

# CLINICAL STUDY ON TUBERCULOSIS OF ABDOMEN IN GOVERNMENT GENERAL HOSPITAL

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## ABSTRACT

**Background:** In spite of considerable advances in recent times, tuberculosis, particularly of the abdomen, still continues to be a major health problem in India. Several recent developments, which have influenced the incidence as well as the clinical course of tuberculosis in general, warrant a fresh look at abdominal tuberculosis. The disease is a diagnostic enigma and the management is still controversial. Surgical treatments, both radical and conservative, are being advocated. Approximately one fifth of patients require surgical intervention. Abdominal tuberculosis (ATB) is a great mimic and an important cause of morbidity. **Materials and methods:** The study was done in Katuri Medical College & Hospital from September 2012 to September 2014. 50 cases have been studied. 49 cases underwent definitive surgeries. Follow up period ranges from 1 month to 22 months. **Results:** The age range of the patients was 16 to 60 years and most commonly involved age group was 20-40 years. Male to female ratio was 1.5:1. Most of the patients belonged to the low socio-economic group. 12% of the patients had a positive history of contact. 60% of the patients presented with intestinal obstruction. The most commonly involved site was the ileocaecal region (44%). Most common surgical procedure done was Limited (segmental) resection (46%). All cases were discharged on 6 months ATT. **Conclusion:** In the present series the approach to surgery was conservative. Limited resection was preferred over Right hemicolectomy. Most of the cases had uneventful post operative period and showed good response to ATT during the follow up.

## INTRODUCTION

Tuberculosis has been one of the oldest diseases known to mankind. Even today, every year, 7 million new infections and 2.5 million deaths are caused by tuberculosis, making it one of the top ten-killer diseases. It forms a major health hazard in the underdeveloped and developing countries like India despite the advent of anti tubercular chemotherapeutic drugs and near adequate control measures. Along with AIDS it has acquired the “Deadly duo”

status. The development of multiple drug resistance is another area of concern.

Tuberculosis is a social disease with medical aspects, described as the barometer of social welfare. Abdominal tuberculosis is a highly endemic entity. It is most common in areas where overcrowding and under nutrition predominate.

The precise prevalence of tuberculosis of abdomen has not been determined due to lack of survey in random samples of population. Primary tuberculosis of intestine without antecedent or associated pulmonary tuberculosis is fairly common.

Abdominal tuberculosis represents the sixth most frequent form of extra- pulmonary tuberculosis after lymphatic, genitourinary, bone and joint, miliary and meningeal tuberculosis. Abdominal tuberculosis denotes involvement of the gastrointestinal tract, peritoneum, lymph nodes, and solid viscera, e.g., liver, spleen, pancreas, etc. Tuberculous bacteria reach the gastrointestinal tract via hematogenous spread, ingestion of infected sputum or contiguous spread from adjacent organs.

Perforation is a serious complication of abdominal TB associated with high morbidity and mortality. The low incidence of tuberculous perforation is due to a reactive fibrosis of the peritoneum. However, in recent years, intestinal perforation, which was relatively rare in the past, has been reported more frequently. The cause of this remains unknown.

This common entity of protean manifestations and presentations with varied complication poses a challenge to the diagnostic & therapeutic skill and ingenuity of a surgeon. The role of surgery in abdominal tuberculosis is:

- a) Diagnostic: for Etiopathological, microbiological diagnosis.
- b) Therapeutic: for Complications like intestinal obstruction, perforation and peritonitis.

#### **AIM OF THE STUDY**

The aim of this study is to evaluate the need for surgery and to know the role of the surgical management in gastro- intestinal tuberculosis.

#### **Objectives of the study:**

1. To study the various clinico pathological manifestations of gastro- intestinal tuberculosis
2. To study the various surgical treatment modalities, their complications and their outcome in the

management of gastro- intestinal tuberculosis.

## **MATERIALS AND METHODS**

A clinical study of fifty cases of abdominal Tuberculosis treated surgically in different surgical units of Katuri Medical College and Hospital was undertaken from September 2012 to September 2014.

A collection of common and rare manifestations of abdominal tuberculosis is presented here under. Stress was laid upon a thorough history taking and physical examination. The different surgical procedures were evaluated. All the routine investigations concerning the disease were done; a few were subjected to special investigations. The ensuing complications of the treatment were studied and the cases were followed up.

### **Inclusion Criteria:-**

All patients who came to Katuri Medical College with pain abdomen, abdominal distention, and mass per abdomen and got admitted into all the surgical units of General Surgery Department were followed up and Diagnosed with Gastro-intestinal Tuberculosis the age of patients more than 16 years.

