

Ileocaecal Tuberculosis: A Pictorial Essay of Various Appearances on Small Bowel Enema

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In third world countries, where tuberculosis is endemic and Crohn's disease is infrequent, tuberculosis is by far the most common cause of inflammatory disease of the bowel. Although any part of the gastrointestinal tract can be involved, the ileocaecal region and the ascending colon are the predominant sites of involvement in 50-90% of cases^{1,2}. The infection may occur following ingestion of infected milk or sputum or by the haematogenous spread to submucosal lymphatic structures from a distant pulmonary infection. Nowadays reports stress that it is due to the human form and not the bovine type of mycobacterium³. Intestinal tuberculosis is considered to occur more often secondary to advanced pulmonary tuberculosis. More recent experience does not support this relationship as clearly and less than 50% of patients with intestinal involvement have radiological evidence of pulmonary disease⁴. In Indo-Pakistan the introduction of antituberculous drugs has reduced the incidence of gastrointestinal tuberculosis associated with pulmonary disease to approximately 5%⁵. However, primary tuberculosis of the intestinal tract is more common⁶. The gross anatomic features are described in three forms, i.e., ulcerative, hypertrophic and mixed, depending upon the stage of development and type of infection. Early lesions are usually ulcerative, the ulcers being transverse, quite short and commonly multiple. In the hypertrophic form, which is more common in the ileocaecal area and colon than in the small bowel, the intestinal wall is massively thickened and densely fibrotic. Various radiological methods can be performed if ileocaecal tuberculosis is suspected. Plain radiographs may show signs of intestinal obstruction, perforation, enteroliths, calcified lymph nodes and ascites. Ultrasound can show ascites, enlarged paraaortic lymph nodes and sometimes ileocaecal mass, Small bowel enema has much better yield than any other investigation including conventional barium meal follow-through examination. Double contrast small bowel enema with good bowel distension can even be picked up early subtle changes at ileocaecal region. Other methods to demonstrate ileocaecal region are large bowel barium enema and peroral pneumocolon. Recent studies showed that CT has a role in conjunction with barium studies for the initial assessment of ileocaecal tuberculosis. The location as well as the intestinal and mesenteric extent of the inflammatory process are well demonstrated with CT. At the same time, evaluation of distal peritoneal, solid-organ, or retroperitoneal disease can be done⁷. However, CT is less helpful providing the anatomical details of bowel as well as early changes, as compared to barium studies.

The various features seen on small bowel enema are:

1) Ulcerations: Earliest changes are stiffness or rigidity and nodularity (Figure 1)

