

Acute Unclassifiable Gastric Volvulus Due to Diaphragmatic Eventration in Adults: A Case Report

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ABSTRACT

Introduction: The aim of our work was to report a case of unclassifiable acute gastric volvulus due to diaphragmatic eventration in an adult treated in the general surgery department of the Ziguinchor Peace Hospital.

Case Report: This was a 52-year-old patient who had consulted for abdominal pain, associated with liquid vomiting and a stoppage of digestive transit. Her history was unremarkable. On physical examination, we noted a clear consciousness, a preserved general condition, a temperature of 37.8°C, a tachycardia of 101 beats/min, a blood pressure of 100/60 mmHg, a tympanic epigastric arch and peritoneal irritation. The attempt to place a nasogastric tube was laborious and brought back 150cc of blackish liquid. On biology, we noted a hyperleukocytosis with neutrophil predominance, a hemoglobin level of 10.6 g/dl, a creatinine level of 17.32 mg/l and an azotemia of 0.39 g/l. The computed tomography scan performed showed an elevation of the left diaphragmatic dome associated with marked gastric hydro-aeric distension and an area of tissue thickening, with vascular congestion, separating a purely hydro gastric contingent and another hydro-aeric contingent. Surgical exploration by laparotomy showed an unclassifiable gastric volvulus around the fundus engaged in a left diaphragmatic eventration. Gastric detorsion, atypical gastrectomy removing the necrotic fundus and phrenoplication were performed. The postoperative course was simple.

Conclusion: Acute gastric volvulus is a rare surgical emergency. The clinical signs are nonspecific and the diagnosis is most often radiological with CT. The treatment is surgical and consists of reduction, management of complications and treatment of the etiology with or without gastropexy.

Keywords

Gastric volvulus, Diaphragmatic eventration, Adult, Emergency, Gastrectomy.

Introduction

Gastric volvulus is defined by an abnormal rotation of all or part of the stomach relative to one of its axes, thus creating the conditions for upper digestive occlusion with gastric dilation and risk of strangulation [1]. Gastric volvulus is a rare, potentially fatal clinical condition. The peak incidence is in the fifth decade. It has

no predilection for sex or race. Depending on the axis of rotation, several varieties of gastric volvulus are differentiated [2,3]. The clinical diagnosis is suggested by the Borchardt triad, which is not very specific and is only present in 70% of cases of gastric volvulus [4,5]. CT scans allow diagnosis and lesion assessment [6]. Complications including gastric necrosis or acute peritonitis due to gastric perforation in free peritoneum are due to delayed diagnosis [7]. Treatment is surgical [8]. In Senegal, Gueye et al. reported a case of acute organoaxial gastric volvulus on a diaphragmatic eventration at Aristide Le Dantec Hospital in 2015 [9]. A case of

idiopathic acute mesentericoaxial gastric volvulus was reported by Bangoura et al in 2022 at the Principal Hospital of Dakar [10].

The aim of our work was to report and discuss the epidemiological, diagnostic and therapeutic aspects from a case of acute unclassifiable gastric volvulus on diaphragmatic eventration in an adult treated in the general surgery department of the Ziguinchor Peace Hospital.

Case Report

This was a 52-year-old patient who had consulted for abdominal pain more pronounced in the epigastrium, associated with liquid vomiting and a stoppage of digestive transit. Her history was unremarkable. On physical examination, we noted a clear consciousness, a preserved general condition, a temperature of 37.8°C, a tachycardia of 101 beats/min, a blood pressure of 100/60 mmHg, a tympanic epigastric arch, a tender abdomen as a whole with a cry from the umbilicus, a dependent dullness of the flanks, an empty rectal ampulla and a painful cul-de-sac of Douglas as well as the vaginal cul-de-sacs. The rest of the examination was unremarkable. The attempt to place a nasogastric tube was laborious. The nasogastric tube brought back 150cc of blackish liquid in 2 hours after its placement.

Biology showed hyperleukocytosis with neutrophil predominance at 19,360 leukocytes/mm³ and a hemoglobin level of 10.6 g/dl, while platelets were at 253,000/mm³. Acute renal failure was noted with creatinine at 17.32 mg/l and azotemia at 0.39 g/l. Hypokalemia was noted at 3.32 mmol/l. The prothrombin rate (PT) was 70%, the activated cephalin time (ACT) was 21.1 seconds for a control of 28 seconds.