### **Exclusion Criteria:-**

The patients who were diagnosed with other pathology apart from Tuberculosis like peptic disease perforation, carcinomatous perforation, or perforation or obstruction or ascites or altered bowel habitus caused by any other cause other than Tuberculosis were excluded from the study.

## **METHOD OF COLLECTION OF DATA**

After admission to the hospital, a detailed clinical history and examination of the patient was done. Relevant investigations were undertaken to make the diagnosis.

Four sequential steps have been followed.

1. Establishing the diagnosis of Gastro-intestinal Tuberculosis, excluding other abdominal conditions that have similar clinical features,
2. Identify the presence of Pulmonary Tuberculosis, excluding other possible etiologies of the Abdominal Tuberculosis,
3. Assess the severity of the disease,
4. Detect any complications.

Investigations which include following were done in order to establish the diagnosis.

Routine investigations like complete hemogram, Blood urea, were performed. Along with them ALT AST levels, bilirubin levels were done.

Also Chest X-Ray, Erect X-Ray Abdomen, Ultrasound Abdomen, CT-Scan Abdomen, Barium Studies, Colonoscopy, and Diagnostic Laproscopy Histopathological Examination were done.

### OBSERVATIONS AND RESULTS

**Table No. 1 Age distribution.**

Age in Years	15-20	21- 30	31-40	41-50	51-60	Total
Numbers	9	18	10	9	4	50
Percentage	18	36	20	18	8	100
Mean Age (in Years)	32.68					

**Table No. 2 Sex distribution**

Sex	Number	Percentage
Male	30	60
Female	20	40
M : F Ratio = 1.5 : 1		

#### Socio- Economic Status:

In the present study all the patients except two belonged to lower socio- economic strata of the society.

#### History of pulmonary Tuberculosis:

In the present series six cases had history of pulmonary Tuberculosis. One was on treatment while he presented with abdominal tuberculosis and three had discontinued the treatment the after intensive phase of DOTS.

**Table No. 3 Symptoms**

Symptoms	Numbers	Percentage %
Abdominal pain	45	90
Altered bowel habits	26	52
Vomiting	23	46
Distension	22	44
Fever	14	28
Abdominal mass	4	8

Anorexia/Weight loss	15	30
Menstrual Irregularities	5	10

**Table No. 4 : Physical Findings**

Signs	Numbers	Percentage
Abdominal Tenderness	28	56
Distension	24	48
Mass in RIF	13	26
Hyperperistaltic Bowel sounds	9	18
Guarding	7	14
Rigidity	7	14
Mass other than RIF	1	2
No findings	2	4

**Table No. 5: Mode of Presentation**

Diagnosis	Numbers	Percentage
Sub acute Intestinal Obstruction	20	40
Acute Intestinal Obstruction	10	20
Mass per abdomen	12	24
Perforative Peritonitis	7	14
Acute Appendicitis	1	2

**Investigations:****BLOOD INVESTIGATIONS:**

Haemoglobin estimation was done in all cases. It ranged from 6.7 gm% to 13gm%. Of all the fifty patients in the present series 41 cases were having Haemoglobin of less than 11 gm%. Erythrocyte Sedimentation Rate (ESR) was done for all the fifty cases, it ranged from 20mm to 81mm after one hour. Sputum AFB was done for 10 patients, four of them showed a positive report.

**RADIOLOGICAL INVESTIGATIONS:**

Chest- X- Ray was done for 40 cases; four of them showed features of pulmonary tuberculosis, one of them showed miliary mottling. Erect-X-Ray abdomen was done for all 50 cases, of which 22 cases showed multiple air fluid level suggesting obstruction, 7 cases had gas under diaphragm, and 21 had a normal X- ray. Barium study was done for 16 cases, of which 3 showed narrowing of ileocaecal junction ,3 showed strictures, 5 showed pulled up caecum ,3 had ascending colon narrowing. In 2 cases studies were normal. Ultrasound abdomen was done for 39 cases, sonological findings were that of mass in 9, mesenteric lymph node enlargement was seen in three, 13 showed dilated air filled bowel loops, free fluid was seen in 4 and in one case USG showed features of acute appendicitis. In 9 cases USG showed no abnormality. CT scan abdomen was done

for 15 cases, 13 showed ileocaecal and ascending colon thickening, out of those which showed mural thickening, eight showed significant luminal narrowing. In the present series seven cases showed fat stranding, omental thickening and 5 showed mesenteric or Para aortic lymph node enlargement.

