

## Pseudo-obstruction But a Real Perforation

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### Case Objectives

- Recognize acute colonic pseudo-obstruction and implement a medical management plan.
- Identify when colonoscopy is indicated for treatment of acute colonic pseudo-obstruction.
- Describe the risks associated with colonoscopy in the setting of acute colonic pseudo-obstruction.
- Understand the risk factors for and frequency of perforation during colonoscopy.
- List the most common complications in colonoscopy.
- Outline steps providers and institutions can take to decrease the risk of complications with colonoscopy.

### Case & Commentary—Part 1

*A 77-year-old healthy man with a history of long-standing gastroesophageal reflux disease, refractory to medical management, was admitted to the hospital for surgical treatment (a laparoscopic Nissen fundoplication). The surgery was uncomplicated, and he was slowly recovering in the hospital.*

*Postoperatively, he developed an ileus. Despite conservative treatment, his symptoms progressed and computed tomography (CT) of the abdomen revealed acute colonic pseudo-obstruction (sometimes referred to as Ogilvie syndrome). He was treated conservatively with placement of a nasogastric tube, discontinuation of all oral intake, administration of intravenous fluids, and cessation of all medications that can impair colonic motility.*

Acute colonic pseudo-obstruction (ACPO) is severe dilation of the colon without the presence of a mechanical obstruction. ACPO typically occurs in hospitalized or institutionalized patients after surgery or in association with severe illness. Timely recognition and management of ACPO is important to minimize morbidity and mortality of this serious condition. Risk factors for ACPO are shown in [Table 1](#). Patients at highest risk for developing ACPO typically have one or more of the following risk factors: advanced age, immobility, postsurgical, electrolyte abnormalities, and use of constipating medications.<sup>(1)</sup>

ACPO should be suspected in patients with abdominal distention and altered bowel habits. ACPO should be suspected in patients who have acute illness or have just had surgery who develop abdominal distention in association with abdominal pain, nausea/vomiting, or altered bowel habits (e.g., constipation or diarrhea). Diagnosis of ACPO is secured with imaging showing a dilated colon in the absence of a mechanical obstruction ([Figure](#)). Once mechanical obstruction is excluded (typically requires a CT scan or a water-soluble contrast enema study), management of ACPO is focused on reversal and treatment of precipitating factors and decompression of the colon. Prompt treatment is important to reduce the risk of complications, including colonic ischemia and/or perforation. The risk of perforation depends on the acuity, severity, and duration of colonic distention. Cecal diameter greater than 10–12 cm and duration of distention longer than 6 days are associated with increased risk of perforation.[\(2,3\)](#)

Principles of ACPO management are shown in [Table 2](#). Empiric therapy starts with treating reversible causes, including correction of electrolyte abnormalities, NPO with IV fluids, minimizing the use of narcotic pain and other constipating medications, placement of nasogastric and rectal decompression tubes, and optimizing patient mobility with frequent turns, sitting, standing, and walking.[\(3\)](#) In the case above, providers followed guidelines for conservative management.

## Case & Commentary—Part 2

*This conservative management did not work, as the patient developed worsening distention and severe abdominal pain. He was not a candidate for pharmacologic treatment with neostigmine (an acetylcholinesterase inhibitor that can stimulate motility). The next step in treatment was colonoscopy with the goal of decompressing the dilated colon.*

*A gastroenterologist who had just finished her fellowship training performed a decompression colonoscopy. At the beginning of the procedure, the gastroenterologist inserted the colonoscope and began insufflation (pumping air into the colon—a routine part of the colonoscopy and allows for better visualization). Almost immediately, the patient's abdomen became diffusely distended and he became more tachycardic. An abdominal radiograph revealed free air, consistent with a colonic perforation. He was taken emergently to the operating room, where he underwent resection of the perforated colon. Unfortunately, he developed progressive septic shock requiring mechanical ventilation and vasopressors. Despite maximal efforts, he died later that day.*

