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Original Research Article

Intestinal Obstruction due to Tuberculosis: A retrospective Observational Study

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Abstract

Introduction: Intestinal tuberculosis (ITB) continues to be obstructive bowel disease in developing countries, especially those areas where tuberculosis is endemic. It often complicates diagnostic and therapeutic approaches, as it closely resembles other inflammatory or neoplastic bowel conditions.

Aim: The goal of the current study was to examine the clinical presentation, diagnostic methods, surgical techniques, and results in patients who present with TB-related intestinal obstruction.

Methods: Over the course of a year, 50 patients with TB-related intestinal blockage were admitted to the Department of general surgery Aiims Raipur. The study used information on surgical procedures, complications, imaging and histological findings, clinical presentation, and demographics. The majority of patients were in the 20–40 age range, with a small male preponderance.

Results: The predominant clinical presentation was abdominal pain, distension, vomiting, and constipation. Ileocaecal region was the predominant site. Surgical procedures included adhesiolysis, resection and anastomosis, and stricturoplasty based on intraoperative findings. Most postoperative complications were trivial and required conservative treatment.

Conclusion: In endemic countries, tuberculosis is a significant cause of obstruction. A prompt diagnosis, proper surgical procedures, and antitubercular therapy improve the outcome. Timely treatment and early diagnosis are imperative to prevent recurrence and reduce morbidity.

Keywords: Intestinal tuberculosis; Bowel obstruction; Ileocaecal tuberculosis; Abdominal tuberculosis; Surgical management.

Introduction

Intestinal obstruction is still one of the commonest surgical emergencies seen in developing countries, the aetiological factors being wide and various, including postoperative adhesions, herniae, malignancies and infections. Tuberculosis (TB) occupies a unique and interesting place as one of the infectious causes, especially in those countries where the disease burden is heavy, as in India.

Abdominal tuberculosis is a well-known extrapulmonary manifestation of Mycobacterium tuberculosis infection and is responsible for a considerable amount of morbidity and mortality in endemic areas [1]. This may involve the gastrointestinal tract, peritoneum, lymphatic nodes or solid viscera and cause complications such strictures, perforations and intestinal obstruction [2]. Abdominal TB continues to be associated with pose diagnostic problems in spite of improved diagnosis and therapy due to its varied presentation and similarity to other inflammatory or neoplastic diseases [3]. The ileocecal region is the most common site involved in intestinal tuberculosis for its abundant lymphoid tissue and conditions that allow for stasis and neutral pH, which promotes mycobacterial colonization [4].

The cause in Intestinal tuberculosis is the transmural inflammation which eventually leads to fibrosis, strictures and resultant obstruction [5]. Subacute intestinal obstruction is a common presentation, with symptoms that include abdominal pain, distention, vomiting, and changes in bowel habits, with a febrile and cachetic state [6]. It can resemble other conditions like Crohn's disease, carcinoma, or other granulomatous

conditions, emphasizing a need for more clinical suspicion in endemic regions [7]. The diagnosis still relies mainly on imaging, endoscopy, and histopathology as definitive to which highly accurate molecular tools like GeneXpert and PCR, could complement the diagnosis [8].

Increases in immunocompromised people and the emergence of multidrug-resistant TB strains are responsible for the surge in TB incidence [9]. In India, intestinal TB is still a leading cause of small bowel blockage, leading to a significant number of surgical cases [10]. For proper management, it is important to comprehend the disease's clinical, pathological, and outcome profiles, as well as the implications of the clinical and surgical management undertaken for the case. This retrospective study looked at the clinical presentation, diagnosis methods, intraoperative findings, and surgical outcomes of patients with TB-induced intestinal obstruction at the All India Institute of Medical Sciences in Raipur over the course of a fiscal year. In order to address this health issue, the objective is to make it easier to integrate evidence-based surgical approaches with early diagnosis.

