Gastric volvulus in infancy and childhood

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ABSTRACT

We report on a retrospective analysis of the medical records of 12 children who had gastric volvulus. Five males and 7 females with gastric volvulus were treated at our hospital over a period of 6 years. Their ages ranged from 2 months - 2 years (mean 5 months). Two of them presented acutely with intrathoracic gastric volvulus associated with a paraesophageal hernia in one and a recurrent left posterolateral diaphragmatic hernia in the other. The remaining 10 patients presented with repeated attacks of vomiting and failure to thrive in 8 of them. Two patients were in addition complaining of shortness of breath and choking attacks. Gastroesophageal reflux was demonstrated in 8 of our patients. The two patients with acute intrathoracic gastric volvulus were treated with repair of the defect and gastropexy for the patient with paraesophageal hernia. All the remaining patients were treated with gastropexy. In all, the gastropexy was anterior and fundic without fundoplication. This report indicates that chronic gastric volvulus should be included in the differential diagnosis of children with repeated attacks of vomiting and failure to thrive. These children should be investigated radiologically by plain x-ray to rule out associated diaphragmatic hernia and barium meal. Anterior and fundic gastropexy without fundoplication is the treatment of choice.

Keywords: Gastric volvulus, children.

Gastric volvulus, which was first described by Berti in 1966, is an abnormal rotation of one part of the stomach around another. In the past, gastric volvulus was considered to be very rare in the pediatric age group, but now it is being diagnosed with increasing frequency. This is attributed to the liberal use of investigative techniques including barium meal for the evaluation of children with repeated attacks of vomiting. This is a report of 12 children with gastric volvulus outlining aspects of presentation, diagnosis and treatment.

Case Report. Over a period of 6 years from 1992 to 1997, 12 infants and children with the diagnosis of gastric volvulus were treated at our hospital. Their clinical features and method of repair are shown in Table 1. Two of them presented acutely with acute intrathoracic gastric volvulus. One of them was a 3 month old male who was referred to our hospital because of persisting vomiting of one weeks duration. The vomitus was brownish in colour. His chest x-ray was suggestive of a left paraesophageal hernia. Barium meal showed a left paraesophageal hernia with intrathoracic gastric volvulus. He was operated on as an emergency and was found to have a large left sided paraesophageal hernia with almost the whole stomach herniating into the chest. The stomach was congested but viable. Repair of the diaphragmatic defect as well as anterior and fundic gastropexy were carried out. Postoperatively the patient did well and now he is 1 year post-operatively, with no more vomiting and gaining weight. The other patient presented at the age of 4 months with severe acute respiratory distress and

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980
cyanosis of sudden onset. This patient had repair of a left posterolateral congenital diaphragmatic hernia as a newborn. His chest x-ray showed a huge dilated stomach with intestinal loops in the left side of the chest. Naso-gastric tube was passed with difficulty and drained coffee ground fluid. Following this there was marked improvement in his general condition. A repeat chest x-ray showed a significant decrease in the size of the stomach with associated herniation of bowel loops into the chest. He was operated on and found to have a recurrent left diaphragmatic hernia with intrathoracic herniation of the stomach and small intestine. The stomach was congested but viable. The contents were reduced, the hernial sac excised and the defect closed. Post-operatively the patient did well and he is now 3 years post-operatively and well. The remaining 10 patients all presented with repeated attacks of vomiting, and failure to thrive in 8 patients. Two patient, in addition, were complaining of shortness of breath and choking attacks. In all, barium meal was diagnostic of gastric volvulus of the organo-axial type (Figure 1). Associated gastroesophageal reflux was demonstrated radiologically in 8 of our patients. During surgery, 5 of them were found to have mobile spleens, while in the remaining 5 no anatomical defects could be demonstrated apart from lax ligaments. All were treated with both anterior and fundic gastropexy.

Post-operatively, all did well, the vomiting stopped and they started to gain weight, except one who was re-admitted with bronchial asthma like symptoms, chronic liver disease, rickets and severe chest infection and died one month post-operatively.

