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

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

International Journal of Current Pharmaceutical Review and Research 2026; 18(7); 101-105

Original Research Article

Assessment of Diagnostic Predictors and Treatment Outcome of Abdominal Tuberculosis

Keshav Kumar Jaiswal[1], Kailash Charokar[2], Nikhil Vyas[3]

[1]Post Graduate Trainee MS General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

[2] Professor, Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

[3]Assistant professor, Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

Received: 01-04-2026 / Revised: 15-05-2026 / Accepted: 21-06-2026

Corresponding author: Dr. Keshav Kumar Jaiswal

Conflict of interest: Nil

Abstract

Background: Abdominal tuberculosis remains a major health problem in developing countries and is associated with significant diagnostic and therapeutic challenges because of its nonspecific clinical presentation and varied radiological manifestations. The present study aimed to evaluate the diagnostic predictors and treatment outcomes of abdominal tuberculosis.

Methods: This descriptive observational and analytical study was conducted in the Department of General Surgery, People's Hospital, Bhopal, from April 2024 to March 2026. A total of 58 clinically suspected cases of abdominal tuberculosis were enrolled. Clinical profile, radiological findings, operative details, diagnostic predictors, and treatment outcomes were analyzed. Diagnostic modalities including AFB Ziehl–Neelsen staining, CBNAAT, AFB culture, and histopathology were evaluated using an Integrated Reference Standard (IRS) as the gold standard.

Results: The mean age was 37.31 ± 13.91 years, with male predominance (55.17%). Common symptoms included loss of appetite (82.75%), weight loss (79.31%), abdominal pain (74.13%), and fever (67.2%). Acute intestinal obstruction was the most common presentation. CBNAAT demonstrated the highest sensitivity (100%) and diagnostic accuracy (95.83%). Operative management was required in 79.31% of patients, with resection and end-to-end anastomosis being the commonest procedure. Mortality was 6.52%.

Conclusion: Early diagnosis using molecular techniques such as CBNAAT and timely surgical intervention significantly improve outcomes in abdominal tuberculosis.

Keywords: CBNAAT, TB, Diagnostic predictors, Abdominal TB.

DOI: 10.25258/ijcpr.18.7.17

Introduction

Tuberculosis (TB) continues to remain a major global public health challenge, particularly in developing countries where poverty, overcrowding, malnutrition, and inadequate sanitation contribute significantly to disease transmission and progression. Despite substantial advances in diagnostic techniques and therapeutic strategies, TB continues to cause considerable morbidity and mortality worldwide.

The World Health Organization has recognized tuberculosis as one of the leading infectious causes of death globally and has declared it a global health emergency. According to the WHO Global Tuberculosis Report 2025, approximately 10.8 million people developed active tuberculosis in 2023, resulting in nearly 1.25 million deaths worldwide, including deaths among HIV-positive individuals [1]. India continues to account for the largest share of the global TB burden, contributing nearly one-fourth of all reported cases, thereby emphasizing the persistent healthcare and socio-economic challenges associated with the disease [1]. Although pulmonary tuberculosis is the most common presentation, extrapulmonary tuberculosis (EPTB) constitutes a substantial proportion of cases, particularly among immunocompromised individuals.

EPTB accounts for nearly 15–20% of all tuberculosis cases in immunocompetent patients, with a significantly higher incidence in patients

with HIV infection [2]. Among the different forms of EPTB, abdominal tuberculosis remains one of the most important yet diagnostically challenging clinical entities [3]. Abdominal tuberculosis encompasses involvement of the gastrointestinal tract, peritoneum, mesenteric and retroperitoneal lymph nodes, and solid abdominal organs such as the liver and spleen [4]. The disease may occur through hematogenous dissemination from a primary pulmonary focus, lymphatic spread from infected nodes, ingestion of infected sputum, or direct extension from adjacent structures [5]. The ileocecal region is the most commonly affected site because of the abundance of lymphoid tissue, physiological stasis, and increased absorptive activity in this area [6]. Morphologically, intestinal tuberculosis may present in ulcerative, hypertrophic, ulcero-hypertrophic, or fibrotic stricture forms, whereas peritoneal tuberculosis may manifest as ascitic, loculated, fibrotic, or purulent variants [7].

