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Gastrointestinal Tuberculosis Still a Challenge for Radiologists and Gastroenterologists

Abstract: Tuberculosis (TB) is a major health problem in Iran. All parts of the gastrointestinal (GI) tract can be affected by TB. Therefore, it should be included in the differential diagnoses of almost any GI diseases, and physicians should be aware of the imaging characteristics of TB in the GI tract. This is a report of 4 patients with different types of GI involvement by TB, along with its clinical pictures and imaging characteristics.

Keywords: Tuberculosis, Gastrointestinal, Mycobacterium Infections, Gastrointestinal Diseases

Introduction

Mycobacterium tuberculosis, the primary cause of tuberculosis (TB), affects one-third of the world population causing the highest mortality rate among any infectious agent.¹ In the developed countries, the reported cases of TB have increased in association with epidemics of AIDS. According to a recent report by WHO, Iran was found to be among the countries with the high prevalence of multidrug-resistant TB (MDR-TB).² Although pulmonary manifestations predominate in most cases of TB, gastrointestinal (GI) involvement may be present as a part of the multi-organ disease process or even in the absence of other identifiable sites of infection, an entity the so-called, primary GI TB. Infections of the upper GI tract are very uncommon. The most frequent site of intestinal involvement is the ileocecal region.³ In the latter condition, differentiation of the disease from Crohn's disease may be very difficult. However, abdominal TB can involve omentum, retroperitoneal lymph nodes, liver, spleen, and female genital tract. Since GI TB can imitate almost any other GI diseases, physicians should be able to recognize the imaging characteristics of the disease. Herein, we describe four patients with different patterns of GI involvement by TB and discuss their imaging characteristics, main differential diagnoses, and the ways to reach the definite diagnosis.

Case Presentation

Patient 1

A 28-year-old woman from a rural area in Northeast of Iran presented with epigastric pain and mild dysphagia to solid foods for two months. She gave a history of pulmonary TB which was treated two years before. The physical examination was non-revealing. Her plain chest radiography was normal but on barium swallow, an ulcer with a smooth margin was detected in the mid-esophagus (Figure 1). Upper GI endoscopy revealed an ulcerative lesion in the middle part of the esophagus (Figure 2). The mucosal biopsies of the lesion were reported as undifferentiated carcinoma. Her young age and a history of pulmonary TB strongly raised the possibility of other diagnoses and thus, the mucosal biopsy specimens were referred to a second pathologist. The slides revealed multiple caseating granulomas. Also, acid fast bacilli (AFB) were seen in the esophageal biopsies.



Figure 1: Barium swallow in patient 1 shows an ulcer with a smooth margin and eccentric luminal narrowing in mid-portion of the esophagus

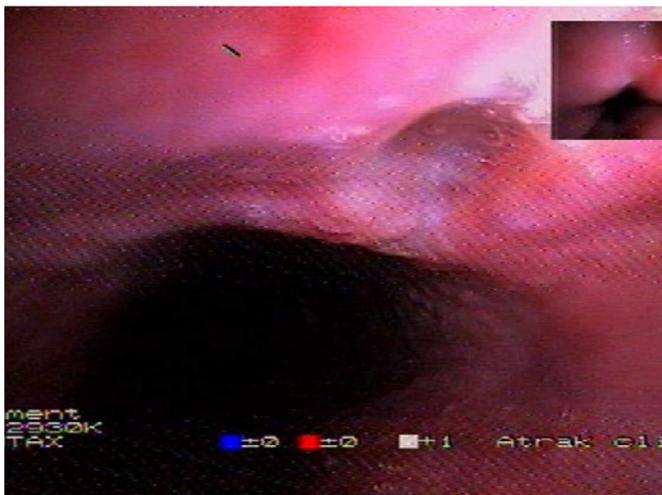


Figure 2: Upper GI endoscopy in patient 1 showing an ulcerative lesion in the middle part of the esophagus

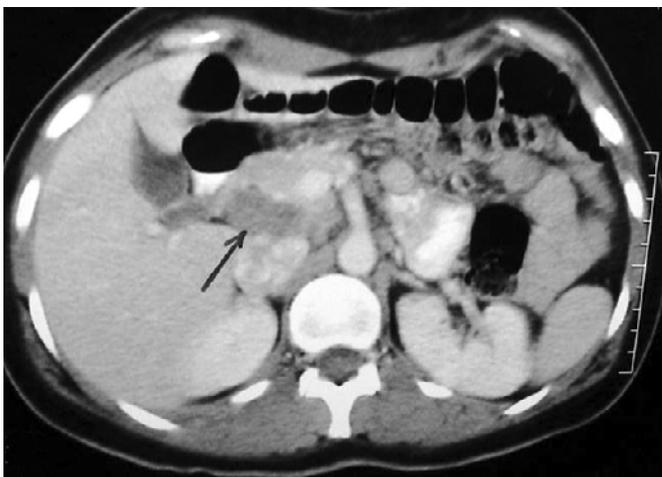


Figure 3: Abdominal CT scan of patient 2 shows peripancreatic lymph node enlargement (arrow).

