



# Acute primary gastric volvulus with open suture gastropexy: a case report

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**Introduction and importance:** Gastric volvulus is rare and may result in a closed-loop obstruction. Even with appropriate management, mortality may occur in up to 50% of patients. The conventional treatment for acute gastric volvulus has been immediate operation with reduction and detorsion of the volvulus.

**Case presentation:** Here, the authors present a case of acute gastric volvulus following fasting. The patient underwent definitive surgical treatment with detorsion and gastropexy, and was discharged with no postoperative complications.

**Clinical discussion:** Acute gastric volvulus is a rare yet serious medical condition that requires immediate diagnosis and intervention to prevent complications. The case presented highlights the importance of recognizing both common and subtle signs of gastric volvulus, though nonspecific symptoms may delay diagnosis. In this patient, the acute onset of symptoms following a large meal and failure to pass a nasogastric tube were early indicators that prompted imaging and led to the diagnosis of mesenteroaxial gastric volvulus. CT imaging played a crucial role in confirming the diagnosis, demonstrating its value in acute abdominal presentations where symptoms overlap with other causes of gastrointestinal obstruction. This case also emphasizes the importance of early intervention to avoid ischemic complications and improve survival rates.

**Conclusion:** Acute gastric volvulus is a rare, potentially life-threatening condition that can easily be missed due to nonspecific symptoms. Early recognition, prompt imaging, and immediate surgical intervention are critical to preventing serious complications such as strangulation and necrosis.

**Keywords:** fasting, acute abdominal pain, gastric volvulus

## Introduction

Gastric volvulus is defined as an abnormal rotation of the stomach around one of its axes, classified according to the cause, the axis of rotation, and acute versus chronic presentation. First described by Berti in 1866 as an autopsy finding<sup>[1]</sup>, gastric volvulus is characterized by an abnormal rotation of the stomach around its longitudinal (organoaxial) or transverse (mesenteroaxial) axis.

Acute gastric volvulus is a rare, potentially life-threatening entity, which is often underdiagnosed. The clinical presentation of acute gastric volvulus was classically described as the triad of Borchart<sup>[2]</sup>, composed of acute epigastric pain, retching without the ability to vomit, and inability to pass a nasogastric tube.

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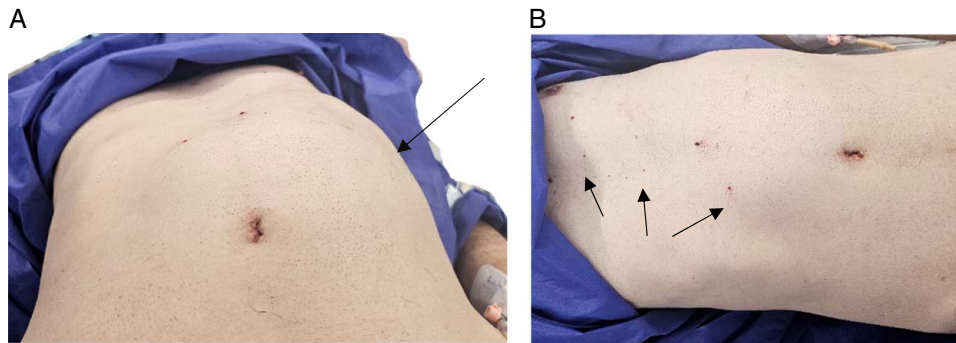
## HIGHLIGHTS

- Gastric volvulus is a rare condition.
- Gastric volvulus may happen following a long period of fasting.
- Gastric volvulus requires urgent attention, that is, intervention.

However, the clinical presentation may be nonspecific, with a diagnosis only made based on abdominal imaging. A complete volvulus may result in a closed-loop obstruction, causing strangulation, and necrosis. Therefore, it is considered an emergency, requiring prompt intervention. Here, based on the Surgical Case Report (SCARE) 2023 guideline<sup>[3]</sup>, we present a case of gastric volvulus, presented by acute abdominal pain and distension, who underwent successful surgical intervention.

