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Fibrotic Abdominal Tuberculosis Presenting as Acute Small Bowel Obstruction Due to Multiple Bands in a Virgin Abdomen: case report

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Case Report

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Abstract

Introduction

Small bowel obstruction (SBO) is a common surgical emergency, most frequently caused by postoperative adhesions. In patients with a “virgin abdomen,” defined as no prior abdominal surgery, trauma, or radiation, the aetiology is less predictable and often raises concerns for malignancy or internal hernia. Abdominal tuberculosis (ATB), particularly the fibrotic-fixed subtype, is a rare but important cause of adhesive SOB and may present with nonspecific clinical and radiological findings.

Case Presentation

We report the case of a 45-year-old Sudanese male with a history of treated pulmonary tuberculosis who presented with a 7-day history of colicky abdominal pain, vomiting, fever, and constipation. Clinical examination revealed tachycardia and localized abdominal tenderness without surgical scars. Contrast-enhanced computed tomography suggested small bowel intussusception without ascites. Conservative management failed, prompting an exploratory laparotomy. Intraoperatively, multiple dense fibrotic adhesions and constricting bands involving the distal ileum were identified in a virgin abdomen. Adhesiolysis was performed, and a mesenteric lymph node biopsy was obtained. Histopathology demonstrated caseating granulomatous inflammation consistent with tuberculosis. The patient was commenced on anti-tubercular therapy and had an uneventful recovery.

Conclusions

Fibrotic abdominal tuberculosis should be considered in the differential diagnosis of adhesive SBO in patients with a virgin abdomen, particularly in endemic regions. Radiologic findings may be misleading, and definitive diagnosis often requires histopathological confirmation. Early surgical intervention combined with anti-tubercular therapy leads to favorable outcomes.

INTRODUCTION

Small bowel obstruction (SBO) accounts for approximately 12–16% of emergency surgical admissions worldwide and remains a major cause of morbidity [1]. Postoperative adhesions are responsible for the majority of cases, accounting for up to 75% of cases [2]. However, in patients without prior abdominal surgery, the so-called “virgin abdomen”, the etiological spectrum differs significantly and includes congenital bands, internal hernias, neoplasms, and inflammatory bowel disease [3]. Despite this, recent evidence suggests that adhesions may still occur in the virgin abdomen, challenging traditional assumptions. Infectious causes, particularly abdominal tuberculosis (ATB), are increasingly recognized in endemic regions and among high-risk populations [4].

ATB represents approximately 1–3% of all tuberculosis cases and can involve the gastrointestinal tract, peritoneum, lymph nodes, and solid organs. but remains prevalent in endemic areas. Peritoneal tuberculosis is classically characterized into three forms: wet-ascitic, fibrotic-fixed, and dry-plastic [5].

The fibrotic-fixed type is characterized by dense adhesions, matted bowel loops, and mesenteric thickening, often with minimal or absent ascites, making diagnosis particularly challenging [6].

We report a rare case of fibrotic abdominal tuberculosis causing adhesive small bowel obstruction in a virgin abdomen, with imaging suggestive of intussusception. This case is notable because there was no prior surgical history despite the presence of dense adhesions, and the radiologic appearance was consistent with intussusception. It contributes to the increasing evidence that tuberculosis can be an overlooked cause of adhesive SBO in a virgin abdomen and highlights the need to consider infectious causes in atypical cases to prevent diagnostic delays and inappropriate treatment.

CASE PRESENTATION

A 45-year-old Sudanese male from a tuberculosis-endemic area presented with a 7-day history of progressive colicky abdominal pain localized to the right paraumbilical region. The pain was associated with fever, nausea, recurrent vomiting, and absolute constipation. There was no history of prior abdominal surgery or trauma.

The patient had been treated for sputum-positive pulmonary tuberculosis one year prior and had completed a full course of anti-tubercular therapy. He resided in a region with a high prevalence of tuberculosis in eastern Sudan. There was no known family history of gastrointestinal or malignant disease, and no relevant psychosocial risk factors aside from endemic exposure.

On examination, he appeared cachectic with a weight of 46 kg and height of 176 cm (body mass index 14.9 kg/m²). He was tachycardic (110 beats per minute), normotensive (110/70 mmHg), and had an oxygen saturation of 95% on room air. He was afebrile at presentation.

