

Sigmoid Volvulus Causing Prolonged Complete Mechanical Intestinal Obstruction Without Bowel Ischemia in a Geriatric Patient: A Case Report

Felicia Evelyne Soesilo,¹ Yunita,¹ Ajie Teguh Saputra,¹ Daniel Ardian Soeselo^{2,3*}

¹Medical Doctor Professional Program, Faculty of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia

²Department of Surgery, Faculty of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Jakarta, Indonesia

³Department of Surgery, Faculty of Medicine and Health Sciences, Atma Jaya Teaching Hospital, Jakarta, Indonesia

ABSTRACT

Introduction: Sigmoid volvulus is a major cause of large bowel obstruction in older adults and can progress to bowel ischemia, necrosis, and perforation. Although prolonged complete obstruction raises concern for bowel compromise, symptom duration alone does not necessarily indicate bowel nonviability. This case highlights the importance of intraoperative assessment of bowel viability in determining surgical management. **Case:** A 76-year-old male with chronic constipation and recently reduced mobility presented with progressive abdominal distension, abdominal pain, and complete absence of defecation and flatus for one week. He had no fever, nausea, or vomiting. Laboratory investigations showed hyponatremia, hypokalemia, and impaired renal function. Contrast-enhanced computed tomography demonstrated marked bowel dilatation, a redundant sigmoid colon, and twisting consistent with complete mechanical obstruction due to sigmoid volvulus. After fluid resuscitation, electrolyte correction, and gastrointestinal decompression, exploratory laparotomy was performed. A 360° rectosigmoid volvulus was identified without ischemia or perforation. Detorsion and manual decompression were followed by three-point sigmoidopexy. The patient recovered uneventfully and was discharged on postoperative day 5. **Discussion:** This case is clinically significant because it demonstrates preserved bowel viability despite prolonged complete obstruction. Intraoperative assessment, rather than symptom duration alone, guided surgical management and allowed a non-resectional approach. **Conclusion:** Prolonged complete mechanical intestinal obstruction due to sigmoid volvulus may occur without bowel necrosis. Timely stabilization, diagnosis, surgical exploration, and assessment of bowel viability are essential for individualized management.

Keywords: Bowel viability, case report, complete mechanical intestinal obstruction, geriatric patient, sigmoid volvulus, sigmoidopexy.



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<https://doi.org/10.55175/cdk.v53i10.1969>
e-ISSN: 2503-2720

INTRODUCTION

Sigmoid volvulus is the most common form of colonic volvulus, in which the sigmoid colon twists around its mesenteric axis, resulting in intestinal obstruction.¹ In developing countries, sigmoid volvulus accounts for up to 50% of all cases of intestinal obstruction, whereas it represents only 3%–6% of cases in Western countries.² Predisposing factors include chronic constipation, megacolon, and abnormal fixation of the dorsal mesocolon to the abdominal wall.¹ Patients typically present with abdominal distension, acute abdominal pain, vomiting, complete constipation (obstipation), and, in some cases, hematochezia. If left untreated, the condition may progress to bowel strangulation and intestinal necrosis.^{1–3}

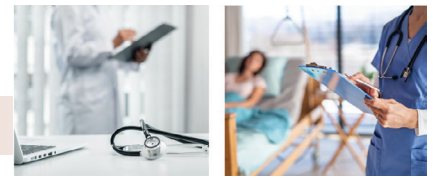
Complete mechanical intestinal obstruction secondary to sigmoid volvulus constitutes a surgical emergency. This condition leads to the accumulation of fluid and gas proximal to the site of obstruction, increased intraluminal pressure, and impaired microvascular perfusion, ultimately resulting in intestinal ischemia, bacterial translocation, sepsis, and death.^{3–5}

