

Original Research Article

Spectrum of clinical presentation and surgical management of intestinal tuberculosis at tertiary health centre

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ABSTRACT

Background: Tuberculosis is a transmittable disease caused by *Mycobacterium tuberculosis*. Tuberculosis (TB) is a widespread and serious health issue, particularly in developing nations where ignorance, poverty, overcrowding, inadequate sanitation, and malnutrition are prominent. The goal of this study was to assess the clinical signs and outcomes after surgery for intestinal TB and to compare the clinicopathological profile and outcome of surgical therapy of abdominal tuberculosis in our environment to what has been reported in the literature.

Methods: The research was carried out at the SMS hospital in Jaipur, general surgery ward. This was a hospital-based descriptive observational study that lasted until September 2021 carried out from September 2020 to September 2021 the necessary sample size was reached. The sample size was computed using a 95% confidence interval and the assumption that 76.7% of the patients had abdominal pain. The sample size of 68 patients with intestinal TB was rounded up to 70 patients.

Results: Out of 70 patients, there were 30 patients in the age range 15-30 years, followed by 20 (28.57%) in the age group 46-60 years, and 16 (22.85%) in the age group 61-75 years. Females made up 55.71% of the 70 patients.

Conclusions: The disease is characterised by young age at presentation, delayed manifestation, poverty, and high morbidity and mortality in this region. These issues must be addressed in order to provide the best possible treatment for these individuals. The key to an early and successful diagnosis of abdominal tuberculosis is extreme monitoring in patients with abdominal symptoms.

Keywords: Intestinal tuberculosis, Malnutrition, Poverty, Abdominal pain, Overcrowding

INTRODUCTION

Tuberculosis (TB) is a pervasive and serious health issue, particularly in developing nations where ignorance, poverty, overcrowding, inadequate sanitation, and malnutrition are prominent.¹

Hippocrates discovered the first documented link between tuberculosis and gastro-intestinal symptoms in the 5th century BC, when he noted that diarrhoea in a person with phthisis was a fatal symptom.² Tuberculosis is a big concern, especially in developing countries, accounting for 7-10 million new cases and 6% of global

fatalities each year.³ Despite continuous efforts to combat tuberculosis (TB), it continues to be a major health problem in impoverished nations like India, where fatalities due to TB accounting for 50/100,000 people.⁴ In regions where milk supplies continue to be contaminated with tubercle bacilli, or pulmonary or other kinds of tuberculosis are endemic, intestinal tuberculosis is still frequent.⁵

After lymphatic, genitourinary, bone and joint, military, and meningeal tuberculosis, abdominal tuberculosis is the sixth most prevalent site of affection in extrapulmonary tuberculosis.^{6,7} The World Health Organization (WHO)

has declared it a global emergency, and it is the most serious communicable disease on the planet.^{8,9}

Intestinal tuberculosis is most frequent in people between the ages of 25 and 44.¹⁰ Abdominal discomfort, vomiting, abdominal distension, diarrhoea, abdominal mass, and constitutional symptoms such as weight loss, fever, anorexia, and night sweats are all common symptoms.^{11,12}

Early diagnosis of intestinal tuberculosis remains a difficulty for general surgeons due to a wide range of clinical manifestations and a lack of definitive diagnostic studies. Intestinal tuberculosis is also difficult to cure definitively. Despite improved health standards in developed countries, tuberculosis is once again on the rise, owing to an influx of immigrants from third-world countries, an increase in the incidence of human immunodeficiency virus (HIV) infection, an ageing population, alcohol addiction, increased use of immunosuppressive drugs, and the emergence of multi-resistant *Mycobacterium tuberculosis* strains.^{13,14}

The goal of this study was to assess the clinical signs and outcomes of surgery for intestinal TB and to compare the clinicopathological profile and outcome of surgical therapy of abdominal tuberculosis in our environment to what has been reported in the literature.

Aims and objectives

To assess the clinical signs and outcomes after surgery for intestinal TB and to compare the clinicopathological profile and outcome of surgical therapy of abdominal tuberculosis in a tertiary centre in west Rajasthan.

METHODS

This was a hospital based prospective observational study that took place at the department of general surgery SMS Medical College, Jaipur.

Study population

Patients admitted in SMS surgical wards with abdominal diagnosed on histopathologic basis as abdominal tuberculosis formed the study population. After taking due approval from the ethical committee the research was carried out at the SMS hospital in Jaipur general surgery ward.

