https://doi.org/10.15446/cr.v9n2.95622

STOMACH VOLVULUS. CASE REPORT

Keywords: Stomach Volvulus; Surgical Procedures, Operative; General Surgery.
Palabras clave: Vólvulo gástrico; Procedimientos quirúrgicos operativos; Cirugía general.

Jorge Armando Ángel-Barrios
José Alejandro Díaz-Castillo
Cristina Judith Padilla-Herrera
Fundación Universitaria Sanitas
- Faculty of Medicine - Department of General Surgery - Bogotá D.C. - Colombia.
Unidad de Servicios de Salud Occidente de Kennedy - General Surgery Service
- Bogotá D.C. - Colombia.

Corresponding author
José Alejandro Díaz-Castillo.
Servicio de Cirugía General, Unidad de Servicios de Salud Occidente de Kennedy.
Bogotá D.C. Colombia.
E-mail: josealejandrodiazc@hotmail.com

Received: 06/07/2021 **Accepted:** 19/07/2021

RESUMEN

Introducción. El vólvulo gástrico es una patología poco común descrita como una emergencia quirúrgica con tasas de mortalidad de hasta el 50%, por lo que su sospecha clínica debe confirmarse con imágenes contrastadas, las cuales deben realizarse de manera oportuna y son de gran utilidad para plantear un abordaje terapéutico basado en la estabilidad clínica del paciente, sus comorbilidades y el eje del estómago rotado (volvulado). Esta patología puede abordarse mediante tratamiento quirúrgico y no quirúrgico.
Presentación del caso. Hombre de 43 años de edad quien durante los 2 últimos años presentó disfagia y epigastralgia, predominantemente postprandial, las cuales se exacerbaron una semana antes de su ingreso a urgencias. Se realizó endoscopia de vías digestivas altas que permitió establecer diagnóstico de estómago en reloj de arena y radiografía de vías digestivas altas que evidenció vólvulo gástrico mesenterioaxial. El paciente fue sometido a una laparotomía exploratoria en la cual se realizó la corrección del vólvulo gástrico. El procedimiento fue exitoso y el paciente tuvo una recuperación adecuada y sin complicaciones.
Conclusión. Considerando la alta mortalidad descrita en pacientes con vólvulo gástrico, se requiere un adecuado diagnóstico para evaluar el plan terapéutico y determinar si los pacientes son candidatos a manejo no quirúrgico (conservador) o quirúrgico. El procedimiento más realizado para esta patología es la gastropexia anterior por vía abierta, la cual fue realizada en el paciente del caso clínico reportado con resultados satisfactorios.

ABSTRACT

Introduction: Gastric volvulus is a rare condition described as a surgical emergency with mortality rates of up to 50%. Clinical suspicion should be confirmed with contrasted images, which must be performed in a timely manner, in order to establish a diagnostic and propose a therapeutic approach based on the clinical stability of the patients, their comorbidities, and the axis of the volvulated stomach. This condition can be treated both surgically and non-surgically.
Case presentation: A 43-year-old man who for the past 2 years presented dysphagia and epigastralgia, predominantly postprandial, which were exacerbated a week before his admission to the emergency department. An endoscopy of the upper gastrointestinal tract led to a diagnosis of hourglass stomach, while an upper gastrointestinal X-ray showed a mesenterioaxial gastric volvulus. The patient underwent an exploratory laparotomy in which the gastric volvulus was corrected. The procedure was successful, and the patient had an adequate recovery without complications.
Conclusion: Considering the high mortality described in patients with gastric volvulus, a precise diagnosis is required to decide whether the patients are candidates for non-surgical (conservative) or surgical treatment. The most commonly performed procedure is open anterior gastropexy, which was performed in the reported patient with satisfactory results.

INTRODUCTION

Gastric volvulus (GV), which is defined as an abnormal rotation of the stomach along its long or short axis (1,2), was first described in 1841 by Vic Robitansky as the cause of bowel strangulation. Subsequently, in 1866, Berti, based on the autopsy findings of a 61-year-old woman, made a more detailed description of this condition (2,3). There is not enough information in the current literature to establish the prevalence of GV; however, this condition is described as a surgical emergency with mortality rates of up to 50%, and its early detection and treatment are extremely important (3,4).

The treatment of GV depends not only on its etiology, but also on the clinical condition and hemodynamic stability of the patient. With this in mind, nonsurgical versus surgical approach has been described in the literature. Regarding the latter, two approaches have been described, open and laparoscopic, with the second being the preferred option since it is associated with fewer complications and shorter hospital stay (1,3).

The following is the case of a man with a clinical and radiological diagnosis of GV, in whom a surgical approach by means of open gastropexy was considered for the treatment of his condition, achieving a satisfactory improvement.

