

## Emphysematous Gastritis: A Case Report and a Review of Literature

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### Abstract

**Introduction:** Gas is rarely found within the viscera outside the lumen of the gastrointestinal tract. **Emphysematous gastritis** is a rare form of infection of the stomach wall by gas producing organisms. **Clinical Picture:** A 45-year-old Chinese lady underwent hepatectomy for hepatocellular carcinoma. Postoperatively, she turned septic and encephalopathic with worsening liver function. Computed tomography scan revealed a thickened, oedematous stomach wall with air pockets within. **Treatment:** The patient was started on a course of broad spectrum antibiotics. **Outcome:** She responded and was discharged well. **Conclusion:** Emphysematous gastritis is a rare condition with high mortality. There is however, still no preferable approach of treatment despite therapeutic advances.

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**Key words:** gas, stomach wall, gastric emphysema

### Case Report

A 45-year-old Chinese lady, who is a known hepatitis B carrier, presented with increasing alpha fetoprotein levels and a palpable liver 6 cm below the costal margin. Computed tomography (CT) scan of the abdomen showed a large heterogeneous mass in the right lobe of the liver, and she underwent a right hepatectomy for hepatocellular carcinoma.

On the eighth postoperative day, the patient became increasingly jaundiced with murky discharge from the abdominal drain. Investigations revealed leukocytosis with deteriorating liver function, and ultrasound of the liver showed partial thrombosis of the right portal vein (Fig. 1). She turned drowsy and disoriented in the ward despite empirical antibiotics therapy. The impression was that of hepatic encephalopathy secondary to sepsis and an urgent CT scan of the abdomen and pelvis was performed looking for intra-abdominal fluid collection. However, the stomach wall was noted to be oedematous and air pockets were seen within the thickened wall (Fig. 2).

Cultures from the abdominal drain showed multiresistant *Pseudomonas* and *Acinetobacter* sensitive to meropenem. The patient showed clinical improvement after being started on intravenous meropenem and was subsequently discharged well.

### Discussion

Terms used in literature for gas in the wall of the stomach include gastric emphysema, (Gastric) pneumatosis

intestinalis and emphysematous gastritis. The term “gastric emphysema” is often used when there is no associated infection, in which gas enters the stomach wall following mucosal breach.<sup>1</sup> Patients with gastric emphysema do not usually present with acute abdomen unlike those with emphysematous gastritis, and prognosis is usually excellent.

Emphysematous gastritis is a rare variant of phlegmonous gastritis. It is caused by gas forming organisms and may arise from local spread through the mucosa or even hematogenous dissemination from a distant focus. The stomach is a very uncommon site of involvement because of its acidity and efficient mucosal barrier.

This was first described by Frankel in 1889,<sup>2</sup> who strongly believed that it was infective in origin and termed it “gastritis acuta emphysematosa”. A review by Moosvi et al<sup>3</sup> of 27 cases from 1889 to 1990 showed that, in most patients, there was a prior insult to the mucosal barrier of the stomach, either by corrosives ingestion such as ammonia, acid (37%) or alcohol abuse (21%). A history of recent abdominal surgery and gastroenteritis was found in 15% each. Isolated reports of phytobezoar<sup>4</sup> and adenocarcinoma,<sup>5</sup> leukaemia,<sup>6</sup> pancreatitis<sup>7</sup> and disseminated strongyloidiasis<sup>8</sup> in a patient receiving chemotherapy for lymphoma have also been described.

A further review of 15 cases from 1990 to 2005<sup>2,9-14</sup> again showed that most patients had similar predisposing factors such as alcohol abuse, gastric ulcer or had some form of immunocompromise. Out of this 15, only 3 had no possible

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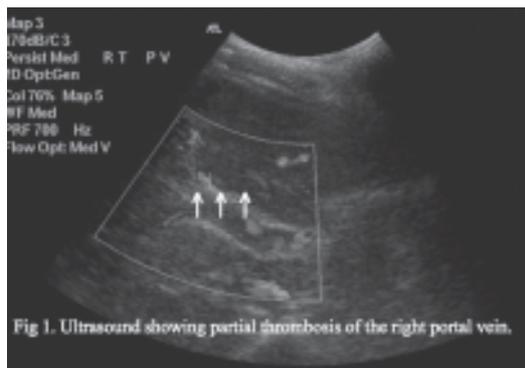


Fig. 1. Ultrasound showing partial thrombosis of the right portal vein.

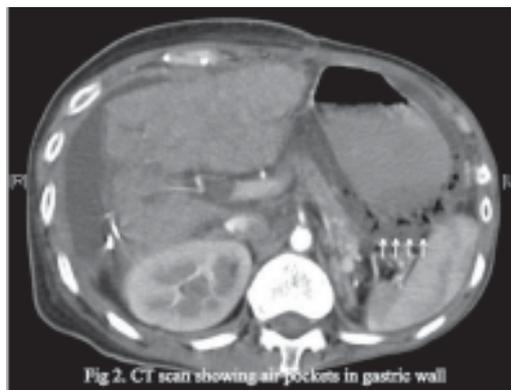


Fig. 2. Computed tomographic scan showing air pockets in gastric wall.

predisposing factors. These patients typically present with abdominal pain, diarrhoea, nausea and vomiting. Abdominal examination usually reveals abdominal distension, decreased bowel sounds and epigastric tenderness, giving suspicions of acute abdomen.

Common organisms include *Enterobacter* species, *Pseudomonas aeruginosa*, *Candida albicans*, and *Staphylococcus aureus*.

Diagnosis of emphysematous gastritis can be made based on clinical presentation as well as collection of gas in the gastric wall, characteristically in an irregular mottled appearance, compared to the thin linear lucencies seen in gastric emphysema. These changes can be seen on a plain abdominal X-ray, but CT is more sensitive<sup>15</sup> for detecting small amounts of gas in the stomach wall and characteristically portal venous gas in the liver.<sup>16</sup>

Mortality is high in patients with emphysematous gastritis despite aggressive treatment like total gastrectomy. This has not changed in recent years despite marked improvement in therapeutic advances. From the available literature, there has been no preferable approach or treatment. Some authors report that mortality is 100% without surgical intervention while others believe that surgical intervention should not

be instituted since active infection could delay or prevent healing of wound edges. Perforation, however, is an indication for surgery and strictures occurring due to healing after extensive inflammation can be a late indication for surgical intervention.

We believe our patient responded well to therapy because a diagnosis was made promptly, and timely intervention with the appropriate antibiotics. In addition, our patient was neither immunocompromised, nor was she on any immunosuppressive drugs. She had no predisposing factors other than that of recent abdominal surgery.

## Conclusion

Air in the stomach wall is a rare finding. Terms used in the literature include gastric emphysema, pneumatosis intestinalis and emphysematous gastritis. A rare case of a post hepatectomy patient with otherwise no predisposing factors, who survived emphysematous gastritis, is described along with a review of literature on this subject.

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