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Gastrointestinal Tuberculosis: Clinico-Pathological Profile and Surgical Outcome of Patients Undergoing Laparotomy

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Abstract: *Tuberculosis is one of the earliest diseases affecting the mankind. Abdominal tuberculosis constitutes a common public health issue in developing countries like ours. Gastrointestinal tuberculosis often involves the ileo-caecal region. Surgery in case of abdominal tuberculosis is required to overcome the deleterious effects of the disease like tissue disorganization, obstruction and perforation.*Aims And Objectives: *1. To study the various clinical profiles of gastrointestinal tuberculosis in patients undergoing laparotomy;2. To study the surgical pathology of gastrointestinal tuberculosis; 3. To study the various surgical treatment modalities based upon the intraoperative findings and its outcome.* Results: *This is a prospective study over 12 months at Government Medical College & Hospital Amritsar, Punjab. This study was done to study the clinic-pathological profile of gastrointestinal tuberculosis undergoing laparotomy. Incidence of gastro intestinal tuberculosis was seen highest in age group 15 to 25 years with male predominance. Most common presentation being intestinal obstruction with ileo-caecal as the most common area involved and right hemicolectomy as the commonest procedure done. Common surgical pathologies were ileo-caecal mass and ileal perforation and this also has relation to pulmonary tuberculosis.*Conclusion: *Inspite of specific antituberculous drugs and vast measures against the disease, including chemoprophylaxis and pasteurization, abdominal tuberculosis remains a fairly common disease even today. Gastrointestinal tuberculosis has an indolent course and the common mode of presentation is usually sub acute or chronic intestinal obstruction. Prompt surgical exploration, vigilant postoperative care and administration of ATT helped to treat the patients successfully with their complete cure and rehabilitation.*

Keywords: *gastrointestinal tuberculosis, laparotomy, obstruction, perforation*

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I. Introduction

Tuberculosis is one of the earliest diseases affecting the mankind. Tuberculosis (TB) was a prevalent infection even in Ancient Greek and Egypt. It was known to Hippocrates who gave it the name of phthisis, which means wasting disease (1). In India, tuberculosis is still considered as a social disease, reflecting the standards of living in a community. Tuberculosis can quiet rightly be termed India's "National Disease".

Abdominal tuberculosis constitutes a common public health issue in developing countries like ours. It is relatively less common in the western world. It can occur as a primary disease or develop secondary to pulmonary tuberculosis. It carries significant morbidity and mortality (2,3). The tubercle bacilli may reach the gastrointestinal tract via direct contact through the ingested food, swallowing infected sputum, haematogenous route, or may spread from infected adjacent lymph nodes and viscera such as fallopian tubes (4). Abdominal TB is predominantly a disease in young adults. Two thirds of the patients are of 21-40 years old and the sex incidence is equal (5).

Gastrointestinal tuberculosis often involves the ileo-caecal region. The ileal and ileo-caecal regions are the most common sites affected. Associated colonic involvement is frequent and isolated colonic involvement is not uncommon. Abdominal tuberculosis may present clinically as an acute abdomen, either due to bowel obstruction, perforation or mass in right lower abdomen mimicing acute appendicitis or appendicular mass. Most of the patients present with chronic abdominal pain recurrent sub-acute obstruction and low-grade fever with or without weight loss (4).

Surgical management of intestinal tuberculosis has changed considerably from bypass operation and hemi colectomy to conservative resections and stricturoplasty. Surgery in case of abdominal tuberculosis is required to overcome the deleterious effects of the disease like tissue disorganization, obstruction and perforation. The study is intended to know the various modes of presentation; different modalities of treatment and prognosis in our hospital.

II. Aims and Objectives

1. To study the various clinical profiles of gastrointestinal tuberculosis in patients undergoing laparotomy.
2. To study the surgical pathology of gastrointestinal tuberculosis.
3. To study the various surgical treatment modalities based upon the intraoperative findings and its outcome.

III. Material and Methods

The prospective observational study of sample size 31 patients was conducted in the Department of Surgery, Government Medical College, Amritsar, Punjab, over a period of 12 months. Subjects were recruited from patients who presented in Surgical OPD and in Emergency Department of GMC&H Amritsar, after obtaining written informed consent. All the histopathologically confirmed patients of gastro intestinal tuberculosis admitted to wards in the Department of General Surgery were subjected to detailed history, thorough clinical examination, investigations and surgical outcomes.

Inclusion Criteria:

- Gastro Intestinal Tuberculosis patients undergoing Laparotomy (Elective and Emergency) where the operative diagnosis has been confirmed by histopathological examination.

Exclusion Criteria

- Abdominal Tuberculosis other than gastrointestinal tract.
- Pure Peritoneal Tuberculosis (Confirmed either by laparotomy or diagnostic laparoscopy and is histopathologically positive).
- Diagnosis confirmed histopathologically or by Fine needle aspiration cytology but managed medically.

All the patients were classified on the basis of sex, age, mode of presentation, physical signs, subtype of abdominal tuberculosis involvement, region involved, surgical procedures performed and their outcomes. Interpretation of results was made on the basis of Simple Descriptive Analysis.

IV. Results

This study was done to study the clinic-pathological profile of gastrointestinal tuberculosis undergoing laparotomy.All the patients admitted in the hospital with a confirmed diagnosis of gastro intestinal tuberculosis in the histopathological report were included in the study and were studied from the date of their admission to surgical wards and their course of stay in hospital and discharge with antitubercular treatment and follow up, after obtaining a written informed consent.

Table 1. Age wise distribution (n=31)

Age group	No. of Patients	Percentage
15 – 25	12	38.70%
26 – 35	9	29.03%
36 – 45	5	16.12%
46 – 55	4	12.90%
56 -65	1	3.22%
Total	31	

Incidence of gastro intestinal tuberculosis was seen highest in age group 15 to 25 years (38.70%), followed closely by age group 26 to 35 years in which 9 (29.03%) patients were present (Table 1) .

Table 2. Sex wise distribution (n=31)

Sex	No. of Patients	Percentage
Male	17	54.83%
Female	14	45.16%
	31	100%

According to sex of patients, male predominance was present (Table 2).

Table 3. Type of Surgery (n=31)

	No. of Patients	Percentage
Elective	20	64.51%
Emergency	11	35.48%

Out of the total 31 patients operated, 20 (64.51%) were elective cases and 11 cases (35.48%) were emergency. Amongst 11 emergency patients, 9 were cases of perforation peritonitis; one was a case of acute intestinal obstruction and one case of appendicitis (Table 3).

Table 4. Clinical presentation (n=31)

Clinical presentation	No. of Patients	Percentage
Abdominal pain	31	100%
Vomiting/Nausea	18	58.06%
Abdominal distension	6	19.35%
Constipation	4	12.90%
Bleeding per rectum	1	3.22%

Of the 31 patients, all the patients had abdominal pain, 18 patients had features of vomiting and nausea, 6 patients had abdominal distension, 4 patients had constipation and one patient had bleeding per rectum (Table 4).

Table 5. Area of Involvement

Area of Involvement	No. of Patients	Percentage
Ileo-caecum	16	51.6%
Ileum	16	51.6%
Colon	5	16.12%
Appendix	1	3.2%
Jejunum	1	3.2%
Anorectum	0	0
Duodenum	0	0
Stomach	0	0

Most common area of involvement was seen equally in ileo-caecal region and ileal alone region, which was equivalent to 16 (51.6%) in each (Table 5).

Table 6. Clinical modes of presentation (n=31)

Mode of presentation	No. of Patients	Percentage
Intestinal Obstruction	20	64.51%
Perforation Peritonitis	9	29.03%
Bleeding Per Rectum	1	3.22%
Appendicitis	1	3.22%

Out of 31 patients, 20 patients (64.51%) presented with features of intestinal obstruction, 9 patients (29.03%) presented with perforation peritonitis and one patient each presented with bleeding per rectum and clinically as appendicitis (Table 6).

Table 7. Pathology of Intestinal Obstruction (n=20)

Causes	No. of Patients	Percentage
Ileo-Caecal mass	12	60%
Ileal Stricture	3	15%
Distal ileal segment thickening	'1	5%
Ileo-caecal Stricture	1	5%
Ileal Stricture with Colo-duodenal fistula	1	5%
Stricture at Hepatic Flexure of colon	1	5%
Hepatic flexure mass	1	5%
Total	20	

In the intestinal obstruction group, 12 had ileo-caecal mass (60%), 3 patients (15%) and one each of distal ileal segment thickening, ileo-caecal stricture, ileal stricture with colo- duodenal fistula, stricture at hepatic flexure of colon and hepatic flexure mass (Table 7).

