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Impending Gastric Rupture in a Neonate with Gastric Outlet Obstruction due to Malrotation

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ABSTRACT

This is a case report of a neonate with impending gastric rupture due to malrotation with gastric outlet obstruction. A preoperative plain abdominal X-ray showed expansion of the gastric bubble. A barium meal demonstrated an unusual bulging of the gastric wall extending from the fundus to the body of the stomach on the greater curvature side and malrotation of the duodenal loop. At operation a malrotation with volvulus and a rupture of the seromuscular layer with bulging of the mucosa in the stomach was found. We think that this unusual bulging of the gastric wall in the barium meal is an important radiological sign of impending gastric rupture.

The therapeutic results of neonatal gastric rupture are very poor, and improvement of these is an important problem. The author have experienced a case of a newborn believed preoperatively from the findings of simple abdominal X-ray and upper GI series to be accompanied by a state of impending gastric rupture. On laparotomy, it presented with tear of the serosa and tunica muscularis on greater cavature side of the anterior wall of the stomach and intestinal malrotation. Life was saved by simple suture of the seromuscular layer for the stomach and Bill's operation for malrotation type I. From the findings of this case it is quite possible for a state of impending gastric rupture to be present in early stage of neonatal gastric rupture. Moreover performance of operation at this stage was considered to remarkably improve the therapeutic results.

CASE REPORT

A 10-day-old male was admitted because of vomiting. History of present illness revealed full term baby with birth weight of 2100 g. Baby was breast-fed 12 hr after birth without vomiting. Since the time of birth, feeding and meconium excretion were both satisfactory, but 5 days after birth vomiting occurred. At this time, oral feeding was discontinued, nasogastric tube was inserted and drip-infusion was begun. This case was referred to our department 10 days after birth.

Condition at admission; Weight 1750 g, emaciated baby with bulging of the upper abdominal region was seen on inspection.

Laboratory findings at admission; Hemoconcentration (+). Total bilirubin 10.8 mg/dl. Acid base balance normal. Findings on plain X-ray of the abdomen revealed marked expansion of the stomach bubble and decreased gas shadow in the digestive tract below the duodenum (Fig. 1). Upper GI series revealed abnormal bulging of the stomach from the fundus to the body and an abnormal running of the duodenum (Fig. 2). From these findings, the diagnosis of impending gastric rupture and malrotation was made.

Operation was performed 4 hr after admission. At operation, the stomach showed approximately 6 cm of tear of the seromuscular layer from the cardiac orifice to the body of anterior wall of the stomach. Bulging of the mucosa was seen, but no perforation. Detailed examination of the

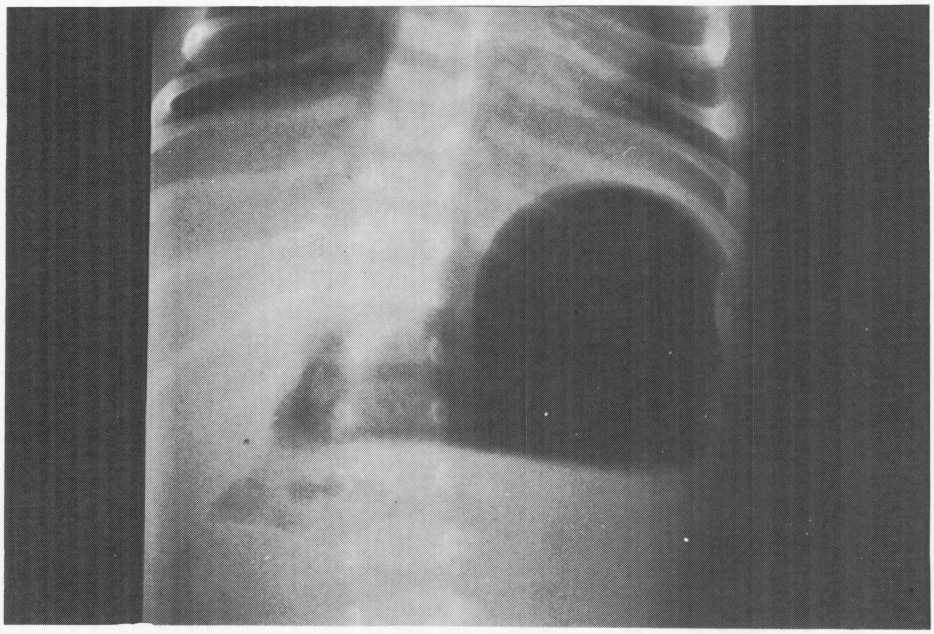

Fig. 1. Findings on plain X-ray of the abdomen revealed marked expansion of the stomach bubble and decreased gas shadow in the digestive tract below the duodenum.

