

# Gastric Volvulus – A Diagnostic Dilemma

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**Abstract:** Gastric volvulus is a rare disease and it is defined as an acquired rotation of the stomach or parts there of more than 180 degree creating a closed loop obstruction. Gastric volvulus is a potentially life-threatening entity and most cases of gastric volvulus occur in association with eventration of left hemidiaphragm or a hiatal hernia. Unless it stays in the back of the emergency physicians' mind, diagnosis of gastric volvulus, which can have significant morbidity and mortality associated with it, can be easily missed. Early radiological imaging with x-ray, barium study or computed tomography (CT) can facilitate the management of the patient. Here we present two cases of chronic gastric volvulus; in 1st case there was gastric volvulus with eventration of diaphragm and in 2nd case gastric volvulus was seen in a case of diaphragmatic hernia.

**Keywords:** Gastric volvulus, Diaphragmatic Hernia, Eventration, Obstruction.

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## 1. INTRODUCTION

Gastric volvulus (Latin *volvare*, to roll) is defined as torsion of more than 180° of the stomach around itself<sup>1</sup>. A brief History revolves around 3 B's—it was first described by Berti in 1866, First successful operation was done by Berg in 1896 and First delineation of classic triad of Borchardt in 1904<sup>2</sup>. Gastric volvulus is rare as stomach is secured in place by the gastrophrenic ligaments, esophageal hiatus, retroperitoneal fixation of the duodenum, short gastric vessels and gastro colic ligament. It occurs only when these attachments are lax or absent. Secondary causes are eventration of the diaphragm, diaphragmatic hernia, congenital bands, wandering spleen and paraesophageal hernia<sup>3</sup>. The clinical symptoms of gastric volvulus depend on the duration of onset, type of volvulus and extent of obstruction. Obstruction may manifest as an acute, recurrent or chronic condition<sup>1,4</sup>. Patients may exhibit classical triad of Borchardt's – epigastric distension, violent unproductive retching and inability to pass a nasogastric tube. The features result from obstruction at the gastroesophageal and pyloric ends. This triad may be seen up to 30% of adults but is rare in children<sup>5,6</sup>.

Here we present two cases of chronic gastric volvulus; in 1<sup>st</sup> case there was gastric volvulus with eventration of diaphragm and in 2<sup>nd</sup> case gastric volvulus was seen in a case of diaphragmatic hernia.

## 2. CASE REPORT

### CASE 1:

A 14 year old boy presented to medical outpatient department with off and on swelling in epigastrium (Figure 1), spherical in shape associated with pain which aggravates on taking meals and subsides on its own or may be after vomiting. Patient was kept NPO and Ryle's tube was passed with difficulty and caused decompression of stomach. Patient was referred with suspicion of Gastric Outlet Obstruction (GOO) with CECT abdomen suggestive of distended stomach with fluid level consistent with GOO (?? tubercular). There was no obstructing mass noted on CECT. Plain chest x-ray and Barium meal study were done (Figure 2) suggestive of gastric volvulus. Exploratory laparotomy was done and eventration of diaphragm with gastric volvulus was found. Gastric mobilization with plication of diaphragm along with anterior gastropexy was done (Figure 3). Post operative period was uneventful and patient was discharged with stable vitals under satisfactory condition.