Chest examination revealed reduced air entry on the right side. Abdominal examination demonstrated mild distension and localized tenderness in the right paraumbilical region without guarding or rebound tenderness. No surgical scars were present. These findings were consistent with subacute small bowel obstruction without peritonitis.

Laboratory investigations showed anemia (hemoglobin 9.8 g/dL) with a normal white blood cell count and platelet count. Renal function tests revealed mild impairment (creatinine 1.5 mg/dL; urea 74 mg/dL). Viral screening for HIV, hepatitis B surface antigen, and hepatitis C virus was negative.

Abdominal ultrasonography suggested possible chronic intussusception. Contrast-enhanced computed tomography (CT) demonstrated a bowel-within-bowel configuration in the right paraumbilical region, consistent with small bowel intussusception, along with clustered bowel loops and no significant ascites

(Fig. 1). The main differential diagnoses included intussusception, adhesive small bowel obstruction, and neoplastic pathology.

Initial management included bowel rest, nasogastric decompression, intravenous fluid resuscitation, electrolyte correction, and broad-spectrum antibiotics. Despite conservative management, the patient showed no clinical improvement, necessitating surgical intervention. An exploratory laparotomy was performed. Intraoperatively, multiple dense fibrotic adhesions and constricting bands involving the distal ileum were identified (Fig. 2). The bowel loops were matted and friable despite the absence of prior surgical intervention. Adhesiolysis was performed to relieve the obstruction. Two incidental serosal injuries occurred and were repaired primarily. A mesenteric lymph node biopsy was obtained.

Histopathological examination revealed caseating granulomatous inflammation, which confirmed the diagnosis of fibrotic abdominal tuberculosis causing adhesive small bowel obstruction. (Fig. 3). The therapeutic intervention included both surgical (adhesiolysis) and pharmacological (anti-tubercular therapy) management. No postoperative complications or adverse events were observed, and the patient demonstrated good adherence to therapy.

The final diagnosis was fibrotic abdominal tuberculosis presenting as adhesive small bowel obstruction in a virgin abdomen. The patient underwent exploratory laparotomy with adhesiolysis followed by anti-tubercular therapy, resulting in complete recovery without complications.

DISCUSSION

Small bowel obstruction (SBO) in a virgin abdomen represents a significant diagnostic challenge due to the wide and often unpredictable range of underlying etiologies. While malignancy and internal hernias are frequently prioritized in the differential diagnosis, infectious causes such as abdominal tuberculosis (ATB) must also be considered, particularly in endemic regions [7].

Preoperative diagnosis of ATB is difficult because of its nonspecific clinical presentation and variable radiological features. In the present case, contrast-enhanced computed tomography (CT) suggested intussusception based on a bowel-within-bowel configuration. However, intraoperative findings did not confirm true intussusception. This discrepancy may be explained by transient telescoping of bowel loops, pseudo-intussusception due to matted loops, or distortion of bowel anatomy caused by dense adhesions. Such radiologic pitfalls are well recognized and highlight the limitations of imaging in fibrotic forms of ATB.

Unlike the wet-ascitic type, the fibrotic-fixed subtype often lacks significant ascites, making radiological diagnosis particularly challenging. Instead, CT findings may include clustered bowel loops, mesenteric thickening, and mural enhancement. These features are nonspecific and may mimic malignancy, Crohn’s disease, or peritoneal carcinomatosis [9]. Consequently, radiological interpretation alone is often insufficient for definitive diagnosis.

The pathophysiology of ATB involves hematogenous or lymphatic dissemination of *Mycobacterium tuberculosis* to the peritoneum, followed by a delayed hypersensitivity reaction. This process leads to granuloma formation, caseation, and progressive fibrosis [6, 8]. Over time, dense interloop adhesions, fibrotic bands, and matted bowel loops develop, ultimately resulting in mechanical obstruction, as observed in this case. This pathophysiological mechanism provides a clear explanation for the development of adhesive obstruction in the absence of prior surgery, supporting the causal relationship between tuberculosis and the patient's presentation.

The patient's history of previously treated pulmonary tuberculosis is clinically relevant. Abdominal involvement may occur due to reactivation of latent infection or residual dissemination from prior disease. Additionally, severe malnutrition, as reflected by the patient's low body mass index, likely contributed to immune compromise and predisposed the patient to disease reactivation. These factors further strengthen the plausibility of tuberculosis as the underlying etiology.