CASE PRESENTATION

A 43-year-old African-American man, with no relevant medical history, was referred to the emergency department of a tertiary care center in Bogotá (Colombia) by the gastroenterology service (outpatient clinic) after following him for 6 months due to a 2-year history of dyspepsia symptoms, which exacerbated a week before his admission to the emergency room. At the gastroenterology outpatient clinic, an upper gastrointestinal (GI) endoscopy was requested, and 5 days after the appointment it was performed, revealing stenosis in the body and antrum of the stomach (which divided the stomach into two chambers that made it difficult for the endoscope to advance); mucosa of the body and antrum with flat patchy erythema; and ulcer of fibrinous tissue with a hematic spot of approximately 10mm in the fundus of the stomach.

Also, the report of endoscopic findings showed hourglass stomach and a grade IIc gastric ulcer in the gastric body as per the Forrest classification. In view of this finding, the gastroenterology service requested a priority upper gastrointestinal tract X-ray as an extension study (performed on the same day as the upper GI endoscopy), which showed paralysis of the left half of the diaphragm and mesenteroaxial GV (Figure 1). Therefore, the patient was referred that same day to the emergency room for evaluation by general surgery.

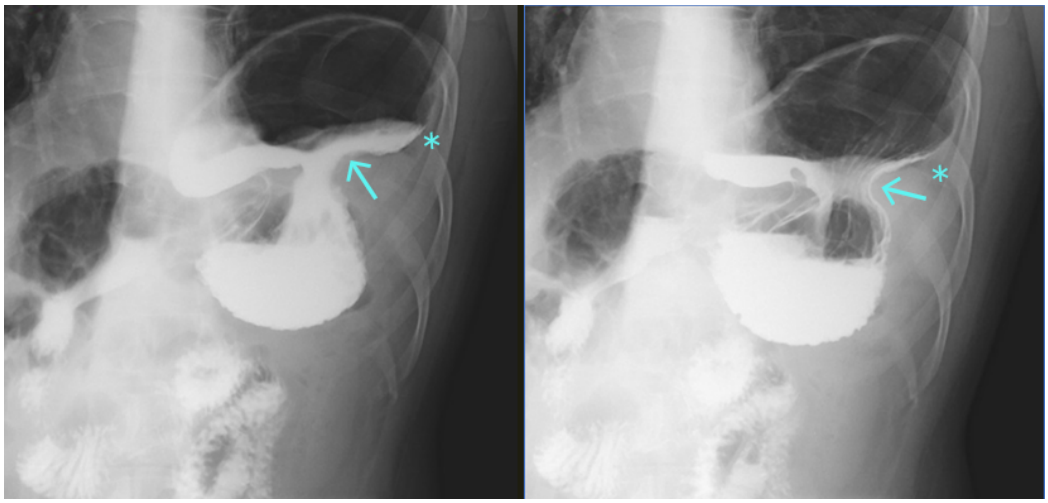

Figure 1. X-ray of the digestive tract.
* Paralysis of the left half of the diaphragm.
→ Mesenteroaxial gastric volvulus.
Source: Image obtained while conducting the study.

The patient was admitted to the emergency room in an acceptable general condition, with no signs of respiratory distress; with a distended abdomen and generalized pain on deep palpation; and no signs suggesting peritoneal irritation or acute abdomen. Vital signs on physical examination were: blood pressure: 128/81 mmHg, heart rate: 89 bpm, respiratory rate: 18 rpm, and temperature: 36°C.

Taking into account that there was no relevant medical history to explain the patient's condition, the general surgery service considered surgery, and therefore, on the same day of admission, an exploratory laparotomy was performed with intraoperative findings of mesenteroaxial GV, without gastric or intestinal ischemia. During the same procedure, the GV was surgically corrected by means of an anterior gastropexy with four 3/0 polypropylene (PP) sutures, including one fixation in the gastric fundus up to the diaphragm pillar and two additional fixations in the greater curvature of the stomach and in the antrum of the stomach.

Treatment with non-steroidal anti-inflammatory drugs (dipyrone 1g intravenous every 8 hours and acetaminophen 1g orally every 8 hours) was started and an adequate postoperative progress was observed. The patient tolerated adequately the intake of liquid meals with progression to solids, did not present associated abdominal pain, and given his clinical stability the general surgery service indicated discharge on the third day of hospital stay.

The patient attended a postoperative follow-up appointment thirteen days after his discharge and stated that he had no pain or clinical signs suggestive of associated complications, so no additional diagnostic imaging was requested, and he was definitively discharged from the hospital.

