Yield of repeat forward-view examination of the right side of the colon in screening and surveillance colonoscopy

Brian T. Clark, MD,[1,*] Neil D. Parikh, MD,[1,*] Loren Laine, MD[1,2]

New Haven, West Haven, Connecticut

Background and Aims: Colonoscopy is less protective for cancers of the right side of the colon than for distal colon cancers. Repeat examination of the right side of the colon has been suggested to increase adenoma detection and potentially provide greater protection against the development of cancers of the right side of the colon. Our prospective study assessed the yield of a second forward-view examination of the right side of the colon done immediately after the initial examination.

Methods: All men 50 to 75 years of age undergoing screening or surveillance colonoscopy at the West Haven Veterans Affairs Medical Center were invited to participate. A second forward-view examination was performed if the Boston Bowel Preparation Scale score was 8 to 9 (scale = 0-9) with right a side of the colon segment score of 2 to 3 (scale = 0-3). The primary outcome was the per-patient adenoma detection rate (including sessile serrated polyps) on a repeated examination of the right side of the colon, defined as the number of patients with ≥1 adenoma on the second examination of the right side of the colon divided by total number of patients. An increase in the adenoma detection rate (ADR) was a secondary outcome.

Results: Repeated examination of the right side of the colon, performed in 280 patients, revealed additional adenomas in 43 patients (15.4%; 95% confidence interval [CI] of difference, 11.3%-21.0%). The overall ADR increased by 3.2% (95% CI, 1.1%-5.3%) after the second examination of the right side of the colon; the ADR for the right side of the colon increased by 6.7% (95% CI, 3.8%-9.7%). Ten patients (3.6%) had a change in their screening/surveillance interval with the addition of findings on the second examination of the right side of the colon.

Conclusion: A substantial 15.4% of patients had additional adenomas detected on a second forward-view examination of the right side of the colon, whereas the overall ADR increased significantly by 3.2%. Given the lack of additional training or equipment required, repeated forward-view examination of the right side of the colon is a simple, readily available method to achieve a modest improvement in the ADR. (Gastrointest Endosc 2016;84:126-32.)

Screening and surveillance colonoscopies decrease the incidence of colorectal cancer, but interval cancers, which develop before the next scheduled colonoscopy, remain a concern and account for up to 10.5% of colorectal cancers.[1-6] Furthermore, a number of studies indicate that the protective effect of colonoscopy is significantly less for cancers in the right side of the colon than for distal cancers.[5,7-9]

Potential explanations for this reduced protection include poorer bowel preparation in the right side of the colon, different biological behavior of neoplasms of the right side of the colon, and a greater number of flat lesions such as sessile serrated polyps (SSPs) that are more difficult to visualize in the right side of the colon. A variety of methods are being considered to potentially increase the detection of neoplastic lesions in the right side of

Abbreviations: ADR, adenoma detection rate; BBPS, Boston Bowel Preparation Scale; SSP, sessile serrated polyp.

DISCLOSURE: *All authors disclosed no financial relationships relevant to this publication.*

*Drs Clark and Parikh contributed equally to this article.

0016-5107/$36.00
http://dx.doi.org/10.1016/j.gie.2015.12.030

Received October 20, 2015. Accepted December 18, 2015.

Current affiliations: Section of Digestive Diseases, Yale University School of Medicine, New Haven, Connecticut (1), VA Connecticut Healthcare System, West Haven, Connecticut (2) USA.

Reprint requests: Loren Laine, MD, Section of Digestive Diseases, Yale School of Medicine, PO. Box 208019, New Haven, CT 06510-8019.

If you would like to chat with an author of this article, you may contact Dr Laine at loren.laine@yale.edu.

the colon including repeated examination, retroflexed examination, mechanical fold-flattening, and increased colonoscopic field of view.

