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GASTRIC VOLVULUS – A REVIEW OF 38 CASES

Volvo gástrico: revisão de 38 casos

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ABSTRACT – ***Background*** - Gastric volvulus is frequently an asymptomatic disease, and it is usually diagnosed during radiographic examination of the superior digestive tract. The acute form, however, can spawn serious and lethal clinical consequences. This disease is defined by the anomalous rotation of the stomach over itself, and it can be classified according to type, extension, direction, etiology, and clinical presentation. ***Aim*** – To review the records from 38 patients with gastric volvulus diagnosed in the Hospital das Clínicas of University of São Paulo between 1968 and 2001. ***Methods*** – This is retrospective analysis of 38 patient records. It was collected from each patient: name, age of first symptom appearance, gender, main clinical findings and complementary exams, volvulus type, extension, direction, etiology, and clinical presentation, therapeutic procedures, type of surgery performed, eventual recurrence, and long-term evolution. ***Results*** - It was observed that occurrences of gastric volvulus are mainly secondary (75.8%). For the majority of patients (n=33), surgery was chosen as the treatment option: chronic disease in 29 cases and acute in four. Conservative treatment was reserved only for patients with no clinical conditions to surgical treatment. Anterior gastropexy was associated to high recurrence rates. Suturing the low gastric curve to the hepatic capsule and the transverse colon to the left subphrenic space (Tanner´s operation) seemed to be the technical treatment of choice for primary gastric volvulus. ***Conclusion*** - Treatment of gastric volvolus must be tailored according the etiology of the disease.

HEADINGS – Stomach. Gastric volvulus. Surgery. Hiatal hernia.

INTRODUCTION

Gastric volvulus is defined by the anomalous rotation of the stomach over itself, and it can be either acute or chronic. This rotation can reach different degrees, leading to variable clinical syndromes. These can range from dyspeptic symptoms to complete rotation with vascular impairment, and the latter of these requires surgical intervention. Clinically, the Borchardt[9] triad can be found in this disease. It is characterized by strong epigastric pain and distension, inability to vomit, and difficult or impossible nasogastric tube bypass. These symptoms must be promptly recognized, because this triad reflects the clinical expression of torsion that may lead to stomach gangrene.

Most cases of gastric volvulus have a secondary cause. Diseases of the stomach, like peptic ulcers, retract the small curvature and predispose the stomach to mesenteric-axial axis rotation. Inside hernia bag migration, especially through the diaphragm, commonly produces gastric torsion. Stomach ligament laxity is one cause for primary volvulus.

The first gastric volvulus description is attributed to Berti[6] in 1866 during a post-mortem exam. Berg[5] reports the first case with successful surgical reduction. In the third decade of the 1900's the first radiological studies were shown. Rosselet[37] described signs of asymptomatic gastric torsion, whereas Weiss[43] a chronic volvulus development case.

This study intended to illustrate the main features of the clinical presentation of gastric volvulus during a 34 years of follow-up in an university hospital.

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METHODS

The gastric volvulus classification employed in this paper contains many factors related to physiopathology, etiology and clinical presentation. It is based on the post-mortem observations by Payer[36] and Von Haberer[41], which have been modified by Anzillotti[2] and Sawyer[39].

According to this classification, it was retrospectively analyzed the records of 38 patients admitted at the Discipline of Digestive Tract Surgery of the Department of Gastroenterology at the Hospital das Clínicas from the University of São Paulo between 1968 and 2001. The following data were collected from each patient: name, age of first symptom appearance, gender, main clinical findings and complementary exams, volvulus type, extension, direction, etiology, and clinical presentation, therapeutic procedures, type of surgery performed, eventual recurrence and long-term evolution.

RESULTS

Twenty-eight patients were male (73.7%) and mean patient age was 48.2 years (range: 4 months to 74 years old). Most cases occurred in the third and fifth decades of life (nine cases each) (Table 1).

