Case Report

Mesenteroaxial Gastric Volvulus in a 4-year old Boy

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Abstract

Gastric volvulus, which is defined as an abnormal rotation of the stomach of more than 1800, is said to be a rare surgical emergency in childhood. Many of the cases reported in the world literature have been the acute and secondary type with predisposing factors.

The acute type is potentially lethal if not properly managed. We describe an acute gastric volvulus in a 4-year-old child, the primary type, without any predisposing factor, which was so difficult to diagnose that the boy was first treated for malaria, sepsis and meningitis before the right diagnosis was finally made.

Keywords: Gastric volvulus, stomach, children, diagnosis

Introduction

Gastric volvulus (GV) is a rare cause of gastrointestinal obstruction in children. It is produced by an abnormal rotation of one part of the stomach around another and leads to either regurgitation, retching or vomiting in younger children and in the older ones epigastric pain in addition. Diagnosis is by chest and plain erect abdominal roentgenograms in addition to the clinical features[1,2]. Upper gastrointestinal contrast studies help to confirm the diagnosis[1,3,4]. Treatment is mainly surgical, especially in the acute form and this should be done after initial vigorous resuscitation. This will avoid gastric ischaemia which may lead to gangrene or perforation of the stomach and possible death[5]. Since 1899 only 77 children with this disease entity have been documented in the world literature[5]; this figure increased to 100 by 1997[6]. Ever since then, there have been occasional reports about children having GV, but the only large series so far from one centre involves, in all, 52 children with this anomaly[3]. In Sub-Saharan Africa there have been three or so reports which include children with GV[6-8]. We present our experience with one case of GV in a 4-year old boy, stressing the challenges involved especially in the diagnosis (and treatment) of such a rare disease entity.

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Case Study

A 4-year-old boy presented in May 2003 with vomiting, fever and abdominal pains of two days duration. During the first day of his illness, the child was said to have vomited six times and on the second day four times, all scanty. He was first seen in a clinic and treated for malaria before being referred to Komfo Anokye Teaching Hospital, where he was admitted to the Child Health Department. He was noted on admission to have lost weight but this was attributed to the child's refusal to eat as a result of his condition.

The child was found to be ill-looking, restless, weak, and lethargic with sunken eyes. The neck was supple and Kerning's sign was equivocal. The upper half of the abdomen was grossly distended and tender; the tenderness extended from the right hypogastrium to the left. Bowel sounds were present. Digital rectal examination did not reveal any pathology. All other systems were normal. So a provisional diagnosis of hypoglycaemia, severe malaria (with severe dehydration) and sepsis, to rule out meningitis, in that order, was made.

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Fig. 1: An erect abdominal X-ray film shows a huge, distended stomach

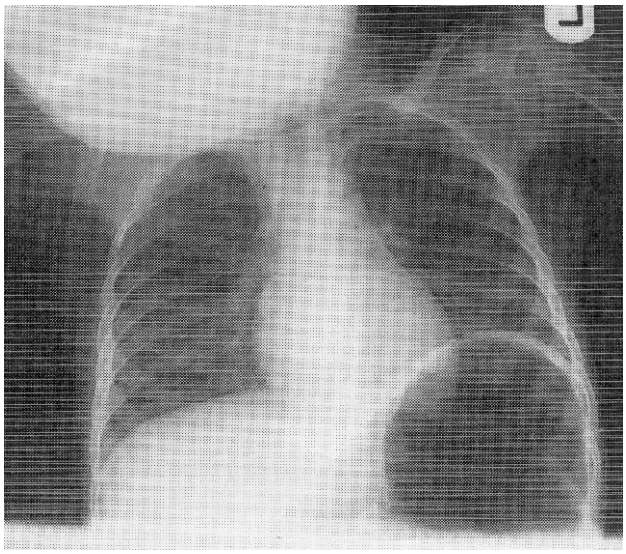


Fig. 2: Stomach bubble in the same child.

The haemoglobin level was 11.3g/dl with haematocrit of 35.9% and WBC count of 13.2 × 109/L, with segmented neutrophils of 65.0% and lymphocytes at 35%. No malaria parasites were seen. A lumbar puncture performed on admission produced clear cerebrospinal fluid (CSF), which was not under pressure and yielded no bacterial growth on culture after 48 hours. Blood electrolytes, urea and creatinine were within normal range. A random blood sugar done, also on admission, revealed a sugar level of 1-2 mmol/l. Ultrasonography of the abdomen showed a normal liver, spleen and kidneys but was unable to visualize the stomach because it was obscured by a lot of gas. Chest and abdominal radiographs (Figs. 1 & 2) showed a huge, intra-abdominal organ, distended with gas, presumed to be the stomach. With a diagnosis of intestinal obstruction, the child was referred to the paediatric surgeon on the second day of admission and 4 days from the onset of the illness. On the basis of the physical and radiological examination a diagnosis of volvulus of either the stomach (rare in children) or the sigmoid colon (also rare) was entertained.

The resuscitation, started by the paediatricians, was continued. The urine output was good (there was already a urethral catheter in situ). The nasogastric (NG) tube drained about 700 ml of clear gastric fluid with brownish particles on the first day of admission; besides the clear fluid, the collecting bag was distended with air. On the second day of admission the bag was filled with only air with little or no gastric contents in it.

