CASE REPORT

Gastric volvulus following diagnostic upper gastrointestinal endoscopy: a rare complication

Vilvapathy Senguttuvan Karthikeyan,¹ Sarath Chandra Sistla,² Duvuru Ram,² Nagarajan Rajkumar²

¹Department of Urology, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India

²Department of Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India

Correspondence to

Dr Vilvapathy Senguttuvan Karthikeyan, sengkarthik@yahoo.co.in

SUMMARY

Esophagogastroduodenoscopy (EGD) is a commonly used, safe diagnostic modality for evaluation of epigastric pain and rarely its major complications include perforation, haemorrhage, dysrhythmias and death. Gastric volvulus has been reported to complicate percutaneous endoscopic gastrostomy but its occurrence after diagnostic EGD has not yet been reported in literature. The successful management relies on prompt diagnosis and gastric untwisting, decompression and gastropexy or gastrectomy in full thickness necrosis of the stomach wall. A 38-year-old woman presented with epigastric pain and EGD showed pangastritis. Immediately after EGD she developed increased severity of pain, vomiting and abdominal distension. Emergency laparotomy carried out for peritoneal signs revealed eventration of left hemidiaphragm with the stomach twisted anticlockwise in the longitudinal axis. After gastric decompression and untwisting of volvulus, anterior gastropexy and gastrostomy was carried out. Hence, we report this rare complication of diagnostic endoscopy and review the existing literature on the management.

BACKGROUND

Esophagogastroduodenoscopy (EGD) is a commonly used diagnostic modality for evaluation of upper abdominal pain. It carries a low risk of adverse events with large series reporting adverse events at rates ranging from 1 in 200 to 1 in 10 000 with mortality rates of 0–1 in 2000.¹ The major complications are perforation, haemorrhage, dysrhythmias and rarely death.² The occurrence of gastric volvulus (GV) as a complication has been reported after percutaneous endoscopic gastrostomy (PEG)³ but to the best of our knowledge its occurrence after diagnostic endoscopy has not yet been reported in literature. Volvulus of caecum, sigmoid or transverse colon has been reported as a very rare complication of colonoscopy.⁴

The successful management of GV relies on prompt diagnosis and gastric untwisting, decompression and gastropexy or gastrectomy in full thickness necrosis of the stomach wall.⁵ GV can be prevented by removal of as much gas as possible after EGD. Here we report probably the first case of GV occurring as a rare complication of diagnostic endoscopy and review the existing literature on the management of this condition.

CASE PRESENTATION

A 38-year-old woman presented with upper abdominal pain for 3 days, not relieved with intravenous proton pump inhibitors. An EGD was carried out and it showed pangastritis. Immediately after EGD the patient developed increased severity of pain and vomiting with abdominal distension. The upper abdomen was distended with palpable and dilated bowel loops in the epigastrium and the left hypochondrium.

INVESTIGATIONS

Chest X-ray showed fundus gas shadow in the left hemithorax (figure 1). Ultrasound showed a grossly distended stomach with minimal left pleural effusion.

TREATMENT

The patient developed peritoneal signs and emergency laparotomy was carried out. Intraoperatively, eventration of the left hemidiaphragm was noted. The stomach was twisted anticlockwise in the longitudinal axis by 180° and grossly distended with ecchymosis on surface (figure 2). Gastric decompression and clockwise untwisting of volvulus was carried out and stomach colour improved with oxygen. Anterior gastropexy and gastrostomy was carried out. She developed left pleural effusion and improved with intercostal tube drainage.

Figure 1 Chest radiograph showing fundus gas shadow in the left hemithorax.

CrossMark

To cite: Karthikeyan VS, Sistla SC, Ram D, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-202833

Figure 2 Intraoperative image showing eventration of the left hemidiaphragm and grossly distended stomach, twisted anticlockwise in the longitudinal axis.

OUTCOME AND FOLLOW-UP

Gastrostomy was removed after 3 weeks and the patient is now doing well on follow-up for the past 2 years.

DISCUSSION

GV was first reported by Berti in 1866 in an autopsy and the first surgical treatment was reported by Bu Berg in 1897.⁶ GV, characterised by abnormal rotation of the stomach by more than 180°, is a life-threatening condition thus making prompt diagnosis and treatment imperative. GV is a primary event only in 30% cases and it is most often secondary to another cause. It leads to intermittent, acute, intermittent or chronic foregut obstruction, forming a closed loop obstruction,⁷ with a risk of strangulation, culminating in necrosis, perforation, hypovolaemic shock and death if not treated at the right time.⁵ The peak incidence is during the fifth decade.⁸

GV can be classified based on the aetiology or the axis of rotation or the mode of presentation.

Types of GV based on aetiology

Primary (idiopathic) GV is due to neoplasia, adhesions or any abnormality in the attachment of the stomach. Failure of supportive mechanisms in the forms of agenesis, elongation or disruption of the gastric ligaments, namely gastrohepatic, gastrocolic and gastrosplenic, predispose to idiopathic GV. Secondary GV is due to disorders of gastric anatomy or function or abnormalities of adjacent organs such as spleen and diaphragm.⁵

Types of GV based on axis of rotation

Organoaxial volvulus is the most common type, which rotates along the cardiopyloric axis with two sites of obstruction, most commonly associated with a large hiatal hernia and left diaphragmatic eventration resulting in an upside down stomach. The mesenteroaxial volvulus accounts for about one-third of GV where the stomach rotates around a transverse axis at the pyloroantral area resulting in the pyloric or antral portions becoming anterior to the stomach. The third type is a combination of these two types.⁹