If patients fail to respond to 24 hours of conservative management or have already been optimized, prioritization shifts to active colonic decompression. Decompression of the colon can be performed medically or endoscopically. For patients without contraindications, neostigmine 2 mg intravenously over 3–5 minutes is generally effective at stimulating colonic contraction and decompression.[\(4\)](#) Stool production is generally swift, within 15 minutes, and high volume. It is important to have the bedpan ready before administering the neostigmine. While neostigmine is effective, the risk of cardiovascular collapse limits its use. Neostigmine is absolutely contraindicated in patients with known hypersensitivity or mechanical obstruction of the intestinal or urinary tract. Relative contraindications include a history of asthma, cardiac arrhythmia, congestive heart failure, recent myocardial infarction, bradycardia, or use of beta-blockers. All patients who receive neostigmine should be on a cardiac monitor. Resuscitation equipment, including atropine as a reversal agent, should be immediately accessible. Use of

methylalntrexone in patients on narcotics has been reported.(5) If treatment of ACPO is successful with the above measures, maintaining normal electrolytes, a regular bowel regimen, avoidance of constipating medications, and patient mobilization are key to reduce the risk of recurrence.

Colonoscopy is indicated as a treatment when conservative measures fail and the colon remains dilated. However, colonoscopy is contraindicated in the setting of overt peritonitis or perforation. Guidelines for the role of colonoscopy in the management of ACPO were published by the American Society of Gastrointestinal Endoscopy.(1) Colonoscopic decompression in the setting of ACPO is associated with rates of perforation and mortality in approximately 2% and 1% of cases, respectively.(1,6) In ACPO, the already dilated and possibly ischemic bowel is at particularly high risk for overdistention and perforation. To reduce such risk, it is important to minimally insufflate the colon (if at all). Risk factors for perforation in general include prolonged distention, ischemia, excessive insufflation of the colon, technical factors that result in looping of the colonoscope, or tension at a point of endoscope fixation from prior adhesions. Therefore, the goal of colonoscopy is to decompress the colon as safely as possible and to try to prevent recurrence of distention.

In this case, it is unclear if radiographs were obtained immediately prior to initiation of colonoscopy. Because the abdomen became distended immediately upon colonoscopy insertion, it is possible that a perforation was already present before the colonoscopy was started, and then the air insufflation made clear that a perforation was present. Abdominal radiographs should generally be obtained at least daily, and more frequently if there is a change in clinical status. These images should be reviewed prior to colonoscopy to exclude evidence of perforation.

The appropriate timing of interventions for ACPO is clinically challenging because conservative therapy is reported to be effective in 20% to 92% of cases and the risk of complications with endoscopic therapy is high, especially when ischemia is present.(1) Even when pharmacologic or endoscopic therapy for ACPO is successful, relapse occurs in approximately 40% of patients.(1) Therefore, it is important to address the underlying etiology (e.g., electrolyte abnormalities). Placement of a decompression tube during colonoscopy appears to reduce the rate of recurrence in retrospective series, and daily administration of polyethylene glycol electrolyte-balanced solution has been shown to reduce the rate of relapse in a small randomized controlled trial.(7)

This case also highlights the dramatically higher risk of perforation from colonoscopic decompression in the setting of ACPO compared to elective colonoscopy. Population-based studies demonstrate that while elective colonoscopy is quite safe, the risk of postcolonoscopy bleeding, perforation, and mortality is reported to be 2.6/1000, 0.5/1000, and 2.9/100,000, respectively.(8) The risk of complications is lower for screening and surveillance colonoscopy than for diagnostic or exams, with a clearly higher risk when polypectomy is performed (e.g., perforation rate of 0.8/1000). Overall, the risk of serious complications from colonoscopy (which includes cardiovascular events, severe abdominal pain and diverticulitis, in addition to those listed above) is estimated to be 2.8 per 1000.(9) Risk factors associated with colonoscopic perforation in elective colonoscopy include colonic dilation (as in this case), colonic ischemia, severe colitis (e.g., in the setting of infection), corticosteroid use, colonic stricture, severe diverticular disease, abdominal/pelvic radiation, or abdominal/pelvic surgery.(10)

Due to the risk of complications resulting in significant morbidity and mortality, it is important to have a strong indication to perform the colonoscopy in the first place and to ensure that there are no absolute contraindications. The anticipated benefit of performing the procedure should outweigh the risks, which must be clearly explained to the patient during the informed consent process. Colonoscopic technique is always important, but is critically important in the setting of preexisting risk factors for complications. Physicians must be especially careful to avoid barotrauma (i.e., overdistention of the colon), minimize looping of the colonoscope during advancement through the colon, and recognize when further advancement of the colonoscope may cause perforation. Ultimately, the physician must use their experience and judgment to determine when the risks of proceeding with the procedure outweigh the risk of complications from an incomplete procedure.

