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Study of Intestinal Obstruction Due to Tuberculosis

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Abstract

Background: Intestinal TB continues to be a major source of illness in developing nations such as India, where tuberculosis is prevalent. While pulmonary involvement is more prevalent, gastrointestinal tuberculosis (GITB) may manifest as intestinal obstruction, frequently resembling other surgical disorders such Crohn's disease or malignancy. Timely diagnosis and suitable treatments are crucial to avert complications and diminish fatality rates.

Objective: To examine the clinical manifestations, diagnostic difficulties, surgical observations, and histological validation of intestinal obstruction cases attributable to tuberculosis, derived from a one-year prospective study.

Methods: This prospective observational study was carried out over one year in the Department of Surgery at a tertiary care facility. Patients exhibiting clinical and radiological characteristics of acute or subacute intestinal blockage were assessed. A comprehensive history, physical examination, imaging (X-ray, ultrasound, CT scan), and laboratory tests were conducted. Cases with intraoperative observations or histopathological evidence confirming intestinal TB were included. The collected data encompassed age, sex, clinical symptoms, imaging findings, obstruction site, surgical interventions executed, and post-operative results.

Results: Among 82 patients with intestinal obstruction, 16 (19.5%) were diagnosed with tuberculosis as the underlying etiology. The ileocecal area was the most frequently affected site, accounting for 75% of tuberculosis cases. The primary clinical manifestations included

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stomach discomfort (100%), vomiting (81%), weight loss (69%), and fever (44%). Imaging demonstrated characteristics indicative of stricture, mass development, or thickened bowel loops in most instances. Surgical procedures varied from partial resection with anastomosis to stricturoplasty and ileocecal excision. The histopathological analysis validated the diagnosis in every instance. The incidence of surgical complications was minimal, and the majority of patients exhibited favorable responses to antitubercular therapy (ATT).

Conclusion: Tuberculosis must be regarded as a differential diagnosis in patients presenting with intestinal obstruction, especially in endemic regions. The ileocecal area is the most commonly affected place. The diagnosis relies on a synthesis of clinical suspicion, imaging, intraoperative observations, and histopathological analysis. Timely surgical intervention followed by antitubercular therapy results in positive outcomes. Heightened awareness and prompt intervention are essential for mitigating complications and enhancing prognosis in tubercular intestinal obstruction.

Keywords: Intestinal tuberculosis, intestinal obstruction, ileocecal tuberculosis, antitubercular therapy, abdominal tuberculosis, surgical management.

1. Introduction

Tuberculosis (TB) continues to be a significant public health issue globally, particularly affecting emerging nations like India (World Health Organization [WHO], 2023). Although pulmonary tuberculosis is the predominant kind, extrapulmonary tuberculosis especially gastrointestinal tuberculosis (GITB) is gaining recognition due to its increasing prevalence and advancements in diagnostic methods (Debi et al., 2014; Bhargava & Gupta, 2008). Abdominal TB is the sixth most prevalent extrapulmonary manifestation, frequently presenting as either acute or chronic intestinal obstruction (Bhansali, 1977; Kapoor, 1986; Sharma & Bhatia, 2004).

Intestinal TB predominantly impacts the ileocecal area due to its rich lymphoid tissue, stasis, and little digestive activity in that region (Paustian, 1964; Das et al., 2004). The disease can manifest in multiple ways, such as strictures, adhesions, hyperplastic lesions, or ulcerative

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alterations, all of which may lead to partial or full intestinal obstruction. It can resemble other illnesses, including Crohn's disease, cancer, or enteric fever, complicating diagnosis, especially when evident lung involvement is absent (Horvath & Whelan, 2004; Khan et al., 2006).

Notwithstanding progress in diagnostic imaging and laboratory techniques, the preoperative identification of tubercular intestinal obstruction continues to pose challenges, particularly in resource-constrained environments. Most instances are diagnosed during or after surgery based on macroscopic observations and histological validation (Suri et al., 1999; Debi et al., 2014). Imaging techniques such as ultrasonography, barium studies, and contrast-enhanced computed tomography (CECT) may indicate tuberculosis through characteristics such as intestinal wall thickening, mesenteric lymphadenopathy, and ascites, although they lack definitive specificity (Bhargava & Gupta, 2008; Makharia et al., 2015).

Surgical intervention is frequently required in instances of acute intestinal obstruction, especially when patients exhibit intense discomfort, vomiting, and abdominal distension. Common surgical methods encompass stricturoplasty, segmental resection with anastomosis, or ileocecal resection, contingent upon intraoperative results (Das et al., 2004; Chatzicostas et al., 2002). Surgery must be succeeded by a complete regimen of antitubercular therapy (ATT) to guarantee remission and avert recurrence (Sharma et al., 2021).

