

Unsedated colonoscopy: just add water?

Gazing out over Jackson Valley with the majestic peaks of the Tetons behind me might seem an odd inspiration for an editorial about 2 new studies on unsedated hydrocolonoscopy. But my mind segues easily: it is time for GI endoscopy to go as green as the sprawling pastures before me.

Since the advent of unsedated flexible colonoscopy almost 50 years ago, gradual refinements have resulted in a highly sophisticated technique that is safe, widely used, and saves lives. But at what cost? Today only about 1% of colonoscopies are done without sedation, and the price tag for the 20 million or so endoscopic procedures that we perform in the United States (40% of which use anesthesia providers) has ballooned to an estimated 3.2 billion health care dollars per year.¹

The direct and indirect costs of comfort are indeed a substrate for health care reform and an intersociety and interdisciplinary political flash in the pan. Like it or not, now is the time to scrutinize the unsavory ratio defined by low benefit services (enhanced safety from monitored anesthesia care has no evidence base) to disproportionate expenditures.² So what can the endoscopist do? At the risk of forcing an awkward hydrocolonoscopy analogy here, consider the words of the great American naturalist John Muir, whose activism no doubt preserved the very vista before me: "Take a course in good water and air; and in the eternal youth of Nature you may renew your own. Go quietly, alone; no harm will befall you."

Perhaps he was on to something, although for purposes of this editorial, let us give a preferential nod to water over air. Water distention, in lieu of air insufflation, was first described in a patient with extensive diverticulosis.³ When the patient was infused during the insertion phase of colonoscopy while in the left lateral position, the gentle pressure head and weight from warm water is thought to straighten the sigmoid colon, reduce spasm, and minimize the lengthening effect that is the hallmark of air insufflation. In nearly a dozen international reports,⁴⁻⁶ hydrocolonoscopy has been shown to effect efficient cecal intubation rates, minimize narcotic requirement, and improve abdominal pain scores compared with air insufflation in minimally and unsedated cohorts.

Copyright © 2010 by the American Society for Gastrointestinal Endoscopy
0016-5107/\$36.00
doi:10.1016/j.gie.2010.08.010

The current issue of *GIE* includes 2 prospective, randomized studies evaluating the ability of water method routine colonoscopy to attenuate, or altogether abandon, the need for supplemental intravenous sedation. In the Radaelli et al study,⁷ the main outcome was whether the use of warm-water infusion during insertion reduced the proportion of patients requiring on-demand sedation. It also examined overall patient tolerance, procedure time, cecal intubation rate (CIR) (which defined procedural success), and adenoma detection rates (ADRs). A total of 230 patients were evenly divided to undergo either warm-water infusion or traditional air insufflation without routine sedation. Although patients in the water group did not receive or request less sedation than their insufflated counterparts, there was such a trend (12.9% in the water cohort vs 21.9% in the air), and overall tolerability appeared superior. The median time to reach the cecum (7 minutes) was statistically longer in the water group (and for you skeptics, it only diluted efficiency by 2 minutes), yet the overall procedural time was tantamount (keep reading to find out why). More patients in the water group would at least try it again without anesthesia, even when asked again 24 hours later, long after any potentially confounding euphoria had worn off.

The current issue of *Gastrointestinal Endoscopy* includes 2 prospective, randomized studies evaluating the ability of water method–routine colonoscopy to attenuate, or altogether abandon, the need for supplemental intravenous sedation.

In a similar but smaller and more strictly designed exploratory randomized, controlled trial, Leung et al⁸ studied the tolerability of unsedated hydrocolonoscopy in U.S. veterans. Unlike the Italian study, patients really had to read the read fine print because there was no sedation backup, and for the endoscopist, not a single per-protocol insertional air puff was allowed. Forty-two and 40 patients were respectively randomized to scheduled water or air method colonoscopy and were evaluated for overall discomfort, willingness to repeat, CIR, and ADR. Water compared favorably with air in overall discomfort scores (2.3 vs 3.3), CIR (93% vs 78%), and willingness to repeat (93%

vs 78%), whereas overall procedure times and ADRs were similar. The median time to reach the cecum was almost a half an hour longer for both groups compared with the Radaelli et al study, and total procedure time approached a whopping hour (56 minutes to be precise, luxurious even by Veterans Administration [VA] time zones).