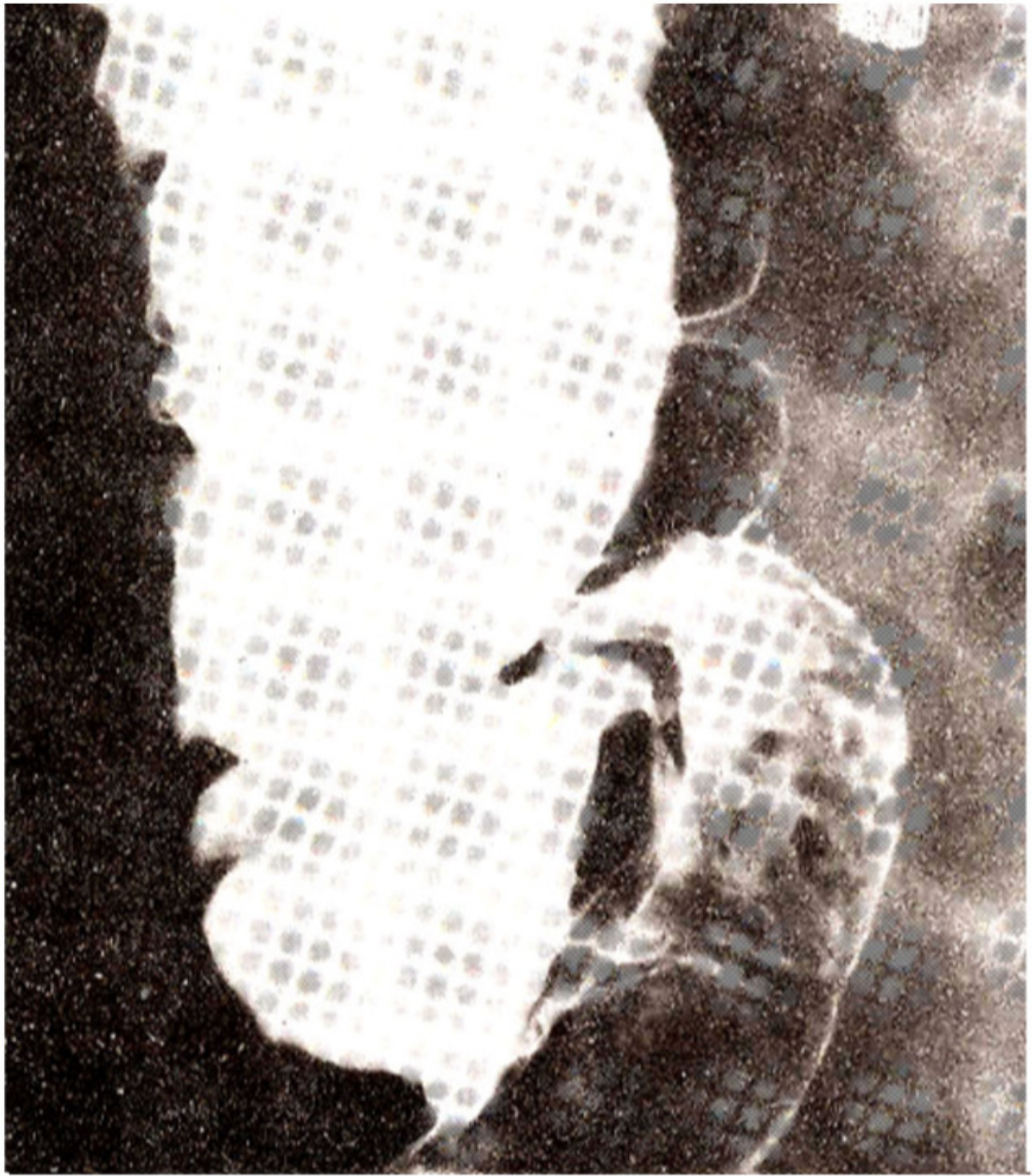


Figure 1. Early changes. Terminal ileum showing nodularity and irregularity of mucosa.

in terminal ileum⁸. Spasm and accelerated transit time in an area of ulcerative enteritis is typical in the acute phase of infection. The ulcerative lesions most commonly seen are short and multiple, giving spiculated margin to the bowel wall (Figure 2)