Figure: 1. Upper Abdomen Swelling after taking meals

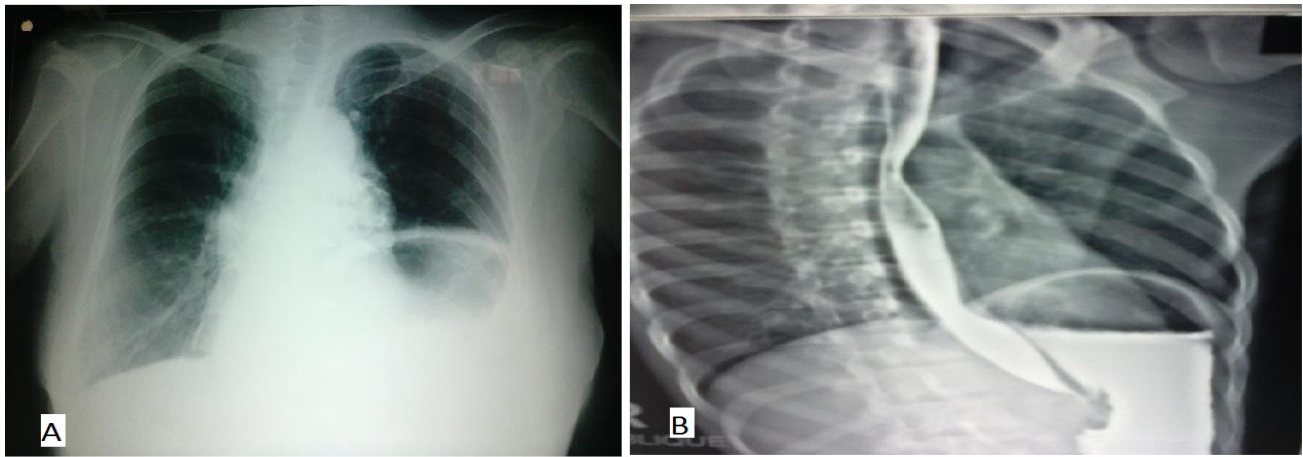


Figure 2- A) X ray Chest PA view- shows Left dome of diaphragm is higher in position  
B) Rt Oblique View- Barium study shows fundus and body of stomach higher than GE junction



Figure: 3. Intraoperative photo showing Stiches applied on lesser curvature, greater curvature, fundus and pylorus to anterior abdominal wall.

#### CASE 2:

A 21 year old man presented to surgical OPD with c/o recurrent retching, heart burn and dysphagia. On examination there was diminished breath sound on left lower chest. Two years back there was history of dyspnoea for which left sided ICD was done which resulted in passage of food particles from ICD. The tube came out of its own, the wound healed slowly but there were recurrent attacks of pain and cough. Upper GI endoscopy (Figure 4) was done outside showed stricture at gastro oesophageal junction. Repeat endoscopy and dilatation of stricture was performed which resulted in partial dilation and repeat endoscopy was planned after two days. The patient developed severe chest pain after the procedure. Patient

was kept on conservative line to let things settle down then Barium meal (Figure 5) was done which showed delayed passage of dye through GE junction, suggestive of diaphragmatic hernia and gastric volvulus. Exploratory laparotomy and left sided thoracotomy was done (Figure 6) which revealed Bochdalek type congenital diaphragmatic hernia and gastric volvulus with perforation near GE junction. Abdominal contents (stomach, transverse colon, spleen, etc) was pushed down and anterior gastropexy with repair of diaphragm and rent in GE junction with fundoplication was done. Post operatively there was chest infections which subsequently subsided and patient was discharged satisfactorily.

### 3. DISCUSSION

There are two types of gastric volvulus: organoaxial and mesenteroaxial. The most common type is organoaxial, in which the stomach rotates along the longitudinal axis and is associated with paraesophageal hernias. The mesenteroaxial type, in which the stomach rotates between the lesser and greater curvatures, is believed to be idiopathic, causing chronic symptoms<sup>7</sup>. The presence of persistent vomiting and epigastric pain despite initial antiemetic treatment should trigger one to think of gastric volvulus, despite the patient appearing very stable and healthy.

In gastric volvulus, the etiology of the rotation is either primary or secondary. Primary refers to the absence of diaphragmatic defects or intra-abdominal abnormality causing the volvulus and also it may be seen in children with different ages<sup>8</sup>. Laxity of the ligaments which anchors the stomach in place within the abdominal cavity is a common cause. Lengthening of the ligaments due to stretching gives rise to abnormal rotation of the mesentery. In 30% of gastric volvuli, there is a primary cause. Secondary gastric volvulus have alternative causes, including congenital or traumatic diaphragmatic hernias, hiatal hernias, diaphragmatic eventration, abdominal bands or adhesions<sup>9</sup>. Many cases occur with a paraesophageal hernia or diaphragmatic eventration like our patients.

Treatment can be either surgical or medical in nature. Conservative management consists of endoscopic reduction or percutaneous endoscopic gastrostomy. The risk of gastric perforation is significant in conservative treatment. Therefore, patients should be considered carefully for conservative treatment. The gold standard is open laparotomy with detorsion and revention with anterior gastropexy. Nissen fundoplication decreases future occurrences in patients with a hiatal hernia<sup>10</sup>.

Diaphragmatic eventration refers to permanent elevation of an immobile hemidiaphragm in which peripheral muscular attachment is normal with no interruption in peritoneal or pleural layers. It may be congenital or acquired owing to phrenic nerve dysfunction. Phrenic nerve dysfunction may result from adjoining inflammation, trauma (birth, external or surgical) or involvement by neoplastic pathology. The congenital type is usually present in childhood. In adults, however, it tends to remain undetected as it is mostly asymptomatic. The patient may present with chest complaints, e.g. respiratory distress and dyspnoea on exertion, or abdominal complaints, e.g. epigastric pain, belching and dysphagia. Eventration may be further complicated by acute gastric volvulus, chronic gastric volvulus or chronic recurrent volvulus of the splenic flexure of the colon. Perforation in gastric volvulus is rare; only a few cases have been reported<sup>11-13</sup>. Perforation may be secondary to strangulation, which is more common with organo-axial volvulus. The incidence of strangulation may be as high as 28% in acute gastric volvulus<sup>14, 15</sup>. Perforation may also result from trauma by the tip of the nasogastric tube<sup>13</sup>, emphasising the need to remain careful while inserting nasogastric tube in such a patient.

