

## Short Communication

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# Laparoscopic Sleeve Gastrectomy as a Good Surgical Alternative in Gastric Volvulus Caused by Diaphragmatic Eventration

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**Summary**

**Background:** Acute gastric volvulus is a rare but potentially life-threatening cause of upper gastrointestinal obstruction. Therefore, emergency physicians must maintain a high index of suspicion when patients present signs and symptoms suggesting foregut occlusion. Surgical treatment of gastric volvulus, secondary to diaphragmatic eventration, can vary with no standard routines. In this communication, we discuss the value of a laparoscopic gastric sleeve to prevent recurrence.

**Keywords:** Gastric volvulus; Laparoscopic gastric sleeve; Left hemidiaphragmatic eventration

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Left hemidiaphragmatic eventration in adult patients is rare; the diagnosis is usually made when a chest radiograph is performed to diagnose another condition. It can be detected in routine chest x-rays with a frequency that varies from 1/1400 to 1/32000 in asymptomatic cases [1]. Diaphragmatic eventration is characterized by a considerably thinning hemidiaphragm. During laparoscopic surgery, one can observe how hemidiaphragmatic thickness is reduced to two thin serous layers (pleural and peritoneal) [1-3]. In large eventations, the left hemidiaphragm usually involves an intrathoracic stomach, leading to a gastric volvulus. The left colic flexure and spleen also ascend to the chest by constant traction of the gastrocolic ligament and omentum. With the thoracic abdominal organs so occupied, the mediastinum and lungs suffer compression. The heart also undergoes a dextroversion and a shift to the right. Lung retraction is proportional to the severity of the eventration and particularly affects the basal pyramid. Large diaphragmatic eventrations carry a reduction or inversion of diaphragmatic kinetics, impacting ventilatory mechanics.

Therefore, respiratory function tests evidence of a restrictive syndrome usually associated with a decrease from 50 to 25% of vital capacity and forced expiratory volume reduction per second. The etiology of diaphragmatic eventrations is always difficult to determine in adult patients who have no history of trauma or previous surgeries. The probable etiology in this patient group may be phrenic paralysis secondary to previous pericarditis, pleural effusion, or tubercular lung disease. The absence of any other background information can be attributed to a degenerative etiology in the elderly [1]. Some patients with diaphragmatic eventration are asymptomatic. Warning signs usually involve breathing and atypical digestive symptoms.

We previously described a case of an adult patient who had neither a history of trauma nor disease who debuted with an acute gastric volvulus. In this particular case, it was not possible to establish a specific etiology, and diagnosis was established with a CT of the abdomen and endoscopy. The initial treatment of this patient in the emergency department was gastric decompression with a nasogastric tube that we put in place at the time of endoscopy. The patient remained hospitalized on intravenous fluids, parenteral nutrition, antibiotics, analgesics, and proton-pump inhibitors; moreover, the surgery indicated persistence of gastric volvulus. The surgical techniques used to treat the diaphragmatic eventration were gastropexy [4] and diaphragmatic fibrous tissue excision followed by suturing, diaphragmatic incision suturing with superposed planes, and simple plication of the diaphragm. In the adult patient with an eventration of the left hemidiaphragm, without

ventilatory compromise, and symptoms of acute gastric volvulus, a good alternative is **laparoscopic sleeve gastrectomy** [5]. In this case, the left hemidiaphragm is high, reaching the fourth or fifth intercostal space. There, the diaphragmatic muscle does not exist. Often, only the left crura is present and the diaphragmatic muscle has deteriorated to a thin and atrophic poorly resistant aponeurotic layer. If clinical evolution allows, the patient must be prepared for a vertical laparoscopic gastrectomy. The technical details are similar to those of a bariatric gastric sleeve; however, some points are discussion; the closure of the crura and fixation of the gastric sleeve with omentum so that it will not rotate.

**Conclusions**

In adult patients with a diaphragmatic eventration on the left side but who have no pulmonary symptoms and an acute gastric volvulus independent of etiology, laparoscopic sleeve gastrectomy is a good alternative to consider.

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