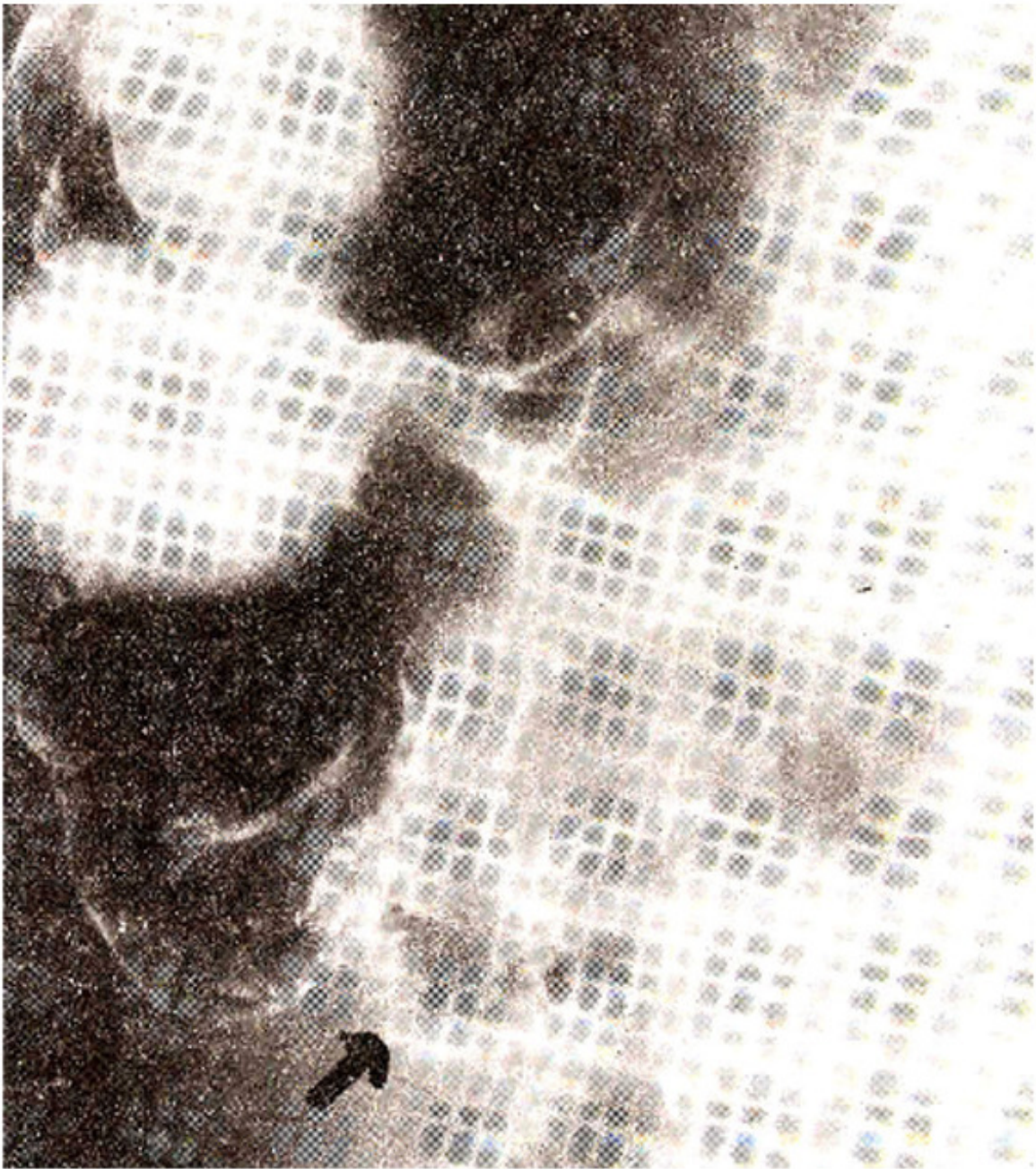


Figure 2. Ulcerations and nodularity in ileocaecal region giving spiculated margins (arrow). Loss of ileocaecal valve.

and occurring at several levels with normal intervening bowel but in rare cases may involve a long portion of intestine. The ulcers may be annular or circular or less commonly elongated (Figure 3), oval or irregular and lying transversely. Ulcers located in the more distal ileum extend as a rule to the adjacent colon.

2) Hypertrophic lesions: They are more common and appear as hourglass (Figure 4)



Figure 4. Hourglass stricture in terminal ileum (arrow)

or angulated strictures and often multiple. The preterminal ileum is circumferentially narrowed (Figure 5).