**OTHER INVESTIGATIONS:**

In the present series eight cases underwent Colonoscopy, biopsy was taken in three, all confirming the diagnosis of Tuberculosis, ascending colon narrowing was seen in seven cases, out of these three showed multiple mucosal nodules and fibrosis as well, and in one case only mucosal nodules were seen.

Of the fifty cases, nine patients underwent Diagnostic Laparoscopy, and biopsy was taken in five of these cases. Small multiple whitish nodules scattered all over the peritoneum (tubercles) were seen in four, variable degrees of omental thickening was seen in four. Ileocaecal and ascending colon thickening seen in seven cases and mesenteric lymph node enlargement was seen in six of the cases who underwent the procedure, adhesions were seen in one case.

**Operative findings:**

In the present series of 50 cases, forty seven cases 94%, showed features of intestinal Tuberculosis; in the remaining three, one was a case of mesenteric cold abscess at the root of mesentery pressing on jejunum, one showed features of acute appendicitis, with severely inflamed appendix and one was a case of plastered abdomen secondary to peritoneal tuberculosis, surgery was abandoned in this case. Most of the cases had multiple findings.

Of the forty seven cases of intestinal Tuberculosis, ileocaecal thickening was the most common finding, present in 22 cases (44%), caecal thickening with or without ascending colon strictures were present in 9 cases. Pulled up caecum with narrow ileocaecal valve was present in 3 cases. One case showed sigmoid colon thickening and in one case appendisectomy was done and was later diagnosed to be Tuberculosis.

Small bowel strictures were found in 12 cases, two were in jejunum, rest all were in ileum. Ileal perforation was found in 7 cases, adhesions were found in two cases. Other common findings were larged mesenteric lymph nodes in 14 cases and omental thickening in 3 cases.

**Table Number 6: Surgical options**

Procedure	Number	Percentage
<b>RESECTIONS</b>		
Limited(Segmental)	23	46
Right Hemicolectomy	9	18
Small Bowel	6	12
Stricturoplasty	6	12
Perforation closure	2	4

Adhesiolysis	2	4
Only bypass	2	4
Only biopsy	1	2
Mesentric cold abscess drainage	1	2
Appendisectomy	1	2

**Complications:**

Operative morbidity was 12%, most of them having one or more complications. These were more frequent in those undergoing emergency surgery. The most common complications were wound infections (10%) of cases and pulmonary infections. One patient (2%) developed a faecal fistula and one (2%) developed burst abdomen requiring re-operation. In this series of fifty cases four patients died a mortality of 8%. All four deaths occurred among the cases that underwent emergency procedures. Those who died following operation generally had multiple complications.

**Follow-up:**

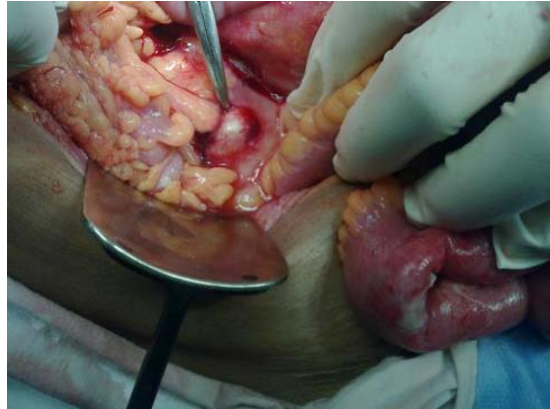
All the cases had a regular follow-up at 1, 3, 6, 12, 18 months; 96% of them were relieved of the symptoms. General condition of the patients improved with weight gain and correction of anaemia. All the cases were discharged on 6 months of Anti-tuberculosis treatment regimen as per RNTCP schedule.

**Table 7: Histopathological diagnosis**

Site	Pathological Type	Number	Percentage
Intestinal	Hyperplastic	31	62
	Ulcerative	12	24
Peritoneal	Ascitic	Nil	-
	Caseous	Nil	-
	Plastic	1	2
	Mixed	Nil	-
Mesentric node		6	12



