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Barium enema examination of the colon is a common and usually safe procedure. More than 3 million examinations are performed in the United States each year with very few resulting complications (1). However, two to four colonic perforations occur per 10,000 barium exams, and other complications such as appendicitis, perforation of the vagina, portal vein gas, bacteremia, and direct damage to the rectal mucosa also may be seen, though rarely (2). Barium granuloma is another unusual complication of the barium enema exam. Less than 50 cases have been reported in the literature, perhaps because most patients are asymptomatic. However, barium granuloma may be mistaken for carcinoma and may result in excessive and unwarranted intervention (3).

The following case describes a patient whose clinical picture and proctosigmoidoscopy were consistent with rectal carcinoma but whose biopsy revealed only barium granuloma (Fig 1).

A 70-year-old man had a proctosigmoidoscopy at Henry Ford Hospital for evaluation of anemia and weight loss. A barium enema had been performed 11 days before the sigmoidoscopy, showing minimal diverticulosis. Physical examination, including digital exam of the rectum, was unremarkable. Sigmoidoscopy revealed a 3 to 4 mm pale, gritty nodule in the rectum approximately 10 cm from the anal verge. Because the nodule was thought to be an early carcinoma, a biopsy was performed using alligator forceps. Pathology described this lesion as containing inflammatory cells, fibrous tissue, and small accumulations of barium. Barium crystals were seen within the fibrous connective tissue of the lamina propria and also within the cytoplasmic membranes of mononuclear cells. No evidence of malignancy was seen.

Barium sulfate granuloma of the rectum develops when barium is forced through a discontinuity in the rectal mucosa. This occurs when intrinsic disease such as amebiasis or ulcerative colitis is present, but it also occurs in normal individuals (4). Iatrogenic injury from insertion of the enema tip, overinflation of the enema balloon, and proctosigmoidoscopy with or without biopsy can predispose to barium granuloma formation (5).

Carney and Stephens (4) reviewed 19 patients with barium granuloma. Of these 19 patients, three had abnormalities of colonic mucosa seen by barium radiology predisposing to barium granuloma; one patient had ulcerative colitis; one had diverticulitis; and one had rectal polyps. However, six had normal examinations. On direct visualization during proctosigmoidoscopy, ten patients had mass lesions; two patients had small raised nodules; one had a vesicovaginal fistula; and six had suspicious ulcers. One patient was subjected to abdominoperineal resection because of the size and irregularity of the ulcer (4). Others have seen barium granuloma as pedunculated polyps and plaques (6).

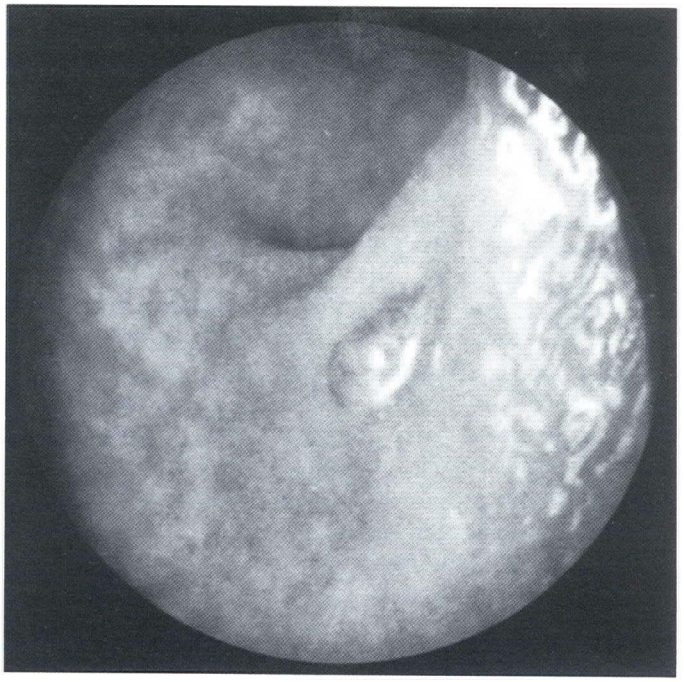

Fig 1—Endoscopic view of the lesion.

