

## A STUDY ON VARIOUS MODES OF PRESENTATION OF GASTROINTESTINAL TUBERCULOSIS AT EMERGENCY, ITS MANAGEMENT AND OUTCOMES

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### ABSTRACT

Abdominal tuberculosis is the 6<sup>th</sup> most common form of extrapulmonary tuberculosis, among which ileocaecal tuberculosis is most common. Tuberculosis has been declared a global emergency by the World Health Organization (WHO) and is the most important communicable disease worldwide. Approximately one third of the world population is infected and about three millions die each year from this disease. It presents with a wide variety of symptoms and signs. Gastrointestinal tuberculosis presents to emergency department as subacute intestinal obstruction, acute intestinal obstruction and peritonitis. Although Antitubercular chemotherapy is the mainstay in treatment of abdominal tuberculosis, surgical intervention becomes necessary for two reasons- diagnostic and therapeutic. Diagnostic laparotomy becomes necessary for histopathological/microbiological diagnosis, more often in patients with peritoneal or lymph node TB. Therapeutic surgery is the treatment of choice in emergency for treating intestinal obstruction & peritonitis. Morbidity and mortality will be high in patients with late presentation and associated comorbidities.

### AIMS AND OBJECTIVES:

(1) To study various modes of presentation and management of Gastrointestinal Tuberculosis at emergency surgical care, in our hospital, its management and outcomes. (2) To evaluate the morbidity and mortality in acute presentations of Gastrointestinal tuberculosis.

### MATERIALS AND METHODS

An Observational study of 40 patients admitted in the acute surgical care unit of Our Hospital, Hyderabad, presenting with acute abdomen who have been confirmed to have Gastrointestinal tuberculosis at laparotomy and on histopathology from Aug 2013 to Aug 2015. The patient was managed by laparotomy and procedure according to the mode of presentation. All the patients were given ATT post operatively.

### RESULTS

Gastrointestinal tuberculosis is more common in 2<sup>nd</sup> and 3<sup>rd</sup> decade of life. Acute presentations were found to be more common in male. Intestinal obstruction is one of the commonest presentation of gastrointestinal tuberculosis presenting as surgical emergency and contributes significantly to high morbidity and mortality. Morbidity and mortality is less in the study due to early intervention and effective chemotherapy.

### CONCLUSION

A high index of suspicion, proper evaluation and therapeutic trial in suspected patients is essential for an early diagnosis and timely definitive treatment, in order to decrease the morbidity and mortality associated with this disease.

### KEYWORDS

Gastrointestinal Tuberculosis, Acute Intestinal Obstruction, Subacute Obstruction, Peritonitis, Adhesiolysis, Peritoneal Lavage, Perforation Closure, Resection & Anastomosis, Right Hemicolectomy, Ileotransverse Anastomosis, Anti-Tubercular Therapy.

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**INTRODUCTION:** Tuberculosis has been declared a global emergency by the World Health Organization (WHO) and is the most important communicable disease worldwide. Approximately one third of the world population is infected and about three millions die each year from this disease.<sup>1</sup>

It remains the principal cause of death in the developing countries,<sup>2</sup> probably due to poverty, lack of education, low detection rate, non-availability of experienced staff and insufficient coverage of the community by immunization programme.

The incidence of tuberculosis is again on the rise in developed countries, due to the influx of immigrants from third world countries, HIV infection and increasing use of Immunosuppressive therapy.<sup>3</sup>

The disease may involve any system of the body but abdomen is one of the commonest sites of involvement after lungs.<sup>4</sup> Though potentially curable, abdominal tuberculosis

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continues to be a major cause of morbidity and mortality. In the abdomen, tuberculosis may affect the gastro-intestinal tract, peritoneum, lymph nodes, and solid viscera.

Intestinal tuberculosis has usually one of the three main forms i.e. ulcerative, hypertrophic or ulcero-hypertrophic, and fibrous stricturing form.<sup>5</sup> The disease can mimic various gastrointestinal disorders, particularly the inflammatory bowel disease, colonic malignancy, or other gastrointestinal infections.<sup>6</sup>

Most Patients have a chronic presentation but may present late with complications like sub a cute and acute obstruction and sometimes presents with a palpable mass<sup>7</sup> or strictures.<sup>8,9,10</sup> Constitutional Symptoms may or may not be present.<sup>8</sup> Microbial diagnosis is difficult in intestinal TB. Histopathology and radiology is the mainstay of diagnosis.

Most patients with abdominal TB can be treated with ATT alone. But patients with acute abdomen require emergency laparotomy. Patients with patent strictures respond to conservative management and patients with intestinal obstruction, peritonitis, strictures or masses usually require surgery

#### AIMS & OBJECTIVES:

1. To study various modes of presentation and management of Gastrointestinal Tuberculosis at emergency surgical care, in our hospital, its management and outcomes.
2. To evaluate the morbidity and mortality in acute presentations of Gastrointestinal tuberculosis.

#### GASTROINTESTINAL TUBERCULOSIS<sup>11</sup>:

- Abdominal tuberculosis is the 6<sup>th</sup> most common form of extrapulmonary tuberculosis, among which ileocaecal tuberculosis is most common.
- It presents with a wide variety of symptoms and signs.
- It is common in young adults between 15- 40 yrs.
- Male to female ratio is 1:1.4.

