Focal Granulomatous (Crohn's) Colitis:
Radiologic-Pathologic Correlation

Norman Joffe 1, Donald A. Antonioli 2, Michael A. Bettmann 1, and Harvey Goldman 2
Departments of Radiology 1 and Pathology 2, Beth Israel Hospital and Harvard Medical School, Boston, Massachusetts, USA

Abstract. In patients with Crohn's disease, early or localized lesions of the colon, termed 'focal granulomatous colitis', may give rise to small and often relatively inconspicuous nodular or tumor-like contour defects in conventional barium enema studies. This radiologic sign, first illustrated by Ettinger [7], has received scant attention in the literature. The present communication is intended to re-emphasize the radiologic appearances of focal granulomatous (Crohn's) colitis in conventional barium enema examinations, provide pathologic correlation, and illustrate by selected case reports the clinical significance of recognizing this particular radiologic abnormality.

Key words: Colon, inflammation – Colitis, granulomatous – Colon, ulcerations.

The differentiation of various forms of inflammatory disease of the colon is best made by a consideration of the collective clinical, radiologic, gross distribution, and histopathologic features [1-4]. Radiologic findings most suggestive of Crohn's colitis [1, 5, 6] are fistula formation and concomitant disease of the small bowel; other characteristic features include rightsided disease, segmental distribution, 'skip lesions', rectal sparing, asymmetric involvement, and deep longitudinal ulcerations with transverse fissures. Such findings generally represent relatively advanced disease. Early or localized lesions, termed 'focal granulomatous colitis', may present as small (1.0 to 1.5 cm), eccentric contour defects of the colon in both conventional and double-contrast barium enema studies. This radiologic sign, first illustrated by Ettinger [7], has received scant attention in the literature. The detection of such focal lesions may be helpful in establishing the particular form of colitis and also in determining the full extent of colonic involvement. The present communication is intended to re-emphasize the radiologic appearances of focal Crohn's colitis in conventional barium enema studies, provide pathologic correlation and demonstrate by illustrative case reports the significance of recognizing this particular radiologic abnormality.

Case Reports

Case 1

A 35-year-old white female with known Crohn's disease of the distal and terminal ileum was referred for surgery because of the failure of medical therapy to control recurrent abdominal cramps, fever, diarrhea, arthralgias, and weight loss. Barium enema examination revealed a persistent small contour defect on the inferior aspect of the transverse colon (Fig. 1A) suggesting the presence of focal Crohn's disease of the colon. The findings were confirmed at surgery which consisted of resection of the diseased ileum and a subtotal colectomy with ileosigmoid colostomy.

At pathologic examination, the distal 20 cm of ileum showed diffuse mucosal ulceration, mural thickening, and luminal stenosis. In the transverse colon, corresponding to the radiologic finding, there was a discrete small ulcer with a raised, edematous border (Fig. 1b). A few tiny, superficial ulcerations were noted elsewhere in the resected colonic segment. Microscopic examination of the ulcers showed necrosis and marked inflammation confined to the mucosa and submucosa (Fig. 1C). Although granulomas, transmural inflammation, fissures, or fistulous tracts were not identified, the pathologic diagnosis of Crohn's disease was based on the presence of involvement of the terminal and distal ileum in conjunction with discrete ('skip') areas of colonic disease between which the colon was grossly and microscopically normal.

Comment: In this patient, who was studied prior to the availability of colonoscopy, the radiologic detection of a small, eccentric nodular defect in the transverse colon suggested the presence of focal Crohn's...
Fig. 1. Case 1.
A Note small, eccentric contour defect associated with ulceration (arrow) on inferior aspect of barium-filled transverse colon.
B Photograph of surgical specimen showing discrete ulceration (arrows) in transverse colon.
C Photomicrograph of the discrete lesion reveals that ulceration, inflammation, and necrosis have focally destroyed the mucosa (M) and extended well into the submucosa (SM); the muscularis externa is intact. (Hematoxylin and, eosin ×16)

colitis and indicated that the disease was not confined to the small bowel. As a result, a more extensive surgical resection was performed; pathologic examination confirmed the presence of the focal lesion in the transverse colon and showed a few additional 'aphthous' ulcers elsewhere in the colon.

Case 2

A 19-year-old white female complained of crampy abdominal pain and bloody diarrhea of several months' duration. Sigmoidoscopy revealed diffusely friable, ulcerated rectal mucosa most suggestive of ulcerative colitis. Following treatment with corticosteroids there was a gradual resolution of her symptoms.

A subsequent barium enema revealed diffuse ulceration of the rectum and left colon; the inflammatory changes involved the bowel in a continuous, uniform, symmetric manner from the rectum to the distal transverse colon, at which site there was an abrupt transition to normal-appearing bowel (Fig. 2A). Although the radiologic findings in the rectum and left colon were consistent with either ulcerative or Crohn's colitis, the additional presence of a small 1 cm irregular nodular defect on the medial aspect of the ascending colon and a similar eccentric contour defect on the inferior aspect of the cecum (Figs. 2A and B) were highly suggestive of focal 'skip' lesions supporting a diagnosis of Crohn's disease.

The findings were subsequently confirmed by pathologic examination following proctocolectomy and ileostomy. This disclosed three discrete ulcerated lesions in the right colon located 1, 7 and 12 cm from the ileocecal valve in the resected specimen; two of these represented the focal lesions noted on radiologic examination. Microscopically, these lesions showed mucosal ulceration with inflammation extending into the muscularis externa (Fig. 2D). The colonic mucosa between these ulcers was grossly and microscopi-