

## Routine rectal retroflexion during colonoscopy has a low yield for neoplasia

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use of routine retroflexion should be at the discretion of the endoscopist.

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### Abstract

**AIM:** To investigate the value of retroflexion in detecting neoplasia in the distal rectum.

**METHODS:** This was a prospective observational study performed in an academic endoscopy unit. Consecutive patients undergoing colonoscopy had careful forward viewing of the distal rectum by retroflexion. Of 1502 procedures, 1076 (72%) procedures were performed with a 140° angle of view colonoscope and 426 (28%) were performed with a 170° angle of view colonoscope. The outcome measurement was the yield of neoplasia in the distal rectum detected by forward viewing *vs* retroflexion.

**RESULTS:** A total of 1502 patients, including 767 (51%) females and 735 (49%) males, with mean age of 58.8 ± 12.5 years were enrolled. Retroflexion was successful in 1411 (93.9%) patients, unsuccessful or not performed because the rectum appeared narrow in 91 (6.1%). Forty patients had a polyp detected in the distal rectal mucosa. Thirty-three were visible in both the forward and retroflexed view (25 hyperplastic, 8 adenomatous). Seven polyps were visualized only by retroflexion (6 hyperplastic sessile polyps, one 4 mm sessile tubular adenoma). There was no significant difference in information added by retroflexion with 140° *vs* 170° angle of view instrument.

**CONCLUSION:** To our knowledge, this is the largest reported evaluation of retroflexion in the rectum. Routine rectal retroflexion did not detect clinically important neoplasia after a careful forward examination of the rectum to the dentate line. Since retroflexion has risks and may cause discomfort, the

### INTRODUCTION

Retroflexion is a commonly performed maneuver during colonoscopy<sup>[1]</sup>, and has been strongly endorsed as an essential component of colonoscopy by experts, and specifically for the purpose of detecting neoplasia<sup>[1]</sup>. However, whether retroflexion substantially or significantly increases the detection of neoplasia during sigmoidoscopy and colonoscopy is controversial<sup>[2-5]</sup>. Among the four previously published reports of retroflexion, two failed to detect a single adenoma in retroflexion<sup>[2,3]</sup> and two detected lesions of such substantial size that the care with which the forward viewing of the distal rectum was performed is suspect<sup>[4,5]</sup>. Further, rectal retroflexion may be uncomfortable for patients and may result in perforation<sup>[6-9]</sup>. Retroflexion can be a useful therapeutic maneuver in the colon or rectum for polypectomy<sup>[10,11]</sup> and in the rectum for treatment of hemorrhoids<sup>[12,13]</sup>. However, two prospective studies found that anoscopy was superior to retroflexion for detection of hemorrhoids<sup>[14,15]</sup>, and experts have opined that anoscopy provides more clinically useful information about hemorrhoids than can be detected by retroflexion<sup>[16]</sup>. Regardless of the contribution of retroflexion to the detection of non-neoplastic disease, the apparent mandate for performance of retroflexion during colonoscopy is the detection of neoplasia<sup>[1]</sup>.

Given that the literature on the value of rectal

retroflexion during routine procedures is mixed<sup>[2-5]</sup>, we prospectively assessed the detection of neoplasia during rectal retroflexion in 1502 consecutive patients.

## MATERIALS AND METHODS

As part of our continuous quality improvement program, one of us (Douglas Kevin Rex) prospectively recorded the findings of retroflexion during colonoscopy from June 20, 2005 to August 15, 2006. Patients with poorly prepared colons, known history of rectal cancer or rectal resection, active Crohn's disease or ulcerative colitis, and patients referred for resection of known rectal polyps or for other therapeutic interventions in the rectum were excluded. Permission to review the data for publication was granted by the Institutional Review Board at Indiana University/Purdue University Indianapolis. The colonoscope used was prospectively recorded with regard to its angle of view (140° or 170°). Colonoscopes without cap-fitting were used as they were available and not otherwise selected.

The rectum was initially examined on forward view with withdrawal of the colonoscope to the dentate line with reflection of the tip in all directions using torque and up-down and right-left deviation as possible and appropriate. The endoscope was reinserted and retroflexed using the method of Grobe *et al*<sup>[2]</sup>. Manual rotation of the instrument was performed to inspect in a circumferential manner the anorectal area. The maneuver was considered successful if a complete 360° visualization of the distal rectum was obtained. Cases where retroflexion was successful, unsuccessful, or not attempted were documented. Whether polyps in the distal rectum were visible on forward or retroflexed views or both was prospectively recorded.

## RESULTS

There were 1502 eligible patients, including 767 (51%) females and 735 (49%) males, with the mean age of 58.8 ± 12.5 years (range 17-95 years). Retroflexion was successfully performed in 1411 (93.9%) patients, unsuccessful in 1 patient because of a narrow rectum, and not attempted in 90 (6.0%) because the endoscopist judged that the rectum was too narrow. One thousand and seventy six (72%) procedures were performed with a 140° angle of view colonoscope while the rest 426 (28%) were performed with a 170° angle of view colonoscope.

We found that 40 of 1411 (2.8%) patients had a polyp detected in the distal rectum, of which 33 were visible in both the forward and retroflexed view (25 hyperplastic, 8 adenomatous), and 7 were visible only during retroflexion (6 hyperplastic and 1 adenomatous). Of the 8 adenomas in the distal rectum detected on both the forward and retroflexed view, the mean size was 7.3 mm (range 3-15 mm), 3 were pedunculated, 5 were sessile, 7 were tubular and 1 was tubulovillous. Each adenoma was detected in a separate patient and none had high-grade dysplasia. The adenoma detected only on retroflexion was a 4 mm tubular adenoma with

low-grade dysplasia. Thus, 1 of 1411 patients had an adenoma detected only by retroflexion and none had an advanced adenoma or cancer.