**Discussion.** The stomach is normally fixed in its place at 2 points, the gastroesophageal junction at the level of the esophageal hiatus and the pylorus where the duodenum is fixed retroperitoneally. Add to this the 4 ligaments, the gastrophrenic, gastroplenic, gastrohepatic and gastrocolic which fix the stomach on the sides as well, and because of this the stomach does not rotate, or if it rotates this is usually less than 180°. So for gastric volvulus to occur, these
anatomical anchors are either absent or abnormally lax. This is specially so in the presence of other predisposing factors such as diaphragmatic hernia, evagination of diaphragm, paraesophageal hernia and asplenia/polysplenia syndrome. Two of our patients had diaphragmatic hernia, a paraesophageal hernia in one and a recurrent posterolateral diaphragmatic hernia in the other. In both, and as a result of herniation of the stomach into the chest, gastric volvulus was intrathoracic. Intrathoracic gastric volvulus is very rare and can be rapidly fatal necessitating prompt diagnosis and treatment. Of the remaining 10 patients with gastric volvulus 5 of them had mobile spleens, while in the other 5 no anatomical defect could be detected apart from lax ligaments. Gastric volvulus is classified into: (1) organo-axial where the greater curvature of the stomach rotates around an imaginary line joining the esophageal hiatus and the pylorus, (2) mesenterio-axial where the pylorus or cardia rotates anteriorly around an imaginary line joining the greater and lesser curvatures of the stomach, (3) mixed gastric volvulus where the stomach rotates in both planes. Although posterior rotation is possible it is very rare, and in all our patients the rotation was anterior and the volvulus was of the organo-axial type. The clinical symptoms of gastric volvulus depend on the degree of rotation and obstruction, and based on this gastric volvulus is divided into acute and chronic. Whereas acute gastric volvulus is very rare, chronic gastric volvulus, on the other hand, is more common and not uncommonly gastric volvulus can be intermittent. Two of our patients presented acutely with intrathoracic gastric volvulus. The presentation of those with chronic gastric volvulus is usually in the form of repeated attacks of vomiting which can be blood stained and as a result of this, these children fail to grow. So gastric volvulus should be included in the differential diagnosis of infants and children with repeated attacks of vomiting and failure to thrive. Children with persisting vomiting should be investigated radiologically, which should include a plain x-ray of the chest and abdomen to rule out associated diaphragmatic hernia or evagination and barium meal which is usually diagnostic. Gastroesophageal reflux which is secondary to the volvulus is common in these patients. In 8 of our patients, gastroesophageal reflux was demonstrated radiologically.

The management of these patients is still controversial. There are those who advocate surgery for all children who present with either acute or chronic gastric volvulus, but because some of these patients respond to conservative management alone, by sitting them in the upright recumbent position after feeds or nursing them in the prone position, such a conservative approach was advocated by others. In our patients there was no place for conservative treatment, 2 had acute gastric volvulus, and the remaining 10 patients had persisting vomiting with failure to thrive in 8 and shortness of breath and choking attacks in 2. The type of surgery to be performed is also still controversial. There are those who advocate anterior gastropexy while others perform fundic gastropexy, and there are those who add fundoplication to gastropexy to correct the associated gastroesophageal reflux. We, like others, believe that gastroesophageal reflux in these patients is secondary to the volvulus and should be managed conservatively. Anterior gastropexy alone, may predispose to gastroesophageal reflux by altering the angle of His, and so reducing the pressure in the lower esophageal high pressure zone. All our patients were treated both anterior as well as fundic gastropexy without fundoplication and responded well to the surgical treatment. This approach, we think not only corrects the gastric volvulus, but also the addition of fundic gastropexy should help eliminate the associated gastroesophageal reflux by reforming the angle of His without formally performing fundoplication, which can be unsuccessful in a high proportion of patients in early infancy.

References
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