


“Cat Scratch Colon” and Cecal Barotrauma perforation during colonoscopy using CO₂ insufflation

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Abstract

Cecal perforation due to barotrauma is an increasingly recognized complication of colonoscopy when using room air for insufflation. CO₂ is increasingly being utilized for insufflation due to more rapid absorption compared to ambient air and results in reduced post-procedural pain and flatulence. Use of CO₂ is thought to protect against barotrauma injury, and use of CO₂ during endoscopy has not previously been reported to cause barotrauma perforation during colonoscopy. We present a case of cecal perforation secondary to barotrauma during routine screening colonoscopy with CO₂.

Keywords

Cat scratch colon, cecal barotrauma, perforation

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A 77-year-old man with hypertension and hyperlipidemia was referred for routine screening colonoscopy. As the current standard at our institution, CO₂ was used as the insufflation agent. The procedure was uncomplicated with total procedure time of 18 min. Findings were notable for sigmoid diverticulosis and bright red linear lesions in the cecal mucosa with a small amount of fresh heme (Figure 1). No polyps were found and no biopsies or other therapeutic interventions were performed.

After meeting standard discharge criteria, the patient was discharged home. However, 4h later, he returned to the Emergency Department complaining of progressive abdominal pain. His examination was notable for peritoneal signs and kidney, ureter, bladder (KUB) revealed pneumoperitoneum (Figure 2). He was taken for emergent laparotomy which found a 20-cm serosal tear on the anti-mesenteric surface of the cecum. He underwent right hemi-colectomy with primary anastomosis and was discharged 10 days later without further complications. This perforation was likely secondary to barotrauma given the lack of therapeutic intervention and considering the characteristic “cat-scratch” endoscopic findings in the cecum.

Perforation is the most feared complication of colonoscopy with reported incidence of 0.03%–0.3%.^{1–4} Barotrauma from over insufflation has been reported as the second most common cause, responsible for up to 35% of perforations during colonoscopy.⁴ The cecum, which has the largest

diameter of the colon, is most susceptible to barotrauma perforation. This phenomenon is explained by the Law of Laplace where the tension in the wall is a product of intraluminal pressure times the radius of the lumen. Ex vivo studies have demonstrated that the human cecum perforates at mean intraluminal pressures of 81 mmHg.⁵ In one series, the average sustained intraluminal pressure during colonoscopy was 22 mmHg, with transient elevations as high as 134 mmHg during maneuvers such as slide-by and external pressure.⁵

First described by McDonnell et al.⁶ in 2007, “cat scratch colon” is an endoscopic finding representing barotrauma-induced mucosal injury from excessive insufflation. The lesions are characterized by parallel, linear red mucosal marks with or without fresh heme. Cat scratch lesions are more common in female patients, in patients with chief complaint of diarrhea, and while biopsy of a majority of these lesions is histologically normal, there is an increased association with collagenous colitis.⁶ Collagenous colitis is

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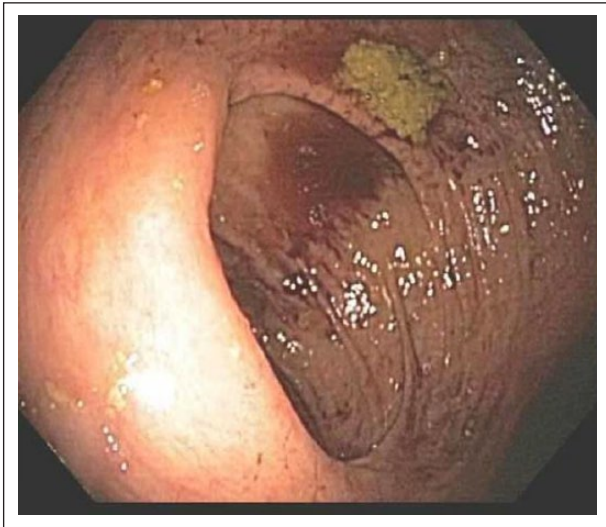


Figure 1. Cat scratch colon endoscopic findings demonstrated in the patient's cecum.



Figure 2. Upright KUB demonstrating diffuse pneumoperitoneum.
KUB: kidney, ureter, bladder.

postulated to increase the rigidity of the subepithelium, thereby increasing the risk of barotrauma.

In the intestines, intraluminal CO₂ is absorbed 160× faster than nitrogen and 13× faster than oxygen.⁷ Recent meta-analysis demonstrates reduced post-procedure discomfort and flatulence when using CO₂ compared to ambient air.⁸

The more rapid absorption of CO₂ is a theoretical mechanism that may protect against barotrauma. This is the first reported case of barotrauma perforation during colonoscopy using CO₂ for insufflation. It highlights that even when using CO₂, endoscopists must remain vigilant for the signs of barotrauma injury, including “cat scratch colon” markings, to minimize this dreaded complication.

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Declaration of conflicting interests

The authors declare that there is no conflict of interest.

Ethical approval

Our case fulfilled institutional criteria for case reports using existing data and was granted a waiver for informed consent by the Institutional Review Board at the University of Utah.

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