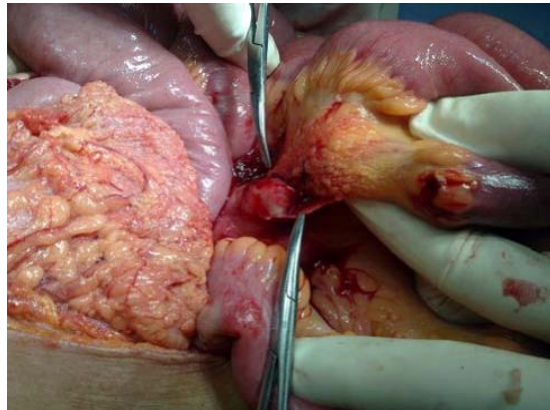
**TUBERCULAR ILEAL PERFORATION**



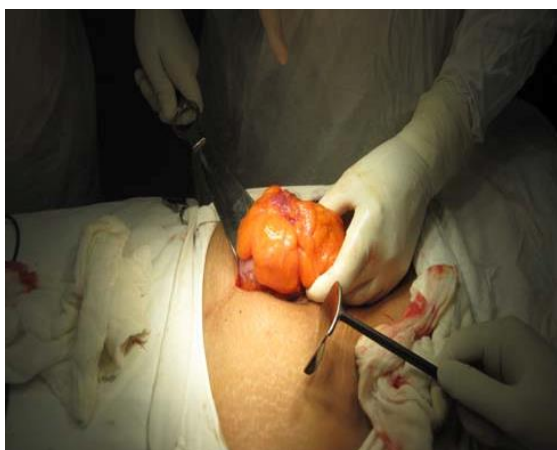
**MESENTERIC LN ENLARGEMENT**



**TUBERCULOSIS OF APPENDIX**



**MESENTERIC LN EXCISION BIOPSY**



**ILEOCAECAL TUBERCULOSIS**

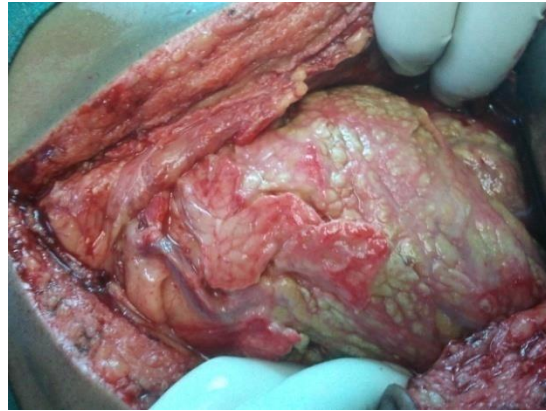


**RIGHT HEMICOLECTOMY**





**RIGHT HEMICOLECTOMY SPECIMEN**



**ABDOMINAL COCOON**



**MILIARY TB OF MESENTERY**



**OMENTAL TUBERCULOSIS**



**FAECAL FISTULA**



**BURST ABDOMEN**

### **DISCUSSION**

Tuberculosis is still a highly prevalent disease in India like other developing countries of the world where malnutrition, overcrowding and poor sanitary conditions exist. Intestinal tuberculosis also represents a relatively common health problem. As the symptoms and signs of intestinal tuberculosis are non specific and there is no

equivocal diagnostic features either clinically and radiologically, many a times laparotomy, diagnostic Laparoscopy and histopathological examination is needed to establish the diagnosis. In this series 50 cases of intestinal tuberculosis with various symptoms and signs have been reported. The main focus of this study was the epidemiological observation, clinical manifestation, diagnosis and surgical treatment of patients with intestinal Tuberculosis.

The results are analysed in comparison to various studies done on Abdominal Tuberculosis.

**Table Number : 8 Age Incidence:**

Age (in Years)	Bhansali S.K <sup>2</sup> (310)*	M.B. Islam et al <sup>3</sup> (60)*	Forrest C et al <sup>1</sup> (137)*	Present Series (50)*
15-20	16%	15%	16%	18%
21-30	41%	40%	35%	36%
31-40	25%	35%	20%	20%
41-50	8%	6.6%	11%	18%
51-60	5%	3.3%	5%	8%

\*Bracketed values represent total sample size of each series.

**Table Number: 9 Sex Incidence:**

Studies	Males	Females	Ratio
Bhansali. S.K(310)	150	160	1 : 1
M.B. Islam et al (60)	25	35	0.7 : 1
Forrest C et al (137)	77	60	1.28 : 1
Present series (50)	30	20	1.5 : 1

\* Bracketed values represent total sample size of each series.

#### **Socio-Economic Status:-**

In a case study of abdominal tuberculosis By Abdulrahman Sibiany<sup>4</sup> et al in Departments of Surgery and Medicine, King Abdulaziz University Hospital 78 patients with abdominal tuberculosis (TB) were admitted to the medical and surgical departments at two major teaching hospitals in Jeddah. They were young patients with average age of 31 years. They all belonged to low socio-economic class.

In present study of 50 patients all the patients except two belonged to lower socio-economic status. This is most probably because of malnutrition, over-crowding, lack of sufficient education and poor sanitary conditions.