Operator inexperience may have contributed to the morbidity and mortality in this case. It is unclear if the gastroenterologist, who had just recently completed her training, was experienced in the management of ACPO. Current competency-based gastroenterology fellowship training programs are designed to graduate gastroenterologists who have demonstrated clinical competence in a wide variety of clinical scenarios. However, there are invariably situations that arise that are beyond the experience of an individual physician. It is in these situations where it is important to recognize one's limitations and seek expert counsel. As a group, fellowship-trained gastroenterologists are prepared to perform routine colonoscopies with low complication rates that are not affected by provider volume.<sup>(11)</sup> Elective colonoscopy, however, carries a significantly lower risk compared to high-risk colonic decompression for ACPO, which is uncommonly performed since the introduction of neostigmine.

An institutional culture that encourages communication among all members of the health care team can help to reduce the risk for complications. For example, an experienced endoscopy nurse may have recognized abdominal distention prior to insertion of the colonoscope or recommended use of CO<sub>2</sub> instead of air insufflation. The new gastroenterologist may not have felt comfortable calling a more experienced colleague to ask for advice in managing this case. Institutions can also encourage development of protocols to aid clinicians in managing complicated conditions. Individuals must recognize their limitations and know when to seek help. Institutions face significant challenges in ensuring that their providers are competent to perform the procedures that they are called upon to perform. Guidelines for the granting of endoscopic privileges recommend the use of objective criteria and direct observation to assess competence, often relying upon the use of proctors.<sup>(12)</sup>

In this case, the patient may have already had a perforation before the colonoscopy was performed, which ideally would have been identified before the procedure worsened his clinical condition. If a perforation is immediately recognized during colonoscopy, there may be an opportunity to correct the defect using clips.<sup>(13)</sup> Immediate closure of the defect decreases the risk of spillage of the colonic contents into the peritoneum and thereby reduces the risk of peritonitis. The chance of successful immediate closure is highest in patients with small perforations and absence of peritonitis.<sup>(14,15)</sup> However, some patients may require surgical intervention. That was the appropriate next step for this patient; endoscopic attempts at closure would not be recommended since the site of perforation was not endoscopically visualized (as it was probably ischemic). It is likely that peritonitis, sepsis, and multi-organ failure progressed postoperatively, ultimately leading to the death of this patient.

## Take-Home Points

- Acute colonic pseudo-obstruction is a gastrointestinal urgency that requires prompt recognition and management.
- The tenets of treatment include:
  - Exclude mechanical obstruction.
  - Initiate conservative management, including treatment of any reversible causes and increased ambulation or frequent position changes, as able.
  - If conservative therapy fails, neostigmine is recommended for patients who do not have contraindications to its use.
  - Colonoscopy with placement of a decompression tube should be performed if medical management fails.
- Colonoscopic decompression is associated with a high risk for perforation and mortality and should be performed by an experienced endoscopist using techniques to minimize the risk for perforation.
- Institutions should, whenever possible, use objective criteria and direct observation to assess competence in the performance of invasive procedures, such as colonoscopy.

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## Tables

### Table 1. Risk Factors for Acute Colonic Pseudo-obstruction.

Advanced age Hypokalemia Hypophosphatemia Hypotension Orthopedic surgery High narcotic requirements Limited patient mobility

### Table 2. Key Principles of Medical Management of Acute Colonic Pseudo-obstruction

Correct underlying electrolyte disorders Mobilize patient Minimize use of medications that slow intestinal motility (e.g., narcotics, calcium channel blockers) Insert nasogastric and rectal decompression tubes, place on low-intermittent suction

## Figure

**Figure. Radiograph of Acute Colonic Pseudo-obstruction. (Image courtesy of Radiopaedia.org. From case rID: 11684.)**







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