

Gastric Volvulus Associated with Eventration of Diaphragm

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Abstract

Diaphragmatic eventration is an abnormally elevated hemidiaphragm in thoracic cavity with poorly developed musculature. This condition can lead to abnormal displacement of intra-abdominal organs. It usually remains asymptomatic in early life. It presents later with respiratory and occasionally gastrointestinal complications. A clinical case of eventration of diaphragm, displacement of the splenic flexure of colon, omentum and spleen into thoracic cavity with gastric volvulus is uncommon. Gastric volvulus occurs when the stomach twists around one of its axis. It is commonly along its long axis (organoaxial volvulus) and less commonly along the vertical axis (mesenteroaxial). Mortality rate of gastric volvulus range from 30%-50%. Hence early diagnosis and prompt intervention prevents development of necrosis and perforation of stomach. We report a case of 30year old male having left sided diaphragmatic eventration associated with organoaxial gastric volvulus and displaced intra-abdominal organs treated with successful surgical intervention.

Key words: Eventration; Diaphragm; Gastric; Volvulus; Malrotation; Organo-axial; Mesentero-axial, Gastric outlet obstruction, Derotation; Gastropexy.

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Introduction

Gastric volvulus is an uncommon condition. In 1886, Berti was the first to describe a gastric volvulus after performing an autopsy on female patient and first surgery performed by Berg in 1897. It occurs when the stomach twists around one of its axis. Typically, the stomach twists along its long axis (organoaxial volvulus) in two third cases, it is usually acute and associated with diaphragmatic defect. Along the vertical axis (mesenteroaxial) in one third cases, it is partial (< 180 degrees), recurrent and not associated with anatomical defect in the diaphragm.

Eventration of diaphragm is defined as an abnormal elevation of an intact diaphragm. This is usually congenital in nature due to incomplete muscularization of diaphragm. It may be acquired due to phrenic nerve injury. It presents later in life with respiratory and occasionally GI symptoms associated with gastric volvulus.

Major symptoms at presentation are sudden, severe and constant abdominal pain, distension and vomiting. Mortality rate of acute gastric volvulus range from 30%-50% caused mostly by strangulation, thus highlighting the importance of timely diagnosis and surgical management. We here present a rare case of acute gastric volvulus with eventration of diaphragm treated with derotation and gastropexy.

Case Presentation

A 30 year old male presented with complains of abdominal pain and distension from 2 days. Pain was sudden in onset, colicky type, continuous, severe intensity, increased with food intake associated with Vomiting 2-3 episodes, contained food particles. H/o breathing difficulty since 1 day, increases in supine position. Occasional alcohol intake since 5 years. No significant past surgical / medical history. Patient was conscious and oriented with temperature of 98.7 F, pulse 100bpm and blood pressure 150/100mmHg. 90% Oxygen saturation at room air, 98% with 2L O₂, with respiratory rate of 24cpm. Physical examination revealed diffusely distended abdomen with epigastric tenderness, guarding present, No rigidity, bowel sounds sluggish. Complete haemogram showed elevated leucocyte count. Rest of the laboratory parameters were within normal limits.



Fig. 1: Chest X-ray showing mediastinal shift to the right, collapse of lower zones of left lung and presence of bowel in the left thoracic cavity.



Fig. 2: Erect X ray abdomen (Fig. 2) shows elevated left hemidiaphragm with bowels in the thorax. USG ABDOMEN & PELVIS: Grossly distended fluid filled abdomen with mild splenomegaly.



Fig. 3:

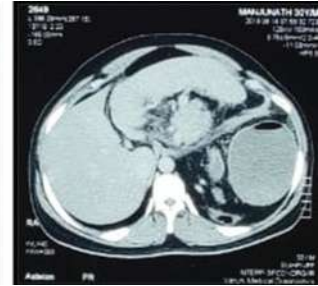


Fig. 4:

(**Fig. 3 and 4**) CECT ABDOMEN Large defect in the left hemidiaphragm measuring 10.5 x 9.9cm with herniation of the pylorus of the stomach, splenic flexure of the colon and omentum into the left hemithorax suggestive of Gastric volvulus with no evidence of perforation. Left lung lower lobe consolidation.

Patient underwent emergency laparotomy with anterior gastropexy with mesh placement.

