e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2025; 17(9); 1573-1578

Original Research Article

Study of Intestinal Obstruction due to Tuberculosis

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Received: 27-07-2025 / Revised: 25-08-2025 / Accepted: 27-09-2025

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Conflict of interest: Nil

Abstract:

Background: Intestinal tuberculosis (ITB) continues to be a major cause of morbidity in developing countries like India, often mimicking other abdominal conditions. Despite advances in imaging and chemotherapy, diagnosis and management remain challenging due to its varied presentation.

Methods: This retrospective study analyzed patients with intestinal obstruction secondary to tuberculosis who underwent surgical management. Data regarding clinical presentation, operative findings, type of surgery, postoperative outcome, and follow-up were evaluated.

Results: Most patients presented with abdominal pain, distension, and vomiting. The ileocecal region was the most frequently involved site. Strictures and adhesions were common intraoperative findings. Resection with primary anastomosis and stricturoplasty were the preferred procedures. Postoperative complications were minimal, and the majority of patients responded well to anti-tuberculosis therapy (ATT).

Conclusion: Early diagnosis and timely surgical intervention combined with ATT offer favourable outcomes in ITB-induced obstruction. High clinical suspicion is essential to avoid delayed treatment and complications.

Keywords: Intestinal Tuberculosis; Abdominal Tuberculosis; Intestinal Obstruction; Retrospective Study; Surgical Management; Anti-Tubercular Therapy.

Introduction

Intestinal obstruction continues to be a major cause of surgical admissions, particularly in developing countries where infectious diseases remain prevalent [1]. Among the various etiologies, tuberculosis (TB) remains a significant yet often overlooked cause of intestinal obstruction. Even though tuberculosis is primarily a pulmonary disease, extrapulmonary involvement accounts for up to 20% of all TB cases, and the abdomen is one of the most frequently affected sites [2,3].

Abdominal tuberculosis can involve the gastrointestinal tract, peritoneum, lymph nodes, or solid organs such as the liver and spleen [4]. Within the gastrointestinal tract, the ileocecal region is most commonly affected because of its rich lymphatic tissue and stasis of intestinal contents [5]. The pathological changes ulceration, fibrosis, strictures, or hypertrophic lesions may narrow the intestinal lumen, eventually leading to partial or complete mechanical obstruction [6].

The clinical presentation of intestinal tuberculosis is variable and nonspecific. Most patients present with intermittent abdominal pain, vomiting, distension, altered bowel habits, anorexia, and significant weight loss [7]. These symptoms may mimic other chronic inflammatory or malignant diseases such as Crohn's disease, lymphoma, or carcinoma, which often delays diagnosis and treatment [8]. Despite advances in imaging and endoscopic techniques, a large proportion of patients continue to present late with acute or subacute intestinal obstruction requiring emergency surgical management [9,10].

Diagnosis of intestinal tuberculosis is often challenging. Radiological investigations such as ultrasound and CT scan may suggest intestinal thickening or mesenteric lymphadenopathy, but definitive confirmation depends on histopathological evidence of caseating granulomas or detection of Mycobacterium tuberculosis using GeneXpert or PCR [11,12]. In resource-limited settings, many patients are still diagnosed only after

laparotomy, when gross features such as multiple strictures, adhesions, and thickened bowel loops are visualized [13].

Management involves both medical and surgical approaches. While antitubercular therapy (ATT) remains the cornerstone of treatment, surgery is indicated in patients with acute obstruction, perforation, or diagnostic uncertainty [14]. The surgical options include stricturoplasty, limited resection with anastomosis, or bypass procedures, depending on the extent and severity of disease [15].