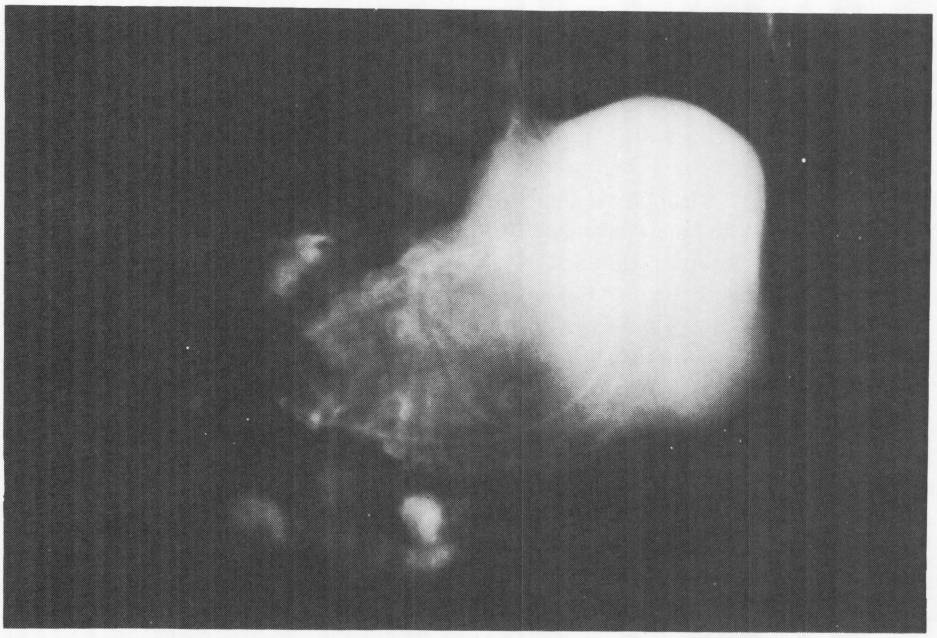

Fig. 2. Upper GI series revealed abnormal bulging of the stomach from the fundus to the body and an abnormal running of the duodenum.

abdominal cavity revealed type I malrotation with volvulus. In the region of impending gastric rupture, suture of the seromuscular layer using atraumatic 5-0 braided silk and Bill's operation for malrotation was done. Postoperative course was very satisfactory and the patient was discharged 26 days after operation, when his body weight had become 2850 g.

DISCUSSION

Gastric rupture in the neonate is a highly lethal and catastrophic disease, so that early detection is most important for the improvement of the survival rate. Several authors have postulated various etiologies as to gastric rupture. These include gastric tissue ischemia[2], and mechanical disruption[1]. We are of the opinion that, stomach rupture of the newborn is not caused by one factor alone, but rather several factors combined together cause rupture of the stomach.

In our case, it seemed that rising intragastric pressure due to duodenal stenosis following malrotation occurred and then seromuscular layer of the stomach was torne.

Some of the gastric ruptures reported in newborns are due to mechanical disruption. These usually follow pyroric atresia, duodenal obstruction from atresia and mid gut volvulus, tracheoesophageal fistula, and diaphragmatic hernia. Gastric rupture caused by increased intragastric pressure is grossly and histologically the same as the seen in the so-called spontaneous rupture[4].

In our case, bulging gastric mucosa had no perforation and same cases have been reported by Shaw[4] and Nishijima[3].

In early stage of gastric rupture, it seems that seromuscular layer starts to tear followed by gastric mucosa bulge and then mucosal rupture occurs. Therefore in early stage of gastric rupture, simple abdominal X-ray shows dilatation of stomach bubble and upper GI series show abnormal bulging from the fundus to the body of the stomach. This shows a prerupture stage and if at this stage abnormality is noticed and operation done, prognosis becomes good.

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