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Fatal Gangrenous Sigmoid Volvulus with Septic Shock in an Elderly Patient with Multiple Comorbidities: A Case Report

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Abstract

Background: Sigmoid volvulus is a leading cause of large bowel obstruction in older adults. Delayed presentation increases the risk of bowel gangrene, perforation, and peritonitis, and outcomes in frail patients remain poor even after timely surgery.

Case presentation: A man in his seventies with type 2 diabetes mellitus, stage III hypertension, and a previous inferior myocardial infarction presented with ten days of worsening abdominal pain, distension, vomiting, and absolute constipation, plus months of unintentional weight loss. On arrival he was tachycardic and dehydrated, with a rigid, distended abdomen and signs of peritoneal irritation. Laboratory tests showed leukocytosis, raised C-reactive protein, and acute kidney injury. Contrast-enhanced CT showed colonic obstruction with a rotated sigmoid mesentery. It also showed free fluid, hepatomegaly, bilateral adrenal thickening, and bilateral renal lesions. The APACHE II score was 28–29. Emergency laparotomy found purulent peritonitis and a gangrenous sigmoid volvulus. Sigmoid resection with end colostomy (Hartmann-type procedure) was performed. The patient was extubated early but later developed sepsis-related deterioration despite escalation to meropenem. He required re-intubation for acute respiratory failure and developed thrombocytopenia ($56 \times 10^3/\mu L$), lactic acidosis, and refractory shock. He died of cardiac arrest in the second postoperative week after 45 minutes of unsuccessful resuscitation.

Conclusion: Neglected sigmoid volvulus with transmural gangrene and peritonitis carries very high mortality in elderly patients with cardiometabolic disease, even with appropriate source control. Early presentation, prompt recognition, and early intensive sepsis management are essential. New thrombocytopenia in postoperative sepsis should be treated as a warning sign of impending organ failure.

Keywords: sigmoid volvulus; large bowel obstruction; gangrene; peritonitis; Hartmann procedure; sepsis.

Introduction

Colonic volvulus is the twisting of a segment of bowel around its mesenteric axis, producing a closed-loop obstruction and impaired vascular supply. The sigmoid colon is the most frequent site, and sigmoid volvulus is a significant cause of large bowel obstruction worldwide. It is especially common in older, institutionalized, and neuropsychiatrically impaired patients, and in those with chronic constipation and a redundant sigmoid colon with a narrow mesenteric base [1,2].

When a patient presents early and without ischemia, endoscopic detorsion is usually successful and is the recommended first step, typically followed by elective sigmoid resection because recurrence after detorsion alone is common [1,3]. When the bowel is gangrenous or perforated, or when peritonitis is present, emergency laparotomy with resection is required. Resection with end colostomy (Hartmann procedure) is usually preferred in unstable or contaminated settings [1,2]. Mortality is markedly higher in patients with gangrenous bowel, and older age and comorbidity further worsen outcomes [2].

Postoperative sepsis adds a second, independent threat. Delayed source control, intra-abdominal contamination, and organ dysfunction combine to cause septic shock, and recommended management includes early antimicrobials, hemodynamic support, and organ support [4]. We describe a fatal case of neglected gangrenous sigmoid volvulus in an elderly patient with diabetes, hypertension, and prior myocardial infarction. We focus on the clinical trajectory, the contribution of comorbidity, and the lessons for early recognition and critical care.

Case Presentation

Presentation and history

A man in his seventies was brought to the emergency department by ambulance with severe abdominal pain. He reported ten days of progressively worsening pain that began as vague discomfort and became constant and generalized. It was accompanied by marked abdominal distension, nausea, recurrent vomiting, and complete cessation of stool and flatus. He and his family also reported substantial unintentional weight loss over the preceding months.

His history included type 2 diabetes mellitus and stage III essential hypertension (ESC/ESH classification). There was no history of tuberculosis, chronic hepatitis, or drug or food allergy. Rapid screening for hepatitis B surface antigen, hepatitis C antibody, HIV, and syphilis was negative.

