



## Chronic Mesenteroaxial Gastric Volvulus And Diaphragmatic Hernia

### KEYWORDS

Gastric volvulus; diaphragmatic hernia; gastropexy

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**ABSTRACT** *Mesenteroaxial volvulus is a form of gastric volvulus that rotates around the short axis of the stomach. We present a case of patient who presented with episodic abdominal pain, vomiting and weight loss for one year. Imaging revealed mesenteroaxial volvulus and managed by laparotomy – repair of diaphragmatic hernia & gastrostomy tube gastropexy. This case illustrates the difficulties in diagnosing an intermittent volvulus. Some of the computed tomography(CT scan) features of gastric volvulus are described, and the usefulness of CT in assisting with the diagnosis is highlighted.*

### Introduction :

Gastric volvulus is a rare clinical entity, and a clinically relevant cause of acute abdominal pain in adults. It may prove to be a diagnostic dilemma for clinicians in view of the nonspecific clinical symptoms. The imaging diagnosis also remains challenging.<sup>1</sup>

Abdominal computed tomography (CT) has been underutilised in the diagnosis of gastric volvulus in previously reported series.<sup>2</sup> The present case illustrates the value and importance of abdominal CT in the rapid diagnosis of acute abdominal pathology and, in particular, gastric volvulus. It is imperative that the diagnosis is made early in the course of the disease, to allow prompt surgical intervention and prevention of life-threatening complications.

### Case report :

A 65 year old man presented with postprandial intermittent epigastric discomfort with non-bilious vomiting and significant weight loss since last one year. There was no history of fever, abdominal distension or bowel disturbances. He was not on any medication. There was no prior history of abdominal trauma or surgery. There was no history of melena or hematemesis.

Examination revealed epigastric tenderness. Succussion splash and visible gastric peristalsis, which are common features of chronic duodenal ulcer with gastric outlet obstruction in our environment, were conspicuously absent. Routine blood and urine investigations were unremarkable. Esophagogastroduodenoscopy showed wide oesophageal hiatus, dilated stomach with prominent gastric folds & hyperaemia of gastric mucosa in body & antrum & scope could not be negotiated post pylorus raised possibility of volvulus. Chest X ray (figure 1) was suggestive of air fluid level at right hemithorax. CT scan of abdomen with oral & IV contrast was advised. CT was suggestive of focal narrowing in mid segment of stomach with herniation of distal segment into right hemi thorax above liver and right hemi colon with passive collapse of adjacent right lung consistent with mesenteroaxial gastric volvulus. (Figure-2 and 3)

After informed consent, patient was posted for elective laparotomy. At surgery, a markedly dilated stomach with hemorrhagic surface , distal segment of stomach with he-

patric flexure & its mesocolon herniating into right pleuro-peritoneal cavity through large diaphragmatic defect were noted (figure 4). Closure of diaphragmatic defect with sutures and gastrostomy tube gastropexy with intercostal tube drainage and feeding jejunostomy were performed.

Because his postoperative course was uneventful the patient was discharged on the tenth day following surgery in good condition. One year follow up was unremarkable.



Figure: 1 Chest radiograph (PA view)

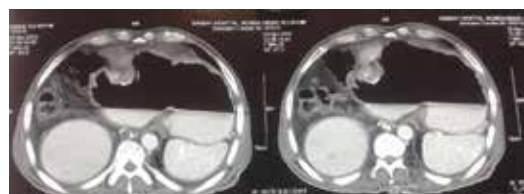


Figure 2: Axial series of images through the abnormally orientated, distended stomach



Figure 3 and 4: Coronal CT images of gastric volvulus and intraoperative appearance of stomach with diaphragmatic defect

#### Discussion:

Gastric volvulus is defined as an abnormal, acquired rotation of the stomach of more than 180 degrees, creating a closed loop obstruction. Acute gastric volvulus is an acute, life-threatening, surgical emergency. The peak age group of incidence is in the fifth decade, with equal frequencies between the sexes and across all races. If not recognised and treated quickly, it can result in complications such as gastric ischemia, necrosis and perforation.<sup>3</sup> The Borchardt clinical triad of symptoms (epigastric pain, retching and inability to pass a nasogastric tube) are useful and valuable pointers to the suspected diagnosis.<sup>1,4,5</sup>

Gastric volvulus can be classified based on axis of rotation, severity (acute or chronic), extent (total or partial) or aetiology (primary or idiopathic).<sup>6</sup> The most frequently used classification system describes 3 types of gastric volvulus: organoaxial, mesenteroaxial and combination-unclassified.<sup>5,6</sup> This is based on the axis of rotation (figure 5). Organoaxial is the most common variant, accounting for approximately two-thirds of cases, and occurs when the stomach rotates along its long axis.<sup>1,6</sup> The greater curvature is displaced superiorly, and the lesser curvature lies more caudally in the abdomen. If the twist is >180°, gastric outlet obstruction occurs. The gastroesophageal (GO) junction and pylorus maintain their normal anatomical positions and are not in close proximity. There is also less risk of ischemia in organoaxial volvulus.

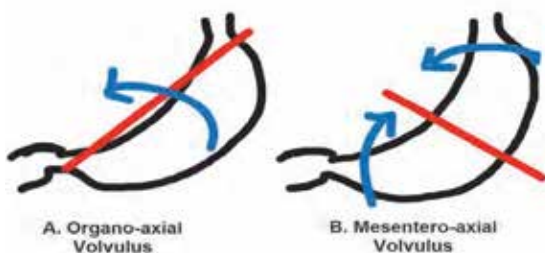


Figure 5: Sketch demonstrating the mechanism of both (a) organoaxial and (b) mesenteroaxial volvulus. In (a), organoaxial volvulus develops secondary to twisting of the stomach along its long axis (red line). In (b), there is rotation of the stomach around the short axis (red line) resulting in mesenteroaxial volvulus.

A predisposing factor for volvulus is the presence of an abnormality relating to the anchoring of the stomach and the surrounding ligaments.<sup>6</sup> This is thought to be one predisposing factor in the development of the second type of

volvulus, and the variant encountered in our patient – mesenteroaxial volvulus. There is reversal of the relationship of the GO junction and pylorus, and they may lie in close proximity to each other. The third type of volvulus is the combined type that exhibits features of mesenteroaxial as well as organoaxial volvulus.<sup>3, 5, 6</sup>

The aetiology of the rotation is either primary or secondary. “Primary” refers to the absence of diaphragmatic defects or intra-abdominal abnormality causing the volvulus. Laxity of the ligaments which anchors the stomach in place within the abdominal cavity is a common cause. In 30% of gastric volvuli, there is a primary cause.<sup>7</sup> Secondary gastric volvuli have alternative causes, including congenital or traumatic diaphragmatic hernias, hiatal hernias, eventration of the diaphragm, abdominal bands or adhesions.<sup>9</sup> Our patient has large right sided diaphragmatic hernia as etiology.

Imaging: Gastric volvulus may have a nonspecific clinical presentation, hence increasing the reliance on imaging to assist in coming to the correct diagnosis. Radiography, upper gastro-intestinal tract contrast studies and CT are the imaging modalities most often used to make the diagnosis of volvulus. CT has been underutilised in previously reported series of gastric volvulus, and has not been advocated as the primary imaging study.

In our patient, the CT scan was performed early, and expedited diagnosis and management. Abdominal CT is often done in the setting of abdominal pain and vomiting and can help in confirming abnormal rotation of the stomach.<sup>1</sup>

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 prevention with anterior gastropexy. Nissen fundoplication decreases future occurrences in patients with a hiatal hernia.<sup>7</sup>

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