

Mesenteroaxial gastric volvulus associated with diaphragmatic hernia. A case report

Paul Reginaldo Villagran Ovando M.D.

Ricardo Sebastián Arreola Rosales M.D.

Brendy Marisol Velásquez Orozco M.D.

Mynor Abraham Marroquin

Solorzano M.D.

Jose Carlos Echeverría Solís M.D.

Mary Geyovana Cotí Coyoy M.D.

Background: 30-year-male patient who presented with acute dyspnea, fever, and abdominal pain associated with vomiting. Imaging studies showed a left diaphragmatic defect with intrathoracic gastric herniation and abnormal rotation compatible with mesenteroaxial gastric volvulus. Left pulmonary compression and mediastinal shift were observed. Tomography was key for timely diagnosis.

Keywords: Gastric volvulus, diaphragmatic hernia, computed tomography.

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Case Report

Plastic Surgery



Gastric volvulus is an uncommon but life-threatening condition characterized by an abnormal rotation of the stomach or a portion of it by more than 180° around its short or long axis. This pathologic rotation can compromise gastric luminal transit and mesenteric blood supply, leading to acute gastric outflow obstruction, ischemia, gangrene, perforation, and severe peritonitis or sepsis.

First described by Berti in 1866, gastric volvulus is classically categorized based on its etiology (primary or secondary) and its anatomical axis of rotation (organoaxial, mesenteroaxial, or mixed). Primary gastric volvulus accounts for approximately one-third of cases and arises from laxity or congenital absence of the normal gastric anchoring ligaments (gastrohepatic, gastrosplenic, gastrocolic, and phrenicogastric ligaments). Secondary gastric volvulus constitutes two-thirds of cases and occurs in association with congenital or acquired anatomical defects, most commonly diaphragmatic anomalies such as paraesophageal hiatal hernias, traumatic diaphragmatic ruptures, or congenital defects (e.g., Bochdalek or Morgagni hernias).

Mesenteroaxial gastric volvulus is less frequent than the organoaxial subtype, accounting for roughly 29% to 35% of cases. In mesenteroaxial rotation, the stomach rotates around its transverse axis (a line connecting the greater curvature to the lesser curvature), causing the antrum and pylorus to displace anteriorly and superiorly above the gastroesophageal junction. Because of its presentation as an acute abdominal and respiratory crisis, rapid and accurate imaging is essential. Contrast-enhanced computed tomography (CT) plays a pivotal role in confirming

the diagnosis, defining the structural etiology, and excluding tissue necrosis prior to operative repair.

Case report

30-year-old male patient with dyspnea, fever, and abdominal pain with vomiting. Upon examination, he presented with hypoxemia, tachycardia, and decreased air entry in the left hemithorax. The X-ray showed intrathoracic hydroaerial levels.

Discussion

Gastric volvulus represents a critical diagnostic challenge due to its variable clinical presentation and potential for rapid deterioration. Classically, acute gastric volvulus presents with Borchardt's triad, which consists of severe epigastric pain, retching without actual emesis, and inability or extreme difficulty in passing a nasogastric tube. However, this full clinical triad is observed in less than half of patients, particularly when secondary diaphragmatic defects allow significant herniation into the thoracic cavity. In our patient, the thoracic displacement produced striking cardiopulmonary symptoms (dyspnea, hypoxemia, mediastinal shift), which initially directed attention toward a primary intrathoracic or pulmonary crisis.

Anatomically, mesenteroaxial volvulus occurs when the stomach twists perpendicular to its long axis (along the mesenterico-axial line). Unlike organoaxial volvulus—which typically rotates along the longitudinal axis connecting the gastroesophageal junction to the pylorus and is frequently associated



Figure 1. Chest X-ray showing hydroaerial levels in the left hemithorax, suggestive of an intrathoracic stomach. The tomography showed a left diaphragmatic defect with herniation of the stomach, omentum, and intestinal loops. Gastric rotation with inversion of the curvatures and ascent of the antrum was observed, compatible with a mesenteroaxial volvulus. In addition, left pulmonary compression and mediastinal shift.