Emergency CT scan showed elevation of the left diaphragmatic dome associated with marked gastric hydro-aeric distension and an area of tissue thickening, with vascular congestion, separating a purely hydro gastric contingent and another hydro-aeric contingent (Figures 1 and 2).

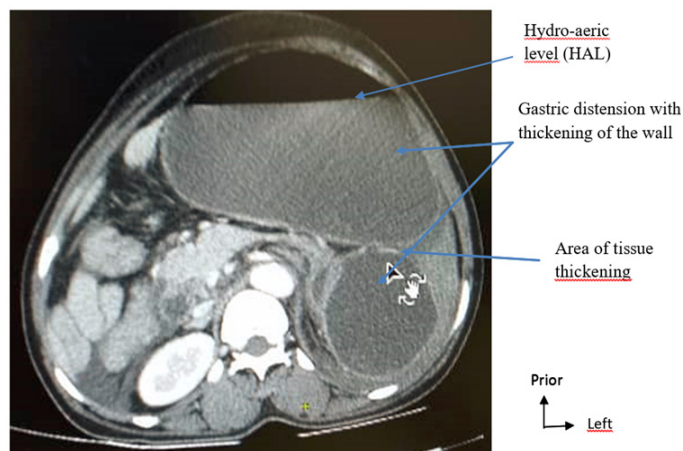


Figure 1: Abdominal CT scan in axial section of gastric volvulus in our patient showing NHA, gastric distension and the gastric plication area (Image from the surgery department of the Ziguinchor Peace Hospital).

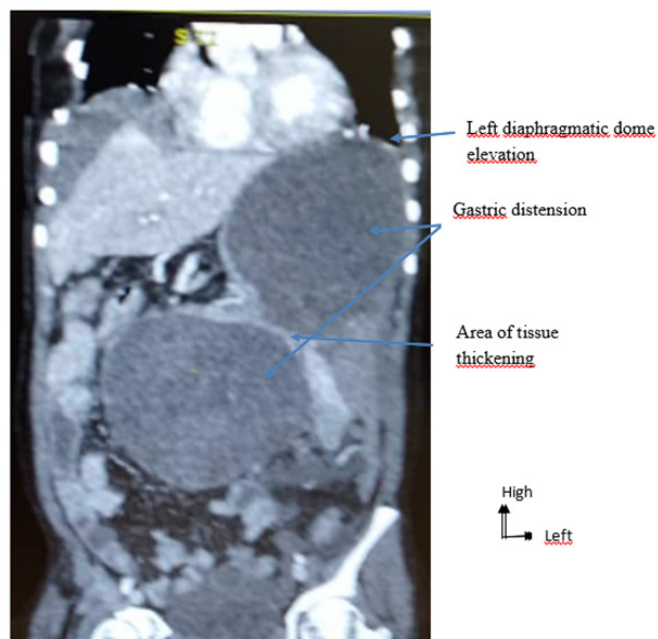


Figure 2: Abdominal CT scan with coronal reconstruction of the gastric volvulus in our patient showing elevation of the left diaphragmatic dome, gastric distension and the gastric plication area (Image from the surgery department of the Ziguinchor Peace Hospital).

Surgical exploration by xipho-pubic laparotomy showed an unclassifiable gastric volvulus with one turn of the spiral in the anteroposterior direction, around the fundus engaged in a left diaphragmatic eventration; with necrosis of the fundus; hemorrhagic peritoneal fluid with blood clots (400cc), laxity of the gastro-colic ligament (Figure 3 and 4).