The clinical presentation of abdominal tuberculosis is highly variable and frequently non-specific. Patients commonly present with chronic abdominal pain, fever, weight loss, anorexia, altered bowel habits, abdominal distension, and generalized malaise [8]. Acute presentations may occur secondary to complications such as intestinal obstruction, perforation, hemorrhage, or peritonitis [9]. Owing to its protean manifestations, abdominal tuberculosis often mimics several other intra-abdominal conditions including Crohn's disease, malignancy, appendicitis, and nonspecific inflammatory disorders, thereby leading to diagnostic confusion and delays in treatment [10].

The diagnosis of abdominal tuberculosis remains difficult because there is no single definitive non-invasive diagnostic test. Conventional laboratory investigations and radiological findings such as ascites, bowel wall thickening, lymphadenopathy, omental thickening, and abdominal masses are suggestive but not pathognomonic [11].

Histopathological confirmation demonstrating caseating granulomas remains the diagnostic gold standard in most cases [12]. Consequently, invasive procedures such as endoscopy, image-guided biopsy, laparoscopy, or laparotomy are often required for definitive diagnosis [13]. In resource-limited settings, delayed access to advanced imaging and molecular diagnostic techniques further complicates timely diagnosis and management [14].

Anti-tubercular therapy (ATT) remains the cornerstone of treatment for abdominal tuberculosis, especially in uncomplicated cases diagnosed early [15]. Surgical intervention is generally reserved for patients presenting with complications such as intestinal obstruction, perforation, abscess formation, fistulae, or diagnostic uncertainty [16]. Despite improvements in medical imaging, endoscopic techniques, and surgical management, delayed diagnosis and treatment continue to contribute significantly to morbidity and adverse outcomes [17].

In endemic regions such as India, there remains a paucity of comprehensive studies evaluating the diagnostic predictors, clinicopathological characteristics, management strategies, and treatment outcomes of abdominal tuberculosis. Identification of reliable diagnostic predictors may facilitate earlier diagnosis, reduce unnecessary surgical interventions, and improve patient outcomes. Therefore, the present study was undertaken to assess the diagnostic predictors and treatment outcomes of abdominal tuberculosis in patients managed at a tertiary care centre. The study also aimed to evaluate the clinical presentation, radiological and histopathological findings, therapeutic approaches, and overall outcomes in order to contribute toward the development of a more effective diagnostic and management algorithm for abdominal tuberculosis.

Material & Methodology

This descriptive observational and analytical study was conducted in the Department of General Surgery at People's College of Medical Sciences and Research Centre and associated People's Hospital from 1st April 2024 to 31st March 2026, with data collection carried out up to 31st December 2025. The study included all newly diagnosed patients aged 18 years and above with clinically suspected abdominal tuberculosis and supportive radiological findings admitted to the Department of General Surgery during the study period. Patients already receiving anti-tubercular therapy and those with neoplastic diseases were excluded. Institutional Ethics Committee approval was obtained, and written informed consent was taken from all participants.

Demographic variables including age, gender, socioeconomic status, educational status, residence, and previous history of anti-tubercular therapy were recorded. Clinical presentation, microbiological findings, radiological findings, histopathological features, operative findings, postoperative complications, and treatment outcomes were documented in a structured study proforma. Patients were followed up for three months after registration. Relevant biological samples were collected for Ziehl–Neelsen staining for acid-fast bacilli (AFB smear), Cartridge Based Nucleic Acid Amplification Test (CBNAAT), AFB culture, and histopathological examination. All samples were processed according to standard laboratory protocols and Revised National Tuberculosis Control Programme (RNTCP)

guidelines. An Integrated Reference Standard (IRS) was used as the gold standard for diagnosis. Cases with supportive clinical and radiological findings along with positivity in any one of AFB smear, CBNAAT, AFB culture, or histopathology were considered confirmed abdominal tuberculosis cases. All diagnosed patients received anti-tubercular therapy as per RNTCP guidelines. Surgical intervention was performed in selected patients with complications or diagnostic uncertainty. Statistical analysis was performed using SPSS software. Sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy of various diagnostic modalities were calculated. A p-value <0.05 was considered statistically significant.