Study duration

This was a hospital-based descriptive observational study that was carried out from September 2020 to September 2021.

Sample size

The sample size was computed using a 95% confidence interval and the assumption that 76.7 percent of the

patients will have stomach pain. The sample size calculated was 68 patients with intestinal TB which was rounded up to 70 patients.

Inclusion criteria

All patients with abdominal discomfort, acute/subacute/chronic intestinal blockage, perforation peritonitis, and ascites with a history of tuberculosis or risk factors for tuberculosis who were operated or underwent diagnostic laparoscopy were included in the study after giving written and informed consent.

Exclusion criteria

Patients with histopathology report other than tuberculosis (inflammatory bowel disorders, other bacterial enteritis, pseudo-obstruction, or cancer). Patients who were treated on an outpatient basis. Intestinal obstruction in infants and children up to the age of twelve. Patients who refused to undergo surgery.

Data collection and analysis

For all the patients that fulfilled the above criteria a prefixed performa was filled and details including the patients' vitals, investigations and management were noted. after the sample size was reached the data collected was assessed in MS excel for this descriptive study. Any statistical analysis was done with the help of SPSS version 29.0 software.

RESULTS

The study was conducted at the SMS hospital in Jaipur general surgery ward. It was noted that out of 70 patients, 30 were in the age range 15-30 years, followed by 20 (28.57%) in the age group 46-60 years, and 16 (22.85%) in the age group 61-75 years. The average age was 45.85±18.39 years. Out of the 70 patients, 55.71% were female (Figure 1).

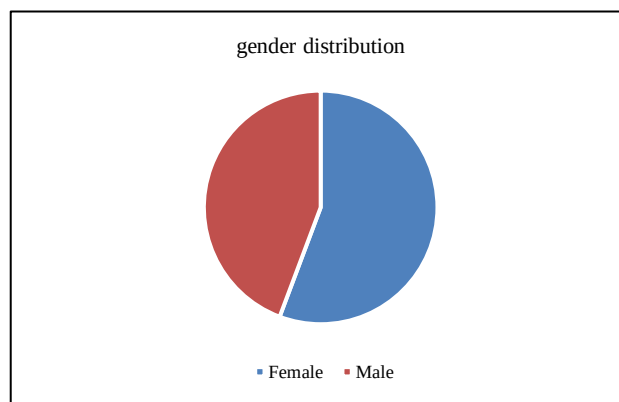


Figure1: Sex wise distribution.

In our study all 70 patients (100%) had abdominal pain, 64 patients (91.42%) had anorexia, and 59 patients

(84.28%) had reported obstipation (Figure 2). Other symptoms included vomiting, abdominal distention, fever, weight loss etc.

Table 1: Demographic data.

Age (range)	No. of cases (%)	Mean age
15-30	30 (42.85)	45.85±18.39 years
31-45	4 (5.71)	
46-60	20 (28.57)	
61-75	16 (22.85)	

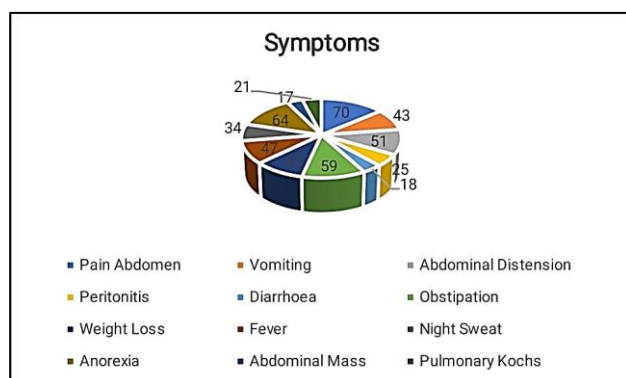


Figure 2: Diagrammatic representation of symptoms.

Hematological parameters were calculated. The average HB was 10.61 mg/dl and the average TLC was 12908/cc. In this study, x-ray FPA revealed that 37 patients (52.8%) had dilated bowel loops and 25 patients (35.715%) had gas under diaphragm. In the chest x-ray, it was found that pleural effusion occurred in 22 (31.42%) patients, followed by miliary TB in 11 (15.71%) patients. Out of the 70 patients, 45 never had ATT treatment, whereas 12 (17.14%) had received regular ATT treatment and 13 (18.57%) had been defaulters. In USG total abdomen, dilated bowel loops was present in 30 patients, echogenic free fluid collection in 25 individuals, mass in RIF in 13 patients, enlarged mesenteric lymph nodes in 11 patients, and ascites in 13 patients.