A Bochdalek hernia results when there is failure of closure of the diaphragm posteriorly during embryogenesis. This opening is generally found to be a 2-cm defect located just superior to the adrenal gland<sup>16</sup>. Symptomatic Bochdalek hernias in adults are relatively rare, but the incidence of asymptomatic Bochdalek hernias in the adult population has been estimated to be anywhere between 1 in 2000 to 7000 based on autopsy studies<sup>17, 18</sup> to as high as 6% in early CT findings<sup>19</sup>.

The symptoms associated with Bochdalek hernias are most often pulmonary or gastrointestinal in nature. Symptomatic Bochdalek hernias in adults are typically manifested as gastrointestinal symptoms related to obstruction of the herniated organ<sup>20</sup>. Contents of left-sided Bochdalek hernias may include colon, stomach, spleen, small bowel, omentum, pancreas, and adrenal gland<sup>21</sup>.

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#### 4. CONCLUSION

Two patients who came to this hospital in short span were diagnosed by upper GI series. Gastric volvulus is complicated by eventration of diaphragm and congenital diaphragmatic defect. A high index of suspicion supplemented with barium studies may solve this complex problem.

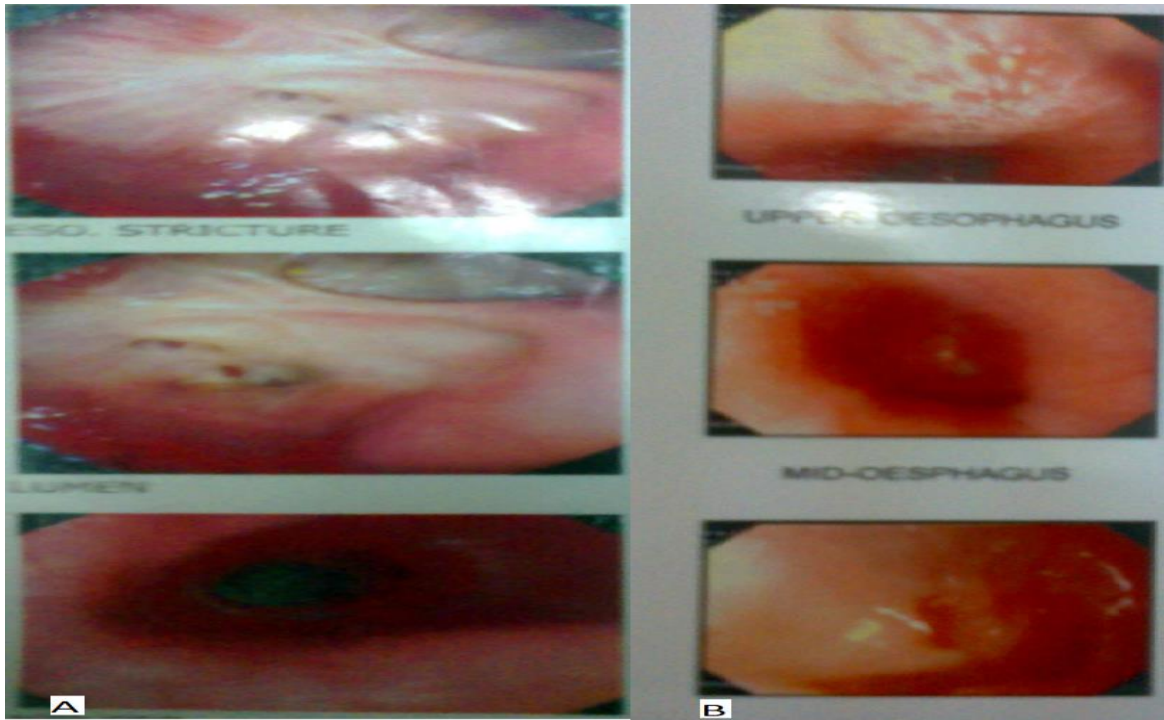


Figure 4- A) Endoscopy suggestive of esophageal stricture  
B) Dilatation was supposedly partly successful but actually resulted in perforation