Experimental studies have extensively investigated bacterial translocation from the intestinal lumen to extraintestinal tissues and shown that it contributes to systemic infection and septic shock in untreated intestinal obstruction lasting 48–72 hours.⁶ Complex electrolyte disturbances, including hypokalemia, metabolic acidosis, and severe

dehydration, further exacerbate the patient's clinical condition.^{6,7}

Therefore, complete mechanical intestinal obstruction caused by sigmoid volvulus represents a life-threatening spectrum of acute abdominal pathology that requires prompt diagnosis and a multidisciplinary management approach to prevent fatal complications. This case is novel not because it uses three-point sigmoidopexy, an established surgical technique. Rather, the clinical interest lies in the occurrence of prolonged complete mechanical intestinal obstruction caused by sigmoid volvulus in a geriatric patient with a one-week history of complete obstipation, yet with preserved bowel viability and no intraoperative evidence

Correspondence Author daniel.ardian@atmajaya.ac.id



of ischemia or perforation. This case illustrates the importance of individualized surgical decision-making based on clinical assessment and intraoperative evaluation of bowel viability rather than relying solely on the duration or apparent severity of obstruction to determine the need for bowel resection.

CASE

A 76-year-old male presented to the Emergency Department with a one-week history of progressive abdominal distension and bloating. During the same period, he had experienced complete absence of both defecation and flatus. The abdominal distension progressively worsened and was accompanied by persistent, stabbing abdominal pain involving the entire abdomen, which substantially limited his ability to walk and perform daily activities. Despite the prolonged absence of bowel movements and flatus, he denied fever, nausea, and vomiting. The patient had a five-year history of chronic constipation and had been regularly attending the internal medicine outpatient clinic for constipation-predominant irritable bowel syndrome (IBS-C). His usual bowel movement frequency was approximately once every three days. In the weeks preceding admission, his mobility had also declined substantially, with prolonged bed rest and markedly reduced physical activity. This history provided a relevant clinical background of chronic constipation and reduced mobility preceding the acute deterioration.

On admission, the patient appeared acutely ill but was fully conscious and alert. His blood pressure was 130/75 mmHg, heart rate 92 beats/min, respiratory rate 20 breaths/min, body temperature 36.5°C, and oxygen saturation 99% on room air. He weighed 44 kg and was 150 cm tall, with a body mass index (BMI) of 19.56 kg/m². The skin was warm with normal turgor, although the oral mucosa appeared dry. Cardiovascular and respiratory examinations were unremarkable. Abdominal examination revealed marked distension with visible bowel loops and peristaltic movements. Diffuse abdominal tenderness was present, with generalized tympany on percussion. High-pitched metallic bowel sounds were predominantly audible over the right abdomen. There was no hepatosplenomegaly. The extremities were

warm with good peripheral perfusion, and no other significant abnormalities were identified. Laboratory investigations showed hemoglobin 10.2 g/dL, leukocyte count $5.57 \times 10^3/\text{mm}^3$, platelet count $215 \times 10^3/\mu\text{L}$, estimated glomerular filtration rate (eGFR) 44.8 mL/min/1.73 m², blood urea nitrogen 37 mg/dL, and serum creatinine 1.52 mg/dL. Electrolyte abnormalities included sodium 129.11 mmol/L and potassium 2.83 mmol/L. Chloride was 96.6 mmol/L, ionized calcium was 1.15 mmol/L, prothrombin time was 14.4 seconds, and activated partial thromboplastin time was 32.1 seconds. These findings indicated significant electrolyte disturbances and impaired renal function in the setting of prolonged gastrointestinal obstruction and suspected volume depletion.

Contrast-enhanced abdominal computed tomography demonstrated marked dilatation of the bowel loops with bowel wall thickening. The sigmoid colon appeared redundant, with an abrupt transition point (cutoff sign) and suspected twisting at the distal sigmoid colon. The radiological findings were consistent with complete mechanical intestinal obstruction secondary to sigmoid volvulus. Based on the clinical and imaging findings, an urgent surgical approach was considered necessary. Initial management focused on physiological stabilization before definitive surgical intervention. The patient received intravenous fluid resuscitation with 2,000 mL of Ringer's Lactate over 24 hours, urethral catheterization for urine output monitoring, and nasogastric tube placement for gastrointestinal decompression. Cefazolin 2 g and metronidazole 500 mg were

administered intravenously immediately before surgery. Vital signs and abdominal findings were monitored serially. Following fluid resuscitation, correction of the electrolyte abnormalities, and hemodynamic stabilization, emergency exploratory laparotomy was performed approximately 12 hours after admission.

