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ACUTE BOWEL PERFORATION POST-BOWEL PREPARATION IN A PATIENT WITH CONNECTIVE TISSUE DISEASE

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ABSTRACT

Isosmotic oral agents are commonly used in bowel preparation due to their minimal side effects. However, bowel perforation is a rare and severe complication. Connective tissue disease and medications such as nonsteroidal anti-inflammatory drugs/steroids can weaken the colonic wall, which increases the risk of perforation. We present a case of a 67-year-old male with undifferentiated mixed connective tissue disease who developed a bowel perforation after administration of bowel prep. The patient initially presented to the emergency department with diffuse abdominal pain, with imaging showing evidence of perforation. Despite surgical and medical intervention, the patient passed away.

KEYWORDS

Bowel preparation, bowel perforation, connective tissue disease

LEARNING POINTS

- This case highlights that oral isosmotic agents that are commonly used for bowel preparation are not risk free.
- This case highlights that patients with connective tissue disease who receive bowel preparation with oral isosmotic agents are at increased risk for adverse events.

INTRODUCTION

Isosmotic oral agents are commonly used for bowel preparation for routine colonoscopy due to their simplicity, low cost, and effectiveness. Isosmotic agents, which often contain polyethylene glycol (PEG), cleanse the intestinal lumen by inducing a cathartic effect through large-volume lavage[1]. Bowel preparation generally does not cause significant side effects, although some patients may complain of cramping or fullness during bowel preparation. These isosmotic agents can cause critical complications, including colon perforation. These consequences can be life-threatening, culminating in multiple gastrointestinal manifestations such as ischemia, hemorrhage, and obstruction, especially in patients with connective tissue disease (CTD)[2]. In this case report, we discuss a 67-year-old male with undifferentiated CTD (UCTD) who was diagnosed with colonic perforation secondary to bowel preparation.

CASE DESCRIPTION

A 67-year-old male with a past medical history of

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hypertension, atrial fibrillation, and UCTD on chronic prednisone and hydroxychloroquine presented to the emergency department (ED) with complaints of diffuse abdominal pain after starting his oral bowel prep a day prior. On presentation to the ED, he reported diffuse abdominal pain with nausea and vomiting and was having liquid bowel movements before coming to the ED.

He was initially hemodynamically stable, with significant laboratory findings of a white blood cell count of 15.3 and a lactate level of 2.6. A computed tomography (CT) scan of the abdomen and pelvis showed pneumoperitoneum and free fluid in the right upper quadrant with a large abscess 16 × 10 × 10 cm adjacent to the region of the hepatic flexure of the colon *(Fig. 1)*. Within hours, he became hypotensive, requiring intravenous (IV) fluid resuscitation and piperacillin/tazobactam therapy. Despite fluid resuscitation, the patient still needed vasopressor therapy. A perforation in the proximal transverse colon was identified, and a right colectomy with primary anastomosis was performed.

Postoperatively, the patient was transferred to the intensive care unit, requiring mechanical ventilation and multiple vasopressors. Although enteral nutrition was initially attempted through his nasogastric tube, he developed an ileus, prompting the cessation of tube feeds and initiation of total parenteral nutrition (TPN). Due to ongoing septic shock postoperatively, a CT scan of the abdomen and pelvis was ordered. Imaging revealed a developing abscess in the left upper quadrant but no evidence of an anastomotic leak *(Fig. 2)*. His condition deteriorated, and despite resuscitative efforts, he persisted in shock leading to death.

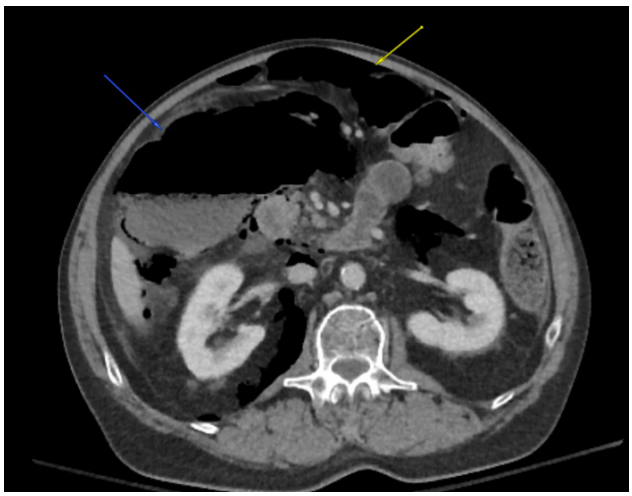


Figure 1. Focal inflammatory changes in the region of the hepatic flexure of the colon with large adjacent abscess 16 × 10 × 10 cm (blue arrow). Associated pneumoperitoneum and free fluid in the right upper quadrant (yellow arrow).

