Acute gastric volvulus: A vicious twist of tummy-case report

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ARTICLE INFO

Article history:
Received 26 October 2016
Received in revised form 9 December 2016
Accepted 9 December 2016
Available online 11 December 2016

Keywords:
Primary gastric volvulus
Organoaxial
Gastric gangrene
Borchardt’s triad
Acute gastric volvulus
Total gastrectomy

ABSTRACT

INTRODUCTION: Gastric volvulus is an uncommon disorder and can present either in the acute or chronic setting with variable symptoms. A robust blood supply of the stomach from different sources does not allow ischemia to develop early. When it occurs in the acute scenario, patients present with severe epigastric pain and retching without vomiting. Together with inability to pass nasogastric tube, they constitute Borchardt’s triad.

PRESENTATION OF CASE: We report a case which presented in the emergency department with severe abdominal pain, abdominal distension and vomiting and a previous history of pulmonary tuberculosis. An incidental finding of uterovaginal prolapse was present. A diagnosis of acute gastric volvulus with peritonitis was made and total gastrectomy with Roux-en-Y esophagojejunostomy for gangrenous and perforated stomach was performed.

DISCUSSION: Primary gastric volvulus occurs in the absence of any defect in the diaphragm or adjacent organ pathology and may be caused by weakening of gastric supports. We wish to highlight if there is a possible association of primary gastric volvulus with uterovaginal prolapse reflecting a general laxity of body ligaments or with fibrosis of the lung secondary to pulmonary tuberculosis resulting into the twisting of the stomach.

CONCLUSION: Acute gastric volvulus is a surgical emergency requiring early diagnosis and aggressive management, as a delay results into complications like gangrene and perforation which substantially increase the morbidity and mortality in these patients.

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1. Introduction

Gastric volvulus is an abnormal rotation of the stomach by more than 180°. It is a rare clinical entity that is difficult to diagnose and can be fatal in the acute scenario. Borchardt’s triad of severe epigastric pain, retching and inability to pass a nasogastric tube is present in 70% cases and is believed to be diagnostic for acute gastric volvulus [1]. Complications include gastric ischemia, gangrene, perforation, pancreatic necrosis [2], omental avulsion [3] and even splenic rupture [4] in few cases. The rarity of the disease accounts for the associated high mortality (30–50%) and hence requires high index of clinical suspicion [5]. A prompt and correct diagnosis followed by immediate surgery remains the key factor in reducing the morbidity and mortality.

2. Presentation of case

A 35 years old lady presented in the emergency ward with the complaints of pain in abdomen and nonbilious vomiting for last 2 days. Pain was gradual in onset, starting from upper part of abdomen. It quickly increased in intensity and spread to whole abdomen. There was history of low grade, intermittent fever and productive cough for last 10 days. There was no history of hematemesis. Patient was diagnosed with pulmonary tuberculosis 2 years back for which she took antitubercular treatment for 18 months. Patient had no other comorbidities. There was no history of trauma or any surgical intervention.

On examination, she was pale, severely dehydrated with sunken eyes. She was tachypneic, had pulse rate of 120/min and her blood pressure was 90/60 mm of Hg. Abdominal examination revealed marked distension in the epigastrium and umbilical region with generalized tenderness, guarding and rigidity. Bowel sounds were absent. All the hernial sites were normal and digital rectal examination was also normal. Chest auscultation revealed decreased air entry on the left side and bilateral coarse crepitation. Incidentally, she had third degree uterovaginal prolapse (Patient had two normal vaginal deliveries and there was no history of any pelvic trauma or surgery).

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http://dx.doi.org/10.1016/j.ijscr.2016.12.005
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Patient was resuscitated with intravenous fluids to correct dehydration and electrolyte imbalance. A nasogastric tube was attempted but could not be passed through. Patient was investigated and her haemoglobin was 9.1 g/dL with leucocytosis (white cell count = 17,400/mm\(^3\)). Renal function test were normal. X-Ray chest PA view showed opaque left hemithorax with leftward shift of mediastinum and fibrobronchietatic opacities in right upper and middle zones (Fig. 1). Plain X-Ray abdomen revealed a single massively distended viscus occupying almost whole of the abdomen, predominantly in the epigastrium and the umbilical region, showing a large fluid level in erect position (Fig. 2). Ultrasound abdomen was compromised due to bowel gases. Based on the clinical features and typical finding on X-Ray abdomen, a provisional diagnosis of acute gastric volvulus with peritonitis was made.