Examination

The patient was in severe distress, pale, weak, and adynamic, with dry mucous membranes and reduced skin turgor consistent with profound dehydration. He was conscious and oriented, with generalized weakness and no focal neurological deficit.

- Blood pressure 165/94 mmHg
- Heart rate 105 beats per minute, regular
- Respiratory rate 21 breaths per minute
- SpO_2 97% on room air
- Temperature 36.5–37.8 °C

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Heart sounds were muffled but regular without murmurs. Breath sounds were vesicular bilaterally. The abdomen was markedly asymmetric, severely distended, rigid, and diffusely tender, with muscular defense and positive signs of peritoneal irritation (Vallix and Sklyarov signs). Bowel sounds were hypoactive to absent. A nasogastric tube immediately drained dark retained gastric and small bowel contents. Digital rectal examination showed an empty rectal ampulla with an edematous, collapsed lumen and no palpable mass. A urinary catheter returned clear, concentrated urine, and costovertebral angle tenderness was absent.

Investigations

Parameter	Result
White cell count	15.34 × 10^3/μL (neutrophils 85.4%)
Hemoglobin / hematocrit	13.5 g/dL / 40.1%
Platelets	230 × 10^3/μL
Creatinine	146.31 μmol/L
C-reactive protein	69
PT / INR / APTT / fibrinogen	12.6 s / 0.97 / 22.0 s / 276 mg/dL
ALT / AST / GGT / ALP	10.4 / 33.8 / 16.4 / 67 U/L
Total / direct bilirubin	21.57 / 12.68 μmol/L

Urinalysis showed turbid urine with proteinuria (1.0 g/L), microalbuminuria, glucosuria, hematuria (20–25 red cells per high-power field), pyuria, and trace bacteria. The ECG showed sinus rhythm, left axis deviation, low-voltage complexes, and pathological Q waves in leads III and aVF, consistent with an old inferior infarction without acute ischemia. Echocardiography showed mild left ventricular hypertrophy, an ejection fraction of 55%, grade I diastolic dysfunction, mild-to-moderate mitral regurgitation, mild aortic regurgitation, and no pericardial effusion. The chest radiograph showed increased vascular markings and mild fibrotic change, with clear lung fields.

Abdominal ultrasound showed marked meteorism, distended bowel loops, and small amounts of free fluid in the subhepatic space and pelvis. Contrast-enhanced CT of the abdomen and pelvis confirmed mechanical large bowel obstruction. It showed gaseous and fluid distension of the colon with multiple air-fluid levels, an edematous rectal wall with an emptied lumen, and a non-homogeneous, rotated sigmoid mesentery with severe suprastenotic dilatation of the proximal colon. Free fluid was present in the subhepatic, perisplenic, paracolic, and pelvic spaces. Incidental findings were hepatomegaly (craniocaudal span 18.2 cm), bilateral nodular adrenal thickening, bilateral renal cortical atrophy, a 3.3 cm heterogeneous mass in the upper pole of the right kidney, and a 1.6 cm lesion in the left kidney. The admission APACHE II score was 28–29, corresponding to a predicted mortality above 77%.

Treatment

The patient received fluid resuscitation, nasogastric decompression, and urinary catheterization. Conservative measures (cleansing enemas and pharmacological stimulation of gut motility) failed. Given the peritoneal signs, CT evidence of volvulus, and clinical deterioration, endoscopic detorsion was not considered appropriate and emergency laparotomy was undertaken.

Through a midline incision, a large volume of foul-smelling purulent exudate was found. Both small and large bowel were massively dilated. The sigmoid colon was grossly enlarged and twisted on its mesentery, with black-green discoloration indicating transmural gangrene. The sigmoid mesentery was dissected and mobilized with identification and preservation of the left ureter. The inferior mesenteric artery and vein were ligated and divided, and the entire gangrenous sigmoid was resected. The rectal stump was closed with a purse-string suture, and an end descending colostomy was created. The peritoneum was lavaged with warm saline, two silicone drains were placed, and the abdomen was closed in layers.

