

Ileosigmoid Knotting: A Case Series

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Abstract

Case Report

This case study describes two distinct cases of ileosigmoid knot (ISK), an uncommon surgical emergency that poses a serious risk of rapid necrosis caused by the small intestine twisting around the base of the sigmoid colon. The uniqueness of these cases lies in their rarity and the challenge they present in diagnosis due to the variability in clinical symptoms. The main symptoms observed included abdominal pain, distension, and vomiting, which are common in various gastrointestinal disorders, making the preoperative diagnosis of ISK particularly difficult. The primary diagnosis was confirmed only during surgery, highlighting the importance of exploratory procedures in such cases. To intraoperative findings, the therapeutic intervention comprised meticulously untwisting the knot, followed by excision of the necrotic segments and either anastomosis or stoma. The outcomes were favorable, with both patients showing signs of recovery post-surgery. The most important point to be gained from these cases is maintaining a high suspicion index for ISK among individuals presenting with acute bowel obstruction even in the absence of specific radiological signs. Early surgical intervention is crucial to prevent potentially fatal complications. This study contributes to the scientific literature by providing further insight into the diagnostic challenges and therapeutic strategies associated with ISK.

Keywords: Volvulus, intestinal obstruction, ileosigmoid knotting, necrosis.

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INTRODUCTION

The Ileosigmoid volvulus is a double volvulus characterized by a wrapping of the small intestine around the sigmoid base producing the obstruction of the small intestine and colon, which can quickly cause intestinal necrosis [1]. This clinical condition is uncommon in Western nations While its prevalent in certain African, Middle Eastern, and Asian countries [2, 3]. Due to the delay in diagnosis, it is regarded as a true surgical emergency that has resulted in a high rate of morbidity and fatality. Understanding how it appears and its typical radiological abnormalities will enable prompt, appropriate surgical treatment, assuring a favorable prognosis [4].

PATIENT AND OBSERVATION

In this report, two cases of ISK treated in the visceral surgical emergency department of the University Hospital of Agadir are described:

Patient Information:

The initial patient is a 36-year-old man who has never had surgery before. The patient was admitted because of a sudden onset of abdominal pain that had been developing for more than 24 hours

before admission, along with vomiting and a stoppage of the transit.

The second patient was a woman in her 45th year of age who had no known medical history. The patient was admitted because of the diffuse abdominal pain and discomfort and abrupt onset of transit stoppage and vomiting, which had been getting worse for about 12 hours before admission.

Clinical Findings

Upon admission, the first patient's physical examination indicated a decline in the overall health status, with a 140 bpm heart rate and a 10/5 mmHg BP measurement. The abdominal region was observed to be enlarged and tense, presenting with generalized defense. The hernial orifices were free of any abnormalities, and the rectal bulb was found to be empty. The remainder of the physical examination yielded normal results.

Subsequent ultrasound imaging revealed a substantial finely echogenic outpouring, and a biological examination showed elevated levels of leukocytes and C-reactive protein.

In contrast, the second patient presented with stable hemodynamic status and no visible abdominal scarring. The abdomen was distended and showing elastic resistance with tympanic features, and no evidence of herniation. The rectal ampulla was empty, according to a rectal examination. The rest of the somatic examination did not reveal any significant abnormalities. An abdominopelvic ultrasound scan disclosed a moderate echogenic effusion.

Timeline of current episode:

The initial patient reported a sudden onset of abdominal pain, vomiting, and cessation of bowel movements, which had persisted for over 24 hours prior to hospital admission. Subsequent to the patient's admission, a comprehensive evaluation of the patient's condition was conducted, followed by an emergency laparotomy once the patient's condition had been stabilized.

In the case of the second patient, symptoms including generalized abdominal pain, vomiting, and abrupt commencement of bowel movements had been experienced for approximately 12 hours prior to hospital admission. Upon admission, the patient underwent a thorough evaluation, and an exploratory laparotomy was performed on the same day.

Diagnostic Assessment

In both cases, the diagnostic testing included a physical examination, ultrasound, and biological exam. The diagnostic challenge was the non-specific nature of the symptoms, which could indicate a variety of gastrointestinal disorders.

The definitive diagnosis for both patients was established as an ileosigmoid knot, which was confirmed during surgical exploration. In the first case, the surgical procedure revealed that the base of the sigmoid colon was encircled by the small bowel ** resulting in necrosis

of the torced ileum over a length of 80 cm, positioned 20 cm apart from the ileocecal valve.

In the second case, the surgery disclosed a moderate quantity of serosanguinous fluid along with grelic necrosis spanning over 1 m, situated 05 cm from the ileocaecal junction. This condition was determined to be secondary to an ileosigmoid node. It was also noted that the sigmoid did not exhibit any signs of necrosis.

Therapeutic Interventions:

In the case of the first patient, the therapeutic approach was surgical in nature, comprising the resection of necrotic sections of the ilium and sigmoid. This was followed by the creation of a right-sided loop ileostomy with a left-sided Bouilly-Volkman colostomy.

Concerning the second patient, the therapeutic strategy also involved surgery, specifically the resection of the ischemic sections of the small bowel and the sigmoid colon. Subsequently, an end-to-end bowel anastomosis was performed, connecting the ileum to the remaining ileum and the colon to the remaining colon.

