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Unraveling Emphysematous Gastritis: A Radiological Saga

ABSTRACT

Objective: Emphysematous gastritis is an uncommon but severe condition marked by the presence of intramural gas within the gastric wall, typically resulting from gas-forming bacterial infections. This study aims to analyse the radiological presentations and outcomes of three distinct cases to enhance diagnostic accuracy and guide management strategies.

Methods: We performed a retrospective analysis of three patients diagnosed with emphysematous gastritis. Each case was evaluated using various imaging techniques including plain abdominal X-ray, and computed tomography (CT). The radiological findings were correlated with clinical outcomes and treatment approaches.

Results: Radiological evaluations revealed distinctive patterns: (1) Plain X-rays in two patients demonstrated diffuse gas within the gastric wall. (2) CT scans provided detailed insights into the extent of intramural gas, identified associated complications such as pneumoperitoneum, and assessed the involvement of adjacent organs. Clinical management varied; one patient responded well to conservative treatment with antibiotics and supportive care, while the other two required surgical intervention due to complications including perforation and systemic infection.

Conclusion: The imaging features of emphysematous gastritis are critical for early diagnosis and effective management. This case series highlights the utility of imaging modalities in evaluating the severity and extent of the disease, which can significantly influence treatment outcomes. Prompt and accurate radiological assessment is essential for optimizing patient care in this challenging condition.

Key words: Emphysematous Gastritis, Tomography, X-Ray Computed, Hepatic Portal Venous Gas, Pneumatosis Cystoides Intestinalis, Pancreatitis

INTRODUCTION

Emphysematous gastritis is an uncommon kind of phlegmonous gastritis and can be identified by the production of air in the stomach wall by gas-forming microbes. Due to potentially catastrophic outcomes (high morbidity and mortality), early diagnosis and treatment are critical.[1] characterized by the formation of air in the gastric wall by gas-forming microorganisms. Early diagnosis and treatment are important because of its fatal consequences (high morbidity and mortality Risk factors include alcoholism, renal failure, diabetes mellitus, gastritis recent abdominal surgery, long-term corticosteroid usage and intake of caustic substances. Due to its rarity and vague symptoms, which include fever, coffee-ground emesis, acute pain in abdomen and signs of systemic symptoms, diagnosis is challenging.[2] We present series of three cases of emphysematous gastritis.

CASE PRESENTATION

Case 1

A 20-year-old female presented to the emergency department with a 6-day history of abdominal pain and nausea. There was no history of any previous illness/ surgery. On physical examination, she appeared acutely ill. There was mild tenderness noted over the epigastric region and left hypochondrium. Her blood pressure on time of arrival was 90/60 mm hg. Laboratory examinations revealed normal total white blood cell count; however showed raised neutrophil counts. NG tube was placed massive amount of bilious aspirate drained.

The patient underwent a radiograph and computed tomography (CT) examination. Abdominal radiograph obtained in supine position showed collections of gas within the stomach wall (Fig. 1a) Axial and coronal CT revealed diffuse gastric wall thickening and extensive intramural air (Fig. 1c). No pneumoperitoneum suggestive of gastric perforation were noted. There was left sided pleural effusion. Subsequently, the lesion was diagnosed as emphysematous gastritis. Therefore, a endoscopy was performed which showed severe necrosis of the gastric mucosa (Fig. 1b).

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Fig. 1: (a) Supine abdomen radiograph showing distended stomach with gas along greater curvature

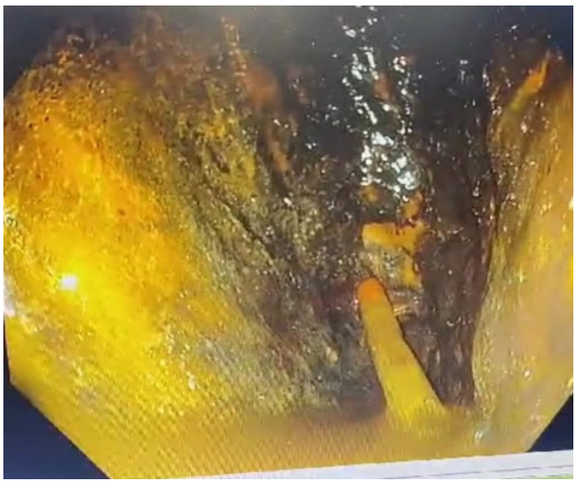

Fig. 1: (b) Upper GI endoscopy showing mucosal necrosis of the gastric wall

Fig. 1: (c) Axial section showing diffuse wall thickening and irregular air in the stomach wall.

Patient underwent total gastrectomy and oesophagojejunostomy and jejunojejunostomy and drains were placed in subhepatic space and in the pelvis. ICD was put in left pleural cavity.

