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Percutaneous Endoscopic Gastrostomy as Definitive Treatment for Gastric Volvulus in a 94-Year-Old High-Risk Surgical Patient: A Case Report

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Abstract

Gastric volvulus is an uncommon condition characterized by abnormal rotation of the stomach around one of its anatomical axes. Its diagnosis can be challenging because of its low incidence and nonspecific clinical presentation, particularly in elderly patients, and it may occur in association with a hiatal hernia. Delayed diagnosis may result in serious complications, including ischemia and perforation. Management should be individualized according to patient characteristics and surgical risk. We report the case of a 94-year-old woman with multiple comorbidities, including cardiovascular disease, chronic kidney disease, and long-term anticoagulant therapy, who presented with acute abdominal pain, abdominal distension, nausea, and hematemesis. CT revealed findings consistent with gastric volvulus without evidence of perforation. Given her elevated surgical risk, therapeutic endoscopy was performed, including gastric decompression, endoscopic reduction of the volvulus, and placement of a percutaneous endoscopic gastrostomy (PEG) for gastric fixation. The patient experienced immediate resolution of symptoms, with no procedure-related complications, and remained free of recurrence during 12 months of follow-up. This report highlights the successful use of endoscopic reduction followed by PEG as a long-term management strategy for gastric volvulus in a frail, high-risk surgical patient. It underscores the potential role of this minimally invasive approach in carefully selected patients who are not candidates for definitive surgical repair.

Categories: General Surgery, Geriatrics, Gastroenterology
Keywords: elderly patient, gastric volvulus, gastropexy, percutaneous endoscopic gastrostomy, therapeutic endoscopy

Introduction

Gastric volvulus is a rare condition defined as an abnormal rotation of the stomach along its longitudinal or transverse axis [1]. Approximately 70% of cases are organoaxial volvulus, while mesenteroaxial volvulus accounts for a smaller proportion [2,3]. Most cases present acutely and may exhibit nonspecific or atypical clinical manifestations, which can delay diagnosis [4].

Primary gastric volvulus accounts for approximately 30% of cases and is associated with laxity or absence of the gastric suspensory ligaments, including the gastrocolic, gastrohepatic, gastrophrenic, and gastrosplenic ligaments [3]. Secondary gastric volvulus is more common and is frequently associated with paraesophageal hiatal hernias, congenital diaphragmatic defects, adhesions, fibrous bands, trauma, or previous upper GI surgical procedures, such as fundoplication [2].

Early diagnosis is crucial because gastric volvulus carries a significant risk of strangulation, leading to gastric ischemia, necrosis, and perforation, with reported mortality rates ranging from 30% to 50% in complicated cases [4]. Diagnosis relies on a thorough clinical history, physical examination, and imaging studies. Although upper GI contrast studies have historically been considered the diagnostic gold standard, CT is currently preferred because it provides detailed anatomic information and facilitates assessment of complications such as ischemia or perforation [5].

Initial management includes gastric decompression, usually with a nasogastric tube, followed by reduction of the volvulus, which may be achieved endoscopically or surgically. However, decompression and reduction alone have been associated with recurrence rates of up to 64% [6]. Therefore, definitive fixation of the stomach should be considered whenever possible. Available options include surgical gastropexy and minimally invasive endoscopic approaches, such as percutaneous endoscopic gastrostomy (PEG), which can serve both nutritional and gastric fixation purposes [7].

This report highlights the successful use of endoscopic reduction followed by PEG as a long-term

management strategy for gastric volvulus in a frail, high-risk surgical patient. It underscores the potential role of this minimally invasive approach in carefully selected patients who are not candidates for definitive surgical repair.

Case Presentation

A 94-year-old woman with a medical history significant for cardiovascular disease (ischemic heart disease), chronic kidney disease, and chronic antithrombotic therapy with rivaroxaban and clopidogrel presented to the emergency department with a 24-hour history of sudden-onset epigastric pain associated with progressive abdominal distension, nausea, inability to tolerate oral intake, and two episodes of coffee-ground hematemesis. Her regular antithrombotic medications had been discontinued at the onset of symptoms because of her inability to take oral medications. She denied fever or other associated symptoms.

On admission, her vital signs were as follows: heart rate, 112 beats/min; blood pressure, 96/60 mmHg; respiratory rate, 18 breaths/min; and normal body temperature. Physical examination revealed epigastric tenderness on both superficial and deep palpation, with signs of peritoneal irritation.