TABLE 1 - Clinical presentation of gastric volvulus (n = 38)

Chronic : 34 cases (89.5%)
Burning epigastric pain: 24 (70.6%)
Nausea and vomiting: 13 (38.2 %)
Atypical pain: 10 (29.4 %)
Improvement with ventral decumbence: 10(30%)
Acute : 4 cases (10.5 %)
Improvement with ventral decumbence: 4(100%)
Acute pain: 4(100%)
Previous pain episode: 2(50%)
Vomiting: 2(50%)
Borchardt triad: 2(50%)

With respect to clinical presentation, 34 chronic (89.5%) and four acute (10.5%) volvulus cases were present. Among patients with chronic volvulus, the most common symptoms included burning epigastric pain (70.6%), nausea and vomiting (38.2%), atypical pain (29.4%), and improvement with ventral decumbence (29.4%). Among those with acute volvulus, the most common symptoms were acute pain (100%), improvement with ventral decumbence (100%), previous pain episodes (50%), vomiting (50%), and the Borchardt triad (50%).

The most common type of volvulus within our cases was the organo-axial type. It was observed 20 cases (52.6%) of this type and seven (18.4%) of the mesenteric-axial type. In 11 cases (28.9%), it was impossible to identify the type due to insufficient data.

Conservative treatment was performed for 18 patients with chronic volvulus; all of these were in the beginning of the experience. From these, 13 patients later underwent a surgical procedure. The five remaining patients did not, due to adverse clinical conditions; treatment for these patients was done by a fractional diet, rest after meals and anti-spasmodic medication. From these five cases treated only clinically, one remained asymptomatic. Three had sporadic crises and one did not continue with the follow-up. Among the acute volvulus cases, it was tried unsuccessfully to perform clinical treatments like nasogastric tube placement and ventral decumbent rest. Surgery was indicated in these four cases.

Analysis of the surgical cases revealed that secondary volvulus predominates over primary volvulus (Table 2). Among the primary cases (24.2%), the ligament looseness was the mainly cause. For secondary volvulus cases (75.8%), post-operative adhesions and hiatus hernia prevailed.

Thirty-three patients (29 due to chronic and four to acute volvulus) were operated. The surgical procedures performed are listed in Table 3, and they were separated based on acute or chronic volvulus.

TABLE 2 - Etiology of gastric volvulus cases that underwent surgery

Primary : 8 cases (24.2 %)
Ligament laxity: 6
Ligament agenesis: 2
Secondary : 20 cases (75.8%)
Post-operative adhesions: 6
Cholecystectomy: 1
Gastrectomy :2
Exploring laparotomy: 1
Perforated ulcer suture: 1
Enterectomy by intestinal volvulus: 1
Inflammatory adhesions: 3
Gastric ulcer: 2
Duodenal ulcer: 1
Congenital diaphragmatic hernia: 1
Diaphragmatic evisceration: 3
Mediastinum tumor post-operative: 1
Post-trauma: 2
Hiatus hernia: 9
Hiatus hernia + diaphragmatic hernia: 1
Hiatus hernia + gastric ulcer: 1
Iatrogenic: 1

TABLE 3 - Surgical procedures performed in 33 cases of gastric volvulus treatment

Procedure	Chronic (n = 29)	Acute (n = 4)
Simple reduction	2	2
Diaphragmatic hernia repair	0	0
Anterior gastropexy	3	2
Gastropexy and gastrostomy	1	0
Billroth II gastrectomy	0	0
Billroth I degastrectomy	1	0
Gastrectomy + Lind	1	0
Gastropexy + Lind	3	0
Diaphragmatic hernia repair + Lind	2	0
Gastrectomy + Tanner	1	0
Tanner	2	0
Gastropexy + Diaphragmatic hernia repair	1	0
Lind	1	0
Nissen	5	0

Simple reduction was performed in four cases (two acute and two chronic). These cases included three post-operative adhesion cases and one case with an imprudent suture of the great to small gastric curvature that occurred during a surgical procedure for a perforated gastric ulcer performed at another service. The latter patient died of multiple organ insufficiency, as did another patient who was a victim of acute volvulus secondary to post-laparotomy adhesions due to abdominal trauma. The other two cases showed good evolution for four months, at which point follow-up was lost.

