

## Clinical Evaluation, Diagnosis and Surgical Management of Abdominal Tuberculosis at Basaveshwar Teaching and General Hospital, Kalaburgi

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**Abstract:** Abdominal tuberculosis is an increasingly common disease that poses a diagnostic challenge as the nonspecific features of the disease may lead to diagnostic delays and development of complications. A high index of suspicion is an important factor in early diagnosis. Abdominal involvement may occur in the GI tract, peritoneum, lymph nodes or solid viscera. Early diagnosis and initiation of anti-TB therapy and surgical treatment are essential to prevent morbidity and mortality. A retrospective study was conducted on 60 patients with abdominal TB from January 2016 to May 2017 in Basaveshwar Teaching and General Hospital, Kalaburagi. The median age was 32 years (Range 6-70 years). The majority of patients had primary abdominal TB with a M:F of 2:1. A total of 27 patients (45%) presented with intestinal obstruction, 18 patients (30%) presented with peritonitis, 5 patients (8.3%) presented with abdominal masses. A total of 54 patients (90%) underwent surgical treatment for abdominal TB. Stricture in 16 patients (32%) were the most common operative finding. Ileocecal region was the most common bowel involved in 25 (54.3%) patients. Surgical procedure performed were : resection of the diseased segment of bowel including right hemicolectomy in 18 (33.3%) cases, release of bands and adhesions 16 (29.6%) cases, perforation repair in 12 cases (22.2%), stricturoplasty in 2 cases (13.7%). In presence of gross peritonitis temporary ileostomy is performed. Complications and mortality rates were 16.6% and 3.7% respectively. 1 patient had post operative intestinal leak and another had developed fecal fistula. The median duration of hospital stay was 14 days. This study emphasizes the importance of early recognition diagnosis and surgical management of this potentially treatable disease.

**Keywords:** Tuberculosis abdomen, clinico pathological profile, intestinal stricture, bowel perforation, resection anastomosis

## INTRODUCTION

Tuberculosis is a life threatening disease which can virtually affect any organ system [1]. Global burden of TB is nearly 12 million. According to WHO report 2013, there were an estimated 8.6 million annual incidence of TB globally and 1.3 million people died from disease in 2012.

There is an increased incidence of TB in developing countries due to increasing prevalence of immunocompromised individuals mainly due to AIDS pandemic, immigrant population, deteriorating social conditions with cutbacks in public health services [2]. The primary site of TB is usually lung, from which it can get disseminated into other parts of the body. The other routes of spread can be contiguous involvement from adjacent tuberculosis lymphadenopathy or primary involvement of extra pulmonary organ.

The abdominal TB can be difficult as it presents with nonspecific clinical / radiological features and requires high degree of suspicion for diagnosis. The abdominal TB, which is not so commonly seen as pulmonary TB, can be a source of significant morbidity and mortality and is usually diagnosed late due to its nonspecific clinical presentation [3]. Approx 1-3% of total TB cases are extra pulmonary [4].

Most cases of TB are caused by Mycobacterium Tuberculosis and the reservoir of infection is human with active TB. Abdominal TB may be contracted by drinking dairy milk contaminated with Mycobacterium Bovis [5]. The other modes of infection of abdominal TB include hematogenous spread from a primary focus that reactivates later or military TB, spread via lymphatics from infected nodes. Whereas intestinal TB exists in one of the 3 main forms

- Ulcerative
- Hypertrophic / ulcero hypertrophic
- Fibrous stricturing form [6]

TB (Peritonitis) exists in 4 main form namely ascitic, loculated (encysted), plastic (fibrous) and purulent forms [10]. The lymph nodes in the small bowel mesentery and the retroperitoneum are commonly involved, and these may caseate and calcify [7].

The diagnosis of abdominal TB in initial stages is difficult as the clinical features are vague, diverse and there is no specific diagnostic test. It remains a considerable diagnostic challenge especially in the absence of pulmonary infections as the disease can mimic various gastrointestinal disorders, particularly the inflammatory bowel disease, colonic malignancy or other gastrointestinal infection.