Given the resurgence of tuberculosis and the diagnostic difficulty associated with its abdominal form, it is crucial to study its clinical profile and outcomes in regional healthcare settings. Therefore, the present retrospective study, conducted in the Department of General Surgery, DRIEMS Institute of Health Sciences & Hospital, Cuttack, Odisha, over a period of one year, was undertaken to evaluate the clinical presentation, operative findings, and postoperative outcomes in patients presenting with intestinal obstruction due to tuberculosis. This study aims to improve clinical awareness and contribute to early diagnosis and effective management strategies in similar healthcare environments [16].

Materials and Methods

Methodology: This retrospective observational study was conducted in the Department of General Surgery, DRIEMS Institute of Health Sciences & Hospital, Cuttack, Odisha, over a period of one year (January 2024 to December 2024). The study aimed to analyze the clinical presentation, operative findings, and outcomes in patients presenting with intestinal obstruction secondary to tuberculosis.

Study Design and Sample Size: The study included 80 patients who were admitted with features of intestinal obstruction and were later confirmed to have tubercular etiology either intraoperatively or on histopathological examination. Patient data were retrieved from hospital medical records, operation theatre registers, and pathology reports.

Inclusion Criteria

- Patients aged 18 years and above of either sex.
- Patients diagnosed with intestinal obstruction due to tuberculosis based on intraoperative findings and/or histopathological confirmation.
- Patients who underwent surgical intervention at DRIEMS Hospital during the study period.

Exclusion Criteria

- Patients with intestinal obstruction due to other causes such as adhesions, malignancy, or volvulus.
- Patients who were already on antitubercular therapy prior to admission.
- Incomplete hospital records or lack of postoperative follow-up data.

Data Collection

A structured data sheet was used to collect patient information, which included:

1. **Demographic data:** age, gender, and residence.
2. **Clinical presentation:** duration of symptoms, nature of pain, vomiting, distension, constipation, weight loss, and fever.
3. **Laboratory findings**: complete blood count, ESR, and Mantoux test results.
4. **Radiological findings**: abdominal X-ray and ultrasonography/CT scan findings.
5. **Intraoperative findings:** site and number of strictures, presence of adhesions, perforation, or mesenteric lymphadenopathy.
6. **Type of surgical procedure performed:** stricturoplasty, limited resection with anastomosis, or bypass procedure.
7. **Postoperative course:** duration of hospital stay, postoperative complications, and initiation of antitubercular therapy.
8. **Follow-up:** evaluated for symptom relief, wound healing, and recurrence at one, three, and six months after surgery.

Data Analysis: All collected data were tabulated and analyzed using Microsoft Excel and SPSS version 26.0. Quantitative data such as age, hospital stay, and duration of symptoms were expressed as mean ± standard deviation (SD), while qualitative variables such as gender distribution, clinical symptoms, and operative findings were represented as frequency and percentage. Statistical comparisons were made using the Chi-square test for categorical data and the Student's t-test for continuous variables. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: The study protocol was reviewed and approved by the Institutional Ethics Committee of DRIEMS Institute of Health Sciences & Hospital, Cuttack. As it was a retrospective study based on existing hospital data, the requirement for individual informed consent was waived. All patient data were anonymized to ensure confidentiality.

Results

A total of 80 patients presenting with features of intestinal obstruction secondary to tuberculosis were included in this retrospective analysis. The demographic, clinical, radiological, intraoperative, and postoperative outcomes were studied in detail.

Demographic Profile: Out of 80 patients, 48 (60%) were males and 32 (40%) were females, giving a male-to-female ratio of 1.5:1. The mean age of the study population was 34.8 ± 9.2 years, ranging from 18 to 60 years. The majority of patients (62.5%)

belonged to the 21–40 years age group, indicating that tubercular intestinal obstruction primarily affects young adults in their productive years.