Anterior gastropexy was performed in five cases (three chronic patients with ligament laxity and two acute patients with gastrocolic ligament agenesis). The symptoms disappeared during the post-operative period, but symptoms recurred less than one year after discharge in three primary cases. One of these three patients required another surgery for gastric volvulus. Anterior gastropexy was associated with diaphragmatic hernia pexy (diaphragmatic evisceration after resection of a mediastinal tumor) and gastrostomy (for an 8-month-old child); in each of these cases, there was good post-operative evolution.

Lind esophagogastrofundoplication procedure (partial fundoplication) associated with anterior gastropexy was employed in three cases of hiatal hernia in which it was noted ligament laxity that permitted great gastric mobility. These three cases showed good evolution during the long-term follow-up period and no recurrence. Five patients with gastric volvolus secondary to hiatus hernia were submitted to laparoscopic floppy Nissen fundoplication. The follow-up showed no recurrence after at least five years.

Diaphragmatic hernia suture was performed in three cases. Besides the anterior case already described, it was adopted in two cases of traumatic diaphragmatic rupture and one case of congenital diaphragmatic hernia. In one case of hiatal hernia, this procedure was associated to esophagogastrofundoplication. In another patient with hiatal hernia without ligament laxity, Lind fundoplication was performed. All patients exhibited no recurrence.

Six patients with secondary gastric volvulus were submitted to gastric resection for removal of the causal factor. In two cases, the etiology was strong post-gastrectomy adhesions. In three, the etiology was a small curvature gastric ulcer with intense scar retraction (in one case associated with hiatus hernia). In one case, the etiology was a duodenal ulcer with bulbar distortion. One of these cases had minor symptoms appear after one year, and one case showed clinical symptoms compatible with dumping syndrome.

Colon dislocation associated with gastropexy in hepatic capsule (Tanner's surgery) was performed in three patients. The first two patients (one with secondary volvulus due to post-laparotomy adhesions for intestinal volvulus and one with primary volvulus due to ligament looseness) were followed for six years without recurrence of symptoms. The third case, a patient with secondary volvulus due to an angular incisure gastric ulcer, was treated with Tanner's surgery associated with distal gastrectomy with Billroth I reconstruction. This patient was followed for five years and remains asymptomatic.

DISCUSSION

The normal stomach has great mobility but stays in a habitual position due to both its continuity with the cardia and duodenum and the action of many ligaments (e.g., gastrophrenic, gastrosplenic, gastrohepatic and gastrocolic). The absence or distension of these ligaments is necessary for volvulus to occur. Dalgaard in experiments with corpses showed that the stomach cannot rotate 180 degrees unless the gastrosplenic and gastrocolic ligaments are sectioned[20]. In addition to ligament alterations, other etiologies can be involved in volvulus genesis. Congenital or acquired (e.g., post-operative) adhesions or lesions (ulcers or tumors) can provide a basis for gastric rotation.

Gastric volvulus is more likely to occur in the fifth decade of life (in this study, in the third decade as well), and it occurs with the same frequency in both genders (1.3 males to 1 female in this series) [3,10,12,20,21,29,32,3334]. Its clinical presentation can be in an acute form with a variable degree or in a chronic form with uncertain and sporadic dyspeptic symptom supremacy[3,21]. Chronic gastric volvulus accounts for the majority of cases (89.5%). Its symptoms include uncharacteristic epigastric pain that begins after meals followed by abdominal distension, vomiting and even dysphagia[15,19].