Abdominal CT demonstrated an organoaxial gastric volvulus with marked gastric distension. In this case, only a noncontrast CT scan was available; therefore, assessment of gastric wall contrast enhancement was not possible. However, the available images showed no evidence of free intraperitoneal air, gastric wall disruption, or intramural emphysema. The noncontrast CT clearly demonstrated the transition point consistent with gastric volvulus. Laboratory studies revealed anemia and prolonged coagulation parameters related to anticoagulant therapy (Figure *1*).

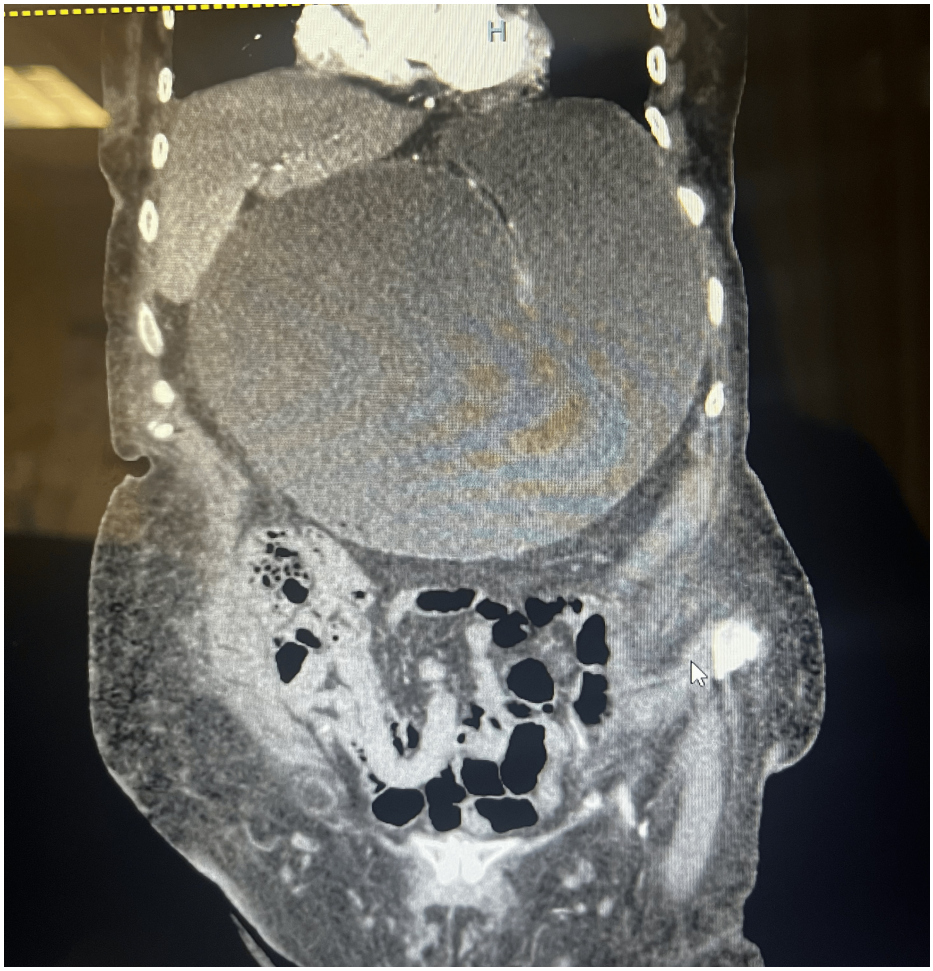


FIGURE 1: CT showing radiologic findings consistent with gastric volvulus.

Given the patient's advanced age, frailty, multiple comorbidities, and high surgical risk (American Society of Anesthesiologists physical status III-IV), a multidisciplinary evaluation was performed. This consisted of a collaborative discussion among the endoscopist, general surgeon, anesthesiologist, and geriatrician to determine the most appropriate management strategy. The decision-making process also incorporated the

patient's and her family's preferences after a thorough discussion of the potential risks and benefits of the available treatment options, including the risks associated with surgical intervention. In our institution, treatment decisions for high-risk patients are routinely based on this multidisciplinary approach, together with consideration of the patient's overall clinical condition and preferences. Consequently, a minimally invasive therapeutic approach was selected.

Upper GI endoscopy confirmed gastric dilatation and torsion consistent with gastric volvulus. It was performed, providing gastric decompression and successful endoscopic reduction of the volvulus. The endoscopic reduction was performed using the alpha-loop maneuver, the technique originally described by Tsang et al. in 1995 [8]. In addition to its therapeutic role, endoscopy served as an important diagnostic tool by allowing direct assessment of gastric mucosal viability. No macroscopic evidence of ischemia or necrosis was observed.