**Table Number: 10 Symptomatology:**

Symptoms	Forrest C et al	M.B. Islam et al	Present
Abdominal pain	86%	83.3%	90%
Altered bowel habits	50%	71.6%	52%
Vomiting	47%	25%	46%
Distension	31%	63%	44%
Fever	29%	60%	28%
Abdominal mass	9%	40%	8%
Anorexia/Weight loss	10%	60%	30%
Menstrual Irregularities	12%	8%	10%

In a study of Clinical presentation of abdominal tuberculosis in HIV seronegative adults by Cengiz Bolukbas et al<sup>5</sup> in Turkey, five groups were constituted as non-specific abdominal pain (24 cases), ascites (24 cases), bowel habit alteration (22 cases), acute abdomen (9 cases) and others (9 cases).

In a study conducted by Syed Mozammel Hossain et al<sup>6</sup> which included 32 female and 20 male patients. Varied presentation of abdominal tuberculosis included pain in abdomen (95%), fever (84.6%), weight loss (88%) and mass in abdomen. Laparoscopic and open adhesiolysis (18.75%) resection and anastomosis (12.5%), stricturoplasty (12.5%), loop ileostomy (25%), closure of perforation (18.75%) and limited right hemicolectomy (12.5%) were the procedures carried out. Surgical exploration is reserved for equivocal cases and for those who present as emergencies.

In a study of Clinicopathological profile of patients with abdominal tuberculosis by Miah AR, et al<sup>7</sup> Out of the 53 patients, 33 were males and 20 females with age ranging 16-70 (Mean 30.01±11.7) years. Abdominal pain was the most common presenting symptom in 47 (88.68%), fever in 45 (84.9%) and weight loss in 37 (69.81%) cases. Anemia was found in 41 (77.36%), cachexia 40 (75.47%), ascites 20 (37.74%), palpable abdominal mass in 14 (26.42%) and features of intestinal obstruction in 5 (9.43%) cases

**Table NO: 11 Physical Findings:**

Signs	Forrest C et al	Present Series
Abdominal Tenderness	28%	56%
Distension	41%	48%
Mass in RIF	14%	26%

Hyperperistaltic Bowel Sounds	14%	18%
Guarding	15%	14%
Rigidity	15%	14%
Mass other than RIF	10%	2%
No findings	3%	4%

**Mode of Presentation:-**

In a retrospective study on Epidemiology and clinical presentation of abdominal tuberculosis 298 adult cases admitted in Safdarjang Hospital, New Delhi over a 3-year period were studied by Sircar S, Taneja VA, Kansra U<sup>8</sup>. These constituted 17% of the total number of admissions for tuberculosis. Age at presentation was variable with maximum cases in 21 to 40-year age group (58% of cases) with a mean age of 32.7 years. There was a slight female preponderance (57%). Sixty-three per cent were residing in urban areas.

**Diagnosis:**

Diagnosis is difficult because of vague symptoms and signs with no pathognomic investigations .

**Barium contrast Studies:-**

Barium contrast studies are often rewarding in patients suspected to have intestinal tuberculosis. It is a invaluable diagnostic tool and helpful in diagnosing a large number of cases.

In a study conducted by Nakano. H et al<sup>9</sup> of Department of Internal Medicine, School of Medicine, Fujita Health University, Toyoake, Japan 7 cases of intestinal tuberculosis in an active stage were studied by the double-contrast barium enema (DCBE) method.

Formerly, diagnosis of intestinal tuberculosis in the early stage by single-contrast barium enema (SCBE) and barium meals was based on functional phenomena, such as spasm and hypermotility of the ileocecal region.

Presently, this can be better accomplished by DCBE. DCBE enables the detection of shallow ulcers with their characteristic elevated margins. These ulcers are frequently slim and transversally oriented. Confluence of ulcers may create whole girdle ulcers or affect entire segments.

In more advanced stages, characteristic deformities, also evident by SCBE, such as symmetrical annular stenoses, shortening, retraction, pouch formation, and the frequently observed pathology of the ileocaecal valve and the caecal region, acquire a new dimension with DCBE

In present series of 50 cases Barium study was done for 16 cases, of which 3 showed narrowing of ileocaecal junction ,3 showed strictures, 5 showed pulled up caecum ,3 had ascending colon narrowing. In 2 cases studies were normal

#### **DIAGNOSTIC ULTRASOUND:-**

In a study conducted in South Africa in HIV – Positive individuals by Tom Heller et al at <sup>10</sup> to investigate diagnostic value of abdominal ultra sound in HIV- positive inpatients in a rural African setting. The study was to know the sonographic diagnosis and treatment response in HIV – positive adults in rural South Africa.