Acute gastric volvulus occurs 30 to 60% of the patients described in the literature[1,13,16]. This frequency is higher than that observed in this study (10.51%). This could be explained by the characteristics of this hospital service: a high volume elective stomach surgery unit. The sudden presentation of acute gastric volvulus includes epigastric pain that radiates to the back and scapular region. Failed efforts to vomit and abdominal distention instead of vomiting are common in the initial presentation. The Borchardt[9] triad (strong epigastric pain and distention, inability to vomit, and difficulty or impossibility of passing a nasogastric tube) suggest initial blockage of the pylorus, followed by cardia obstruction and posterior gastric distention. This triad was observed in 50% of the cases in this series, which is less frequent than in others reports[38]. Carter[13] emphasized other aspects of acute gastric volvulus, such as bareness symptoms (i.e., when the stomach is in thoracic position) and the importance of thorax radiography observation and rapidly conducted contrasted studies. Serious cases show exuberant symptoms, with digestive hemorrhage appearance and even stomach gangrene.

These symptoms are typically found in 5 to 60% of acute cases[13]. Strangulation often occurs in patients with traumatic diaphragmatic hernia (90% of cases). Cardiopulmonary insufficiency and shock may progress to death during evolution of the disease if surgery is delayed. Mortality rates ranging from 12 to 50% are described for acute cases[20,25,30].

In accordance with the findings of others authors[16] organo-axial was the most frequently observed type in our study (52.6%). In a revision of 200 cases, Wastell and Ellis[42] found organo-axial gastric volvulus in 59 % of patients. This was followed in frequency by the mesenteric axial volvulus type (29%), both types (2%), and no classification (10%)[62]. Organo-axial volvulus occurs when there is a rotation around the cardiopyloric axis. This is the most common type in the world literature, and it has the highest rate of predisposition to visceral strangulation. Anterior rotation of the major gastric curvature usually occurs, and this moves the posterior face of the stomach to an anterior position[9]. The obstruction occurs on the pyloric or cardia levels. An association with diaphragmatic defects is common[13].

The mesenteric-axial type was present in 18.4% of our cases. This type is characterized by a rotation around the transverse stomach axis, which leads to antropyloric obstruction. Partial, spontaneous resolution of the torsion is common, and the presence of previous episodes has been reported. The reference point with respect to direction is the transverse colon; posterior volvulus shows complete rotation, with the stomach positioned in front of the transverse colon[38].

Primary gastric volvulus represents 30% of the cases related in the literature and is more common in adults, although it was initially described in children[12,16]. It was observed a similar frequency of occurrence in this study, where secondary volvulus was predominant in the operated cases (75.8%). In cases of primary volvulus, five patients had laxity and two had ligament agenesis. Secondary gastric volvulus may occur after rotation around a base point formed by an associated disease. Gastric ulcers and neoplasia retract the small curvature, thereby predisposing the stomach to rotation. Hiatal hernia is the most common disorder related to gastric volvulus (20%); in these cases, rotation occurs around the hernia ring[32]. Others predisposing factors include splenomegaly, colonic distention [35], and post-operative adhesions (present in 21% of our patients).

Conservative treatment can be performed in special situations, such as when the patient does not have a good clinical condition or has been preparing for a surgical procedure. Hydroelectrolytic disturbs correction, nasogastric tube passage, and procinetic administration for vomiting provide initial treatment approaches. This therapeutic modality eventually succeeds, most often in mesenteric-axial volvulus cases where there is no cardia obstruction. In this series, however, 13 of 18 patients (72%) that underwent clinical treatment for chronic volvulus need later surgical treatment. All patients with acute volvulus required later surgical treatment. Similar observations have been made by other authors[3].

Endoscopic treatment, which allows volvulus decompression and reduction, has been successfully used to treat patients with high surgical risk and acute presentation[7,8,22,28]. In some cases where the endoscopic reduction is effective (mainly in cases of intra-thoracic volvulus), a laparoscopic approach may help. This procedure allows safe reduction, placement of a gastrostomy tube and treatment of an underlying disease like hiatal hernia[4,11,30].

Clinical pleomorphism and etiological factor variety makes the standardization of therapeutic conduct difficult. In chronic volvulus with few symptoms, other abdominal causes like gallstones, gastritis and hiatal hernia must be investigated. Regardless of whether volvulus is acute or chronic, surgical conduct is the treatment of choice once volvulus has been confirmed as the diagnosis responsible for the clinical symptom presentation. It was adopted here a median laparotomy to complete an abdominal cavity inspection. This procedure reduces the stomach; if possible, it also resects the hernia sac. In cases of extreme gravity, a temporary gastrostomy can be performed to attach the stomach; it was performed such a procedure in one case.

