

Crohn disease: CT findings after treatment

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Abstract

Within a period of 5 years, we followed by computed tomography (CT) three patients with Crohn disease who were undergoing treatment. From the spectrum of disease abnormalities, some subsided and others remained. Bowel wall thickening was the most common pretreatment CT finding but was somewhat altered after treatment.

Key words: Crohn disease—Computed tomography findings—Treatment.

Double-contrast barium studies of the gastrointestinal tract remain the procedure of choice for the initial diagnosis of Crohn disease [1].

The ability of computed tomography (CT) to image the bowel wall and surrounding fat directly has become a major diagnostic tool in the detection of Crohn disease [2]. With CT, the diagnosis can often be based on the symmetrical thickening of the bowel wall, segmental distal ileal distribution, skip areas of involvement, fistulas, and abscesses [3, 4]. Moreover, fibrofatty proliferation of the mesenteric fat and regional lymphadenopathy are seen in patients with Crohn disease [5].

We report three cases of Crohn disease and the post-treatment CT findings.

Case reports

Case 1

A 15-year-old woman was hospitalized in July 1991 because of diarrhea and high fever. After establishing the diagnosis of Crohn disease with barium studies (Fig. 1A) and colonoscopy, we performed

CT of the bowel to detect the extraluminal component of the disease. Having first cleaned the bowel, we then distended it with water and showed a symmetric and circumferential thickening (10 mm) of the transverse and ascending colon, with homogeneous density and lobulated inner contour. The ileocecal valve was also thickened. There was focal fibrofatty proliferation of the mesentery shown as excessive fat surrounding the involved colon with increased attenuation that produced a mass effect on adjacent loops. Regional and retroperitoneal lymphadenopathy (≥ 1 cm in diameter) also coexisted (Fig. 1B). With corticosteroid and sulfasalazine treatment, she was under remission for a long period of time, but in June 1992 she had a new relapse, with a high fever and palpable “tumor” in the right iliac fossa.

At that time, CT findings were circumferential thickening (7 mm) of the ascending colon and ileocecal valve (the inner contour was smooth), an inflammatory mass in the right lower quadrant involving the terminal small bowel and cecum, and diffuse areas of linearly increased attenuation in the mesentery. The lymphadenopathy was more extensive now, and the fibrofatty proliferation of the mesentery remained the same (Fig. 1C). She was prescribed sulfasalazine, corticosteroid, and azathioprine.

In June 1995, during which the patient was in remission for 30 months, CT examination showed a focal wall thickness (5 mm) of the right flexure but with a smooth transition to the normal wall, and the lymphadenopathy was reduced. The fibrofatty proliferation of the mesentery was “dirty,” and the residual from the previous inflammatory mass was also present (Fig. 1D).

Case 2

A 50-year-old woman with a 2-year history of bloody diarrhea and anemia was hospitalized in March 1991. Barium study of the large bowel showed strictures and ulcerations in the ileocecal valve and terminal ileum (Fig. 2A). Colonoscopy proved unsuccessful in passing through the valve, although the large bowel was normal. After excluding other possible diseases, the diagnosis of Crohn disease was made. CT examination of the bowel with the previous technique revealed circumferential homogeneous thickening (5 mm) of the terminal ileal wall with an irregular outer contour. The ileocecal valve was also thickened (Fig. 2B). She was prescribed corticosteroid and methotrexate. Another CT examination 9 months later showed the same findings. She was in remission but relapsed 30 months later. A CT then showed the wall thickness (3 mm) of the terminal ileum with a smooth outer contour. There were fewer involved loops, and the ileocecal valve had a thinner wall (Fig. 2C).