TB is characterized by difference modes of presentation that is chronic, acute and acute on chronic or it may be incidental finding at laparotomy for other disease. It usually runs an indolent course and presents late with complications especially acute / subacute intestinal obstruction due to mass or stricture formation in small gut and ileocecal region / or gut perforation causing peritonitis [8].

The management of abdominal tuberculosis poses diagnostic and therapeutic challenges to general surgeon practicing in developing countries like India. Late presentation of disease coupled with ignorance, poverty, overcrowding, poor education, malnutrition, lack of modern diagnostic and therapeutic facilities especially in rural areas are the hindering factors that prevent early diagnosis and cause the patient to present when complications had occurred [9].

Often surgery plays an important role in the diagnosis and treatment of abdominal tuberculosis. In many cases surgery is the only therapeutic option for the patients presenting with complications of abdominal tuberculosis. The present study intends to describe the demography, clinic pathological profile, various surgical options and their outcome in the management of abdominal TB at our Tertiary care center and comparing it with the data present in literature.

## MATERIALS AND METHODS

This a retrospective study conducted in Department of General Surgery, Basaveshwara Teaching and General Hospital, Kalaburagi. 60 patients of abdominal TB who were operated between the period of Jan 2015 to May 2017 in various surgical units in the Department were considered. Out of these only those cases which either had positive histopathology / gross operative findings or both conforming to the diagnosis of TB were included in the study.

The hospital record of these patients was searched for demographic profile, clinical presentation, baseline and specific investigations, operative procedure and findings, histopathology and anti TB therapy administered. Any complications during the course of hospitalization and final surgical outcome were also noted down. For the follow up, the OPD record were perused. The result were tabulated and summarized.

## RESULTS

Out of the 60 patients included in the study population, 40 patients (66.6%) were males with 20 (34%) patients were females. The age of patients in this series varied from 6 years to 70 years, mean age being 32 years. The age distribution is shown in Table 1. The disease showed a predilection to young adults and middle aged subjects 56.6% of cases being in the range of 21 to 40 years.

**Table -1: Age and sex distribution of the study population**

Age in years	Number of cases	Male	Female	Percentage
0-10	1	1	0	1.6
11-20	11	6	5	18.3
21-30	19	15	4	31.6
31-40	15	10	5	25
41-50	6	3	3	10
51-60	3	2	1	5
61-70	5	3	2	8.3
	60	40	20	100

Out of these 70% were from low socio economic group. The patients were grouped according to WHO BMI classification (Table 2), The BMI was calculated as weight in Kgs divided by square of height in meters ( $\text{kg/m}^2$ ). The majority of the patients were in the underweight category, 68% of total patients were in underweight category with 7% in the female group and 61% in male group. Median BMI was 18.29.

**Table -2: Distribution of cases according to BMI**

Category	BMI	Males	Female	Total	% age
Underweight	<18.5	27	14	41	68
Normal	18.5-24.99	13	5	19	32
Pre obese	25-29.99	0	1		
		40	20	60	100

**Table -3: The different modes of clinical presentation is depicted in table below**

Type of presentation	Number of cases	Percentage
Acute intestinal obstruction	13	28.2
Subacute intestinal obstruction	16	34.7
Acute peritonitis	10	21.7
Perforation	7	15.2

Duration of symptoms varied from day 1 to 5 years and less than a year in 95% cases. 38% cases had acute onset of disease. 98% of patients presented with pain abdomen (intermittent and colicky) as primary complaint.

**Table-4: Clinical Presentation seen in study population**

Clinical presentation	Number of cases	Percentage
Abdominal pain	56	93.3
Vomiting	45	75
Constipation	32	53.3
Weight loss	20	33.3
Abdominal distention	28	46.6
Fever	20	33.3
Features of peritonitis	18	30
Abdominal tenderness / muscle guarding	18	30
Abdominal mass	5	8.3

The commonest presenting symptom was abdominal pain in 56 (93.3%). The most common mode of presentation was acute in 42 (70%) patients, followed by sub-acute and chronic presentation in 10 (16.6%) and 8 (13.3%) patients respectively. 93% of patients presented with pain abdomen (intermittent and colicky) as primary complaint. 45 cases (75%) had history of vomiting, 28 patients (46%) had abdominal distension while 32 cases (53%) had complains of constipation. In the present study group, 33% of the cases had mild to moderate fever while 20 cases had significant loss of weight (>10%) in the past history.