DISCUSSION

GV is a potentially fatal condition defined as an abnormal rotation of the stomach, which can be up to 180 degrees (1,5). Although the prevalence of this condition is unclear due to the limited information available in the literature, it has been established that the peak age of incidence is 50 years of age, with no association with race or sex (1,4). Risk factors for GV include: age over 50 years, abdominal wall hernias, congenital or acquired anomalies of the diaphragm, phrenic nerve palsy, kyphoscoliosis, and anatomical malformations of the gastrointestinal tract (1).

The stomach is an organ located in the upper part of the abdomen that is close to the diaphragm and other organs such as the large intestine, spleen, pancreas, and liver (5). In addition, it is normally fixed by four ligaments (hepatogastric ligament, hepatoduodenal ligament, gastrosplenic ligament, and greater omentum) which, together with the gastroesophageal junction and the pylorus, prevent it from rotating on its own axis (1,2).

Depending on its etiology, GV is classified as primary or secondary (5,6). Primary GV, also referred to as acquired, is the result of neoplasms, adhesions and/or anomalies in the fixation of the stomach, alterations that can occur due to the absence of hepatic ligaments or due to lesions in the ligaments that adhere to the stomach and are of both congenital and acquired origin (1,3,6). Secondary GV is attributed to disorders of the gastric anatomy and function, or to abnormalities of adjacent anatomical structures such as the diaphragm or spleen (1,6). According to the literature, the primary etiology is the most common, while the secondary etiology is responsible for 30% of the cases (1,4). Paraesophageal hernia is the most common cause of secondary GV (2,4).

GV can also be classified according to its anatomy. This classification was proposed in 1940 by Singleton and is based on the axis in which rotation takes place (2):

1. Organo-axial rotation: this variant is most commonly associated with the presence of paraesophageal hernias and diaphragmatic eventration and is characterized by rotation through the axis contiguous to the gastroesophageal junction, also known as the long axis (Figure 2) (1-3).
2. Mesenteroaxial volvulus: this variant is characterized by the rotation of the stomach in an axis perpendicular (horizontal) to its longitudinal axis, also known as short axis, leading to the displacement of the antrum and the superior pylorus towards the gastroesophageal junction (Figure 2) (1-3).
3. Organoaxial and mesenterioaxial rotation: this variant, which is the rarest, results in a combined volvulus (1,3,7). Its clinical manifestations may vary depending on the acuity of symptom onset, the type of volvulus, and the degree of obstruction (2,3).

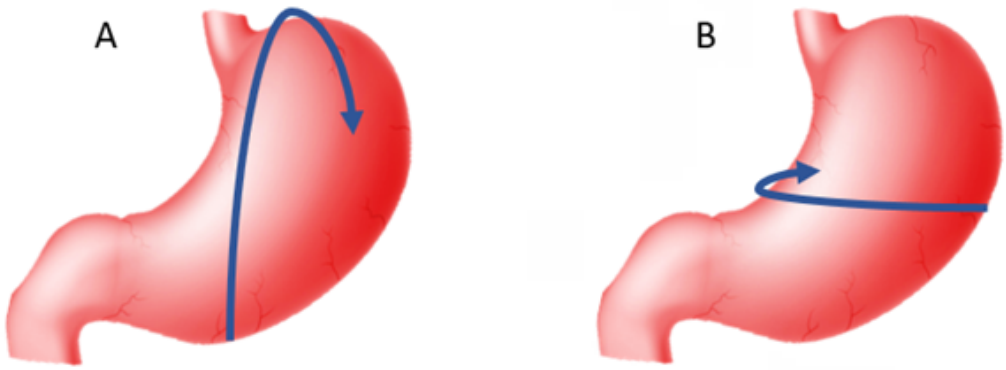

Figure 2. Schematic representation of the types of gastric volvulus. A) Organoaxial; B) Mesenteroaxial.
Source: Own elaboration.

In 1904, Bouchardt described the GV triad, which is found in 70% of cases (2) and involves severe epigastric pain, retching but no vomiting, and inability to pass a nasogastric tube (1,2). This triad indicates the presence of an initial obstruction of the pylorus, a subsequent obstruction of the cardia, and finally a closed loop intestinal obstruction (2,6,7).

A number of symptoms associated with GV have been described, for example hematemesis, which is the result of ischemia of the esophageal or gastric mucosa (secondary to retching); likewise, vague symptoms such as dysphagia, abdominal distention, or heartburn have been reported (1). Complications associated with GV include ulceration, perforation, bleeding, pancreatic necrosis, omental avulsion, and rupture of splenic vessels (3).