At laparotomy, using an upper midline incision, the stomach was found to be twisted around a transverse line connecting the greater and lesser curvatures, thus causing the antrum to lie over the

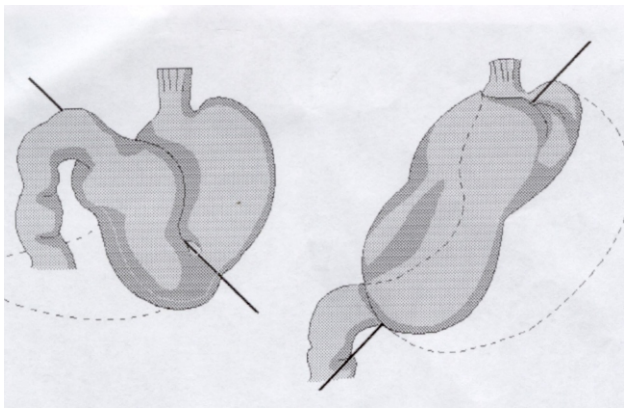


Fig. 3: Diagrammatic representation of volvulus of the stomach

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cardia. The distal portion of the stomach was hyperaemic and congested at various areas. The NG tube was only felt coiled up in the proximal portion of the stomach; it was unable to pass down to the distal portion because of the complete obstruction. No other pathology was seen either in the stomach or in the peritoneal cavity. After untwisting the stomach, it regained its normal appearance. Gastropexy was performed. Postoperatively, recovery was uneventful and he was discharged home in a very satisfactory condition a week after surgery. There has been no recurrence of symptoms ever since his discharge.

Discussion

The term volvulus is derived from the Latin word, volvere, which means to twist around. Volvulus of the stomach is a rare condition and a surgical emergency in children[9,10]. In general, the most common volvulus of the stomach is the twist around a line joining the gastroesophageal junction to the pylorus; in this, the greater curvature swings upwards and anteriorly causing an organoaxial volvulus[11]The other type of volvulus is the one in which the stomach twists around a horizontal line joining the greater to the lesser curvature; in this case, the antrum rotates anteriorly and to the left and thus forms the mesenteroaxial type of gastric volvulus[11](Fig. 3). There may also be the combined form of gastric volvulus in which the stomach twists both organoaxially and mesenteroaxially but such a combination is very rare. In children, mesentero-axial volvulus is the most common[5]. Aetiologically, gastric volvulus can be idiopathic or primary[12] (when no obvious cause of the disease can be found) and congenital or acquired[12] (associated with congenital or acquired abnormalities that result in abnormal mobility of the stomach; this is also referred to as secondary gastric volvulus). Finally, gastric volvulus may be acute or chronic[13,14]. When rotation of the stomach exceeds 1800, gastric obstruction or strangulation may occur[4].

The triad of symptoms of GV in adults includes epigastric distension, inability in passing a nasogastric tube and unproductive vomiting; these were first described by Borchardt (in Yang CY et al[2] and Akoad M[11]). This triad of symptoms is not always seen in paediatric patients. Instead, there may be symptoms such as emesis in neonates and in older children - abdominal distension (especially epigastric), vomiting, weight loss or constipation[9,10]. Our patient had all the symptoms of GV related to his age, that is, epigastric distension, vomiting, weight loss and abdominal pain. Another sign that we noticed in our patient after passing a nasogastric tube was that the collecting bag always filled up with air with little or no gastric content. This we assumed to be due to complete obstruction of the stomach so that the NG tube could not be passed farther than the cardia of the stomach and as such drained only the swallowed air, thus distending the collecting bag.

During the first days of his illness, there was an unexplained fever and the child was treated for malaria. He was also hypoglycaemic on admission to hospital he had refused to eat because of the vomiting. Lastly a lumbar puncture was done for suspected meningitis. This shows how difficult it is to make a preoperative diagnosis of GV in general[15], and in children in particular, especially neonates[3,13]. All these led to a delay in diagnosis and referral to the paediatric surgeon. It was only when a plain erect abdominal and chest X-rays were obtained did the suspicion of a surgical problem come up. The diagnosis of either a GV or sigmoid/large bowel volvulus (both rare in children) can be made based on the clinical features and plain radiographs of the thoracoabdominal region and confirmed with contrast studies[10,16]. As a result of the delay in coming to a definitive diagnosis and the late referral to the surgeon, it was thought unwise to waste more time again to perform a contrast examination to confirm the diagnosis, since the signs of intestinal obstruction in this child were obvious.

Ultrasonography, to the best our knowledge, is not useful in the diagnosis of GV as confirmed by

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other workers[17,18]. The air in the stomach is a hindrance to its visualization. It did not add much to making a diagnosis in this child's case except to confirm that there was no asplenia, which is considered one of the predisposing factors for GV[2,19]. Other predisposing factors include: deficient fixation of the gastric ligaments, diaphragmatic defects such as eventration or hiatal hernias[4,10,17]. Our child was vigorously resuscitated and a laparotomy done, which revealed a mesenteroaxial gastric volvulus. the most common type seen in children[5]. Of late, another acceptable form of treating this pathology is laparoscopic reduction of GV and repair of associated anomalies[4,20], where the facilities and technical know-how are available.

In conclusion, gastric volvulus is a rare and often very difficult to recognize disease entity in children. Careful attention to signs and symptoms of this anomaly and a high index of suspicion will lead to its early clinical recognition, prompt surgical reduction with gastric fixation and repair of associated defects, if found. This will prevent delays which lead to gastric ischaemia, perforation and death.

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