Digestive Diseases and Sciences (2023) 68:7–8
https://doi.org/10.1007/s10620-022-07594-6

EDITORIAL

Runaway Insufflation: Does Anesthesia or Spasm Hinder Insufflation During Colonoscopy?

Kenneth W. Hung[1]

Accepted: 23 May 2022 / Published online: 27 June 2022

Careful examination of the entire colon is the foundation of a colonoscopy that has a high likelihood of identifying and removing all polyps present. Procedural factors, such as colonoscope withdrawal time of at least 6 min, two examinations of the right colon, optimal bowel prep quality, and retroflexion in the right colon are associated with a higher rate of finding at least one adenoma during each screening colonoscopy (adenoma detection rate) in patients that are 50 or older. These measures are essential quality measures associated with a decreased probability of developing colorectal cancer [1–3]. Despite this focus on maneuvers that improve colonoscopic quality, inadequate exam quality accounts for most cases of post-colonoscopy colorectal cancer [4]. A thorough exam is also contingent on adequate colonic insufflation to fully distend the colon, facilitating complete inspection of the colonic mucosa and removal of premalignant polyps, since collapsed folds as a consequence of inadequate insufflation may conceal polyps that may progress to colorectal cancer. Though sufficient insufflation is an essential component of a thorough colonoscopy, there is a surprising lack of data regarding factors that affect the adequacy of insufflation during colonoscopy.

In this issue of *Digestive Diseases and Sciences*, Madhoun et al. identified factors associated with difficulty with insufflation during colonoscopy in a Veteran population [5]. Endoscopists were surveyed regarding the difficulty with insufflation after each colonoscopy. The authors reported that insufflation was difficult in 24% of colonoscopies, associated with older age, anesthesia use, chronic obstructive pulmonary disease, diabetes mellitus, and trainee involvement. Many of these conditions are associated with decreased tone of the anal sphincter or colonic spasm, the two major factors that the authors postulated that increase the difficulty with insufflation. The authors also reported that procedures with more adenomas and longer duration had greater difficulty with insufflation. Anesthesia use, a modifiable factor in the performance of colonoscopy, was associated with a two-fold increased rate of difficulty with insufflation.

Anesthesia use in colonoscopy has become more common in recent years [6]. Anesthesia provides a deeper level of sedation, associated with improved patient satisfaction though with a slightly increased risk of complications compared with moderate sedation, usually consisting of a benzodiazepine and opiate [7, 8]. Despite the increasing prevalence of anesthesia in colonoscopy, procedures performed with anesthesia are not consistently associated with an increased rate of polyp detection compared with procedures performed with moderate sedation [9]. A plausible explanation may be reduced resting anal sphincter pressures with propofol use, with consequent increased gas efflux which increases the difficulty of achieving adequate insufflation [10]. This article suggests that since anesthesia increases the difficulty of insufflation, the procedure time may also be prolonged.

This article is an important first step in addressing an understudied yet vital component of colonoscopy, the ability to adequately insufflate the colon. Though one would expect a less satisfactory examination when insufflation is inadequate, the authors found an increased rate of polyp detection in procedures in which adequate insufflation maintenance was considered difficult. A possible explanation for this finding is increased provider awareness of colonic insufflation when targeting multiple polyps for removal. Difficulty with insufflation was also associated with longer procedure duration, which may affect endoscopy unit efficiency. Though one cannot change a patient's age and comorbid conditions that in turn may affect the ability to sufficiently distend the lumen, one modifiable factor is to reserve the use of

✉ Kenneth W. Hung
kenneth.hung@yale.edu

[1] Department of Internal Medicine, Section of Digestive Diseases, Yale School of Medicine, P.O. Box 208019, New Haven, CT 06520, USA

anesthesia for individuals lacking risk factors for difficulty with insufflation.

There are a few limitations to this study, including the absence of a validated, objective scale to assess the difficulty with insufflation and the predominantly white male population undergoing colonoscopy for different indications. Though there is a potential for recall bias, endoscopists were surveyed immediately after the procedure. Since difficulty with insufflation is inherently subjective, it is possible that the fellows surveyed may have perceived more difficulty with insufflation compared with more senior gastroenterologists. Furthermore, gastroenterologists who have endoscopy time with anesthesia support may have a different sense of difficulty with insufflation than gastroenterologists without regular anesthesia support. Objective measurement of total gas instilled or amount of time spent insufflating the colon may precisely determine the impact of insufflation on colonoscopy quality and efficiency. Further studies involving a more diverse patient population are needed to objectively assess challenges with maintaining insufflation in the context of adequacy of exam and provider and patient satisfaction with the exam.

In conclusion, this article provides key hypothesis-generating data regarding the adequacy of colonoscopy examination through the lens of insufflation. As the quality of colonoscopy continues to improve, it will be important to reduce the amount of "runaway insufflation" to achieve optimal mucosal views.

Funding None.

Declarations

Conflict of interest The author has no relevant disclosures.

References

1. Barclay RL, Vicari JJ, Doughty AS, Johanson JF, Greenlaw RL. Colonoscopic withdrawal times and adenoma detection during screening colonoscopy. *N Engl J Med.* 2006;355:2533–2541.
2. Clark BT, Rustagi T, Laine L. What level of bowel prep quality requires early repeat colonoscopy: systematic review and meta-analysis of the Impact of preparation quality on adenoma detection rate *Am J Gastroenterol*. 2014;109:1714–1723; quiz 1724.
3. Kushnir VM, Oh YS, Hollander T, et al. Impact of retroflexion vs. second forward view examination of the right colon on adenoma detection: a comparison study *Am J Gastroenterol*. 2015;110:415–422.
4. Anderson R, Burr NE, Valori R. Causes of post-colonoscopy colorectal cancers based on world endoscopy organization system of analysis. *Gastroenterology.* 2020;158:1287-1299.e1282.
5. Madhoun MF, Bader N, Ijlal A, et al. Factors associated with difficulty maintaining insufflation of the colon during endoscopy. *Dig Dis Sci.* (Epub ahead of print). https://doi.org/10.1007/s10620-022-07592-8.
6. Krigel A, Chen L, Wright JD, Lebwohl B. Substantial increase in anesthesia assistance for outpatient colonoscopy and associated cost nationwide. *Clin Gastroenterol Hepatol.* 2019;17:2489–2496.
7. Dossa F, Medeiros B, Keng C, Acuna SA, Baxter NN. Propofol versus midazolam with or without short-acting opioids for sedation in colonoscopy: a systematic review and meta-analysis of safety, satisfaction, and efficiency outcomes. *Gastrointest Endosc.* 2020;91:1015-1026.e1017.
8. Wernli KJ, Brenner AT, Rutter CM, Inadomi JM. Risks Associated With Anesthesia Services During Colonoscopy *Gastroenterology*. 2016;150:888–894; quiz e818.
9. Turse EP, Dailey FE, Bechtold ML. Impact of moderate versus deep sedation on adenoma detection rate in index average-risk screening colonoscopies. *Gastrointest Endosc.* 2019;90:502–505.
10. Tran K, Kuo B, Zibaitis A, Bhattacharya S, Cote C, Belkind-Gerson J. Effect of propofol on anal sphincter pressure during anorectal manometry. *J Pediatr Gastroenterol Nutr.* 2014;58:495–497.