Rare disease

Acute gastric volvulus: an uncommon complication of a hiatus hernia

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Summary

An 80-year-old male patient with a history of a hiatus hernia presented with acute abdominal pain and vomiting. CT of his abdomen revealed extraluminal free gas consistent with a perforation. He had a large hiatus hernia. The subdiaphragmatic portion of the stomach was distended and adopted a more transverse lie. The radiological findings were in keeping with acute gastric volvulus with secondary ischaemic complications. Acute gastric volvulus is an abnormal rotation of the stomach resulting in complete obstruction. It is a surgical emergency and does not always present in its classical form. Clinicians should be mindful of this diagnosis in patients presenting with an acute surgical abdomen, especially if the presentation is non-specific, as delays in diagnosis are associated with significant morbidity and mortality.

BACKGROUND

Acute gastric volvulus is a surgical emergency, with non-specific features and is associated with significant morbidity and mortality. We therefore think it is important to remind clinicians and radiologists of this entity by providing a brief overview of the condition and its imaging findings.

CASE PRESENTATION

An 80-year-old male patient with a history of a hiatus hernia presented with acute abdominal pain and vomiting. On examination, he was tachycardic, tachypnoeic and peripherally shut down. His abdomen was distended and peritonitic, with reduced bowel sounds.

INVESTIGATIONS

Biochemistry revealed an elevated C-reactive protein with a normal white cell count and haemoglobin. He was hypoxic on his blood gas, with a metabolic acidosis (pH 7.18) and elevated lactate (7.26 mmol/l). An ECG demonstrated widespread ischaemic changes.

An urgent CT of his abdomen and pelvis was performed with intravenous contrast. The scan was performed on the 64-slice Siemens scanner in our department. This revealed a significant quantity of free fluid and free air in keeping with a perforation (figure 1). Air was noted outlining the mesentery and within the portal venous system. He had a large hiatus hernia, with air in the posterior mediastinum surrounding the intrathoracic portion of the stomach. The subdiaphragmatic stomach was significantly distended and adopted a more transverse lie (figures 2 and 3). The remainder of the solid viscera were normal.

The radiological findings were in keeping with acute gastric volvulus secondary to a large hiatus hernia with secondary complications of ischaemia and perforation.

TREATMENT

This patient underwent an emergency laparotomy. The fundus of the stomach was gangrenous, with further gangrene

and multiple perforations at the gastro-oesophageal junction. The remainder of the stomach was normal. The patient underwent a partial gastrectomy and oesophagectomy with a gastro-oesophageal anastomosis.

OUTCOME AND FOLLOW-UP

Unfortunately, the patient did not survive and died shortly afterwards while in the intensive care unit.

DISCUSSION

Gastric volvulus involves the rotation of the stomach along its axis. While uncommon, it can present as a surgical

Figure 1 An axial slice of a contrast-enhanced CT of the abdomen and pelvis. This showed free gas (red arrow) and free fluid (red asterisk) in keeping with perforation. The stomach was distended and fluid-filled (white arrow).

Figure 2 A coronal slice of a contrast-enhanced CT of the abdomen and pelvis. This demonstrates free fluid (red asterisk) with air in the intrahepatic biliary tree (red arrow) as well as in the mesentery (purple arrow) and outlining the peritoneum. The stomach is dilated and adopted a horizontal lie (white arrow).

emergency, the risk of mortality being high if not recognised early and managed appropriately.

The aetiology can be classified as either primary or secondary to an underlying cause. Primary gastric volvulus occurs commonly due to a laxity of the supporting ligaments of the stomach, thereby allowing the stomach to twist along its mesentery.¹ Secondary volvuli can occur due to a number of causes including eventration of the diaphragm, abdominal adhesions, phrenic nerve palsy, traumatic diaphragmatic rupture or splenic abnormalities. Intrinsic gastric pathology (for example tumours) or masses outside the stomach can also act as a lead point and predispose to volvulus.^{1 2} However, the most common cause in adults is a hiatus hernia.

Gastric volvulus usually presents in the 5th decade of life, with no sex preponderance.¹ It has also been reported in the paediatric setting.²

Gastric volvulus is subdivided into three types: Organo-axial, mesetero-axial or a combination of the two. Organo-axial, the most common, involves rotation of the stomach along its long axis that is the line joining the cardia and the pylorus. It occurs in approximately 59% of cases.¹ This results in the greater curvature of the stomach adopting a more cranial position, with the lesser curvature located inferiorly. Mesenteroaxial rotation is less common and occurs in approximately 29% of cases. It involves the rotation of the stomach along its short axis, that is a line joining the lesser and greater curvatures. The result is an 'upside

Figure 3 An axial slice of a contrast-enhanced CT of the abdomen and pelvis. The intrathoracic portion of the stomach is dilated (red asterisk) and fluid-filled. There was free air in the posterior mediastinum (white arrow).

down' stomach. A mixed type occurs is reported to occur in approximately 12% of cases.

Gastric volvulus can be further classified as acute or chronic. In the chronic form, a partial volvulus occurs and this is less likely to cause ischaemic injury. This is most commonly of the mesenteroaxial type.² In acute volvulus, rotation of the stomach is more than 180 degrees.³ This can result in a closed-loop obstruction. Progressive dilatation of the stomach as a consequence of gastric-outlet obstruction results, eventually leading to ischaemia. If not recognised early, this can result in infarction and necrosis of the stomach, resulting in rupture and peritonitis. The associated mortality is then approximately 42–56%.¹ Notably, the stomach has a rich blood supply, therefore ischaemic events of this sort occur in approximately 5–28% of patients.²

The classical presentation of acute gastric volvulus, occurring in 70%, is that of Borchardt's triad, that is intractable writhing, sudden epigastric pain and an inability to pass an nasogastric tube into the stomach.¹ Other presenting features include isolated dyspepsia, epigastric pain or dysphagia. Gastric volvulus can also cause chest pain and ischaemic changes on an ECG, thereby mimicking a myocardial infarction.⁴

Plain radiographic findings include a retro-cardiac air, in keeping with an intrathoracic portion of the stomach. Air-fluid levels in the mediastinum may also be noted. A barium study may be performed, helping to establish the type of volvulus and also to determine the degree of obstruction by establishing if there is flow of oral contrast into the duodenum.³ However, in the acute setting, this may not be feasible, especially if there is diagnostic uncertainty or if the patient is critically ill. CT is now commonly performed, helping to delineate the anatomy and to establish any complications arising from complete volvulus.⁵

Gastric volvulus can be treated surgically or via an endoscopic approach to decompress and devolve the stomach. A gastropexy helps prevent a recurrent volvulus.²

In summary, acute gastric volvulus is a surgical emergency which can present in a non-specific fashion. Due to its high associated mortality, it needs to be recognised and managed early. Early cross-sectional imaging is crucial in establishing the underlying diagnosis.

Learning points

- ▶ Acute gastric volvulus is a surgical emergency.
- ▶ Gastric volvulus is subdivided into three types: Organo-axial, mesentero-axial or a combination of the two.
- ▶ The classical presentation of acute gastric volvulus, occurring in 70%, is that of Borchardt's triad that is, intractable wrenching, sudden epigastric pain and an inability to pass a nasogastric tube into the stomach.
- ▶ Early cross-sectional imaging is vital as prompt diagnosis will improve patient outcome.

Competing interests None.

Patient consent Obtained.

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