Intraoperative exploration revealed a single 360° twist of the rectosigmoid colon, confirming sigmoid volvulus. Despite the one-week history of complete obstipation and marked abdominal distension, the sigmoid colon showed no evidence of ischemia, necrosis, or perforation. The volvulus was successfully detorsed, restoring the sigmoid colon to its normal anatomical position. Manual decompression of the markedly dilated bowel was subsequently performed. Because the affected bowel remained viable and there was no evidence of perforation, bowel resection was not considered necessary. A three-point sigmoidopexy was then performed by fixing the sigmoid colon to the peritoneum to reduce the risk of recurrent volvulus. The procedure was completed without intraoperative complications, and the surgeon achieved meticulous hemostasis before abdominal closure.

The postoperative course was uneventful. The patient remained afebrile and hemodynamically stable, without vomiting or respiratory complications. On postoperative day 2, he passed stool and tolerated oral water intake. The urinary catheter was removed to facilitate early mobilization. On postoperative day 3, he passed stool twice,

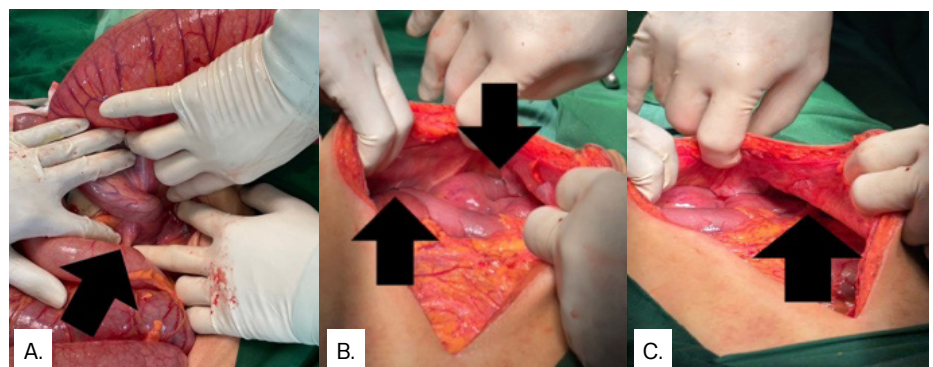
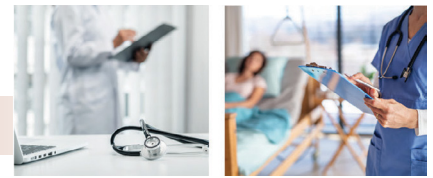


Figure 1. Intraoperative findings of complete mechanical intestinal obstruction secondary to sigmoid volvulus. (A) Sigmoid volvulus demonstrating marked colonic dilatation and twisting of the sigmoid mesentery. (B & C) Three-point sigmoidopexy performed by fixing the sigmoid colon to the abdominal wall to reduce the risk of recurrence.



tolerated oral intake, and showed no clinical evidence of persistent intestinal obstruction; therefore, the nasogastric tube was removed. By postoperative day 4, he had passed stool three times and tolerated a full serving of rice porridge. On postoperative day 5, he remained clinically stable, continued to pass stool three times daily, tolerated a regular soft porridge diet, and had a dry surgical wound without evidence of surgical site infection. He was subsequently discharged in good condition with instructions for outpatient follow-up and education regarding recognition of recurrent symptoms.