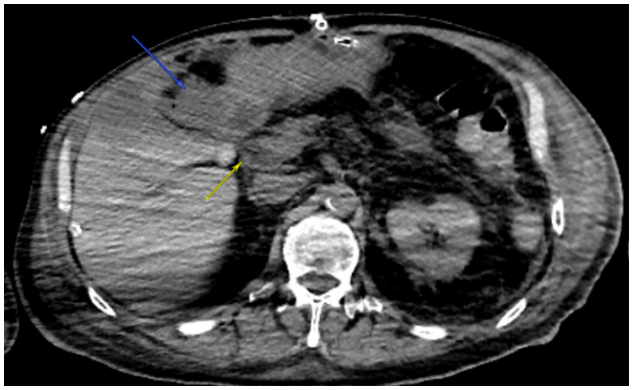


Figure 2. Increased size fluid collections in the gastric hepatic space in the right upper quadrant compatible with abscesses (blue and yellow arrows).

DISCUSSION

Isosmotic oral agents usually contain PEG, sodium sulfate, sodium bicarbonate, sodium chloride, and potassium chloride[1]. It typically has a poor taste and commonly causes abdominal cramping and fullness due to the large volume required. This formulation is balanced with nonfermentable electrolyte solutions, which theoretically minimizes the risk of fluid and electrolyte shifts[1]. Dosing consists of either a single dose or a split dose. Adequate preparation allows polyps larger than 5 mm to be visualized[3]. The validated Boston Bowel Preparation Scale (BBPS) is considered the gold standard for preparation quality. The BBPS has an excellent polyp detection correlation and recommended screening intervals[4]. Understanding different preparation formulations, scales, and dosing promotes proper risk assessment of adverse events to optimize patient safety and minimize complications in higher-risk patients.

Although adverse events are typically rare, perforation and large bowel obstruction are severe consequences related to oral bowel preparation[5]. Other adverse events include vomiting-induced esophageal perforation, acute respiratory distress syndrome, and anaphylactic shock[6]. One retrospective analysis analyzed 20 patients with large bowel obstruction (n=18) or perforation (n=2). Both patients who experienced perforation used PEG for preparation, and the proposed mechanism for perforation is believed to be due to increased intraluminal pressure within the intestinal tract[6]. Patients who suffer from an adverse events may present asymptomatically or endorse a variety of symptoms, including diarrhea, constipation, abdominal pain, and change in stool caliber. Prompt detection of symptoms using clinical reasoning and imaging is critical in initiating management for severe, even potentially fatal, adverse events.

Clinical suspicion and imaging play a critical role in diagnosing suspected bowel perforation. Computed tomography imaging is the primary modality for bowel perforation detection. CT scan accurately detects the perforation site in about 85% of cases[7]. Clues to localize the perforated site include the location of fat stranding, wall thickening, wall enhancement, wall discontinuity, oral contrast leak, and the regional appearance of pneumoperitoneum[7]. Pneumoperitoneum and an abscess likely secondary to enteric leak were visualized on CT imaging in the current case.

CTD consists of an interplay of disorders via chronic, autoimmune, and inflammatory processes. Pathogenesis of CTD commonly involves immune complex deposition

in blood vessel walls, impacting the blood supply to the gastrointestinal system[2]. These vascular abnormalities and inflammation may weaken the intestinal wall, thus increasing susceptibility to bowel perforation. Drugs such as nonsteroidal anti-inflammatory drugs (NSAIDs) and steroids may also contribute to the potential for bowel perforation[8]. A retrospective analysis of 105 patients who received surgery for colorectal perforation showed that fecal peritonitis and CTD were significant prognostic factors[9]. Fecal peritonitis was a significant prognostic factor in the CTD group, represented by cumulative survival curves being significantly worse for patients with fecal peritonitis in the CTD vs. non-CTD group[9]. Additionally, the CTD group after surgery had a significantly worse cumulative survival curve compared to the non-CTD group[9]. Fecal peritonitis poses a significant risk of mortality due to sepsis. However, mortality is not significantly impacted if the peritonitis is properly managed[10]. Careful monitoring is advised to properly treat patients with bowel perforation via surgery and antibacterial treatment. The most common perforation site for patients with CTD was the sigmoid colon, compared to our patient, who experienced perforation in the proximal transverse colon[9]. Physicians should recognize that connective tissue diseases (CTD) and medications like NSAIDs and steroids can compromise the integrity of the colonic wall, thereby heightening the risk of bowel perforation with oral isosmotic bowel preparation.

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