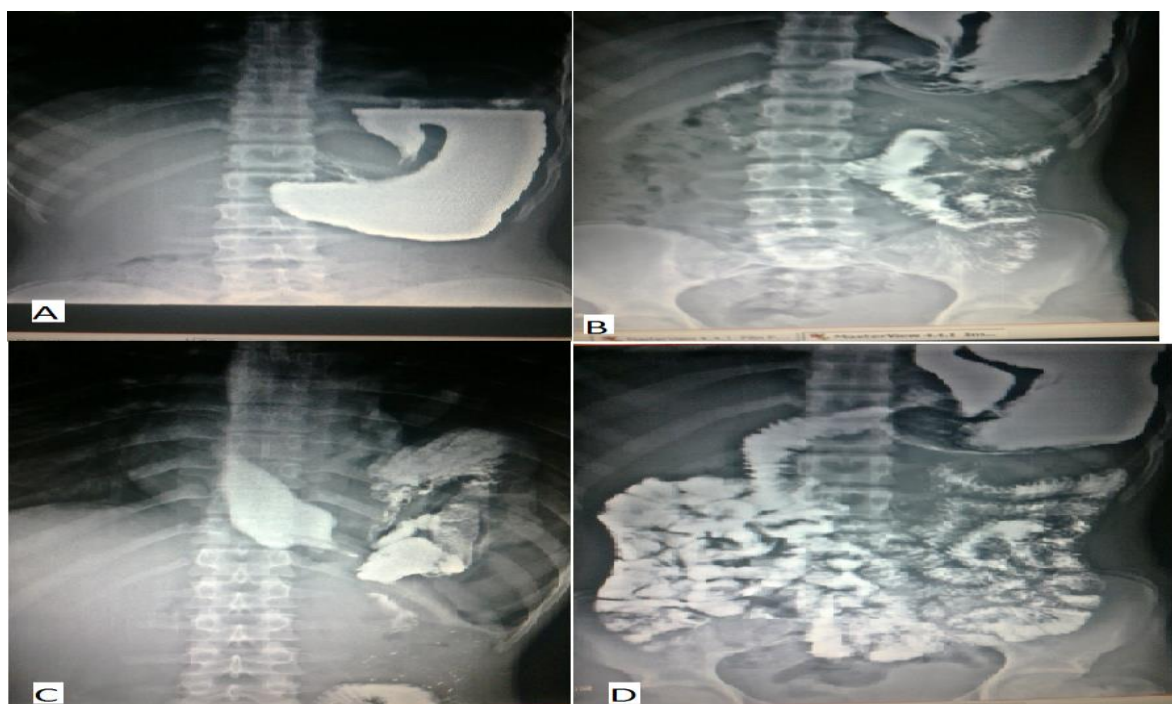
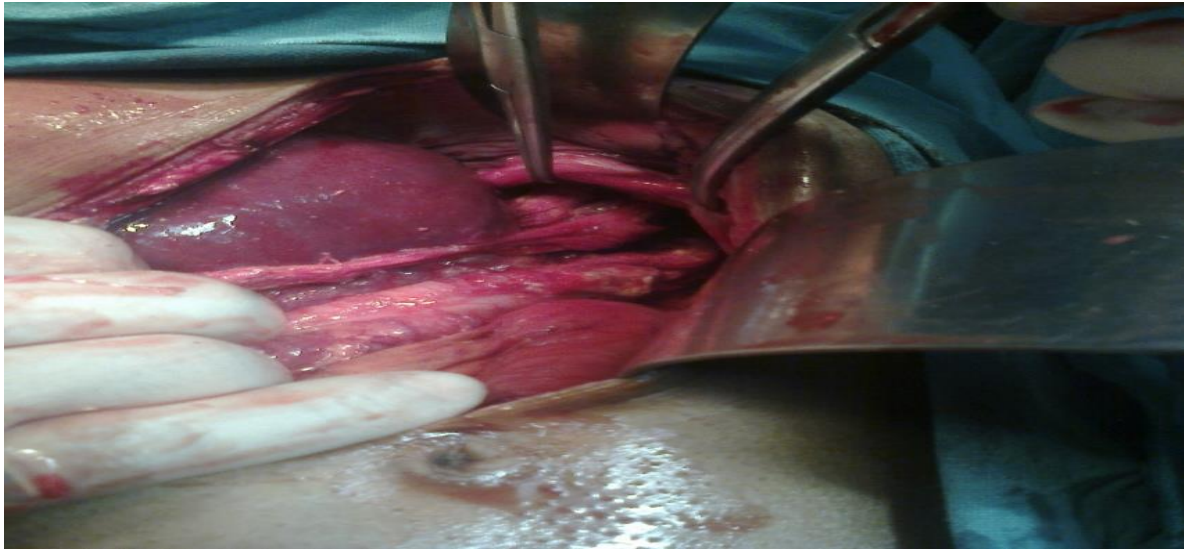


