Turkish Journal of Pediatric Surgery 2024;38(3):127-130
Doi: 10.62114/JTAPS.2024.44

Turkish Journal of Pediatric Surgery

Case Report

OPEN ACCESS

A rare cause of intestinal obstruction in children: Sigmoid volvulus

Asya Eylem Boztaş Demir, Gül Özyüksel, Hilmican Ulman

Intestinal obstruction stands as a serious cause of surgical intervention in the pediatric population. Nonetheless, sigmoid volvulus (SV), in contrast to its prevalence among adults, emerges as an exceedingly rare occurrence in children. Many predisposing factors have been described for pediatric SV, including Hirschsprung's disease, malrotation, chronic constipation, redundant sigmoid colon, and hypoganglionosis.[1] The precise incidence of SV in pediatric patients still remains elusive, with only 93 reported cases documented by 2007.[2]

Typically, patients initially present with symptoms such as abdominal pain, distention, vomiting, absence of stool output, and occasionally fever. However, these often manifest in a non-specific manner, leading to severe complications such as hemorrhagic infarction, intestinal perforation, sepsis, shock, and even death, if left untreated.[3]

In this article, we present a female case admitted with complaints of abdominal pain, inability to pass stool for eight days, and vomiting and diagnosed with SV as a rare cause of intestinal obstruction.

Abstract

Sigmoid volvulus (SV) presents as a significant cause of intestinal obstruction, predominantly observed in adults. However, its occurrence in pediatric populations is exceedingly rare. We present an 11-year-old female case admitted with complaints of abdominal pain, inability to pass stool for eight days, and vomiting. Her abdomen was distended and she was on respiratory distress. Abdominal plain radiograph revealed grossly dilated bowels. The computed tomography confirmed the diagnosis of SV. Due to the patient's respiratory instability and prolonged symptom duration emergency laparotomy was performed. Intraoperatively, a 40-cm long and 15-cm wide sigmoid colon was found 360 degrees twisted around its mesentery, without evidence of perforation. After manual detorsion, full-thickness biopsies were taken. The postoperative recovery was uneventful, with a histopathological report revealing a normal ganglionic colon. After a few weeks of outpatient follow-up, an elective laparoscopic sigmoidectomy was performed to eliminate the high risk of recurrence. The patient remained asymptomatic and her chronic constipation improved without medication during a one-year follow-up. In conclusion, SV may present with the signs of intestinal obstruction and must be considered in the differential diagnosis of acute abdomen. Early recognition and appropriate surgical intervention are crucial for favorable outcomes in such cases.

Keywords: Constipation, intestinal obstruction, pediatric surgery, sigmoid volvulus.

CASE REPORT

An 11-year-old female patient was referred to the pediatric emergency department of our tertiary care center with complaints of deterioration in general condition, abdominal distension, inability to feed, lack of stool output, and vomiting every time she ate for the last eight days. In her final hospital visit with the same symptoms two days ago, she was prescribed laxatives for constipation and antibiotics for urinary tract infection, to no avail. Her physical examination revealed a grossly distended abdomen and respiratory distress. A nasogastric tube was inserted and bilious

Received: May 22, 2024
Accepted: August 29, 2024
Published online: December 18, 2024

Correspondence: Asya Eylem Boztaş Demir, MD.

E-mail: asyaeylem@gmail.com

Department of Pediatric Surgery,

Department of Pediatric Surgery, Bakırçay University, Çiğli Training and Research Hospital, İzmir, Türkiye

Citation:

Boztaş Demir AE, Özyüksel G, Ulman H. A rare cause of intestinal obstruction in children: Sigmoid volvulus. Turkish J Ped Surg 2024;38(3):127-130. doi: 10.62114/JTAPS.2024.44.

