

## GASTRIC VOLVULUS ASSOCIATED WITH TRAUMATIC DIAPHRAGMATIC HERNIA: A DELAYED PRESENTATION

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Gastric volvulus cases are usually associated with congenital diaphragmatic hernia.<sup>1,2</sup> Delayed presentation of traumatic diaphragmatic hernia with gastric volvulus is relatively unusual. This case report discusses an adult who presented with gastric volvulus after sustaining a gunshot wound to the left lower chest about one year prior to presentation.

### Case Report

A 34-year-old male presented with severe epigastric pain, persistent vomiting and retching for two days. He had experienced progressive symptoms of epigastric pain, dyspepsia, vomiting, and weight loss of about 30 kg over a one-year period following a through-and-through gunshot wound to the left lower chest from a missile of unknown source. At that time, he was treated by insertion of two left-sided chest tubes and blood transfusions. Hemorrhage from the left chest decreased gradually, chest tubes were removed after about one month of treatment, and the patient was discharged from the hospital.

On the later admission, physical examination revealed that the patient was in pain, distressed, and dehydrated. There were several scars on the left chest, and an entry gunshot wound scar was seen at the 8th intercostal space below the tip of the left scapula posteriorly. There were also chest tube marks, and an exit wound scar at the 7th intercostal space at the right midclavicular line. There were no other abnormal physical findings. Chest x-rays revealed an eventration of the left diaphragm, or a suspected chronic left diaphragmatic hernia (Figure 1). Barium meal studies revealed an organoaxial gastric volvulus with gastric outlet obstruction, the greater curvature of which was above the level of the lesser curvature, and the cardia and pylorus positioned at about the same level (Figure 2).

Through an upper midline abdominal approach, with the chest prepared for left thoracotomy in case the stomach

could not be dissected safely from its intrathoracic position, exploration revealed the presence of a gastric volvulus herniating into the left chest cavity through an old left diaphragmatic defect. After meticulous dissection, the stomach was reduced and the diaphragmatic defect was repaired, using interrupted horizontal mattress sutures with number zero monofilament polypropylene. The gastric volvulus was treated by anterior gastropexy and Stamm gastrostomy. Postoperative course was uneventful. The patient was discharged and remains asymptomatic four years after surgery.

### Discussion

Gastric volvulus associated with traumatic diaphragmatic hernia is relatively rare.<sup>3,4</sup> The majority of cases of gastric volvulus are associated with congenital abnormalities, of which congenital diaphragmatic hernias presenting in early childhood are the most common.<sup>2</sup> Other predisposing causes of gastric volvulus include lax ligaments, bands, adhesions, peptic ulcer disease, gastric neoplasms, and eventration of the diaphragm.<sup>5,6</sup> This case is rather unusual because of the delayed presentation of a missed traumatic diaphragmatic hernia associated with gastric volvulus.

Gastric volvulus may present acutely with Borchardt's triad (severe epigastric pain and distention, vomiting then retching without production of any vomitus, and difficulty or inability to pass a nasogastric tube), or with chronic vague abdominal symptoms. This patient most likely developed chronic symptoms of gastric volvulus over a one-year period, superimposed by the acute symptoms at presentation. The diagnosis of gastric volvulus is usually made by barium studies. Radiological signs of gastric volvulus include a double air-fluid level on upright films, inversion of the stomach with the greater curvature above the level of the lesser curvature, positioning of the cardia and pylorus at the same level, and downward pointing of the pylorus and duodenum.<sup>7</sup>

Gastric volvulus is classified according to its type into an organoaxial type, where the stomach may rotate about a line between the pylorus and the cardia, and a mesenterioaxial type, where the stomach may rotate about a line drawn from the mid-lesser to mid-greater curvature. Chest x-rays are interpreted as normal in approximately 50% of patients with penetrating diaphragm injuries.<sup>8</sup>

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Penetrating diaphragmatic injuries are frequently overlooked initially if there is no herniation of viscera and no other significant injuries. In such cases, presentation is usually delayed until the defect gets larger in size with visceral herniation, as was most likely the case in this patient.

In summary, data from this patient demonstrate that diaphragmatic injury after penetrating gunshot wounds of the lower chest can easily be missed initially, and can manifest with a complication at a later date. The diagnosis of penetrating diaphragmatic injury depends on a high index of suspicion and careful interpretation of chest x-rays.<sup>8</sup> All gunshot wounds that penetrate the lower chest should be explored without inordinate delay.<sup>9</sup> Gastric volvulus is treated by various surgical procedures, depending on the predisposing cause and the condition of the stomach at the time of operation.

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