Figure: 5 (A-D). Stomach has rotated so that antrum is higher in position and GE junction, fundus and body are lower in position



**Figure: 6. Intraoperative photo showing herniation of stomach and bowel.**

#### REFERENCES

- [1] Cribbs RK, Gow KW, Wulkan ML. Gastric volvulus in infants and children. *Pediatrics* 2008,122(3):e752-62. Epub 2008 Aug 4.
- [2] Berti A (1886) Singolare attortigliamento dell' esofago col duodeno sequito da rapida morte, *Gass Med Ital* 9:139
- [3] Scherer LR, Haller JA (1992) Gastrostomy in infants and children: gastric volvulus, In Scott HW Jr, Sawyers J: *Surgery of the stomach, duodenum, and small intestine*, ed 2, Boston, Blackwell Scientific Publications
- [4] Rashid F, Thangarajah T, Mulvey D, Larvin M, Iftikhar SY. A review article on gastric volvulus: a challenge to diagnosis and management. *Int J Surg* 2010,8(1):18-24. Epub 2009 Nov 10.
- [5] Mayo A, Erez I, Lazar L, Rathaus V, Konen O, Freud E (2001) Volvulus of the stomach in childhood: the spectrum of the disease. *Pediatr Emerg Care* 17(5):344-348
- [6] Borchardt M (1904) Zur Pathologie and Therapie des Magenvolvulus, *Arch Kin Chir* 74:243
- [7] Moy RK, Salazar AM, Chan SB. Inability to pass a nasogastric tube: a surgical emergency. *Am J Emerg Med* 2007; 25: 213-5.
- [8] Andiran F, Tanyel FC, Balkancı F, Hiçsönmez A. Acute abdomen due to gastric volvulus: Diagnostic value of a single plain radiograph. *Pediatr Radiol* 1995; 25 Suppl 1: S240.
- [9] Chau B, Dufel S. Gastric volvulus. *Emerg Med J* 2007; 24: 446- 7.
- [10] Machado NO, Rao BA. Gastric volvulus with identifiable cause in adults. Presentation and management. *Saudi Med J* 2004; 25: 2032-4.
- [11] Kim HS, Yoo JS, Han SJ, Park H. Chronic recurrent volvulus of the colonic splenic flexure associated with the eventration of left diaphragm. *Korean J Gastroenterol* 2007;49(1):37-40.
- [12] Oh A, Gulati G, Sherman ML, Golub R, Kutin N. Bilateral eventration of the diaphragm with perforated gastric volvulus in an adolescent. *J Pediatr Surg* 2000;35(12):1824-1826.
- [13] Sharma S, Gopal SC. Gastric volvulus with perforation in association with congenital diaphragmatic hernia. *Indian J Pediatr* 2004;71(10):948.
- [14] Farag S, Fiallo V, Nash S, Navab F. Gastric perforation in a case of gastric volvulus. *Am J Gastroenterol* 1996;91(9):1863-1864.

- [15] Carter R, Brewer LA 3rd, Hinshaw DB. Acute gastric volvulus. A study of 25 cases. *Am J Surg* 1980;140(1):99-106.
- [16] Hung YH, Chien YH, Yan SL, Chen MF. Adult Bochdalek hernia with bowel incarceration. *J Chin Med Assoc.* 2008;71:528- 531.
- [17] Salacin S, Alper B, Cekin N, Gulmen MK. Bochdalek hernia in adulthood: a review and an autopsy case report. *J Forensic Sci.* 1994;39:1112-1116.
- [18] Nitecki S, Mar-Maor JA. Late presentation of Bochdalek hernia: our experience and review of the literature. *Isr J Med Sci.* 1992;28:711-714.
- [19] Killeen KL, Mirvis SE, Shanmuganathan K. Helical CT of diaphragmatic rupture caused by blunt trauma. *Am J Radiol.* 1999;173:1611-1616.
- [20] Asensio JA, Demetriades D, Rodriguez A. Injury to the diaphragm. In: Mattock KL, Feliciano DU, Moore EE, eds. *Trauma.* New York: McGraw Hill, 1999;603-631.
- [21] Thomas S, Kapur B. Adult Bochdalek hernia: clinical features, management and results of treatment. *Jpn J Surg.* 1991;21: 114-119.