The reported patient did not meet Bouchardt's triad and presented with nonspecific symptoms consisting of long-standing abdominal pain, which was exacerbated a week before admission to the emergency department, yet he had symptoms suggestive of upper gastrointestinal tract bleeding. This patient was diagnosed with primary GV because he was not in the population at risk and had no risk factors associated with this condition, in addition, there was no evidence of anatomical defects that could be related to the secondary etiology. Due to intraoperative findings, this case was classified as mesenteroaxial according to Singleton's classification.

The diagnosis of GV should be supported by diagnostic imaging such as chest X-ray, which may describe nonspecific findings of a mass in the retrocardiac space with the presence of air, although it is not always useful since it could be reported as normal or describe intestinal distension (1). Abdominal X-ray, on the other hand, may show findings of a distended stomach with liquid content inside (1,2).

The gold standard for the diagnosis of GV are studies with barium swallow in the upper GI tract (1-3); however, computed tomography (CT) with contrast medium is the most reliable study due to the ease of its performance in the emergency department (1,2) and its high percentage of specificity and sensitivity for the diagnosis of this condition (90% and 100%, respectively) (1). CAT scan also describes characteristic findings such as the presence of an antral-body transitional zone (antrum located at the same level as the gastric fundus or above) (1,2), gastric pneumatosis (which can be an indirect sign of gastric necrosis), or the presence of the whirlpool sign (in which the esophagus and stomach rotate around each other) (1).

In cases of GV, the approach to abdominal pain must be detailed to consider differential diagnoses such as perforated peptic ulcer, acute cholecystitis, acute pancreatitis, and acute coronary syndrome (4-8). The literature describes a non-surgical therapeutic approach that involves passing a nasogastric tube blindly to decompress the stomach and thus reduce pain and retching; on some occasions, spontaneous disrotation is stimulated, thus improving perfusion and improving the resolution of the acute condition (1,6). If this procedure cannot be performed blindly, the passage of the tube into the stomach must be guided by endoscopy.

The use of upper GI endoscopy may take a diagnostic and therapeutic approach in which decompression and fixation of the stomach is performed using at least one percutaneous endoscopic gastrostomy tube and/or several fixation points (6). Conservative management such as this is considered in patients without clinical or radiological evidence of gastric involvement or comorbid patients in whom surgery is not possible (6). GV resolution with upper GI endoscopy is used to decrease the ischemia time and to guarantee the irrigation of the stomach, especially the short gastric arteries (1).

The surgical approach has three objectives: reduction of the volvulus, resection or repair of the non-viable stomach, and prevention of recurrence by repairing the trigger (1-3). Some of the surgical techniques described for stabilization of the stomach include the Opolzer operation (partial gastrectomy + gastrojejunostomy + fundo-antral gastrostomy) (3), Tanner's gastropexy with colonic displacement (the greater omentum is completely divided to reduce traction on the greater curvature and avoid recurrence), and Grey's Ghimenton gastropexy (a transverse mesocolic defect is created and sutured to the anterior region of the stomach) (1,2-3).

In the surgical approach, the irrigation of the short gastric arteries must always be preserved to help anchor the greater curvature of the stomach. Likewise, the secondary anatomical defect must be repaired, and in the case of a diaphragmatic hernia, the hernia sac must be removed and separated in order to suture the defect (2).

The scarcity of literature on the treatment of GV makes it impossible to compare between a laparoscopic and an open approach. However, it has been established that the former is associated with fewer complications (ulceration, perforation, bleeding, pancreatic necrosis, omental avulsion, and rupture of splenic vessels) and reduces hospital stay, which is why this approach may be indicated in patients at high risk for open surgery or chronic GV (3,8-10).

In the present case, the upper GI X-ray with barium swallow was the test that confirmed the diagnosis of GV. According to the literature, in this case, conservative management with nasogastric tube placement for gastric decompression plus percutaneous gastropexy via upper GI endoscopy should have been performed initially. However, a surgical approach was decided in view of the possibility of correcting the secondary causes of GV, which resulted in the prevention of complications, as evidenced in the postoperative follow-up.

CONCLUSIONS

GV is a potentially fatal condition that requires an early diagnostic and therapeutic approach to reduce associated complications. In this sense, it is necessary to determine the etiology and the axis in which the gastric volvulus is located in order to propose the most appropriate treatment. Likewise, when considering the surgical approach, candidate patients should have an emergency surgical assessment in which the three therapeutic objectives are always considered. The most commonly used technique is open anterior gastropexy; however, depending on the intraoperative findings, other surgical techniques can be applied. Finally, it is important to keep in mind that the minimally invasive approach is associated with fewer complications and a shorter hospital stay.

ETHICAL CONSIDERATIONS

The patient gave written informed consent for the publication of this case report.

CONFLICT OF INTEREST

None stated by the authors.

FUNDING

None stated by the authors.

ACKNOWLEDGMENTS

None stated by the authors.

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