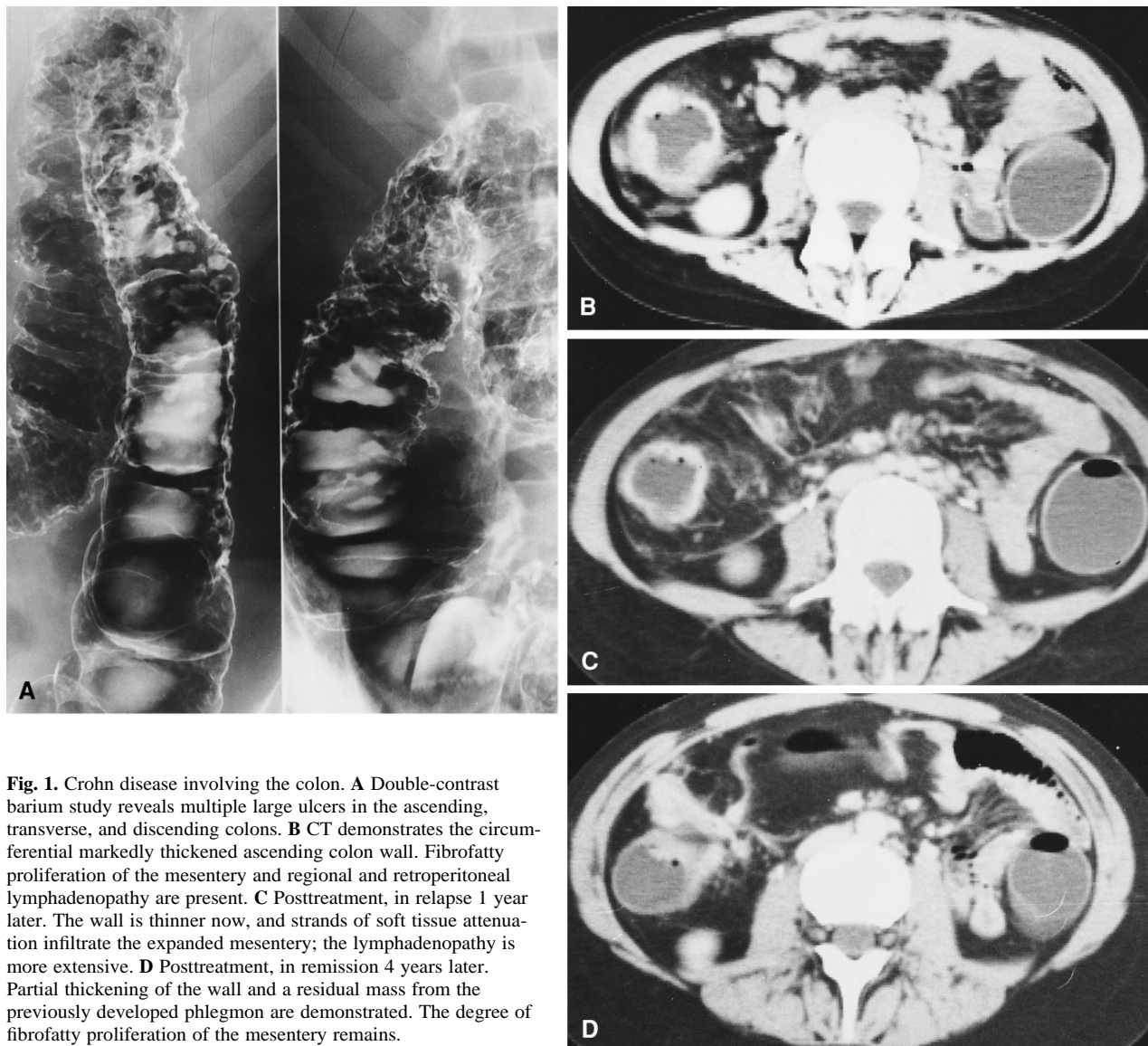


Fig. 1. Crohn disease involving the colon. **A** Double-contrast barium study reveals multiple large ulcers in the ascending, transverse, and descending colons. **B** CT demonstrates the circumferential markedly thickened ascending colon wall. Fibrofatty proliferation of the mesentery and regional and retroperitoneal lymphadenopathy are present. **C** Posttreatment, in relapse 1 year later. The wall is thinner now, and strands of soft tissue attenuation infiltrate the expanded mesentery; the lymphadenopathy is more extensive. **D** Posttreatment, in remission 4 years later. Partial thickening of the wall and a residual mass from the previously developed phlegmon are demonstrated. The degree of fibrofatty proliferation of the mesentery remains.

Case 3

A 43-year-old man with a 20-day history of abdominal pain, fever, bloody diarrhea, and anemia was hospitalized in August 1991.

After establishing the diagnosis of Crohn disease with barium studies (Fig. 3A) and colonoscopy, CT showed circumferential homogeneous thickening (8 mm) of the ascending and transverse colon wall (Fig. 3B). The ileocecal valve and some loops of the terminal ileum were also involved (7 mm wall thickness). There was also retroperitoneal lymphadenopathy. He was prescribed corticosteroid and sulfasalazine and went into remission. CT 6 months later showed that the bowel wall (8 mm) had become thinner in the ascending colon (Fig. 3C). The terminal ileum was normal in appearance, and there was no lymphadenopathy.