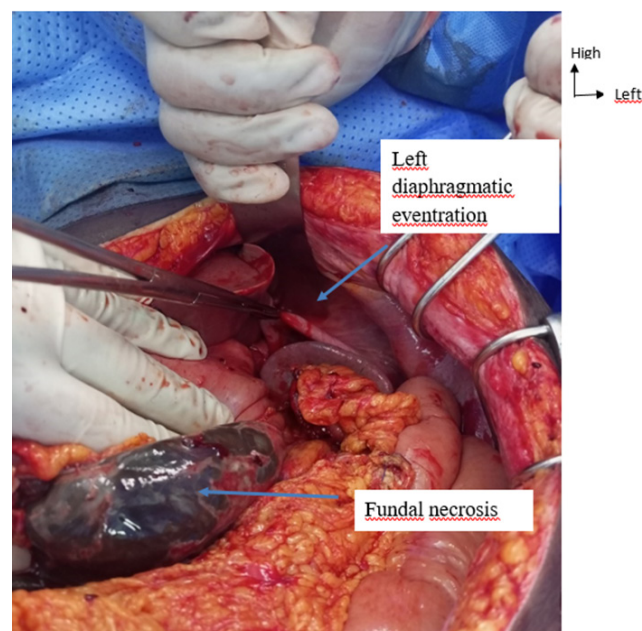


Figure 3: Perioperative aspect, showing gastric volvulus with one turn of the spiral with necrotic fundus at the bottom and left diaphragmatic eventration (Image from the surgical department of the Ziguinchor Peace Hospital).

A gastric detorsion was performed, an atypical gastrectomy removing the necrotic fundus with a gastric suture by a running suture with absorbable thread, polyglactin 910 USP 3/0 (vicryl® 3/0), reinforced by simple stitches with the same thread; a phrenoplication by a running suture with non-absorbable thread, Polyester USP 2 (Mersuture® 2); The postoperative course was uneventful. Intestinal transit resumed on the second postoperative day, the nasogastric tube was removed on the 5th postoperative day with a resumption of well-tolerated oral feeding on the same day. The patient was discharged on the 7th postoperative day. The anatomopathological examination of the surgical specimen revealed ischemic necrosis of the gastric wall. No complications were noted after 10 months

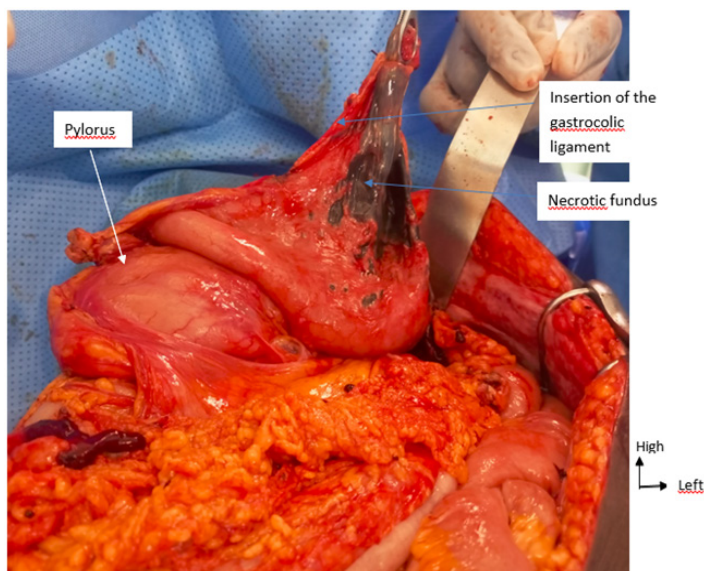


Figure 4: Per-operative aspect, showing gastric volvulus with necrotic fundus, gastric dilatation (Image from the surgery department of the Ziguinchor Peace Hospital).

Discussion

Acute gastric volvulus is rare and its incidence is not well defined in the literature with approximately a thousand cases reported in the literature to date [11]. The largest series included 29 cases and 44 cases respectively [12,13].

In Senegal, this is probably the third reported case, which indicates the rarity of this entity [9,10]. Gastric volvulus is most commonly found in elderly subjects, with a peak frequency around the age of fifty [14,15].

Cases of young adults in whom the etiopathogenesis was dominated by traumatic diaphragmatic lesions have also been reported [16,17]. Pediatric forms, often secondary to congenital anomalies, have been reported [2]. Our patient was in her fifties and had a diaphragmatic lesion. Regarding gender, there does not seem to be a predominance for one sex according to most authors [12,18], even if a female predominance is reported by some authors [19,20].

Depending on the axis of gastric torsion, several types of gastric volvulus are distinguished. The organo-axial form defined by gastric rotation around a longitudinal cardio-pyloric axis is the most frequent, approximately 60% of cases of gastric volvulus [2,21]. The unclassifiable form represents only 10% of gastric volvulus with an anarchic rotation not following any well-defined axis [2,3]. In our patient, it was an unclassifiable form. Parkash, in his series of acute gastric volvulus, noted a predominance of mesenterico-axial forms (2/3) followed by organo-axial forms (1/3) [19].

