal S, Nayal B. 2013. Spontaneous Resolution of Emphysematous Gastritis with Vaso-occlusive Disease-A Case Report. *Malays J Med Sci* 20:68-70
7. Wong YY, Chu WC. 2002. Emphysematous gastritis associated with gastric infarction in a patient with adult polycystic renal disease: CT diagnosis. *AJR Am J Roentgenol* 178:1291
8. Nehme F, Rowe K, Nassif I. 2017. Emphysematous gastritis with hepatic portal venous gas: a shift towards conservative management. *BMJ Case Rep* 2017
9. Ono R, Ito R, Yamamoto K, Aoki K, Kobayashi Y. 2022. Emphysematous gastritis. *BMJ Case Rep* 15
10. Weaver A, Weintraub R, Smith B. 2019. Recognizing emphysematous gastritis. *Jaapa* 32:27-9

CONSENT

- Written consent was provided by patient for presentation and publication of case report.