An 81 year old woman presented to our department with a two day history of nausea and retching but was unable to vomit. For the past three weeks she had been experiencing dysphagia with only small amounts of liquid tolerated, excessive belching, and weight loss. She had no abdominal pain and her bowels were opening normally. She had a known hiatus hernia and previous oesophagitis for which she was taking regular omeprazole.

On examination she did not have a fever but she was dehydrated and tachycardic. Her abdomen was soft and non-tender and a cardiorespiratory examination showed no abnormalities. She underwent chest radiography and computed tomography of her chest and abdomen (figs 1 and 2). She was treated successfully for her condition and discharged home.
Questions

- 1 What are the differential diagnoses for this patient?
- 2 What is the abnormality on computed tomography?
• 3 What is the most likely diagnosis?
• 4 How can this condition be treated?

Answers

1 What are the differential diagnoses for this patient?

Short answer

The differential diagnoses include proximal upper gastrointestinal obstruction secondary to oesophageal motility disorders, reflux oesophagitis, peptic ulcer disease, oesophageal or gastric cancer, and complicated hiatus hernia.

Long answer

Given the patient’s presentation with nausea, retching, and excessive belching, a diagnosis of gastric outlet obstruction is possible. Since the advent of proton pump inhibitors, cancer is the most common cause of such obstruction. Stenosis caused by a prepyloric ulcer must also be considered, but abdominal pain and vomiting are usually prominent in this setting. Such symptoms were not seen in our patient so this diagnosis can be excluded. An oesophageal motility disorder, such as presbyo-oesophagus, is also a possible diagnosis.

An exacerbation of her previously diagnosed oesophagitis could also be the cause of her symptoms, especially as her hiatus hernia will contribute to acid regurgitation. An oesophageal or gastric malignancy must be ruled out in our patient given her longer history of dysphagia and weight loss. Prolonged reflux oesophagitis will predispose her to Barrett’s metaplasia and developing a lower oesophageal carcinoma.

2 What is the abnormality on computed tomography?

Short answer

The cross sectional (fig 3) and coronal computed tomography (fig 4) images show a large air-containing organ in the posterior mediastinum that has two chambers separated by a septum.
Fig 3 Computed tomography image showing a cross sectional view of the stomach in the posterior mediastinum

Fig 4 Computed tomography image showing a coronal view of the stomach in the posterior mediastinum

**Long answer**

The cross sectional computed tomography image shows a view through the chest and lower ribs. The liver is just visible and the abnormality is best described as a large air-containing organ in the chest that has two chambers separated by a septum. The coronal image displays the same
pathology, which is consistent with a hiatus hernia that has undergone rotation to cause a gastric volvulus. The two chambers seen represent the fundus and body of the stomach.

3 What is the most likely diagnosis?

Short answer

A gastric volvulus.

Long answer

The most likely diagnosis is a mesentero-axial gastric volvulus that has developed from a paraoesophageal hernia.

Gastric volvulus is uncommon and is characterised by abnormal rotation of the stomach through more than 180°. It can occur in children as a result of congenital diaphragmatic defects. Gastric volvulus in adults is rare under the age of 50 and can be classified according to aetiology. A primary gastric volvulus can occur with agenesis or disruption of the four major ligaments—gastrocolic, gastrosplenic, gastrohepatic, and gastrophrenic—that fix the stomach to the posterior abdominal wall. A secondary volvulus may result from abnormalities of adjacent organs, disorders of gastric anatomy, and diaphragmatic defects such as paraoesophageal hernias, with the last defect being the more common cause. Gastric volvulus can be further classified according to axis of rotation and whether it presents acutely or chronically.

Organo-axial rotation is the most common cause of secondary gastric volvulus, and it occurs when the stomach rotates around an axis adjoining the gastro-oesophageal junction and the pylorus (fig 5). The greater curvature of the stomach will therefore finally rest superior to the lesser curvature in an inverted position. In a mesentero-axial volvulus the stomach rotates around a line passing through the greater and lesser curvature of the stomach.

Fig 5 Schematic drawing of stomach, its ligamental attachments, and types of gastric volvulus. Left: organo-axial volvulus; right: mesentero-axial volvulus. Reproduced, with permission, from Elsevier
The presentation of a gastric volvulus is varied and correlates with the speed of onset. Acutely, patients may develop severe epigastric pain and retching without vomiting. These symptoms and the inability to pass a nasogastric tube represent a triad of findings that is diagnostic of acute gastric volvulus and reportedly occurs in 70% of cases. Patients with more chronic presentations may have non-specific symptoms such as dysphagia and bloating. These symptoms can often be missed or attributed to other conditions such as peptic ulcer disease.

The diagnosis of gastric volvulus can be confirmed by the following radiological modalities:

- Chest radiography. This may show an air filled sac behind the heart shadow described as a precardiac air bubble or a fluid filled sac.

- Plain abdominal radiography. This may show a massively distended viscus in the upper abdomen. In a mesentero-axial volvulus findings include a spherical stomach on supine images and two air fluid levels on erect images, with the antrum positioned superior to the fundus.

- Upper gastrointestinal contrast studies. These are sensitive and specific if performed when the stomach is in the “twisted” state and may show an upside down stomach.

- Computed tomography. This shows the whole anatomy of the stomach, making precise diagnosis possible. Specific advantages include the ability to detect the presence or absence of gastric pneumatosis and free air, and the exclusion of other abdominal pathology.

### 4 How can this condition be treated?

**Short answer**

It should initially be treated conservatively with fluids and electrolyte correction, but the mainstay of treatment is decompression, reduction, and prevention of recurrence, which can be accomplished with surgery in the form of a laparoscopic reduction with excision of the hernial sac, hiatal defect repair, and gastropexy.

**Long answer**

Initial treatment for gastric volvulus includes appropriate fluid resuscitation and electrolyte correction because patients are often very dehydrated. A nasogastric tube will decompress the stomach and alleviate some of the symptoms. An early surgical opinion must be obtained in the acute setting because vascular compromise leading to perforation may occur. The general aims of surgery are to reduce the volvulus, prevent recurrence, and repair any predisposing factors such as diaphragmatic defects. The patient’s comorbidities and whether the volvulus is acute or chronic are major determinants of a conservative versus a surgical approach. Open and laparoscopic surgery can both be used to treat this condition. Both techniques can de-rotate the volvulus, excise the hernial sac, and repair the diaphragmatic hiatal defect. A gastropexy can be used to fix the stomach on to the posterior abdominal wall while repairing any defects present. A laparoscopic fundoplication and various endoscopic techniques can also be used to treat a gastric
volvulus. A laparoscopic approach is generally preferable to open surgery because it is less invasive and has the advantage of a shorter hospital stay.9

Patient outcome

The patient underwent a laparoscopic reduction of her mesentero-axial gastric volvulus. The hernial sac was excised, the hiatal defect was repaired, and a gastropexy was performed. She needed support in an intensive care unit after surgery and another gastroscopy to correct some bleeding from a duodenal ulcer. She then made an unremarkable recovery and was discharged home two weeks later.

Notes

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Footnotes

Competing interests: All authors have completed the Unified Competing Interest form at www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author) and declare: (1) No financial support for the submitted work from anyone other than their employer; (2) No financial relationships with commercial entities that might have an interest in the submitted work; (3) No spouses, partners, or children with relationships with commercial entities that might have an interest in the submitted work; (4) No non-financial interests that may be relevant to the submitted work.

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References


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