#### PRESENTATIONS TO EMERGENCY:

- **Sub a cute Intestinal Obstruction:** This is the most common presentation of ileocaecal tuberculosis where a mass in right iliac fossa is palpable.
- **Acute Intestinal Obstruction:** Ileal TB more commonly presents as this condition as strictures, bowel adhesions, fibrosis and secondary infection are more common. Rarely ileocaecal TB may also present as acute intestinal obstruction.
- **Tuberculous Peritonitis:** Peritoneal involvement of tuberculosis.
  - **Acute Type:** Rare, due to rupture or perforation of mesenteric tuberculous lymph nodes.
  - **Chronic Tuberculous Peritonitis:**
    - Infection is usually from mesenteric lymph nodes, ileocaecal tuberculosis, fallopian tubes.
    - Presents with pain, loss of weight and appetite, abdominal mass, doughy abdomen.

#### RARE PRESENTATIONS:

- TB enteritis, Incarcerated inguinal hernia,<sup>12</sup> TB Cocoon.<sup>13</sup> rare form of Peritoneal Tuberculosis where there are dense viscerovisceral and visceroparietal adhesions with small bowel inside these adhesions making the abdomen look like a cocoon. It may precipitate obstruction.

#### SIGNS AND SYMPTOMS:

- Abdominal pain is the most common symptom (90%). It is usually seen in right lower quadrant and colicky in nature but becomes generalized and dull if peritonitis or obstruction supervenes.
- Fever, anaemia, loss of weight and appetite are seen in up to 1/3<sup>rd</sup> of the patients of generalized tuberculosis.
- Mass in right iliac fossa (35%), which is hard, nodular, non-mobile, non-tender with impaired resonance.
- Diarrhoea- 10-20%- Usually seen in ulcerative type of ileocaecal tuberculosis and often similar to diarrhoea seen in terminal regional ileitis. The number of stools rarely exceeds 3-6, semisolid in consistency, frank pus or blood is seldom noted. Depending upon the extent and location of the inflammatory process in the small bowel, secondary malabsorption may set in giving rise to steatorrhea and a rancid odour of stools.
- Depending on the presence or absence of other types of tuberculosis some symptoms may be present like.

**Cough, Haemoptysis:** Pulmonary TB, Amenorrhea, haematuria-Genitourinary TB, Back pain-TB spine.

**DIAGNOSIS:** Intestinal tuberculosis should be differentiated from (Differential diagnosis)<sup>14</sup>:

Carcinoma caecum, Amoeboma, Appendicular mass, Ectopic kidney, Retroperitoneal tumour, Lymph node mass, Psoas abscess, Crohn's disease

#### INVESTIGATIONS<sup>15</sup>:

- **Complete Blood Picture:** Moderate degree of anaemia, total leucocyte count is raised upto 8000 cells/cc, with lymphocytosis in 40-50% cases & ESR is raised.
- **Complete Urine and Stool Examination:** It difficult to demonstrate tubercle bacilli in either urine or stool. Stool examination may show occult blood.
- **PPD skin tests:** Mantoux, Heaf and Tine tests. Mainly used for screening. Nearly all abdominal TB cases show positive results. False negative-Pts with weight loss, immunosuppression, overwhelming TB infection (miliary TB). Positive results-BCG vaccination, cases sensitized by typical mycobacterium and in patients with active infection.
- ELISA, SAFA (soluble antigen fluorescent antibody), SERUM IgG are other serological tests that help in the diagnosis.
- Anti-Cord Factor Antibody to differentiate it from Crohn's disease.

- **Biochemical Assays:** Proteins, ADA (Adenosine Deaminase Activity), and Interleukins. ADA has a sensitivity and specificity of 95-98%. Serum ADA >54 U/L; ascitic ADA >33 U/L; ascitic ADA: serum ADA >0.985 is significant.

#### IMAGING MODALITIES<sup>11</sup>:

- **Chest X-Ray:** To find out if there is any primary focus (pulmonary TB). Classic picture is that of upper lobe disease with infiltrates and cavities. In the era of AIDS, there is no pathognomonic pattern on the chest X-ray.
- **Plain X-Ray Abdomen:**
  - Obstruction - multiple air-fluid levels.
  - Peritonitis - air under diaphragm.
  - Calcifications - In the bowel or lymph node.
- **Barium Study X-Ray:** (Enteroclysis followed by barium enema or a barium follow through X-ray).
  - Contraindicated in cases of obstruction.
  - **Earliest Signs:** Increased transit time, hypersegmentation (chicken intestine), and flocculation of barium. Pulled up caecum, conical caecum, pulled down hepatic flexure. Obtuse ileocaecal angle.
  - **Stierlin Sign:** Hurrying of barium due to rapid flow and lack of barium in inflamed segment.
  - **Inverted Umbrella/Fleischner Sign:** Narrow ileum with thickened ileocaecal valve.
  - **Napkin Ring Lesions:** Ulcers and strictures in the terminal ileum and caecum.
  - **Other Signs:** Persistent narrow stream (string sign); multiple strictures with enormous dilation of proximal ileum (mega ileum); straightening of ileocaecal junction with 'goose neck' deformity.
- **Ultrasonography Of Abdomen:**
  - Thickened bowel wall, mesentery, omentum and peritoneum, loculated ascitis with fine septae, Mesenteric thickness >15 mm, Hepatosplenomegaly, Lymph nodal enlargement with matting.
  - **Club-Sandwich Appearance:** Interloop ascitis with alternate echogenic and echo free areas.
  - **Stellate Sign:** bowel loop radiates from its mesenteric root.
  - **Pseudokidney Sign:** Pulled up caecum presenting with a mass in subhepatic region.
- **CT scan Abdomen:**
  - Done with oral contrast- CT enteroclysis.
  - Thickened bowel wall, mesentery and peritoneum, Ileocaecal valve thickening, Enlarged/ matted/ necrosed mesenteric nodes often with cold abscess, Nodules in the mesentery, peritoneum and other solid organs, Adhesions in the bowel/stricture/dilations of the bowel/features of obstruction & Loculated ascitis.
- Colonoscopy to rule out carcinoma caecum.

