

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

A case report on gastric volvulus of a 17 years old boy from Bangladesh

M. Tasdik Hasan^{a,b,*}, S.M. Tajdit Rahman^c, Hasan M Shihab^d, Hassan Rushekh Mahmood^{a,b}, Tanni Chowdhury^e, Quamrul Akhtar Sanju^a^a Shaheed Suhrawardy Medical College, Sher-e-Bangla Nagar, Dhaka, Bangladesh^b International Center for Diarrhoeal Diseases Research, Bangladesh, Mohakhali, Dhaka, Bangladesh^c National Institute of Diseases of the Chest & Hospital, Mohakhali, Dhaka, Bangladesh^d Combined Family Medicine and Preventive Medicine Program, MedStar Franklin Square Medical Center and Johns Hopkins Bloomberg School of Public Health, USA^e Curtin University, Australia

ARTICLE INFO

Article history:

Received 22 June 2017

Received in revised form 31 August 2017

Accepted 1 September 2017

Available online 7 September 2017

Keywords:

Case report
gastric volvulus
young patient
Bangladesh

ABSTRACT

INTRODUCTION: Gastric volvulus is a rare and true surgical emergency which is life threatening if not recognized and treated quickly. There have been approximately 300 reported cases globally till now. This condition most often occurs during 5th decade of life but there are over 100 reported pediatric cases also. This following rare incidence was such a case of a young patient in Bangladesh. It was the first case of gastric volvulus managed by the surgery department of the concerned hospital.

PRESENTATION OF CASE: A 17 year old boy with frequent post meal vomiting presented with abdominal fullness and mild upper abdominal pain for 2 months. He was absolutely constipated for 2 weeks. On examination, there was distension of abdomen with mild tenderness. He had no significant respiratory distress. Plain X-ray revealed elevation of left hemi-diaphragm. The contrast meal study showed organoaxial volvulus of stomach. Elevation of left hemidiaphragm and an ectopic subdiaphragmatic kidney was found in CT scan of chest.

DISCUSSION: After adequate preparation, the patient was subjected to laparotomy and anterior gastropexy with plication of left hemi diaphragm was done. Gastric volvulus can manifest as an acute abdominal emergency or as a chronic intermittent problem. It requires a high index of suspicion and proper investigation.

CONCLUSION: It should be suspected in congenital abnormalities of diaphragm and associate with many other congenital abnormalities like ectopic kidney. Early surgical repair remains the treatment of choice.

© 2017 Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

The term volvulus is derived from the Latin word *volvere*, meaning to turn or roll. Gastric volvulus is defined as an acquired rotation of the stomach or parts thereof more than 180° creating a closed loop obstruction [1]. Berti first described gastric volvulus in a

female autopsy patient in 1866 [2]. Because many cases of chronic volvulus are not diagnosed, the incidence and prevalence of gastric volvulus is unknown. Since Berti's initial description in 1866 [2], there have been approximately 300 reported cases. Males and females are equally affected. About 10–20% of cases occur in children [3], usually before age 1 year, but cases have been reported in children up to age 15 years [4]. Gastric volvulus in children is often secondary to congenital diaphragmatic defects. The condition is uncommon in adults younger than 50 years [3]. We hereby present a rare case of gastric volvulus of a young patient of Bangladesh. It was the first case of gastric volvulus managed by the surgery department of this hospital.

* Corresponding author at: Shaheed Suhrawardy Medical College, Sher-e-Bangla Nagar, Dhaka, Bangladesh.

E-mail addresses: tasdikhdip@yahoo.com, tasdik@icddr.org (M.T. Hasan), tanim@mail.com (S.M.T. Rahman), hshihab1@jhmi.edu (H. M Shihab), dr.rossi82@gmail.com (H.R. Mahmood), tanni.chowdhury@yahoo.com (T. Chowdhury), qa_sanju@yahoo.com (Q.A. Sanju).

¹ M. Tasdik Hasan was an intern physician at the study site (SHSMC) during the study. After completion of internship he has joined his current affiliation (icddr,b). HRM was a medical officer of the study site & switched to current workstation later on.

