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Case Report

Sigmoid Volvulus: A Case Report

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Abstract

Sigmoid volvulus is one of the most frequent causes of large bowel obstruction and constitutes a surgical emergency with a high risk of morbidity and mortality if not promptly treated. It occurs predominantly in elderly individuals and in populations living at high altitudes, such as the Andean region, where a fiber rich diet and anatomical factors contribute to dolichomegacolon. We report the case of a 72-year-old male patient from Riobamba, Ecuador, who presented with abdominal distension, pain and absence of stool evacuation. The diagnosis of sigmoid volvulus was confirmed radiologically and endoscopic decompression was attempted but failed. Definitive management consisted of sigmoid resection with primary end-to-end anastomosis, with a favorable postoperative outcome and no complications. Current literature supports early surgical resection to reduce recurrence and mortality rates, especially in patients with dolichomegacolon. This case underscores the importance of timely diagnosis, individualized management and the need for awareness of regional risk factors.

Keywords: Sigmoid Volvulus; Dolichomegacolon; Intestinal Obstruction; Surgery

Introduction

Sigmoid volvulus is a major cause of large bowel obstruction and represents a potentially life-threatening abdominal emergency when not managed promptly. It occurs when the sigmoid colon twists around its mesenteric axis, resulting in a closed-loop obstruction with a significant risk of bowel ischemia, necrosis and perforation if diagnosis and treatment are delayed. This condition accounts for a considerable proportion of intestinal obstructions worldwide, particularly in regions with high altitude and populations consuming fiber-rich diets, such as the Andean region, sub-Saharan Africa and parts of Asia [1-3]

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Anatomical predisposition, characterized by a long and narrow mesocolon associated with sigmoid redundancy (dolichomegacolon), is one of the most important risk factors for torsion. Additional contributing factors include chronic constipation, prolonged laxative use, neuropsychiatric comorbidities and alterations in intestinal motility, all of which facilitate both the initial presentation and recurrence of the disease [4,5].

The clinical presentation of sigmoid volvulus typically includes progressive abdominal distension, crampy abdominal pain, nausea, vomiting and absolute constipation. On physical examination, patients may exhibit abdominal tympany and diffuse tenderness and in advanced cases, signs of peritonitis may be present, indicating ischemia or perforation [6]. Radiological studies play a central role in diagnosis, with abdominal X-ray often demonstrating the classic "coffee-bean sign" and contrast-enhanced CT scan confirming the whirl sign and assessing for complications such as ischemia or perforation [7].

Initial management aims to rapidly decompress the colon and stabilize the patient. Endoscopic detorsion with flexible sigmoidoscopy or colonoscopy is recommended as the first-line treatment in hemodynamically stable patients without signs of

ischemia or perforation, achieving success rates between 60% and 95% [8,9]. However, nonoperative management alone is associated with a high recurrence rate and therefore, early elective sigmoid resection is strongly advised after successful decompression to prevent future episodes [3,10]. In cases where endoscopic detorsion fails or there is evidence of ischemia or perforation, urgent surgical intervention is indicated, typically involving sigmoidectomy with primary anastomosis or Hartmann's procedure depending on the intraoperative findings and patient condition [3,8,10].

These findings underscore the importance of early recognition, prompt diagnosis and appropriate surgical planning, as well as understanding the anatomical, dietary and geographical risk factors that influence the disease course and outcomes in patients with sigmoid volvulus.

Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore, was exempt.

Case Presentation

Initial Presentation

A 72-year-old mestizo male farmer, resident of Riobamba (2600-2800 m above sea level), with no relevant medical or surgical history, presented with a 24-hour history of diffuse abdominal pain of sudden onset, progressive distension, vomiting of foul-smelling content and absence of bowel movements and flatus. On physical examination, he was hypertensive (180/101 mmHg), tachypneic (24 breaths/min), with a heart rate of 76 bpm, oxygen saturation of 92% on room air and signs of dehydration. The abdomen was distended, tympanic to percussion, tender on deep palpation, with diminished metallic peristalsis and no signs of peritoneal irritation. Digital rectal examination revealed an empty rectal ampulla and a clean glove. Laboratory tests (complete blood count, electrolytes, creatinine) were within normal limits. Abdominal radiography showed colonic dilatation. With the presumptive diagnosis of sigmoid volvulus without apparent vascular compromise, an attempt was made at decompression using a No. 36 rectal tube, without success (Fig. 1).

