Splenic Flexure Colonic Volvulus: A Pediatric Case Report

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Volvulus of the colon is an unusual cause of intestinal obstruction in the pediatric population. Splenic flexure colonic volvulus is the most uncommon site in children. We report a case of splenic flexure volvulus (SFV) in a 21-month-old boy with underlying cerebral palsy and epilepsy. He experienced abdominal distension, bilious vomiting and absence of bowel movement for 2 days. Abdominal radiography showed a proximal distended colon and a “coffee bean sign” at the left upper quadrant. Barium enema revealed a “bird beak sign” at the splenic flexure, which confirmed the diagnosis of SFV. Detorsion of SFV occurred while undergoing exploratory laparotomy. He received regular follow-up in the subsequent 3 years without recurrence.

Key Words: colon, splenic flexure, volvulus
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Volvulus of the colon is an unusual cause of intestinal obstruction in the pediatric population [1–4]. Colonic volvulus mostly occurs in the sigmoid colon. Splenic flexure volvulus (SFV) is the least common form of colonic volvulus [5]. Surgical treatment is the main choice of therapy. Spontaneous reduction is extremely rare in this entity. We report a case with spontaneous reduction in a 21-month-old boy.

Case Presentation

A 21-month-old boy presented with abdominal distension, nausea, bilious vomiting and decreased urine voiding over the preceding 2 days. He was known to have quadriplegic cerebral palsy, epilepsy and hydrocephalus, and had undergone V-P shunt placement.

There was a long history of constipation and absence of stool passage in the preceding 3 days. On examination, he was toxic, dehydrated, tachypnea, tachycardia and hypotensive. His abdomen was grossly distended. The bowel sound was hypoactive. The capillary refill time was delayed by 3 seconds. The complete blood count showed an elevation of white cell count (12.4 × 1000/μL) with neutrophils dominant. Abdominal radiography showed a proximal distended colon and a “coffee bean sign” at the left upper quadrant (Figure 1). Subsequent barium enema revealed a “bird beak sign” at the splenic flexure and contrast medium could not pass further despite an increased filling pressure (Figure 2). Thus, colonic volvulus at the splenic flexure and hypovolemic shock were diagnosed. After fluid resuscitation, his clinical condition improved and blood pressure elevated to normal range. Then we performed an emergency operation due to the failure of detorsion by barium enema. However, the absence of SFV was found during exploratory laparotomy. We assumed that detorsion of SFV occurred before laparotomy. Redundant descending colon and distended intestine were observed during laparotomy. Colopexy and...
bowel decompression were performed during surgery. The patient recovered well and his symptoms resolved postoperatively. There were no recurrences during the subsequent 3 years of follow-up.

**DISCUSSION**

Pediatric splenic flexure colonic volvulus is rare. Between 3% and 5% of all intestinal obstructions are caused by colonic volvulus in the pediatric population [2,3,6]. The sigmoid colon is the most common site for volvulus [1–3,7]. SFV, which accounts for 1% of colonic volvulus in adults, is rarely reported in the pediatric population [8,9].

The etiology of this entity is multifactorial. The splenic flexure is attached to the stomach, spleen and diaphragm by gastrocolic, phrenocolic and splenocolic ligaments, respectively. In the relatively fixed portion, the splenic flexure is unlikely to undergo torsion [9–13]. The possible congenital factors that may predispose a subject to large bowel volvulus include: (1) an elongated or redundant segment of colon; (2) absent ligamental attachments at the splenic or hepatic flexures; and (3) an absence or malfixation of the mesenteries [1–4,6,14]. Chronic constipation is the main risk factor to colonic volvulus [1,4,6,15–17]. Other risk factors are Hirschsprung’s disease, mental retardation, cerebral palsy or myotonic dystrophy, which might lead to constipation [1,4,6,15–17]. The abnormal posture in children suffering cerebral palsy may also contribute to distension of colon [1]. In this case of a neurologically impaired child, fecal loading from constipation may cause a distended colonic loop with anomalous ligamental fixation to twist, resulting in colonic volvulus at the splenic flexure [1].

The clinical presentation of colonic volvulus is colon obstruction. The common symptoms of colonic volvulus in children are abdominal pain, vomiting, constipation, and passage of bloody mucoid discharge per rectum; the common signs are abdominal distension, tenderness and a mass [1–4,6,15]. Patients with acute course tend to deteriorate rapidly and present with shock and septicemia [1–4,6]. Marked abdominal tenderness with rebound is observed frequently. Bowel sounds are initially hyperactive but diminish gradually [3,4,6]. However, SFV can present as small bowel obstruction [18]. If the presentation is delayed, ischemic necrosis and gangrene and perforation may follow, with peritonitis.

There are several features on abdominal radiography. A markedly dilated, air-filled colon with an abrupt termination at the anatomic splenic flexure on plain radiograph of the abdomen may be suggestive of SFV [14]. If there are no signs of peritonitis, a large bowel contrast may show a characteristic “bird’s beak” formation at the anatomic splenic flexure [14]. Usually, detorsion of the volvulus may occur during barium enema or the passage of a rectal tube or a colonoscope. Our patient had the typical radiographic finding of SFV. The volvulus disappeared while performing
laparotomy. We therefore assumed that detorsion occurred during preoperative preparation. The residual barium in the colon and relaxation of abdominal muscle tone during anesthesia may have aided in the reduction of volvulus.

Colopexy and bowel decompression is the only choice for this case because of the poor surgical risk. Usually, the definite treatment of colonic volvulus in children is resection of the involved segment and primary anastomosis. Non-operative decompression to allow for elective resection can be performed without signs of bowel infarction or peritonitis [1,19]. Simple de-rotation without resection in colonic volvulus is associated with a high recurrence rate of 31% and a mortality rate of 29% [15]. From the practical experience of adult volvulus, operative detorsion and colopexy [20,21] or tube colostomy [9] for fixation of the colon are only suggested as alternative surgical procedures in high-risk elderly patients, but recurrence has been reported following suture fixation [22]. However, the experience is rare in children with SFV. Surgical resection of the involved segment and primary anastomosis are still recommended in these patients to prevent recurrence.

REFERENCES

在小兒病患的腸阻塞原因，大腸扭結是相當不常見的原因，而兒童的大腸扭結發生部位最少見的就是在脾間處。我們報告一個患有腦性麻痺與癲癇的 21 月大男童發生脾間處大腸扭結的病例。他在就診前 2 日開始有腹脹、嘔吐、臍溝而沒有排便。腹部 X 光檢查發現近端的大腸膨大且左上腹“咖啡豆徵象”。使用輸液灌腸發現在脾間處有 “鳥嘴徵象”，符合脾間處大腸扭結的表現。在剖腹手術時發現脾間處大腸扭結已經矯正歸位。在術後 3 年的追蹤未發現有復發的現象。

關鍵詞：大腸、脾間處、腸扭結

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