Due to the clinical and diagnostic similarities with other gastrointestinal disorders, intestinal TB remains a diagnostic challenge. There is an imperative to enhance knowledge among practitioners, particularly in endemic areas, where delayed diagnosis leads to elevated complication rates and avoidable morbidity (Khan et al., 2006; WHO, 2023).

This study aimed to investigate the clinical profile, diagnostic methodology, surgical findings, and outcomes of patients diagnosed with intestinal obstruction attributable to tuberculosis during a one-year duration at a tertiary care facility. This study seeks to discover patterns and problems in diagnosis and management to raise clinical suspicion and facilitate prompt surgical and medicinal interventions, ultimately improving patient outcomes.

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2. Materials and Methods

2.1 Research Design and Duration

This was a prospective observational study carried out over one year in the Department of Surgery at a tertiary care facility. The study comprised individuals hospitalized with clinical and radiological indications of intestinal obstruction, who were later diagnosed with tuberculosis using intraoperative observations and histological validation.

2.2 Study Cohort

All patients aged 15 years and older with acute or subacute intestinal blockage were assessed. Individuals diagnosed with intestinal TB were incorporated into the final study.

2.3 Eligibility Criteria:

Individuals aged 15 years or older
Clinical manifestations of intestinal obstruction include abdominal pain, vomiting, constipation or obstipation, and abdominal distension.
Intraoperative signs indicative of tuberculosis include strictures, lumps, thickened bowel segments, mesenteric lymphadenopathy, and adhesions.
Histopathological verification of intestinal tuberculosis
Agreement to partake in the research

2.4 Criteria for Exclusion:

Patients with obstructions caused by cancer, hernia, volvulus, or adhesions not associated with tuberculosis
Prior diagnosis of Crohn's disease or inflammatory bowel disease
Insufficient clinical or histological documentation

2.5 Clinical Assessment and Diagnostic Investigation

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A comprehensive history and physical examination were performed for all patients, emphasizing symptoms such as:

Abdominal discomfort (site, duration, characteristics)
Emesis (biliary/non-biliary)
Modified intestinal patterns
Pyrexia, weight reduction, and anorexia
Previous history of tuberculosis or antitubercular therapy

Preliminary laboratory assessments comprised a complete blood count, erythrocyte sedimentation rate, and chest radiography to evaluate for pulmonary tuberculosis. Imaging examinations including:

Standard abdomen X-ray (upright and supine perspectives)
Abdominal ultrasonography (USG)
A contrast-enhanced CT scan (CECT) was conducted to assess the degree and etiology of the blockage.

2.6 Intraoperative Observations and Intervention

Patients exhibiting symptoms of peritonitis or persistent blockage underwent exploratory laparotomy. Intraoperative findings comprised:

Location and quantity of strictures
Thickening of the bowel wall
Hypertrophied mesenteric lymph nodes
Existence of adhesions or perforation

The surgical techniques conducted were determined by the findings and encompassed:

Partial resection and anastomosis

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Stricturoplasty
Ileocecal resection
Adhesiolysis

2.7 Histopathological Analysis

Resected tissues were sent for histological analysis, confirming the diagnosis of intestinal tuberculosis through the identification of:

Caseating granulomas
Epithelioid cell aggregates
Langhans gigantic cells

2.8 Postoperative Care and Monitoring

All patients diagnosed with tuberculosis were commenced on conventional antitubercular therapy in accordance with national standards. Monitoring for problems, symptom relief, and weight gain was conducted over a three-month period.

2.9 Statistical Examination

Data were documented in Microsoft Excel and analyzed with SPSS version 25.0. Results were presented as frequencies, percentages, and means. Chi-square and Fisher's exact tests were employed to evaluate significance where warranted. A p-value less than 0.05 was deemed statistically significant.

3. Results

Throughout the one-year research duration, 82 patients had clinical manifestations of intestinal blockage. Among these, 16 patients (19.5%) were diagnosed with intestinal tuberculosis (TB) through intraoperative observations and histological analysis.

3.1 Demographic Profile

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The average age of patients was 34.8 ± 9.2 years.
The male-to-female ratio was almost 1.7:1.
A majority of patients (68.7%) were from low socioeconomic level and rural backgrounds.

