Benchmarking and quality-screening colonoscopy

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Key words: adenoma detection rate, water method with water exchange

Abbreviations: ADR, adenoma detection rate; PEG, polyethylene glycol; US, United States

Commentary

Benchmarking is the process of comparison with a standard to develop best practices. The motivation is to provide evidence that physician performance is of high quality. Payers, accrediting organizations, licensing bodies and patients are asking for such information. For colorectal cancer (CRC) screening programs high quality standards include completing intubation to the cecum, identifying all precursor lesions, e.g. optimal adenoma detection rate (ADR) and appropriate surveillance recommendation. Other parameters worthy of consideration include educational campaigns to increase the number of patients screened, working in half-day blocks to minimize operator fatigue, use of modern tools/endoscopes, improving withdrawal techniques by reminders and feedback to ensure thorough inspection, all to ensure high ADR. A less well-recognized parameter, at least in the U.S. but not overseas, is to maintain/increase the proportion of unsedated examinations to minimize sedation complications and contain costs in screening cases.

Missed lesions may in part account for interval cancers and lower effectiveness in reducing cancer mortality in the proximal colon. Colonoscopists need new methods to manage this challenge. Missed proximal lesions in screening colonoscopy is suggested by a population-based report demonstrating that screening colonoscopy failed to eliminate completely interval cancers.¹ Case-control studies also revealed screening colonoscopy did not reduce cancer mortality^{2,3} or reduced it at best by ~50%⁴ in the proximal colon. Even US epidemiologic data have demonstrated a similar pattern.^{5,6} Adenoma detection rate but not cecal intubation rate is an independent predictor of risk of interval colorectal cancer after screening colonoscopy.⁷ Taken together focusing on maneuvers that enhance detection of proximal lesions with malignant potential is a prudent approach for benchmarking to improve the quality and outcome of screening colonoscopy.

Modern approaches to modify polyp detection rate or ADR have yielded conflicting results. These include use of high-definition wide-angle endoscope,^{8,9} dye-spray

chromoendoscopy,¹⁰⁻¹² and withdrawal time >6 min.^{13,14} Adenoma detection was not enhanced by narrow band imaging.^{15,16} Feedback of monitoring results could increase polyp detection¹⁷ but whether such measures will translate into increase in ADR is unknown. Increase in the total number of adenomas detected in the proximal colon in unblinded studies has been reported for the third eye retroscope.¹⁸⁻²⁰ The reports, however, did not describe the impact on ADR.

Retrospective reports have implicated poor bowel preparation in low rates of adenoma detection.^{21,22} Conflicting results on bowel cleanliness have been reported in studies evaluating educational aids^{23,24} and the effect on ADR was not described. Bowel preparation quality scores assessed by unbiased observers have been reported to be improved by split-dose bowel preparation,^{25,26} but no information on ADR was presented. Although morning preparation improved bowel preparation score (Ottawa scale) for afternoon colonoscopy, the improved cleanliness did not alter overall polyp detection rate, adenomatous polyps or number of patients with adenomas.²⁷ One split-dose study showed significantly better bowel preparation quality scores by 2 L polyethylene glycol (PEG)+ascorbic acid (n=52) compared with PEG+bisacodyl (n=55); there was also a higher ADR (39% vs. 20%) of borderline significance (p=0.04 by Chi Square, and p=0.054 by Fisher's exact test).²⁸ In another split-dose study of 2 L PEG + ascorbic acid the superior cleansing effect was reproduced without mention of impact on ADR.²⁹ A unique feature of this body of literature is that the evaluated measures are not totally under the direct control of the colonoscopist. The question remains whether the colonoscopist can execute interventions during insertion to impact the cleanliness of the colonic lumen for improved inspection of the mucosa during withdrawal. However, engagement in such cleaning risks loss of the disclaimer that the colon preparation is suboptimal and therefore cannot exclude small significant lesions.

Water exchange has been reported to provide salvage cleansing of sub optimally prepared colon³⁰⁻³¹ and the serendipitous finding of significantly higher ADR.³⁰⁻³⁴ **Table 1** shows the collective data of two publications. The water exchange method increased overall ADR. The increase was also notable in the proximal colon (**Table 2**). The mechanism of increased ADR by the water exchange method is not fully understood. The utility of the water exchange method rests with permitting visualization of the lumen for advancement of the colonoscope while maintaining minimal distention. The salvage cleansing effect of water exchange is a possible contributing factor to enhanced inspection. One

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Table 1. Effect of water exchange on overall ADR

Removal of infused water occurred predominantly during insertion				
	Air n/N (ADR)	Water Exchange n/N (ADR)	Diff (%)	P**
Leung ³³	27/90 (30%)*	35/92 (38%)*	+ 8	0.01
Ramirez ³⁶	88/191 (46%) [†]	101/177 (57%) [†]	+ 11	0.04

*All comers=screening, surveillance and diagnostic; [†]Screening only; **Fisher's exact test.

Table 2. Effect of water exchange on overall proximal ADR and <10 mm ADR

Removal of infused water occurred predominantly during insertion				
Water method*	Air (N=90) ³³	Water Exchange (N=92) ³³	Diff	P**
Proximal	17%	29%	12%	0.06
Proximal (<10 mm)	14%	28%	14%	0.03
Water method [†]	Air (N=191) ³⁶	Water Exchange (N=177) ³⁶		
Proximal	35%	46%	11%	0.03
Proximal (<10 mm)	31%	42%	11%	0.04
Average proximal ADR difference			12%	
Average proximal <10 mm ADR difference			13%	

*All comers=screening, surveillance and diagnostic; [†]Screening only; **Fisher's exact test.

hypothesis under evaluation is that less need for cleaning during withdrawal and less suction-induced contraction or collapse of the lumen during withdrawal result in a higher proportion of the time during withdrawal to be devoted to inspection. The longer withdrawal times in the water exchange group in some of these studies may be due to increased inspection time or added time needed for biopsy or polypectomy related to the increased number of adenomas found. Future studies should focus on evaluating the hypotheses that the water method with water exchange alone or in combination with other complementary modalities may be an important tool in screening colonoscopy benchmarking and quality improvement. The ability to enhance detection of adenomas in the proximal colon may provide a timely solution to the problem of missed lesions in the proximal colon is another hypothesis worthy of testing.³⁵ These studies should be considered and supported.

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Disclosure

The author has no conflict of interests to disclose relevant to this manuscript.

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