Postoperative course

The patient was transferred to the intensive care unit intubated and mechanically ventilated. Norepinephrine was started for postoperative and septic vasodilation, and empirical piperacillin/tazobactam with amikacin was given. He was weaned and extubated to low-flow nasal oxygen (4–5 L/min) within the first four postoperative days, and stomal function began to return. Mild lethargy prompted a brain CT, which showed moderate cortical atrophy without hemorrhage or infarction. In the second postoperative week his condition worsened. The white cell count rose to 17.20 × 10^3/μL (neutrophils 87.2%) and creatinine climbed to 149.9–176.8 μmol/L. Antimicrobial therapy was escalated to renally adjusted meropenem. He then developed acute respiratory failure, with a respiratory rate of 50 breaths per minute and SpO_2 of 86% despite non-invasive CPAP. He was re-intubated and ventilated, and refractory post-intubation hypotension required norepinephrine plus epinephrine.

Within the following days the platelet count fell to 56 × 10^3/μL, and hematology advised hemostatic support. Blood gas analysis showed uncompensated metabolic acidosis with lactate up to 6.46 mmol/L. Despite maximal ventilatory, vasopressor, and inotropic support, he developed sudden asystole. Advanced cardiac life support was started immediately, including chest compressions, weight-adjusted epinephrine every 3–5 minutes, and 100% oxygen. After 45 minutes without return of spontaneous circulation, death was declared.

Discussion

Sigmoid volvulus and the cost of delay

Sigmoid volvulus arises when a long, redundant sigmoid loop with a narrow mesenteric base twists, creating a closed-loop obstruction. Progressive distension raises intraluminal pressure, compromising venous outflow and then arterial inflow, and ultimately causing gangrene and perforation. Chronic constipation, advanced age, comorbidity, and impaired mobility or cognition are recognized risk factors [1,2]. Our patient had a ten-day prodrome of obstruction before presentation, which probably allowed progression from reversible obstruction to transmural necrosis with peritonitis. Delay is a recurrent theme in the literature and is a key determinant of mortality [2].

The clinical picture was typical: abdominal pain, distension, vomiting, and obstipation, with CT showing a rotated sigmoid mesentery and a markedly dilated proximal colon. CT is the preferred modality in equivocal cases and helps identify ischemia, perforation, and alternative diagnoses [2]. In this patient, tachycardia, leukocytosis, markedly raised CRP, acute kidney injury, free fluid, and peritoneal signs on examination indicated that the bowel was no longer salvageable by non-operative means.

Management principles

Current guidance from the American Society of Colon and Rectal Surgeons, the World Society of Emergency Surgery, and the American Society for Gastrointestinal Endoscopy supports endoscopic detorsion in hemodynamically stable patients with no evidence of gangrene or perforation, followed by interval resection in suitable candidates [1–3]. Endoscopy also allows assessment of mucosal viability. Our patient had peritonitis and CT-evident decompensation, which

are recognized contraindications to attempted endoscopic reduction [1,3]. Emergency resection was therefore the correct course.

For gangrenous sigmoid volvulus, resection with end colostomy (Hartmann procedure) avoids anastomotic risk in a contaminated field and a physiologically compromised host. It is generally preferred over primary anastomosis in unstable or high-risk patients [1,2]. The procedure here was technically standard, including ureteric identification and high mesenteric vessel ligation. Mortality for gangrenous cases remains substantial in the literature even with optimal technique, and higher still in elderly patients with cardiac and metabolic disease [2].