Materials and Methods

Study Design and Setting: The All India Institute of Medical Sciences (AIIMS), Raipur, India's Department of General Surgery, conducted this retrospective observational study. During the one-year study period from January 2023 to January 2024, the study documents the patients who were admitted and operated on for intestinal blockage due to tuberculosis. The study received ethical approval from AIIMS Raipur's Institutional Ethics Committee. Throughout the study, confidentiality was also upheld in accordance with the Declaration of Helsinki. As this was a retrospective record-based study with no direct patient contact, the Institutional Ethics Committee granted a waiver of informed consent.

Because this study was retrospective in nature and based entirely on previously recorded hospital case files, no randomisation or allocation of patients was performed. All patients were included consecutively according to the availability of complete medical records. As the study did not involve any intervention or prospective assignment, concepts such as randomisation, blinding, or allocation concealment were not applicable.

Study Population and Sample Size: The study included a total of 50 patients diagnosed in the course of the study either intraoperatively or histopathologically with intestinal obstruction secondary to tuberculosis. The study followed a retrospective design, hence, for the collection of data the authors utilized hospital records, operation theatre logs, and histopathology reports.

Inclusion Criteria: All patients diagnosed with intestinal obstruction due to abdominal tuberculosis during the study period whose complete medical and operative records were available.

Exclusion Criteria: Patients with incomplete case files.

The study followed a retrospective design, hence, for the collection of data the authors utilized hospital records, operation theatre logs, and histopathology reports. The study included patients from all age and sex groups. Patients with intestinal obstruction attributed to conditions other than tuberculosis were excluded (postoperative adhesions, malignancy, hernia, or volvulus). Patients case files, discharge summaries, operative notes, and pathology reports were utilized for the data collection. The study sought to analyze a number of different parameters, which included the demographic profile (age, sex, residence), clinical presentation (duration of symptoms such as abdominal pain, distention, vomiting, constipation, fever and weight loss), lab tests, imaging studies, intraoperative findings, histopathological findings, and treatment results.

The radiological evaluations conducted include abdominal X-rays, ultrasound, and Contrast Enhanced CT (CECT) scans, concentrating on the findings related to Tuberculosis (TB) including, strictures, bowel wall thickening, lymphadenopathy, and peritoneal involvement. Caseating granulomatous inflammation with acid-fast bacilli on histopathological examination was considered a confirmation.

Management and Outcome Evaluation: Following the recommendations of the Revised National Tuberculosis Control Programme (RNTCP), antitubercular treatment (ATT) was initiated for all patients following histological or clinical confirmation. Segmental resection with anastomosis, stricturoplasty, ileotransverse bypass, and adhesiolysis were among the surgeries performed in response to intraoperative findings. Every patient's complications, hospital stay, and death were documented.

Post-operative management followed the standard institutional protocol. All patients received intravenous paracetamol as baseline analgesia, with opioid rescue medication such as tramadol or morphine administered when necessary. Early ambulation, NG tube removal, and reintroduction of oral feeding were done as tolerated. Pain assessment using VAS was included only when it was documented in the original nursing records. For patients without documented VAS scores, postoperative pain was assessed based on the type

and frequency of analgesic requirement. No fresh VAS scoring was performed retrospectively.

Data analysis: Data was managed with Microsoft Excel 2019 and statistical analysis was done with SPSS version 26.0 (IBM Corp, Armonk, NY, USA). Quantitative data was recorded as mean with standard deviation (SD) and categorical data was recorded with its frequency and percentage. Chi-square or Student's t-test was used for comparative analysis on categorical variables between groups (eg. type of surgery and outcome). p value of ≤ 0.05 was statistically acceptable.

Results

The study comprised fifty patients who had intestinal blockage as a result of tuberculosis. Below is a summary of the demographic, clinical, radiological, intraoperative, and postoperative results.

Demographic Profile: Among the 50 patients, 32 were males (64%) and 18 (36%) were females, which resulted in a male-to-female ratio of 1.8:1.