**Laboratory, Radiological and histological investigations**

Hematological investigations revealed Hb% ranging from 5.6g to 13g% of which 26 patients were grossly anemic with Hb% below 9g%. ESR done in 28 cases ranged from 5mm to 80mm in 1 hour estimation, out of whom 22 had raised ESR. Sputum exam proved negative for AFB in all the 18 patients in whom the test was carried out. Ascitic fluid analysis was done in 2 patients, both of the cases showing high lymphocyte count >100. Radiological findings of chest x-ray done in 31 cases revealed 2 patients having apical Koch's

lesion. 1 case had bilateral apical TB. 1 patient had military mottling and 1 chest x ray demonstrated right sided pleural effusion.

Plain x-ray abdominal in erect posture done as emergency in 13 patients showed 10 films which multiple air fluid levels, suggestive of intestinal obstruction 7 cases had gas under diaphragm, 1 showing central ground glass appearance and rest 2 were normal study.

Abdominal ultrasound and CT scan were performed in 36 patients (60%) and 9 (15%) patients respectively and revealed abnormal findings suggestive of abdominal TB such as ascites, enlarged lymph nodes, omental thickening bowel wall thickness and abdominal masses. According to abdominal ultrasonography, 23 patients had ascitic with fibrinous strands seen in ascitic fluid. Barium studies performed in 15 (26.6%) patients and features suggestive of abdominal TB were luminal narrowing with proximal dilatation of bowel loops pulled up caecum and narrowing of terminal ileum. Histological examination of biopsy specimen was done in 48 patients (80%) and revealed presence of non caseating granuloma in 32 (53.3%) patients, central caseation in 10 (16.6%) patients and chronic inflammatory cells infiltration with no definite granuloma in 10 (16.6%) patients. In 8 (13.3%) patients with suggestive clinical history and negative diagnostic workup, response to therapeutic trail of anti TB drugs was the basis of diagnosis.

Classification regarding subtypes of abdominal TB after investigations and laparotomy as depicted in Table 5 and patterns of TB peritonitis are displayed in Table 5 as follows.

**Table-5: Subtypes of abdominal TB involvement**

Type	Number of Cases	Percentage
Peritoneal alone	14	23.3
Intestinal alone	36	60
Peritoneal and intestinal	10	16.6

**Table-6: Types of TB peritonitis (Total number of cases 24)**

Type of TB peritonitis	Number of cases	Percentage
Wet ascitic and plastic peritonitis	10	41.6
Wet ascitic	6	25
Localized pelvic collection	1	4.16
Dry military peritonitis	5	20.18
Adhesive and miliary	2	8.33

Among 46 cases of intestinal involvement the different parts of bowel involved in study group are depicted in table as follows

**Table-7: Region of affection in intestinal TB**

Type	Number of cases	Percentage
Ileocaecal	25	54.3
Ileal alone	14	30.4
Colonic alone	4	8.6
Duodenal	2	4.3
Gastric	1	2.1

Out of the 60 cases in study group, 6 were managed conservatively with anti TB therapy. 36 of them underwent emergency surgery and the rest 18 patient had an elective surgery d/t failure to resolve

with conservative management that is poor response to therapeutic trial of anti TB drugs. Patients who failed to respond to therapeutic trial of anti TB drugs underwent surgery and tissue diagnosis was established of TB in all 18 patients. Operative findings of abdominal TB are depicted in table.

Ileo cecal region was the most common bowel involved in 25 (54.3%) patients, followed by ileum 14 (30.4%) and duodenum and stomach in 2 (4.3%) and 1 cases (2.1%) resp. The colon was involved in 4 (8.6%) patients. Segmental bowel resection with end to end anastomosis for strictures was the most frequent surgical procedure performed in 16(32%) cases followed by release of bands and adhesions in 13 cases (26%). Post operatively all the patients were required to take anti TB drugs for a period of 9 months.

