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Short Running Title: Gastric mesenteroaxial rotation in hiatal hernia

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TITLE: Epigastric pain: Incarceration or rotation?

ABSTRACT

Introduction:

Acute intrathoracic gastric volvulus occurs when the stomach has a twist mesenteroaxial/organoaxial or chest cavity resulting in a dilatation or rupture of the diaphragmatic hiatus or diaphragmatic hernia. The purpose of this work is to show a interesting case of gastric volvulus in a patient with several comorbities.

Case Report:

A 77 year-old woman with pass history of hiatal hernia and mental disease associated with diabetes and atrial fibrillation. Patient went to the emergency department due to vomiting associated with blood. Analytical parameters (WBC, HGB, PCR, metabolic panel and liver function), showed no significant alterations. Thoracic X-ray revealed an enlarged mediastinum due to herniation of the stomach. A CT scan confirmed intra-thoracic localization of the gastric antrum with twist. Patient's symptoms were relieved by nasogastric intubation and analgesia. After six months the patient is still asymptomatic.

Conclusion:

In general, the treatment of an acute gastric volvulus requires an emergent surgical repair. In patients who are not surgical candidates (with comorbidities or an inability to tolerate anesthesia), endoscopic reduction should be attempted.

Chronic gastric volvulus may be treated nonemergently, and surgical treatment is increasingly being performed using a laparoscopic approach. In this case, it is a chronic form that was solved with the placement of the nasogastric tube.

A nasogastric decompression is an option in the chronic form of hiatal hernia associated to gastric volvulus in patients with serious comorbidities.

Keywords: Gastric volvulus, hiatal hernia, mesenteroaxial

TITLE: Epigastric pain: Incarceration or rotation?

INTRODUCTION

Gastric volvulus (GV) is an abnormal rotation of the stomach, primary etiology - laxity or agenesis of the gastric ligaments or secondary - adhesions; hiatal hernia and others [1], first described by Berti in 1866 [2]. According to the axis of rotation is classified into organoaxial - longitudinal axis parallel to the imaginary line cardiopyloric being the most common (60%) - axial - mesenteric - transverse axis perpendicular to the line cardiopyloric (30%) - and mixed style - a combination of the both [3].

The acute GV, represented by sudden abdominal pain, vomiting and triad Borchadt (epigastric distention, inability to pass the gastric tube and ineffectual efforts to vomit), is prone to tissue ischemia, necrosis and gastric perforation, and is considered an emergency surgery [2-4].

The chronic form of presentation is asymptomatic or oligosymptomatic, and may be responsible for uncharacteristic symptoms of abdominal discomfort and heart burn [4, 5] and often requires a new procedure to treat the condition, especially if the patient presents several comorbities. Here, we present a different concept in gastric volvulus treatment.

CASE REPORT

A 77 year-old woman with pass history of Diabetes, mental disease and hiatal hernia complained of epigastric pain and abdominal cramps, more evident after meals and relieved by vomiting. Patient went to the emergency department due to vomiting associated with blood and halitosis. Analytical parameters (WBC, HGB, PCR, metabolic panel and liver function), showed no significant alterations.

Thoracic X-ray revealed an enlarged mediastinum due to herniation of the stomach. The stomach bubble (gastric fundus) could be seen in its usual position suggesting herniation of the gastric antrum (Figure 1 - asterisk). A CT scan confirmed intra-thoracic localization of the gastric antrum (Figure 2). The diagnosis is a hiatal hernia with gastric mesenterioaxial rotation type, as depicted in Figure 2, where the arrow indicates the duodenum near the hernia position. An upper gastrointestinal

endoscopy showed gastric stasis. The exam was interrupted due to patient intolerance, suggestive of gastric torsion. The patient's symptoms were relieved by nasogastric intubation and analgesia. After six months of follow-up the patient still asymptomatic.

DISCUSSION

GV is a complete obstruction of the gastric lumen by rotation, that can occur at any age, with equal frequency in men and women [6]. In 25% of patients, gastric rotation is primary or idiopathic and occurs because there is a lengthening of ligments [5-7]. In 75% of patients, GV is associated with a pathological factor namely: hiatus hernia, diaphragmatic hernia resulting from trauma, herniation of the left diaphragm phrenic nerve injury, chronic pyloric obstruction with dilatation of the stomach or prior gastroesophageal surgery [6, 7]. In the presented case, the most probable etiology is laxity ligaments and hiatal hernia, although we cannot exclude other causes.

The most commonly used classification was proposed by Singleton and describes three types of GV, according to the rotational axis: type 1 or organoaxial - is the most common (59%) and the rotation occurs about a line drawn from the pylorus to the esophagus - gastric junction; type 2 or mesenteroaxial - occurs in about 29 % of patients and rotation turns on an axis that connects the greater curvature and the hepatic hilum. As we can see in the presented pictures of CT scan; type 3 - a rare form (3%), which combines types 1 and 2 and forms [1-4].

Supplementary examination in these patients is important for diagnosis. In the analytical control, there may be a hyperamylasemia and elevated levels of lactate dehydrogenase and alkaline phosphatase. Gastrointestinal contrast studies, barium or gastrografin, have high sensitivity and specificity. The endoscopy usually shows a high deformation with gastric pylorus and difficult access, and in the most advanced stage of the disease, mucosal ulcerations. CT has important diagnostic value in GV, as for example in this case, where it was performed in the acute phase and provided a rapid diagnostic. Moreover, this exam can detect the presence of pneumatosis or pneumoperitoneum in case of necrosis and perforation [6].

Recent data suggests that routine elective repair of completely asymptomatic paraesophageal hernias may not be indicated. Surgical treatment of gastric voluvus

includes reduction of the stomach and limited gastric resection in cases of gastric necrosis. The laparoscopic approach can be used in most of the cases, but conversion to open access should be considered for complex problems or for the safety of the patient [8, 9].