The average age of the patients was 36.8 years and varied from 18 to 65 years (± 11.7 years). Most patients were aged 21-40 years (60%) which is the economically most productive age group. Most patients (72%) came from rural areas and low socioeconomic status backgrounds.

Table 1: Demographic distribution of patients (n=50)

Parameter	Category	No. of patients (%)
Age (years)	<20	4 (8%)
	21–40	30 (60%)
	41–60	12 (24%)
	>60	4 (8%)
Sex	Male	32 (64%)
	Female	18 (36%)
Residence	Rural	36 (72%)
	Urban	14 (28%)

Clinical Presentation: In 92% of cases, the most frequent initial symptom was abdominal discomfort, which was followed by distension of the abdomen (78%), vomiting (68%), and constipation (60%). Fever and weight loss were reported in 42% and 38% of cases, respectively, as constitutional symptoms. Prior to presentation, the average duration of symptoms was 3.5 ± 1.2 months.

Table 2: Clinical presentation of patients

Symptom	No. of patients (%)
Abdominal pain	46 (92%)
Abdominal distension	39 (78%)
Vomiting	34 (68%)
Constipation/obstipation	30 (60%)
Fever	21 (42%)
Weight loss	19 (38%)
Diarrhea	10 (20%)

Radiological and Laboratory Findings: On plain abdominal X-ray, multiple air-fluid levels and dilated bowel loops were noted in 80% of patients. Ultrasound abdomen revealed thickened bowel loops with mesenteric lymphadenopathy in 28 (56%) cases**.** CECT abdomen (performed in 30 patients) showed strictures (40%), bowel wall thickening (36%), and mesenteric lymphadenopathy (30%). Mantoux test was positive in 60%, while ESR was elevated (>30 mm/hr) in 74%.

Table 3: Radiological and laboratory findings

Parameter	Finding	No. of patients (%)
X-ray abdomen	Multiple air-fluid levels	40 (80%)
Ultrasound	Bowel wall thickening + lymph nodes	28 (56%)
CECT (n=30)	Stricture	12 (40%)
	Bowel wall thickening	11 (36%)
	Lymphadenopathy	9 (30%)
Mantoux test	Positive	30 (60%)
ESR (>30 mm/hr)	Elevated	37 (74%)

Radiological and Laboratory Findings: Eighty percent of the patients had simple abdominal X-ray findings that showed dilated bowel loops and various air-fluid levels. On the abdominal ultrasonography, 28 patients (56%) had thickened bowel loops with mesenteric lymphadenopathy. Of

the 30 patients who had abdominal CECT, 30% showed mesenteric lymphadenopathy, 36% had thickening of the intestinal wall, and 40% had bowel strictures. 74% of the patients had an increased ESR (>30 mm/hr), and 60% of the patients had a positive Mantoux test.

Intraoperative Findings and Procedures: The region most often affected was the ileocecal area, accounting for 68%, followed by the jejunum at 14%, ileum at 12%, and colon at 6%. Multiple strictures were found in 40% of cases, and in 38%, a single stricture with proximal dilatation was observed. Five cases had perforation, while tubercular mass or adhesions were found in 16%. Surgical management consisted of resection and anastomosis (46%), stricturoplasty (28%), ileotransverse bypass (12%), and adhesiolysis (14%). Double-barrel ileostomy was performed in selected patients where primary anastomosis was unsafe due to severe inflammation or contamination; however, the exact number of such procedures was not consistently documented

Exact defect size and stricture length were not consistently documented in the operative notes. While the anatomical location and number of strictures were available, quantitative measurements of the diseased bowel segment (in cm) were missing for most patients. Therefore, defect size could not be analysed and has been marked as “not documented.”

