

## A Case Series on Abdominal Tuberculosis

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Received: 16 Jan 2025; Revised: 4 Aug 2025; Accepted: 7 Aug 2025; Available online: \*\*\*

### Summary

Tuberculosis (TB) is a global health concern, primarily affecting the lungs. However, extrapulmonary manifestations of TB can occur, including abdominal TB, which is a rare but serious complication. We present a case series of three patients with abdominal TB, the diagnostic difficulties encountered, the varying nature of the presentation, and different approaches taken to arrive at a definite diagnosis and subsequent treatment. The first case is of a 17-year-old human immunodeficiency virus (HIV)-negative female patient on treatment for pulmonary TB who developed intestinal obstruction; the second case is of an HIV-positive male patient on treatment who presented with abdominal pain and distension for 3 months; and the third case is of an HIV-positive male patient on treatment presenting with acute abdominal pain whose initial evaluation was complicated by an imaging diagnosis of intussusception.

These cases highlight the challenging nature of abdominal TB and emphasize the importance of considering it as a differential diagnosis in patients with obstructive symptoms, even in immunocompetent individuals on appropriate treatment.

**Keywords:** Abdominal tuberculosis, Peritonitis, Laparoscopy, Laparotomy, Case series

Ann Afr Surg. 2025; 22(4): \*\*-\*\*\*

**DOI:** <http://dx.doi.org/10.4314/aas.v22i4.6>

**Conflict of interest:** None

**Funding:** None

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### Introduction

Tuberculosis (TB) is a major global health problem, with a high burden in developing countries as reported by the World Health Organization (1). While pulmonary involvement is the most common presentation, extrapulmonary TB, including peritoneal involvement, is relatively uncommon. Abdominal TB affects 10–30% of patients with pulmonary TB (2). Abdominal TB is challenging to diagnose due to its nonspecific clinical features, often mimicking other common causes of acute abdomen (3). The prevalence of abdominal TB has been

increasing. This has been attributed to immunocompromised states, such as human immunodeficiency virus (HIV) infection and alcoholic liver disease, and migration to endemic areas (4). We present a case series of abdominal TB seen at our facility, showcasing the varied clinical presentation, the dilemma in diagnosis, especially in our resource-limited setting, and the various surgical approaches used in the management of this condition. The patients were treated

at a suburban referral hospital in Central Kenya over a 1-year period.

### Case 1

A 17-year-old HIV-negative female patient, previously diagnosed with pulmonary TB and received treatment for 6 months, presented with a 1-week history of abdominal pain, distension, and vomiting along with constipation for the preceding 3 days. She had no history of previous abdominal surgery. She had experienced similar symptoms on and off in the preceding month, with a low-grade fever and scanty stools. Her vital signs were a blood pressure of 125/75 mmHg, a heart rate of 76 beats per minute, a temperature of 37.1 °C, and a respiratory rate of 18 breaths per minute. Physical examination revealed abdominal tenderness and distension.



Figure 1. Abdominal X-ray showing multiple air–fluid levels (single arrow) and dilatation of small bowel (double arrow).

Laboratory investigations showed mild leukocytosis of 13,000/ $\mu$ L and an elevated C-reactive protein level of 76

mg/L. An abdominal X-ray (Figure 1) revealed dilated small bowel loops (double blue arrow) with multiple air–fluid levels (single blue arrow). The patient could not afford a computed tomography (CT) scan of the abdomen.

A diagnosis of small bowel obstruction was made and she was admitted for non-operative management that included nasogastric tube decompression, intravenous fluid resuscitation with crystalloid solutions, intravenous antibiotics, urethral catheterization with input and output monitoring, serial abdominal examinations, and X-rays. Initially, she responded well to the intervention and passed stool on the second day but gradually developed worsening abdominal pain and distension and had a feculent nasogastric output on the fifth day.



Figure 2. Intraoperative findings of granulomatous mass (arrowhead).

Due to the worsening of intestinal obstruction noted clinically, the patient underwent an emergency laparotomy. Intraoperatively, she had extensive small bowel adhesions, mesenteric tubercles of moderate to large size, and large granulomatous masses causing complete obstruction of the terminal ileum (arrowhead) (Figure 2).