## Case presentation

A 66-year-old male presented to the emergency department, with acute abdominal pain and distension, at 5 A.M. The pain had an acute onset, following terminating a Ramadan fasting of more than 12 hours. The onset of symptoms was the previous evening, after taking the Iftar meal. The pain was generalized and constant, without radiation, and was associated with nausea. He also had experienced several times of coffee ground vomiting. He denied constipation, diarrhea, or previous similar episodes. He had a history of hypertension, and was receiving an angiotensin



**Figure 1.** Abdominal examination showing (A) a large mass and (B) multiple cherry angiomas.

receptor blocker, losartan with a dose of 25 mg, twice daily. Surgical history included bilateral inguinal hernia repair.

On physical examination, he was found to be afebrile, with stable vital signs (heart rate; 80, blood pressure; 130/90, temperature; 36.4 °C, SpO<sub>2</sub>; 98% in room air). He had multiple cherry angiomas on anterior thoracic and abdominal skin. The abdominal examination also revealed marked distension localized to the epigastrium and left upper quadrant (Fig. 1), which was associated with mild tenderness. No peritoneal signs were noted.

Laboratory testing revealed only a mild respiratory alkalosis (pH; 7.51, pCO<sub>2</sub>; 26.8, HCO<sub>3</sub><sup>-</sup>; 21.2). While in the emergency department, he received isotonic intravenous fluids, that is, normal saline solution. We tried to insert a nasogastric tube (NGT) in the emergency department, which was not successful. Though, he continued to experience persistent nausea and vomiting. At that time, chest and abdominal radiographs were ordered, which is illustrated in Figure 2.

An abdominopelvic computed tomography (CT) scan with intravenous contrast was conducted following the suspicious findings of radiographs (Fig. 3). The CT scan illustrated severe gastric distension, and findings suspicious for mesenteroaxial gastric volvulus, which included superior and posterior displacement of gastric antrum, an almost 180° twist in the distended stomach, and distal esophageal distension up to a transitional zone, which was due to pressure from the distended

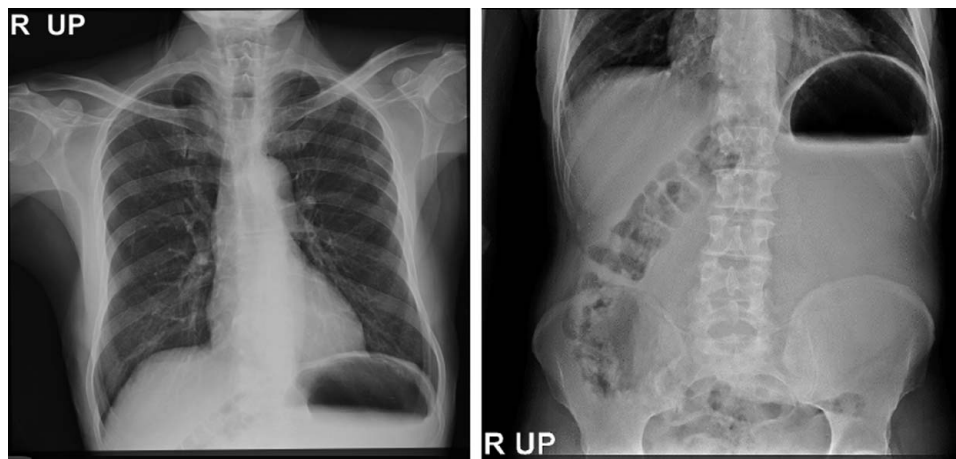
stomach. Stomach mucosa revealed normal enhancement, and no sign of ischemia/infarction was noted. The CT scan also showed a horseshoe kidney.

He was taken to the operating room for prompt surgical intervention. Under general anesthesia, laparotomy was performed using an upper midline incision. The stomach was severely distended, with the antrum displaced superior and posterior to the fundus and proximal gastric body. There were no signs of ischemia or necrosis. Using manual pressure, stomach detorsion was performed (Fig. 4).