#### ASCITIC FLUID ANALYSIS<sup>11</sup>:

- Exudate with protein level >2.5 g/dl, Specific gravity >1.016, Glucose <30 mg/dl, Decreased pH, Serum – ascitic fluid albumin gradient is <1.1, Lymphocyte predominant cells with count as high as 4000 cells/mm<sup>3</sup>, AFB in ascitic fluid is seen in <3% of cases, ADA levels in ascitic fluid >33 U/L, LDH >90 U/L. On culture of ascitic fluid tubercle bacilli is demonstrated in only 7-33% of cases. The yield is more when >1 liter of fluid is sent.

#### MANAGEMENT:

**Anti-tubercular Treatment<sup>16</sup>:** Remarkable progress has been made in the last 60yrs since the introduction of Streptomycin in 1947 for the treatment of TB. Later, the discoveries of Isoniazid (1952), Ethambutol (1961), Rifampin (1962) and redefinition of Pyrazinamide has changed the strategies in the chemotherapy of tuberculosis. Fluoroquinolones, newer macrolides and some rifampicin congeners are the recent additions to the antimycobacterial drugs.

A new dimension got added in the 1980's due to spread of HIV with high prevalence of TB and MAC complex infection among these patients. Emergence of 'multidrug resistant' (MDR) TB is threatening the future of current antitubercular chemotherapy.

**According to their clinical utility they can be divided into:**

**First Line:** High antitubercular efficacy and low toxicity. Used routinely. Isoniazid (H) Rifampicin (R) Pyrazinamide (P) Ethambutol (E) Streptomycin (S).

**Second Line:** Low antitubercular or high toxicity or both. Used in special circumstances only. Thiacetazone (Tzn), Paraaminosalicylic acid (PAS), Ethionamide (Etm), Cycloserine (Cys), Kanamycin (Kmc), Amikacin (Am), Capreomycin (Cpr).

**Newer Drugs:** Ciprofloxacin, Ofloxacin, Clarithromycin, Azithromycin, Rifabutin.

#### DOSAGE<sup>17</sup>:

Isoniazid	5(4-6)	300mg
Rifampin	10(8-12)	600mg
Pyrazinamide	25(18-25)	2000mg
Ethambutol	15(15-20)	1600mg
Streptomycin	15(12-18)	1000mg
<b>First line drugs</b>		

DRUG	DOSAGE
Thiacetazone	2.5 mg/kg up to 150 mg (max)
PAS	200 mg/kg up to 10-12 g (max)
Ethionamide	15-20 mg/kg/day up to 0.5-0.75 g (max)
Cycloserine	10-15 mg/kg/day up to 1000 mg (max)

Aminoglycosides	0.75-1.0 g
Fluoroquinolones	800-1500 mg/day
Macrolides	500-1000 mg/day
Rifabutin	5 mg/kg up to 300 mg (max)
<b>Second line and newer drugs</b>	

**Treatment Regimens:** These are regimens of 6-9 month duration which have been found highly efficacious. A WHO expert group has framed clear-cut treatment guidelines for different categories of TB patients.

All regimens have an initial intensive phase, lasting for 2-3 months aimed to rapidly kill the TB bacilli, bring about sputum conversion and afford symptomatic relief. This is followed by a continuation phase lasting for 4-6 months during which the remaining bacilli are eliminated so that relapse does not occur. Treatment of TB categorized by:

- Site of the disease.
- Sputum smear-positivity/negativity.
- History of previous treatment.

**Category I:** New (untreated) smear positive pulmonary TB.

- New smear negative pulmonary TB with extensive parenchymal involvement.
- New cases of severe forms of extrapulmonary TB, viz. meningitis, military, pericarditis, peritonitis and intestinal, bilateral or extensive pleural effusion, spinal, genitourinary.

**Category II:** Smear positive failure, relapse and interrupted treatment cases.

**Category III:** New cases of smear negative pulmonary TB with limited parenchymal involvement.

- Less severe forms of extrapulmonary TB, viz. lymph node, unilateral pleural effusion, bone (excluding spine), peripheral joint or skin.

**Category IV:** Chronic cases who have remained or have become smear positive after completing fully supervised treatment regimen. These are most likely MDR cases.