Emergency exploratory laparotomy was performed in view of generalized peritonitis. On exploration, 500 ml of blackish, foul smelling toxic fluid was drained from the general peritoneal cavity. Stomach was markedly distended, twisted (organoaxially) and gangrene was present at the fundus and body (Fig. 3). A single 1.5 cm × 1.5 cm perforation was found in the upper part of the greater curvature of the stomach. Left dome of the diaphragm was intact. Rest of the abdominal viscera were normal. Total gastrectomy with Roux-en-Y esophagojunostomy was performed (Fig. 4) with placement of left subdiaphragmatic drain near the esophagojunostomy and another in the Morrison's pouch near the duodenal stump. Postoperatively, patient required ventilatory support due to poor respiratory function in an intensive care unit. She was started enteral feeds via nasoejunal tube from 5th postop day. She started taking oral feeds after weaning off from the ventilator and removal of nasoejunal tube. Postoperative CECT chest revealed bronchiectasis with fibrotic cavities in right lung and chronic empyema on the left side (Fig. 5). Sputum for acid-fast bacilli was positive and a diagnosis of relapse of pulmonary Koch's was made. She was put on category II antitubercular treatment and was discharged on 15th postop day.

3. Discussion

Volvulus is described as more than 180° rotation of a hollow viscus around its mesentery, resulting in obstruction, impairment of vascularity and eventually ischemia. Most common organ to undergo volvulus in adults is sigmoid colon, followed by caecum to a lesser extent. Gastric volvulus is very uncommon, usually presenting in the 5th decade [6]. It can present either in the acute or chronic form. Acute gastric volvulus may lead to gangrene in 5–28% of the patients [7]. There is no sex or racial predilection [8].

Fig. 1. Showing opaque left hemithorax with bronchiectatic changes on right side.

Fig. 2. (a) Shows single large air-fluid level. (b) Shows single large gaseous shadow.
Gastric volvulus can be classified on the basis of the underlying etiology as primary or secondary. In approximately 70% cases, it occurs secondary to anatomical or functional disorders of the stomach or of the adjacent structures like spleen and diaphragm [5]. The most common association in adults is with paraesophageal hernia. Other causes include trauma, eventration of diaphragm [9] and phrenic nerve palsy [10]. Primary gastric volvulus occurs due to malignancy, adhesions or failure of the gastric supports namely gastrocolic, gastroepiploic, gastroepiploic, and gastrohepatic ligaments. In our case, the gastric volvulus was of primary type without any associated diaphragmatic defect or paraesophageal hernia. As the patient also had third degree uterine prolapse, it might indicate the general laxity of the ligaments contributing to the rotation of stomach resulting in organoaxial volvulus. Patient also had active pulmonary tuberculosis with fibrosis on the left side and mediastinal shift to left. It is not known whether this contributes to the occurrence of volvulus or not.

Based on the axis of rotation, it can be organoaxial or mesenteroaxial or combined. Organoaxial variety is the commonest (60% cases) and is characterized by rotation of the stomach about an axis passing through the gastroesophageal junction and pylorus, with greater curvature lying superior to the lesser curvature [11]. Mesenteroaxial type is less common in which stomach rotates about an axis passing perpendicular to the longitudinal axis of stomach. Stomach lies in the vertical plane with antrum and pylorus lying anterior and superior to the gastroesophageal junction. The rarest variety is the combined form. In our case, the gastric volvulus was of organoaxial type. Patient had developed gangrene of the fundus and body of stomach with perforation as the patient presented to the hospital 2 days after the onset of symptoms.

