Barium Enema After Flexible Sigmoidoscopy: Is Delay Necessary?

Wm. MacMillan Rodney, MD, Martin Quan, MD, Donald Gelb, MD, and Richard A. Friedman, MD
San Bernardino and Los Angeles, California

There exists a traditional belief that sigmoidoscopy immediately prior to barium enema produces excessive gas and irritability, which subsequently interfere with performance and interpretation of the barium enema study. A survey was initiated to determine whether primary care physicians are generally advised not to perform barium enema examination immediately following proctosigmoidoscopy on the same day. Almost two thirds (56/89) of the physicians indicated that delaying barium enema examination was standard practice in their community. A prospective study was performed on 16 subjects who were examined by a 60-cm flexible sigmoidoscope and then sent for air-contrast barium enema. Ninety-four percent (15/16) of the subjects completed radiologic examinations with no increase in technical difficulty or patient discomfort. One subject was considered to have excessive gas on scout film and was rescheduled for barium enema examination on another day. This preliminary study supports the hypothesis that the majority of patients can sequentially receive both examinations on the same day. For appropriate patients this scheduling would represent a great savings in time, effort, and exposure to bowel preparation protocols.

There continues to be a difference of opinion regarding performance of barium enema examination immediately following proctosigmoidoscopy. During a recent scientific exhibit on flexible sigmoidoscopy, an informal poll of family physicians and general internists was performed by one author (WMR). The majority of those polled recommended delaying the barium enema if sigmoidoscopy had been performed the same day. Traditional teaching indicates that sigmoidoscopy leads to excessive gas and colonic irritation, which subsequently interfere with effective barium enema examination. Such recommendations and counter-recommendations have been noted in the recent literature.[1] Critics of same-day barium studies have stated that sigmoidoscopy irritates the colon, leaving it full of air and mucus. Such an effect is thought to impair the quality of subsequent radiologic study and interpretation.

In a family practice training program that had implemented and studied the use of flexible sigmoidoscopy,[2-4] it had been routine to schedule

From the Department of Family Medicine, UC Irvine-San Bernardino County Medical Center, San Bernardino, the Division of Family Medicine, University of California at Los Angeles, and the Departments of Family Practice and Radiology, Charter Community Hospital, Los Angeles, California. Requests for reprints should be addressed to Dr. Wm. MacMillan Rodney, Department of Family Practice, San Bernardino County Medical Center, 780 E. Gilbert Street, San Bernardino, CA 92404.

patients for sigmoidoscopy followed immediately by double-contrast barium enema. Thus one bowel preparation served for both examinations. No reports of incomplete, inadequate, or difficult barium enema examinations had been returned. Encouraged by this unstructured, anecdotal experience, a formal study was undertaken.

This prospective study asked the following: Are primary care physicians generally advised to withhold barium enema examination following proctosigmoidoscopy? If barium examination (with air contrast) of the colon is performed immediately following 60-cm flexible proctosigmoidoscopy, is there an increased number of incomplete, inadequate, or more difficult to perform radiologic examinations of the colon?

Methods

In the first part of the study, four groups of physicians were asked the question "Do the radiologists in your community generally recommend postponement of lower gastrointestinal barium enema studies for at least one day following flexible proctosigmoidoscopy? To the best of your knowledge at the present time, please answer yes or no." Group A consisted of 30 physicians attending the scientific exhibit section of the California Medical Association scientific assembly. Twenty-three family physicians (group B) and 16 family practice residents (group C) enrolled in continuing medical education were asked this question on a pretest regarding colorectal cancer screening. Group D consisted of 20 physicians attending the American Academy of Family Physicians-American Society for Gastrointestinal Endoscopy flexible sigmoidoscopy workshop.

In the second part of the study, the sigmoidoscopy study group consisted of 16 subjects who were examined by a 60-cm flexible sigmoidoscope and then sent for an air-contrast barium enema. A board-certified radiologist (RAF), who was blinded to the prior sigmoidoscopy, then graded scout films as to the amounts of gas present in the bowel. These categories were normal, small, moderate, and large. All patients received the barium enema with air-contrast examination and were later matched with the no-sigmoidoscopy control group on the basis of age, sex, and disease.