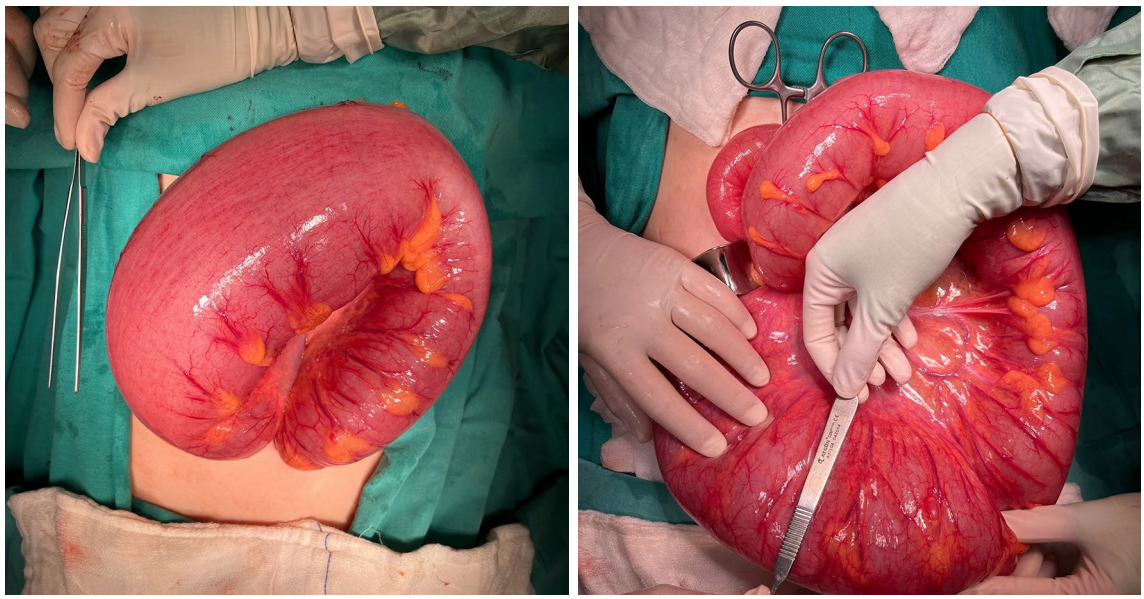

Figure 1. Intraoperative view of sigmoid colon.

gastric content was drained. Laboratory investigations indicated slight hypokalemia (3.30 mmol/L) and hyponatremia (135 mmol/L); however, the infectious markers were normal. Abdominal plain X-ray revealed grossly dilated bowels compressing stomach. Computed tomography (CT) with IV contrast confirmed the volvulus of the sigmoid colon (Figure 1). Due to the patient's respiratory instability resulting from abdominal distension and prolonged symptom duration, the endoscopic reduction was deemed inappropriate and an emergency laparotomy was performed in the operating room.

Intraoperatively, with a midline incision, the abdomen was explored. A 40-cm long and 15-cm wide

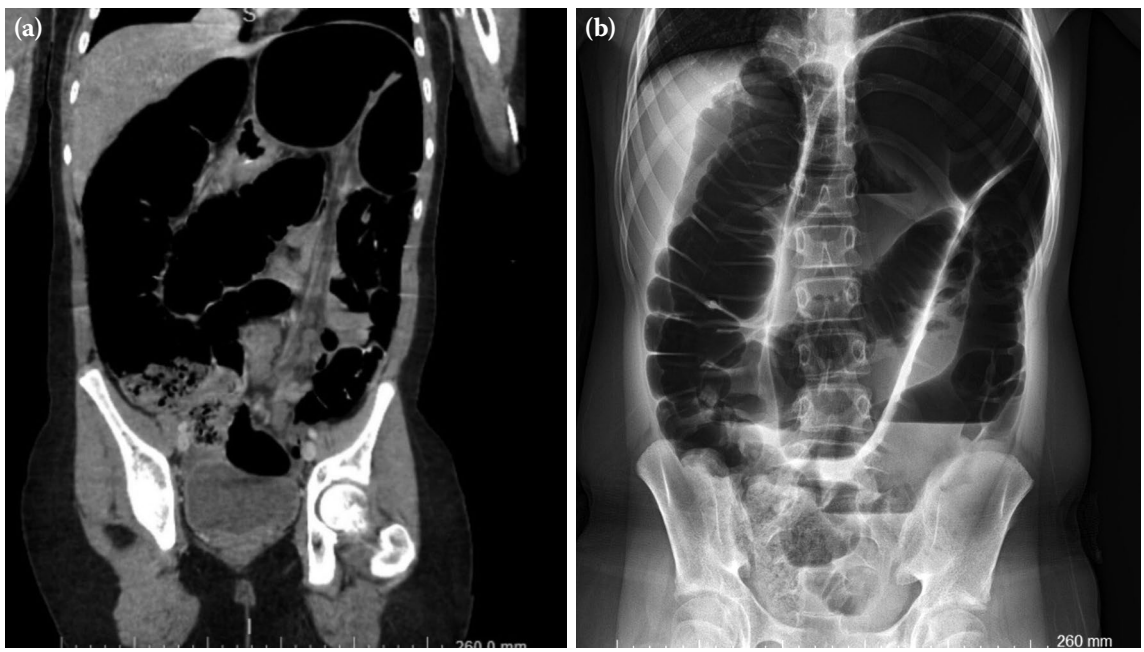

Figure 2. **(a)** Abdominal computed tomography, **(b)** abdominal X-ray.

sigmoid colon was found 360 degrees twisted around its mesentery, without evidence of perforation or ischemia (Figure 2). Manual detorsion and evacuation of contents were performed. The appendix was in the right lower quadrant, and the embryonal rotation of the intestines was observed to be normal. The fibrous bands found in the sigmoid colon mesentery were excised and the mesentery was expanded. Then, a full-thickness colonic biopsy was taken from 2 cm above the peritoneal reflection and a rectal biopsy was taken transanally. The operation was completed without complications. Ion imbalance was corrected in the postoperative period and the recovery was uneventful. She defecated on the first postoperative day and was discharged after tolerating full oral feeding. Constipation treatment was prescribed and she was followed in the outpatient setting for several weeks. The histopathology reported both of the specimens as normal ganglionic colon.

