



Perforated Diverticulitis of the Transverse Colon: An Unexpected Cause of Abdominal Pain During Preoperative Bowel Preparation

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Diverticulitis affecting the transverse colon is uncommon, with perforation being exceptionally rare. It is not usually considered in the differential diagnosis of a patient with acute abdominal pain. We report a case of nonspecific abdominal pain secondary to a perforated diverticulum in the transverse colon during preoperative bowel preparation. A 74-year-old Caucasian female had sudden onset abdominal pain and nausea with routine bowel preparation. This undifferentiated acute abdomen was suggestive of a bowel perforation, which was later confirmed by a computed tomography scan. Surgical exploration determined the location of the perforation in the transverse colon. We report an unusual presentation of preoperative abdominal pain during routine bowel preparation. It is extraordinarily uncommon to see rupture of a transverse colon diverticulum in a patient with sigmoid involvement, and bowel preparation as a cause of rupture has not been previously documented. Because perforation of a transverse colon diverticulum generally has a nonspecific clinical presentation, it should be considered in the differential diagnosis for a patient with known diverticular disease who has acute onset abdominal pain and signs of peritonism.

Key words: Perforated diverticulum – Transverse colon – Diverticulitis

The prevalence of diverticulosis in Westernized-populations is estimated as high as 70% at 80 years of age.^{1–3} That said, this statistic is particularly difficult to assess accurately as most people remain

asymptomatic with only 10%–25% of patients experiencing clinical symptoms during their lifetime.³ Acute bowel perforation makes up 30%–35% of all emergency procedures done on patients with diver-

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Fig. 1 CT angiogram abdominal aorta and portal venous phase CT: There is a large volume of free gas noted in the ante-dependent portion of the peritoneal cavity (arrows). This is consistent with a bowel perforation; however, a definite site of perforation was not seen on CT.

titulitis and most large case series show an overall mortality between 12%–36% for patients undergoing operative intervention.⁴

Although the exact mechanism underlying perforation is largely unknown, it is thought to arise secondary to elevated intradiverticulum pressures and focal necrosis.⁵ The fact that intracolonic pressures are generally elevated in the sigmoid colon, and up to 99% of individuals have sigmoid involvement, may explain why diverticular perforations almost solely occur in this segment of the bowel.^{6,7}

Diverticulitis affecting the transverse colon is uncommon, and perforation is exceptionally rare with fewer than 40 cases reported in the medical literature over the last 70 years.^{8–17} As such, it is not usually considered in the differential diagnosis of a patient with acute abdominal pain. We report a case of nonspecific abdominal pain secondary to a perforated diverticulum in the transverse colon following ingestion of bowel preparation.

Case Presentation

The patient, a 74-year-old Caucasian female, was admitted to the hospital in late May 2015 prior to an elective ultralow anterior resection for repair of a colovaginal fistula. She had a significant medical history of coronary artery disease, hypertension,

dyslipidemia, moderate sigmoid diverticular disease, and an abdominal aortic aneurysm.

At the time of admission, she denied any significant symptomology aside from those associated with her colovaginal fistula. More specifically, she did not describe any abdominal pain, nausea, vomiting, or change in her bowel habits. She was admitted as usual, and started on the customary 4L of bowel preparation prior to surgery—we use Glycoprep (Fresenius Kabi Australia Pty Ltd, Mount Kuring-gai, New South Wales, Australia), a standard electrolyte-balanced bowel preparation. After ingesting the initial 2 L of bowel preparation, the patient began to complain of increasing abdominal pain and nausea. She was tachycardic and hypertensive with a diffusely tender abdomen. She had a positive Blumberg's sign, but her abdomen was otherwise soft with no distention or guarding. The bowel preparation was ceased and the patient was given 20 mg buscopan and 8 mg ondansetron to no effect. With the unrelenting abdominal pain increasing in severity on the background of a known abdominal aortic aneurysm, blood work as well as an abdominal computed tomography scan with contrast was ordered. Aside from an elevated lactate (3.2 mmol/L), troponin (24 ng/L), and aspartate aminotransferase (38 U/L) her blood work was largely unremarkable. Specifically, there was no elevation of her lipase, C-reactive protein, or white cell count. The imaging noted evidence of a bowel perforation, with a large pneumoperitoneum and gas seen within the small bowel and sigmoid mesentery (Fig. 1). There was also an interval increase in the size of her abdominal aortic aneurysm but no evidence of rupture. A definite site of bowel perforation was not evident, but it was assumed that the descending colon or sigmoid was the culprit due to the distribution of gas locules, and her known moderate diverticular disease in this region of the colon.

The patient was taken to the operating room for an emergency laparotomy. To our surprise, the perforation was identified in the transverse colon. A section of bowel proximal to her defect was removed, a Hartmann's procedure along with repair of her colovaginal fistula was completed, and an end, midtransverse, colostomy was created in the left lower quadrant. An intraabdominal swab taken at the time of surgery noted growth of *Bacteroides uniformis*, *Pseudomonas aeruginosa*, and *Candida albicans*—all of which are recognized gastrointestinal microflora in humans.^{18,19} Gross and microscopic examination of the operative specimen noted a

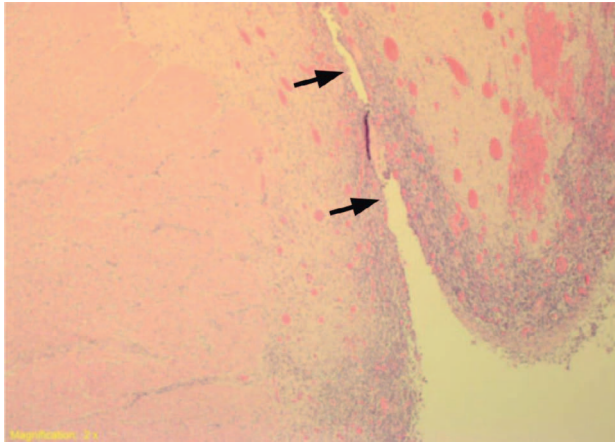


Fig. 2 Section of transverse colon at 2-times magnification: As can be seen, there is a pericolic abscess with lining of macrophages and granular tissue. There is direct extension of abscess into muscularis propria with a formed tract (arrows).

perforated diverticulum in the transverse colon with possible diverticular abscess formation (Fig. 2).

Due to her significant comorbidities, she was admitted to the intensive care unit postoperatively, and had a prolonged hospital stay with a slow recovery. She was discharged 27 days later.

Discussion and Conclusion

This case reminds us that acute onset abdominal pain has a broad differential diagnosis, and perforation of a transverse colon diverticulum should not be overlooked as a potential cause of peritonitis—especially in a patient with known diverticular disease.

The exact mechanism of perforation in our patient is unknown. Whether the rupture was secondary to the bowel preparation increasing intradiverticulum pressure, or due to a coincidental ischemic event is simply speculation. What is known is that it is extraordinarily rare to see rupture of a transverse colon diverticulum—especially in a patient with known sigmoid diverticular disease. Additionally, there are no documented cases of bowel perforation secondary to the use of bowel preparation, and it is not routinely noted as a possible adverse event.^{20,21}

The reason for reporting this case is to highlight the fact that bowel preparation as a cause of perforation has not been documented in the medical literature, and that this may have implications for its use, as well as patient consent prior to procedures where it is necessary.

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