A RARE CASE OF ACUTE GASTRIC VOLVULUS IN A YOUNG BOY

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ABSTRACT Gastric volvulus is a rare condition either acute or chronic presentation. The vague presentation makes the diagnosis difficult with subsequent difficulty in management. Borchardt’s triad helps to clinch the diagnosis on a clinical basis; however, barium swallow, CT scan, and endoscopy are more reliable investigations. We describe a case of a 17 year male patient who presented with complaints of 3 days history of abdominal pain over the epigastrium region and distension over the same region. With the initial diagnosis of acute abdomen, the patient was taken for an emergency laparotomy. The diagnosis and the intraoperative findings provided an opportunity to discuss the gastric volvulus condition and its management.

KEYWORDS Acute gastric volvulus, gastric wall necrosis, Borchardt’s triad, total gastrectomy, Roux en Y gastrojejunostomy

Introduction

Multiple cases of acute gastric volvulus have been reported in the literature since 1904, when Borchardt described gastric volvulus[1,2,3]. Gastric volvulus is defined as an acquired rotation of the stomach more than 180 degrees creating a closed-loop obstruction[4]. From obstruction, it can go on to cause strangulation and eventually necrosis of the stomach. The Patient can have varied presentations depending on the degree of rotation and extent of strangulation[5]. Many classifications have been put up for the ease of understanding gastric volvulus. Anatomical variations, including organoaxial, mesenteroaxial, or both; on the onset of symptoms, acute or chronic (symptoms >3 months) or primary/secondary, based on the aetiology[6]. Organoaxial is the commonest type of acute gastric volvulus, which is commonly secondary to paraesophageal hernias[6]. Acute gastric volvulus results in vascular compromise leading to the classical Borchardt’s triad of symptoms, including retching, epigastric pain, and distension. The Barium swallow study is considered the gold standard investigation due to its ability to examine the degree of obstruction and rotation[2,7]. If the patient is hemodynamically stable and can undergo endoscopy, it can confirm the stomach’s tortuous appearance and the diagnosis. A Computed tomography scan can aid in diagnosis but should not delay the time of surgery whenever indicated. Gastric volvulus is a rare surgical emergency that needs prompt diagnosis and early treatment to avoid the dreaded complications. The literature review suggests that in children, only a few acute idiopathic mesenteroaxial gastric volvulus cases have been reported[8]. However, such cases reported in the adult population are very rare. Here, we are presenting an unusual case of acute idiopathic organoaxial gastric volvulus in a young boy of 17 years of age who presented to our emergency ward.

Case report

A 17 year old male patient presented to our emergency room with a history of pain over the epigastrium region with distension for the last 3 days. The pain was associated with nausea, vomiting, a dull aching type, and progressive. Distension was progressive and more in the epigastrium region, extending to the left hypochondriac region. There was no history of fever or systemic disturbances. The patient had heavy meals than usual three days ago, after which he had developed pain. The patient’s vital signs examination showed a pulse rate of 112 beats per minute, blood pressure of 112/70 mm of Hg, respiratory rate
of 18/minutes, and body temperature of 36.5°C.

In the abdominal examination, the patient had more asymmetrical distention over the epigastrium and left hypochondrium and tenderness—abdominal guarding present. Bowel sounds were absent, and digital rectal examination was unremarkable. There was no mass or any other pathological findings seen per abdominally.

Laboratory investigations revealed a high WBC count of 22500/ cu mm (neutrophils 87%). Otherwise, the rest of the haematological and biochemical findings were unremarkable (Haemoglobin - 13.3 gm/dl, platelets – 4.8 lakhs/cu mm, serum urea – 40 mg/dl, serum creatinine – 1.1 mg/dl, sodium – 136 mEq/L, potassium – 5 mEq/L, INR – 1.24).

The erect abdominal radiograph revealed not much information regarding the condition except for the nonspecific gaseous shadow over the left hypochondrium (Figure 1). Ultrasonography of the abdomen suggested aperistaltic bowel loops with fluid in the peritoneal cavity. No air foci were seen, which ruled out the possibility of hollow viscus perforation. Unfortunately, an abdominal CT scan could not be done about the patient’s poor condition. Initial fluid resuscitation was done, and Ryle’s tube was inserted, which drained 1000 cc of dark brown-coloured fluid. The patient was considered for emergency laparotomy.

We performed laparotomy with a midline incision, revealing a relatively enlarged stomach with necrosis of its wall extending from the gastroesophageal junction to just above the
The posterior wall was inspected, which was also necrotic. Crepitus could be felt throughout the stomach wall, but no perforations were seen. The spleen, liver, gallbladder, and duodenum were normal in their anatomical positions and healthy, ruling out the possibility of celiac trunk thrombosis. In addition, the small and large intestine up to the rectum was healthy.

The stomach was resected from the GE junction and at the pylorus, and gastrectomy was done (figure 4). No diaphragmatic hernia was found. The distal pyloric stump was closed in two layers. The jejunum was divided, the distal stump mobilized up to the oesophagus, and oesophagojejunostomy was done using a circular stapler. The proximal jejunal loop was anastomosed to the jejunum through an end-to-side jejunoojejunal anastomosis forming a ‘Y’ loop of Roux [Roux en Y oesophagojejunoanastomosis]. A feeding jejunostomy was done distal to this anastomosis. Two drains were placed one in the pelvis and another at the oesophageojejunal anastomotic site. The abdomen was closed in layers.