The authors of both studies are to be congratulated for navigating the stormy waters of traditional sedation to the promise of minimally sedated hydrocolonoscopy. VA studies, in which the vast majority of subjects are elderly, stoic men, are often prone to criticism for results that cannot be readily extrapolated to the public at large. In this case, the reported prolonged cecal intubation time will no doubt be a hurdle to widespread adoption in private practice models. Beyond minimized sedation, however, there is another benefit to hydrocolonoscopy that makes sense: a squeaky clean colon (although endoscopy nurses may disagree, and I do not advise wearing one's best designer shoes on block time days). In a previous study, Leung et al⁹ found a much reduced cancellation rate because of poor prep.

Although neither study commented directly on prep quality, it would stand to reason that the water method would only help provide clarity. So why then the rather shocking finding of the Italian study that a significantly lower proportion of polyps was found in the water group (an ADR of 25% vs 40% in the air cohort)? Because more polyps were detected and underwent polypectomy in the air group, the perceived efficiency of air insufflation was mitigated and no overall procedure time difference was seen. Although not a primary endpoint, this is the first such report to raise the question of diminishing adenoma returns. While not significant, the VA study water cohort actually trended toward a higher ADR. Having done a few hydrosopes myself and reviewing the world literature, I am prepared to go on record and call this particular finding an aberration; it's no big deal.

What's not to love? Hydrocolonoscopy has a soothing spa-like ring to it (might the name alone increase screening rates?), is not a tough sell (the human body is already anywhere from 60% to 80% water, depending on body size and whether one is getting a colonoscopy in Dr. Leung's pioneering endoscopy unit), and has a gradual learning curve fit for fellowship training. It is not going to solve our health care budgetary crisis, and I do not envision a world of sedation-free colonoscopy (at least not in the United States). But consider this: as long as your patient is comfortable, you will never regret the bolus you never gave.

For patients who are at higher risk of, or fear, anesthesia-related complications, have no escort, want to interact with their physician during the examination, or need to get back to the trading floor that afternoon, there is little doubt that we have another option.

So are things up in the air or is this technique a bridge over troubled water? If a little insufflation is needed, would CO₂ + H₂O = a happy belly? More randomized, controlled trials are welcome, but I wouldn't wait for further confirmation if the indication is ripe. Hydrocolonoscopy, in its simple green elegance, has unrealized potential to change the way we practice.

DISCLOSURE

The author disclosed no financial relationships relevant to this publication.

David H. Robbins, MD, MSc

*Center for Advanced Therapeutic Endoscopy
Lenox Hill Hospital
New York, New York, USA*

Abbreviations: ADR, adenoma detection rate; CIR, cecal intubation rate; VA, Veterans Administration.

REFERENCES

1. Aisenberg J, Brill JV, Ladabaum U, et al. Sedation for gastrointestinal endoscopy: new practice, different economics. *Am J Gastroenterol* 2005; 100:996-1000.
2. Orkin FK, Duncan PG. Substrate for healthcare reform: anesthesia's low-lying fruit. *Anesthesiology* 2009;111:697-8.
3. Falchuk ZM, Griffin PH. A technique to facilitate colonoscopy in areas of severe diverticular disease [letter]. *N Engl J Med* 1984;310:598.
4. Baumann UA. Water intubation of the sigmoid colon: water instillation speeds up left-sided colonoscopy. *Endoscopy* 1999;31:314-7.
5. Hamamoto N, Nakanishi Y, Morimoto N, et al. A new water instillation method for colonoscopy without sedation as performed by endoscopists-in-training. *Gastrointest Endosc* 2002;56:825-8.
6. Brocchi E, Pezzilli R, Tomassetti P, et al. Warm water or oil-assisted colonoscopy: toward simpler examinations? *Am J Gastroenterol* 2008; 103:581-7.
7. Radaelli F, Paggi S, Amato A, et al. Warm water infusion versus air insufflation for unsedated colonoscopy: a randomized, controlled trial. *Gastrointest Endosc* 2010;72:701-9.
8. Leung F, Harker J, Jackson G, et al. A proof-of-principle, prospective, randomized, controlled trial demonstrating improved outcomes in scheduled unsedated colonoscopy by the water method. *Gastrointest Endosc* 2010;72:693-700.
9. Leung FW, Aharonian HS, Leung JW, et al. Impact of a novel water method on scheduled unsedated colonoscopy in U.S. veterans. *Gastrointest Endosc* 2009;69:546-50.