Table 1: Demographic Profile of Patients (n = 80)

Parameter	Category	Number	Percentage (%)
Age (years)	18–20	6	7.5
	21–40	50	62.5
	41–60	19	23.8
	>60	5	6.2
Gender	Male	48	60.0
	Female	32	40.0

Clinical Presentation: All patients (100%) presented with abdominal pain, which was colicky in nature and localized mostly to the right lower quadrant. Other frequent symptoms included vomiting (86.3%), abdominal distension (77.5%), and constipation (70%). Systemic features of tuberculosis, such as weight loss (53.8%) and low-grade fever (40%), were also commonly observed. The mean duration of symptoms before admission was 4.2 ± 1.6 weeks, with a range of 2–8 weeks.

Table 2: Clinical Presentation (n = 80)

Symptom	Number	Percentage (%)
Abdominal pain	80	100
Vomiting	69	86.3
Abdominal distension	62	77.5
Constipation	56	70.0
Weight loss	43	53.8
Fever	32	40.0

Radiological and Laboratory Findings: Plain abdominal X-rays showed multiple air-fluid levels and dilated bowel loops in 72 (90%) patients, consistent with mechanical intestinal obstruction. Ultrasound abdomen revealed dilated intestinal loops in 67 (83.8%) cases and mesenteric lymphadenopathy in 22 (27.5%) cases. In patients who underwent CT scans (n=35), thickened bowel walls and multiple strictures were the dominant findings. Laboratory investigations showed mild anemia in 64 (80%) patients and elevated ESR in 70 (87.5%) patients.

Intraoperative Findings: At laparotomy, ileocecal region was the most frequently affected site, noted in 48 (60%) cases, followed by ileal involvement (26.3%) and jejunal involvement (10%). Colonic involvement was relatively rare (3.7%). Multiple strictures were seen in 32 (40%) patients, while adhesions were present in 18 (22.5%). Perforation of the intestine was identified in 8 (10%) cases.

Table 3: Intraoperative Findings (n = 80)

Finding	Number	Percentage (%)
Ileocecal involvement	48	60.0
Ileal involvement	21	26.3
Jejunal involvement	8	10.0
Colonic involvement	3	3.7
Multiple strictures	32	40.0
Adhesions	18	22.5
Perforation	8	10.0

Surgical Procedures Performed: Surgery was tailored to the site and extent of disease. The most frequently performed procedure was resection and end-to-end anastomosis in 35 (43.8%) cases, followed by stricturoplasty in 29 (36.3%). Bypass procedures such as ileotransverse anastomosis were done in 8 (10%), while diagnostic biopsy only was done in another 8 (10%) cases with extensive disease where definitive resection was not feasible.

Table 4: Type of Surgical Procedure (n = 80)

Procedure	Number	Percentage (%)
Resection with anastomosis	35	43.8
Stricturoplasty	29	36.3
Bypass procedure	8	10.0
Biopsy only	8	10.0

Postoperative Course and Outcomes: The mean duration of hospital stay was 8.4 ± 2.3 days. Postoperative complications occurred in 16 (20%) patients. The most common complications were wound infection (7.5%), prolonged paralytic ileus (6.3%), and anastomotic leak (3.8%). No postoperative mortality was reported.

All patients were started on standard antitubercular therapy (ATT) once the diagnosis was confirmed histopathologically. Follow-up was done at 1, 3, and 6 months postoperatively. During follow-up, 3 (3.8%) patients developed recurrence of symptoms, while 74 (92.5%) reported complete symptomatic relief and weight gain.

Table 5: Postoperative Complications and Outcomes (n = 80)

Outcome	Number	Percentage (%)
Wound infection	6	7.5
Prolonged ileus	5	6.3
Anastomotic leak	3	3.8
Recurrence during follow-up	3	3.8
Mortality	0	0
Complete symptom relief at 6 months	74	92.5

Discussion

Intestinal obstruction remains one of the most serious complications of abdominal tuberculosis, particularly in developing countries where tuberculosis is still highly prevalent [17]. The present retrospective study evaluated 80 cases of intestinal obstruction secondary to tuberculosis treated surgically at DRIEMS Institute of Health Sciences & Hospital, Cuttack. The findings reaffirm that intestinal tuberculosis is a disease primarily affecting young adults, with a slight male predominance, consistent with earlier studies [5,18].