Large hiatal hernias with or without gastric volvulus can be repaired either transabdominally (open or laparoscopic) or via thoracotomy, however to date, there are no randomized trials directly comparing open transthoracic vs. open transabdominal repair.

In the surgical approach, we need to take to consideration four hallmarks: 1) Hernia sac excision. Sac dissection during paraesophageal hernia repair is thought to release the tethering of the esophagus, facilitating reduction of the hernia and the decrease of early recurrence, as well as protecting the esophagus from iatrogenic damage [10]; 2) Reinforced repair. Primary sutured crural repair has been the main option for many years, but follow-up has suggested very high recurrence rates (>42%) after laparoscopic paraesophageal hernia repair [11]. Several case series suggests benefit with mesh, however, there are a few which question the use of meshed repair [12]; 3) Fundoplication. The majority of reports in the recent literature describe the performance of a fundoplication as a step of the repair. In a case-controlled study, surgeons found increased dysphagia with fundoplication, and of reflux symptoms in the group without fundoplication, thus routine fundoplication should be avoided [13]; 4) Gastropexy. One of the first studies using anterior gastropexy to reduce the recurrence rate after laparoscopic hiatal hernia repair with gastric volvulus showed no recurrences up to 2 years of follow-up evaluation [14]. This finding has been supported by a recent study showing that the addition of an anterior gastropexy significantly reduced recurrent hernias. However, other reports found no significant difference in recurrence rate [15].

In this case, the placement of a nasogastric tube has the function of gastric decompression, and in this case it solved the GV. A nasogastric decompression is possible only because the cardia mesenterioaxial VG is open. The endoscopic "desrotation" have satisfactory results but it is a temporary solution, being the definitive treatment the surgical approach. Urgent surgery in acute cases is fundamental and its delay increases mortality [4]. Contraindications for surgical

treatment involve conditions or comorbidities in which the patient cannot tolerate general anesthesia. The surgeon should also use clinical judgment and make sure the patient conditions are optimal before the operation.

CONCLUSION

A nasogastric decompression is an option in chronic form of hiatal hernia associated to gastric volvulus.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

AUTHOR'S CONTRIBUTIONS

Ana Franky Carvalho

Conception and design, Acquisition of data, Analysis and interpretation of data, Final approval of the version to be published

Ana João Rodrigues

Drafting the article, Critical revision of the article, Final approval of the version to be published

Pedro Leão

Conception and design, Acquisition of data, Analysis and interpretation of data; Drafting the article, Critical revision of the article, Final approval of the version to be published

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TABLES

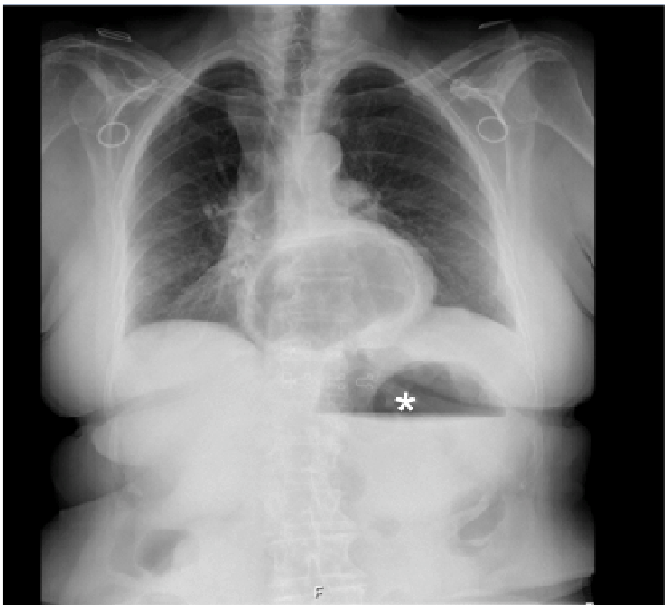
N/A

FIGURE LEGENDS

Figure 1: X-Ray shows an enlargement of mediatinum due to a gastric antrum.* indicates gastric fundus.

Figure 2: CT scan images. (A) CT scan shows a coronal view of gastric antrum position in mediastinum (arrow). (B) A coronal CT scan view of duodenum position (arrow). (C) A transversal CT scan view a first portion of duodenum towards in hiatal hernia (arrow).

FIGURES



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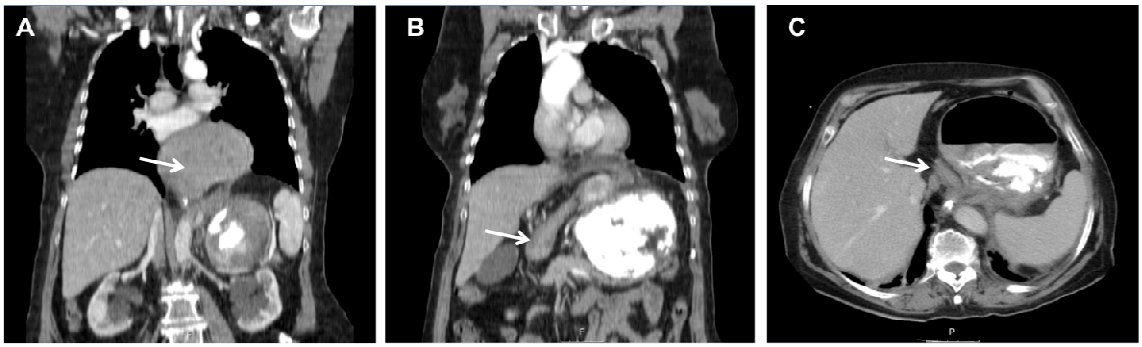

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