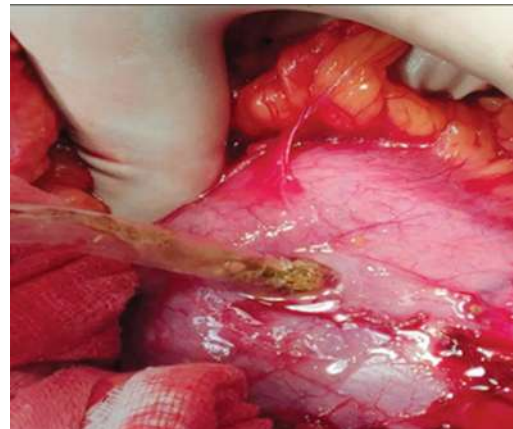


Fig. 5: Intra op Grossly distended stomach with malrotation.

Enterotomy done and aspirated 8.5 litres of partially digested food particles. Derotation of stomach done by releasing all supporting ligaments. Colon and omentum reduced from left hemithorax into the peritoneal cavity and mesh placed over the diaphragm. Spleen is noted in the left paramedian position. Anterior Gastropexy done. Feeding jejunostomy done. ADK drain placed in-situ. ICD placed in the left hemithorax Patient shifted to ICU and shifted to ward on 2nd day. ICD removed on POD3. Patient developed burst abdomen on POD10. Tension suturing done after thorough peritoneal wash. FJ retained. ADK drain placed in-situ. Sutures removed after POD15. Patient recovered well, with no recurrence of symptoms.

Discussion

Elevation of the diaphragm can be congenital or acquired. Congenital eventration of diaphragm is an abnormal elevation of one leaf of intact diaphragm

characterized by a developmental abnormality of the diaphragm musculature. Eventration can be unilateral or bilateral. The left side is affected more often than the right, and males are affected more often than females. The affected diaphragm may consist of a fascial layer with few or no muscle fibers. Phrenic nerve is normal in all congenital cases. Acquired diaphragmatic eventration is seen in phrenic nerve injury.

Gastric volvulus is defined as an abnormal rotation of the stomach leading to gastric outlet obstruction. Approximately 80% of GV cases occur in adults. The exact incidence of GV is unknown. The volvulus can be classified as organoaxial, where the stomach rotates around an axis that connects the gastroesophageal junction and the pylorus; mesenteroaxial, where the rotation occurs around an axis that bisects both the lesser and greater curve; or mixed. Strangulation is less likely to occur in mesenteroaxial volvulus, where spontaneous detorsions with recurrent acute episodes may occur.

Primary volvulus (25–30%) has been associated with the absence or laxity of the gastrocolic or gastrosplenic ligaments. Secondary volvulus (70–75%) is always associated with underlying para esophageal and diaphragmatic hernias, connective tissue disorders, adhesions and anterior abdominal wall defects. The clinical presentation depends on the degree of rotation and time of onset. Acute volvulus usually presents with abdominal or chest pain, severe vomiting and epigastric distension. Borchardt triad (pain, retching and inability to pass a nasogastric tube) occurs in up to 70% of cases. Mortality of acute volvulus varies from 30 to 50%. Chronic volvulus presents with non specific symptoms like vomiting, epigastric pain, distension, early satiety, retching and gastrooesophageal reflux.

The diagnosis is frequently made by an abdominal radiograph and CT scan which provides with specific details of the anatomical abnormalities. On endoscopy, distortion of gastric anatomy with difficulty intubating the stomach or the pylorus is highly suggestive. Progressive ischaemic ulceration, or mucosal fissuring suggests late stage disease with strangulation. Acute volvulus is an abdominal emergency and early surgery is mandatory. Delayed diagnosis may result in strangulation, ischaemia and necrosis with perforation, leading to shock and septicemia. In chronic volvulus, surgery is the preferred treatment however it can be managed conservatively with prokinetic agents and anti-secretory therapy. It is

important to consider patients age, comorbidity, physical performance, life expectancy to decide on treatment modality.

Symptomatic gastric volvulus associated with diaphragmatic eventration is a surgical emergency and always requires surgical repair. Definitive treatment includes gastric decompression, reduction of the volvulus, repair of the predisposing anatomical defects and fixation of the stomach. Nonviable or gangrenous areas may require subtotal or total gastrectomy. Our patient underwent exploratory laparotomy with reduction of volvulus and anterior gastropexy with mesh placement. Abdominal approach in this case facilitated safe reduction of the thoracic contents back into the abdomen. Recently, endoscopic reduction of the gastric volvulus, percutaneous endoscopic gastropexy, and laparoscopic gastropexy for a gastric volvulus have been reported to be safe and effective.

Conclusion

This report describes a rare case of diaphragmatic eventration with acute organoaxial gastric volvulus. Non-specific symptoms and signs may lead to delay in diagnosis. Early diagnosis by clinical suspicion and appropriate imaging combined with prompt surgical management is the key to prevent life-threatening complications. Surgery must be offered according to the etiology and to the patient's characteristics.

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