One hundred and eighty adult HIV-positive patients were screened; 30 (16.7%) showed sonographic signs of abdominal TB. Presenting symptoms were weight loss (86.7%), abdominal pain (76.7%), and diarrhea (60%). Abdominal lymph node enlargement was the diagnostic finding in almost all cases (96.7%); hypoechoic lesions of the spleen were seen in 50% and ascites in 73.3%. Follow-up information was available for 25 patients: 24% had died and the remaining 76% reported symptomatic improvement and weight gain.

Finally it was concluded that Characteristic sonographic features of abdominal TB are common in HIV- infected inpatients in a rural African setting and Ultrasound should be introduced into clinical algorithms for the diagnosis of extrapulmonary TB.

In a study conducted by Jain R et al <sup>11</sup> 56 patients with clinical features suggestive of abdominal tuberculosis (history of fever, abdominal pain, and weight loss) with no history of intestinal obstruction and normal barium studies of the small bowel had abdominal sonography. All sonograms were independently assessed by three radiologists, and the findings were tabulated by consensus. Diagnosis of tuberculosis was confirmed by sonographically guided biopsy of mesenteric lymph nodes in 19 patients, analysis of aspirated ascitic fluid in 12, and response to antituberculous chemotherapy in 25. Sonography was repeated 1, 3, 6, and 12 months after antituberculous chemotherapy was begun. Abdominal sonograms were also performed in 30 healthy volunteers, and measurements of mesenteric thickness were recorded. The mesenteric thickness was statistically compared in two groups of patients: patients at presentation with patients at the end of antituberculous chemotherapy and patients at presentation with healthy individuals.

It was concluded that the mesenteric thickness in healthy individuals ranged from 5 to 14 mm. Sonographic findings in all patients with abdominal tuberculosis included an echogenic thickened mesentery (> or = 15 mm) with mesenteric lymphadenopathy.

Other findings were dilated small bowel loops in 38 patients, minimal ascites in 17, matted small bowel loops in five, and omental thickening with altered echogenicity in three. Regression of these changes was noted on follow-up of all patients undergoing treatment.

The characteristic sonographic features of early abdominal tuberculosis are mesenteric thickness of 15 mm or more and an increase in the mesenteric echogenicity (due to fat deposition), combined with mesenteric lymphadenopathy. Presence of dilated small bowel loops and ascites further substantiate the diagnosis.

In present series, of 50 cases sonological findings were that of mass in 9, mesenteric lymph node enlargement was seen in 3, 13 showed dilated air filled bowel loops, free fluid was seen in 4 and in one case USG showed features of acute appendicitis. In 9 cases USG showed no abnormality.

#### **COLONOSCOPY:**

In a study conducted by S Shah et al <sup>12</sup> in 50 patients with colonic tuberculosis are reported in whom a colonoscopic diagnosis confirmed by histological examination was possible in 40.

Bacteriological studies did not increase the diagnostic yield. Abdominal pain was the most common symptom (90%) and an abdominal mass was the most common abnormal physical finding (58%).

A nodular mucosa with areas of ulceration was the usual colonoscopic finding. Ileocaecal disease was found in 16, ileocaecal and contiguous ascending colon disease in 14, segmental colonic tuberculosis in 13, ileocaecal disease and non-confluent involvement of another part of the colon in five, and pancolitis in two patients. This report emphasises that colonoscopy is a useful procedure for diagnosing colonic tuberculosis and that segmental colonic tuberculosis is not uncommon.

In the present series eight cases underwent Colonoscopy, biopsy was taken in three, all confirming the diagnosis of Tuberculosis, ascending colon narrowing was seen in seven cases, out of these three showed multiple mucosal nodules and fibrosis as well, and in one case the ulcers are transverse and circumferential, with irregular margins and shaggy bases were seen which are characteristic of tuberculous intestinal ulceration.

#### **DIAGNOSTIC LAPROSCOPY:**

In a study published in Journal of the Royal Society of London Importance of Diagnostic Laproscopy was studied by S. Rai and W M Thomas <sup>13</sup>, 36 patients had this diagnosis of Abdominal Tuberculosis. The case records

were examined to identify features, including history, clinical presentation, investigations and diagnostic procedures, that might help with diagnosis of future cases.

32 of the patients were of Asian origin, predominantly from the Indian subcontinent. The most common presenting complaints were abdominal pain and weight loss. On clinical examination the findings were non-specific. Only 2 patients were found to have concurrent pulmonary TB. The most consistent laboratory finding (>90%) was a low haemoglobin with a raised C-reactive protein.

An ultrasound scan of the abdomen revealed findings consistent with TB in 9/28 patients and a CT scan was helpful in 6/11. Laparoscopy, although usually performed as a last resort, proved the most effective investigation, yielding the diagnosis in 23 (92%) of the 25 patients in whom it was performed.