The affected bowel segment was freed from the inflammatory mass. The appendix was normal and a

drain was left in situ. A histopathological evaluation of the biopsied mass revealed tuberculous granulomatous inflammation with a positive Ziehl–Neelsen staining. The drain was removed on post-operative day 3. She was started on oral feeds, physiotherapy, and ambulation and discharged 7 days later in good general condition. She was then restarted on a drug regimen consisting of isoniazid, rifampicin, ethambutol, and pyrazinamide, awaiting culture results. She has been doing well and started gaining weight and going to school as before.

## Case 2

A 70-year-old male patient presented to our hospital with a history of progressively worsening abdominal pain and distension over the past 3 months. The pain was initially mild and diffuse, accompanied by a weight loss of approximately 7 kg from a baseline of 85 kg over the 3 months before admission. The patient was HIV positive on treatment. He had good compliance with his medications.

Notably, the patient denied any respiratory symptoms; however, he reported alterations in bowel habits, with decreased frequency of bowel movements and scanty stools for the past 2 weeks.

Over the last 2 weeks preceding his admission, the abdominal pain, predominantly localized to the right iliac fossa, intensified and became severe. The patient's appetite had decreased significantly, and abdominal distension persisted. His bowel habits remained altered, and he noted an overall decline in energy levels. The patient had sought medical attention at the surgical outpatient service initially, where routine laboratory tests were performed. The initial lab results, including complete blood count, liver function tests, and renal function tests, were within normal limits. The abdominal CT scan done revealed a gross accumulation of ascitic fluid within the peritoneal cavity, and the appendix was not visualized clearly, raising concerns for acute complicated appendicitis. The patient was severely dehydrated and pale and was admitted for resuscitation, evaluation, and further management. Despite the imaging findings suggestive of appendicitis, the patient's clinical history, age, and presentation raised suspicions of an alternative diagnosis. To explore this

further, a colonoscopy was performed, which revealed no significant abnormalities within the colon. This unexpected result, combined with the patient's ongoing symptoms and unclear diagnosis, led the team to consider other potential causes. A chest X-ray was normal. GeneXpert testing of sputum was negative, further confounding the diagnostic process. The lack of a definitive diagnosis and the patient's worsening clinical condition prompted the decision to proceed with diagnostic laparoscopy. Intraoperatively, mild grade 1 bowel adhesions, serous ascites, and widespread small peritoneal tubercles were observed. Biopsies of the peritoneal tubercles and ascitic fluid were obtained and sent for histopathological and biochemical analyses.

Based on the clinical presentation, laparoscopic findings, and suspicion of TB, the decision was made to initiate the patient on a treatment regimen consisting of isoniazid, rifampicin, ethambutol, and pyrazinamide. Subsequent histopathological examination of the peritoneal tubercles confirmed the presence of caseating granulomas consistent with TB. The biochemical analysis of the ascitic fluid showed elevated levels of adenosine deaminase (ADA), providing further support for a tuberculous etiology. The patient's post-operative course was uneventful, and his symptoms gradually improved on treatment. He continued to make progress during his hospital stay and subsequent follow-up visits, and he currently reports no further abdominal symptoms.

## Case 3

A 41-year-old male patient presented to the emergency department with a 1-day history of acute central abdominal pain, distension, and vomiting. He denied any recent changes in bowel habits, weight loss, or respiratory symptoms. The patient had no prior history of TB or other significant medical conditions. An abdominal ultrasound revealed ileo-ileal intussusception, and a contrast-enhanced CT of the abdomen showed a thickened right colon wall with contrast enhancement and multiple small pulmonary nodules but no evidence of intussusception. These findings raised concerns for possible metastatic colon carcinoma. A colonoscopy was performed, revealing a

large circumferential nodular mass of the ascending colon extending to the cecal region.