Comorbidity and physiological reserve

The APACHE II score of 28–29 on admission quantified what the clinical picture suggested: a patient with limited reserve facing a major septic insult. Several features contributed. Diabetes impairs immune function and wound healing and predisposes to infection. Prior myocardial infarction, left ventricular hypertrophy, and diastolic dysfunction reduce the capacity to tolerate the fluid shifts, vasopressors, and positive-pressure ventilation of critical illness. Pre-renal acute kidney injury on a background of bilateral renal cortical atrophy limited the safe dosing of nephrotoxic antimicrobials and left little margin for further insult.

The incidental findings are also notable. Months of unintentional weight loss, hepatomegaly, bilateral adrenal thickening, and renal masses raise the possibility of an underlying systemic or malignant process, which could have contributed to frailty and reduced resilience. Without histological or autopsy confirmation these remain unproven and should be interpreted cautiously. They do emphasize that older patients presenting with an acute abdomen often carry unrecognized chronic disease.

Postoperative sepsis and organ failure

The early course, with successful extubation and returning stomal function, was initially reassuring. The second week brought a rising white cell count, worsening renal function, acute respiratory failure, and refractory shock. Escalation from piperacillin/tazobactam plus amikacin to meropenem reflected concern for resistant or inadequately controlled intra-abdominal sepsis. Possible explanations include persistent intra-abdominal infection or an undrained collection, leakage or contamination from the closed rectal stump, hospital-acquired pneumonia, and aspiration. Re-laparotomy or repeat imaging for residual collections was not documented in this case and, had the patient's condition allowed, would have been a reasonable step in the evaluation of persistent sepsis. The Surviving Sepsis Campaign guidelines emphasize early source identification and control, timely appropriate antimicrobials, balanced fluid resuscitation, vasopressor titration, and organ support [4].

Respiratory failure in this patient was likely multifactorial: abdominal distension and diaphragmatic splinting, sepsis-related lung injury, fluid overload on a background of diastolic dysfunction, and possible pneumonia. Post-intubation hypotension requiring dual vasopressors suggests combined septic vasodilation and myocardial depression.

Thrombocytopenia as a prognostic signal

Thrombocytopenia in this patient developed late (platelets 56 × 10^3/µL, from a baseline of 230) in the setting of worsening sepsis, lactic acidosis, and shock. In critically ill septic patients, falling platelet counts reflect a combination of increased consumption, endothelial injury, microvascular thrombosis, immune-mediated destruction, and decreased bone marrow production. They are consistently associated with organ dysfunction and mortality. A coagulopathy of this kind is a component of sepsis-induced coagulopathy and may progress to disseminated intravascular coagulation [4]. A full coagulation panel at the time of the fall was not available, which limits interpretation. Even so, the temporal association with rising lactate and vasopressor requirement points to microcirculatory failure. Platelet trends therefore deserve daily attention after emergency abdominal surgery. A falling count should prompt a search for ongoing infection, drug causes (including piperacillin/tazobactam, meropenem, and heparin if used), and consumptive coagulopathy.

Lessons

First, older patients with prolonged obstructive symptoms should be assessed urgently for volvulus and ischemia, and public and primary care awareness of "red flag" symptoms may reduce delay. Second, when peritonitis or CT signs of ischemia are present, early surgery rather than endoscopic or conservative attempts is warranted. Third, risk scoring on admission supports early, realistic discussions with families and informs the intensity of critical care planning. Fourth, postoperative surveillance for sepsis, including trends in platelets, lactate, creatinine, and inflammatory markers, with a low threshold for repeat imaging, may allow earlier intervention for persistent sources of infection.

Conclusion

Neglected sigmoid volvulus complicated by transmural gangrene and purulent peritonitis carries a grave prognosis in elderly patients with diabetes, hypertension, and cardiac disease. In this case, technically appropriate emergency resection with end colostomy could not prevent progression to septic shock, respiratory failure, thrombocytopenia, and fatal cardiac arrest. The case underscores the importance of early diagnosis and referral, prompt surgical decision-making when ischemia is suspected, and vigilant postoperative monitoring for evolving sepsis, in which new thrombocytopenia is an important warning sign.

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