<http://dx.doi.org/10.1016/j.ijscr.2017.09.004>

2210-2612/© 2017 Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

2. Presentation of case

A 17 years old male, muslim, student of a local madrasah presented to the outpatient department of Shaheed Suhrawardy Medical College & Hospital, Dhaka Bangladesh referred by a local informal health care provider with 2 months of abdominal fullness and mild episodic epigastric pain which was sudden in onset, dull in nature, spread to the whole abdomen. His pain usually started after taking meal & was relieved by vomiting. He had history of frequent foul smelling, non projectile, frequently induced bilious vomiting which mainly contained undigested food materials. He was absolutely constipated for 2 weeks. He used to take anti-ulcerant for this problem. He had no significant past, family and personal history. Physical examination demonstrated a teenage man who appeared unwell and dehydrated a mild degree. Pulse was 72 beats/min and regular, BP 130/90 mm of Hg, respiratory rate 18 breaths/min & temperature 98.4 °F. His abdomen was distended and mild tenderness was present in epigastric region by superficial and deep palpation. There was no guarding, rebound tenderness, organomegaly or any other palpable mass. Per rectal examination revealed no significant abnormality. The remainder of his lab results, including renal and liver function tests was normal.

The initial clinical impression was gastric outlet obstruction. At that initial moment he was treated conservatively and a nasogastric tube was placed with some difficulties. Plain radiographs demonstrated elevated left hemi-diaphragm and displacement of fundic gas in the midline. Because of the patient's status and our concern about gastric outlet obstruction, a radiological consultation was requested and a barium meal follow through was performed. This revealed organoaxial volvulus of the stomach. Upper GIT endoscopy showed no lesion and suggested that stomach is distorted and rotated, pyloric opening was seen but could not be passing through. CT scan of chest gave an impression of elevated left hemi diaphragm with ectopic left sided sub-diaphragmatic kidney. The patient belongs to a poor family, he did all his investigations from a below standard diagnostic center & the hospital was not equipped with adequate diagnostic facilities at that time. Moreover, repeat investigation(s) could not be suggested considering the financial status of the patient. Thus, most of the images were low resolution & substandard. With these diagnostic challenges, the surgeon had to proceed with the surgical intervention. After surgical reassessment, the patient was taken for laparotomy. Though laparoscopic approach is popular and better in this case, open approach was followed by considering the limited advanced laparoscopic facilities of the hospital. Under general anesthesia an exploratory laparotomy was performed by midline incision. During laparotomy, diagnosis of organoaxial volvulus was confirmed and anterior gastropexy with placcation of the left hemi-diaphragm was done. The patient recovered gradually and was discharged on tenth post-operative day. Two months after the operation, the patient remained asymptomatic.

3. Discussion

Gastric volvulus is a rare entity that is difficult to diagnose. If the gastric ligaments are relaxed, any cause of gastric distention can predispose to excessive rotation, setting the stage for volvulus [5]. Other predisposing factors include diaphragmatic injury or surgery, congenital hernias and diaphragmatic eventration associated with phrenic nerve paralysis, left lung resection or pleural adhesions. In some cases, intra-abdominal adhesions act as a rotational axis for the stomach [6].

Gastric volvulus can be acute, chronic, or acute on chronic. The most frequently used classification system was proposed by Singleton [7] who described 3 types of gastric volvulus: organoaxial,

mesenteroaxial and combination-unclassified. Organoaxial volvulus is the most common variant, occurring in approximately 59% of cases [8]. Because the duodenum and gastroesophageal (GE) junction are relatively fixed, the stomach rotates around the longitudinal axis with the greater curvature rotating (most often) anteriorly [9]. This rotation is analogous to “wringing out a wet rag” [10]. In mesenteroaxial volvulus, which comprises 29% of cases [8], rotation occurs around the transgastric axis (a line connecting the middle of the lesser curvature with the middle of the greater curvature). It is reported that most cases of chronic gastric volvulus are related to mesenteroaxial rotation. Additionally, is described in the literature that a normal stomach cannot rotate more than 180° unless the gastrosplenic or gastrocolic ligaments are divided [11,12].

The clinical picture of gastric volvulus may occur as an acute abdominal emergency or as recurrent volvulus. The famous Borchartd triad [13] that is present typically in cases of acute gastric volvulus is described. This triad includes severe epigastric pain with distention, vomiting followed by violent, nonproductive retching, and finally difficulty or inability to pass a nasogastric tube into the stomach. Carter [6] reported 3 additional findings that may facilitate early diagnosis. These include: minimal abdominal findings when the stomach is completely intrathoracic; a gas-filled viscus in the lower chest or upper abdomen shown by chest x-ray; and obstruction at the site of volvulus shown by upper gastrointestinal contrast study. Gastric volvulus can also present with cardiovascular complaints. Moreover, a missed diagnosis of gastric volvulus may lead to strangulation, perforation, hemorrhage, ischemia, and gastric necrosis [13]. The mortality rate of gastric volvulus is reported to be up to 42–56%, secondary to gastric ischaemia, perforation, and necrosis [14]. Chronic volvulus, which accounts for two-thirds of adult cases, may be asymptomatic, may be reported as an incidental finding on routine chest x-ray or upper GI series, or may present with vague, spontaneously resolving symptoms – usually nondescript upper abdominal pain. Because of its remitting nature, chronic gastric volvulus is easily confused with peptic ulcer disease or cholecystitis [15] and may remain undiagnosed for years.