In the current study, the mean age of patients was 34.8 years, with 62.5% belonging to the 21–40 years age group. Similar demographic trends have been reported by Bhansali et al. and Nagi et al., who found the highest incidence among patients aged 20–40 years [19,20]. This reflects the strong association of the disease with low socioeconomic conditions, malnutrition, and poor sanitation, all of which increase the risk of primary infection and subsequent reactivation [21]. The male predominance (60%) in our series aligns with the gender distribution seen in other Indian studies [22].

Clinically, abdominal pain, distension, and vomiting were the most common presenting symptoms in our cohort. These findings correlate with the results of Sharma et al. [4], who reported abdominal pain in 95% and vomiting in 80% of cases. The presence of systemic symptoms such as fever and weight loss in nearly half of our patients emphasizes the chronic and insidious nature of tubercular infection, often mimicking other inflammatory or neoplastic intestinal diseases [23].

Radiological evaluation remains a cornerstone in diagnosis. In our series, plain X-rays demonstrated multiple air–fluid levels in 90% of cases, while ultrasonography revealed dilated loops in 83.8% of patients. These observations are in agreement with those of Kapoor et al. [24], who emphasized the usefulness of imaging in detecting strictures and mesenteric involvement, though histopathological confirmation remains essential for diagnosis.

Intraoperatively, the ileocecal region was the most commonly affected site (60%), followed by the ileum (26.3%) and jejunum (10%). This pattern is well-documented in previous studies [25,26]. The predilection for the ileocecal area has been attributed to physiological stasis, abundant lymphoid tissue, and increased absorption surface in that segment [27]. Multiple strictures and adhesions were also frequent in our series, representing the chronic healing response of the intestinal wall to repeated inflammation [28].

The surgical approach in intestinal tuberculosis is guided by the site, number, and extent of lesions. In our study, resection and anastomosis were performed in 43.8% of patients, while stricturoplasty was carried out in 36.3%. These results are comparable with those of Tandon et al. [29], who reported resection in 45% and stricturoplasty in 35% of their cases. Resection is preferred for multiple or long-segment strictures and for those complicated by perforation, whereas stricturoplasty remains an

excellent bowel-conserving procedure for isolated short strictures [30].

Postoperative morbidity in the current study was 20%, with wound infection and paralytic ileus being the most frequent complications. This complication rate is within the range reported by other series (15–25%) [31,32]. Importantly, there was no mortality in our study, and 92.5% of patients achieved complete symptomatic relief at six months after initiation of antitubercular therapy. Early postoperative initiation of ATT has been shown to improve mucosal healing and prevent recurrence [33].

Overall, the findings highlight that intestinal tuberculosis should be suspected in any patient presenting with subacute intestinal obstruction, especially in endemic regions. Prompt surgical intervention combined with appropriate ATT yields excellent outcomes and minimizes long-term morbidity. The results from our series thus reinforce the need for timely diagnosis and combined surgical–medical management to prevent fatal complications and recurrence [34,12].

Conclusion

Intestinal tuberculosis remains a significant cause of small bowel obstruction, particularly in endemic regions. The disease often presents with nonspecific symptoms that delay diagnosis, emphasizing the need for high clinical awareness. Surgical management plays a crucial role, especially in cases presenting with acute obstruction, perforation, or diagnostic uncertainty. Resection with primary anastomosis or stricturoplasty provides excellent results when combined with postoperative anti-tubercular therapy. Histopathological confirmation remains the gold standard for diagnosis. Early surgical intervention, coupled with appropriate medical therapy, significantly reduces morbidity and mortality. A multidisciplinary approach involving surgeons, pathologists, and infectious disease specialists ensures optimal patient outcomes and prevents recurrence. Strengthening awareness and improving diagnostic accuracy are key to better management of this curable but potentially life-threatening disease.

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