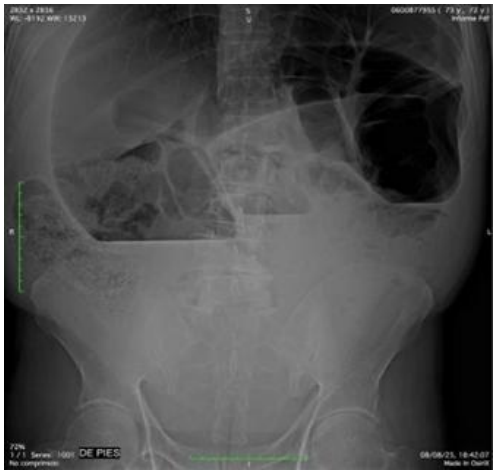

Figure 1: Upright abdominal plain radiograph.

Marked dilation of colonic loops is observed, with large air-filled images adopting the characteristic "coffee bean" configuration, suggestive of sigmoid volvulus. Air-fluid levels compatible with distal intestinal obstruction are identified. No pneumoperitoneum or radiological signs of perforation are evident in the provided image.

Surgical Treatment

A midline infraumbilical exploratory laparotomy was performed. Intraoperative findings included dilatation of the sigmoid, descending and transverse colon, with the volvulus base located in the lower third of the sigmoid, rotated approximately 180° and the presence of a small amount of serous inflammatory fluid. After partial exteriorization of the volvulated segment, decompression was achieved by aspirating its contents using a suction system with a tobacco pouch suture for security, followed by detorsion (Fig. 1).

Bowel viability was confirmed, with no evidence of necrosis. Resection of approximately 70 cm of redundant sigmoid and descending colon was carried out, followed by construction of a hand-sewn, double-layer, end-to-end anastomosis using 3-0 polypropylene. A mixed drain was placed in the abdominal cavity and a Penrose drain in the subcutaneous tissue. The procedure was completed without intraoperative complications (Fig. 2).

Figure 2: Intraoperative findings. Dilatation of the sigmoid, descending and transverse colon with ischemic areas, without perforation.

Postoperative Course

In the immediate postoperative period, the patient remained hemodynamically stable. At 48 hours, bowel function returned with passage of flatus, allowing the initiation of progressive oral intake. He was discharged with an analgesic and antibiotic regimen, without immediate complications. The histopathological report confirmed intestinal volvulus associated with focal ischemia and segmental ulcerative colitis.

Follow-up

At the outpatient follow-up visit on postoperative day eight, the surgical wound showed no signs of infection, the abdominal drain had minimal serous output and clinical evolution was satisfactory. In subsequent follow-ups, no complications or recurrences were documented, with adequate functional recovery and reintegration into his usual activities (Fig. 3).

Figure 3: Postoperative follow-up.

Intermediate postoperative control showing a midline infraumbilical surgical wound, without signs of dehiscence or evident collection.

Discussion

Sigmoid Volvulus (SV) remains a critical surgical emergency, particularly in populations with anatomical and dietary predispositions. Our case involves a 72-year-old male from the Andean region of Ecuador (2600-2800 m above sea level), where high-fiber diets and dolichomegacolon are recognized risk factors. This presentation aligns with epidemiological patterns described in multiple series from high-altitude areas in South America, Africa and Asia, which report an increased incidence among older adults and rural populations with a diet rich in vegetables and grains [1-3]. Anatomical predisposition, including a long and narrow mesocolon and sigmoid redundancy, further facilitates torsion and volvulus formation [4,5].

Clinically, the patient presented with sudden-onset abdominal pain, progressive distension, vomiting and absence of stool or flatus, which are classic hallmarks of SV. Digital rectal examination revealed an empty ampulla and plain radiography showed the typical "coffee bean" sign. This constellation of findings is well described in the literature and remains essential for rapid bedside diagnosis, especially in resource-limited settings [6-8].