Result

A total of 58 patients with abdominal tuberculosis were included in the study, with a mean age of 37.31 ± 13.91 years and slight male predominance (55.17%). Most patients were underweight and commonly presented with loss of appetite, weight loss, abdominal pain, and fever. Acute intestinal obstruction was the most frequent clinical presentation. Radiological evaluation predominantly demonstrated bowel wall thickening, mesenteric fat stranding, increased mesenteric echogenicity, and bowel strictures. Operative management was required in the majority of patients, with resection and end-to-end anastomosis being the most commonly performed procedure. CBNAAT showed the highest diagnostic sensitivity (100%) and diagnostic accuracy (95.83%) among all diagnostic modalities. Histopathology most frequently revealed intestinal tuberculosis. Postoperative complications were observed in a minority of cases, paralytic ileus being the commonest, while overall mortality was noted in three patients.

Table 1: Demographic and clinical profile of patients with abdominal Tuberculosis

Variable	Findings
Mean age	37.31 ± 13.91 years
Most common age group	18–30 years (41.38%)
Gender	Male: 55.17%, Female: 44.83%
BMI	Underweight: 51.72%, Severely underweight: 20.68%
Common symptoms	Loss of appetite (82.75%), Weight loss (79.31%), Abdominal pain (74.13%), Fever (67.2%)
Common clinical signs	Abdominal tenderness (55.17%), Abdominal distension (48.27%)
Common presentation	Acute intestinal obstruction (29.31%)
Past pulmonary TB	25.86%
Mean haemoglobin	9.68 ± 0.76 g/dl
Mean serum albumin	2.08 ± 0.37 g/dl

Table 2: Radiological findings and management pattern in patients with abdominal tuberculosis

Variables	Findings
Common USG findings	Small bowel wall thickening (82.75%), Increased mesenteric echogenicity (68.96%), Dilated bowel loops (55.17%)
Common CECT findings (n=38)	Bowel wall thickening (89.47%), Mesenteric fat stranding (84.21%), Mesenteric lymphadenopathy (60.52%), Small bowel stricture (60.52%)
Management strategy	Emergency surgery: 55.17%, Elective surgery: 24.14%, Conservative treatment: 20.69%
Common operative findings (n=46)	Small bowel adhesions and bands (60.86%), Mesenteric lymphadenitis (39.13%), Multiple ileal strictures (15.21%)
Common operative procedure	Resection with end-to-end anastomosis (36.95%)
Average hospital stay	9.18 days

Table3: Diagnostic predictors, histopathology and outcome

Variables	Findings
IRS positive cases	49/58
AFB Zn stain accuracy	Sensitivity 91.13%, Specificity 100%, Accuracy 92%
CBNAAT accuracy	Sensitivity 100%, Specificity 80%, Accuracy 95.83%
AFB culture accuracy	Sensitivity 75%, Specificity 100%, Accuracy 81.25%
Histopathology accuracy	Sensitivity 73.68%, Specificity 100%, Accuracy 76.19%
Most common histopathology	Intestinal tuberculosis (33.33%)
Common postoperative complication	Paralytic ileus (12.06%)
Mortality	3 patients
Patients without complications	65.51%

Discussion

Abdominal tuberculosis continues to be a significant cause of morbidity in developing countries such as India, where delayed diagnosis and varied clinical manifestations frequently complicate management [1,2]. The present study evaluated the demographic profile, clinical presentation, radiological findings, diagnostic predictors, operative management, and treatment outcomes in patients with abdominal tuberculosis.

In the present study, the mean age of patients was 37.31 ± 13.91 years, with the majority belonging to the 18–30 years age group, indicating that abdominal tuberculosis predominantly affects the young and economically productive population. Similar observations were reported by Bhansali and Sharma et al., who documented a higher incidence in the second and third decades of life [2,6]. A slight male predominance (55.17%) was observed, which is consistent with the studies by Rathi and Gambhire [4]. This male preponderance may be related to greater environmental exposure, occupational stress, malnutrition, and higher prevalence of risk factors such as alcoholism.