**Table-8: Operative findings in the study group**

Procedure	Operative findings	Site	Frequency	Percentage
Diagnostic laparotomy			4	7.4%
	Ascitic fluid	pelvic cavity	2	
	Adhesions and bands	Peritoneum	1	
	Tubercles	Peritoneum	1	
Exploratory laparotomy			50	92.5%
	Strictures		16	32.%
		Ileum	14	
		Jejunum	2	
	Bands and adhesions	Peritoneal surfaces	13	26%
	Bowel perforation		12	24%
		Ileum	10	
		Colon	2	
	Ileocaecal mass and mesenteric thickening	Terminal ileum and caecum	5	10%
	Mesenteric lymphadenitis		3	6%
	Peritoneal adhesions and cocoon formation	Peritoneum	1	2%

**Table-9: Types of surgical procedure performed in study population**

Type	Number of cases	Percentage
Segmental end to end bowel resection and anastomosis	18	33.3
Release of bands and adhesions	16	29.6
Repair of bowel perforation	12	22.2
Right hemicolectomy which ileo transverse anastomosis	2	3.7
Exploratory laparotomy + biopsy(segmental bowel resection which ileostomy)	4	7.4
Strictureplasty	2	3.7

Post-operative complications were common in emergency operated patients noted in 6 patients (10%) who developed wound infection, 3 (5%) patients developed burst abdomen. Mortality was observed in 2 cases, 1 being an anastomotic leak on 3<sup>rd</sup> post-operative

day and other being fecal fistula developing after 20 days of surgery. The patients were followed up for a period of 4 weeks.

A total of 58 patients (97%) were discharged having recovered and improved. The overall length of hospital stay ranged from 4 to 45 days with a median of 14 days. Patients who developed complications stayed longer in the hospital. Of the 58 patients only 30 patients were available for follow up over a variable time period from 3 months to 9 months. All the patients were continued on the anti TB therapy. It comprised of Isoniazid, Rifampicin, Ethambutol, pyrazinamide and streptomycin as per standard category 1 or II regime for a period ranging from 6-12 months. Complete course of anti TB therapy rendered cure from the disease.

## DISCUSSION

On the developing countries abdominal TB is a significance cause of mortality and morbidity. It is one of the major health problems [10,11]. A total of 60 cases have been analyzed in this study. The male to female ratio was 2:1. Some authors have quoted female dominance in their studies [12]. The mean age was found to be 32.6 years which is consistent with the mean age of 33 years as found by AD wells in their study of 30 cases [13]. The disease is more common at peak of the productive life [14]. Eventually it causes considerable financial losses to the individual and family with the added burden of the cost of treatment it

needs. 68% of the population in this study was in the underweight category (WHO BMI classification). Undernourishment was more prevalent in the male group (61%) as compared to the females (14%).

The duration of sickness in the study population before admission ranged from 4 days to 2 years, which a mean of 4 months. Generally the symptoms were abdominal pain, low grade fever, weight loss, anorexia, disturbed bowel habits and abdominal distension. 97.2% patients presented with pain abdominal in our series, which is comparable to studies of SK Bhansal and A Mohammed reporting pain abdominal as primary symptom in 94% cases and 98% respectively [15,16].

Low literacy rates, lack of awareness about the disease, personal bias d/t low level of acceptance at time of diagnosis, lack of accessibility to health care facilities, and the vague symptoms of this disease, all account for the delayed presentation. The patients are often diagnosed once complications occurs, like intestinal obstruction / intestinal perforation and peritonitis. The studies in the literature also support similar findings [17, 18].