On subsequent day, increase in subsequent drain output was noted. In suspicion of anastomotic site leak, NCCT with oral contrast and CECT scan was asked. NCCT scan with oral contrast showed, extravasation of iodinated contrast from the proximal anastomotic site communicating to the subhepatic space. (Fig. 1f)

There was air loculi noted in portal venous system. On CECT, there was diffuse hypo-enhancement of the small and large bowel loops with evidence of air in the bowel wall. Jejunojejunostomy site was normal. There were few hypodense areas noted in the left lobe of liver suggestive of infarcts.

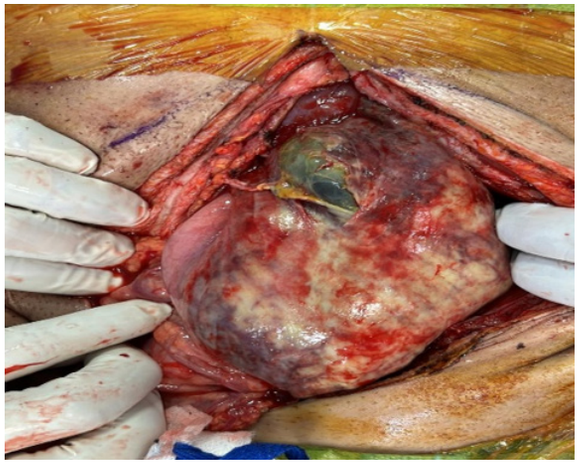

Fig. 1: (e) Showing Intra-op image of the necrosed stomach.

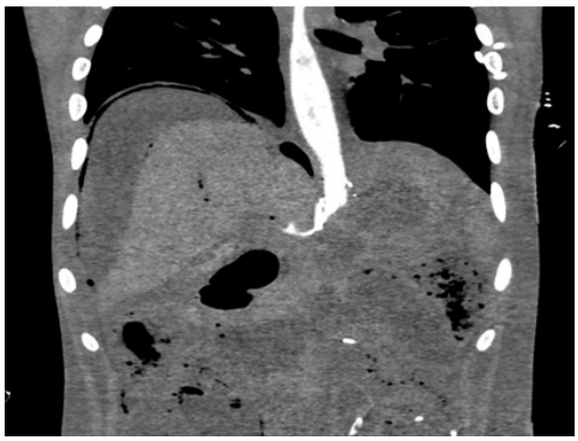

Fig. 1: (f) Coronal section showing active extravasation of contrast from the anastomotic site.

Case 2

A 44-year-old male with a known history of binge alcohol ingestion was admitted at the emergency room with haematemesis, epigastric pain, and melena.

At physical examination, he was found to have cold extremities and a distended abdomen. Hypotension (94/58 mm Hg) and tachycardia (140/min) were noted.

Blood tests showed anaemia, leucocytosis {3×109/L; (normal 4–11)}with neutrophilia 80% and elevated levels of C reactive protein (48.90 mg/dL, <5). Serum amylase and lipase levels were also raised. Aspartate aminotransferase (AST) was in the upper limit of normal range (76 U/L, 12–40).

A nasogastric tube was placed and a moderate amount of blood was drained. Abdominal CT scan showed gastric distension and presence of gas in the gastric wall, findings consistent with emphysematous gastritis (Fig. 2a). Portal venous gas was seen. The pancreatic parenchyma was completely necrosed and was replaced by air loculi. Superior mesenteric vein (SMV) showed hypodense filling defect suggestive of thrombus. Bilateral small renal infarcts were seen. Air loculi was also noted in the splenic parenchyma and in the large bowel wall (Fig. 2b).