Using 140° angle of view colonoscopes, 6 of 1076 (0.56%) patients had a polyp detected only by retroflexion, including the patient with the adenoma. Using 170° angle of view instruments, 1 of 426 patients (0.23%) had a polyp detected only by retroflexion ( $P = 0.41$ ; Chi-square test).

## DISCUSSION

In this prospective series, we found that routine performance of retroflexion during colonoscopy added little to the diagnostic yield of neoplasia. Importantly, retroflexion was performed only following a detailed forward-viewing examination of the entire rectum to the dentate line with a concerted attempt to view the entire rectal wall, including the distal rectum, on forward view. We also perform a careful digital rectal examination prior to colonoscope insertion, and none of the distal rectal polyps reported here were appreciated by palpation. Given that perforation has been reported to result from retroflexion<sup>[6-9]</sup>, and that we are anecdotally aware of medical-legal actions against endoscopists for perforations occurring from retroflexion, we believe our data support a perspective that retroflexion during lower endoscopy is not mandated and must be left to the discretion of the endoscopist.

Previous studies have drawn varied conclusions with regard to the value of routine retroflexion during lower bowel endoscopy. Cutler and Pop<sup>[3]</sup> reported no adenomas detected only by retroflexion in 453 patients and questioned the value of routine retroflexion. Grobe *et al*<sup>[2]</sup> deemed retroflexion valuable in 75 patients, but did not document a single adenoma detected only by retroflexion. Hanson *et al*<sup>[4]</sup> detected four adenomas in 526 patients that were visible only on rectal retroflexion, and one was a 15 mm tubulovillous adenoma. Varadarajulu *et al*<sup>[5]</sup> reported the highest yield of routine retroflexion. Among 590 patients (91% male), 6 had adenomas detected only on retroflexion, of which all were > 1 cm in size and 2 were pedunculated. They stated that 50% of the distal rectal lesions were visible only on retroflexion. For unclear reasons, we did not encounter this prevalence of advanced pathology in the distal rectum either with forward or retroflexed views. Although the polyps we encountered were generally smaller, we could still visualize a high percentage (83%) on forward view. Thus, perhaps the value of routine retroflexion could be greater than we encountered when performed in different populations or if a different technique from the one that we used was employed to perform the forward examination that precedes retroflexion.

From an imaging perspective, the goal in exposing colorectal mucosa during colonoscopy is to expose and examine all of it. Based upon the senior authors' experience, knowledge of rectal anatomy, and logic, the need for retroflexion to complete exposure of the rectal mucosa is likely to vary based on each patients' unique

rectal anatomy. Thus, in some patients with narrow rectum, the rectal walls are visible circumferentially in a continuous fashion as they extend proximally when viewed from the internal anal verge in the forward view. Logically, retroflexion has little to add in such patients. In patients with a larger rectum, the posterior rectal wall may not be visible continuously when the instrument is looking forward from the anal verge. In this instance, retroflexion is logically more likely to add information, to be easier to perform, safer to perform, and more comfortable for the patient. In the senior authors' experience, the distal rectal walls are more likely to be continuously visible when viewed in the forward view from the anal verge using a 170° angle of view colonoscopy, as compared to a 140° angle of view instrument. In this study, the fraction of patients with a polyp detected only on retroflexion was lower with the 170° angle of view instrument compared to the 140° instrument, but the difference was not significant. Additional study of the impact of 170° angle of view instruments on the value of routine rectal retroflexion seems warranted.

Limitations of the current study include the relatively low yield of neoplasia in the distal rectum. However, the endoscopist of this study reported the highest adenoma detection rates in the literature<sup>[17]</sup>, so there is no reason to believe that the study population had a low prevalence of adenomas. Indeed, the low prevalence of distal rectal adenomas may reflect the progressive shift of neoplasia toward the proximal colon in recent decades. A second limitation is that the procedures were performed by a single endoscopist. Endoscopists with less effective forward viewing technique could logically expect a higher yield from retroflexion.

Retroflexion in the rectum is unquestionably a useful diagnostic or therapeutic maneuver during colonoscopy in some patients and should be mastered by all colonoscopists. Retroflexion may provide useful information about benign anal disease and can provide a critical advantage for completion of polypectomy in some cases. Our study, however, supports the conclusion of Cutler that routine rectal retroflexion adds little to the detection of rectal neoplasia after careful forward viewing. Given the low yield of retroflexion when careful forward viewing has been completed, as well as the discomfort and risk of retroflexion, performance of retroflexion in routine cases should be at the discretion of the endoscopist. Anecdotally, we recommend that the appropriateness of retroflexion be considered after reaching the anal verge in the forward view and assessing whether the rectal walls are continuously visible as they extend proximally, as well as the size and anatomy of the patient's rectum.

## COMMENTS

### Background

Some experts believe that retroflexion or performance of a U-turn must be performed routinely during colonoscopy to rule out neoplasia in the distal rectum. However, the available literature is mixed with regard to the value of

routine retroflexion.

### Applications

The study found that routine performance of retroflexion has a very low yield for neoplasia. Since retroflexion has a low but real risk, the results suggest that retroflexion is not routinely required to achieve a highly effective colonoscopy.

### Terminology

Rectal retroflexion refers to a maneuver during colonoscopy in which the instrument tip is deflected in U-turn so that the imaging system is directed backward, allowing clear visualization of the distal rectum.

### Peer review

Every year many patients experience complications associated with the practice of retroflexion. Prospectively collected data on whether or not retroflexion is essential is very much needed.

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