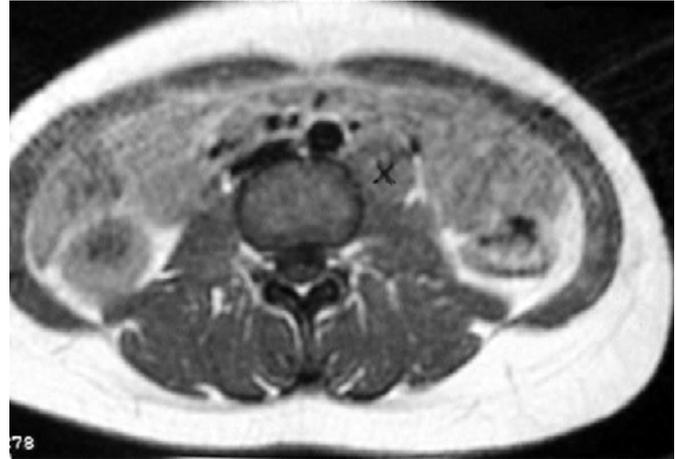


Figure 4: T₁-weighted abdominal MR image in patient 2 revealing para-aortic lymphadenopathy (crossed lines).

Anti-TB drug therapy (two months of isoniazid, rifampin, ethambutol, and pyrazinamide, followed by four months of isoniazid and rifampin) was instituted. Her symptoms completely resolved, thereafter, and the esophagus appeared normal on follow-up endoscopy.

Patient 2

A 45-year-old woman from Tehran, presented with fatigue, dizziness, and peri-umbilical abdominal pain. Her physical examination was normal. Laboratory examinations revealed a hemoglobin level of 12.4 g/dL, an erythrocyte sedimentation rate (ESR) of 40 mm/hr, and a positive tuberculin skin test (PPD). Upper GI endoscopy was normal. Abdominal CT scan showed para-aortic lymphadenopathies (Figure 3) which were confirmed by the abdominal MRI (Figure 4). Laparoscopic biopsies of the lymph nodes demonstrated caseating granulomas, and the patient was treated with anti-TB drugs for six months. One year later, she was symptom-free.

Patient 3

A 28-year-old woman from northwestern Iran, presented with abdominal pain, occasional fever, and a 12-kg weight loss within six months. Physical examination revealed mild hepatosplenomegaly. She had a normocytic anemia; a hemoglobin level of 8 g/dL, and a positive tuberculin skin test. On abdominal CT scan, there was thickening of ileal loops in the right lower quadrant (Figures 5 and 6). Small bowel series revealed narrowing in the terminal ileum along with dilatation of the proximal ileal loops (Figures 7 and 8). The diagnosis of small intestinal TB was made on diagnostic laparotomy. The standard six-month anti-TB treatment was instituted and she improved clinically after two months of treatment.

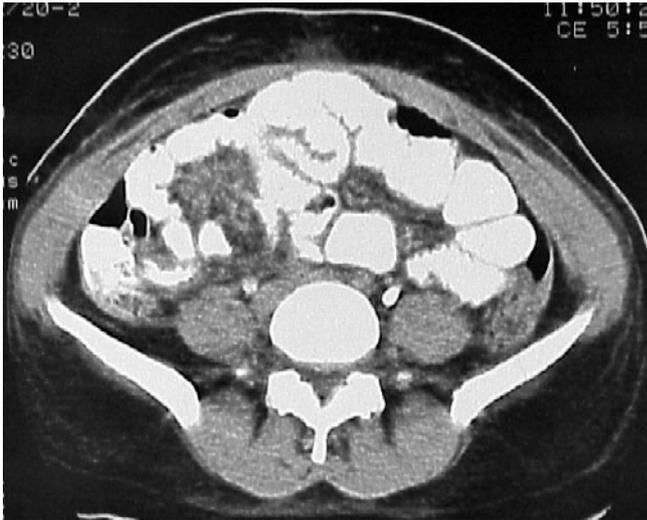


Figure 5: Abdominal CT scan in patient 2 showing irregularity and mural thickening in terminal ileal loop and cecum.