Discussion

Although CT has been shown to be of limited value in the diagnosis of Crohn disease, it has proved to be

extremely useful in detecting the extraluminal component of the disease and has a significant effect on clinical management [6]. It is performed as an adjunct to barium studies and endoscopy in patients with Crohn disease [7].

The CT findings of the disease include bowel wall thickening, luminal narrowing, fistulas, sinus tracts, abscesses, inflammatory streaking of fat planes, and mesenteric changes, including fibrofatty infiltration, mesenteric thickening, and interloop abscesses [3, 4, 8, 9]. From this spectrum, we saw bowel wall thickness, an inflammatory mass, focal fibrofatty proliferation of the mesentery, and regional lymphadenopathy in our cases.

The symmetric and circumferential thickening of the bowel wall, a common finding in our patients, was ho-

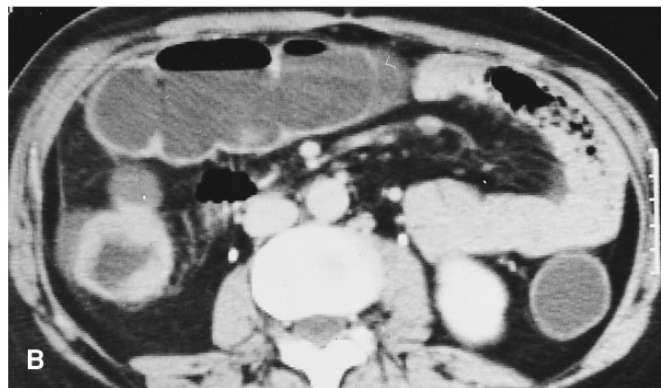
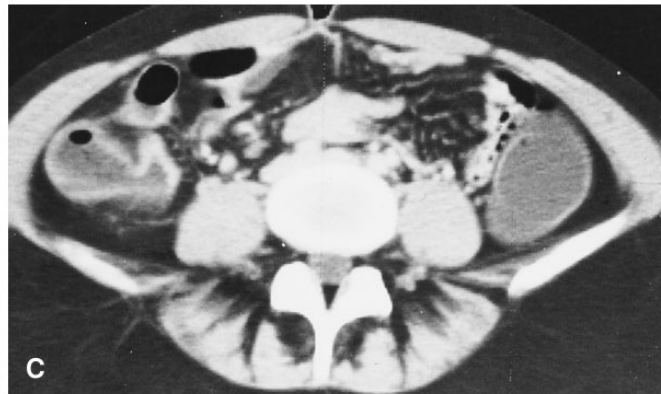


Fig. 2. Crohn disease involving the ileocecal valve and terminal ileum. **A** Single-contrast barium study reveals the terminal ileum as irregularly narrowed. **B** CT demonstrates the wall thickness of the ileocecal valve. **C** Posttreatment and during remission, the wall is thinner.

Fig. 3. Crohn disease involving the colon. **A** Single-contrast barium study demonstrates ulcers in the left aspect of the transverse colon. **B** CT demonstrates circumferential thickening of the ascending colon wall, which is also involved. **C** Posttreatment and during remission, the wall is thinner at a lower level.

mogeneous in density without the double-halo and target signs, its margins were lobulated (or irregular), and ranged between 8 and 10 mm for the colon (average = 9 mm) and between 5 and 7 mm for the terminal ileum (average = 6.5 mm) after adequate distention of the lumen with water [10, 11]. These wall findings are similar to those reported by others [1, 6]. After receiving treatment and during periods of remission, CT showed fewer involved bowel loops. The wall thickness was circumferential or focal, with smooth margins, and ranged between 5 and 8 mm for the colon (average = 6.5 mm) and was 3 mm for the terminal ileum.

From the extraluminal components of the disease, focal fibrofatty proliferation of the mesentery, which was seen in one patient, remained the same during 4 years of follow up.

The regional lymphadenopathy subsided, and some linear fibrotic densities in the mesentery represented the residual of the inflammatory mass.

The most common abnormality detected by CT in Crohn disease is thickening of the bowel wall [12]. The bowel wall thickness was a stable abnormality in our patients before and after treatment, although it could be thinner and shorter or have changed in shape after treatment.

We have found that bowel wall thickness, which is the most common pretreatment abnormality detected by CT, is also altered to a lesser extent after treatment. We suggest that, when there is an improvement of the Crohn disease activity index, an unaltered extensive mural thickening as revealed by CT after immunosuppressive

therapy can predict those patients who will need a strictureplasty.

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