**Fig-1: Concentric tubercular stricture in the ileum.**



**Fig-2: Tubercular perforation with distal stricture in the ileum causing purulent peritonitis.**

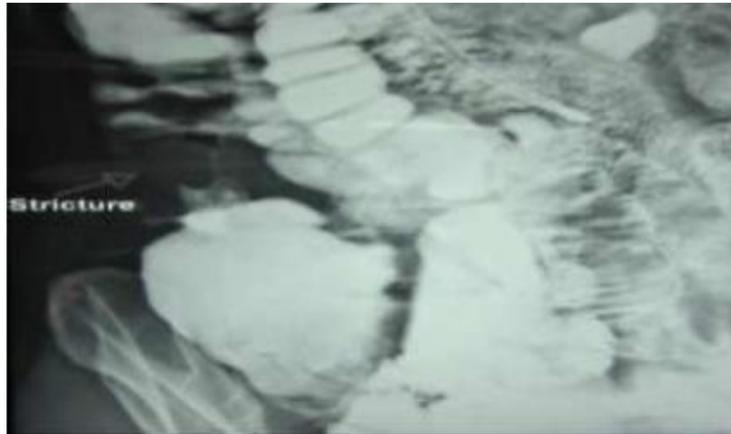
Acute presentation of the disease was the common mode of presentation which essentially brought them for the hospitalization and treatment. The

more number of acute presentations in the present series is in accordance with studies in the literature. In the study of A Mukhopadhyay, abdominal TB constituted a

significant percentage (10%) of all cases attending the emergency with acute abdomen [19]. The majority of the patients were admitted with intestinal obstruction and peritonitis. They all underwent emergency laparotomy. This further support the view of delay is

diagnosis of abdominal TB, till the development of complications.

79% of the patients in our study had primary abdominal TB. Similar is the observation of other studies conducted in developing countries [20].

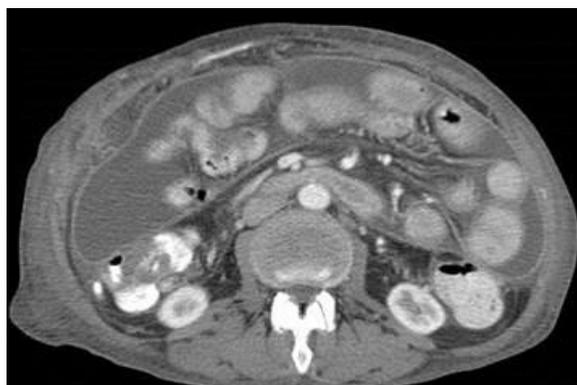


**Fig-3: Enteroclysis showing stricture of the ileum**

The presumptive diagnosis of abdominal TB is based on radiological investigation. The chest x-ray, ultrasound abdomen, enteroclysis and CT scan of the abdomen contribute to variable extent in making the diagnosis. Chest x-rays showed evidence of pulmonary TB in 8.3% of the cases which is in wide contrast with study of A. Manohar and N Machado who found the positivity rate in 40.8% and 43.2% respectively [21,22]. The USG gives useful supportive findings – terminal ileum and caecal wall thickening, loculated ascitic with free-fluids, interloop ascites producing sliced bread sign, and mesenteric lymphadenopathy [23]. In the present study abdominal sonography was done in 94% cases which revealed almost similar findings. Enteroclysis is a useful investigation. It was done for 32% cases. Findings of enteroclysis were increased small bowel transit time, multiple strictures with

segmental dilatation of bowel loops, matting of the bowel loops. CT scan gives a better imaging of the intestines and other structures. In advanced disease gross wall thickening, adherent loops, large regional nodes, mesenteric thickening can together form a soft tissue mass centered on ileocecal junction [22].

CT scan can also pick up ulceration or nodularity within the terminal ileum, along with narrowing and proximal dilatation. In the colon, involvement around the hepatic flexure is common. Complications of perforation, abscess and obstruction are also seen. However, its cost is its main limiting factor. In the present review only 8.3% of the patients had undergone CT. This is comparable to similar studies in literature [24, 25].