Retroflexed examination of the right side of the colon after standard forward examination was suggested to potentially allow for greater detection of adenomas, especially those on the back side of folds. A 2011 cohort study of 1000 patients identified additional adenomas in 4.4% of patients with an increase in the adenoma detection rate (ADR) of 2.2%, whereas a second cohort study in 1341 patients found additional polyps in 5.0% (proportion with additional adenomas not provided) and an increase in the ADR of 1.8%.[10,11] However, subsequent trials indicated that the increase in detection of adenomas was comparable with a second examination in the retroflexed or forward position.[12,13]

These results have led some experts to recommend a second examination of the right side of the colon, especially when polyps are detected on the initial examination.[14,15] A second forward-viewing examination of the right side of the colon may be the simplest method to improve adenoma detection and potentially decrease interval cancer. No additional equipment is required, and the additional risk, time, and expense related to performing the second examination and any additional polypectomies are relatively minor. However, despite these recommendations, evidence to support a second forward examination of the right side of the colon is limited. A prospective trial examined the yield of repeated forward-view examination of the proximal colon (hepatic flexure to cecum) in 400 patients and found that the ADR was increased by 2.3%, and screening/surveillance intervals were changed in only 3.3% of patients.[13]

Determining whether the yield of a second examination of the right side of the colon is clinically meaningful and justifies routinely incorporating a second examination is important to inform endoscopists and guideline panels determining the optimal methods for colonoscopic screening and surveillance. We therefore performed a prospective study in patients undergoing screening or surveillance colonoscopy to determine the yield of a second forward-view examination of the right side of the colon done immediately after completing the initial examination.

MATERIALS AND METHODS

Study population

All men 50 to 75 years of age undergoing colonoscopy for an indication of screening or surveillance at the West Haven Veterans Affairs Medical Center were invited to participate prospectively. Exclusion criteria included the following: previous resection of any portion of the colon or rectum, active antithrombotic therapy preventing polypectomy, American Society of Anesthesiologists Class 3 or higher, familial polyposis syndrome, inflammatory bowel disease, inability to achieve cecal intubation, a total Boston Bowel Preparation Scale (BBPS) score of 0 (solid stool covering all segments of colon), or inability to completely remove a polyp. Eligible patients were recruited before their scheduled procedure, and informed consent was obtained.

This study was approved by the institutional review board of the West Haven Veterans Affairs Medical Center in November 2013 with continuing review approval in November 2014.

Study design

All colonoscopies had to be performed by 1 of 4 study endoscopists who were attending gastroenterologists on the faculty at Yale School of Medicine. Eligible patients who consented to participate underwent planned colonoscopy by 1 of the 4 study endoscopists performing procedures that day per normal standard of care. The colonoscope was passed to the cecum and was then withdrawn with washing and aspirating of colonic contents as needed to optimize visualization of colonic mucosa. The mucosa was carefully examined, and all polyps that were identified were removed, as would be done for any other screening or surveillance examination. All procedures were performed by using Olympus (Tokyo, Japan) EVIS Exera II high-definition colonoscopes. Narrow-band imaging could be used at the discretion of the endoscopist. Each polyp was submitted for histological assessment per usual standard of care.

After completing the colonoscopy, the endoscopist rated the adequacy of bowel preparation by using the BBPS,[16,17] scoring the left side of the colon, transverse colon, and right side of the colon segments as 0 (mucosa not seen due to solid stool or thick liquid stool that cannot be cleared), 1 (areas of the colon segment not well seen due to staining, residual stool, and/or opaque liquid), 2 (minor amount of residual staining, small fragments of stool and/or opaque liquid but mucosa seen well), or 3 (entire mucosa of the colon segment visualized well). If a patient had a total BBPS score of 8 to 9 (scale, 0-9), including a right side of the colon segment score of 2 or 3, and the endoscopist rated the prep as adequate (defined as able to identify polyps >5 mm), then the colonoscope was not removed, and a different study endoscopist immediately performed a second examination of the colon. We did not mandate specific aspects of colonoscopic technique, such as equal withdrawal times, for the first and second colonic examinations. In order to minimize the burden on the endoscopy center, we limited enrollment of same-day second examinations to no more than 2 in 1 day.

The age of the patient, indication for colonoscopy (screening, surveillance), and study endoscopist were recorded. In addition, the size of the polyps was categorized at the time of colonoscopy as $\leq$5 mm, 5 to 9 mm, or $\geq$10 mm. Endoscopists were asked to estimate sizes