In patients with the relevant background and clinical history, laparoscopy is the investigation of choice.

In a study of Abdominal tuberculosis: diagnosis by laparoscopy and colonoscopy by Ibrarullah et al <sup>14</sup> 34 patients were diagnosed to have abdominal tuberculosis on the basis of laparoscopy or colonoscopy. Laparoscopy was performed in 23 patients. Peritoneal tuberculosis was diagnosed in 19 of them, characterized by presence of ascites, multiple whitish tubercles, fibrous bands and adhesions, hyperaemic edematous bowel loops or dense adhesions without ascites. Multiple jejunoileal hyperemic short segments with serosal neovascularization was noticed in three patients. Laparoscopy was safe and helped in the diagnosis of peritoneal as well as intestinal tuberculosis in 87% of patients. Colonoscopy is useful for colonic and terminal ileal lesion with a positive diagnostic yield of 54%.

Das and Shukla <sup>15</sup> working in an endemic area reported that diagnosis was made only in 50% of cases. Forrest C et al <sup>1</sup> reported preoperative diagnosis was made in 69% of the cases. In the present study correct preoperative diagnosis was made in 60% of cases, diagnosis was more often correct in sub acute intestinal obstruction or mass per abdomen, than in acute obstruction or atypical presentation.

In present series of 50 cases, 9 patients underwent Diagnostic Laparoscopy, and biopsy was taken in 5 of these cases. Small multiple whitish nodules scattered all over the peritoneum (tubercles) were seen in 4, variable degrees of omental thickening was seen in 4. Ileocecal and ascending colon thickening seen in seven cases and mesenteric lymph node enlargement was seen in six of the cases who underwent the procedure, adhesions were seen in one case.

**Operative management:**

When surgery is done, it must suite the pathological findings (Pujari, 1979)<sup>16</sup>. Resection of an ileocaecal mass can be of a limited extent rather than the classical hemicolectomy because extensive resection of bowel can lead to malabsorbtion (Prakash et al, 1975)<sup>17</sup> and strictures can be treated by stricturoplasty (Katariya et al, 1977)<sup>18</sup> can be done even in emergency. Perforations are best handled by resection rather than over sewing (Eggleston et al, 1983)<sup>19</sup>.

A study was conducted by Syed Mozammel Hossain, Md Mostafizur Rahman, Shaikh Amir Hossain, Sk Farid Uddin Ahmed<sup>6</sup> on Mode of presentation of abdominal tuberculosis.

In this study which included 32 female and 20 male patients, varied presentation of abdominal tuberculosis included pain in abdomen (95%), fever (84.6%), weight loss (88%) and mass in abdomen were seen. Laparoscopic and open adhesiolysis (18.75%) resection and anastomosis (12.5%), stricturoplasty (12.5%), loop ileostomy (25%), closure of perforation (18.75%) and limited right hemicolectomy (12.5%) were the procedures carried out. Surgical exploration is reserved for equivocal cases and for those who present as emergencies.

Phillipo L Chalya<sup>20</sup> conducted a study on Clinicopathological profile and surgical treatment of abdominal tuberculosis in a northwestern Tanzania

A prospective descriptive study of patients who presented with abdominal tuberculosis was conducted at Bugando Medical Centre (BMC) in northwestern Tanzania.

Out of 256 patients enrolled in the study, males outnumbered females. The median age was 28 years (range = 16–68 years).

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. Forty-eight (18.8%) patients were HIV positive.

A total of 212 (82.8%) patients underwent surgical treatment for abdominal tuberculosis. Bands /adhesions (58.5%) were the most common operative findings. Ileo-caecal region was the most common bowel involved in 122 (57.5%) patients. Release of adhesions and bands was the most frequent surgical procedure performed in 58.5% of cases.



Complication and mortality rates were 29.7% and 18.8% respectively. The overall median length of hospital stay was 32 days and was significantly longer in patients with complications. Advanced age (age  $\geq$  65 years), co-morbid illness, late presentation, HIV positivity and CD4+ count  $<$  200 cells/ $\mu$ l were statistically significantly associated with mortality. The follow up of patients were generally poor as only 37.5% of patients were available for follow up at twelve months after discharge.

P. Agarwal et al <sup>21</sup> conducted a retrospective study of 50 paediatric cases admitted to the Dept of Paediatric Surgery, BYL Nair Hospital, Mumbai for the various clinical presentations, role of investigation, site of involvement and indications for surgery in abdominal tuberculosis.