Similar to our case, most patients initially present without signs of peritonitis or hemodynamic instability. Studies have demonstrated that early recognition and prompt management significantly reduce the risk of bowel ischemia and mortality [9]. CT scanning is now considered the gold standard for diagnosis, identifying the mesenteric "whirl sign" and assessing bowel viability [10]. In this case, although CT was not performed due to the rapid surgical decision-making, the clinical and radiographic findings were sufficient to justify exploratory laparotomy - a pragmatic approach in emergency contexts where advanced imaging is not always available.

Initial management includes resuscitation (fluid replacement, correction of electrolyte imbalances and antibiotic therapy as indicated) and an attempt at endoscopic decompression in the absence of peritonitis or suspected necrosis. Endoscopic decompression has high success rates in relieving acute obstruction; however, recurrence rates following conservative decompression remain significant, influencing the definitive management strategy. Therefore, surgical resection of the redundant sigmoid segment is recommended in surgical candidates, ideally during the same hospitalization after successful decompression, to reduce recurrence and cumulative morbidity from repeated episodes [1].

Regarding management, the patient underwent surgical resection of approximately 70 cm of redundant sigmoid and descending colon with primary end-to-end anastomosis. This is in line with the current WSES 2023 consensus guidelines, which recommend resection and primary anastomosis as the definitive management in hemodynamically stable patients without necrosis or perforation [1]. Endoscopic decompression can be attempted in stable patients, but recurrence rates range between 45% and 71%, particularly in elderly individuals with dolichomegacolon [11-13]. In our case, initial rectal tube decompression was unsuccessful - a scenario reported in up to 30% of cases, often due to severe redundancy or volvulus angle [14].

Several large series support immediate surgical management after failed decompression or when high-risk anatomical features are present. Arnold, et al., reported that early surgical intervention within 48 hours was associated with lower morbidity and shorter hospital stay compared to delayed surgery in elderly patients [15]. Similarly, Atamanalp, et al., emphasized that definitive sigmoid resection is crucial to prevent recurrence and improve survival [2].

Bowel viability was confirmed intraoperatively in our patient, enabling primary anastomosis rather than Hartmann's procedure. The literature supports primary anastomosis in stable patients with viable bowel, showing mortality rates below 5% and recurrence rates below 3% when appropriately selected [16-18]. Conversely, in unstable patients or when bowel necrosis is present, a staged procedure remains safer [1,19]. Histopathology in this case revealed intestinal volvulus with focal ischemia and segmental ulcerative colitis, without transmural necrosis or perforation. Ischemic changes are present in approximately 30-40% of patients with SV at the time of surgery, correlating with delayed presentation and higher mortality [20]. The absence of necrosis in this patient likely contributed to the favorable postoperative evolution, including early bowel function recovery and absence of complications or recurrence at follow-up.

From a pathophysiological standpoint, the combination of high-altitude residency, high-fiber diet and anatomical redundancy provides an ideal setting for volvulus development. Preventive measures, including early diagnosis and timely elective surgery after initial decompression, are particularly relevant in such populations to reduce recurrence and emergency surgery rates [3,13,21].

Comparing our case to published evidence, the management strategy - early surgical resection with primary anastomosis in a stable patient after failed decompression - is consistent with current best practice recommendations. The patient's favorable postoperative course mirrors outcomes reported in elective or early emergency resections, where complication and recurrence rates are lowest [15,17]. This case reinforces the importance of individualized decision-making that balances patient stability, intraoperative findings and anatomical risk factors.

Conclusion

Sigmoid volvulus associated with dolichomegacolon represents a diagnostic and therapeutic challenge in Andean regions, where dietary and anatomical factors predispose to its occurrence. Recent evidence supports early surgical resection as the best strategy to prevent recurrence and serious complications, particularly in patients with redundant colon. The case presented demonstrates that colectomy with primary anastomosis can be successfully and safely performed in selected patients, reaffirming its role as the definitive treatment while avoiding the morbidity associated with colostomy and the need for a subsequent restorative surgery.

Conflict of Interest

The authors declare no conflicts of interest that may have influenced the research, authorship or publication of the article.

Informed Consent Statement

Informed consent was taken from the patient.

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Authors' Contributions

All authors have contributed equally to this work and have reviewed and approved the final manuscript for publication.

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