Volvulus can involve all or part of the stomach, determining partial or total volvulus [18]. In our patient, we found a partial gastric volvulus involving the fundus. However, as Bédioui pointed out, the most affected gastric portion in partial forms is the gastric antrum [18]. According to Shivanand, partial volvulus would be more frequent and would carry the same risk of strangulation as the complete form [2]. The direction of gastric volvulus is most often anterior with a passage of the greater curvature forward and upward, taking with it the transverse colon in the organoaxial form. In mesenterico-axial volvulus, the pyloric region moves forward, upward and in front of the stomach. Belayneh had reported a case of gastric volvulus associated with splenopancreatic torsion on a wandering spleen [15]. In our patient, there was a rotation in the posterior direction with passage of the greater curvature backwards and displacement of the spleen and left kidney backwards. Laxity of the gastrocolic ligament was also noted.

Acute gastric volvulus is classically manifested by abdominal pain localized to the epigastrium or left hypochondrium, with sudden onset [15,22]. In our patient, the onset of symptoms was sudden and the pain was localized to the epigastrium before spreading to the entire abdomen. Borchardt's symptomatic triad of epigastric pain, epigastric distension associated with non-productive vomiting efforts, and an inability to insert a nasogastric tube is highly suggestive of the diagnosis of acute gastric volvulus [15,23]. However, this triad was absent in 30% of patients [4,5]. In our patient, this triad was incomplete. The defense found in our patient was probably related to peritoneal irritation secondary to gastric necrosis and hemoperitoneum. We did not find any history of dyspnea or trauma in our patient. This was probably a congenital diaphragmatic eventration characterized by hypoplasia over part or all of the hemi-diaphragm [24].

The CT scan performed on our patient allowed the diagnosis. Standard frontal radiography can also find images suggesting gastric volvulus such as intrathoracic and retrocardiac air-fluid levels at two interfaces of different heights, a large air bubble in the right hypochondrium or the absence of a gastric air pocket [2,25]. However, radiography is quite limited because it does not allow to highlight the contributing factors, nor to assess the signs of suffering except in cases of perforation where a pneumoperitoneum can be visualized [32].

Due to the risk of ischemia by strangulation, perforation, and possible recurrence after endoscopic reduction, emergency surgery

remains the gold standard treatment for acute gastric volvulus [26]. It combines reduction of the volvulus, management of complications, and treatment of the etiology to prevent recurrence [18]. Definitive management depends on the patient's clinical condition and intraoperative findings. Gangrenous areas and perforations require resection of the affected area, which may involve local resection, partial or total gastrectomy [15]. Laparotomy is the most commonly used surgical approach, allowing wide access to the abdominal cavity [18]. The laparoscopic approach was first tested in the treatment of acute gastric volvulus in 1993 by Koger [27]. Other sporadic cases have been published subsequently [28,29].

In our patient, we performed a detorsion and an atypical gastrectomy and then we performed the cure of the diaphragmatic eventration by phrenoplication without associated gastropexy by laparotomy. However, Rantomalala had not performed a cure of the diaphragmatic eventration but had performed a gastropexy [21]. Gueye had neither performed a cure of the diaphragmatic eventration nor a gastropexy [9]. This attitude would expose the patient to the risk of recurrence. The gastropexy would be optional in the case of surgical approach by laparotomy, because postoperative adhesions most often result in a natural gastropexy [18]. In the case of laparoscopic approach, the gastropexy is systematic, especially since cases of gastric volvulus complicating laparoscopic cures of hiatal hernia (without initially associated gastric volvulus) have been reported [31].

The prognosis is often excellent in forms operated early, as in our case [8-10,21]. In forms seen late, mortality can reach 30 to 50%. The most common causes of death in these patients are sepsis due to gastric perforation and cardio-respiratory comorbidities [12,33].

Conclusion

Acute gastric volvulus is a rare surgical emergency. The clinical signs are not very specific and the diagnosis is most often radiological with CT. The treatment is surgical and consists of reduction, management of complications and treatment of the etiology with or without gastropexy in order to prevent recurrence. Laparotomy is the most used approach, however laparoscopy is increasingly performed. Endoscopic treatment is most often a waiting treatment, or is then indicated in patients at high operative risk.

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