Many patients had multiple findings, including cocooning in two cases and appendicitis in one. Colonoscopy was performed in 8 patients. In colonoscopy, it was discovered that 11.4 percent of patients had ICJ Ulcers, 8.57% had caecal ulcers, and 7.14% had intra-luminal mass in caecum.

It was observed that out of 35 (50%) patients who underwent CT scan, 23 (32.85%) patients had ICJ narrowing and 10 (14.28%) patients had ascites. ICJ narrowing was the most common observation in 23 (32%) patients, followed by mesenteric lymph node enlargement, ascites in 10, and dilated bowel loops in 9. Pulled up caecum (4), omental caking (4), RIF mass (5), and pneumoperitoneum were among the other findings (3). Multiple results were found in many cases.

44 patients (62.85%) underwent emergency laparotomy surgery and 12 (17.14%) underwent elective surgery. Intraoperatively, it was found that 30 patients had stricture, 25 patients with perforation, and 11 patients with adhesion (Table 2). The majority of patients (16) had resection with stoma development, followed by 14 who underwent resection with anastomosis. In 11 patients, loop ileostomy was made, adhesiolysis in 8 patients, and stricturoplasty in seven individuals. Multiple surgeries were performed on certain patients.

Table 2: Distribution of cases according to operative finding.

Operative findings	No. of patients	Percentage
Stricture	30	42.85714
Perforation	25	34.28571
Adhesion	11	15.71429
Miliary tuberculosis	21	30
ICJ Mass	4	5.714286
Appendicitis	1	1.428571

Based on location of pathology it was found that terminal ileum was involved in 34 cases (48.57%). Ileocaecal junction illness affected 29 patients (41.42%), while proximal bowel disease affected 7 patients (10%).

In our study HIV was present in 12.85% of the individuals.

Table 3: Distribution of patients according to post-op wound infection in patients who were operated (60).

Post-op wound infection	No. of patients	Percentage
Yes	30	50
No	30	50
Total	60	100

In this study, 50% of the patients experienced a post-operative wound infection and 5% of the patients had anastomotic leak. Every single patient received a conclusive. HPE report. The mortality rate in this study was 8.57%. In addition to individuals who did not have surgery, diagnostic laparoscopy with biopsy was included in conservative care. In total, conservative treatment was used on 20% of the patients.

DISCUSSION

90 million tuberculosis patients were registered in national surveillance systems and reported to the World Health Organization (WHO) between 1980 and 2005. Although the global TB incidence rate peaked between 2000 and 2005, the overall number of new cases continues to rise each year. *M. tuberculosis* infects half of the world's population, and it is the main cause of infectious death, killing around 1.6 million people each year.¹⁵

Abdominal tuberculosis is one of the most prevalent forms of extra-pulmonary tuberculosis. The gastrointestinal (GI) tract, peritoneum, lymphatic system, and solid viscera are subject to differing degrees of tuberculosis involvement, which can occur alone or in combination.

Tuberculosis has a wide spectrum of illness and can affect any system in the body. Tuberculosis of GI tract accounts for 50% of all gastrointestinal cases. The commonest site is distal ileum and caecum. Abdominal tuberculosis is an important but probably underestimated clinical problem.

The diagnosis of abdominal tuberculosis is often delayed, increasing the morbidity associated with this treatable condition.

We found that out of 70 patients, there were a greater number of patients of age group 15-30 years of age with 30 patients followed by 20 (28.57%) in an age group of 46-60 years and 16 (22.85%) patients in an age group of 61-75 years. Mean age was found to be 45.85 ± 18.39 year. We observed that out of 70 patients 55.71% patients were female.

Abro et al found that the age ranged from 10-56 years, with majority (33.3%) of patients belonging to 3rd decade.²⁰ There were 32 females and 28 males with a male to female ratio of 1.4:1 respectively. Bali et al found that the youngest and the oldest patient in the study group were 13 years old boy and a 73 years old lady, respectively.¹⁹ The mean age of the patients in our study was 28.9 years. Sadia et al reported mean age in their study to be 35.9 years. This difference in mean ages in this study and hers is probably due to the larger sample size of 161 patients in her study as compared to our sample size of 70 patients. Males and females being 46 (60%) and 36 (40%), respectively.

Majority 70 (100%) of patients were of pain abdomen followed by 64 (91.42%) Anorexia and 59 (84.28%) obstipation. We observed that 9 (12.85%) patients were HIV positive. All of which were on antiretroviral therapy.

Mandal et al found that the common presenting symptoms, abdominal pain, weight loss, and bowel disturbances were found in 42 (92%), 38 (83%), and 34 (74%) patients, respectively.¹⁵ A study by Chalya et al found that the majority of patients, 152 (59.4%) had symptoms of more than 6 months duration at the time of presentation.¹⁶ The commonest presenting symptom was abdominal pain in 240 (93.8%) patients. The most common mode of presentation was acute in 182 (71.1%) patients, followed by subacute and chronic presentation in 47 (18.4%) and 27 (10.5%) patients respectively. A total of 127 (49.6%) patients presented with intestinal obstruction, 106 (41.4%) with peritonitis, 17 (6.6%) with abdominal masses and 6 (2.3%) patients with multiple fistulae in ano.

We calculated different parameters of CBC. Mean of HB was 10.61 and the haemoglobin level of 36 patients revealed anaemia (≤ 11 gm/dl) and leucocytosis ($\geq 11000/\text{mm}^3$) was found in 45 patients with a mean of $12908 \text{ cells}/\text{mm}^3$. Few of our patients underwent colonoscopy of which 8 (11.4%) patients had ICJ ulcers followed by 6 (8.57%) patients of caecal ulcer and 5 (7.14%) patients of intra-luminal mass in caecum.

Chalya et al found that the median haemoglobin level and ESR were 8.0 (IQR = 4 to 10 gm/dl) (range = 4.2-12.6 gm/dl).¹⁶ The hemoglobin level was less than 10 gm/dl in 211 (82.4%) patients. Serum creatinine and electrolytes were performed in all patients and revealed low results in 102 (39.8%) and 67 (26.2%) patients respectively. Mandal et al found that laboratory investigation revealed anaemia (Hb less than 11 gm%) in 16, leucocytosis ($\text{WBC} \geq 11,000/\text{mm}^3$) in two, and positive Mantoux test in 16 patients.¹⁵ The HIV serological test was positive in eight patients, while two patients had diabetes mellitus.

We observed that on CXR 22 (31.42%) were of pleural effusion followed by 11 (15.71%) of miliary TB. In this study we calculated that 37(52.8%) patients had dilated bowel loops and 25 (35.715%) had gas under diaphragm. On USG abdomen we observed that 25 (35.71%) patients were of echogenic free fluid collection (free fluid with internal septation) followed by 30 (42.8%) patients were of dilated bowel loops and 13(18.57%) patients were of mass in RIF.

USG abdomen is part of the initial investigation panel in abdominal TB. In a recent review, an abdominal ultrasound was found abnormal in 68% of cases. Abro et al found that barium meal follow through was done in 2 patients (3.3%).²⁰ Twelve (20%) patients had CT scan of the abdomen while colonoscopy was done in 4 (6.7%) cases. Diagnostic laparoscopy is now considered as most appropriate evaluation because of its ability to visualize whole abdominal cavity in detail and to take biopsies from suspected lesions at the same time.²¹ Al Muneef et al reported similar laboratory findings.¹⁰ However in 35 (50%) patients in our study had CECT abdomen done of which majority of the patients had ICJ narrowing (23) followed by RIF mass (5), pulled up caecum (4) and gas under diaphragm (3). In our study 60 patients underwent surgery of which majority of the patients i.e. 44 (62.84) had emergency laparotomy for acute intestinal obstruction and perforation and 16 (22.8%) patients had elective surgery and 10 (14.28%) patients were treated conservatively with anti-tubercular therapy only.

A similar study by Chalya et al found that a total of 212 (82.8%) patients underwent surgical treatment for abdominal tuberculosis and the remaining 44 (17.2%) patients were treated conservatively with antitubercular therapy.¹⁶ Of those who underwent surgery, 182 (85.8%) were operated on emergency basis while 30 (14.2%) patients had an elective surgery due to failure to resolve with conservative management (i.e. poor response to

therapeutic trial of antitubercular drugs). Patients who failed to respond to therapeutic trial of ant-tuberculous drugs underwent surgery and tissue diagnosis was established of tuberculosis in all 30 patients.

In the operative findings we observed that 30 patients were of stricture, 25 were of perforation, 21 with miliary TB and 11 were of gross adhesion and ICJ mass was present in 4 patients. We observed that in majority of patients i.e. 16 underwent resection and stoma (ileostomy) followed by 14 of resection and anastomosis and 11 were of loop ileostomy, release of band and adhesions i.e. adhesiolysis was done in 8 patients and stricturoplasty in 7 patients.

Chalya et al found that the site of abdominal TB involvement was intestinal in 127 (49.6%), peritoneal in 106 (41.4%), nodal in 10 (3.9%) and solid viscera in 7 (2.7%) patients.¹⁶

The remaining 6 (2.3%) patients had multiple perianal fistulae. Ileocaecal region was the most common bowel involved in 122 (57.5%) patients, followed by ileum and jejunum in 72 (34.0%) and 12 (5.7%) patients respectively. The colon was involved in 6 (2.8%) patients. Release of bands and adhesions was the most frequent surgical procedure performed in 58.5% of cases. Bali et al found that the commonest intra-operative finding encountered was ileal perforation found in 23 (30.3%) of the patients followed by, in order of decreasing frequency, multiple small bowel perforation in 14 (18.4%), solitary stricture of the small bowel with perforation in 9 (11.8%), ileo-cecal mass in 9 (11.8%), adhesions or bands in 7 (9.2%), single or multiple strictures in 5 (6.6%), stricture with impending small bowel perforation in 5 (6.6%) and jejunal perforation in 4 (5.3%) patients.¹⁸ The frequently performed surgical procedures in order of decreasing frequency were ileostomy (32 patients), resection and anastomosis of the involved bowel (12 patients), primary repair of the perforation (10 patients), right hemicolectomy (8 patients), adhesiolysis (6 patients), stricturoplasty (4 patients) (done in case of single stricture, mostly), jejunostomy (3 patients) and peritoneal and omental biopsy in 1 patient respectively.

In this study we observed that 30 (42.85%) patients had post-op wound infection which was managed conservatively by regular dressing and cleaning of the wound and proper antibiotic as per the culture sensitivity report. We analysed that 3 (4.28%) patients had anastomotic leak. We found that 6 (8.57%) patients died in our study of which 3 died due to anastomotic leak and remaining 3 died as the result of chest complications, shock, sepsis and other co-morbidity.

Bali et al found that amongst the study group patients, 41 developed postoperative complications in the form of surgical site infections in 24 patients, pulmonary complications in 10 patients, enterocutaneous fistula in 4

patients and primary repair or anastomotic breakdown leak in 3 patients respectively.¹⁸ Out of these only two succumbed to their morbidity. Eleven patients in their study group expired in the immediate post-operative period and the cause of death were the sequelae to sepsis and septic shock, i.e. MODS. Rajput et al found that the post-operative complications were encountered in 42 patients (37.5%), of which the major share was contributed by wound infection.¹⁹ Abro et al found that Postoperative complications occurred in 26 (43.3%) patients.²⁰ The complications included wound infections (25%), septicemia (10%), chest infection (10%) and anastomotic leakage (3.3%). Two (3.3%) patients died due to septicaemia following anastomotic leakage.

Our study is limited in terms of number of subjects. A better study could be conducted in a longer duration of study and larger number of subjects. Also, a longer period of follow up to assess the overall prognosis of these patients wherein follow up regarding the antitubercular treatment taken and any repeat surgical treatment could provide better and more significant results.

CONCLUSION

In our environment, abdominal TB is a major public health problem that poses a diagnostic difficulty that necessitates a high index of clinical suspicion. In this region, the disease is characterized by young age at presentation, delayed manifestation, poverty, and high morbidity and mortality. The final diagnosis can be made only after tissue diagnosis in most patients of abdominal TB hence taking a biopsy must be kept in mind while operating a patient where tuberculosis is suspected. These issues must be addressed in order to provide the best possible treatment for these individuals. This study is helpful in providing an insight to the disease pathology and the variety of presentations of abdominal tuberculosis. It also suggests the type of treatment that can be undertaken for variety of patients. The key to an early and successful diagnosis of abdominal tuberculosis is extreme monitoring in patients with abdominal symptoms and providing selective and specific management in each case based on individual findings is beneficial in providing successful results in patients of tuberculosis.

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