The management of SBO in a virgin abdomen remains controversial. While conservative treatment may be appropriate in selected cases, early surgical exploration is often indicated when symptoms persist, the diagnosis remains uncertain, or complications such as ischemia are suspected. In this patient, surgery served both diagnostic and therapeutic purposes. The operative strategy in tuberculous obstruction should prioritize limited adhesiolysis, preservation of bowel length, and avoidance of unnecessary resection. The friability of tuberculous tissue increases the risk of intraoperative injury, as evidenced by the serosal tears encountered in this case.

Definitive diagnosis of ATB frequently requires histopathological confirmation. Surgical exploration is particularly indicated in cases complicated by obstruction, perforation, or ischemia [10]. In our patient, limited adhesiolysis and repair were sufficient to relieve the obstruction without bowel resection.

Surgical management must be complemented by anti-tubercular therapy to ensure complete eradication of infection and prevent recurrence. With timely intervention and appropriate medical treatment, outcomes are generally favorable.

This case has several strengths. It demonstrates a rare presentation of fibrotic-fixed abdominal tuberculosis causing adhesive small bowel obstruction in a virgin abdomen, confirmed by histopathology. The case also highlights an important radiologic pitfall in which CT findings mimicked intussusception, underscoring real-world diagnostic challenges. Additionally, the combined surgical and medical management approach with a favorable outcome adds practical clinical value.

However, certain limitations should be acknowledged. This is a single case report, limiting generalizability. Preoperative diagnostic confirmation of tuberculosis was not achieved, reflecting reliance on intraoperative and histopathological findings. Furthermore, advanced diagnostic modalities such as PCR or culture for *Mycobacterium tuberculosis* were not reported, which could have provided additional microbiological confirmation.

CONCLUSIONS

Abdominal tuberculosis should be considered in patients presenting with small bowel obstruction in a virgin abdomen, particularly in endemic regions or in those with a prior history of tuberculosis. The fibrotic-fixed form may lack typical clinical and radiologic features, leading to diagnostic uncertainty and potential misinterpretation as other conditions such as intussusception. This case underscores the importance of maintaining a high index of suspicion, recognizing the limitations of imaging, and utilizing surgical exploration and histopathology when necessary. Early diagnosis and combined surgical and medical management are essential for optimal outcomes.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal

Availability of data and materials

All relevant data are included within the article.

Competing interests

The authors declare that they have no competing interests.

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Authors’ contributions

HMH was primarily responsible for the patient's surgical management. HMH, MEEI, and WMAJ drafted the initial manuscript. HMH, MEEI, and WMAJ contributed to the study’s conceptualization and design, conducted the literature review, and critically revised the manuscript for important intellectual content. All authors read and approved the final manuscript and agree to be accountable for all aspects of the work.

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Figures

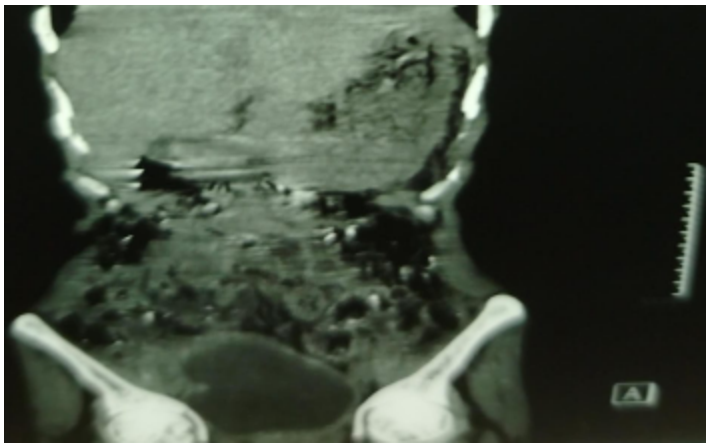


Figure 1

The CT findings were suggestive of intussusception due to a suspected bowel-within-bowel configuration



Figure 2

Exploration revealed multiple dense fibrous adhesive bands causing small bowel obstruction