Postoperatively the patient was extubated the next day. He had stable vitals. Patient bowel sounds could be appreciated on day 3. He started passing flatus and motion regularly after that. Feeding through jejunostomy was started on day 5, gradually increasing, showing no evidence of leak or any other abnormality (Figure 5). The patient was discharged on postoperative day 15, and now the patient is under follow-up. Histopathological examination of the resected stomach specimen showed a necrotic bowel wall.

**Discussion**

Ischaemic necrosis of the stomach is a rare phenomenon because of the stomach’s rich blood circulation. The important causes of ischaemic necrosis of the stomach can be postoperative complications[9,10], anorexia nervosa and bulimia, psychogenic polyphagia, trauma, gastric volvulus, and spinal conditions[11,12]. Our case is of gastric volvulus, which has presented its dreaded complication of gastric necrosis in an adult patient. Betri reported the first case of gastric volvulus in 1866, and Berg performed the first successfully operated case in 1897[3]. Congenital and acquired defects are the main causes of primary gastric volvulus in around 30% of the reported cases[13].

In contrast, the majority of cases (70%) were diagnosed with secondary gastric volvulus presented with paraesophageal hernias, acquired diaphragmatic defects, or postoperative abdominal adhesions. Acquired diaphragmatic defects, paraesophageal herniations, left lung resection, pleural adhesion, or surgery are frequently observed predisposing factors for gastric volvulus in adults[4]. However, in our patient, thorough elicitation of history has shown no evidence of any past surgeries or trauma to the patient. Furthermore, there found to be no abnormalities with the diaphragm in the intraoperative examination. This favours the diagnosis of idiopathic gastric volvulus.

Gastric volvulus often presents with non-specific symptoms making the diagnosis difficult. The symptoms depend on gastric rotation and obstruction—one-third of the cases present with acute and severe left upper quadrant or lower chest pain. The primary symptoms include severe epigastric pain and distention, retching, and inability to pass the nasogastric tube referred to as Borchardt’s triad. Our patient also had presented with progressive epigastric pain and distention with retching for 3 days. Finally, however, we could pass the nasogastric tube, which was thought to be the self-de-rotation of the stomach due to ischaemic and necrotic changes. Organoaxial type of
gastric volvulus, the most frequent type (59%), presents with strangulation and necrosis in 5-28% of cases. In this type, the stomach rotates at the longitudinal axis due to the fixity of the duodenum and the gastroesophageal junction, which leads to anterior rotation of the greater curvature, causing obstruction and strangulation.

The exact cause of gastric volvulus remains unclear. However, the pathogenesis of gastric volvulus could be explained by relaxation of the gastroplenic and gastrocolic ligaments, which may cause gastric distention and lead to rotation, eventually leading to the development of volvulus. Our patient’s stomach was found to be hugely distended and displaced.

Diagnosis of gastric volvulus depends on clinical suspicion and radiological findings. Abdominal radiographs can provide a clue in suspected cases. Computed tomography can provide more accurate details of anatomy and can clinch the diagnosis. An abdominal radiograph showed a non-specific gastric shadow in the left hypochondrium in our patient. Unfortunately, computed tomography could not be done due to the patient’s ill condition, which mandated emergency laparotomy.

A literature review suggests immediate surgical intervention comprising emergency laparotomy following the diagnosis of acute gastric volvulus. The goal of the surgical procedure is to repair the volvulus and limit the chance of recurrence through stomach fixation. The preferred surgical techniques are anterior gastropexy, in which the greater curvature of the stomach is fixed to the anterior abdominal wall. Other procedures include gastropexy with the division of gastrocolic omentum, partial gastrectomy, diaphragmatic crura reapproximation, Hiatal repair, and fundo-antral gastrogastrostomy (Opolzer’s technique). Assessment of gastric viability within the operation is crucial to assist in surgery planning and resecting the gangrenous portion, as was the case in our patient. Conservative approaches like endoscopic reduction are confined to clinically stable and elderly patients with a less physiologic reserve and chronic gastric volvulus. In recent times laparoscopy is gaining more attention as was the case in our patient.

In treating gastric volvulus, with some studies demonstrating satisfactory results. However, data comparing laparoscopy to open procedures is still scant and is open for further study. In our patient, we performed laparotomy through a midline incision and found that the stomach was entirely necrotic. We performed total gastrectomy with Roux-en-Y oesophagojejunostomy using the circular stapler and a distal feeding jejunostomy. The post-operative period was uneventful.

**Conclusion**

Acute gastric volvulus is one of the rare presentations in a young adult patient. It carries high morbidity and mortality if not treated early. It needs high clinical suspicion and early diagnosis to avoid its dreaded complications, including gastric ischemia, necrosis, and perforation. The Patient’s clinical presentation and radiological findings can clinch the diagnosis. However, intraoperative diagnosis is also not uncommon. The management of gastric volvulus mainly depends on the degree of rotation and the necrotic part of the stomach. Prompt treatment of the condition can be life-saving for the patients.

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**Conflict of interest**

There are no conflicts of interest to declare by any of the authors of this study.

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