# GASTRIC VOLVULUS

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## ABSTRACT

Gastric volvulus is a rare but important cause of high intestinal obstruction.Three cases of gastric volvulus were presented, one organoaxial and two mesenteroaxial volvulus. Radiographic findings in these three cases were typical. It is essential that the radiologists recognize the radiographic features of gastric volvulus since prompt corrective surgery is vital in proper management of these patients.

Gastric volvulus is a rare condition defined as an abnormal anterior or posterior rotation of part or all of the stomach about either the saggital or coronal plane of the gastric body. The two main types of volvulus are the organoaxial volvulus - the stomach is twisted around its long axis or coronal plane - and the mesenteroaxial Volvulus where the stomach is twisted around the axis joining the lesser and greater curvature (saggital plane). Volvulus can be complete or partial and can occur in the abdomen or be intrathoracic. The diagnosis of this category can be made by plain film and contrast study of the gastrointestinal tract.

## CASES REPORT

### Case I

A 42-year-old woman complained of intermittent dull pain and fullness of the epigastrium. The physical examination revealed some vague tenderness over the epigastrium without definite rigidity or guarding. A plain film of the abdomen showed multiple air pockets superimposed on the cardiac shadow and a small amount of air in gastric fundus (fig 1). The upper gastrointestinal study revealed organoaxial volvulus of the stomach (fig 2). During the operation, herniation of the colon through the Morgagne foramen was found and the stomach was twisted around its longitudinal plane due to retraction of the gastrocolic ligament.

### Case II

A 4-year-old boy was brought in after experiencing nausea, vomiting and pain at the epigastrium for 1 day. On physical examination, he appeared to be acutely ill and his abdomen was moderately distended. A plain film of abdomen showed a spherical distended fluid-filled stomach and a slight elevation of the left hemi-diaphragm. The upper gastrointestinal study showed mesenteroaxial volvulus of the stomach (fig.3,4). He was transferred to the operating room where it was revealed that the stomach was twisted around its mesenteric axis. Detorse procedure was performed with fixation of the stomach. The post-operative course was uneventful.

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## Case III

A 67-year-old man came to the hospital after having fallen from a significant height. The Physical examination and chest film revealed multiple rib fractures on the left side with elevation of the left diaphragmatic shadow. There was a large air pocket at the left lower lung field. A traumatic diaphragmatic hernia was suggested. An upper gastrointestinal study showed an upside down stomach with a complete obstruction at the distal end (Fig.5). During the operation a large rupture of the diaphragm was found. The stomach was twisted around the saggital axis and herniated into the thoracic cavity. Reduction of the volvulus and herniated stomach was done and the diaphragm was repaired. The post-operative course was uneventful.