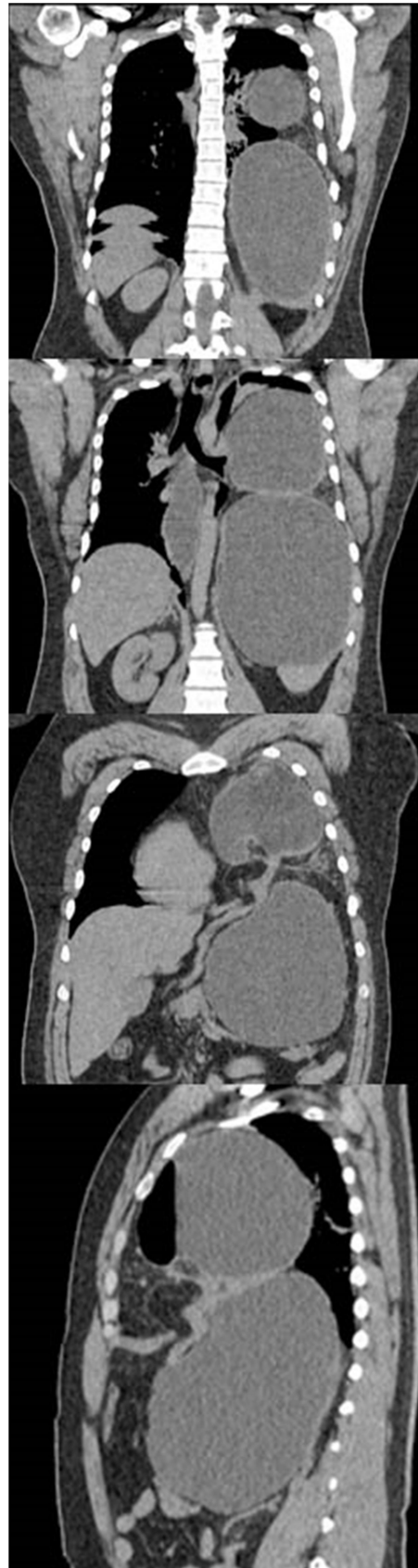


Figure 2. Computed tomography showing an intrathoracic stomach with mesenteroaxial rotation and left pulmonary compression.

with strangulation—mesenteroaxial rotation is often partial ($< 180^\circ$) and recurrent in chronic forms. However, when combined with an acute diaphragmatic hernia, mesenteroaxial rotation can cause acute complete obstruction and severe vascular compromise of the short gastric vessels and gastroepiploic arches.

Cross-sectional imaging with multi-detector CT (MDCT) has surpassed conventional barium upper gastrointestinal series as the gold standard for definitive evaluation. CT not only demonstrates the intrathoracic position of the stomach and the inverted anatomical relationship of the cardia and pylorus, but it also allows direct visualization of:

1. **The Diaphragmatic Defect:** Delineating the exact location, size, and muscular borders of the hernia orifice.
2. **Signs of Ischemia/Strangulation:** Evaluating for gastric wall thickening, intramural pneumatosis (pneumatosis intestinalis), portal venous gas, or absence of mucosal enhancement.
3. **Associated Complications:** Identifying mediastinal mass effect, compressive pulmonary atelectasis, pleural effusions, and pneumoperitoneum indicative of visceral perforation.

Management of acute gastric volvulus associated with a diaphragmatic hernia requires immediate stabilization followed by surgical intervention. Preoperative decompressive measures (such as cautious placement of a nasogastric tube) may reduce intrathoracic pressure. Surgical correction typically encompasses reduction of the herniated viscera, resection of ischemic tissue (if necrosis is present), repair or mesh reinforcement of the diaphragmatic defect, and gastropexy to fix the stomach to the anterior abdominal wall to prevent recurrence.

Conclusion

Gastric volvulus is a rare but critical surgical emergency that requires a high index of clinical suspicion, especially when presenting with acute gastrointestinal and cardiopulmonary symptoms. Computed tomography remains the definitive diagnostic modality, providing precise anatomical mapping of the gastric axis rotation, detailed evaluation of associated diaphragmatic defects, and crucial detection of early ischemic complications. Timely diagnosis via CT enables immediate therapeutic intervention, significantly lowering morbidity and mortality associated with this condition.

Conflicts of interests

The authors declare that there are no financial, personal, or institutional conflicts of interest that could have influence the work reported in this manuscript.

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Ricardo Sebastián Arreola Rosales
Radiology Department
Hospital Regional de Occidente
Quetzaltenango, Guatemala