Combined Use of Double- and Single-Contrast Barium Enema in the Evaluation of Suspected Colonic Disease

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Abstract. Although controversy has surrounded the use of single- and double-contrast barium enemas for many years, a growing opinion exists that these studies are complementary, each possessing advantages in different clinical settings. We have found that when interpretation of double-contrast studies is difficult because suspected abnormalities are subtle or because technical quality of examinations is less than ideal, single-contrast enemas can be helpful. We have been able to obtain high-quality single-contrast studies using low-viscosity, low-density barium suspensions administered immediately following evacuation after initial air contrast evaluation.

Key words: Barium enema, technique – Colon, radiography.

A review of the literature concerning barium examinations of the colon reveals an astonishing amount of controversy regarding the use of single- and double-contrast techniques. A survey of 100 institutions' use patterns published in 1978 showed that increasing numbers of radiologists were employing double-contrast studies. However, at that time only 6 of those institutions reported using double-contrast techniques alone in all cases. Only 5 acknowledged using double-contrast methods alone in selected cases [1]. It seems probable that the percentage use has increased during the past 5 years.

Some authors have suggested that patients who are strongly suspected of harboring significant colonic pathology should undergo both single- and double-contrast barium enemas if the initial examination by 1 method is unrevealing [2, 3]. Unfortunately, since excellent quality double-contrast studies often cannot be produced immediately after single-contrast evaluation, due to difficulty in obtaining adequate mucosal coating, the double-contrast enema after a single-contrast enema requires a second procedure on a separate day. This practice is inconvenient and expensive for patients and their physicians and has not met with widespread acceptance. We have found, however, that good-quality full-column studies can be obtained when double-contrast enemas are followed immediately after colonic evacuation by administration of a low-viscosity, low-density barium suspension. This combination of techniques has been helpful in several clinical situations, examples of which are presented here.

Materials and Methods
In our department, the double-contrast enema is the standard screening examination of the colon, performed in approximately 54% of patients. We study with the double-contrast method all patients in whom evaluation of mucosal detail is critical. In practice this group includes patients with histories suggestive of inflammatory or infectious colitis or of colonic neoplasm. We examine with the single-contrast technique patients with suspected diagnoses of diverticulitis, ischemia, mechanical obstruction, stricture, or fistula formation, and patients who are unable to comply with the physical demands of the air contrast study.

Of our patients initially evaluated with double-contrast enema, 5% undergo single-contrast enema immediately following review of double-contrast films, including a postevacuation view. We choose to examine patients using both techniques in this sequence when we detect an area of possible but questionable abnormality which merits further study or when we are unable to produce a double-contrast study of optimal technical quality.

Preparations for and technique of both double- and single-contrast barium enemas have been described previously [4]. Barium suspensions used are liquid Polibar® (55% w/w, E-Z...
Results

Both polypoid masses and inflammatory and neoplastic processes affecting colonic contour can produce fairly subtle, unconvincing abnormalities in double-contrast studies. The radiographic findings can be accentuated by subsequent single-contrast evaluation. Figure 1A demonstrates a double-contrast enema in which a polypoid mass was suspected in the barium pool just distal to the hepatic flexure. This lesion was shown to better advantage in the single-contrast examination which followed review of the double-contrast films (Fig. 2B). Histologic evaluation showed this mass to be a villous adenoma. The air contrast enema in Figure 2A reveals a contour abnormality in the splenic flexure which was thought to have been due to spasm. However, since the history of a pancreatic tail APUDoma increased the suspicion of metastatic disease we followed the double-contrast study immediately with a full-column examination. The area of abnormality was found to be persistent.