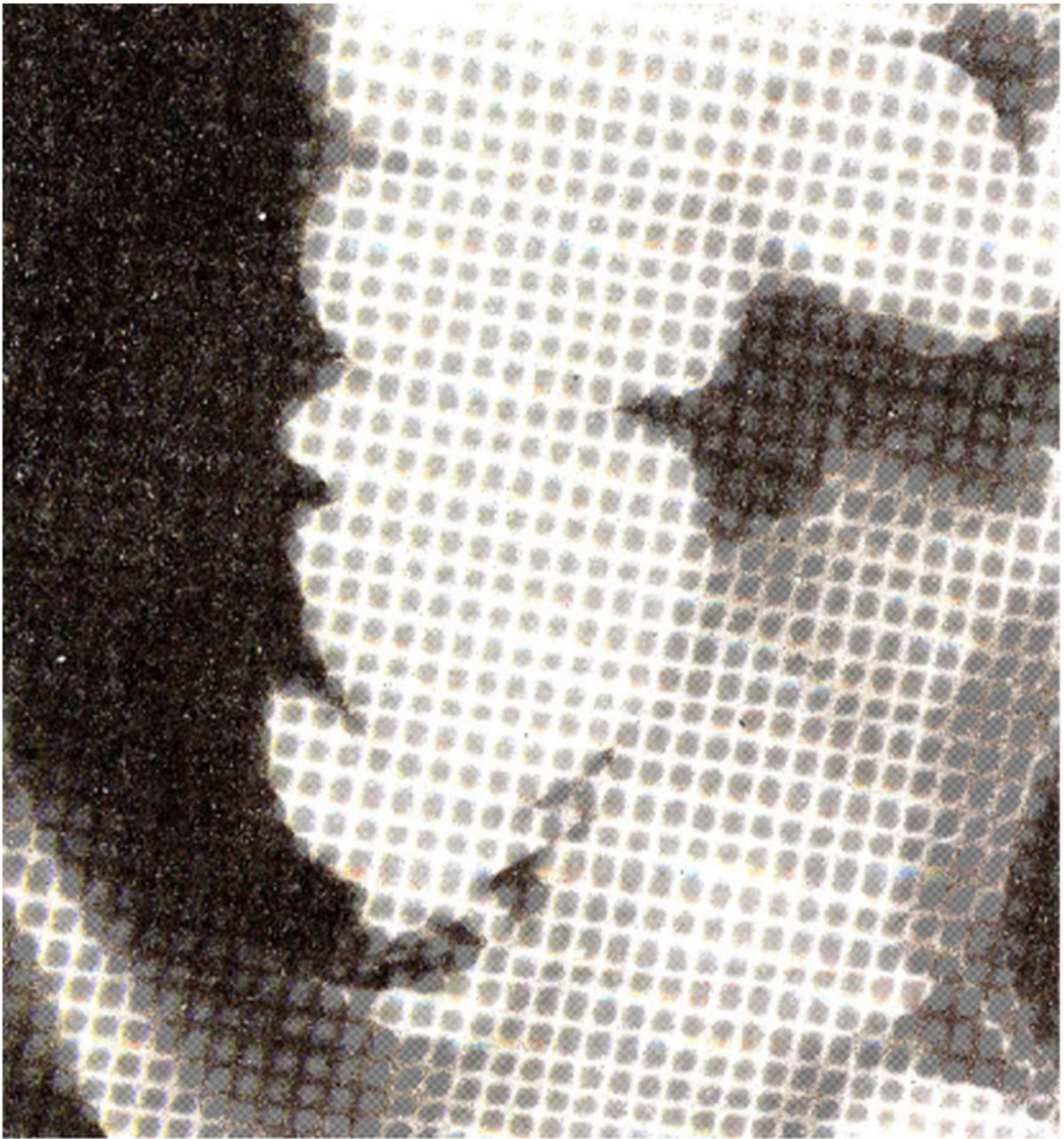


Figure 5. Prevalvular ileum showing circumferential narrowing and ulcerations.

Segmental dilatation of the intervening bowel loops seen.

3) Fixity: The coils of intestine are relatively fixed and cannot be easily separated during fluoroscopic palpation and their position remains unchanged in supine and erect positions. Fixity and adherence of coils results in hypomotility seen as prolonged transit time and dilatation.

4) Mucosal folds: Initially they become coarsened, irregular and show nodularity (Figure 1). Later the terminal ileum becomes thickened, straight and rigid with complete obliteration of the mucosal folds.

5) Ileocaecal valve: It becomes very much thickened and appears as a mass in the caecum. The valve becomes distorted if ulceration and granulation develops. There is often a wide gap between the

ileocaecal valve and the narrow ileum next to it, so called “inverted umbrella” defect (Figure 6)



Figure 6. Very thickened ileocaecal valve (inverted umbrella sign). Nodularity of mucosa and wall thickening at terminal ileum.

or Fleischer sign⁵. The loss of normal ileocaecal angle, so that the tennis ileum either runs directly or at a right angle into the caecum is again a consequence of the hypertrophic process and has been described as typical of ileocaecal tuberculosis⁹. The valve becomes incompetent and widely open.

6) Caecum: The caecum becomes scarred and contracted. Fibrosis results in shortening of the ascending colon and pulled up caecum with its coned appearance (Figure 7).



Figure 7. Narrow terminal ileum, Coned caecum and stricture in ascending colon.

The caecal recess may be more or less retracted or amputated such that the terminal ileum continuous without apparent transition into the ascending colon. The fibrotic ileum emptying directly into the ascending colon through a widely open ileocaecal valve without the visualization of contracted caecum is called Stierlin's sign¹⁰ (Figures 3 and 8).