The diagnosis of this rare clinical entity is very challenging. The gold standard method in detecting gastric volvulus is a barium swallow, which has a very high sensitivity and specificity. On an upper GI series, the GE junction is usually below the diaphragm, the distal portion of the stomach appears cephalad, and a “beak” may appear where the GE junction is normally located [16]. Additionally, highly suggestive of gastric volvulus is the difficulty during endoscopy to intubate the stomach or the pylorus (Fig. 1,).

As for the treatment, gastric volvulus presenting with acute symptoms requires immediate surgical intervention. The most approved surgical treatment consists in anterior gastropexy with open or laparoscopic technique. During this method, the greater curvature of the stomach is fixed to the anterior abdominal wall. Subtotal or total gastrectomy is proposed when the stomach appears gangrenous [17,18]. In high risk patients, endoscopic decompression and reduction may be an option [19]. Also, by conservative method or by laparoscopic and/or endoscopic interventions; chronic gastric volvulus can be managed. Gastric ulceration and gastro-esophageal reflux with esophagitis are the most common complications of chronic volvulus which may lead to iron deficiency anemia to worsen the status of the case by an atypical presentation [20]. This work has been reported in line with the SCARE criteria [21] (Fig. 2,).

4. Conclusion

Gastric volvulus in pediatric population is a rare & complex clinical condition with regard to the causation and the management



Fig. 1. Upper GIT Endoscopy shows stomach is distorted and mucus folds are twisted.

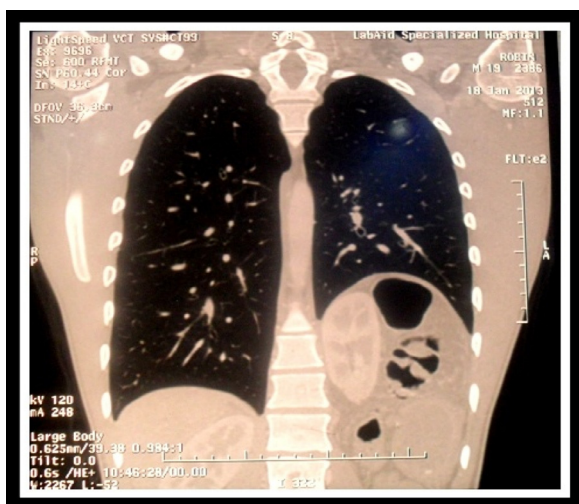


Fig. 2. CT scan of chest reveals eventration of left hemidiaphragm and left subdiaphragmatic kidney.

guideline. Interestingly, in the absence of warning signs sometimes nonoperative approach is advisable [22]. Gastric volvulus should be considered in the differential diagnosis in patients who present with epigastric pain, nonproductive retching, vomiting and evidence of a gastric outlet obstruction – especially if there is difficulty passing a nasogastric tube. It can mimic many other conditions of acute abdomen. So, a high index of suspicion by the symptoms and exclusion of other pathologies seems to be the main criteria to diagnose gastric volvulus. Gastric volvulus should be treated immediately and surgical intervention should be performed as the current choice of treatment by considering the available resources of the hospital setting.

Conflict of interest

The authors declare that they have no conflict of interests.

Funding

Not Such.

Ethical approval

Not such

Consent for publication

Written informed consent was obtained from the patient’s legal guardian(s) for publication of this case report and any accompanying images.

Authors’ contribution

QAS was the chief operating surgeon in the case. MTH contributed in regular follow up of the patient, collection of data from the preoperative, intraoperative and postoperative periods and in drafting the case report. HRM was involved in patient management in the postoperative period. TRT, HMS and TC further contributed by editing and proof reading the report and gave its final form for submission. All the authors had read and approved the final report.

Guarantor

- 1 Dr. Quamrul Akhtar Sanju, Assistant Professor, Department of Surgery, Shaheed Suhrawardy Medical College, Sher-e-Bangla Nagar, Dhaka, Bangladesh.
- 2 Dr. M. Tasdik Hasan, Research Investigator, International Center for Diarrhoeal Diseases Research, Bangladesh (icddr,b).

Acknowledgement

The authors wish to thank the patient & his legal guardian who kindly gave consent for the case to be presented in this manuscript.

References

- [1] N. Tanner, Chronic and recurrent volvulus of the stomach, *Am. J. Surg.* 115 (1968) 105–109.
- [2] A. Berti, singulare attortigliamento de’ esofago col duodenoseguita da rapida morte, *Gazz. Med. Ital.* 9 (1866) 139.
- [3] M. Borchardt, Aus Pathologie und therapie des magenvolvulus, *Arch. Klin. Chir.* 74 (1904) 243.
- [4] W.V. Harford, K.E. McArthur, Diverticula, hernias, volvulus, and rupture, in: M.H. Sleisenger, J.S. Fordtran (Eds.), *Gastrointestinal Disease: Pathophysiology, Diagnosis, Management*, 5th ed., Saunders, Philadelphia, Pa, 1993, pp. 481–483.
- [5] A.R. Askew, Treatment of acute and chronic gastric volvulus, *Ann. R. Coll. Surg.* 60 (1978) 326–328.
- [6] R. Carter, L.A. Brewer, D.B. Hinshaw, Acute gastric volvulus: a study of 25 cases, *Am. J. Surg.* 140 (1980) 99–106.
- [7] A.C. Singleton, Chronic gastric volvulus, *Radiology* 34 (1940) 53–61.
- [8] L.N. Milne, J.J. Hunter, Gastric volvulus: 2 cases and review of the literature, *J. Emerg. Med.* 12 (1994) 299–306.
- [9] G. Teplick, M. Haskin, *Surgical Radiology*, 3rd ed., W.B. Saunders, Philadelphia, 1980, pp. 482.
- [10] S.B. Raffin, *Diverticula Rupture and Volvulus*, 3rd ed., W.B. Saunders, Philadelphia, 1983, pp. 604.
- [11] L.W. Milne, Gastric volvulus: two cases and a review of the literature, *J. Emerg. Med.* 12 (3) (1994) 299–306.
- [12] J.A. Wasselle, J. Norman, Acute gastric volvulus: pathogenesis, diagnosis, and treatment, *Am. J. Gastroenterol.* 88 (10) (1993) 1780–1784.
- [13] M. Borchardt, Zunpathologie und therapie des magnevolvulus, *Arch. Klin. Chir.* 74 (1904) 243–260.
- [14] S. Farag, V. Fiallo, S. Nash, F. Navab, Gastric perforation in a case of gastric volvulus, *Am. J. Gastroenterol.* 91 (1996) 1863–1864.
- [15] H. Ellis, Diaphragmatic hernia: a diagnostic challenge, *Postgrad. Med. J.* 62 (1986) 325.
- [16] P.P. Llaneza, Salt II WB. Gastric volvulus more common than previously thought, *Postgrad. Med.* 80 (1986) 279–288.
- [17] A.R. Askew, Treatment of acute and chronic gastric volvulus, *Ann. R. Coll. Surg. Engl.* 60 (4) (1978) 326–328.
- [18] C. Palanivelu, M. Rangarajan, A.R. Shetty, R. Senthilkumar, Laparoscopic suture gastropexy for gastric volvulus: a report of 14 cases, *Surg. Endosc. Other Interv. Tech.* 21 (6) (2007) 863–866.
- [19] M.N. Lowenthal, H.S. Odes, Endoscopic reduction of acute gastric volvulus complicating motor neuron disease, *Isr. J. Med. Sci.* 21 (1985) 552–553.

- [20] D. Etienne, M. Ona, M. Reddy, Atypical Presentation of Gastric Volvulus, *Gastroenterology Research, North America* (2017) (Available at: <<http://www.gastrores.org/index.php/Gastrores/article/view/813/882>>. Date accessed: 15 June 2017).
- [21] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, D.P. Orgill, S.C.A.R.E. the Group: the SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (2016) 180–186.
- [22] T. Ilaria, M. Giuliana, R. Claudio, S. Ignazio, Gastric volvulus in children ? a diagnostic problem: two case reports, *J. Med. Case Rep.* 10 (1) (2016) 1.

Open Access

This article is published Open Access at sciendoirect.com. It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.