Nutritional assessment demonstrated that the majority of patients were underweight or severely underweight, reflecting the chronic debilitating nature of the disease. Similar findings were reported by Debi et al., who emphasized the close association between malnutrition, poor socioeconomic conditions, and tuberculosis (3). Malnutrition further impairs cell-mediated immunity, thereby increasing susceptibility to Mycobacterium tuberculosis infection.

The clinical presentation in the present study was highly variable. Loss of appetite, weight loss, abdominal pain, and fever were the most common symptoms, findings comparable to those reported by Sharma et al. and Rathi and Gambhire [2,4]. Vomiting and constipation were also frequently observed, reflecting the involvement of the intestinal tract and resulting obstructive pathology. The most common clinical signs were abdominal tenderness and abdominal distension, while right iliac fossa lump was present in nearly one-third of patients. These findings correlate with the classical descriptions of abdominal tuberculosis reported by Bhansali [6]. Acute intestinal obstruction was the most frequent mode of presentation, followed by ascites and perforation peritonitis. Similar observations have been documented in earlier surgical series, where obstruction secondary to strictures, adhesions, and hypertrophic lesions constituted the commonest surgical emergency [6,10]. Perforation peritonitis, although less frequent, was associated with significant morbidity and mortality. Radiological evaluation played an important role in the diagnosis. Ultrasonography commonly demonstrated bowel wall thickening, mesenteric thickening, increased mesenteric echogenicity, and dilated bowel loops. Contrast-enhanced CT scan further identified mesenteric fat stranding, lymphadenopathy, bowel strictures, and peritoneal involvement. These findings are consistent with reports by Debi et al. and Pulimood et al., who highlighted the utility of CT imaging in evaluating abdominal tuberculosis and its complications [3,9].

In the present study, the majority of patients required operative management because many presented with acute complications such as obstruction, perforation, or peritonitis. Resection with end-to-end anastomosis was the most commonly performed procedure, followed by segmental ileal resection with ileostomy and adhesiolysis. These procedures are in accordance with established surgical principles for complicated intestinal tuberculosis described in standard surgical literature [16,18].

The present study also evaluated the diagnostic performance of different laboratory modalities using the Integrated Reference Standard (IRS) as the gold standard. CBNAAT demonstrated the highest sensitivity (100%) and diagnostic accuracy (95.83%), highlighting its value as a rapid and reliable molecular diagnostic tool. AFB Ziehl–Neelsen staining also showed high sensitivity and specificity, whereas AFB culture and histopathology demonstrated lower sensitivity despite excellent specificity. Similar findings have been reported in previous studies emphasizing the superiority of molecular methods over conventional diagnostic techniques in extrapulmonary tuberculosis [19,20].

Postoperative complications in the present study included paralytic ileus, superficial surgical site infection, systemic sepsis, wound dehiscence, and pulmonary complications. However, most patients had satisfactory postoperative recovery without major complications. The mortality rate in the present study was 6.52%, comparable to the findings reported by Deo KB et al. (21). Mortality was primarily associated with emergency surgery, systemic sepsis, multiple organ dysfunction syndrome, and respiratory failure. The average hospital stay was 9.18 ± 4.84 days, which was comparable to previous published studies by Ahmed R et al. [22].

Overall, the findings of the present study emphasize that abdominal tuberculosis continues to present significant diagnostic and therapeutic challenges because of its varied clinical manifestations and nonspecific presentation. Early diagnosis using appropriate radiological and molecular investigations, combined with timely surgical intervention in complicated cases and

standardized anti-tubercular therapy, plays a crucial role in reducing morbidity and mortality and improving overall patient outcomes [1,3,15,19].

Conclusion

Abdominal tuberculosis remains a major diagnostic and therapeutic challenge because of its nonspecific clinical presentation and varied radiological manifestations. Young undernourished adults were most commonly affected, with intestinal obstruction being the predominant mode of presentation. CBNAAT demonstrated the highest diagnostic sensitivity and accuracy among all diagnostic modalities, emphasizing its importance in early diagnosis. Surgical intervention was frequently required in complicated cases, particularly in patients presenting with obstruction or perforation. Early diagnosis, prompt initiation of anti-tubercular therapy, and timely surgical management significantly improve treatment outcomes and reduce morbidity and mortality.