Based on mode of presentation

Acute GV presents with pain in the upper abdomen and lower chest and with severe retching. This along with an inability to pass in a nasogastric tube contributes to Borchardt's triad seen in 70% cases of GV. Haematemesis due to mucosal sloughing following necrosis or

mucosal tear owing to retching may also be seen. Chronic GV, on the contrary, presents with non-specific symptoms of vague mild upper abdominal pain or post-prandial pain, dysphagia, bloating, belching, vomiting and gastrointestinal (GI) bleeding which are frequently mis-attributed to other upper gastrointestinal (UGI) disorders. Associated diaphragmatic lesions may be seen in chronic GV.^{3 10}

Complications of GV include ulceration, perforation, haemorrhage, pancreatic necrosis and omental avulsions.⁵

UGI endoscopy is an important diagnostic procedure in various GI diseases. Though considered a safe procedure, it can rarely lead to various complications like GI perforation, haemorrhage, cardiac arrhythmias and laceration of major vessels. GV has been reported as a complication of PEG, especially in children.³ In PEG, excessive gas inflation might tilt the stomach upward thereby turning the lower part of the posterior wall of greater curvature adjacent to the abdominal wall. The entrance of the PEG site at the posterior wall and minimal adhesions around the stomach may facilitate the twisting of the stomach around the organoaxis causing GV.¹¹ Till date, there is no case report of GV being induced by endoscopy following gas insufflation alone. GV following endoscopy can be prevented by careful monitoring of the patient during the procedure. This complication can be prevented by the removal of as much of air as possible before the completion of the procedure.

Chest radiographs show a retrocardiac, air-filled mass and abdominal films show an increased soft-tissue density in the upper abdomen suggesting a distended fluid-filled stomach. Reliable diagnosis can be made from UGI barium studies^{5 7 8} and it can define the anatomical type of volvulus.⁷ CT scan helps to confirm the rotation of the herniated stomach and the transition point. Endoscopy can reveal a tortuous stomach with difficulty or inability to reach the pylorus.⁷

Acute volvulus requires immediate surgery to prevent vascular compromise.⁷ Management of GV includes stomach decompression with volvulus reduction, gastropexy and correction of intrabdominal pathology. Gastrectomy will be required if full thickness necrosis is present.^{5 12} The preferred procedure is anterior gastropexy in which the greater curve of the stomach is fixed to the undersurface of the anterior abdominal wall. Endoscopic reduction has been reported but does not address the underlying pathology that predisposes to torsion of the stomach.⁷ Many variations of gastropexy such as suturing the lesser curvature to the ligamentum teres or the free edge of the liver, posterior fixation of the greater curvature to the parietal peritoneum and colonic mesentery and fixation of the fundus to the undersurface of the diaphragm have been described.⁹ Definitive procedures for GV include gastropexy with colonic displacement (Tanner's procedure), fundooantral gastrostomy (Oozler's operation), gastrojejunostomy and gastrocolic disconnection.⁹

Learning points

- ▶ Endoscopy, like all invasive procedures, carries significant potential for injury to the patient.
- ▶ Gastric volvulus is a well-known complication of percutaneous endoscopic gastrostomy but clinicians should have a high suspicion that it can follow diagnostic upper gastrointestinal endoscopy.
- ▶ Prompt diagnosis and gastric decompression with untwisting of volvulus is the treatment of choice.
- ▶ This catastrophic complication can be prevented by removal of as much gas used for insufflation as possible after endoscopy.

Contributors VSK and SCS performed the literature search and drafting of the manuscript, and also gave the concept and their approval of the final manuscript. DR participated in the literature search, drafting of the manuscript and gave approval of the final manuscript. NR was involved in the drafting of the manuscript and gave approval of final manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Ben-Menachem T, Decker GA, Early DS, *et al*. Adverse events of upper GI endoscopy. ASGE Standards of Practice Committee Guidelines. *Gastrointest Endosc* 2012;76:707–18.
- 2 Kavic SM, Basson MD. Complications of endoscopy. *Am J Surg* 2001;181:319–32.
- 3 Schrag SP, Sharma R, Jaik NP, *et al*. Complications related to percutaneous endoscopic gastrostomy (PEG) tubes. A comprehensive clinical review. *J Gastrointest Liver Dis* 2007;16:407–18.
- 4 Green J. Guidelines on complications of gastrointestinal endoscopy. <http://www.bsg.org.uk/clinical-guidelines/endoscopy/guidelines-on-complications-of-gastrointestinal-endoscopy.html> (accessed on 2 Jan 2014).
- 5 Rashid F, Thangarajah T, Mulvey D, *et al*. A review article on gastric volvulus: a challenge to diagnosis and management. *Int J Surg* 2010;8:18–24.
- 6 Smith RJ. Volvulus of the stomach. *J Natl Med Assoc* 1983;75:393–7.
- 7 Cardile AP, Heppner DS. Gastric volvulus, Borchardt's triad, and endoscopy: a rare twist. *Hawaii Med J* 2011;70:80–2.
- 8 Cribbs RK, Gow KW, Wulkan ML. Gastric volvulus in infants and children. *Pediatrics* 2008;122:e752–62.
- 9 Channer LT, Squires GT, Price PD. Laparoscopic repair of gastric volvulus. *JLS* 2000;4:225–30.
- 10 Askew AR. Treatment of acute and chronic gastric volvulus. *Ann R Coll Surg Engl* 1978;60:326–8.
- 11 Sookpotarom P, Vejchapipat P, Chongsrisawat V, *et al*. Gastric volvulus caused by percutaneous endoscopic gastrostomy: a case report. *J Pediatr Surg* 2005;40:e21–3.
- 12 Metaxas EK, Condilis N, Kyriazis H, *et al*. The management of acute gastric volvulus. *Ann Ital Chir* 2007;78:511–13.

Copyright 2014 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow