

Original Research Article

Intestinal obstruction caused by tuberculosis: unmasking a silent risk

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ABSTRACT

Background: Intestinal tuberculosis (TB) remains a global health challenge, especially in regions with a high TB prevalence. This manifestation, distinct from pulmonary TB, involves the gastrointestinal tract, often leading to intestinal obstruction. The study addresses the insidious nature of the disease, emphasizing the urgency for timely diagnosis and intervention. Recognizing the multifaceted impact of TB on various organs, the study explores the pathophysiology, clinical presentation, and diagnostic complexities of intestinal TB.

Methods: This study was conducted at Nalanda medical college and hospital in Patna, Bihar, India, the retrospective study spans three years focusing on 127 patients with intestinal obstruction due to TB. Inclusion criteria prioritized histopathological confirmation of TB, ensuring cohort accuracy. The study employed preliminary investigations, including hemogram, chest X-ray, abdominal X-ray, ultrasonogram, sputum examination, and Mantoux test and CECT whole abdomen. Clinical presentations were systematically analyzed, guiding tailored management protocols based on the mode of presentation.

Results: Demographically, the study identified TB as the cause in 127 cases, with a balanced gender distribution and a peak incidence in the 21-30 years age group. Presentations varied, predominantly with acute symptoms. Common complaints included abdominal pain, vomiting, constipation, and distension. Surgical intervention within 24 hours was crucial in 61.1% of cases. Intraoperatively, findings comprised mesenteric thickening, lymph nodal enlargement, and adhesions. Adhesionolysis was the primary procedure. Postoperative complications, mainly wound infections, were noted but had a limited impact on mortality.

Conclusions: This study reveals TB as a significant contributor to intestinal obstruction, emphasizing challenges in early diagnosis. Adhesionolysis emerges as a key operative procedure, underscoring the need for surgical flexibility. Postoperative complications, while notable, have minimal impact on mortality.

Keywords: TB, Intestinal obstruction, Adhesionolysis, Stricturoplasty

INTRODUCTION

Intestinal tuberculosis (TB), a manifestation of extrapulmonary TB, continues to be a significant health concern worldwide, particularly in regions with a high prevalence of tuberculosis.¹ While pulmonary tuberculosis is more commonly recognized, the gastrointestinal tract's involvement, leading to intestinal obstruction, poses a unique challenge for clinicians. The insidious nature of the disease often leads to delayed diagnosis.^{1,2}

TB is primarily known as a respiratory infection, but its ability to affect various organs, including GI tract, is well-documented. World health organization (WHO) estimates that approximately 10% of TB cases involve extrapulmonary manifestations, with GI system being notable site of affliction.^{1,3} Among these manifestations, intestinal TB can manifest as luminal narrowing, strictures, and ultimately, intestinal obstruction. Understanding the pathophysiology, clinical presentation, and diagnostic challenges associated with intestinal obstruction due to TB is imperative for timely intervention and improved patient outcomes.^{1,2}

The pathogenesis of intestinal TB involves hematogenous spread of *Mycobacterium tuberculosis*, leading to granuloma formation within the intestinal wall. The granulomas can cause luminal narrowing, strictures, and adhesions, culminating in partial or complete obstruction of intestinal lumen. While any part of the gastrointestinal tract can be affected, ileocecal region is most involved site. Additionally, immunocompromised individuals, such as those with human immunodeficiency virus infection, are at a higher risk of developing severe forms of extrapulmonary TB, including intestinal obstruction.³⁻⁵

Clinical presentation of intestinal TB often mimics other gastrointestinal disorders, making accurate diagnosis challenging. Patients may present with nonspecific symptoms such as abdominal pain, weight loss, fever, and altered bowel habits. These vague clinical manifestations can lead to a delay in seeking medical attention and subsequent diagnosis. Furthermore, the absence of pulmonary symptoms in some cases can further confound the diagnostic process, as physicians may not immediately associate the symptoms with TB.⁶

Diagnosing intestinal TB requires a multifaceted approach, including clinical, radiological, and microbiological assessments. Imaging modalities such as computed tomography play a crucial role in identifying characteristic features like strictures, luminal narrowing, and lymphadenopathy. However, these findings are not pathognomonic and may overlap with other gastrointestinal conditions. Definitive diagnosis often involves histopathological examination of tissue samples obtained through endoscopic biopsy/surgical resection.⁷

Intestinal obstruction due to TB can lead to severe complications if left untreated. Strictures and adhesions may necessitate surgical intervention to alleviate obstruction and prevent further damage to the intestine. Additionally, the potential for complications such as perforation and peritonitis underscore the urgency of prompt diagnosis and intervention.⁸

The primary aim of this retrospective study is to comprehensively analyse the clinical characteristics and management outcomes of patients with intestinal obstruction due to TB presenting to the acute surgical care unit of the department of general surgery at Nalanda medical college and hospital in Patna, Bihar, India. Through this research, we seek to provide clinicians with evidence-based guidance for the effective diagnosis and management of intestinal obstruction due to TB, ultimately improving patient outcomes and informing future clinical practices.

METHODS

Study design and participants

This retrospective study was designed to investigate the clinical profile and management outcomes of patients

with intestinal obstruction due to TB at the department of general surgery, Nalanda medical college and hospital in Patna, Bihar, India. The study encompassed a three-year period from August 2020 to August 2023 during senior residency period. The participants included 127 patients who sought care at the acute surgical unit during this period, presenting with symptoms indicative of intestinal obstruction associated with TB.

Inclusion criteria

Confirmed case of TB: Participants who included in study must have a confirmed diagnosis of TB, supported by clinical, radiological, and/ or microbiological (HPE) evidence.

Intestinal obstruction: Participants should present with clinical signs and symptoms consistent with intestinal obstruction, as evidenced by abdominal pain, distention, vomiting, and radiological findings.

Age criteria (earning age group): Patients above 20 years of age.

Consent for participation: Informed consent from the participants or their legally authorized representatives is mandatory.

Availability for follow-up: Participants must be willing and able to adhere to the study protocol, including regular follow-up visits.

Exclusion criteria

Non-tuberculous cases: patients who do not have histopathological proven TB was excluded from the study.

Severe co-existing medical conditions: Participants with severe co-existing medical conditions, such as advanced cardiovascular disease/ end-stage organ failure, excluded from the study.

Immunocompromised individuals: Individuals with severe immune-suppression, such as HIV/ AIDS or the undergoing immune-suppressive therapy, excluded from the study.

Inability to provide informed consent: Individuals unable to provide informed consent or lacking a legally authorized representative for the consent excluded.

Unwillingness to participate: Participants who are unwilling to participate in the study or unable to comply with the study requirements excluded.

Other TB treatment: Individuals currently receiving or having recently completed TB treatment was excluded from the study to focus on the impact of TB on the intestinal obstruction.

Preliminary investigations

All patients underwent a standardized set of preliminary investigations to establish a baseline understanding of their health status. These investigations included:

Hemogram: To assess the patient's overall blood count, looking for any signs of anemia or infection.

Chest X-ray PA view: To identify any pulmonary involvement or other related abnormalities.

Erect abdominal X-ray: To reveal any significant findings related to the intestinal obstruction, such as air-fluid levels or dilated loops.

Ultrasonogram of abdomen: A non-invasive imaging technique to visualize abdominal organs and identify any abnormalities.

Sputum examination for AFB (Acid-fast bacilli): A microbiological test to confirm the presence of *Mycobacterium tuberculosis*.

Mantoux test: To determine the patient's immune response to tuberculin, aiding in the diagnosis of TB.

CECT whole abdomen: It better shows segmental bowel wall thickening, luminal narrowing, mesenteric lymphadenopathy, stricture formation, skip lesions, peritoneal involvement

Clinical presentation analysis

The study systematically analyzed the various clinical presentations of patients with intestinal obstruction due to TB. The objective was to identify common symptoms, patterns, and complications associated with the disease, contributing to a comprehensive understanding of its clinical profile.

Management protocols

Patients were managed based on the mode of presentation:

Acute intestinal obstruction: Patients presenting with acute symptoms were treated accordingly, focusing on prompt intervention to alleviate obstruction and prevent complications.

Sub-acute intestinal obstruction: Those with sub-acute presentations received tailored management strategies to address their specific needs.

Colonoscopy and conservative management

Colonoscopy was performed for patients planned for conservative management. This diagnostic procedure aided in visualizing the extent and severity of the

intestinal involvement, contributing to informed decision-making regarding the appropriate management approach.

Post-operative treatment

All patients underwent anti-tubercular therapy (ATT) postoperatively, reflecting a comprehensive approach to managing TB and preventing recurrence.

Ethical considerations

This study adhered to ethical standards and received approval from the institutional ethics committee of Nalanda medical college and hospital, India. The retrospective nature of the study involved the analysis of existing medical records, ensuring patient confidentiality and anonymity. All patient information was securely stored to protect the privacy of individuals involved. Informed consent was not required for this retrospective analysis, given that patient data was anonymized and did not impact individual care.

The ethical considerations also involved transparency in data handling and analysis. The researchers ensured that the study adhered to relevant ethical guidelines, providing a foundation for trustworthy and responsible research practices. The results obtained from this study contribute to the broader understanding of Intestinal Obstruction due to TB, with the overarching goal of improving patient care and outcomes.

RESULTS

Demographics

This retrospective study spanned three years (2020-2023), focusing on 127 patients presenting with intestinal obstruction. TB was identified as the cause in these 127 patients. Among the 127 patients, 70 were males, and 57 were females, maintaining a relatively balanced gender distribution within this subset. The peak incidence of intestinal obstruction due to TB persisted in the 21-30 years age group, impacting the economically active segment of the population. Among the 127 patients, 99 presented with acute intestinal obstruction, while 28 exhibited sub-acute intestinal obstruction, showing the varied clinical spectrum of the disease (Table 1).

Table 1: Demographics and presentation.

Parameters	N
Total patients	127
Acute intestinal obstruction	99
Sub-acute intestinal obstruction	28

Presenting complaints (symptomatology)

The predominant complaints at presentation were pain abdomen, vomiting, constipation, and distension, mirroring the symptomatology observed in the broader

study. Clinical signs included right iliac fossa tenderness in 42 patients, generalized tenderness in 57 patients, and an absence of tenderness in 28 patients. The majority of patients reported symptoms persisting for 3-4 weeks, underscoring the challenge of early diagnosis due to the non-specific nature of symptoms. 42 patients had a known history of TB and were on ATT (Table 2).

Table 2: Clinical characteristics at presentation.

Clinical characteristics	N
Most common complaints	Pain abdomen, vomiting, constipation, distension
Signs at presentation	Right iliac fossa tenderness (42)
	Generalized tenderness (57)
	Absence of tenderness (28)
Duration of pain	3-4 weeks
Past history of tuberculosis	42 patients

Imaging findings

Among the 127 patients, 28 had chest X-ray lesions, 15 showed CECT findings, 8 had mesenteric thickening, 7 presented with ileo-caecal mass, 63 had air-fluid levels (Erect X-ray), 7 had pleural effusion, 14 had consolidation (Table 3).

Table 3: Imaging findings.

Imaging findings	N
Chest X-ray lesions	28
Mesenteric thickening (CECT- whole abd.)	8
Ileo-caecal mass (CECT- whole abd.)	7
Air-fluid levels (Erect X-ray)	63
Pleural effusion	7
Consolidation	14



Figure 1: X ray showing multiple air fluid level in intestinal obstruction.

Management

Out of the 127 patients, 78 (60.2%) underwent surgery within 24 hours of admission, while 49 were initially managed conservatively. Four-two patients (33.0%) found relief with conservative management (Table 4).

Table 4: Management and outcomes.

Management and outcomes	N
Operated within 24 hours	78
Conservative management success	42
Conservative management failure	7

Intraoperative findings

Among the 78 patients undergoing surgery, common intraoperative findings included adhesion in 28 cases, strictures in 14 cases (Figure 3), tubercles in 8 cases, mesenteric thickening in eight cases (Figure 2 B), mesenteric lymph nodes in 8 cases, ileo-caecal mass in 7 cases (Figure 2 A), and fluid in 5 cases with a notable prevalence of adhesions in acute presentations (Table 5).

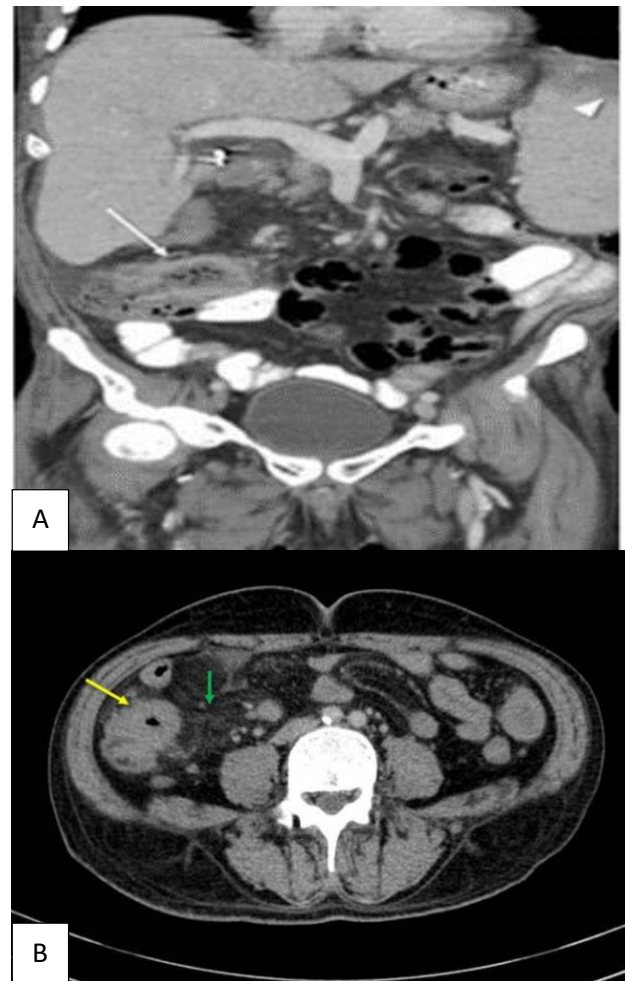


Figure 2 (A and B): CECT showing ilio cecal tuberculosis. CECT showing mesenteric thickening (green arrow) and cecum thickening(yellow arrow).

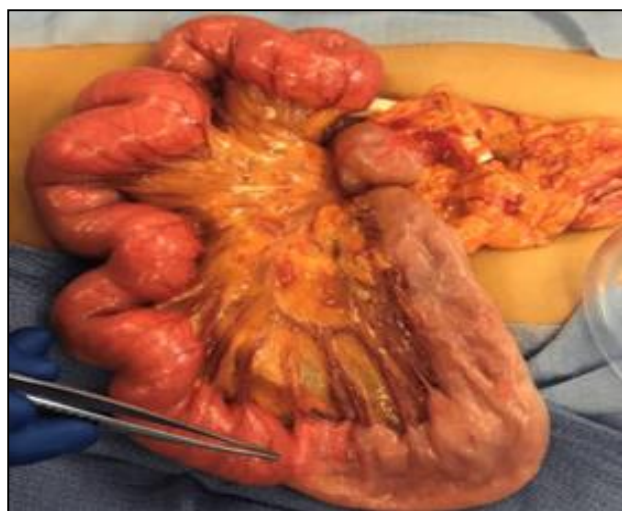


Figure 3: Isolated tubercular stricture of small intestine.

Operative procedures

Adhesionolysis remained the primary procedure for 36 patients, and the 14 patients with strictures underwent stricturoplasty. Resections were performed in 14 patients, with anastomosis, right hemicolectomy was performed in 7 patient and seven required end ileostomy (Table 6).

