Original Article

Gastric volvulus in children: Experience of 6 years at a tertiary care centre

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ABSTRACT

Background: The aim of the study was to review the cases of all children who had gastric volvulus from 2002 to 2007 at a tertiary care centre in India and to compare the outcome of management with the reported series on gastric volvulus in a paediatric age group. **Materials and Methods:** This was a retrospective study of eight children with an age range between 10 days and 2 years who were managed for gastric volvulus between 2002 and 2007. The records of these patients were reviewed for clinical features, investigations, management and outcome. **Results:** All patients were less than 3 years of age with female preponderance (n = 5). Three patients had acute presentation and three had acute-on-chronic symptoms, while two had chronic gastric volvulus. The commonest symptom was abdominal distension. Two patients were diagnosed by barium studies and six had clinical suspicion because of their symptoms and were confirmed intra-operatively. Seven had secondary gastric volvulus of organo axial type with associated pathologies as congenital diaphragmatic hernia (n = 5), Para oesophageal hiatus hernia (n = 2), and one had primary gastric volvulus in a postoperative period in an operated case for a tracheo-oesophageal fistula (n = 1). Seven patients were symptom free at follow-up; one patient succumbed due to septicaemia in the immediate post-operative period which was not related to the pathology of gastric volvulus. **Conclusion:** Gastric volvulus is a rare condition in children and requires prompt diagnosis and urgent intervention in acute presentation where it mimics acute abdomen and strong clinical suspicion.

Key words: Acute presentation, children, gastric volvulus

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INTRODUCTION

Gastric volvulus is defined as a rotation of 180° of stomach upon itself. Clinical presentation may be acute, acute-on-chronic or chronic, with non-specific symptoms such as failure to thrive, recurrent foul eructations and condition can be difficult to diagnose.[1] Acute gastric volvulus in children is a rare condition and can be a life-threatening emergency that requires prompt diagnosis and treatment.[2] Although expectant management has been documented by some, operative intervention is considered as necessary in acute as well chronic cases by most of the studies. Operative procedures can be open or laparoscopic.[3-6]

The purpose of the study was to determine the underlying associated conditions, their correlation with the final diagnosis and their impact on the presentation and the outcome of management of gastric volvulus.

MATERIALS AND METHODS

This was a retrospective study of a total of eight patients diagnosed as cases of gastric volvulus at our tertiary care institute either preoperatively or during the course of the management of their primary pathology between 2002 and 2007. The records of these patients were reviewed with reference to their age, sex, clinical presentation, primary pathology, management for the primary pathology, management for the gastric volvulus and follow-up.

RESULTS

Total eight patients were diagnosed as having gastric volvulus. Their ages at the diagnosis varied from 10 days to 2 years with a mean age of 1 year. Five of the patients were female and three were male. The clinical presentation was epigastric distention in all the eight patients, recurrent non-bilious vomiting in six patients, hematemesis in three patients and a visible palpable gastric lump in two patients. Three patients presented with acute symptoms of sudden abdominal distension with recurrent gastric vomiting; three other patients were initially diagnosed as cases of congenital diaphragmatic hernia in their screening for symptoms and were planned for elective surgical correction but

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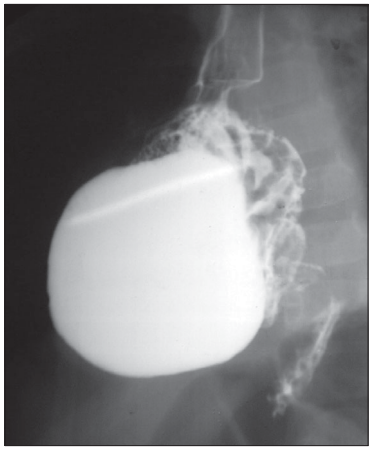


Figure 1: Barium swallow showing organoaxial volvulus with pylorus at a slightly higher level than cardia

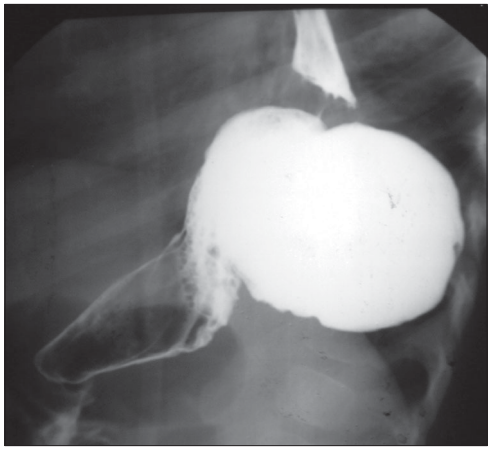


Figure 2: Barium swallow showing organoaxial volvulus before it attained the classical position described in Figure 1

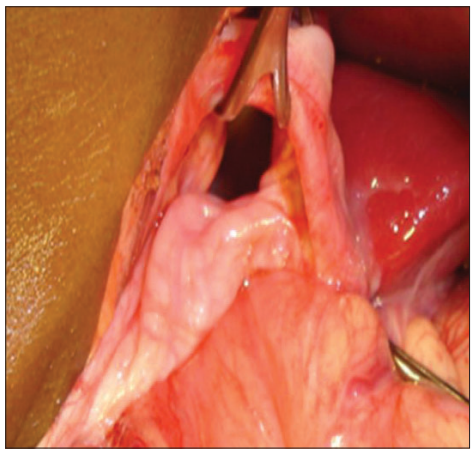


Figure 3: Intra-operative photograph showing hiatus hernia before repair

developed abdominal distension and hematemesis before the planned surgery, and underwent emergency laparotomy. Two patients had recurrent non-bilious vomiting associated with supra-umbilical and epigastric lumps which reduced spontaneously in the recumbent position; their diagnosis was confirmed on barium meal before they underwent surgical corrections [Figures 1 and 2]. All the patients had organoaxial type of gastric volvulus, and the volvulus was secondary to congenital diaphragmatic hernia in five patients and Para oesophageal hiatus hernia in two patients [Figure 3]. One of the patients was operated for congenital tracheo-oesophageal fistula before he developed primary gastric volvulus on the sixth postoperative day.

