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CASE REPORT

Chronic Mesenteroaxial Gastric Volvulus and Congenital Diaphragmatic Hernia: Successful Laparoscopic Repair

Nitinkumar Bhajandas Borkar, Nitin Pant, Satish Kumar Aggarwal

ABSTRACT

Gastric volvulus is a rare cause of recurrent abdominal pain in children. Usually it is associated with diaphragmatic pathology. A 9-year-old boy presented with recurrent abdominal pain and vomiting. Investigations confirmed a volved stomach in the left chest and a left congenital diaphragmatic hernia (CDH). Laparoscopic reduction and repair of CDH was performed successfully. The stomach was devolved and reduced into the abdomen. No gastropexy was performed. The patient is asymptomatic 2 years after surgery.

Traditional treatment of gastric volvulus has been derotation and gastropexy with the anterior abdominal wall. Our case shows that gastropexy may not be needed in all cases. Also, this is perhaps the first case to undergo laparoscopic repair of CDH and gastric volvulus in pediatric population.

Keywords: Gastric volvulus, Congenital diaphragmatic hernia, Laparoscopy.

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INTRODUCTION

Congenital diaphragmatic hernia (CDH) results from failure of pleuroperitoneal canal to close around 6th and 8th weeks of gestation. Although neonatal presentation with respiratory distress is common presentation, delayed presentation and incidental detection is also well known. Association of CDH with mesenteroaxial volvulus of the stomach is also well known. In children, mesenteroaxial is the most common type of gastric volvulus and association with anatomic defects is a rule.[1] Although laparoscopic repair of CDH was reported as early as 1995, there is no report of concomitant correction of symptomatic gastric volvulus.[2] Also the traditional treatment of gastric volvulus has been reduction and gastropexy. Here, we report a case of CDH with mesenteroaxial gastric volvulus, which was managed laparoscopically. No gastropexy was done.

CASE REPORT

A 9-year-old boy presented with history of episodic non-bilious vomiting and recurrent colicky abdominal pain for a year. There was no history of constipation, fever or a prior surgery. On examination there was fullness in upper abdomen but no tenderness. Bowel sounds were normal. There was decreased air entry in the left lower lobe. Rest of the examination was normal. Plain X-ray showed elevated left dome of diaphragm and a large air fluid level just beneath it. Rest of the bowel gas pattern was normal. Visualized lung fields were normal. A nasogastric tube could be easily passed. About 500 ml gastric nonbilious fluid was aspirated with relief from distension. Eventration of diaphragm with volvulus was suspected. A contrast enhanced computed tomographic (CT) scan showed a volved stomach with air fluid level in the left chest and diaphragmatic hernia (Fig. 1).

In view of associated gastric volvulus, laparoscopic approach was used rather than thoracoscopy. Under general anesthesia in supine position, a 10 mm primary port was inserted by open technique. Pneumoperitoneum was created using 10 mm Hg pressure. Two working ports of 5 mm each were inserted in the right and left upper abdomen respectively. An epigastric port was inserted for retracting the liver. The left side was elevated to facilitate the operation. Additionally, the falciform ligament was hooked up with a stitch. The left triangular ligament was taken down to retract the left lobe of liver. A large posterolateral defect in the diaphragm was found, through which the stomach, spleen and part of small bowel and large bowel was herniating (Fig. 2). Intestines were reduced with gentle pull. The spleen was reduced with the help of the shaft of the 5 mm Babcock forceps. The margins of the defect were

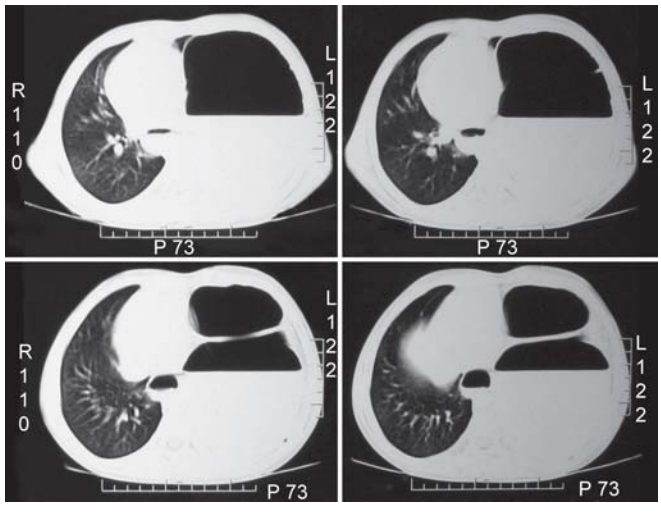

Fig. 1: CT chest showing left diaphragmatic hernia and gastric volvulus

freshened with diathermy. The defect was closed by interrupted polyglactin 2/0 sutures using intracorporeal knotting (Fig. 3). Chest tube was inserted under guidance before taking the last two bites. The viscera were placed in the normal anatomical position. Hemostasis was checked and port sites closed. Postoperative chest X-ray showed satisfactory profile of the left diaphragm and expanded lung (Fig. 4). The nasogastric tube was removed on the 3rd day and feeds started. The child was discharged on the 5th postoperative day. He has remained asymptomatic during a 2 years follow-up.