The detorsion only and endoscopic reduction approaches were known to have high risks of recurrence. Therefore, after discussing the risks with the family, a subsequent elective laparoscopic sigmoidectomy was performed to eliminate the high risk of recurrence. Using a three-port approach, the mesentery of the colon was sealed and cut with an energy device and, a 40-cm long, dilated sigmoid colon was excised. The anastomosis was performed with a circular stapler. The patient recovered well and was fed on the third postoperative day, to be discharged one day later. During a one-year follow-up, she remained asymptomatic and achieved daily bowel movements without medication. A written informed consent was obtained from the parents and/or legal guardians of the patient.

DISCUSSION

Sigmoid volvulus presents a diagnostic challenge in pediatric cases presenting with abdominal pain and vomiting symptoms, often ranking low in the list of differential diagnoses.[4] Despite its rarity in children, with an estimated incidence of 1.67 cases per 100,000 in the general population, prompt recognition is essential to prevent potential complications.[5]

The anatomical characteristics of the large bowel, including the proportional length of the sigmoid colon, undergo developmental changes during childhood.[6] Notably, our patient exhibited an unusually elongated sigmoid colon, measuring 40 cm, nearly twice the expected length for her age. Chronic constipation coupled with inadequate prior treatment, likely contributed to this anomaly.

Clinical suspicion of SV arises when characteristic radiographic findings, such as dilated colon loops and the classic “coffee bean” sign are observed on plain abdominal X-rays. Ultrasonography is usually insufficient for diagnosis due to intense gas superposition in the abdomen. While barium enema and colon radiography remain valuable diagnostic and even sometimes treatment modalities, their utility may be limited in unstable patients or those with prolonged symptoms, as in our case.[7] Barium enema carries a high risk of perforation, if the duration of the patient's clinical complaints are long or the patient is hemodynamically unstable. Although CT is often avoided in pediatric patients due to concerns of ionizing radiation, it emerges as a life-saving tool for the diagnosis of SV in cases with unstable clinical status.

The treatment of SV in children still remains a topic of controversy. Reduction with sigmoidoscopy or barium enema is successful in stable patients. In both procedures, a rectal biopsy is recommended to investigate the etiology. Laparotomy is recommended as the first option in patients with poor general condition, or findings of perforation. Notably, the presence of redundant sigmoid poses a significant risk of recurrence, necessitating sigmoid resection to mitigate this risk. Salas et al.[5] suggested that, without sigmoid resection, the recurrence risk was 35% in the non-operative treatment and 25% in the operative approach, emphasizing the importance of definitive treatment in preventing recurrence.

In conclusion, SV warrants consideration in the differential diagnosis of pediatric acute abdomen, particularly in refractory patients with chronic constipation. Rectal and colon biopsies are essential to explore the underlying causes during the treatment. Multimodal diagnostic approaches and tailored treatment strategies are of utmost importance to achieve favorable outcomes and reduce the risk of recurrence in this rare, but potentially life-threatening condition.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: Study conception and design: A.D., G.O.; Data collection: A.D., G.O.; Analysis and interpretation of results: A.D., G.O.; Draft manuscript preparation: A.D., G.O., H.U. All authors reviewed the results and approved the final version of the article.

Conflict of Interest: The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding: The authors received no financial support for the research and/or authorship of this article.

REFERENCES

1. Samuel M, Boddy SA, Nicholls E, Capps S. Large bowel volvulus in childhood. Aust N Z J Surg 2000;70:258-62. doi: 10.1046/j.1440-1622.2000.01803.x.
2. Horvat M, Hazabent M, Sekej M, Kljaić Dujić M. Pediatric sigmoid volvulus of an extremely long sigmoid colon with hypoganglionosis: A case report. J Int Med Res 2021;49:3000605211032429. doi: 10.1177/03000605211032429.
3. Raveenthiran V, Madiba TE, Atamanalp SS, De U. Volvulus of the sigmoid colon. Colorectal Dis 2010;12:e1-17. doi: 10.1111/j.1463-1318.2010.02262.x.
4. Tannouri S, Hendi A, Gilje E, Grissom L, Katz D. Pediatric colonic volvulus: A single-institution experience and review. J Pediatr Surg 2017;52:1062-6. doi: 10.1016/j.jpedsurg.2017.01.063.
5. Salas S, Angel CA, Salas N, Murillo C, Swischuk L. Sigmoid volvulus in children and adolescents. J Am Coll Surg 2000;190:717-23. doi: 10.1016/s1072-7515(00)00270-2.
6. Mirjalili SA, Tarr G, Stringer MD. The length of the large intestine in children determined by computed tomography scan. Clin Anat 2017;30:887-93. doi: 10.1002/ca.22941.
7. Zeng M, Amodio J, Schwarz S, Garrow E, Xu J, Rabinowitz SS. Hirschsprung disease presenting as sigmoid volvulus: A case report and review of the literature. J Pediatr Surg 2013;48:243-6. doi: 10.1016/j.jpedsurg.2012.10.042.