Histopathology and Postoperative Outcome: All patients had tuberculous etiology histopathologically confirmed, including caseating granulomatous with epithelioid cells, Langhans giant cells, and lymphocytic infiltrate. AFB was confirmed in 34% of the biopsy specimens. All patients were given standard ontreatment ATT in the postoperative period. Patients were hospitalized for an average of 10.4 ± 3.1 days. Postoperative complications occurred in 12 (24%) patients, most frequently wound infection (10%), anastomotic leak (6%), and prolonged ileus (8%). There were 2 postoperative deaths (4%) due to septicemia and respiratory failure.

VAS scores were not routinely documented in the hospital files. Therefore, postoperative pain assessment could not be analysed for all patients. Pain evaluation in this study was based on analgesic requirement rather than VAS scoring

Discussion

In this analysis of 50 patients with bowel obstruction due to tuberculosis at AIIMS Raipur, it was noted that ITB is still one of the leading causes of bowel obstructions in developing countries. Like other studies conducted in India and other countries, this condition continues to affect predominantly young adult males [11,10]. This age and gender distribution likely corresponds to the higher risk and incidence of pulmonary tuberculosis disease in males, which can eventually affect the intestines due to dissemination [12]. In this study, the ileocecal region was most commonly affected, corresponding to almost 68% of cases, which is consistent with previous findings [13,14]. This predilection is due to a constellation of physiological factors such as stasis, hyperplasia of lymphoid tissues, and a neutral pH that encourages the growth of Mycobacterium tuberculosis [8].

The presence of several strictures and obstructive inflammatory masses is an indicator of the chronicity of this disease and the granulomatous reaction to the infection [5]. Clinically, most of our patients presented with a combination of abdominal pain, distension, and vomiting, which is a predominant symptom complex noted in other studies [15,16]. Systemic inflammatory symptoms in this cohort, such as fever and weight loss, observed in 40% of patients, reinforce the chronicity of inflammatory disease.

Findings involving air-fluid levels on X-rays, as well as bowel thickening and mesenteric lymphadenopathy seen on ultrasounds or CECT, were supportive albeit not definitive. Findings of similar patterns in imaging have been reported in prior studies, where suspicion was raised due to radiological assessme, and histopathological confirmation was still needed to establish diagnosis [4,17]. In all our cases, granumolous inflammation was caseting, and acid fast bacilli was seen in a third of our patients, similar to findings in [18,19]. This demonstrates once again the relevance of a tissue biopsy in diagnosis, and more specifically to assess for ITB versus Crohn’s disease or a malignancy, as these all have potential to present similarly [3]. In cases that present with an obstruction or perforation, Surgical intervention is still necessary. In our study, most procedures performed were resection with anastomosis, also with stricturoplasty, and these procedures were associated with good of outcomes. Other Indian series also report similar surgical trends [20,21]. The morbidity (24%) and mortality (4%) seen in our patients were within expected limits, and point to good outcomes and timely intervention and the appropriate use of antitubercular therapy [22]. In cases with a partial obstruction, the conservative approach is appropriate, however, in cases with an obstruction or perforation, the indications for surgery are clear [23].

This study has limitations related to its retrospective design. Detailed operative measurements such as exact defect size and stricture length were not consistently documented in the case files. Similarly, postoperative VAS pain scores were not routinely recorded, restricting their analysis. Prospective studies with structured

operative and postoperative documentation are required for more accurate assessment.

Conclusion

India, particularly in endemic regions, continues to deal with significant challenges posed by Intestinal Tuberculosis as a cause of bowel obstruction. The ileocaecal region is primarily affected as patients present with prominent abdominal clinical symptoms that are not specific, thus contributing to delayed diagnosis.

Stricturoplasty or limited resection with anastomosis provides for a good outcome, especially when used in conjunction with antitubercular therapy. To avoid complications and reduce mortality, ITB calls for early diagnosis, prompt surgical treatment, and multidisciplinary approach. In high Tuberculosis burden regions, clinicians should focus with a high degree of suspicion on patients suffering from puzzling intestinal obstruction.

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