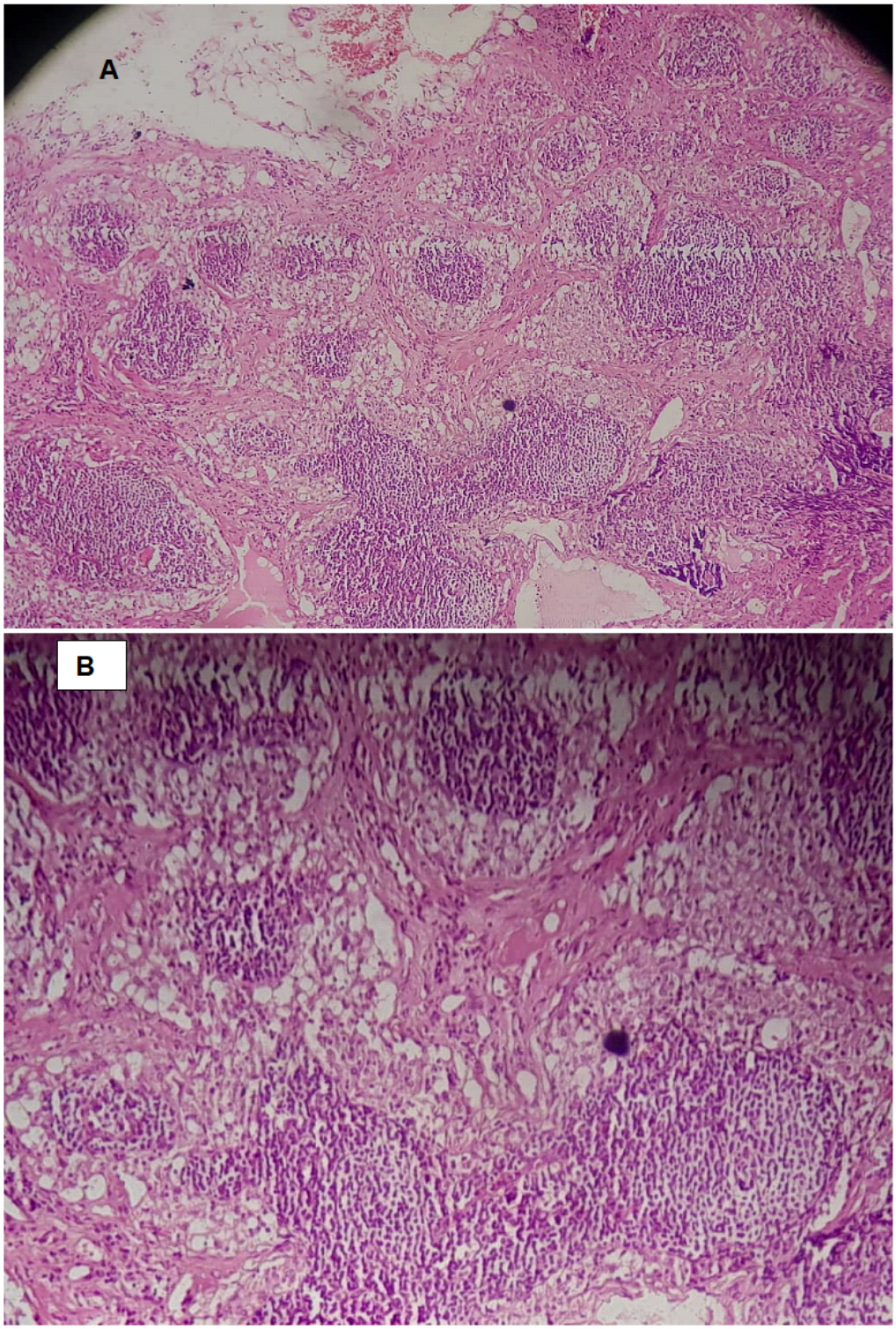


Figure 3

Histopathological findings of the mesenteric lymph node

(A) Low-power view (hematoxylin and eosin stain, ×4) demonstrating preserved lymph node architecture with multiple well-formed granulomas composed predominantly of epithelioid histiocytes.

(B) Higher-power view (hematoxylin and eosin stain, ×10) showing granulomatous inflammation characterized by aggregates of epithelioid macrophages, dense lymphocytic infiltration, and scattered foamy macrophages, consistent with tuberculous lymphadenitis.

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