Patient bowel preparation for the study group consisted of clear liquids for dinner and an 8-oz bottle of magnesium citrate the night before the examination. One or two phosphate enemas were given in the morning prior to the examination. The control group was on a clear liquid diet for 24 hours preceding examination. In addition, two tablets of standardized senna concentrate with docusate sodium were ingested at 2:30 PM the day prior to barium enema. That evening 2.5 oz of standardized extract of senna fruit was taken with continued clear liquids. A bisacodyl suppository was given on the morning of the barium enema.

The radiologist was requested to evaluate the technical aspects of the barium enema study on patients referred from the primary care group. Patients whose scout films revealed inadequate preparation (retained fecal debris) were excluded from the study group. Ratings were requested regarding (1) difficulty in performance of the examination, (2) observed patient discomfort during the examination, (3) completeness of the study, and (4) adequacy of the examination for interpretation. Patients were requested not to inform the radiologist whether they had received sigmoidoscopy.

Patients with the following diagnoses were excluded: (1) severe coagulopathy, (2) acute (less than 2 weeks of symptoms) illness of any cause, and (3) acute abdomen. Thus, the control group consisted of barium enema with no sigmoidoscopy in previous 24 hours or longer, and the study group consisted of flexible sigmoidoscopy with barium enema to follow on the same day.

Results

Almost two thirds of physicians stated that radiologists in their community recommended postponement of barium enema studies following sigmoidoscopy (Table 1). Data were collected on 16 subjects whose bowel preparation was adequate for flexible sigmoidoscopy and barium enema. Six patients were studied sigmoidoscopically but did not receive barium enema examination because of excessive retained fecal material noted on scout film (KUB).

In 15 of 16 patients the barium enema examination was noted to be completed according to the usual standard of radiologic practice. In one

patient excessive air on KUB led to cancellation of the barium enema examination. This patient was rescheduled, but did not return. In those 15 barium enema examinations, all studies were judged to be adequate for radiologic interpretation. None of these studies were technically more difficult to complete than control studies. Patient discomfort was not observed to be increased when compared with standard examinations within the Department of Radiology. Bowel gas patterns as noted on the abdominal scout film were classified into one of four categories by the radiologist (Table 2). An amount of gas consistent with prior sigmoidoscopy was noted in 3 of 16 patients within the study group compared with 1 of 16 within the control group (Table 2). This difference was not statistically significant utilizing the Z test for proportions.

The diagnostic yield by 60-cm flexible sigmoidoscopy for inflammatory bowel disease or adenomatous polyps was 13.6 percent. Barium enema examination was positive for lesions in 5 percent of cases, although an additional 10 percent were suggestive. In these suggestive cases further examination was recommended. An average insertion depth of 59.7 cm was attained in the study group. One case of diverticulosis found on barium enema was not described by the sigmoidoscopist. No complications occurred as a result of any of the examinations.

Table 1. Percentage of Physicians Who Stated That Radiologists in Their Community Generally Recommended Postponement of Barium Enema Studies Following Flexible Proctosigmoidoscopy

Group	Raw Data (Percentage)
A. Random physicians	21/30 (70)
B. CME family physicians	15/23 (65)
C. Family practice residents	9/16 (56)
D. AAFP-ASGE family physicians	11/20 (55)
E. Total	56/89 (63)

Note: The majority of physicians practice in communities where delay of barium enema examination is recommended. CME = Continuing Medical Education; AAFP = American Academy of Family Physicians; ASGE = American Society for Gastrointestinal Endoscopy

Comments

The majority of polled physicians felt that barium enema should be delayed following sigmoidoscopy. A study describing excessive gas or colon irritability and subsequent inability to perform effective barium enema examination of the lower gastrointestinal tract was not present in the medical literature. This preliminary study was designed and implemented to address this issue.

The findings suggest that a great deal of time, expense, and patient inconvenience could be spared by the change of professional behavior described. Barium enema examinations are a frequent complement to sigmoidoscopic examination. Many physicians have been taught and continue to believe that radiologic examination of the lower intestine should be postponed following sigmoidoscopy. There are few data to support this widespread clinical practice for rigid or for flexible sigmoidoscopy.

