

Sensitive Sigmoidoscopy: A Straight Sigmoid Technique

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Abstract: Colorectal cancer prevention requires screening more sensitive than standard colonoscopy in cost, convenience, comfort, and safety, and it requires screening more sensitive epidemiologically than occult blood, radiography, or standard sigmoidoscopy to detect small polyps throughout the colon. Using a 65-cm videosigmoidoscope and no sedation, this family doc-

tor reached the ascending colon (95 percent of polyps) in 81 percent of 78 private practice patients not having prior intraperitoneal surgery (compared with 57 percent of 35 patients with abdominal surgery), mostly by gentle scope rotation for many minutes at 12–20 cm insertion to gather folds and keep the sigmoid colon straight. (*J Am Bd Fam Prac* 1989; 2:103-5.)

By persuading patients to have sensitive sigmoidoscopy every 5 years after age 40, it is likely that many of the 61,000 deaths from colorectal cancer yearly in the United States could be prevented. A high level of confidence that abnormalities will be detected early is the epidemiologic meaning of "sensitive." The straight sigmoid technique allows careful inspection of the entire colon with a 65-cm sigmoidoscope by reaching the splenic flexure within 30 cm of insertion. The safety and comfort are better (more "sensitive") when the sigmoid folds are pleated, avoiding pressure except where the bowel wall is fixed — as by adhesions from surgery or endometriosis. The convenience is more "sensitive" when it can be done as part of a periodic office examination and does not require the transport of a sedated patient. The lower cost associated with sigmoidoscopy is more "sensitive" to the economic concerns of patients and third-party payors when compared with standard colonoscopy.

The predicted increase in life expectancy for persons having a first-degree relative with colorectal cancer has been compared. The investigators predicted that fecal occult blood testing plus flexible sigmoidoscopy every 5 years after age 40 should save 116 days of life at a cost of \$754, assuming the sensitivity to reach 55 percent of polyps.¹ However, when that reach is extended to 90–95 percent of polyps (into ascending colon),² it would seem reasonable that the confidence of early detection would become significantly greater.

Methods

Because the most difficult part of this procedure was motivating the patient to have the examina-

tion,³ many were shown an audio-videotape* of a bleeding polyp and a patient experiencing the examination with minimum discomfort.

Preparation was clear liquids only by mouth for 18 hours, a laxative at bedtime (milk of magnesia for the first 60 cases, then magnesium citrate), and disposable enemas 2 hours before examination. Loperamide (Imodium™), 4 to 8 mg (2 to 4 capsules), was given about 10 minutes before the examination to lessen the evacuation reflex. Double gowns were used by women, and no female assistant with men, to preserve modesty.

The left lateral recumbent position was used to let the sigmoid fall in line with the rectum and descending colon. A pressure pad was placed in the right lower quadrant and held by a rib belt to compress any sigmoid bend. Before anal insertion of the lubricated tip, the patient was told it would feel like a gloved finger insertion as during the preceding general examination. The hilt was controlled with the right hand and scope insertion with the left. Never was the scope inserted with more than 90-degree deflection because of reports that the elbow thus formed was more likely than the tip to perforate bowel. Usually 5 to 30 minutes were given at 12 to 20 cm for rotating (with 2-cm increments of insertion-withdrawal) to gather the straightened sigmoid on the scope, more by feel than sight. This avoided side pressure on the bowel to advance the scope, except at the splenic flexure. At 25 to 30 cm, when 360-degree rotation was comfortable and the splenic flexure lumen was visualized, gentle rotation-insertion usually carried the tip well into the transverse colon, giving only mild, brief discomfort comparable with

*Transcript available from the author with stamped, self-addressed envelope.

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prostate examination. The patient was usually asked to massage the pressure pad, helping to keep the scope and colon in a circle. Suction was rarely needed except in cleaning the scope because patient repositioning drained fluid from the field of view. Sometimes, Shinya's maneuver² was used to convert a transverse colon "M" to "O" (withdraw, press on midabdomen, insert). It was more effective in the knee-chest position, using gravity.