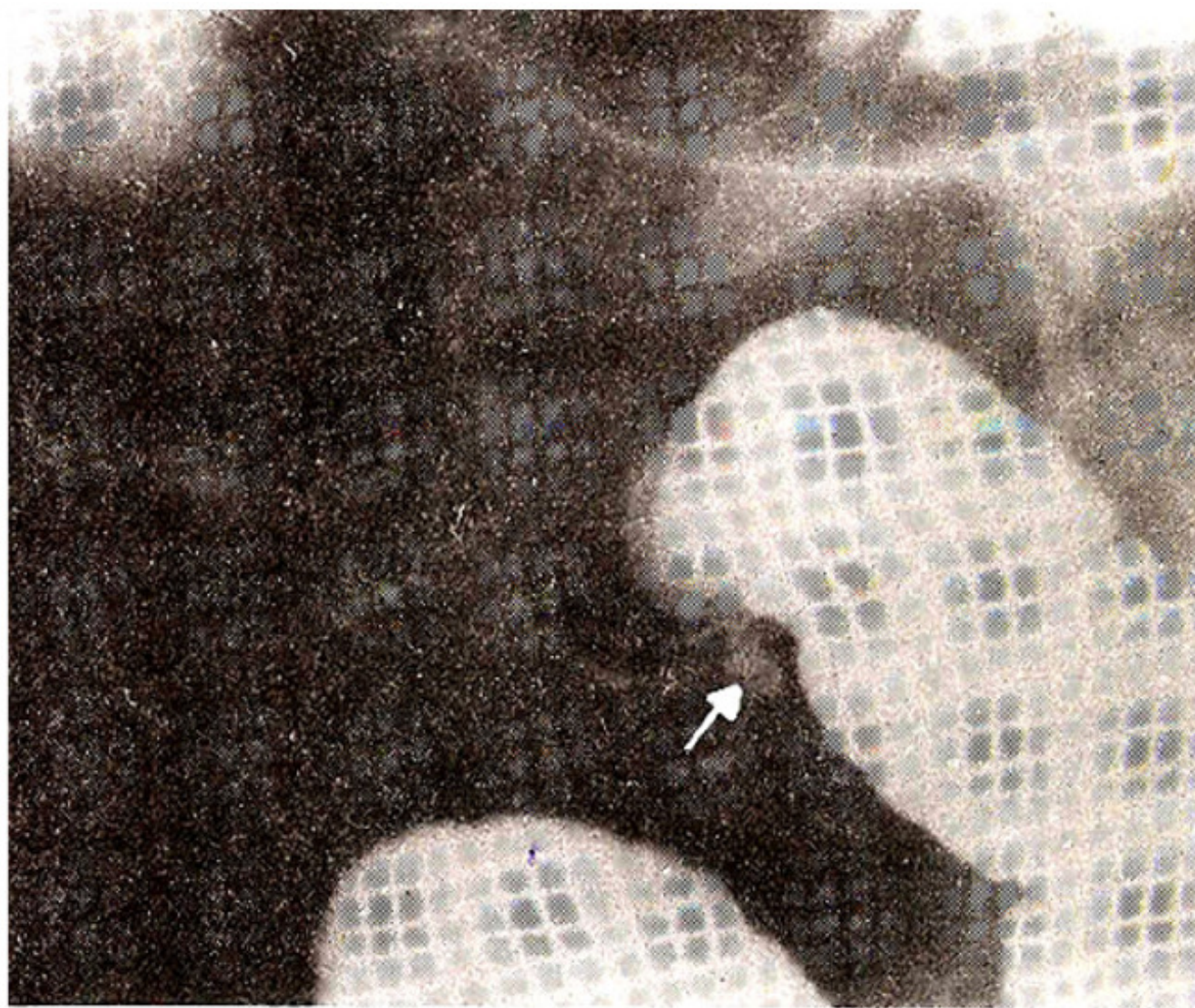


Figure 3. Loss of ileocaecal valve. Ulceration at terminal ileum. Large ulcer is seen (arrow).



Figure 8. Fibrotic caecum. Terminal ileum appears to be in direct continuity with ascending colon (Stierlin's sign).

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