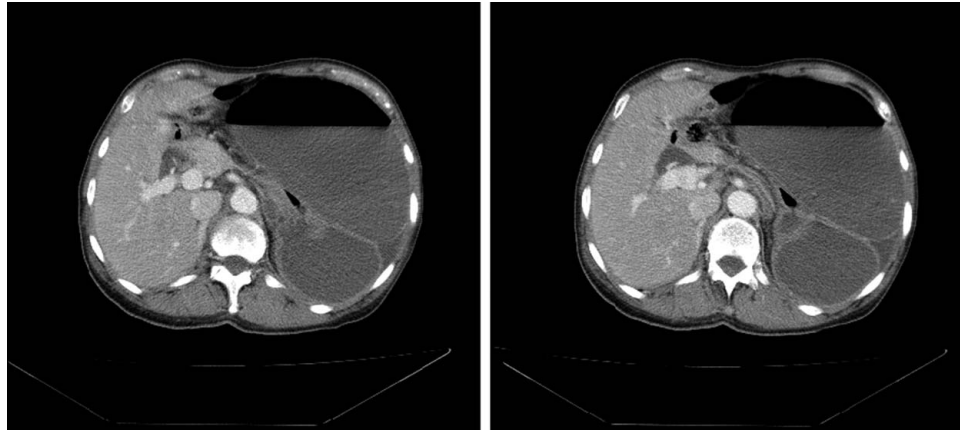
The NGT suctioned about 2000 ml of coffee ground fluid following detorsion. The diaphragm was examined for any anatomical defects, but no defects or hernia were noted. Anterior and lateral gastropexy were done using a 2-0 silk suture, by suturing the gastric wall to the falciform ligament and the abdominal wall, respectively. His vital signs remained within normal limits during the operation. The patient recovered without any complications and was discharged on POD 5.

## Discussion

Gastric volvulus is defined as an at least 180° twist of the stomach, which may result in a closed loop obstruction, and lead to strangulation and ischemia<sup>[4,5]</sup>. In up to 30% of patients, gastric volvulus is primary and occurs as a result of laxity and disruption of ligamentous gastric attachments<sup>[6-8]</sup>. However, in most



**Figure 2.** Chest and abdominal radiographs reveal a large suspicious abdominal mass.



**Figure 3.** CT scan revealing a gastric volvulus.

patients, it is caused by an anatomic disorder of the stomach, spleen, or diaphragm, usually an abnormality in gastric function or a diaphragmatic hernia<sup>[8–10]</sup>.

The most common gastric volvulus, that is, organoaxial rotation of the stomach, occurs when the stomach rotates around the axis connecting the gastroesophageal junction and the pylorus. The less common mesenteroaxial volvulus occurs when the stomach rotates around a line parallel to the gastrohepatic omentum or the line that bisects both the lesser and greater curvature<sup>[4,11]</sup>. The clinical presentation of gastric volvulus depends on the type and degree of rotation, and the acuity of onset<sup>[4,10,12,13]</sup>. Acute gastric volvulus usually presents with chest or abdominal pain, vomiting, and distension. Borchardt triad happens in up to 70% of patients with organoaxial volvulus<sup>[4,7,8]</sup>.

Even with appropriate management, mortality occurs in up to 50% of patients with acute gastric volvulus<sup>[10]</sup>. The conventional treatment for acute gastric volvulus has been immediate operation with reducing and detorsion of the volvulus. This remains the gold standard; though, medical management may be attempted in patients with a high risk for surgery. Immediate surgical resection

is required for stomach necrosis or perforation. Simultaneously, the diaphragmatic hernia should be repaired. Gastropexy is done by fixing the stomach to the anterior abdominal wall with suture, or by the placement of a gastrostomy tube. Open surgery, or the combination of laparoscopic and endoscopic surgical techniques, have shown good results<sup>[4,14,15]</sup>. Our patient underwent definitive surgical treatment with detorsion and gastropexy, and was discharged with no postoperative complications.

### Conclusion

Acute gastric volvulus is a rare, potentially life-threatening entity, which is often underdiagnosed. A complete volvulus may result in a closed-loop obstruction, causing strangulation, and necrosis. Here, we presented a case of gastric volvulus, who underwent successful surgical intervention.

### Ethical approval

Not applicable.

### Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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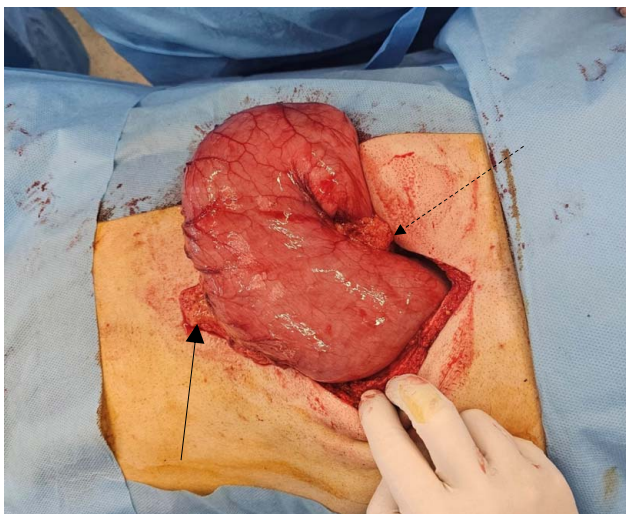
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### Author contribution

B.B. and K.T.-V.: study concept and design, data collection, and writing the paper; S.H. and M.S.F.: data collection and writing the paper.

### Conflicts of interest disclosure

The authors declare no conflicts of interest.



**Figure 4.** Intraoperative image of the stomach after manual detorsion (pylorus and the greater curvature are shown by dashed and solid arrow, respectively).

### Research registration unique identifying number (UIN)

Not applicable.

### Guarantor

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### Data availability statement

Not applicable.

### Provenance and peer review

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### References

- [1] Berti A. Singolare attortiglia mento dele esofago col duodeno seguita da rapida morte. *Gazz Med Ital* 1866;9:139.
- [2] Borchardt M. Zur pathologie und therapie des magenvolvulus. *Arch Klin Chir* 1904;74:243–360.
- [3] Sohrabi C, Mathew G, Maria N, *et al.* The SCARE 2023 guideline: updating consensus Surgical CAse REport (SCARE) guidelines. *Int J Surg (London, England)* 2023;109:1136–40.
- [4] Lopez P, Megha R. Gastric volvulus [Updated 2021 Nov 14]. StatPearls. StatPearls Publishing; 2022.
- [5] Verde F, Hawasli H, Johnson PT, *et al.* Gastric volvulus: unraveling the diagnosis with MPRs. *Emerg Radiol* 2019;26:221–5.
- [6] Woon CY-L, Chung AY-F, Low AS-C, *et al.* Delayed diagnosis of intermittent mesenteroaxial volvulus of the stomach by computed tomography: a case report. *J Med Case Rep* 2008;2:1–6.
- [7] Hsu Y-C, Perng C-L, Chen C-K, *et al.* Conservative management of chronic gastric volvulus: 44 cases over 5 years. *World J Gastroenterol* 2010;16:4200.
- [8] Palanivelu C, Rangarajan M, Shetty AR, *et al.* Laparoscopic suture gastropexy for gastric volvulus: a report of 14 cases. *Surg Endosc* 2007;21:863–6.
- [9] Morelli U, Bravetti M, Ronca P, *et al.* Laparoscopic anterior gastropexy for chronic recurrent gastric volvulus: a case report. *J Med Case Rep* 2008;2:1–3.
- [10] Laurent S, Grayet D, Lavigne CM. Acute and chronic gastric volvulus: radical different prognosis and management. Case report. *Acta Chirurgica Belgica* 2010;110:76–9.
- [11] Bauman ZM, Evans CH. Volvulus. *Surg Clin North Am* 2018;98:973–93.
- [12] Godshall D, Mossallam U, Rosenbaum R. Gastric volvulus: case report and review of the literature. *J Emerg Med* 1999;17:837–40.
- [13] Jeong S-H, Ha C-Y, Lee Y-J, *et al.* Acute gastric volvulus treated with laparoscopic reduction and percutaneous endoscopic gastrostomy. *J Korean Surg Soc* 2013;85:47.
- [14] Takahashi T, Yamoto M, Nomura A, *et al.* Single-incision laparoscopic gastropexy for mesentero-axial gastric volvulus. *Surg Case Rep* 2019;5:1–4.
- [15] Costa MR, Matos AS, Almeida JR, *et al.* Primary gastric volvulus: a report of two cases. *J Surg Case Rep* 2018;2018:rjy227.