Gastropexy has been suggested by many authors as the treatment of choice for primary volvulus. This procedure attaches the stomach to neighboring organs like the liver, diaphragm, or anterior abdominal wall[26]. In this serie however, this technique was related to high recurrence rates (three of five cases). It is therefore not practical as an isolated type of treatment.

Related conditions must be corrected. For example, the hiatal hernia cases (29%) and congenital or acquired diaphragm defects (13% of our patients) in this series must be corrected[17,19,24,27]. When hiatal hernia is present in addition to gastric volvulus, the method of choice is the partial esophagogastrofundoplication proposed by Lind[31] and popularize in Brazil by Gama-Rodrigues or a floppy Nissen total fundoplication, nowdays performed by laparoscopic approach. In cases associated with ligament laxity, gastropexy must be performed. Felix et al.[23] relate 10 cases of anterior gastropexy associated with Lind fundoplication without recurrence during longterm follow-up. These authors emphasize the fact that that esophagogastrofundoplication should be performed to prevent gastric fundus volvulus even in the absence of gastroesophagic reflux. Volvulus arising from small curvature ulcers or neoplasia must be treated by partial gastrectomy.

In the last decades, videolaparoscopy has been adopted for the treatment of gastric volvulus and its associated conditions. In 1993, Koger and Cameron described volvulus reduction followed by percutaneous gastrostomy to attach stomach at the abdominal wall[11,30]. The good outcomes of patients that underwent correction of hiatus hernia, as done in this last five cases, confirmed the importance of laparoscopic approach.

Tanner[40] related good long-term follow-up results after colonic dislocation associated with anterior gastric pexy. After the separation of the transverse colon from the stomach and sectioning of the gastrocolic ligament, the small gastric curvature is attached to the hepatic capsule and the transverse colon is attached to the left subphrenic space. This technique was performed in three last patients. After six years of follow-up in two cases and four in the third, no signs of recurrence were present. It is opinion of these authors that the technique of choice for primary gastric volvulus is to remove the point necessary for gastric rotation.

CONCLUSION

Conservative treatment is reserved only for patients not fit to surgery; the choice of surgical procedure for treatment of gastric volvolus should be done according to etiology; simple gastropexy must be avoid, even in primary cases, when Tanner operation is the best technique; correction of secondary causes of gastric volvolus is the key of a lower recurrence rate.

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RESUMO - ***Racional***- O volvo gástrico é frequentemente condição assintomática e diagnosticado em exame radiológico feito por outras causas. A forma aguda, no entanto, pode ter consequências graves e letais. Ele é definido como rotação anômala do estômago nele próprio e classificado de acordo com o tipo, extensão, direção, causa e apresentação clínica. ***Objetivo*** - Apresentar aspectos clínicos e morfológicos de volvos gástricos. em 38 pacientes. ***Métodos*** – Análise retrospectiva onde foram coletadas informações registradas sobre 38 pacientes a cerda da idade, surgimento do primeiro sintoma, gênero, principais achados clínicos, de exames complementares, tipo do volvo, causa, procedimentos terapêuticos, recidivas e evolução tardia. ***Resultados*** – Em 75,8% o volvo foi secundário Na maioria dos pacientes a opção de tratamento foi cirúrgica. Ele era crônico em 29 e agudo em quatro pacientes. O tratamento conservador foi indicado somente aos sem condições clínicas para operações. Gastropexia anterior foi associada à alta taxa de recidiva. A sutura da pequena curvatura gástrica à cápsula hepática e cólon transverso na fossa subfrência esquerda (operação de Tanner) parece ser o tratamento de escolha nos volvos primários. ***Conclusão*** – O tratamento do volvo gástrico deve ser feito sob medida caso a caso e de acordo com a causa da doença.

DESCRITORES - Estômago. Volvo gástrico. Cirurgia. Hérnia hiatal

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