Best of both worlds - combining water-exchange and cap assisted colonoscopy

Amit Rastogi

Kansas City VA Medical Center, University of Kansas, United States

Colonoscopy continues to be the most commonly performed endoscopic procedure by gastroenterologists in the United States. Detection and removal of adenomas remains the predominant mechanism by which colonoscopy prevents the development of colorectal cancer.¹ However, in spite of technological advancements in optics and the physical attributes of colonoscopes, colonoscopy continues to remain an imperfect tool for the detection of adenomas and in the prevention of colorectal cancer. This has fuelled researchers in their quest to continue to refine colonoscopy techniques and improve its efficiency in colorectal cancer prevention. The reasons for missing adenomas during colonoscopy include – inadequate bowel preparation,² poor withdrawal technique,³ hasty withdrawal,⁴ flat/depressed/subtle lesion and the inability to examine the proximal sides of haustral folds, flexures, ileocecal valve and rectal valves.

The ability to examine the proximal aspects of folds during colonoscopy is limited by the extent of tip deflection of the colonoscope, angle of view of the lens at the tip and the loss of visualization upon close approximation of the tip of colonoscope to the mucosa. Cap assisted colonoscopy (CAC) is a simple technique in which a small transparent plastic cap is attached to the tip of colonoscope. This cap extends for about 4 mm beyond the tip of colonoscope and helps to depress the haustral folds, flexures, ileocecal and rectal valves while keeping an appropriate distance between colonic mucosa and the colonoscope lens. This helps to examine the proximal aspects of these folds, the otherwise blind mucosal areas. The cap can also be used to splay and separate colonic mucosa that may have folded over and thereby obscured small polyps from view. The cap has also been shown to be of assistance in insertion of the colonos-

cope as it helps in luminal orientation especially at bends by keeping the mucosa away from the lens. Multiple studies have evaluated CAC with somewhat conflicting results.⁵⁻¹¹ Two recently published randomized controlled trials from the US showed that there was an improved adenoma detection rate with CAC.^{6,10} Some studies have shown that cap helps in cecal intubation and decreases patient discomfort. A recent meta-analysis showed that CAC improves polyp detection rates and cecal intubation rates.¹²

Another simple technique that has gained recent attention is the water-exchange colonoscopy.^{13,14} Traditionally, air insufflation has been used to help find the luminal direction during insertion of the colonoscope. This distends the colon, making it more susceptible to looping and thus leads to patient discomfort. In water-exchange colonoscopy the air button is turned off and water is infused continuously while air, residual stool debris and water is suctioned out simultaneously. The simultaneous infusion and suctioning of water aids the colonoscopist in insertion of colonoscope without distending and lengthening the colon and has been shown in studies to decrease patient discomfort as well as sedation requirements. Removal of stool debris during the insertion phase results in a cleaner colon during withdrawal for detection of adenomas.

In this issue of the journal, Yen and colleagues report a new method combining CAC and water-exchange colonoscopy.¹⁵ In their pilot study, they compared the adenoma detection rates in 43 colonoscopies performed by 1 colonoscopist using the combined cap and water method to 101 colonoscopies performed by the same colonoscopist using the traditional air insufflation method. Although the proportion of subjects with an adenoma was statistically similar in the two groups, there was a 10% higher detection rate with the combined method. Moreover,

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Correspondence to:
Amit Rastogi; Email: amitr68@hotmail.com

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there was a significantly higher detection rate of adenomas per colonoscopy with the combined method (3.02 vs 1.50, $p=0.0026$). The authors must be congratulated for their ingenuity in combining two simple techniques in colonoscopy that appear to complement each other during both the insertion and withdrawal phase. Although their data appears promising for the combined methods, there are several limitations that need to be acknowledged. This was a relatively small pilot study, in which all procedures were performed by a single endoscopist in a predominantly male veteran population and therefore results may not be generalizable. As is impossible in such endoscopic studies, the endoscopist could not be blinded to the technique being used and hence investigator bias could influence the results. Although Yen et al have very articulately discussed and rationalized how water-exchange method may also improve adenoma detection rates; it is not possible to assess how much incremental benefit was afforded by the water method for adenoma detection in the combined group. Perhaps a three arm study comparing standard colonoscopy, CAC and combined cap and water-exchange colonoscopy may shed more insight into this. Furthermore, the insertion time, sedation requirements and patient discomfort were not compared between the two groups. These limitations notwithstanding, I think this concept of combining CAC

and water-exchange is appealing as both these techniques are simple, inexpensive, relative easy to learn and practical to implement.

How we do colonoscopy continues to evolve. The guiding principle remains making the procedure less uncomfortable to the patient and improving its ability to detect adenomas. This study by Yen et al is an example of how simple techniques can be combined to complement each other and overcome the limitations and drawbacks of the other methods. Their promising data merits further investigation and needs to be confirmed in randomized prospective trials comparing the combined method with CAC and water-exchange colonoscopy alone for adenoma detection and patient tolerance. Such a trial design would provide more definitive and robust evidence for whether combining these two methods is indeed superior to either technique alone. In the meantime the quest for the perfect colonoscopy continues

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