A partial explanation may be a lack of communication between radiologists and primary care physicians. This problem of intraprofessional communication has been described repeatedly.[5,6] In this study 27.3 percent of the patients were being inadequately prepared for their barium enema despite adequate preparation for sigmoidoscopy. Thus, the clinician was not effective in terms of preparing the patient to meet the standards of his or her radiologic colleague. The demographics and diagnostic yield are similar to published studies by hospital-based[7] and office-based[8] nongeneralists. This study confirms the synergistic nature of the two examinations. Lesions beyond the length of the flexible sigmoidoscope were noted on barium enema, and lesions in the distal colon were noted only with flexible sigmoidoscopy.

There were no statistically significant differences between the study and control groups. Only one examination in 16 had to be rescheduled. Furthermore, barium enema examinations following sigmoidoscopy were not noted to be more technically difficult, nor were they more difficult to interpret. There was no observed increase in patient discomfort. The amount of gas following

Table 2. Comparison of Gas Patterns in Study Group vs Controls

	Study Group	Control
Less than normal amount of gas	4/16	2/16
Small amount of gas	3/16	7/16
Moderate amount of gas	6/16	6/16
Large amount of gas (probably prior sigmoidoscopy)	3/16	1/16
Gas pattern suggesting need for cancellation of barium enema	1/16	0/16

Note: Differences were not statistically significant. Sample size is insufficient to preclude the possibility of a type II error; nevertheless, the data suggest support for the general principle that delay of barium enema is not necessary following flexible sigmoidoscopy

flexible sigmoidoscopy can be reduced if the sigmoidoscopist suctions air out as the scope is withdrawn. These instructions were not given to the sigmoidoscopist in these patients.

This preliminary study makes no comment regarding the relative safety of barium enema following biopsy above or below the peritoneal reflection. At present barium enema studies are delayed for one week in those patients who have been biopsied. This delay may be unnecessary given the improved design of biopsy forceps available with flexible sigmoidoscopy.

The results of this study have led to the creation of a less restrictive policy with regard to the performance of barium enema after sigmoidoscopy in the community hospital where the study was conducted. The needs assessment section of the study indicates that re-evaluation of current policies and further study in a spectrum of professional environments should be of benefit to large numbers of patients. The utilization of one preparation for both procedures would be helpful in terms of patient compliance. Time, expense, and aesthetic morbidity for the patient would also be decreased.

Criticisms of the current study concern the fact that the study group did not receive as much bowel preparation as the control group. Future studies should be performed with more rigorous control for this characteristic as well as control for strict matching of symptoms between the two groups. Nevertheless, this study supports the hypothesis that barium enema studies can be effectively performed on the same day following flexible sigmoidoscopy. This lack of interference with effective performance of barium enema examination immediately following flexible sigmoidoscopy has not been previously reported. A larger sample and standards for gas quantity could be developed to address the issue of a type II (B) error. Nevertheless, even if a significant difference could be demonstrated by a larger sample size, the magnitude of the differences would not alter clinical management.

References

1. Thoeni RF: Questions and answers: Timing of barium enema studies following sigmoidoscopy. JAMA 241: 941, 1979

2. Johnson RA, Quan M, Rodney WM: Flexible sigmoidoscopy. J Fam Pract 14:757, 1982

3. Johnson RA, Rodney WM, Quan M: Outcomes of flexible sigmoidoscopy in a family practice residency. J Fam Pract 15:785, 1982

4. Rodney WM, Quan MA, Johnson RA, Beaber RJ: Impact of flexible sigmoidoscopy on physician compliance with colorectal cancer screening protocol. J Fam Pract 15: 885, 1982

5. Cummins RO, Smith RW, Inui TS: Communication failure in primary care: Failure of consultants to provide follow-up information. JAMA 243:1650, 1980

6. Ross JE: The consultation note, letter. J Fam Pract 16:882, 1983

7. Winnan G, Berci G, Panish U, et al: Superiority of the flexible to the rigid sigmoidoscope in routine proctosigmoidoscopy. N Engl J Med 302:1011, 1980

8. Carter HG: Short flexible fiberoptic colonoscopy in routine office examinations. Dis Colon Rectum 24:17, 1983