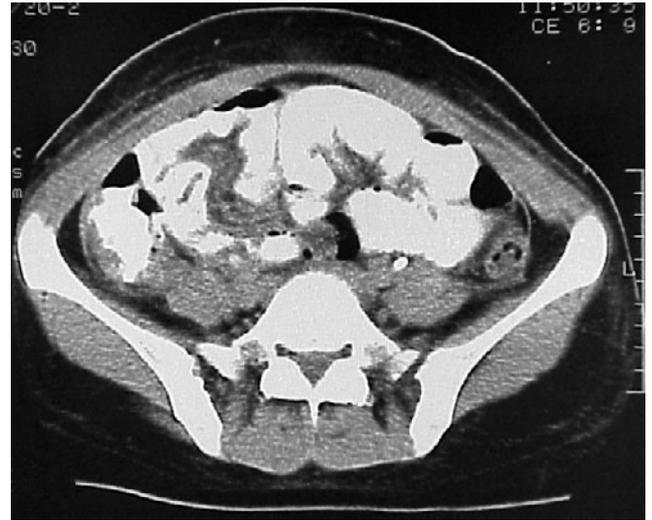


Figure 6: Abdominal CT scan in patient 2 shows concentric mural thickening of terminal ileal loops together with luminal dilatation in proximal loops. Pneumatosis intestinalis is also evident.



Figure 7: Small intestinal follow-through of the patient 2 shows dilatation of ileal loops along with segmental narrowing.

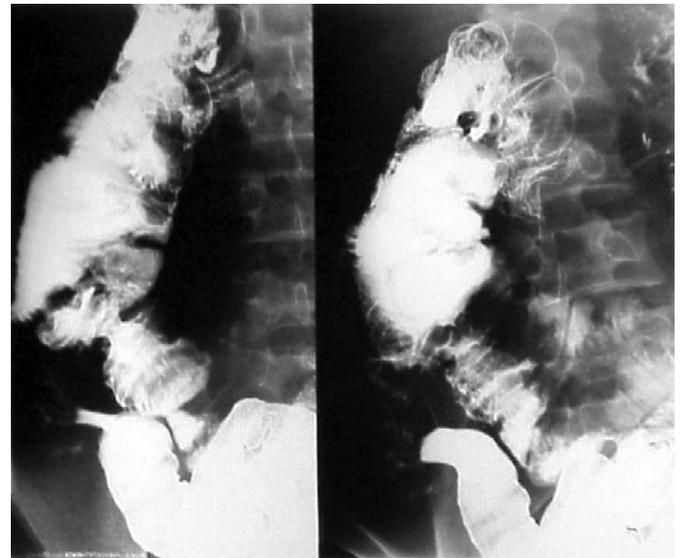


Figure 8: Spot view of the terminal ileum in patient 2 showing mucosal irregularity, thickening and distortion in terminal ileum. Reduced distensibility of the cecum is also seen.

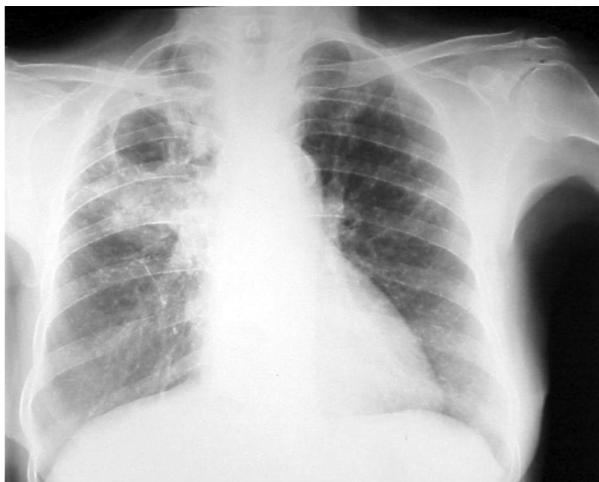


Figure 9: Chest radiography in patient 3 reveals a thick-walled cavity along with micronodular patterns in the right upper lobe.

Patient 4

A 55-year-old woman from Northwest of Iran, was admitted to hospital because of fever, cough, night sweating, and vague abdominal pain of two months duration. Laboratory data indicated a hemoglobin level of 10 g/dL, ESR of 90 mm/hr, and a positive tuberculin skin test. Her chest radiography revealed a cavitory lesion in the upper lobe of the right lung (Figure 9). Abdominal ultrasonography showed multiple para-aortic lymphadenopathies (Figure 10). Her sputum smear was positive for AFB. A six-month course of anti-TB drugs was instituted and her symptoms resolved completely. On follow-up ultrasonography, there was no para-aortic lymph node enlargement.