Acknowledgement

The authors sincerely thank the Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, for their guidance and support throughout the study. We are also grateful to all the patients who participated in this research.

References

1. World Health Organization. Global tuberculosis report 2025. Geneva: World Health Organization; 2025.
2. Sharma MP, Bhatia V. Abdominal tuberculosis. Indian J Med Res. 2004;120(4): 305-15.
3. Debi U, Ravisankar V, Prasad KK, Sinha SK, Sharma AK. Abdominal tuberculosis of the gastrointestinal tract: revisited. World J Gastroenterol. 2014;20(40):14831-40.
4. Rathi P, Gambhire P. Abdominal tuberculosis. J Assoc Physicians India. 2016;64(2):38-47.
5. Kapoor VK. Abdominal tuberculosis. Postgrad Med J. 1998;74(874):459-67.
6. Bhansali SK. Abdominal tuberculosis. Experiences with 300 cases. Am J Gastroenterol. 1977;67(4):324-37.
7. Marshall JB. Tuberculosis of the gastrointestinal tract and peritoneum. Am J Gastroenterol. 1993;88(7):989-99.
8. Sharma SK, Mohan A. Extrapulmonary tuberculosis. Indian J Med Res. 2004;120(4):316-53.
9. Pulimood AB, Peter S, Ramakrishna BS, Chacko A, Mathan MM. Segmental colonoscopic biopsies in the differentiation of ileocolic tuberculosis from Crohn's disease. J Gastroenterol Hepatol. 2005;20(5):688-96.
10. Horvath KD, Whelan RL. Intestinal tuberculosis: return of an old disease. Am J Gastroenterol. 1998;93(5):692-6.
11. Aston NO. Abdominal tuberculosis. World J Surg. 1997;21(5):492-9.
12. Makharia GK, Srivastava S, Das P, Goswami P, Singh U, Tripathi M, et al. Clinical, endoscopic, and histological differentiations between Crohn's disease and intestinal tuberculosis. Am J Gastroenterol. 2010;105(3): 642-51.
13. Uzunkoy A, Harma M, Harma M. Diagnosis of abdominal tuberculosis: experience from 11 cases and review of the literature. World J Gastroenterol. 2004;10(24):3647-9.
14. Tanrikulu AC, Aldemir M, Gurkan F, Suner A, Dagli CE, Ece A. Clinical review of 18 patients with abdominal tuberculosis in southeastern Turkey. J Gastroenterol Hepatol. 2005;20(9):1369-75.
15. Central TB Division. Technical and operational guidelines for tuberculosis control in India 2021. New Delhi: Ministry of Health and Family Welfare, Government of India; 2021.
16. Oya H, Yasuda Y, Uchida T, Muto T. Surgical treatment for intestinal tuberculosis. World J Surg. 1997;21(5):480-3.
17. Dasgupta A, Singh N, Bhatia A. Abdominal tuberculosis: a histopathological study with special reference to intestinal perforation and mesenteric vasculopathy. J Lab Physicians. 2009;1(2):56-61.
18. Williams NS, O'Connell PR, McCaskie AW. Bailey & Love's short practice of surgery. 28th ed. Boca Raton: CRC Press; 2023.
19. Sharma K, Modi M, Yadav DK. Role of CBNAAT in extrapulmonary tuberculosis diagnosis. Int J Res Med Sci. 2020;8(3):1021-5.
20. Tortoli E, Cichero P, Piersimoni C, Simonetti MT, Gesu G, Nista D. Use of BACTEC MGIT 960 for recovery of mycobacteria from clinical specimens. J Clin Microbiol. 1999;37(11):3 578-82.
21. Deo KB, Gurung RB, Shrestha S. Surgical management and outcome of abdominal tuberculosis: a prospective study. Kathmandu Univ Med J. 2016;14(55):214-9.
22. Ahmed R, Rajput A, Agarwal M. Surgical outcome in abdominal tuberculosis: experience from a tertiary care center. Int Surg J. 2016;3(4):1957-62.