DISCUSSION

Sigmoid volvulus is an important cause of large bowel obstruction in older adults and is particularly associated with predisposing factors such as chronic constipation, colonic dilatation, and reduced mobility. In the present case, the patient was 76 years old and had a five-year history of chronic constipation, followed by a substantial reduction in mobility and prolonged bed rest before admission. These factors provide a clinically plausible background for sigmoid volvulus. The patient subsequently developed progressive abdominal distension and complete absence of defecation and flatus for one week, indicating a prolonged course of complete mechanical intestinal obstruction.^{1,2} Sigmoid volvulus is the most common type of colonic volvulus. It predominantly affects older adults, especially those aged 70–80 years with a history of chronic constipation, reduced mobility, or residence in long-term care facilities.³ Although most patients present with an acute onset of symptoms, approximately one-third experience a more gradual clinical course.^{4,5}

This case is noteworthy because the duration and apparent severity of obstruction were not accompanied by clinical features that might commonly suggest advanced bowel compromise. The patient had marked abdominal distension, diffuse abdominal tenderness, and high-pitched metallic bowel sounds, but remained hemodynamically stable and had no fever, vomiting, or leukocytosis. Laboratory investigations did demonstrate significant metabolic abnormalities, particularly hypokalemia and hyponatremia, together with impaired renal

function, consistent with dehydration and the physiological consequences of prolonged obstruction. These findings emphasize that the absence of overt systemic deterioration does not exclude a serious mechanical obstruction and should not delay definitive evaluation.^{6,7}

The radiological findings were important in establishing the underlying cause of the obstruction. Contrast-enhanced computed tomography demonstrated marked bowel dilatation, a redundant sigmoid colon, an abrupt transition point, and suspected twisting of the sigmoid colon. These findings supported the diagnosis of sigmoid volvulus and helped distinguish the obstruction from other causes of mechanical intestinal obstruction.^{8,9} CT assessment is also valuable because it may provide information regarding complications such as bowel ischemia and perforation.^{10,11} In this patient, the radiological assessment supported urgent surgical management after initial stabilization.

A central feature of this case was preserved bowel viability despite the prolonged complete obstruction. Complete mechanical obstruction can increase intraluminal pressure and compromise venous and subsequently arterial perfusion, potentially leading to ischemia, necrosis, bacterial translocation, perforation, and sepsis. Consequently, a one-week history of complete obstipation would raise concern for advanced bowel compromise. However, at laparotomy, the sigmoid colon demonstrated a single 360° twist without evidence of ischemia or perforation. This apparent discrepancy between the prolonged clinical course and preserved bowel viability is the principal clinical interest of the present case.

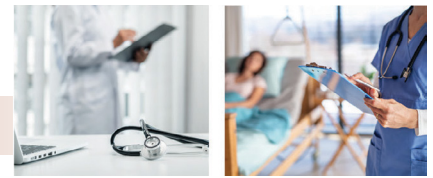
The finding also has implications for surgical decision-making. The surgical technique used in this patient, detorsion followed by three-point sigmoidopexy, is not novel and should not itself be considered the principal novelty of the case. Rather, the significance lies in the intraoperative decision to avoid bowel resection because the affected segment remained viable and there was no perforation. In patients with sigmoid volvulus, bowel resection is generally indicated when ischemia, necrosis, perforation, or

other irreversible bowel injury is present. In contrast, the choice of a non-resectional procedure depends on the clinical context, bowel viability, recurrence risk, and overall patient condition. In the present case, direct intraoperative assessment demonstrated viable bowel, allowing detorsion, decompression, and fixation of the sigmoid colon without resection.

This case therefore illustrates an important principle in managing complicated intestinal obstruction: symptom duration should increase clinical concern and urgency but should not, by itself, determine the extent of bowel resection. The final operative strategy should be individualized according to the patient's physiological condition and the actual status of the bowel at exploration. In this patient, timely resuscitation, correction of electrolyte abnormalities, gastrointestinal decompression, and subsequent surgical exploration allowed the bowel to be assessed directly and preserved when resection was not required.^{12,13}

The geriatric context is also relevant. Older patients with mechanical intestinal obstruction may have reduced physiological reserve and may present with atypical or relatively subtle systemic manifestations despite significant intra-abdominal pathology.¹³ This patient had low body weight, chronic constipation, reduced mobility, hypokalemia, hyponatremia, and impaired renal function, all of which required attention before definitive surgery. Initial fluid resuscitation, electrolyte correction, urinary output monitoring, and gastrointestinal decompression were therefore important components of the perioperative management.^{14,15} Hemodynamic stabilization was achieved within 12 hours, after which surgical exploration was undertaken.