Postoperative complications and mortality

Postoperative complications were observed in 57 patients, with wound infection being the most common. Complications tended to be higher in patients with delayed presentations and associated comorbidities. Most patients were discharged during the 2nd week, with earlier discharges mainly seen in conservatively managed cases. Mortality remained low, with 7 patient (5.51%) succumbing to fecal peritonitis and septic shock in the immediate postoperative period (Table 7).

Table 5: Intraoperative findings.

Intraoperative findings	N
Adhesions	28
Strictures	14
Tubercles	8
Mesenteric thickening	8
Lymph nodes	8
Ileo-caecal mass	7
Fluid	5

Table 6: Operative procedures.

Operative procedures	N
Adhesionolysis	36
Stricturoplasty	14
Resection with anastomosis	14
Ileostomy	7
Right hemicolectomy	7

Table 7: Postoperative complication.

Complications	Percentage (%)
Postoperative complications	44.44
Mortality rate	5.51

DISCUSSION

Intestinal TB remains a significant global health concern, especially in regions with high TB prevalence. This retrospective study, spanning three years and focusing on 127 patients with intestinal obstruction due to TB, provides valuable insights into the clinical landscape and management outcomes.

The study reflects a balanced gender distribution, aligning with prior research.⁶⁻⁹ The peak incidence in the economically active age group emphasizes the socioeconomic impact of this disease. The predominance of acute presentations underscores the urgency in managing these cases promptly. Common symptoms, such as pain abdomen, vomiting, constipation, and distension, mirror the nonspecific clinical manifestations associated with intestinal TB.

Clinical signs, including tenderness and the duration of pain, highlight the challenges in early diagnosis due to nonspecific symptomatology. The presence of TB in patients with a known history emphasizes the importance of vigilance in managing individuals with previous exposure.

The study's findings align with broader literature on the diagnostic complexities surrounding abdominal TB, consistent with research by Awasthi et al.⁹ Clinical signs, such as tenderness and prolonged pain duration, contribute to the elusive nature of early diagnosis, as identified in our study. The nonspecific symptomatology echoes observations by Debi et al emphasizing persistent challenges in distinguishing abdominal TB from other gastrointestinal disorders.¹⁰

These collective findings underscore the imperative for heightened vigilance among healthcare professionals when managing patients with a history of TB contact. Early detection remains crucial, and the integration of targeted screening strategies is vital, as suggested by recent studies.¹¹

Chest X-ray lesions, air-fluid levels, and pleural effusion identified in some patients are consistent with the extrapulmonary manifestations of TB. These findings underscore the need for comprehensive imaging in the diagnostic process.

Our study reveals that a significant proportion of patients (60.2%) underwent surgery within 24 hours, emphasizing the acute nature of many cases. Conservative management, successful in 33.0%, reflects the

importance of tailored strategies, contributing to the evolving landscape of treatment modalities.

The dominance of mesenteric thickening, lymph nodal enlargement, and adhesions in intraoperative findings aligns with the well-established pathophysiology of intestinal TB. Adhesionolysis as the primary operative procedure is consistent with the surgical approach to manage obstructions caused by TB.

The observed postoperative complications, primarily wound infections, are in line with the challenges posed by the disease. However, the relatively low mortality rate (5.51%) suggests that despite complications, effective management strategies were employed.

CONCLUSION

In conclusion, this study sheds light on the clinical complexities of intestinal obstruction due to TB, encompassing a three-year retrospective analysis. TB emerged as a significant contributor, particularly affecting the young and economically active population. The study underscores the challenges in early diagnosis, the diversity in clinical presentations, and the importance of tailored management strategies. Adhesionolysis dominated operative procedures, emphasizing the need for surgical flexibility. Postoperative complications, though notable, did not significantly impact mortality. These findings accentuate the imperative for early recognition, timely intervention, and patient-specific approaches to enhance outcomes in this challenging clinical scenario.

Recommendations

Healthcare providers should heighten awareness of diverse clinical presentations, encouraging early diagnosis. Surgical teams must maintain flexibility in addressing varied findings. Focus on preventive measures and collaborative research is crucial for refining diagnostic and therapeutic approaches, improving outcomes.

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