Of the 50 cases admitted, in Dept of Paediatric Surgery, BYL Nair Hospital, Mumbai, definite surgery was done in 31 (62%) cases for complications or emergencies arising out of abdominal tuberculosis and the rest 19 (38%) cases were subjected to medical management after a diagnostic procedure in the form of laparoscopy, open biopsy or USG guided biopsy.

Coexistent pulmonary tuberculosis was seen in 50% cases. Right quarter colectomy and anastomosis were the commonest surgical procedure done. Wound infection was the commonest post operative complication (58%) and mortality recorded was 6%.

In the present study of 50 cases the approach to surgery was conservative, 49 cases underwent surgery, of which 46% of cases underwent Limited resection and 18% cases underwent right hemicolectomy. As compared to the present study, in Forrest C et al series <sup>1</sup> 18% of the cases underwent Limited resection, while in M.B. Islam et al series <sup>3</sup> only 10% underwent Limited resection. In Forrest C et al series<sup>1</sup> and M.B. Islam et al series<sup>3</sup>, 12% and 63.3% respectively underwent right hemicolectomy. Strictureplasty was done in 12% cases in present series, while it was done in 36% cases in Forrest C et al series <sup>1</sup> while only 3.3% patients underwent the same procedure in M.B. Islam et al series<sup>3</sup>. Only ileotransverse bypass was done in 4% cases in the present series, while it was done for 18% cases in Forrest C et al series <sup>1</sup> and 16.6% cases in M.B. Islam et al series. Bhansali S.K <sup>2</sup> even suggested that bypass patient should be subjected to a secondary excisional procedure when conditions are favourable.

**Table number 12 shows the surgical procedures done in various studies.**

Procedure	Forrest C et al	M.B. Islam et al	Present Study
<b>RESECTIONS</b>			
Limited(Segmental)	18%	10%	46%
Right Hemicolectomy	12%	63.3%	18%

Small Bowel Perforation	31%	6.6%	12%
Strictureplasty	36%	3.3%	12%
Perforation closure	5%	Nil	4%
Adhesiolysis	20%	Nil	4%
Only bypass	18%	16.6%	4%
Only biopsy	18%	Nil	2%
Others	1%	Nil	2%

### Complications, Morbidity and Mortality:

In the present series operative morbidity was 12%, most common complication being wound infection (10%). Wound infection is common (Pujari,1979)<sup>4</sup> Forrest C et al<sup>1</sup> reported a morbidity of 36%, while M.B. Islam et al<sup>3</sup> reported a morbidity of 8%.

Mortality in the present series was low, in total four patients died (8%), all underwent emergency procedures, and no deaths were reported in elective cases. Only M.B. Islam et al<sup>3</sup> reported mortality lower than the present study, no cases died in their study. In Forrest C et al<sup>1</sup> series, it was 3% in elective surgery and 18% in emergency, while Bhansali S.K<sup>2</sup> reported it as 2% and 24% respectively.

Follow up with six months of anti tubercular treatment gave excellent results in 90% of the patients after surgery.

### CONCLUSION

A study on surgical management of abdominal tuberculosis was done on 50 cases. The following conclusion can be drawn from the study.

1. The signs and symptoms of intestinal tuberculosis are protean and nonspecific, and there are no equivocal diagnostic features either clinically or radiologically. The most common presenting complaint was abdominal pain (90%) and the most common sign was abdominal tenderness (56%). As a result, laparotomy, Diagnostic Laparoscopy and histopathological examination were frequently necessary to establish confirmatory diagnosis. Most of the cases were anaemic and poorly nourished.
2. Most common age group being the 2nd, 3rd, and 4th, decades of life contributing 74% of the total sample size.

3. The M: F ratio in the present series was 1.5:1.
4. Diagnosis is difficult in absence of active pulmonary disease, 4 patients had active pulmonary disease, and the accuracy of diagnosis was 60%. It was more difficult in cases of emergency laparotomy, the nature of the obstruction may go unrecognized, particularly in patients having acute symptoms, or caecal masses may be thought to be malignant. The most common diagnosis made was that of Sub acute intestinal obstruction (40%).
5. The most common site involved was ileocaecal region, in 44% of cases.
6. The approach to surgery should be conservative, with the aim of saving maximum bowel length, so Limited resection was the most common surgery performed (46%) in the present series while only 18% cases underwent Right hemicolectomy, and stricturoplasty(12%) was preferred over resection anastomosis(6%) in cases of stricture.
7. Wound infection is common (10%), but most of them respond well to Anti Tubercular Treatment (ATT), so all patients should be started on 6 months of ATT, post operatively. Mortality is high following surgery (8%) especially in emergency cases. All the cases that died in the present series were those who underwent any emergency procedure.

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