The postoperative course further supports the favorable short-term outcome of the selected approach. The patient regained bowel function by the second postoperative day, tolerated progressive oral intake, had no evidence of postoperative infection or recurrent obstruction during hospitalization, and was discharged on postoperative day 5. Although this favorable outcome does not establish superiority of sigmoidopexy



over other surgical approaches, it shows that a non-resectional procedure may be successfully used when bowel viability is preserved and the patient's clinical condition permits.

The present case has several limitations. First, it represents a single patient and therefore cannot establish the comparative effectiveness or superiority of detorsion with sigmoidopexy. Second, the absence of bowel ischemia or perforation was determined intraoperatively and does not allow conclusions regarding the precise mechanisms underlying preservation of bowel viability despite prolonged obstruction. Third, the report describes short-term postoperative recovery, and longer-term follow-up is necessary to assess recurrence after sigmoidopexy. Nevertheless, the case provides a clinically relevant illustration of the need to integrate symptom duration, physiological status, imaging findings, and direct assessment of bowel viability when determining the extent of surgical intervention. Overall, the principal lesson from this case is that prolonged complete mechanical obstruction caused by sigmoid volvulus can occur without bowel necrosis, even in an elderly patient with marked abdominal distension and one week of complete obstipation. The surgical technique itself is established; the clinically important feature is the individualized decision to preserve viable bowel despite the prolonged obstruction. Early recognition, appropriate resuscitation, accurate imaging, and timely surgical exploration remain essential to optimize outcomes.

CONCLUSION

This case highlights the importance of maintaining a high index of clinical suspicion for sigmoid volvulus as a cause of complete mechanical intestinal obstruction in geriatric patients, particularly those with chronic constipation and limited mobility. Prompt diagnosis with contrast-enhanced computed tomography is essential to identify the site and etiology of the obstruction accurately and to exclude complications such as bowel ischemia and perforation. Initial management, including hemodynamic stabilization, correction of electrolyte abnormalities, gastric decompression, and prophylactic antibiotic administration, provides the foundation for definitive treatment. In the present case, exploratory laparotomy with detorsion of the sigmoid volvulus and three-point sigmoidopexy was a safe and effective surgical approach, resulting in an uneventful postoperative course and rapid clinical recovery. The patient regained bowel function, tolerated oral intake, and was discharged without postoperative complications. This case underscores the value of a multidisciplinary approach to diagnosing and managing sigmoid volvulus in elderly patients. Early recognition, comprehensive preoperative stabilization, and timely surgical intervention are key factors in reducing morbidity and mortality while optimizing patient outcomes.

DECLARATIONS

Consent for Publication

Consent for publication was not applicable, as this case report does not contain personally identifiable information or identifiable images of the patient.

Funding

This case report received no specific funding or financial support from any public, commercial, or non-profit organization.

Author Contributions

Felicia Evelyne Soesilo, Yunita, Ajie Teguh Saputra and Daniel Ardian Soeselo contributed to the conception and design, collected data, and wrote the first draft of the manuscript. Daniel Ardian Soeselo reviewed final manuscript. All authors reviewed and approved the manuscript.

Conflict of Interest

The authors declare that they have no conflicts of interest, whether financial or non-financial, related to this case report.

Declaration on the Use of Artificial Intelligence (AI)

Artificial intelligence (AI) assistance was used during the preparation of this manuscript. Specifically, ChatGPT (OpenAI) was used to assist with language editing and draft preparation. The use of AI was limited to supporting the writing process and did not replace the authors' clinical judgment, interpretation of the case, or responsibility for the scientific content. All authors reviewed, verified, and approved the entire content of the manuscript and take full responsibility for its accuracy, integrity, and final content.

Acknowledgments

The authors have no acknowledgements to declare.

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