

Gastric emphysema

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Case

A 47-year-old woman was admitted to the intensive care unit following craniectomy for intracranial haematoma. She reported tenderness in the epigastric region with no evidence of peritonitis. Enhanced computed tomography (CT) of the abdomen revealed a distended stomach and diffuse circumferential air in the stomach wall, with prominent enhancement of the stomach wall mucosa. Pneumoperitoneum was

detected on identification of extraluminal stomach air along the greater curvature (Fig 1). Laboratory results showed no abnormality. The patient had no obvious predisposing factors or infection and inflammatory markers in blood cultures were normal. Based on the clinical presentation and relevant laboratory examinations, assessment of predisposing factors and CT findings, gastric emphysema (GE) was diagnosed and the patient was managed conservatively. She underwent gastric decompression with nasogastric tube placement and fluid resuscitation, and was prescribed a proton pump inhibitor and broad-spectrum antibiotics. Non-enhanced CT scan 11 days later revealed complete resolution of gas within the submucosal layer (Fig 2).

Discussion

Gastric pneumatosis is a rare finding identified by accumulation of gas within the stomach wall. Both GE and emphysematous gastritis (EG) are important differential diagnoses of intramural gastric air. They differ in their aetiology, clinical course, radiographic findings, management, and prognosis. However, it is important to differentiate the much more benign GE from the highly lethal EG.

Gastric emphysema is caused by a disruption in gastric mucosal integrity without underlying infection. Most patients with GE have no or mild symptoms, and the prognosis is excellent.¹ Gastric emphysema is a relatively benign condition and usually self-limiting. The causes of the mucosal defect in GE include increased intragastric pressure, instrumentation such as gastroscopy, severe vomiting, and dissection of air from the mediastinum and ischaemia. The management of GE is usually non-surgical and includes bowel rest with nasogastric tube placement, fluid resuscitation and nutritional support.¹ We think our case of GE was related to stress-related mucosal erosions of the stomach mucosa, and possibly increased gastric distension.

In contrast, EG, resulting from gas-forming organisms and associated with systematic toxicity, is a devastating infectious process with a mortality rate of 60%.^{2,3} Patients with EG usually display severe clinical signs including severe abdominal pain, severe abdominal tenderness, haematemesis, and occult gastric bleeding. The patient may need to be transferred to the intensive care unit and treated with broad-spectrum antibiotics if there is evidence



FIG 1. A 47-year-old woman with gastric emphysema. (a) Axial enhanced computed tomography and (b) sagittal multiplanar reconstruction images revealing a distended stomach and diffuse circumferential air in the stomach wall extending to the lower oesophagus, with prominent enhancement of the stomach wall mucosa. Pneumoperitoneum was evidenced by the presence of extraluminal stomach air along the greater curvature (white arrow)



FIG 2. Same patient 11 days after treatment. Non-enhanced computed tomography scan revealed complete resolution of gas within the submucosal layer

of bacterial infection. Patients should undergo oesophagogastroduodenoscopy and enhancement CT as early as possible when EG is suspected. Surgical intervention is more commonly indicated for EG and is directed at removal of the septic organ, whereas the primary indication for surgical intervention in GE is uncertainty of diagnosis.^{3,4}

In summary, despite similar radiographic findings, GE is typically secondary to mechanical injury of the stomach mucosa, whereas EG is an acute infection of the stomach wall. The differentiation of these two entities depends on the patient's clinical presentation, assessment of predisposing factors, and CT findings.

Author contributions

Concept or design: All authors.

Acquisition of data: G Liang, LC Zeng.

Analysis or interpretation of data: All authors.

Drafting of the manuscript: G Liang.

Critical revision of the manuscript for important intellectual content: All authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Ethics approval

This study was approved by the Hospital of Chengdu University of Traditional Chinese Medicine Research Ethics Committee. Informed consent was obtained from the patient.

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References

1. Matsushima K, Won EJ, Tangel MR, Enomoto LM, Avaella DM, Soybel DI. Emphysematous gastritis and gastric emphysema: similar radiographic findings, distinct clinical entities. *World J Surg* 2015;39:1008-17.
2. Misro A, Sheth H. Diagnostic dilemma of gastric intramural air. *Ann R Coll Surg Engl* 2014;96:e11-3.
3. Guillén-Morales C, Jiménez-Miramón FJ, Carrascosa-Mirón T, Jover-Navalón JM. Emphysematous gastritis associated with portal venous gas: medical management to an infrequent acute abdominal pain. *Rev Esp Enferm Dig* 2015;107:455-6.
4. Inayat F, Zafar F, Zaman MA, Hussain Q. Gastric emphysema secondary to severe vomiting: a comparative review of 14 cases. *BMJ Case Rep* 2018;2018:bcr2018226594.