Intramural Extravasation of Barium Simulating Carcinoma of the Rectum*

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This report describes two patients found to have barium granuloma of the rectum. The lesions appeared as indurated, ulcerated rectal masses that resembled carcinoma on endoscopic examination. Deep mucosal biopsy results demonstrated no malignancy and barium sulfate crystals in tissue macrophages. Radiographs showed persistent soft-tissue barium in the rectum. Past reports of barium granuloma have described ulcerated or polypoid masses in the rectum and anus. Rectal intramural extravasation of barium occurs as a result of asymmetric enema balloon inflation and impaction of the enema tip against the rectal mucosa. [Key words: Carcinoma; Enema, barium; Granuloma, barium; Rectum]

Despite more than 3 million barium enema examinations performed yearly in the United States, complications of colonic radiography are uncommon. Colonic perforation, the most serious complication, has been noted in two of 10,000 air-contrast examinations. Other complications include pneumoperitoneum, barium introduction into and perforation of the vagina, cardiovascular abnormalities, bacteremia, appendicitis, portal vein gas, and damage to the rectal mucosa by the enema tip or rectal balloon. Acutely, retrorectal extravasation of barium may present as a necrotizing proctitis. In addition, localized perforation and barium granuloma caused by enema-tip trauma can present subacutely as polypoid nodules or deep ulcerations of the rectum and can be mistaken for adenocarcinoma. This report describes two such cases of ulcerated rectal mucosal lesions containing barium sulfate that endoscopically resembled carcinoma.

Report of Two Cases

Patient 1: A 78-year-old man was transferred to the Phoenix Veterans Medical Center from another hospital to which he had been admitted three weeks earlier with complaints of abdominal pain. Before his transfer, a barium enema had been undertaken, which delineated diverticulosis. Physical examination on admission revealed right hemiplegia. The abdomen was soft and neither a mass nor tenderness was noted. On digital rectal examination, an indurated anterior rectal mass was palpated 4 cm from the anus. Sigmoidoscopy demonstrated a firm, 2 x 3-cm, friable, mucosal ulcer with a whitish base (Fig. 1). Initial biopsy specimens showed necrosis and inflammation. Because of a strong clinical impression of carcinoma, repeat, deeper biopsies were performed with the patient under general anesthesia. The repeat biopsy specimens showed granulation tissue with acute and chronic inflammatory cells and no evidence of malignancy. Macrophages containing fine granular material identified as barium sulfate were noted, however. An anteroposterior radiograph of the pelvis, 45 days after his original barium enema, delineated barium in the soft tissues of the lower rectum.

Patient 2: A 75-year-old man was admitted to the Phoenix Veterans Medical Center for pulmonary symptoms. He had no abdominal complaints. Physical examination demonstrated dyspnea and a soft, nontender abdomen. Rectal examination revealed a firm, 2-cm mass on the anterior rectal wall. Barium enema examination, done after rectal examination, demonstrated a polypoid mass projecting from the anterior rectal wall. Colonoscopy revealed a 2 x 2-cm submucosal mass with a central ulceration located 6 cm from the anus (Fig. 2). Initial biopsy specimens showed inflammation. Because of a strong clinical suspicion of carcinoma, deeper biopsy specimens were taken, which demonstrated acute and chronic inflammation, numerous macrophages containing barium sulfate (Fig. 3), and no evidence of malignancy. A review of previous radiographs showed barium in the soft tissues of the rectum (Fig. 4). The patient had undergone barium enema examinations seven and ten years previously.
Discussion

Barium enema examination is a frequently performed radiographic procedure. Although generally considered to be free of risk, a number of complications have been reported, some resulting in serious patient injury or death. Amberg has classified the complications of colonic radiography as follows: injury to previously normal mucosa by air or barium, injury to damaged or diseased mucosa, injury to mucosa or remote organs from toxic substances in enema solutions, cardiovascular alterations, bacteremia, or radiation exposure.18

Our patients sustained rectal injuries from barium extravasations into submucosal tissue. These extravasations were detected by digital examination, and on sigmoidoscopy were found to consist of an indurated mucosal mass located anteriorly in the rectal wall. In both, the endoscopic appearance of the rectal lesions was highly suggestive of carcinoma, appearing slightly raised and having a central mucosal ulceration. Deep biopsy specimens of the ulcer margin and base revealed the presence of characteristic, granular-appearing barium sulfate in tissue macrophages. Multiple deep biopsy specimens of the surrounding mucosa detected no malignancy. Plain radiographs of the pelvis, undertaken retrospectively, delineated localized submucosal barium present in the rectal mucosa.

Fig. 2. Arrows indicate raised, 2-cm polypoid rectal mass with central ulceration seen on colonoscopy in patient 2.

Fig. 3. Rectal biopsy specimen demonstrating barium sulfate crystals (arrows) within tissue macrophages (hematoxylin and cosin: × 400).