Category	Initial	Continuation	Duration
I	2H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub> E <sub>3</sub>	4H <sub>3</sub> R <sub>3</sub>	6
II	2H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub> E <sub>3</sub> S <sub>3</sub> + 1H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub> E <sub>3</sub>	5H <sub>3</sub> R <sub>3</sub> E <sub>3</sub>	8
III	2H <sub>3</sub> R <sub>3</sub> Z <sub>3</sub>	4H <sub>3</sub> R <sub>3</sub>	6
<b>Treatment regime of tuberculosis</b>			

In most<sup>18</sup> of the abdominal TB cases ATT is usually continued for 1 to 2yrs after the pts become asymptomatic. An adjunctive glucocorticoid<sup>19</sup> therapy helps in reducing the adhesions formed in the process of healing of TB peritonitis.

**Surgical Treatment:** Although Antitubercular chemotherapy is the mainstay in treatment of abdominal tuberculosis, surgical intervention becomes necessary for two reasons- diagnostic and therapeutic. Diagnostic laparotomy becomes necessary for histopathological/

microbiological diagnosis, more often in patients with peritoneal or lymph node TB. Therapeutic surgery<sup>20</sup> is indicated for complications like intestinal obstruction, perforation and peritonitis, fistulae formation, haemorrhage and failure of conservative management and ATT.

Understanding the terms acute and sub-acute obstruction is crucial to the planning of treatment.<sup>21</sup>

**Acute Obstruction:** There is absolute constipation, vomiting and abdominal distension for 24-48hrs with supporting radiological evidence.

**Sub-acute Obstruction:** There is relative constipation, nausea, vomiting and/or distension for more than 48hrs with supporting radiological evidence.

#### Various Surgical Options<sup>22</sup>:

**1. Primary Peritonitis:** Exploratory laparotomy with peritoneal lavage.

**2. Simple Perforation:** Exploratory laparotomy with closure of perforation in 2 layers.

#### 3. Obstruction:

a. **Adhesions:** Adhesionolysis.

b. **Extensive adhesions +/- volvulus:**

- Release of adhesive band + derotation of bowel.
- Resection with end-to-end anastomosis.
- Limited resection of ileocaecal region.
- Bypass procedures.

c. **Extensive adhesions with mass**

- Limited resection of ileocaecal region.
- Ileotransverse anastomosis.
- Right hemicolectomy.

d. **Strictures:**

- Resection of stricturous segment with end-to-end anastomosis.
- Strictureplasty (if short stricture).

#### 4. Perforation Secondary to Stricture:

- Closure of perforation in 2 layers with stricturoplasty.
- Resection of perforated and stricturous segments and end-to-end anastomosis.
- Closure of perforation + stricturoplasty + ileotransverse anastomosis.
- Closure of perforation + ileotransverse anastomosis.

#### 5. Gangrene:

- Of bowel- resection of the gangrenous part + end-to-end anastomosis.
- Of caecum- caecostomy.

#### MATERIALS AND METHODS:

- An Observational study of 40 patients admitted in the acute surgical care unit of Our Hospital, Hyderabad, presenting with acute abdomen who have been

confirmed to have Gastrointestinal tuberculosis at laparotomy and on histopathology from Aug 2013 to Aug 2015.

- The patients have been selected from all age groups.
- The main inclusion criteria being the laparotomy findings and histopathological positivity of the specimen for tuberculosis.
- The acute clinical presentations have been analysed and studied taking detailed history, clinical examination and investigations according to the proforma given.
- All the patients have been subjected to preliminary investigations:
  - **Preoperative:** (a) Blood investigations. (b) Erect abdominal X-ray. (c) Ultrasonogram of abdomen.
  - **Postoperative:** (a) Chest X-ray PA view (Pre/Postoperative). (b) Sputum examination for AFB (Postoperative).
- The patient was managed by laparotomy and procedure according to the mode of presentation. (a) Acute intestinal obstruction. (b) Sub-acute intestinal obstruction (c) Peritonitis.
- All patients were subjected to sputum examination and chest x-ray postoperatively to establish the incidence of associated pulmonary tuberculosis.
- All the patients were given ATT post operatively.
- Postoperatively the patients were followed till the day of discharge. At the time of discharge, all the patients were advised to continue the full course of ATT as prescribed.
- Further follow up of the patients with periodic observation, of the well-being of the patient, clinical assessment and progress, was noted.

#### OBSERVATION AND ANALYSIS:

**Age Incidence:** Incidence of gastrointestinal tuberculosis in this study was found to be common in 3<sup>rd</sup> decade of life.

**Sex Incidence:** The male to female ratio in this study was found to be 1.85:

Sl. No	Complaint	No. of Patients	Percentage
1	Pain abdomen	40	100%
2	Distension	28	70%
3	Vomiting	37	92.5%
4	Constipation	32	80%
5	Fever	24	60%
6	Weight loss	33	82.5%
7	Cough	16	40%
8	Haemoptysis	0	0%
9	Night sweats	6	15%
10	Fatigue	19	47.5%
11	Diarrhoea	3	7.5%
<b>Presenting complaints (symptomatology)</b>			

In the present study, the most common complaints at the time of presentation were pain abdomen, vomiting,

constipation, wt. loss and distension. The others being constitutional symptoms.