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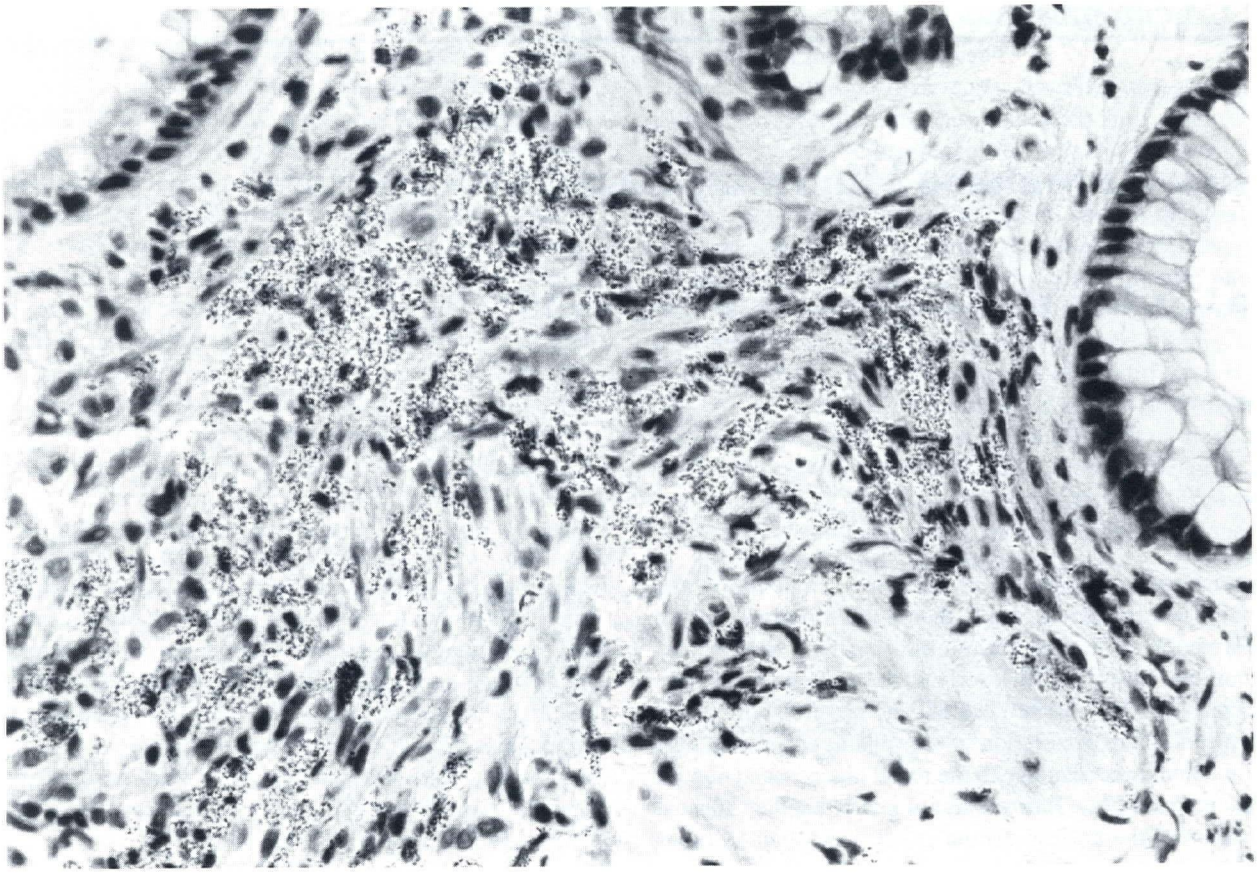

Fig 2—Microscopic view of the barium granuloma (400X).

Formation of barium granulomata begins within days of the initial barium insult. The barium may remain confined to the submucosa without presenting symptoms or may dissect through the various layers causing necrotizing proctitis, abscesses, or polypoid masses. Microscopically, a typical inflammatory reaction occurs beginning with polymorphonuclear infiltration. Elements of a chronic inflammatory response appear at approximately one week. Fibroblasts, macrophages, and multinucleated giant cells with intracytoplasmic barium sulfate crystals collect at the injury site (7) (Fig 2).

To explain the intramural and extramural distribution of barium seen in some cases of barium granuloma, Dubarry et al (8) postulated that barium was carried to its destination via the lymphatics. This was subsequently disputed (4) since regional lymph nodes did not contain barium. Alternately, Carney and Stephens suggest that barium tracks along the path of the perforating arteries even when no intrinsic defect is present in the bowel wall. These sites have been recognized as points of weakness where diverticula develop (4).

Most barium granulomata occur within 4 to 8 cm of the anal verge and are probably the result of trauma during the barium enema examination (9). Lesions may appear highly suspicious for malignancy and warrant careful examination and biopsy. Once the diagnosis is confirmed, little further intervention is required for asymptomatic cases. Symptomatic cases may require local excision (6). Our patient has remained asymptomatic over a one and one-half year period.

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