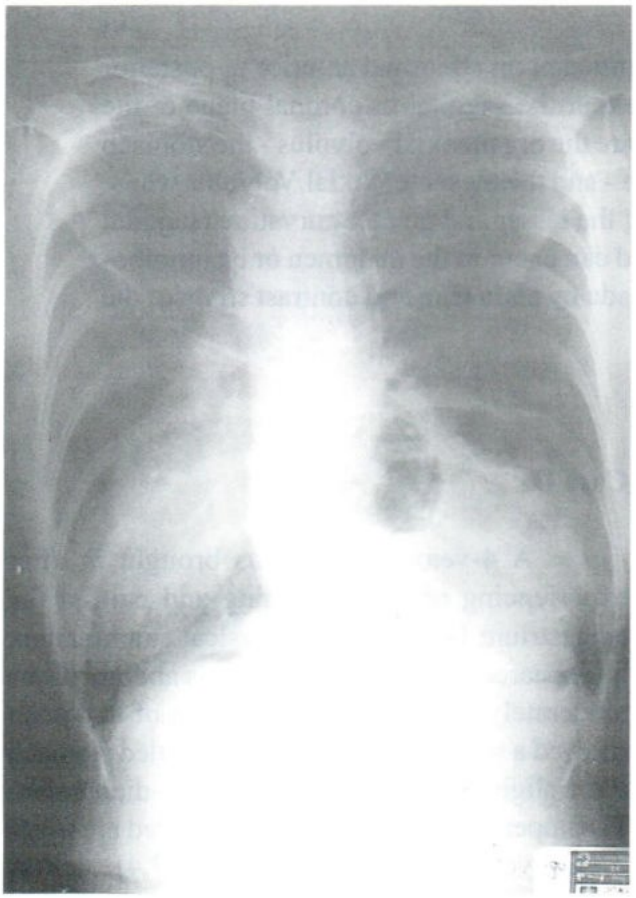

**Fig. 1** Multiple air pockets at retrocardiac area, small amount of air in gastric fundus.

**Fig. 2** Organoaxial volvulus : Transverse position of the stomach with greater curvature rotated upward, the pylorus and duodenum pointed downward.

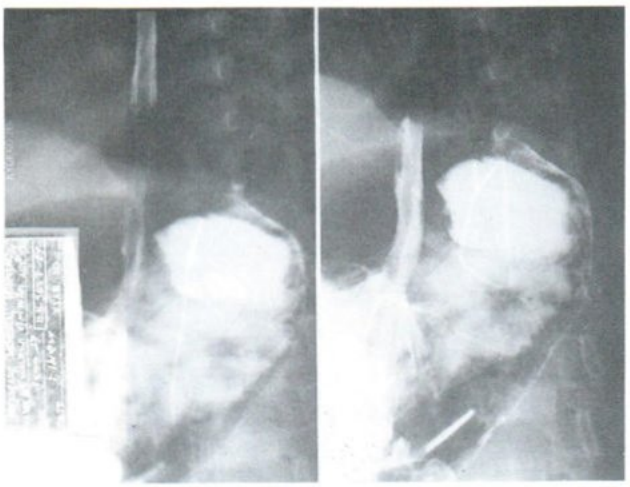

**Fig .3 Case II** Mesenteroaxial volvulus: The E-G junction lied inferior to the antrum which rotated above and to the left of the fundus, creating upside-down stomach.