Patients with acute gastric volvulus typically present with Borchardt’s triad of pain in epigastrium or lower chest associated with severe retching and inability to pass a nasogastric tube. Similar presentation was noted in our case. The chronic form of the disease presents with dysphagia, dyspepsia and intermittent pain after intake of meals. The symptoms may resemble that of peptic ulcer disease, gastritis, cholecystitis or even angina pectoris [12]. It may reduce spontaneously leading to delay in diagnosis and treatment.

A clinical diagnosis is usually difficult as the disease is very uncommon. X-Ray chest may show a retrocardiac air filled mass suggestive of an intrathoracic stomach herniating through the diaphragm. Abdominal radiographs may show a single large gas shadow with paucity of distal bowel gases, consistent with a distended fluid filled stomach which was present in our case. In chronic cases especially associated with paraesophageal hernia, barium study is the gold standard [6]. Computed tomography of abdomen can confirm the diagnosis and also identify the transition point [13]. According to Singham et al., CT abdomen should be the first line of investigation [14].

Management of gastric volvulus depends upon its presentation, the cause and the general condition of the patient. Acute presentation requires immediate surgical intervention after correction of fluid and electrolyte imbalances. Chronic forms may be man-

Fig. 3. Showing distended and gangrenous stomach.

Fig. 4. Showing end to end esophago-jejunostomy.
aged conservatively or repaired in a planned way with satisfactory outcomes.

In the emergency laparotomy, if the stomach is not gangrenous, reduction of the volvulus with anterior gastropexy is the most commonly performed procedure. The greater curvature of the stomach is fixed to the undersurface of the anterior abdominal wall. Partial or total gastrectomy may be required in cases of gangrene or perforation of stomach [5]. To the best of our knowledge, very few cases of gastric volvulus requiring total gastrectomy have been reported in the literature [15–17]. Several other procedures have been described in literature such as diaphragmatic hernia repair, gastropexy with division of gastrocolic ligament (Tanner’s operation), fundo-antral gastrogastrostomy (Opolzer’s operation), repair of diaphragmatic eventration [8]. Nissen’s fundoplication is done in case of hiatal hernia [18]. In our case, gangrene of stomach was present involving the fundus and whole body of stomach along with a perforation on the greater curvature. So we had to perform total gastrectomy with Roux-en-Y esophageojunostomy. Meena et al. reported a similar case of mesenteroaxial volvulus with gangrene of stomach sparing the antrum. They performed an esophagogastric anastomosis with pyloric dilatation, thus preventing bile reflux and preserving some reservoir function of the stomach [19]. Jethwani et al. reported a case of strangulated volvulus with diaphragmatic eventration in a young girl. Patient underwent partial gastrectomy with anterior gastropexy and repair of eventration [20].

Conservative management is recommended in chronic form of the disease especially in the elderly age group. Conservative approach involves endoscopic reduction or percutaneous endoscopic gastrostomy [6]. However, there is a considerable risk of gastric perforation and hence patients have to be selected carefully. Minimally invasive surgical approaches include laparoscopic fundoplication and repair of hiatal and paraesophageal hernia. Laparoscopic repair is associated with lesser complications, shorter hospitalization and is particularly indicated in patients with chronic volvulus [5].

4. Conclusion

Acute gastric volvulus is a surgical emergency with high morbidity and mortality. The most important factor in diagnosing acute volvulus of stomach is high index of suspicion. Constellation of clinical symptoms with radiological studies helps in making the diagnosis. Emergency laparotomy is needed to prevent serious complications like gangrene and perforation.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Conflict of interest statement

None. This work has been reported in line with the SCARE criteria.

Source of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author contribution

Dr. Basudev Kumar was the chief operating surgeon in the case. All the authors were involved in patient management in the postoperative period. Dr. Basudev Kumar, Dr. Tarun Kalra, Dr. Ratnakar Namdeo equally contributed in collection of data from the preoperative, intraoperative and postoperative periods and in drafting the case report. Dr. Rajesh K. Soni and Dr. Ajit Sinha further contributed by editing and proof reading the report and gave its final form for submission. All the authors had read and approved the final report.

Figure 5. Shows tree in bud appearance on CECT chest suggestive of active tuberculosis.
Guarantor
Dr. Rajesh K. Soni.

Ethical approval
Not required.

Acknowledgements
None.

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