Videotapes of the last 80 procedures included commentary by patients indicating tip location by metal detector. Also recorded was physician comment of 360-degree scope rotation at 50 to 70 cm insertion, with the patient's response ("no pain") confirming insertion 20 to 45 cm beyond splenic flexure, as did triangular haustrae observed at that distance on exit. The detector used was the Coinmaster™ 4900D with 4-inch loop, which discriminated the Videosigmoidoscope™ tip from shaft as much as 6 inches away. A custom magnet encircling the tip was used only once because it was expensive, hard to clean, slightly impeded insertion, did not identify tip location to a compass 2 inches away, and gave no audible record. Radiography to locate reach of scope was not attempted. Anatomical findings were variable; even the triangular haustrae of the transverse colon were not often distended to be distinguishable. Reach was confirmed on one occasion by the identification of red velvet mucosa of ileum and on two occasions by the identification of cecal polyps, subsequently removed by gastroenterologists. Of 25 procedures with a 150-cm videocolonoscope, only 6 used more than 70 cm (true length of the flexible sigmoidoscope). The technique used in these procedures was no different except that 80 cm of the videocolonoscope was looped to the hilt with a rubber band.

Findings

Table 1 shows the comparison of the results of patients with and without prior abdominal surgery. Only 57 percent of 35 patients with abdominal surgery were examined into ascending colon, as were 81 percent of 78 persons without such surgery (73 percent of 113 persons overall $P < 0.01$). Cecum was identified in 61 (54 percent). Women were more likely to have had surgery (55 percent of 49) than men (12 percent of 64) and, perhaps for that reason, less likely to be thoroughly examined (69 percent versus 77 percent).

Table 1. Results of 113 Flexible Sigmoidoscopies*

| | Patients with Abdominal Surgery n = 35 | Patients without Abdominal Surgery n = 78 |
|-------------------------------|---|--|
| Ascending colon viewed | 20 (57%) | 63 (81%) |
| Ascending colon not viewed | 15 (43%) | 15 (19%) |

* $\chi^2 = 6.915$ ($P < 0.01$).

Twenty-four polyps were found in 11 persons; 4 patients had more than one, and one dysplastic polyp was found in a patient with previous polyps. No malignancies were detected. The locations of polyps (the largest was 7 mm) and patients' ages when the polyps were found were also as reported in large studies.² Among persons not examined into right colon were 6 men with inadequate preparation and 5 men with ulceration, edema, mucous, or spasm (these conditions were found also in 3 persons who were examined into the right colon). Severe heart failure limited one examination, the magnet one other, leaving only two examinations limited without explanation above. Twenty-two were examined into the right colon but not clearly to the cecum because of the limited length of the scope.

Discussion

The colon contracts to a simple "O" shape (Figure 1) when not distended to "S" and "M" by feces, barium, air, or scope. Adhesions may tend to hold that distended shape. Hocutt, et al. noted, "Average 65-cm scope insertion depth in men (50.7 cm) was greater than that in women (47.3 cm)."^{4(p 190)} That finding seems to support the observation that examination is less sensitive (comfortable or complete) when there has been prior intraperitoneal surgery (which was true of 55% of women compared with only 12% of men who had sigmoidoscopies performed by me in this study). Thus, laparotomy may tend to be inhibited if larger studies confirm its interference with economical and comfortable colon cancer prevention.

Another consequence of being able to predict which patients can have sigmoidoscopies performed comfortably throughout the colon should be the availability of longer scopes at little added



Figure 1. "A colonoscope is fully inserted in the cecum, thus straightening a redundant sigmoid and transverse colon. Once the colon has been straightened, reaching the cecum by straightforward advancement is usually accomplished without difficulty." Used with permission from Shinya H. *Colonoscopy—diagnosis and treatment of colonic diseases*. New York: Igaku-Shoin Medical Publishers, Inc., 1982:67.

cost. A 65-cm scope now costs the same as its manufacturer's 35-cm model. An additional 20 cm would allow more complete examination in about 20 percent of patients.

When done by a physician giving comprehensive and continuing care, the total value of a sensitive sigmoidoscopy (SS), like that of a Papanicolaou smear office visit, should be far greater than

just the number of abnormalities found. For example, numerical findings cannot measure the relief experienced by a housewife whose friend has just died of cancer when she views her own clear colon. They cannot measure the value to an asymptomatic engineer who admitted, only when seeing his sigmoid ulcerations, that he had been about to quit a stress-producing employer, whom he was persuaded to confront with the need for schedule change.

Safety should be better with scope-straightening twists and fold-gathering (when the colon is not held by adhesions) because the scope is advanced without painful side pressures except at the splenic flexure. Groveman, et al. reported that only two transfusions and one surgical repair complicated 17,167 procedures performed by 438 physicians who had taken a 1-day course.⁵ These results were obtained in spite of the fact that 68 percent of those physicians had no supervised experience. It would seem reasonable that those few complications might not have occurred if the physicians had first performed sigmoidoscopies on each other as did the Sacramento Academy General Practice members 30 years ago with rigid scopes.

References

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