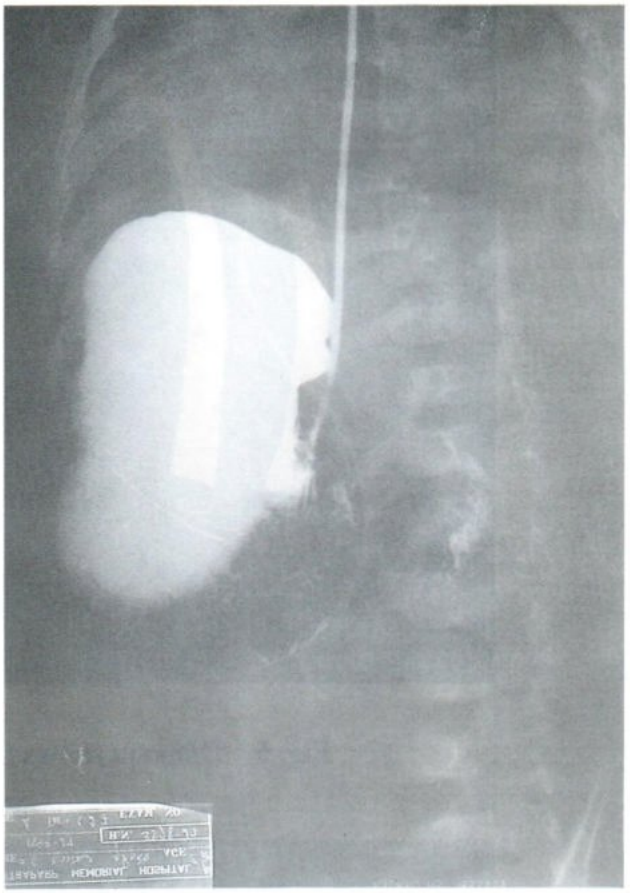

**Fig. 3**

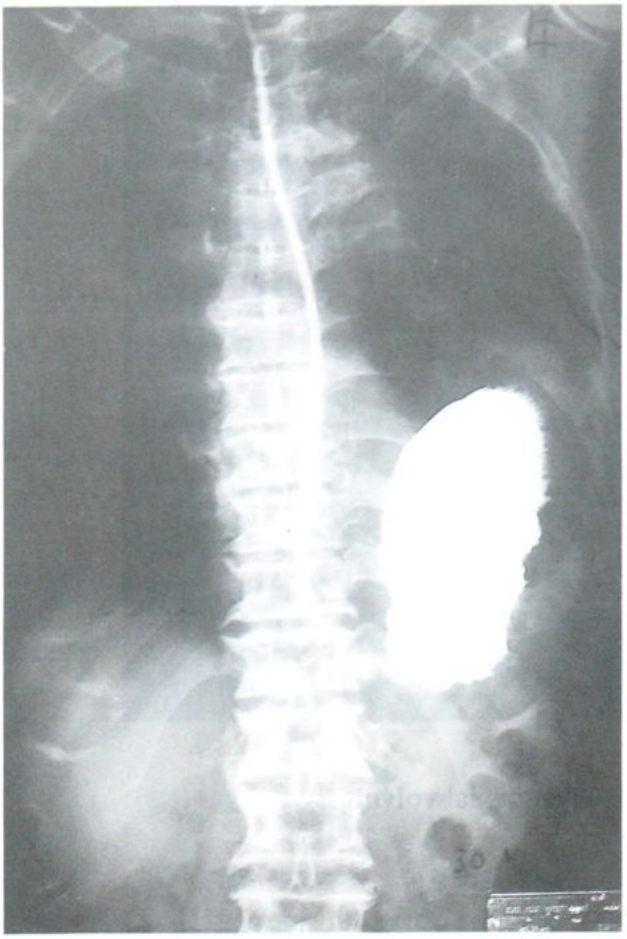

**Fig. 4** Upside-down stomach with complete obstruction, mesenteroaxial volvulus.

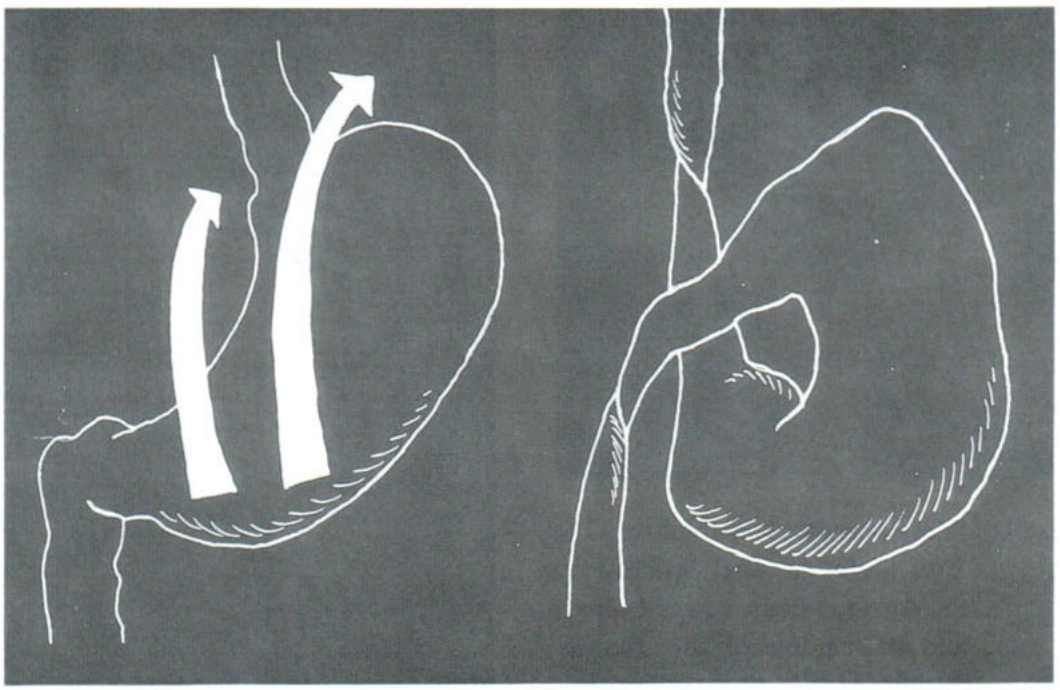

**Fig. 5** Diagram shows : **A.** Mesenteroaxial volvulus.

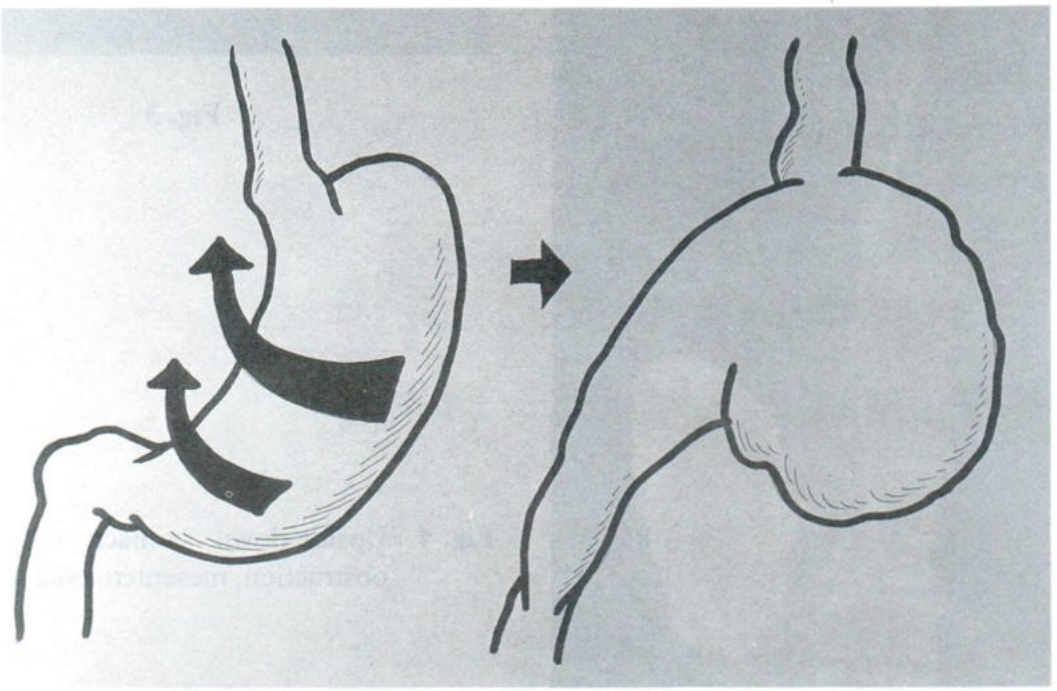

**Fig. 5** Diagram shows : **B.** Organoaxial volvulus.

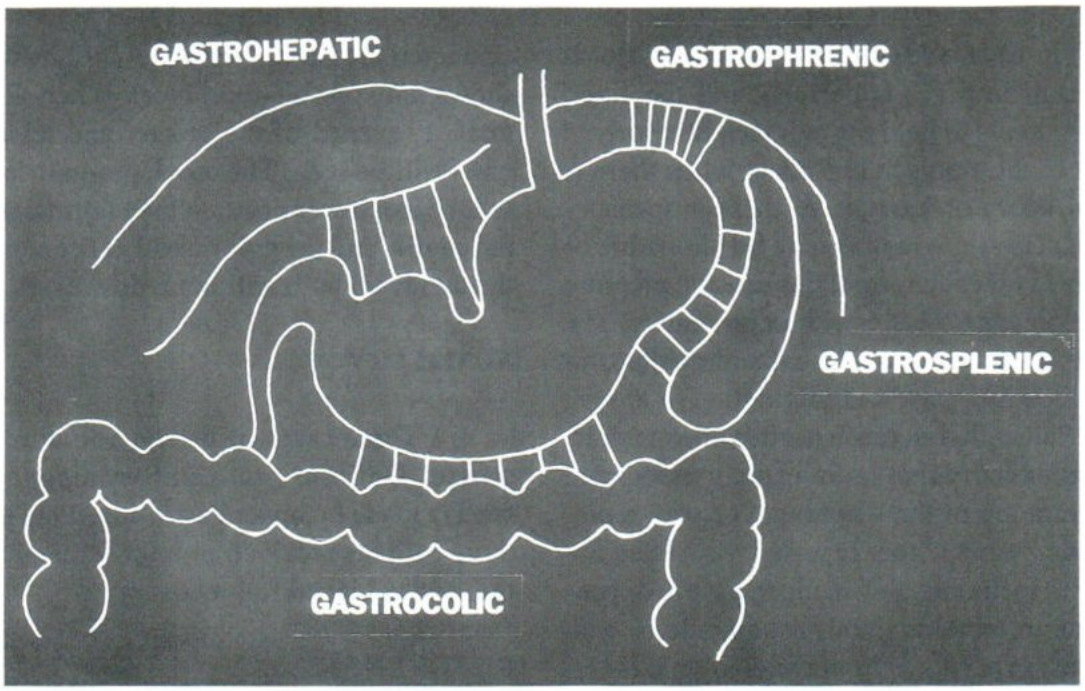


**Fig. 6** Four supporting ligaments of the stomach.

**Table I Anatomical classification of gastric volvulus**

| Classification | Description |
|---|---|
| Location: | |
| Abdominal | Entire volvulus in abdominal cavity; most commonly associated with eventration of left hemidiaphragm |
| Thoracic | Entire rotated stomach in intrathoracic position |
| Direction (fig 5) | |
| Organoaxial | Stomach rotates along longitudinal axis |
| Mesenteroaxial | Stomach rotates in axis of mesentery perpendicular to longitudinal axis |
| Extent: | |
| Complete | Entire stomach involved in the twist |
| Segmental | Most commonly involves segmental twist of distal stomach |

## DISCUSSION

Gastric volvulus is a rare condition. Several types (Table I) are recognized[3]

The stomach is an irregularly shaped viscus that expands and contracts several times daily. In normal circumstances, the stomach is not likely to undergo volvulus because it is suspended relatively securely by the gastric