Internal herniation through the falciform ligament: an unusual cause of intestinal obstruction

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The most common cause of intestinal obstruction in children is postsurgical adhesions. Internal herniation through the falciform ligament is very rare, but frequently causes small bowel obstruction when it occurs. To the best of our knowledge, this is the first case report regarding large bowel obstruction associated with midgut malrotation through the falciform ligament in a child.

Key words: internal hernia, falciform ligament, child.

Intestinal obstruction may occur at any stage of life and may be caused by a variety of etiologies including intestinal atresia, stenosis, congenital megacolon, malrotation and meconium disease of the newborn. Common well-known causes of intestinal obstruction are postoperative adhesions, tumors, hernias, inflammatory bowel disease (IBD) and volvulus. Other, less common causes, such as internal hernia, inflammatory diseases other than IBD and postoperative invagination, should be taken into consideration when the more common causes of obstruction are ruled out[1]. We report a case of large bowel obstruction due to herniation through a defect in the falciform ligament with midgut malrotation in a child.

Case Report

A 7-year-old female, previously diagnosed with intrauterine CMV infection, microcephaly and mental-motor retardation was admitted to the emergency department with the complaint of abdominal distention. The patient had not defecated for 3 days; she had no vomiting and no fever. Her vital signs were normal (pulse rate 108 beats/minute, blood pressure 110/60mmHg, temperature 36.8° C). On physical examination she had marked abdominal distention without tenderness. The white blood cell count was 13400/μL on the initial laboratory test. Other laboratory test values were normal. An abdominal X-ray showed apparent air-fluid levels (Fig. 1). Abdominal ultrasound was normal, but dilated intestinal segments reached 3 cm in diameter. She was admitted to the pediatric surgery unit with a diagnosis of intestinal obstruction. Enteral feeding was stopped; IV hydration and nasogastric decompression were administered. After two days she had no clinical improvement and also had a fever of 38.1° C. Abdominal exploration was planned. An abdominal laparotomy was performed through an upper transverse incision. In the exploration, it was found that the transverse colon and part of the descending colon were looped over between the falciform ligament and the abdominal wall, causing intestinal obstruction. After reduction of the colon, the falciform ligament was resected. There was no need to resect any segment of the colon or small intestine. She also had midgut malrotation, and so a Ladd procedure was performed. She was discharged on the fifth postoperative day, uneventfully.

Discussion

Internal hernias are the cause of less than 1% of intestinal obstructions[2]. Hernia through the falciform ligament is very rare and occurs in 0.2% of internal hernias[3]. The organs most likely to be herniated through the falciform ligament are the small bowel, followed by the omentum. There has been no report of large bowel herniation through the falciform

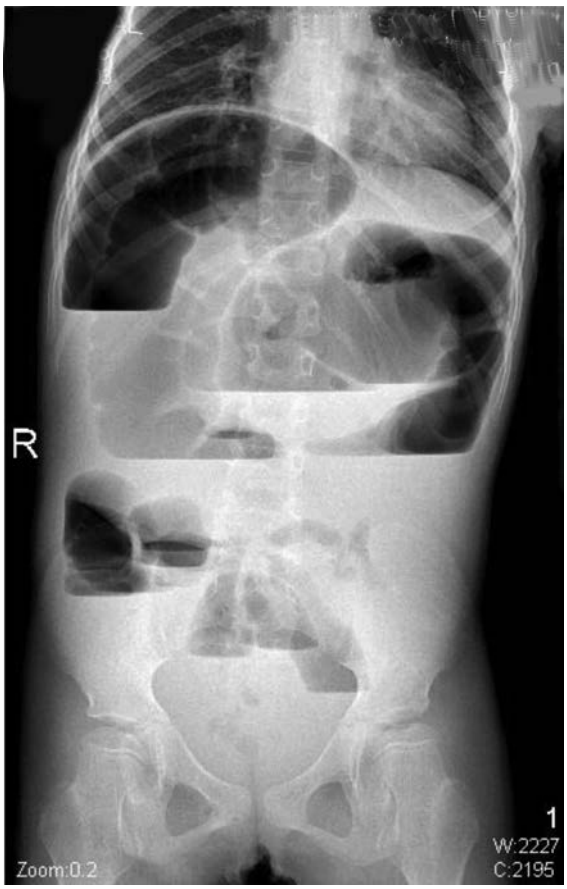

Fig. 1. Abdominal X-ray showing air-fluid levels

ligament in children.

Anatomically, the falciform ligament consists of double layers of the peritoneum and extends from the umbilicus to the tendinous part of the inferior diaphragmatic surface. It has 3 borders: the diaphragm and liver superiorly, the abdominal wall anteriorly and the umbilical vein inferiorly. Failure of the peritoneum to fuse around the umbilical vein would lead to a window in the abdomen; in such a case, the falciform ligament may act like congenital band and cause intestinal obstruction[4].

In literature, fewer than 40 patients, including both adults and children, have been reported up to now. In 2013, Egle at al.[3] reported a case series and literature review of internal hernias through the falciform ligament. Thirty-seven cases were found. Most of the herniated organs were the small bowel (n=32), the omentum (n=5) and the colon (n=1). The patient with the colon herniation was an adult. Thirty-three of the 37 patients had survived, while 4 patients had not. Resection of nonviable tissue had been required in 16 patients (43%)[3].

The most common etiology for defects in the falciform ligament is congenital. Traumatic etiologies are also causes of defects in this ligament. In particular, trocar placement in laparoscopic surgery such as Nissen fundoplication or cholecystectomy may damage the falciform ligament[5-7].

Despite being very rare, internal hernia should always be kept in mind as a possibility since it is also very insidious; the mortality and morbidity of herniation through the falciform ligament are quite high.

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