A histopathological examination of the biopsy taken from the affected area showed granulomatous inflammation, raising suspicion of TB rather than malignancy. The carcinoembryonic antigen level was 2.62, which was within normal limits. The presence of multiple pulmonary nodules complicated the diagnostic landscape, as metastases from colon carcinoma or other malignancies were considered. He could not afford a lung biopsy. Given the inconclusive findings and the unexpected histopathological result, a multidisciplinary approach was adopted. Infectious disease specialists were consulted, and based on the clinical presentation, imaging findings, and the presence of granulomatous inflammation, a diagnosis of abdominal TB was considered. The patient was started on a treatment regimen consisting of isoniazid, rifampicin, ethambutol, and pyrazinamide. Following the initiation of treatment, the patient's abdominal symptoms gradually improved. Serial imaging and clinical assessments showed improvement in the thickened right colon wall. The patient's pulmonary nodules were closely monitored, and serial imaging demonstrated stable appearances without progression. He is currently doing well without any abdominal or chest symptoms.

## Discussion

Abdominal TB is an uncommon extrapulmonary manifestation of TB, characterized by the involvement of the peritoneum, gastrointestinal tract, lymph nodes, and solid organs. It can occur through hematogenous spread from primary pulmonary TB or by direct extension from abdominal organs. The clinical presentation is often nonspecific, with abdominal pain, distension, and fever being the most common symptoms. These features can mimic various intra-abdominal pathologies, leading to delayed diagnosis and increased morbidity (5). In the first case, the patient's clinical history of pulmonary TB and the presence of large tubercles causing intestinal obstruction were the key diagnostic clues. The decision to operate was confounded by the early resolution of symptoms, and the absence of a previous surgery made a diagnosis of small

bowel adhesion obstruction unequivocal. Despite receiving appropriate anti-TB therapy for 6 months, the patient developed tuberculous granulomatous inflammation, indicating treatment failure or possible drug resistance. Treatment failure can occur due to various factors, including poor drug compliance, drug resistance, inadequate dosing, or compromised host immunity (6).

The occurrence of abdominal TB in an immunocompetent host raises several important considerations. First, it highlights that abdominal TB can affect individuals without significant immunosuppression (6). Second, the presence of large tubercles causing intestinal obstruction may suggest an aggressive form of the disease. This may be related to the host's immune response or the virulence of the infecting strain. In the other two cases, the known immune status of the patient was the predisposing factor, yet their clinical progress was less fulminant. Due to nonspecific clinical, radiological, and endoscopic findings, diagnosing abdominal TB continues to be a challenge. Hence, a precise diagnosis is needed (7).

The other two cases illustrate the burden of TB in immunocompromised patients. Despite effective antiretroviral therapy, the incidence of TB remains high. Their clinical courses were less fulminant compared to the first case; however, TB remains a leading cause of morbidity and mortality in this patient population. The third case also demonstrates how TB can mimic a malignancy or other intra-abdominal disorders. Management of abdominal TB involves a combination of medical and surgical interventions, and each case is individualized due to the lack of published protocols on tuberculous peritonitis. The management is dependent upon patients' presentation. Medical intervention with anti-TB therapy is essential in all cases of abdominal TB. In case 3, the resolution of symptoms, including ileo-ileal intussusception, was interesting. The presence of peritoneal or mesenteric inflammation or advanced intestinal TB was the likely lead point of the intussusception (8).

The establishment of a definitive diagnosis of abdominal TB may be unachievable. However, in the presence of a high index of suspicion due to clinical and diagnostic

findings, elevated ascitic fluid ADA, and consistent histopathology (granulomatous inflammation—caseating or not), with nondiagnostic mycobacterial culture, an empiric trial of antitubercular therapy is appropriate. In cases 2 and 3, a definitive diagnosis of TB was not established; however, the imaging findings and histopathological diagnosis of chronic granulomatous inflammation supported the diagnosis of abdominal TB (3). In all cases, laparoscopy, endoscopy, or laparotomy was performed for the diagnosis and management of the complications. Obtaining a peritoneal biopsy for microbiological and/or histological confirmation is considered the gold standard for diagnosis (4, 9).

# Conclusion

These cases highlight the difficulty in diagnosing abdominal TB. The presentation is varied and nonspecific. Exploratory laparotomy, endoscopy, and laparoscopy can aid in the diagnosis and management of complications. Therefore, surgeons should consider abdominal TB in patients presenting with abdominal pain and living in a TB-endemic region.

# Author contributions

DMN led in conceptualization, data curation, formal analysis, investigation, and in writing of the original draft. AW led in writing, reviewing & editing of the original draft. AW and EN led in funding acquisition. AW, DN and EN led in resources. DN led in supervision. PMM supported.

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