DISCUSSION

Gastric volvulus can occur in both adults and children. In 1866, Berti reported a mortality secondary to an isolated acute gastric volvulus.[3] In 1904, Borchardt described the clinical features of acute gastric volvulus which later denominated as 'Borchardt's triad': Acute localized epigastric distension, inability to pass the nasogastric tube and unproductive retching.[4] This triad may not always present in children, as in our case where we were able to pass the nasogastric tube. Delayed presentation of CDH has been reported at all ages and account for 5 to 10% of all CDH.[5] Patients can present with either digestive or respiratory symptoms. Pulmonary hypoplasia, usually a major prognostic factor in neonate, is often minor or nonexistent in this setting. Cameron and Howard found congenital diaphragmatic hernia in 65% of children with gastric volvulus and 84% of those less than 1 month.[6] The high frequency of this association may be explained by the increased space around the stomach under the left diaphragmatic defect and by the laxity of gastrophrenic and gastrosplenic ligament. Surgical treatment is the primary mode of therapy. Traditionally, it includes reduction of the contents, repair of the defect and fixation of the stomach. Contrary to the popular belief, we have not done any gastric fixation in our case. Once the defect was repaired all the viscera occupied the normal anatomical position. Therefore, the extra space around the stomach was obliterated. No extra manoeuvre was required to keep the stomach in its normal position below the left lobe of liver and to the right of the spleen. No gastropexy was, therefore, felt necessary. We feel that gastropexy should be an essential step in idiopathic type of gastric volvulus. A review of 77 cases of gastric volvulus in children described three recurrences, two of which were seen in patients who had undergone reduction only without anterior gastropexy. The third recurrence, however, was seen after reduction and anterior gastropexy.[1] There was no recurrence in the group where reduction and repair of associated defect had been performed. We have not performed gastropexy in our case and the patient has not had a recurrence during 2 years follow-up. Although the tradition favors fixing the stomach, we feel that the main reason for repeated volvulus in our case was availability of free space within the hernia. Once this space was obliterated

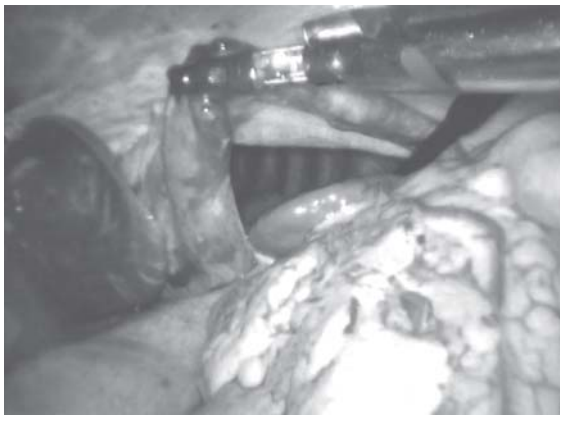

Fig. 2: Laparoscopic view of the defect. Chest wall is seen through the defect

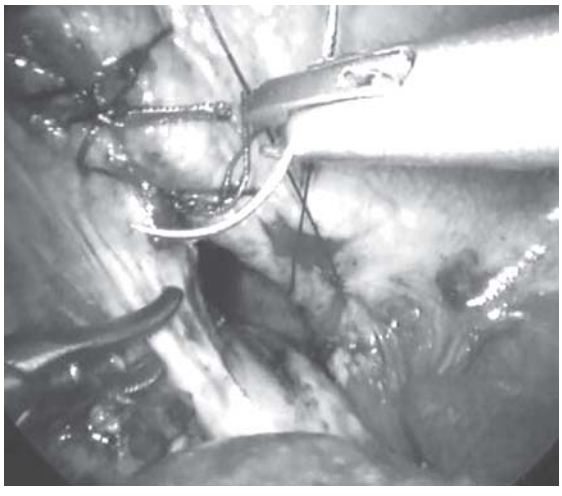

Fig. 3: Laparoscopic view showing suturing of the defect

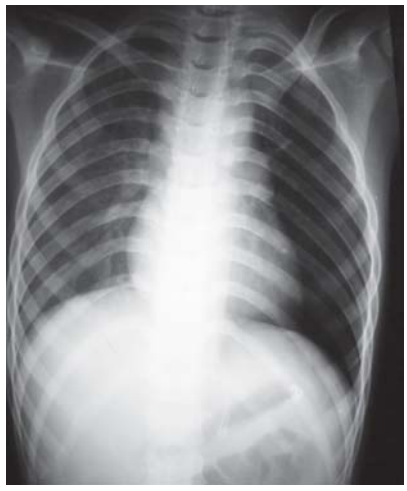

Fig. 4: Postoperative chest X-ray showing normal position of diaphragm

by reducing the contents and repairing the defect, the causative factor was gone and the stomach was restored to its normal anatomic confines. However, we are unable to recommend omitting gastropexy based on a single case. Perhaps more anatomical studies could throw light on this aspect of the treatment.

Usual minimal invasive approach to diaphragmatic hernia is thoracoscopic. We chose to do laparoscopy because we are more familiar with this approach. We do open repair also by abdominal route. Also, it is more useful to detect and treat abnormalities of gut position. The mobilization of the left lobe of liver (especially if it forms a part of the contents) is also easier through the laparoscopic approach. The posterior lip of the defect is better defined after incising the overlying posterior peritoneum. This incision, we believe, is easier and well controlled, if performed laparoscopically. We feel that the choice of the approach should depend upon the surgeon's preference, anatomical defect and associated problems.

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