Follow-up and outcome of interventions:

Following surgery, on the 7th day, the patient was released from in-patient care. Two months afterwards, the patient underwent another surgery to re-establish the small bowel and colonic continuity. As for the second case, the patient was discharged on the 5th day.

Patient Perspective:

Our patients agreed with being fully informed about the entire operation, risks, and outcomes.

Consent and Ethical Approval

Both Patients provide informed permission before study enrollment, and after being fully informed about the purpose and benefits of the study, they voluntarily consent to participate.



Figure 1: Intraoperative view of the ileal node around the base of the sigmoid, with gangrenous ileum



Figure 2: Other intraoperative view of ileosigmoid knot with gangrenous ileum



Figure 3: Resected small intestine

DISCUSSION

The ISK occurs when the small bowel wraps around the base of the sigmoid, causing their twisting. Primarily affects males in the fourth decade and is an uncommon cause of intestinal blockage that quickly may lead to gangrene of the ileum and the sigmoid colon [5, 6].

Although the exact cause of ileosigmoid torsion is unknown, several factors may be implicated: long small intestine mesentery and freely moving intestine; a long sigmoid colon on a tiny pedicle, and lastly, consuming a high-bulk diet while the small bowel is devoid of contents [7, 3]. Quick repletion of the jejunum accelerates its descent into the pelvic region, where it loops around the emptied ileum and joins the sigmoid loop. The problem becomes worse by gut motility [8].

The most accepted pathogenesis is that of Shepherd: The ileum's loops are more likely to descend into the left paracolic gutter and wrap around the sigmoid colon among those with longer, more flexible ileum and sigmoid colon. Eventually, a rapid shift in posture or a strong peristaltic movement can strangle both the ileum and sigmoid colon. The loops tighten and twist more, which mostly results in ischemia of the segments that develop into gangrene and might even extend to the terminal ileum, occasionally involving the caecum and the proximal ascending colon [9].

ISK can be divided into four varieties. Based on the intestinal segment initiated and engaged in the torsion.

Type I: the ileum starts the twisting process, which then wraps around the sigmoid; type II: the sigmoid starts the twisting process around the ileum; type

III: this is the rarest form; it involves the ileocecal segment starting the twisting process around the sigmoid colon or another area of the intestine; and type IV: the mechanism of action is unknown or unclear. [3]. Depending on whether the volvulus is rotating clockwise or counterclockwise during development, Types I and II are separated into subgroups A and B.

The diagnosis of ISK is infrequently made preoperatively because of its rarity, clinical atypia, and inconsistent and overlapping radiologic signs. Only just under 20% of patients may have this diagnosis made before surgery. Most of the patients they are presented with abdominal pain that is often sub-acute and progressive, associated with obstipation by 98.8-100%, abdominal enlargement by 94-100%, nausea and vomiting in 77.5-100%, and rebound tenderness in 67%, and may lead to even shock due to the ischemia, bacterial translocation, systemic inflammatory response, and hypovolemia in 0% to 60% [3, 6].

By Abdominal X-ray findings only, it will be difficult to diagnose ISK because they frequently resemble sigmoid volvulus. They frequently show multiple air-filled levels with distended small bowel and sigmoid loops, which can form an inverted U shape, bent inner tube, or coffee bean shape with no gas present beyond the point of obstruction [10, 11]. Preoperative diagnostic accuracy can be improved, and timely intervention can be facilitated with the help of CT scan. On a CT scan, the characteristic "whirl sign" produced by the torsion of the intestinal loops and mesenteric vessels is visible. With ileal segments winding around the sigmoid pedicle to form a knot that gives a spiral pattern by their twisting, the sigmoid colon exhibits dilated, and thinned-out weakly enhancing walls. The appearance of a "Beaking" occurs when the sigmoid's afferent and efferent limbs converge and the mesentery and mesenteric vessels twist in the direction of the pelvic region [6, 10]. The cecum is medially deviated in some individuals, but the sharp appearance of its medial edge simultaneously with the medial deviation of the distal descending colon are a distinctive findings of ISK on a CT scan [12]. When the patient's vital signs stabilize, an emergency laparotomy is performed. When the affected intestinal segments are still viable, only untwisting the affected area can be used to restore blood flow. Further procedures, such as mesoplasty, sigmoid mesopexy, or even resection in certain circumstances, can be performed to prevent future twisting [11]. However, if the affected intestine develops gangrene, the colon should be clamped to reduce the possibility of spillage of toxic bowel contents before resection. If feasible, an anastomosis can be performed based on the patient's hemodynamic stability and the local circumstances [3, 6]. Concerning the second case that we report, we have carried out an immediate restoration of digestive continuity due to the absence of intestinal perforation, peritonitis and shortness of the small intestine and the sigmoid; Instead, a double segment stoma or left iliac

colostomy should be performed. 35.5% of patients die as a result of complications brought on by ISK, according to literature [6]. Septic shock resulting in multiple organ failure, is the most prevalent cause of mortality. The risk of mortality is heightened by age and symptoms extended beyond 24h, and the severity of gangrene [6, 11].

CONCLUSION

The ISK is considered to be a rare cause of intestinal blockage, that quickly lead to digestive necrosis by the ischemia of the effected segments. The diagnosis of this condition is challenging because it is frequently made during surgery. Establishing a favorable prognosis through early diagnosis and treatment is possible with an understanding of the pathogenesis and typical radiological abnormalities.

Competing Interests: The authors declare no competing interest.

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