Sl. No.	Sign	Obstruction	Peritonitis	Total
1	Tenderness (+)	21	13	34
	(-)	6	13	19
2	Distension (+)	27	6	33
	(-)	0	7	7
3	Guarding (+)	0	13	13
	(-)	0	0	0
4	Rigidity(+)	15	13	28
	(-)	12	0	12
<b>Signs at the time of presentation</b>				

Tenderness, guarding and rigidity were seen in all the cases presenting with peritonitis. In all the cases of obstruction distension was seen, with only showing tenderness & showing guarding.

Sl. No.	Presentation	No. of patients
1	Obstruction	27(67.5%)
2	Peritonitis	13(32.5%)
	(a) Perforation	4(10%)
	(b) Perforation 2 <sup>o</sup> to obstruction	5(12.5%)
3	Others	4(10%)
<b>Mode of presentation</b>		

Most common presentation of gastrointestinal TB in this study was obstruction which constitutes 67.5% followed by Peritonitis which is 32.5%.

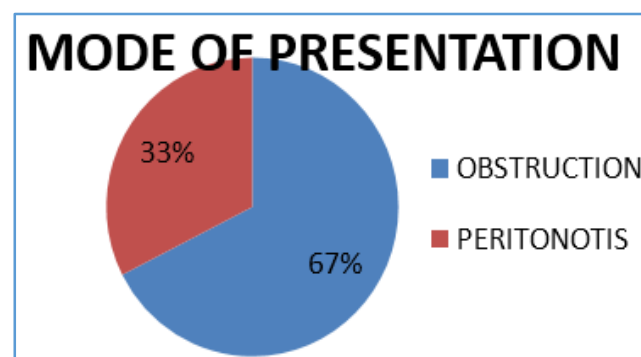


Figure 1

**Duration of Pain:** The majority of our patients had symptoms of 3-4 weeks duration at the time of presentation. The reasons for late presentation in this study may be attributed to the fact that the diagnosis of intestinal TB in its initial stages is usually difficult due to vague and non-specific symptoms as a result patients remain undiagnosed for prolong periods, receiving symptomatic treatment and subsequently present late with complications such as acute or sub-acute intestinal obstruction and peritonitis.

**Past History of Tuberculosis:** Out of 40, 12 patients had past history of tuberculosis and ATT had used ATT.

Sl. No.	No. of patients	Lesion on chest CXR	Sputum AFB positive
1	4(10%)	Consolidation	+
2	4(10%)	Infiltrates	+
3	5(12.5%)	Cavity	+
4	4(10%)	Effusion	+
5	0	Cavity+ Infiltrates	+
6	17(42.5%)	Total	
<b>Associated pulmonary Koch's</b>			

#### X-RAY FINDINGS:

Sl. No.	Changes	No. of Patients
1	Consolidation	4(10%)
2	Infiltrates	4(10%)
3	Cavity	5(12.5%)
4	Effusion	4(10%)
<b>Total</b>		17(42.5%)
<b>Chest</b>		

Among the 40 patients, 17 patients had lesions in the X-ray chest and included all the 12 patients with past h/o TB. The other 5 patients had pleural effusion (2) and consolidation (3).

Sl. No.	Findings	No. of Patients
1	Air fluid levels	20 (50%)
2	Pneumoperitoneum	9 (22.5%)
3	Dilated bowel loops	7 (17.5%)
4	Equivocal	4 (10%)
<b>Total</b>		40
<b>X-Ray erect abdomen</b>		

Erect abdomen X-ray in 20 patients (50 %) showed air fluid levels, in 9(22.5%) patients showed pneumoperitoneum and in 7 patients (17.5%) showed dilated bowel loops.