Although residual blood was present within the stomach, no active bleeding or identifiable bleeding source was detected during endoscopy; therefore, endoscopic hemostasis was not required. The residual blood was considered most likely secondary to venous congestion and ischemic mucosal changes caused by gastric torsion rather than to a focal bleeding lesion. Following endoscopic reduction, no endoscopic features suggestive of a high risk of recurrent bleeding were identified.

To reduce the risk of recurrent volvulus, a PEG tube was placed and fixed to the greater curvature of the stomach for gastropexy to the abdominal wall. The patient tolerated the procedure well, with progressive clinical improvement, resumption of oral intake, and no procedure-related complications (Figure *2*).

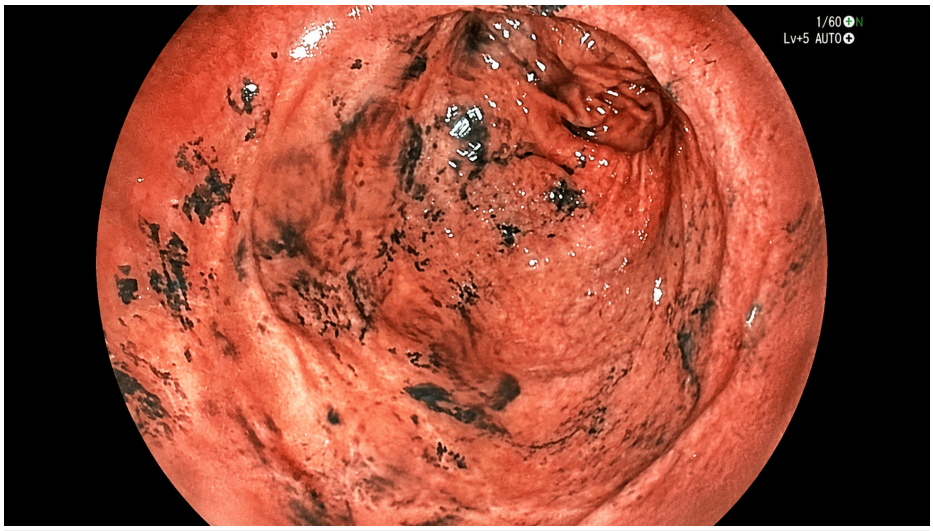


FIGURE 2: Endoscopic visualization of residual bleeding in the gastric antrum.

No signs of gastric necrosis or perforation were identified.

The patient experienced immediate clinical improvement, with complete resolution of abdominal pain and distension. Oral intake was gradually resumed, and she was discharged the day after the procedure without complications. The patient was followed for 12 months through scheduled outpatient visits, during which her clinical status and symptom resolution were assessed. In addition, a follow-up CT scan was performed to evaluate her progress. Although the images from this study were not available, its findings were considered during the patient's follow-up.

Discussion

Gastric volvulus is an uncommon condition but one associated with potentially devastating complications due to prolonged gastric ischemia, resulting in significant morbidity and mortality when diagnosis and treatment are delayed. In this report, we describe the case of a 94-year-old woman diagnosed with gastric volvulus by CT. Her medical history was significant for cardiovascular disease requiring chronic anticoagulant therapy, as well as multiple comorbidities. The condition was successfully managed with endoscopic reduction of the volvulus followed by placement of a PEG tube.

Gastric volvulus is defined as an abnormal rotation of the stomach along its longitudinal or transverse axis [1]. Although rare, it is likely underdiagnosed, with an estimated incidence of approximately one in 10,000 hospital admissions [9]. The importance of early recognition lies in the high risk of strangulation, gastric

ischemia, necrosis, and perforation, with reported mortality rates ranging from 30% to 50% in complicated cases [4]. Therefore, prompt diagnosis and intervention are essential to prevent irreversible gastric injury.

Upper GI endoscopy plays a dual role in the management of gastric volvulus. In addition to facilitating decompression and reduction of the volvulus, it allows direct assessment of gastric mucosal viability and the extent of ischemic injury, which can guide therapeutic decision-making. Endoscopic evaluation may therefore help identify patients who can safely undergo minimally invasive management and those who require urgent surgical intervention.

Initial treatment generally includes gastric decompression, typically with placement of a nasogastric tube when feasible, followed by reduction of the volvulus. However, decompression and endoscopic reduction alone have been associated with recurrence rates as high as 64% [6]. Consequently, definitive gastric fixation should be considered whenever possible to minimize the risk of recurrence (Figure *3*).