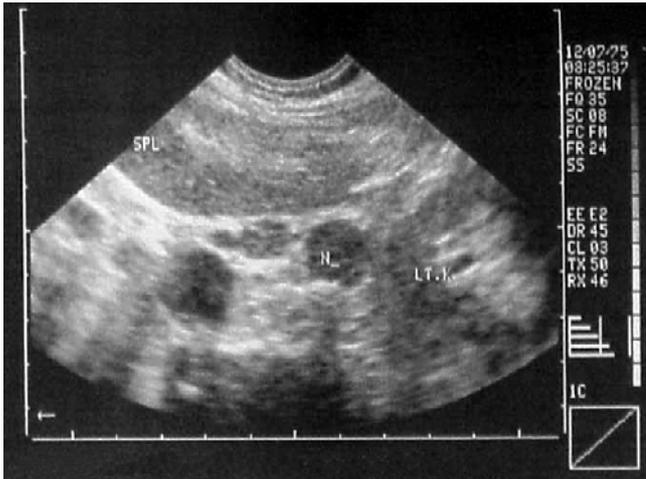


Figure 10: Abdominal sonography in patient 3 showing significant lymph nodes in the splenic hilum and para-aortic region.

Discussion

In esophageal TB the middle third of the esophagus is affected most commonly.⁴ In a recent review of ten patients with esophageal TB, barium contrast esophagography showed ulceration, mucosal irregularity, or esophagotracheal fistula. CT scan of the thorax is helpful to establish the secondary nature of the disease (*e.g.*, mediastinal lymphadenopathy).⁵ In the first patient, esophageal TB presented as luminal narrowing and ulceration with a smooth margin in the mid-esophagus (Figure 1). We have not performed a thoracic CT scan for patient 1, but eccentric luminal narrowing in the patient was perhaps, due to an external compression exerted by mediastinal lymph nodes.

Endoscopic biopsies of the esophageal lesion can reveal granuloma in almost 60%, and positive AFB in 20% of the patients.⁵ The remainder may be diagnosed through evaluation of other involved sites (*e.g.*, cervical lymph node biopsy or mediastinal lymph node aspiration biopsy).

Abdominal lymphadenopathy is one of the commonest findings of TB on abdominal CT scan. It is seen in up to two-thirds of patients with abdominal TB and usually affects multiple lymph node groups at the same time.⁷ Mesenteric and peripancreatic groups are involved most often (Figures 3 and 4).

Despite the common presentations of intestinal TB and Crohn's disease, their ultimate natural histories are completely different, as are their treatments. Appropriate anti-TB treatment completely cures most cases of TB ileocolitis, whereas Crohn's disease is a progressive relapsing illness unaffected by anti-TB treatment.⁶

The commonest finding on the CT scan of the intestinal TB is mural thickening at the ileocecal region, either limited to the terminal ileum or cecum, or more commonly, concurrent involvement of both

regions (Figure 5). Segmental mural thickening of the ileal loops with proximal dilation may also be seen (Figures 6 and 7). The presence of such lesions in combination with ileocecal involvement should strongly suggest the diagnosis of TB.⁷ The presence of ascites also favors a diagnosis of TB, since ascites is uncommon in Crohn's disease. Colonoscopic findings of ileocecal TB include ulcers, strictures, nodules, pseudo-polyps, and a deformed ileocecal valve. The endoscopic finding of aphthous ulcers with normal surrounding mucosa, or the presence of cobblestoning more favors a diagnosis of Crohn's disease. A destroyed gaping ileocecal valve is more likely to be caused by TB than Crohn's. Colonoscopy with biopsy is the most useful non-operative diagnostic modality for ileocecal TB. Some histological parameters can help differentiate TB from Crohn's. Granulomas associated with TB tend to be large and confluent, often with caseative necrosis. In contrast, granulomas associated with Crohn's are infrequent, small, non-confluent, and non-caseating. Microgranulomas, focally enhanced colitis, and a high prevalence of chronic inflammation in endoscopically normal appearing areas also characteristics for Crohn's.⁶ Moreover, polymerase chain reaction (PCR) for *M. tuberculosis* can be helpful. It was shown that PCR becomes positive in 64% of specimens taken from those with intestinal TB, while it becomes positive in none of Crohn's disease.⁸

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