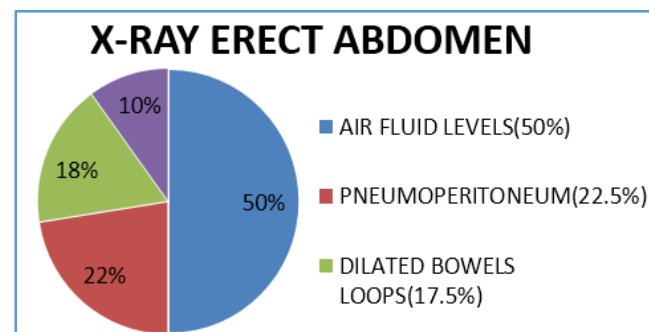


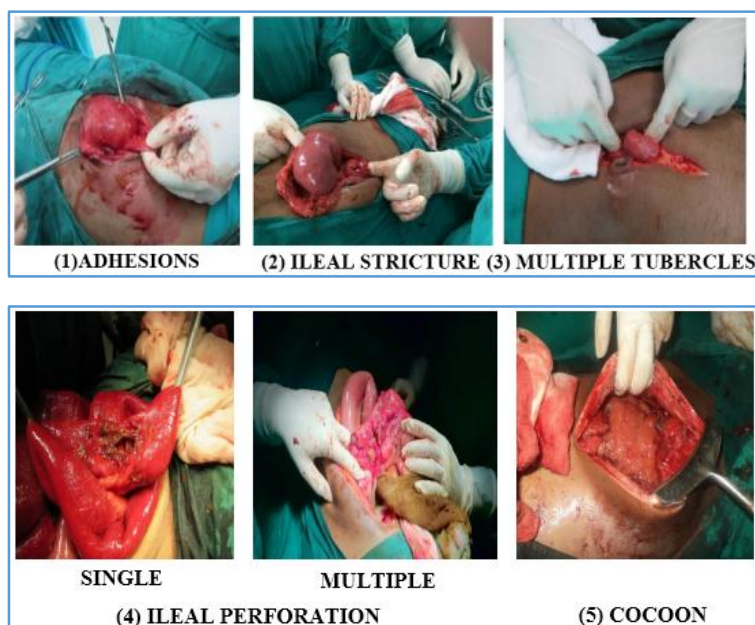
Figure 2

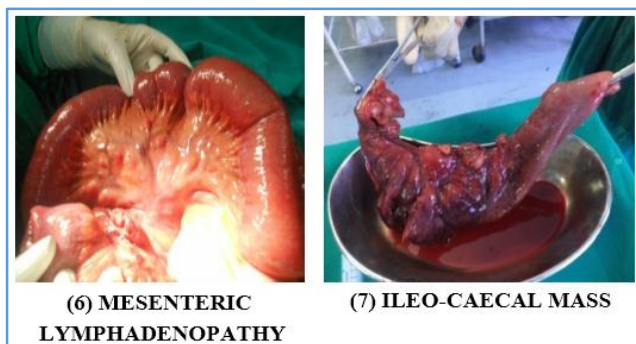
#### MANAGEMENT:

Sl. No.	Findings	Patients	Percentage
1	Adhesions	22	55%
2	Strictures	10	25%
3	Tubercles	9	22.5%
4	Perforation	9	22.5%
5	Mes. Thickening	25	62.5%
6	Lymph nodes	25	62.5%
7	Ileocaecal mass	6	15%
8	Fluid	15	37.5%
<b>Intraoperative findings</b>			

In the present study, among the 40 patients, majority of them had mesenteric thickening and mesenteric lymph nodal enlargement (62.5%), and adhesions (55%). Most of the patients had more than one of the above mentioned findings. The probability of finding adhesions was significantly higher in patients presenting with acute intestinal obstruction.

#### Figures showing intra-operative findings of gastrointestinal tuberculosis:





Sl. No.	Site of stricture	Single	Multiple	Total
1	Jejunum	1	2	3
2	Ileum	4	3	7
3	Ileocaecal junction	0	0	0
	<b>Total</b>	5	5	10

**Strictures**

Most common site of stricture was ileum followed by Jejunum. In 5 cases single stricture and in 3 multiple strictures noted.

Sl. No.	Site of perforation	1	2	Multiple	Total
1	Jejunum	1	0	0	1
2	Ileum	6	1	1	8
3	Jejunum+ Ileum	0	0	0	0
	<b>Total</b>	7	1	1	9

**Perforations**

In this study ileum was the commonest site of perforation which is seen in 8 cases. Only in 1 case jejunal perforation noted.

Sl. No.	No. of patients with mass	Obstruction	Peritonitis
1	6	3	3

**MASS**

Out of 40, 3 patients presenting with obstruction and 3 presenting with peritonitis, total 6 patients were found to have mass intraoperatively.

Sl. No.	Procedure	Patients	Percentage
1	Laparotomy only+ TPL	7	17.5%
2	Adhesionolysis	15	37.55
3	Strictureplasty	3	7.5%
4	Perforation closure	4	10%
5	Resection with end-to-end anastomosis	5	12.5%

6	Resection with end ileostomy	5	12.5%
7	Ileo-transverse anastomosis	2	5%
8	Rt. Hemicolectomy with ileostomy	1	2.5%

**Operative Procedures**

In the present study, among the 40 patients who underwent surgery, adhesionolysis was the most commonly performed procedure. Among the 10 patients with strictures, 3 of them underwent stricturoplasty. Among the 6 patients with an ileocaecal mass an ileo-transverse bypass procedure was done in 2 of them, Rt. hemicolectomy with ileo-transverse anastomosis was done in 3 and Rt hemicolectomy with end ileostomy was done in 1 case.

Sl. No.	Procedure	Patients	Percentage
1	Small Bowel Resections	8	20%
	a. For strictures	1	2.5%
	b. For strictures+ adhesions	5	12.5%
	c. For strictures+ perforation	2	5%
2	Rt. Hemicolectomy	3	7.5%
3	Limited resections	0	0
	<b>Total</b>	<b>11</b>	<b>27.5%</b>

**Resections**

Among the 11 patients who underwent resections, in 8 of them it was due to strictures, in 3 of them due to Ileocaecal mass.

Sl. No.	Procedure	Patients
1	Anastomosis following Resections	Enterio-enteric 3 Enterio-colic 2
2	Anastomosis as a bypass	Enterio-enteric 0 Enterio-colic 2
	<b>Total</b>	<b>7</b>

**Anastomosis**

In all the 11 patients who underwent resections, an end-to-end enterio-enteric or enterio-colic anastomosis was performed in 5 of them where as in 2 patients anastomosis was done as bypass.