ligaments. These include the gastrohepatic ligament along the lesser curvature, the gastrocolic and gastrosplenic ligaments along greater curvature, and the gastrophrenic ligament along the posterior aspect of the

fundus (Fig 6) In addition, the esophagus holds the stomach in place superiorly and the fixed duodenum tends to hold the stomach inferiorly.[4,6] Volvulus of the stomach can occur when there is abnormal laxity or absence of these suspensory ligaments. Gastric volvulus may be idiopathic or secondary to other abnormalities causing pressure or retraction upon the stomach or mesentery. The mesenteroaxial volvulus is usually idiopathic, although cascading gastric configuration or atonic, a dilated fluid-filled stomach is often encountered. The organoaxial volvulus is usually associated with eventration of the diaphragm or with a diaphragmatic hernia. Other reported associated abnormalities including gastric ulcer, gastric or pancreatic tumor, phrenic paralysis, colonic or gastric distension, cast syndrome and colonic diverticulum.[1,2,3,4,7,8]

A radiographic study should readily substantiate the clinical suspicion of gastric volvulus. In mesenteroaxial volvulus, the distended stomach appears spherical on a supine film. There is often a double fluid level, the inferior one lies in the fundus and the superior one lies in the antrum. On upright films and occasionally on supine films, a characteristic "beak" sign is produced by a gaseous distension of the inverted antrum, pylorus and proximal duodenum. An upper gastrointestinal study confirms volvulus and documents the degree of obstruction. The pyloric end of the stomach will have rotated to the left either anteriorly or posteriorly. The greater curvature will be above the lesser curvature. The pyloric end may rise above the proximal end creating an upside down stomach.[1,6,7]

The diagnosis of organoaxial volvulus on plain films is not easy. Although an upper gastrointestinal study can confirm the diagnosis, it may be missed if careful attention is not paid to the position of the esophagogastric junction which is lower than normal. UGI also shows that the stomach is positioned horizontally, there is no characteristic "beak" and the upright film often shows only one air-fluid level. When volvulus is total, a reversal of the greater and lesser curvatures will be seen. The esophago-gastric junction will be in a lower position than normal relative to the cardia, and the pyloric end of the stomach and the duodenal bulb will point downward.[1,3,4,6]

## SUMMARY

Three cases of gastric volvulus were reported. Definite preoperative diagnosis were readily made by upper gastro-intestinal study. All three patients received prompt surgical intervention and achieved full recovery.

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