Duodenal duplication, intestinal malrotation and volvulus: An unusual cause of intestinal obstruction

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Abstract

Duodenal duplication cysts are unusual congenital anomalies. Both intestinal malrotation and duodenal duplication may cause extrinsic duodenal obstruction. We report a case of a 5-month-old boy who presented with signs of duodenal obstruction caused by intestinal malrotation, volvulus and a duodenal duplication cyst.

1. Case report

A 5-month-old boy was admitted to our Pediatric Emergency Department with bilious vomiting and dehydration. He had previously been admitted four times with vomiting and dehydration. After fluid reposition, a plain X-ray of the abdomen revealed paucity of intestinal gas and two air-fluid levels, one in the stomach and the other in the duodenum. Abdominal ultrasound revealed gastroduodenal distension, increased peristalsis, or gastrointestinal infection or hemorrhage. The most commonly associated malformations are spinal malformations. Vertebral anomalies excluded, about 50% of the patients present with related anomalies, most commonly midgut malrotation. There are reports in the literature linking intestinal malrotation to duplications of the stomach, jejunum, appendix, cecum, and colon. However, the association between intestinal malrotation, volvulus and duodenal duplication cyst described here is very rare and should be included in the differential diagnosis of children with obstructive symptoms and duodenal mass.

1. Case report

A 5-month-old boy was admitted to our Pediatric Emergency Department with bilious vomiting and dehydration. He had previously been admitted four times with vomiting and dehydration. After fluid reposition, a plain X-ray of the abdomen revealed paucity of intestinal gas and two air-fluid levels, one in the stomach and the other in the duodenum. Abdominal ultrasound revealed gastroduodenal distension, increased peristalsis and a 5.0 × 3.2 mm cystic mass in the duodenum compatible with an intestinal duplication cyst (Fig. 1). An upper gastrointestinal series suggested intestinal malrotation and volvulus (Fig. 2). A laparotomy confirmed the diagnosis of intestinal malrotation and duplication cyst of the third part of the duodenum (Fig. 3). Reduction of the volvulus, Ladd procedure, resection of the duodenal segment with cystic duplication and termino-terminal duodenal anastomosis were performed. The outcome was uneventful and the infant was discharged on the 7th day after the operation. Outpatient follow-up is ongoing and weight and height growth is normal. Histopathological examination confirmed the diagnosis of a 6.0 × 3.8 × 3.5 cm duodenal duplication cyst with no communication with the intestinal lumen. Ectopic tissue was not present.

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2. Discussion

Intestinal duplications have a broad range of clinical presentations in infancy and childhood, ranging from asymptomatic cases, found incidentally during the gestational period during routine sonography, to cases that present with vomiting, abdominal distension and/or pain, volvulus, intussusception, rectal prolapse, and bleeding [1–3]. Usually, clinical presentation is related to the type, site and size of duplication. Gastrointestinal tract duplications may be cystic or tubular. Cysts are more frequent and may or may not communicate with the adjacent bowel lumen [1–4].

Duplications located in the duodenum usually present as vomiting, feeding problems and/or palpable abdominal mass [1–3]. If there is heterotopic gastric mucosa, ulceration, bleeding and perforation may occur [3,5]. Other manifestations are chronic duodenal obstruction with recurrent pancreatitis [6–8] and/or obstructive or intermittent jaundice [9]. In addition, there are reports of duodenal duplication cysts complicated by infection of the cyst itself [10,11]. About 20% of the patients with congenital extrinsic duodenal obstruction caused by intestinal malrotation may present with associated anomalies of the intestinal lumen, such as duodenal atresia, stenosis or web [12]. The patients with intestinal malrotation are known to have a greater risk of midgut volvulus, requiring urgent diagnosis and treatment.

Cases of intestinal malrotation and gastric, ileal, cecal, and colonic duplication cysts have been reported before. However, the association with duodenal duplication and volvulus has not been described to date. Intestinal malrotation may cause an extrinsic duodenal obstruction because of the Ladd bands, while the duodenal duplication cyst may cause obstruction through extrinsic compression or by volvulus of the affected intestinal segment. In addition, intestinal malrotation may be discovered during surgery to correct an intestinal duplication.

The main clinical manifestation of intestinal malrotation is bilious vomiting. A duodenal duplication cyst may also present as bilious vomiting. The combination of plain abdominal radiography, ultrasonography and a contrast-enhanced study of the upper gastrointestinal tract may confirm the diagnosis before surgery and uncover the need for urgent treatment to avoid intestinal catastrophe caused by volvulus.

References