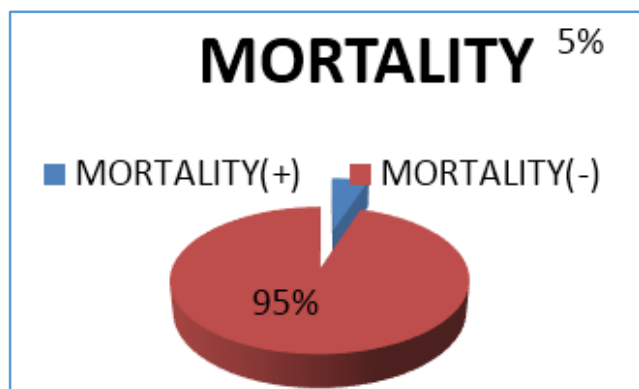
Sl. No.	Complications	Patients	Management
1	Surgical site infection	11(27.5%)	Conservative
2	Burst abdomen	1(2.5%)	Tension sutures
3	Enterocutaneous fistula	1(2.5%)	Conservative
4	Pulmonary complications	3(7.5%)	Conservative
	<b>Total</b>	<b>16(40%)</b>	

**Post-operative complications**



In the present study, post-operative complications were seen in 40% of operated cases. Wound infection was most commonly seen in 11 patients (68.75 %). The complications were significantly higher in those patients who presented late and with associated comorbidities ( $p=0.03$ ).

**HOSPITAL STAY:** In the present study, most of the patients were discharged during the 2<sup>nd</sup> week (72.5%).



**Figure 3**

In the present study, only 2(5%) patients died in the immediate post-operative period 1 due to ARDS and 1 with septic shock.

#### DISCUSSION:

**Age Incidence:** Intestinal tuberculosis, like tuberculosis elsewhere in the body affects the young people at the peak of their productive life. This fact is reflected in my study as the highest incidence of the patients was in the 3<sup>rd</sup> and 4<sup>th</sup> decades of life and more than 75% of the patients were aged below 40 yrs. The presentation of tuberculous intestinal obstruction in this age group has serious impacts on the national economy and production, as working and productive class of community is replaced by sick and ill individuals.

**Sex Incidence:** In our study the incidence was found to be more in males(65%) and the male-female ratio is 1.85:1, the

male-female ratio was observed to be 4:5 by Bhansali S.K., et al, 1:1.3 by Demir K et al, 1:2.04 by Wig J.D. et al.

Sl. No.	Symptom	Present study	Philip et al <sup>23</sup>	Bhansali S.K., et al <sup>24</sup>
1	Pain abdomen	100%	100%	96.05%
2	Constipation	80%	86%	55%
3	Vomiting	92.5%	98%	89%
4	Fever	60%	72%	58%
5	Weight loss	82.5%	80%	26%
6	Diarrhoea	7.5%	25%	21%
7	Distension	70%	62%	-
<b>Symptomatology</b>				

The clinical presentation of tuberculous intestinal obstruction in our patients is not different from those in other studies<sup>23</sup>, with abdominal pain being common to all the patients. The clinical presentation of abdominal TB is usually non-specific and, therefore, often results in diagnostic delay and hence the development of complications such as intestinal obstruction and peritonitis.

**Signs at the time Of Presentation:** In the present study tenderness, distension and guarding was found in 54, 33 & 13 cases respectively which was comparable with the other study of Bhansali s.K. et al where tenderness, distension and guarding was found in 63, 60 & 27 respectively

**Mode of Presentation:** The commonest mode of presentation was found to be the obstruction followed by perforation in the present study and in the study done by Bhansali, S.k et al in a "Study of stenotic lesions of the bowel". Nair S.K. et al in a study of non-traumatic intestinal perforations" observed 24% of the cases are of tubercular origin. Tubercular perforations are uncommon and are difficult to diagnose.

**Past History of Tuberculosis:** In my study, associated pulmonary tuberculosis was found in 30% of cases, a figure which is comparable with other studies.<sup>23</sup>

Finding	Obstruction		Perforation		Others		Total (%)	
	Present study	Bhansali S.K. et al <sup>24</sup>	Present study	Bhansali S.K. et al <sup>24</sup>	Present study	Bhansali S.K. et al <sup>24</sup>	Present study	Bhansali S.K. et al <sup>24</sup>
Air fluid levels	20	41	-	0	-	2	20(50%)	51(76.1%)
Pneumoperitoneum	-	0	9	5	-	0	9(22.5)	5(6.5%)
Gas distended bowel loops	5	1	2	0	-	0	7(17.5)	1(3.1%)
Equivocal	4	1	-	6	-	12	4(10%)	19(25%)
Total		43		19		14		76
<b>Roentological Findings</b>								

In the present study air fluid levels were observed in 50%, Pneumoperitoneum in 22.5%, Gas distended loops in 17.5% and equivocal in 10%. In the other study air fluid levels were seen in 76.1%, pneumoperitoneum in 6.5%. Both studies are comparable showing that in gastrointestinal TB, obstruction is the common presentation followed by peritonitis.



Sl. No.	Operative findings	Present study	Philip et al <sup>23</sup>	Bhansali S.K. et al <sup>24</sup>
1	Adhesions	55%	16.9%	27.4%
2	Strictures	25%	72.9%	40.7%
3	Perforation	22.5%	-	14.70%
4	Mass	15%	3.4%	21.48%
5	Lymphadenitis	62.5%	1.7%	42.9%
6	Multiple tubercles	22.5%	-	34.8%
7	Volvulus	-	-	1.48%
<b>Intraoperative findings</b>				

In my study, adhesions were the major findings, this is in sharp contrast to the study compared, where strictures were more common. This is due to the early suspicion of intestinal tuberculosis, early intervention and early post-operative chemotherapy which has controlled further spread of the disease, whereas in other study majority were late presentations. But as far as the site of pathology is concerned, it was terminal ileum followed by closely followed by the ileocaecal region, which is comparable to other studies. This is possibly because of the increased physiological stasis, increased rate of fluid and electrolyte absorption, minimal digestive activity and an abundance of lymphoid tissue at this site. It has been shown that the M cells associated with Peyer's patches can phagocytes BCG bacilli. The frequency of bowel involvement declines as one proceeds both proximally and distally from the ileocaecal region.

