# **Case Report**

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# Laparoscopic repair of gastric volvulus with diaphragmatic hernia: a case report

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### **ABSTRACT**

Gastric volvulus is a rare but potentially life-threatening cause of upper gastrointestinal obstruction. Emergency surgeon must maintain a high index of suspicion in patients who present with signs and symptoms suggesting foregut occlusion. We report an illustrative case and review the pathogenesis, classification, diagnosis and laparoscopic treatment of this rare entity.

Keywords: Gastric volvulus, Diaphragmatic hernia, Laparoscopy, Mesentricoaxial

## INTRODUCTION

Gastric volvulus affects patients of all ages but most often occurs after the fourth decade of life. If undetected, gastric volvulus can lead to ulceration, perforation, haemorrhage or ischemia and full-thickness necrosis. <sup>1,2</sup> Suspicion is heightened by a large air fluid level in the lower chest seen on chest X-ray; diagnosis is made with an upper gastrointestinal contrast study or esophagogastroduodenoscopy (EGD) and CT abdomen. <sup>3</sup> Laparoscopy is feasible option for surgical correction in acute gastric volvulus with diaphragmatic hernia.

## **CASE REPORT**

A 65 years old female patient came to hospital with the complaint of vomiting and pain in abdomen, since one week. On local examination patient had ill-defined mass at epigastrium, which was not moves with respiration and was tender. Patient was investigated for same complaint in private hospital which was s/o gastric outlet obstruction with gastric volvulus. On haematological

investigation patient has leucocytosis with normal kidney function. On X-ray chest there was obscured left diaphragm with absent fundic bubble? Eventration?? Herniation (Figure 1).

CT scan abdomen was suggestive of rotated stomach around its mesenteric axis with G-O junction and fundus placed posteriorly and downwards, while antrum and pyelorus was placed anteriorly and superiorly, suggestive of mesentrico-axial volvulus which was rare type of gastric volvulus. The distal part of the stomach was also herniated upwards in paraoesophageal location and was collapsed, while proximal part is filled with oral contrast; suggest obstruction at the level of twist (Figure 1). Her upper GI endoscopy was suggestive of gastric body fold itself in mid and flipping to produce gastric volvulus.

Patient was admitted and posted for laparoscopic surgical intervention. There was gastric volvulus with diaphragmatic hernia (Figure 2). Complete stomach was reduced from diaphragmatic rent. Hiatus was normal with Para hiatal diaphragmatic rent. Rent was repaired by

taking suture with monofilament 0-0 and mesh plasty (Figure 3). Feeding gastrostomy was done over body of stomach and anchored to anterior abdominal wall. Postoperative period was uneventful, oral started on 4<sup>th</sup> postoperative day and feeding gastrostomy was removed after six week.

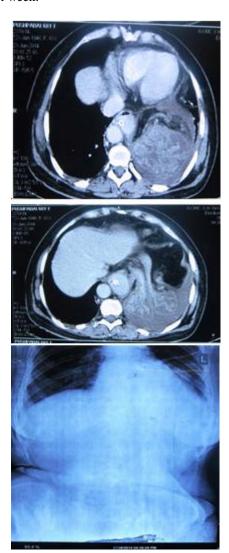


Figure 1: X-ray and CT abdomen suggestive of gastric volvulus with diaphragmatic hernia.



Figure 2: Shows diaphragmatic rent with stomach herniation and left crus of diaphragm.



Figure 3: Shows sac after complete reduction of stomach and mesh plasty.

#### DISCUSSION

Gastric volvulus is known to be an uncommon condition in which there is an abnormal degree of rotation of the stomach around itself, resulting in gastric obstruction. Berti first described gastric volvulus in 1866. The three types of gastric volvulus are organoaxial, mesenteroaxial and a combination of these two. The most common type, organoaxial volvulus, rotates along the cardiopyloric axis with two sites of obstruction. In 1904, Borchardt described the classic triad of severe epigastric pain, retching without vomiting, and inability to pass a nasogastric tube. Although the term gastric volvulus has been applied to abnormalities pertaining to the gastric position without there being any obstruction, Schatzki and Simeone stated that these anomalies, such as the "upside-down stomach" and large paraesophageal hernias, should not be classified as true volvulus unless there is an obstruction. These conditions of torsion, displacement, or chronic volvulus should be distinguished from acute volvulus where obstruction is present.<sup>2</sup> The gastrosplenic and/or gastrocolic ligaments can become stretched, attenuated, and redundant and, following certain operative procedures, transacted. When this occurs, the stomach can then rotate more than 180° and form a volvulus.<sup>3</sup> Most of the reported cases have been associated with diaphragmatic abnormalities, such as eventration or hiatus hernia. About one-third of the cases are associated with hiatus hernia, usually of the giant paraesophageal type.<sup>4</sup>

A primary gastric volvulus occurs spontaneously as a result of ligamentous lengthening. More commonly, secondary volvulus occurs due to diaphragmatic defects or other intra-abdominal factors such as left diaphragmatic eventration, adhesions, gastric ulceration and gastric or duodenal carcinoma. When associated with a large diaphragmatic defect, the greater curvature rotates upward into the defect, creating an "upside down" stomach. This type is most commonly associated with a large hiatal hernia and left diaphragmatic eventration such as present in our case. The mesenteroaxial volvulus, accounting for approximately one-third of gastric volvuli, occurs when the stomach rotates around a transverse axis at the pyloroantral area resulting in the pyloric/antral portions becoming anterior to the stomach. The combination volvulus is rarely encountered. The stomach

as it appears after upper GI contrast study showing an organoaxial volvulus ("upside-down stomach").<sup>6</sup>

Many variations of gastropexy, some with multiple points of fixation, have been reported in the literature. Simple gastric fixation to the anterior abdominal wall, gastrostomy tube placement or suturing the lesser curvature to the ligamentum teres or the free edge of the liver can accomplish gastropexy. Other variations include posterior fixation of the greater curvature to the parietal peritoneum and colonic mesentery or fixation of the fundus to the undersurface of the diaphragm. A solitary PEG tube could potentially create a new point of fixation for a recurrent volvulus. Definitive procedures include gastropexy with colonic displacement (Tanner's procedure), fundoantral gastrostomy (Oozler's operation), gastrojejunostomy and gastrocolic disconnection.

Laparoscopic and endoscopic techniques have also been combined. Koger and Stone reported laparoscopic reduction of an acute organoaxial gastric volvulus due to a paraesophageal hernia. This was followed by broad gastropexy using three pull-type PEG tubes along the greater curvature of the fundus, body and antrum. The PEG tubes were removed two months postoperatively, and a follow-up upper GI showed adequate fixation of the stomach. Other variations of laparoscopic gastropexy have been performed using T-fasteners (Ross Products Division, Abbott Laboratories, Columbus, Ohio), as well as intracorporeal suturing. 11,12

The natural progression in the treatment of gastric volvulus has led to a total laparoscopic approach without compromising the basic tenets of the standard laparotomy repair. <sup>13</sup>

#### **CONCLUSION**

Laparoscopic gastric volvulus with paraesophageal hernia repair was feasible and safe with low morbidity and mortality rates in this elderly patient group.

To achieve good long-term results, standard surgical treatment should include reduction of the stomach, complete excision of the hernia sac, closure of the hiatal defect, floppy Nissen fundoplication, and anterior gastropexy. The laparoscopic gastrostomy tube secures the stomach intra-abdominally and helps prevent migration of the stomach to an intrathoracic position.

Stomach should be pexed to the anterior abdominal wall with a gastrostomy tube.

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