**Fig-4: CT scan with cocoons involving the ileum**

The definite diagnosis of abdominal TB is made on demonstrating tuberculosis granulomas in the

tissues removed surgically. In our study, histopathology was the basis of diagnosis in 82% of patients. The

typical granuloma with central caseation was seen in 25% patients, R Khan has reported similar biopsy pattern [26]. The remaining patients had operative findings in support of abdominal TB. All of them exhibited positive response to anti-tubercular therapy.

Diagnosis laparoscopy is a useful tool to diagnose abdominal TB in patients with chronic presentation. In the present study laparoscopy was done in 8.3% of the patients. It has yielded positive findings and diagnosis of the peritoneal TB. The laparoscopic findings were ascitic fluid, thickened peritoneum (lack of its usual shiny luster) with or without tubercles (multiples, yellowish white, tubercles distributed over the peritoneum and fibro-adhesive peritonitis with thick adhesions fixing the viscera. The omentum, liver and spleen can also be studied with tubercles. DK Bhargava studied 87 patients with higher protein ascites, of which 38 were diagnosed as having tuberculosis [27]. They found visual appearance to be more helpful than histology, culture (82.3 and 37.5%) sensitivity respectively.

Tuberculosis can affect any part of the GIT including the associated digestive system, lymph nodes and peritoneum. In our study commonest site was small intestine and that too terminal ileum and ileocecal region. It was seen in 2/3<sup>rd</sup> of the patients in this study, followed by peritoneal TB. Intestinal obstruction was the commonest mode of presentation followed by perforation. This is consistent with other studies [18,28].

The ileum and ileocecal region preponderance is postulated to be due to abundant lymphoid tissues in this region and being the terminal part of small intestine is subjected to complete digestion and absorption of ingested food [29]. Peyer's patches have the M cells, which phagocytose BCG bacilli.

Majority of our patients required emergency surgery. Various surgical procedures performed in the descending order of frequency were segmental resection of the diseased segment including right hemicolectomy, release of band and adhesions, repair of the perforation, stricturoplasty, Right hemicolectomy was done for the cases with ileocecal mass or stricture. Segmental small bowel resection with primary anastomosis was done in the cases with multiple ileal strictures or long tubular strictures. This achieves excision of the diseased segment with strictures and low risk of leak and fistula formation. In the presence of gross peritonitis and severe sepsis, temporary ileostomy was performed after the resection of diseased intestine or simple exteriorization of the perforated loop, thus avoiding primary anastomosis. In this study few cases had undergone stricturoplasty. This is in contrast to a study by M. Akbar in which stricturoplasty was the common

surgical procedure [18]. Anti-tubercular therapies were given to all the patients postoperatively.

Post-operative complications occurred in patients. Surgical site infection was the commonest complication. This is similar to the finding of other author [17]. 1 patient had post-operative anastomotic leak (fistula) following primary intestinal repair. The pulmonary complications were managed with appropriate antibiotics and intensive chest physiotherapy. One patient required chest tube drainage for the recurrent pleural effusion. All of them recovered except one patient, who developed type II respiratory failure which MODS secondary to severe sepsis and died.

Overall post-operative mortality rate was 2.6% in our study which is comparable to as described by other authors [17,18]. Being a retrospective study, it has its limitations, but it doesn't interfere with the objective of the study. Secondly, the PCR test was not done due to its high cost with availability at limited centers only.

## CONCLUSION

Abdominal TB remains a diagnostic challenge, having diverse and nonspecific symptomatology and there being no specific laboratory tests. Early diagnosis is the key factor in avoiding systemic and local complications of intestinal TB.

Hence a high index of suspicion is needed. Laparoscopy can serve as an important diagnostic tool, as well as a means to obtain fluid and tissue for further confirmatory tests. Proper identification of symptoms and signs at primary care level and timely referral can save many lives. For those patients presenting in emergency, prompt surgical treatment is necessary to avoid further life-threatening complications. A definitive procedure in the form of resection of the diseased segment and primary anastomosis is safe and has largely been adopted in place of simple bypass of obstructive lesion. But in presence of gross peritonitis, a second stage procedure with a temporary ileostomy is preferable. Finally administration of anti-TB therapy is necessary to treat the patients successfully with a complete cure.

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