Sl. No.	Site	Present study	Bhansali S.K. et al <sup>24</sup>
1	Small intestine	25%	78.18%
2	Ileocaecal region	-	21.8%
<b>Strictures</b>			

Small bowel strictures are more common ileum being the commonest site followed by jejunum. This is comparable in both the studies.

Sl. No.		Present study	Bhansali S.K. et al <sup>24</sup>
1	% of cases	25%	14.07%
<b>Perforations</b>			

Ileum was the commonest site of perforation in both the studies.

Sl. No.	Procedure	Present study	Philip et al <sup>23</sup>	Bhansali S.K. et al <sup>24</sup>
1	Laparotomy only+ TPL	17.5%	-	7.40%
2	Adhesionolysis	37.5%	16.9%	17.0%
3	Strictureplasty	7.5%	1.8%	0
4	Perforation closure	1.0%	-	5.9%
5	Resection with end-to-end anastomosis	12.5%	23.7%	7.40%

6	Resection with end ileostomy	12.5%	1.8%	24.4%
7	Ileo-transverse anastomosis	5%	-	14.8%
8	Rt. Hemicolectomy with ileostomy	2.5%	55.9%	81.18%
<b>Surgical procedure</b>				

In my study, adhesionolysis was the most performed procedure whereas right hemicolectomy was more common in the other study. This goes with the intra-operative findings.

Sl. No.	Procedure	Present study	Bhansali S.K. et al <sup>24</sup>
1	Small bowel resections	20%	12.12%
2	Large bowel resections	7.5%	81.18%
3	Large + small bowel resections	-	3.03%
<b>Resections</b>			

More number of small bowel resections we done in the present study, in other studies large bowel resections were more. This goes with the intra-op findings as mentioned above.

Sl. No.	Procedure	Present study	Bhansali S.K. et al <sup>24</sup>
1	Enteroenteric anastomosis	12.5%	30.35%
2	Entero colic anastomosis	5%	35.78%
<b>Anastomosis</b>			

In the present study enteroenteric anastomosis was done in 12.5%, in Bhansali, S.K et al it was 30.35%.

Sl. No.	Complication	Present study	Phillip et al <sup>24</sup>
1	Surgical site infection	27.5%	42.9 %
2	Enterocutaneous fistula	2.5%	10.7 %
3	Burst abdomen	2.5%	7.1 %
4	Pulmonary complications	7.5%	-
<b>Post-operative Complications</b>			

The presence of complications is comparable with other studies.<sup>23</sup>

Sl. No.	Hospital stay	Present study	Phillip et al <sup>23</sup>
1	Range	0-50 days	1-64 days
2	Median	14 days	24 days
<b><i>Length of Hospital Stay</i></b>			

In my study, the average length of hospital stay is lower than other<sup>23</sup> study, this is due to early intervention and effective chemotherapy.

Sl. No.		Present study	Bhansali S.K. et al <sup>24</sup>
1	% of cases	21.87%	22.96%
<b><i>Postoperative Morbidity</i></b>			

Wound infection was found to be the commonest complication in both the studies.

Sl. No.		Present study	Bhansali S.K. et al <sup>24</sup>
1	% of cases	5%	11.84%
<b><i>Mortality</i></b>			

In my study, the mortality is lower than the other study<sup>24</sup>, for the same reasons of early intervention and effective chemotherapy

#### CONCLUSION:

- Gastrointestinal tuberculosis is more common in 2<sup>nd</sup> and 3<sup>rd</sup> decade of life.
- Acute presentations were found to be more common in male.
- Intestinal obstruction is one of the commonest presentation of gastrointestinal tuberculosis presenting as surgical emergency and contributes significantly to high morbidity and mortality.
- Delayed presentation is associated with high morbidity and mortality in our study.
- Gastrointestinal tuberculosis often occurs independent of pulmonary tuberculosis, therefore a high degree of suspicion is necessary to make a clinical diagnosis of abdominal tuberculosis.
- In acute cases of gastrointestinal tuberculosis, surgical management is the optimal method of treatment.
- The most common pathology was adhesions followed by strictures.
- The commonest site of pathology was found to be ileum and ileocaecal region.
- The morbidity was found to be 21.87%, which is more common in late presentations and in patients associated with comorbidities like diabetes and pulmonary tuberculosis.
- The overall mortality was found to be 5%. Mortality was mainly due to ARDS and Toxaemia.

- All patients were given anti tubercular therapy in the postoperative period, leading to a favourable outcome in the patients.
- A high index of suspicion, proper evaluation and therapeutic trial in suspected patients is essential for an early diagnosis and timely definitive treatment, in order to decrease the morbidity and mortality associated with this disease.

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