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CASE REPORT

Congenital Membrane Causing Duodenal Obstruction and Malpositioning of the Descending Colon

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A congenital membrane without intestinal malrotation is a rare cause of duodenal obstruction. Here we present an 11-year-old girl who had suffered from intermittent abdominal cramping pain and vomiting for more than 5 years. The image studies, including a plain abdomen roentgenogram and sonogram, showed no definite diagnosis. The upper gastrointestinal series and small bowel series showed the contrast was static over the third portion of the duodenum and the descending colon pulled up toward the epigastric area. Laparoscopic exploration revealed a congenital membrane extending from the right-side paraduodenal peritoneum through the third portion of the duodenum to the descending colon, which had caused obstruction of the third portion of the duodenum and malpositioning of the descending colon. To the best of our knowledge, this is the first case report in the literature where a congenital membrane caused both duodenal obstruction and malpositioning of the descending colon.

1. Introduction

Abdominal cramping pain with vomiting in children is usually associated with intestinal obstruction. The majority of cases of intestinal obstruction in children are caused by postoperative adhesion, Meckel's diverticulum, or volvulus, for example.[1] For duodenal obstruction, a congenital band anomalies-associated intestinal malrotation has been reported to cause duodenal compressive obstruction[2]; however, there have been no reports of a congenital membrane without malrotation as the cause of duodenal obstruction in the literature. In this article, we report an 11-year-old girl with a congenital membrane, which caused both duodenal compressive obstruction and malpositioning of the descending colon.

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2. Case Report

The 11-year-old girl suffered from intermittent abdominal cramping pain associated with bilious vomiting for more than 5 years. The symptoms occurred several times each year and subsided after conservative treatment. On admission, she had clear consciousness, but appeared slim and acutely ill. Her vital signs were stable. The abdomen was soft with normal bowel sounds. Mild epigastric tenderness was noted and bilious content was found in the draining bag of the nasogastric tube. Laboratory data were within the normal range. An abdomen roentgenogram showed that the descending colon gas was distributed at the mid-abdomen, which suggested malpositioning of the descending colon (Figure 1A). The abdominal sonogram revealed no mass lesion and an absence of superior mesenteric artery (SMA) syndrome, with a 30 degree angle of the SMA and aorta. Subsequently, upper gastrointestinal and small bowel series were performed due to the persistent upper gastrointestinal obstruction following nasogastric tube decompression. A partial obstruction at the third portion of the duodenum and malpositioning of the descending colon were found (Figure 1B and C).

The patient underwent laparoscopic exploration under the impression of a duodenal obstruction. During operation, we found a congenital membrane extending from the right paraduodenal peritoneum through the third portion of the duodenum to the descending colon, which had compressed the duodenum and pulled the descending colon toward the duodenum (Figure 2A and B). The membrane was divided along the descending colon and duodenum. The third portion of the duodenum expanded immediately after the membrane division (Figure 2C and D). Subsequently, she ate well and was discharged 5 days after the operation. No discomfort was noted at the 1-year follow-up.

3. Discussion

A congenital band of the peritoneum is a general term that implies the adhesion of fibrous tissue in the abdomen without previous history of a laparotomy or intraperitoneal inflammation.[3] Bowel obstruction caused by a congenital band is a relatively rare condition and the majority of cases are caused by a single vascular band instead of multiple dense or cohesive adhesions.[2] Some congenital bands have been considered embryogenic, such as vitelline arteries or veins, or omphalomesenteric remnants,[2,4,5] while some are without apparent embryogenic origin.[3,6,7] The well known congenital band that causes duodenal obstruction in infants and children is the Ladd's band, which results from the incomplete rotation of the intestine and extends from the cecum, passing the second portion of the duodenum, and connecting to the right peritoneum.[3] Our patient did not have intestinal malrotation but a wide and thick membrane extending from the right paraduodenal peritoneum to the descending colon near the splenic flexure (Figure 2E). This membrane caused external compression over the duodenum and induced a traction force on the descending colon to move it medially (Figure 2E). The membrane only obstructed the duodenum partially but did not tightly constrict it. Such a partial obstruction of the duodenum was consistent with the episodic abdominal pain and vomiting, which worsened after intake of a large amount of food or a gaseous abdomen and improved after nasogastric decompression and intravenous fluid supportive treatment. The etiology of this membrane is believed to be congenital because our patient had no previous abdominal insult. In addition, its localization indicated that it was not related to embryogenic causes such as vitelline ducts, intestinal fixation anomalies, or fetal intraperitoneal inflammation; however, the etiology of the membrane is unclear.

The clinical manifestations of congenital membranes or bands vary from producing no symptoms to bowel