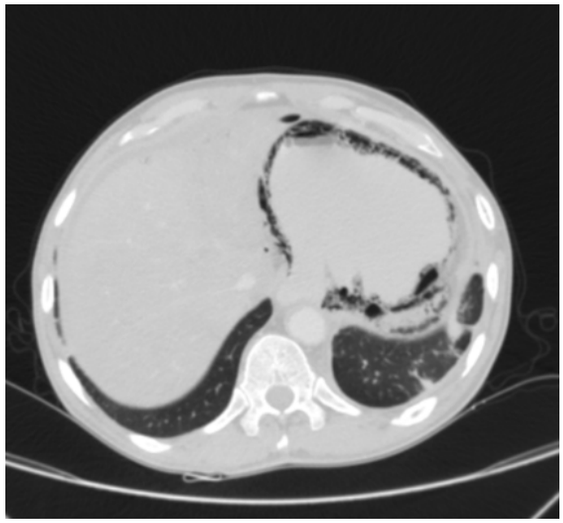

Fig. 2: (a) Emphysematous Gastritis

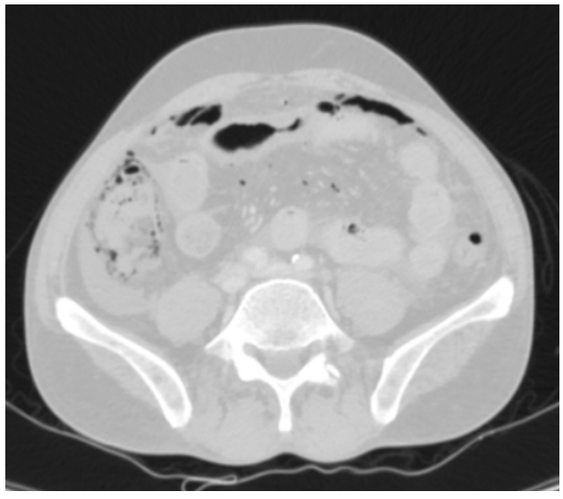

Fig. 2: (b) Pneumatosis coli in ascending colon

Case 3

A 38-year-old male with underlying disease of chronic liver disease developed unusual abdominal pain and coffee ground vomitus. Fever, neutrophilic leucocytosis, and tenderness over his upper abdomen were noted. His vital signs were a heart rate of 108 beats/min and a blood pressure of 104/72 mm Hg. Physical examination showed abdominal distension and epigastric abdominal tenderness without rebound tenderness or guarding. Laboratory findings showed white blood cells of 12 x 103 /L and elevated levels of liver enzymes (aspartate aminotransferase of 212 U/L and alanine aminotransferase of 198 U/L) with normal levels of renal function and electrolytes.

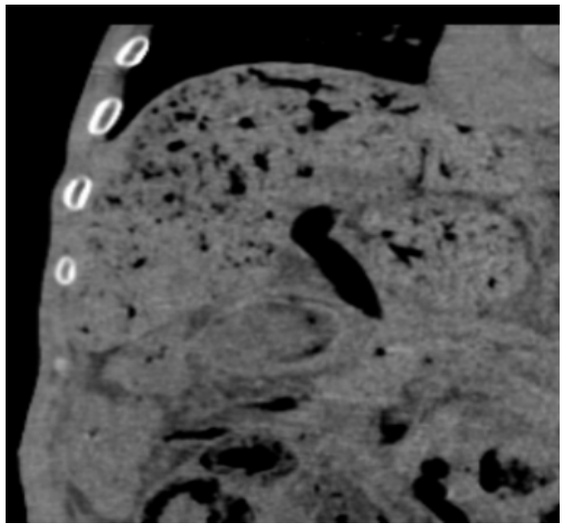

Fig. 3: Air in portal venous system

DISCUSSION

The stomach's natural defences against infection are strong, however after ingesting corrosives, acid production significantly decreases and mucosal damage occurs.

Although the exact pathophysiology of EG is still unknown, it is thought that ischemic lesions or gastric ulcers that have already healed provide an environment that is conducive to bacterial infection, which then allows the bacteria to proliferate and infiltrate the stomach wall. Furthermore, the stomach lining may get colonised by bacteria if there is less acidity or if there are no ulcers in the gastric mucosa. Alternatively, the germs may originate from a distant septic site and travel via the circulation to cause EG.[2]

Acute fulminating illness is the clinical presentation, which may resemble an abdominal viscus perforation. Hematemesis, intense stomach discomfort, tachycardia, fever, shock, leucocytosis, and anaemia are frequently experienced symptoms.[3] the first described by Fraenkel in 1889 (7 When assessing acute abdominal cases, especially when risk factors are present, emphysematous gastritis needs to be considered.

Urgent abdominal CT scanning is necessary to support early detection and management, as timely diagnosis and intervention are critical.[2]

Radiological evidence of gas within the stomach wall can lead to the definitive diagnosis of EG. The most effective imaging method is a computed tomography (CT) scan, which highlights the apparent changes in the stomach, including edematous and thicker folds in the inner lining as well as air pockets trapped in the gastric wall. Air can also occasionally be seen in the veins that carry blood from the stomach, including the portal vein.[2]

Patients with emphysematous gastritis were recently thought to benefit most from medicinal treatment. Surgery's role during the acute period is uncertain. However, patients who show signs of deterioration even after receiving the best medical care, who have involvement of a large portion of stomach, or who have a gastric infarction or perforation should have emergency surgery.[1] characterized by the formation of air in the gastric wall by gas-forming microorganisms. Early diagnosis and treatment are important because of its fatal consequences (high morbidity and mortality

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