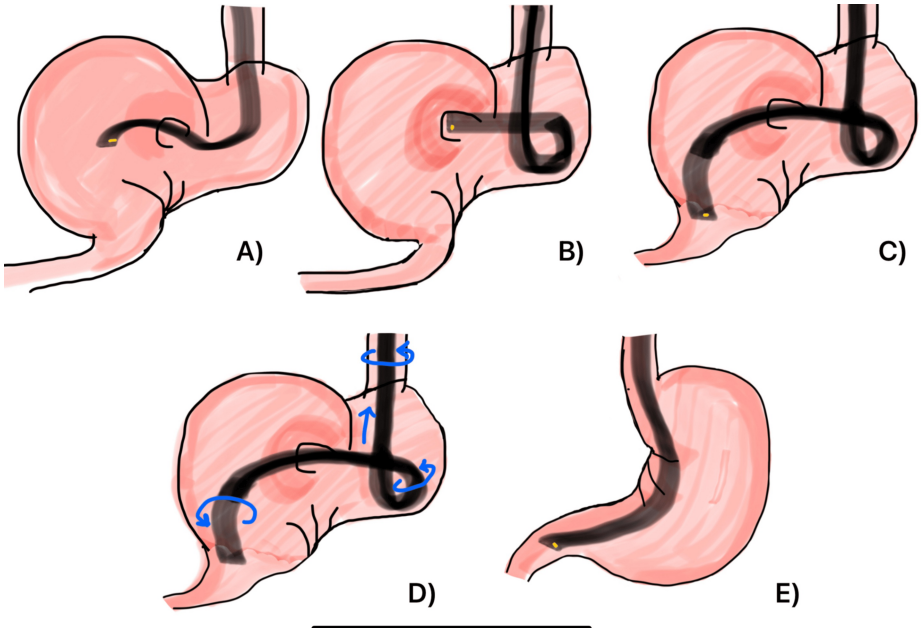


FIGURE 3: Schematic representation of the alpha-loop maneuver.

(A) Advancement of the scope through the gastric volvulus. (B) Retraction of the scope to create an alpha-loop. (C) Reinsertion of the scope through the volvulus. (D) Withdrawal of the scope with clockwise torque to allow uncoiling of the alpha-loop and reduction of the volvulus. (E) Successful reduction of the gastric volvulus.

Adapted from Tsang et al. (1995) [8].

Original schematic drawing created by the authors using the Freeform application (Apple Inc., Cupertino, CA, USA).

Several reports, particularly from Japanese centers, have described the successful use of endoscopic gastropexy and PEG as minimally invasive alternatives for patients who are poor surgical candidates [8,10]. Recent case reports have demonstrated favorable outcomes with endoscopic reduction combined with PEG placement, supporting its role as both a therapeutic and preventive strategy against recurrent volvulus, which has a reported recurrence rate of up to 60% [6].

In the present case, the patient was considered to be at exceptionally high surgical risk because of her advanced age, multiple comorbidities, and chronic antithrombotic therapy. Furthermore, timely intervention was critical to prevent progression to gastric necrosis or perforation. Given these considerations, endoscopic management was selected as the most appropriate therapeutic approach. Successful endoscopic reduction was achieved, followed by PEG placement to secure the stomach to the abdominal wall and reduce the likelihood of recurrence [11]. This strategy avoided the potential complications associated with surgical intervention while providing durable symptom control.

Notably, the patient remained asymptomatic throughout a 12-month follow-up period, with no evidence of recurrent gastric volvulus or PEG-related complications. This favorable outcome supports the growing body of evidence suggesting that endoscopic reduction combined with PEG fixation may represent a safe and effective treatment option for carefully selected high-risk patients.

Conclusions

The management of gastric volvulus in elderly patients remains both a diagnostic and therapeutic challenge. No single treatment strategy is suitable for all patients, and management should be individualized according to clinical presentation, hemodynamic status, comorbidities, and locally available expertise and resources.

This case demonstrates that endoscopic reduction followed by PEG fixation may represent a feasible, minimally invasive therapeutic option for carefully selected patients with gastric volvulus who are elderly, frail, or poor surgical candidates, particularly when conventional surgical management carries an unacceptable level of risk. The successful outcome observed in our patient is consistent with previously reported international experience and highlights the importance of early diagnosis, prompt intervention, and multidisciplinary decision-making to prevent life-threatening complications such as gastric ischemia, necrosis, and perforation. However, as this is a single case report, no definitive conclusions regarding efficacy or generalizability can be drawn, and further studies are required to establish its role in clinical practice.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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