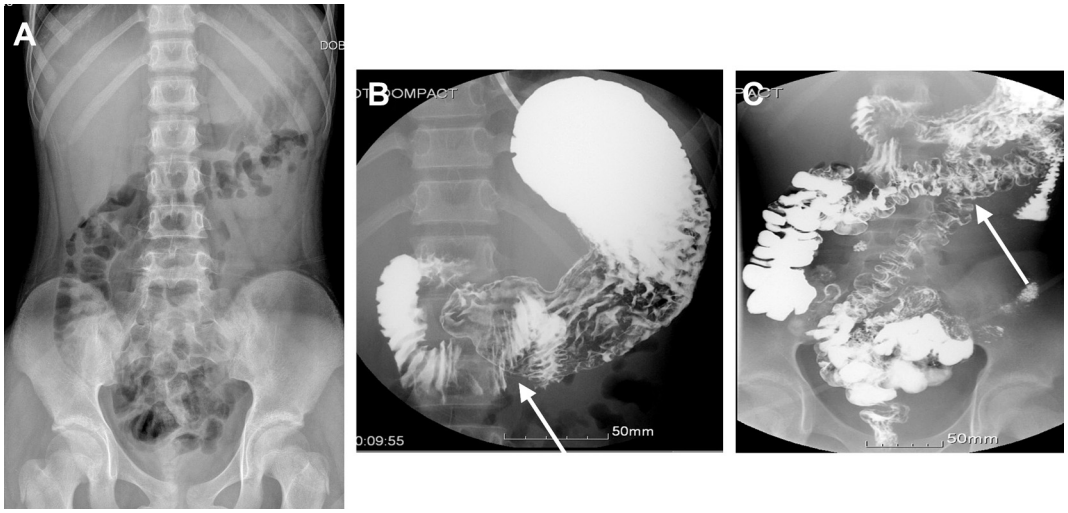

Figure 1 (A) Plain roentgenogram of the abdomen showing descending colon gas distributed at the mid-abdomen, which suggested malpositioning of the descending colon. (B) Upper gastrointestinal series, which showed a cut-off sign on the third portion of the duodenum (arrow). There was no malrotation of the bowel. (C) Small bowel series showing that the upper descending colon was pulled up toward the duodenum and crossed behind the transverse colon (arrow) and then extended obliquely to the right lower abdomen, which suggested malpositioning of the descending colon.

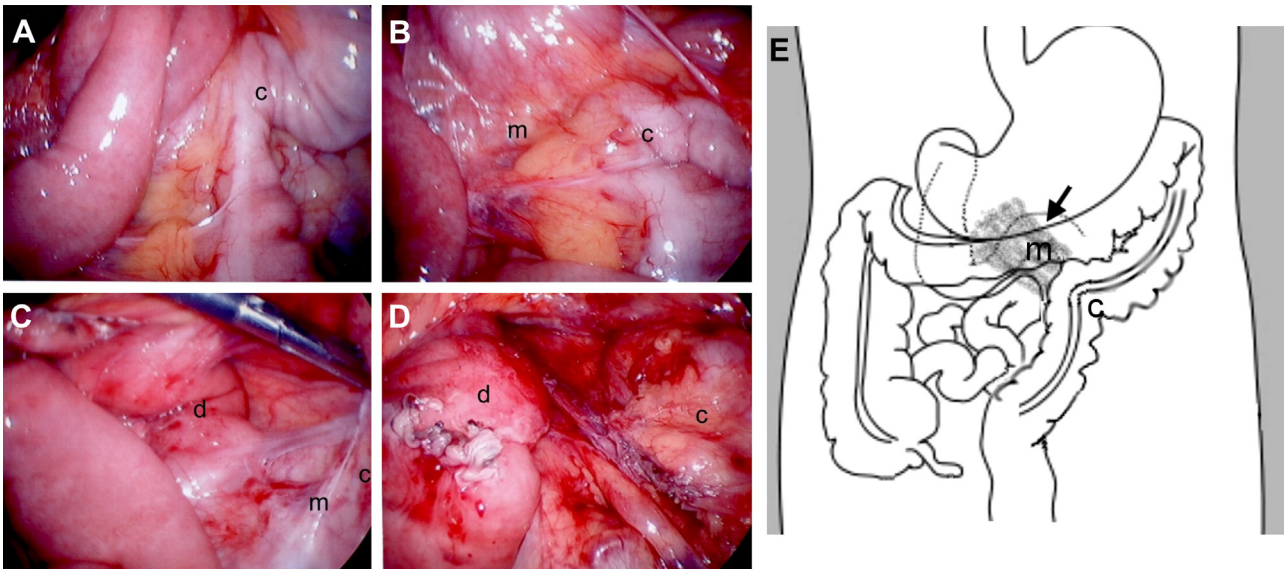

Figure 2 (A) Operative photograph showing the jejunum at the right side with the congenital membranes beneath the jejunum. The descending colon (c) was pulled by the membrane toward the duodenum and formed an acute angle. (B) Operative photograph showing that a fibrous membrane (m) extended from the right paraduodenal peritoneum through the third portion of the duodenum to the descending colon (c). The descending colon was pulled by the membrane towards the duodenum causing compression of the duodenum. (C,D) Operative photographs showing that during and after release of the fibrous membrane (m) between the duodenum (d) and the descending colon (c), the compressed duodenum expanded immediately. (E) Illustration showing the anatomy of the duodenum, small intestine, colon (c) and the fibrous membrane (m).

strangulation, which may be catastrophic and requires prompt surgical treatment.[2] As a definite preoperative diagnosis is difficult, surgery for both diagnosis and treatment is mandatory and depends on a high index of suspicion of mechanical obstruction among patients with no history of previous abdominal operations.[2,8] Our patient had exhibited symptoms for more than 5 years before admission and we found only a cut-off sign over the third portion of the duodenum and malpositioning of the descending colon. Under such a condition, exploratory surgery was required to provide definite diagnosis and proper treatment for this patient. Laparoscope exploration is now widely used in intestinal obstruction. It uses a minimal incision and offers a wide view for checking the intra-abdominal condition as well as performing bowel resection.[9–11] In addition, the diagnostic rate of the causes of obstruction by laparoscopy was possible in 98% of the patients with intestinal obstruction.[12] Consequently, we chose laparoscopic surgery for our patient.

In conclusion, our patient has a unique congenital membrane which caused partial duodenal obstruction and malpositioning of the descending colon, manifesting intermittent symptoms and signs that posed a diagnostic dilemma. Although unusual, this case calls for clinicians to bear in mind the possibility of congenital membranes, which may be related to intestinal fixation anomalies, and it highlights the importance of laparoscopy for accurate diagnosis and therapeutic treatment in such patients.

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