3.2 Clinical Manifestation

The primary presenting symptoms in patients of TB-related blockage were:

Abdominal pain – 100% (16 out of 16)

Emesis – 81.2% (13/16)
Weight reduction - 68.7% (11 out of 16)
Abdominal distension - 62.5% (10 out of 16)
Fever – 43.7% (7 out of 16)

3.3 Radiological Observations

The plain X-ray of the abdomen revealed numerous air-fluid levels in 75% of the cases.
Ultrasonography indicated thickened bowel loops and mesenteric lymphadenopathy in 56% of instances.
Contrast-enhanced CT scan (CECT) demonstrated segmental strictures accompanied by proximal dilatation in 62.5% of patients, predominantly in the ileocecal area.

3.4 Intraoperative Observations

The ileocecal area was the most commonly affected site, occurring in 75% of cases (12 out of 16).
Additional locations comprised the jejunum (three instances) and ileum (one instance).
Prevalent observations comprised strictures, fibrotic adhesions, thickened mesentery, and mesenteric lymphadenopathy.
No instances exhibited perforation or involvement of numerous segments.

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3.5 Conducted Surgical Procedures

Nine patients underwent limited segmental resection with anastomosis.
Five individuals underwent ileocecal resection.
Stricturoplasty - Two patients

3.6 Histopathological Verification

All cases were validated through histopathological examination, which revealed:

Caseating granulomas
Epithelioid cells
Langhans gigantic cells

3.7 Postoperative Results

The majority of patients experienced a smooth recovery.
Minor postoperative problems, such as wound infection, were observed in 2 patients (12.5%).
All patients were discharged on conventional antitubercular therapy (ATT) and monitored for a duration of 3 months.
No instances of recurrence or mortality were documented throughout the brief follow-up interval.

The Table 1 and Figure 1 show the most common clinical features observed in patients with intestinal obstruction due to tuberculosis. Abdominal pain was universally present, followed by vomiting, weight loss, and abdominal distension.

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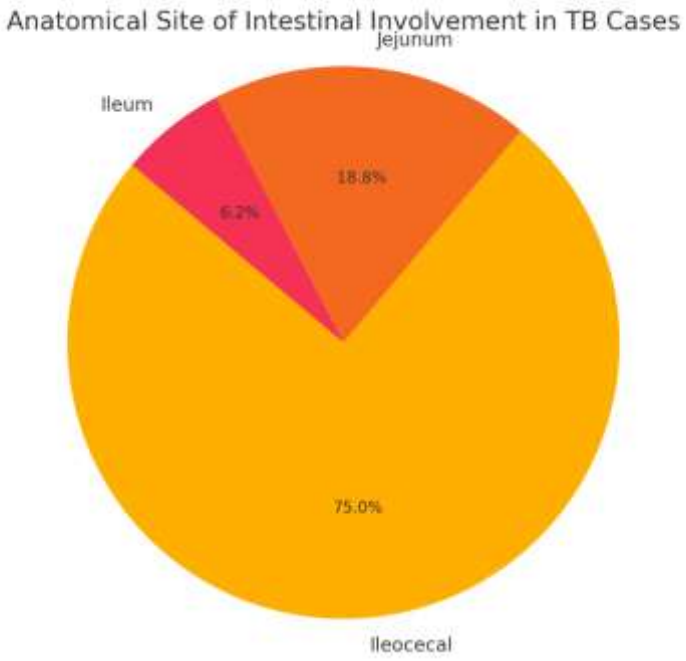

Figure 1: Clinical Features in Patients with Intestinal Obstruction due to TB

Table 1: Clinical, Radiological, and Surgical Findings in Patients with Intestinal Obstruction due to Tuberculosis (n = 16)

PARAMETER	NUMBER OF PATIENTS (N = 16)	PERCENTAGE (%)
CLINICAL FEATURES		
ABDOMINAL PAIN	16	100%
VOMITING	13	81.2%
WEIGHT LOSS	11	68.7%
ABDOMINAL DISTENSION	10	62.5%
FEVER	7	43.7%
IMAGING FINDINGS		
X-RAY WITH AIR-FLUID LEVELS	12	75.0%
USG WITH THICKENED BOWEL/LYMPH NODES	9	56.2%

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CT WITH STRICTURE/THICKENING	10	62.5%
SITE OF INVOLVEMENT		
ILEOCECAL REGION	12	75.0%
JEJUNUM	3	18.7%
ILEUM	1	6.2%
SURGICAL PROCEDURES PERFORMED		
SEGMENTAL RESECTION WITH ANASTOMOSIS	9	56.2%
ILEOCECAL RESECTION	5	31.2%
STRICTUROPLASTY	2	12.5%

4. Discussion

Intestinal tuberculosis (TB), while less prevalent than pulmonary TB, continues to be a notable cause of acute and chronic intestinal blockage in TB-endemic areas like India. The results of our investigation confirm the clinical significance of this condition, particularly in young adults with nonspecific stomach symptoms. Our findings indicated that 19.5% of patients with intestinal obstruction had histopathologically verified tubercular etiology, consistent with prior studies reporting a prevalence of 10–20% in surgical series (Kapoor, 1986; Sharma & Bhatia, 2004; Debi et al., 2014).

The ileocecal area was the most commonly afflicted site in our study (75%), because to its structural propensity characterized by relative stability, extensive lymphoid tissue, and a restricted lumen. This inclination has been regularly documented in previous investigations (Bhansali, 1977; Paustian, 1964; Horvath & Whelan, 2004). The predominant clinical manifestations in our patients included stomach pain, vomiting, and weight loss. These findings corroborate those of Suri et al. (1999), who underscored the necessity of a heightened index of suspicion for tuberculosis in patients with nonspecific stomach symptoms and persistent weight loss.

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Imaging remains essential in the preoperative assessment of these individuals. X-rays frequently display non-specific indicators of blockage, whereas ultrasonography and CT scans offer further insights, including gut wall thickening, strictures, and lymphadenopathy. In our group, CT demonstrated characteristic results in more than 60% of instances. Nonetheless, these characteristics are not pathognomonic and frequently intersect with those observed in Crohn's disease and malignancy, rendering conclusive identification difficult without histopathological examination (Horvath et al., 2004; Bhargava & Gupta, 2008).

Surgical intervention is essential in instances of confirmed blockage, persistent subacute presentations, or ambiguous diagnoses. The predominant methods in our analysis were segmental resection with anastomosis and ileocecal resection, akin to the surgical approach delineated by Chatzicostas et al. (2002). Stricturoplasty was conducted in specific instances of localized fibrotic strictures, but its application was constrained by apprehensions over hidden malignancy or involvement at several sites (Das et al., 2004).

Histopathological confirmation, distinguished by caseating granulomas and Langhans giant cells, is the definitive criterion for diagnosis. In this series, all surgically removed specimens were validated, underscoring the significance of tissue diagnosis when imaging and clinical presentation are ambiguous (Debi et al., 2014).

Postoperative outcomes were predominantly positive, characterized by minimal complication rates and absence of mortality. All patients underwent standard antitubercular therapy (ATT) postoperatively, underscoring the critical importance of medical care with surgical intervention. The efficacy of ATT in averting recurrence and facilitating mucosal healing has been thoroughly documented (Khan et al., 2006; Sharma et al., 2021).

The research is constrained by its modest sample size and brief follow-up duration. Extended monitoring is essential to evaluate long-term recurrence rates and consequences, including strictures and fistula formation. Moreover, access to laparoscopy or image-guided biopsy may facilitate earlier and less invasive diagnoses in specific patients (Makharia et al., 2015).

In conclusion, intestinal tuberculosis must consistently be included in the differential diagnosis of intestinal obstruction, especially in younger individuals from tuberculosis-endemic regions. A multidisciplinary strategy integrating clinical suspicion, imaging, surgical

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investigation, histology, and prompt commencement of ATT is essential for optimum outcomes.

5. Conclusion

This study emphasizes that intestinal tuberculosis is a significant and sometimes overlooked cause of intestinal obstruction, especially in TB-endemic areas such as India. The ileocecal region remains the most frequently impacted area, with patients often exhibiting abdominal pain, vomiting, weight loss, and indications of subacute or acute blockage.

Notwithstanding advancements in imaging techniques, preoperative diagnosis continues to pose difficulties, as radiological abnormalities frequently resemble other conditions such as Crohn's disease or cancers. Consequently, intraoperative observations and histological validation are essential for precise diagnosis. Surgical intervention serves both diagnostic and therapeutic purposes, particularly in obstructive or complex cases.

The postoperative recovery was unremarkable for the majority of patients, all of whom benefited from standard antitubercular therapy (ATT), highlighting the efficacy of integrated surgical and medicinal treatment. Clinicians must uphold a heightened suspicion for tuberculosis in patients exhibiting intestinal obstruction, particularly when a definitive explanation is lacking, to enable prompt identification and enhance outcomes.

Subsequent research including bigger cohorts and extended follow-up is essential to enhance comprehension of the recurrence, complications, and outcomes related to intestinal tuberculosis, as well as to refine surgical decision-making in uncertain cases.

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