All patients had surgical correction of the volvulus including the repair of the diaphragmatic hernia, with Nissen's fundoplication for hiatus hernia, three-point gastropexy at oesophago-cardiac, fundophrenic and anterior gastropexy. The patients with hiatus hernia were put on 3 months of antacids and prokinetics. The neonate with an acute primary gastric volvulus following surgery for tracheo-oesophageal fistula succumbed to septicaemia in the postoperative period. The remaining seven patients were symptom free at follow-up and longest follow-up is of 5 years' mean duration.

DISCUSSION

Since the first description made by Berti in 1866[1] in an adult patient and by Oltmann in 1899 in a paediatric patient, there have been less than 600 reported cases of gastric volvulus in children till 2008.[2] The normal stomach is fixed and prevented from volvulus by the ligamentous attachments of the stomach which are the gastrohepatic, gastrocolic, gastrophrenic and gastrosplenic ligaments. The relative fixity of the pylorus and gastro-oesophageal junction also helps to maintain the normal position of the stomach.

The volvulus of the stomach is primary when these attachments are poor or absent. It can also be secondary to congenital diaphragmatic hernia, hiatus hernia, diaphragmatic eventration, Para oesophageal hernia, wandering spleen, distended stomach, gastric outlet obstruction or with malrotation of the intestine.[3-6] It can also occur secondarily to Nissan's fundoplication.[7] In our series of patients, the volvulus was secondary in seven cases and primary in one case; this is similar to the findings in the series by Cribbs *et al.* in which secondary volvulus was commoner.[2]

The volvulus can be of organoaxial or mesentericoaxial or mixed type, depending upon the axis on which the stomach rotates upon itself.[8,9] The organoaxial type is more commonly found in primary volvulus;[10] most of the mesentericoaxial volvulus in children are secondary

to diaphragmatic hernia and Para oesophageal hernia.[9] The children in our series had organoaxial type of gastric volvulus even where it was associated with diaphragmatic hernia or hiatus hernia. These findings are similar to the report by Darani *et al.*,[11] but differ from those of Mayo[4] and Miller,[8] where most common volvulus was mesentericoaxial.

Gastric volvulus may present as an acute, life-threatening event that carries significant mortality if not diagnosed and managed timely. The suspicion for the diagnosis is based on the common presentation of sudden epigastric distension with persistent non-bilious vomiting. Sudden episode of hematemesis is also common as was seen in two of our patients.

Chronic gastric volvulus is difficult to diagnose because the symptoms are not specific. Chronic, non-specific symptoms such as failure to thrive, recurrent foul eructations and gurglings on moving the child, can be complaints specially when it is associated with large proximal dilated stomach segment or associated severe gastroesophageal reflux. The clinical findings and severity of the presentation are related to the degree of rotation and gastric obstruction. We had patients with a history of recurrent epigastric lump and vomiting which used to resolve on its own. The Borchardt's triad of acute gastric volvulus[11] could not be confirmed in our series of paediatric population.

Hematemesis in children with a gastric volvulus has been reported by Samual *et al.*[12] and is possibly a consequence of ischaemia of the stomach. In our patients, the diagnosis in acute cases was by a strong clinical suspicion due to a sudden onset of the epigastric lump and persistent vomiting, and roentgenogram showing dilated stomach. Those with acute-on-chronic presentations were diagnosed based on the suspicion of their known underlying pathology like diaphragmatic hernia, diagnosed during their work-up for recurrent intermittent vomiting and epigastric distention. The diagnosis in chronic cases was by upper gastrointestinal barium studies where the organoaxial volvulus showed the stomach in a horizontal position with pylorus facing downward and the greater curvature seen above the lesser curvature in front of lower oesophagus. In mesentericoaxial volvulus, the stomach is in an upright position and pylorus is above the gastroesophageal junction. We did not use computerized tomogram scan for our patients, although this can be helpful if the barium studies are inconclusive in suspected chronic or recurrent volvulus.

Some authors[10,13] advocate nonoperative treatment of gastric volvulus, but surgical treatment is recommended by majority of authors.[2,3,8,11] Operative treatment includes reduction, correction of predisposing factors and gastropexy. This can be done by an open procedure as well as laparoscopically with good results. Fundoplication is also advocated by some for the associated reflux disease. Based on our experience so far, we agree that operative intervention is preferred in the treatment of gastric volvulus.

CONCLUSION

Acute gastric volvulus is a clinical emergency which should be promptly managed to prevent complications. Barium studies are diagnostic in cases of chronic and recurrent volvulus. Open or laparoscopic surgical intervention with correction of the predisposing condition should be the definitive management.

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