Table 8. Pathology of Perforation Peritonitis (n=9)

Causes	No. of Patients	Percentage
Ileal Perforation	4	44.44%
Ileal perforation with distal stricture	2	22.22%
Gangrenous ileal segment	'1	11.11%
Ileal Perforation with distal ileo-caecal mass	1	11.11%
Mid-jejunal perforation	1	11.11%

Out of 9 patients, 4 patients (44.44) had ileal perforation alone followed by 2 patients (22.22%) who presented with ileal perforation with distal ileal stricture (Table 8).

One patient presented with abdominal pain, vomiting with bleeding per rectum and clinically was a case of acute intestinal obstruction and intraoperatively patient had a terminal ileal ulcer. Another patient presented with complaints of pain abdomen associated with vomiting and intraoperative it was found to be due to appendicitis. Tuberculosis of appendix is a very rare feature and the most common presentation is acute appendicitis and similarly it was found in our case.

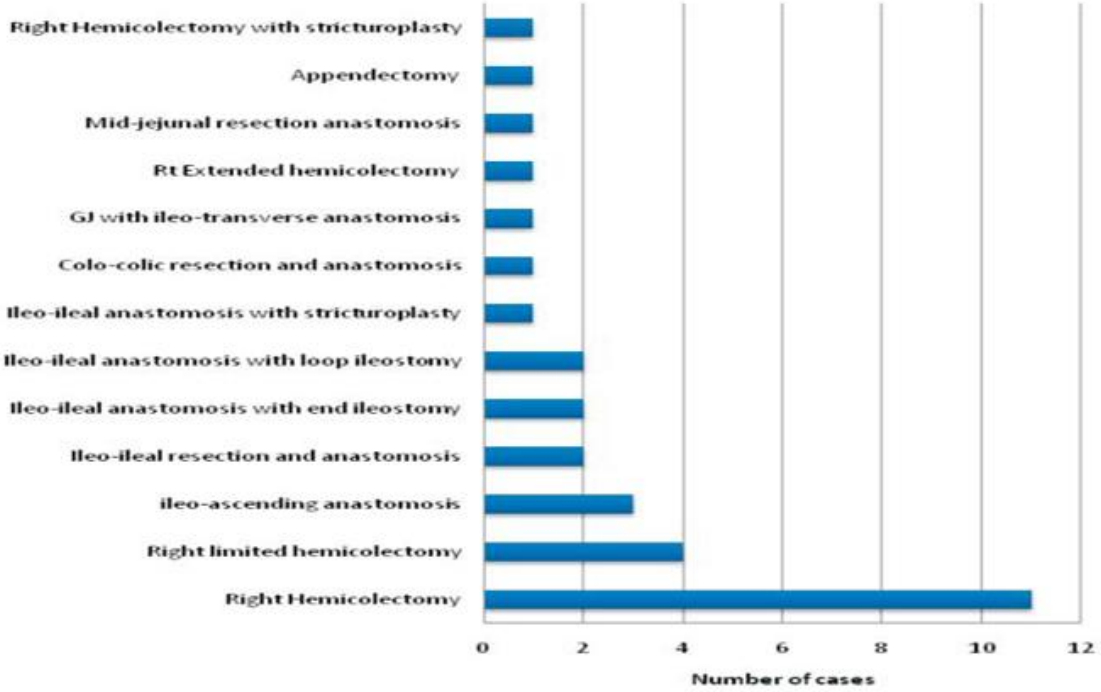

Figure 1

On comparing the procedures, right hemicolectomy was the most common procedure performed in 11 cases (35.48%), followed by limited right hemicolectomy in 4 cases (12.90%). In case of appendicitis, appendectomy was done which later came out to be tuberculosis of appendix (Fig. 1) .

Table 9. Additional Procedures performed (n=6)

Procedure	No. of Patients	Percentage
Loop ileostomy	4	66.66%
End ileostomy	2	33.33%

In total 6 additional procedures were done along with definitive surgery, out of which 4 (66.67%) were loop ileostomy and 2 (33.33%) were end ileostomy (Table 9).

There were 5 morbidities in total out of 31 cases, with one case each of wound dehiscence, enterocutaneous fistula with drug-induced hepatitis, intestinal obstruction, SSI and parastomal hernia with prolapse of stoma.

There were a total of 5 patients (16.12%) who had a previous history of tuberculosis and one patient was on anti tubercular treatment when he was diagnosed with gastro intestinal tuberculosis, one patient each was HIV positive and HCV positive. Amongst 31 patients, 5 patients had history of pulmonary tuberculosis, while the rest of them did not have any such history and the primary focus was found to be gastrointestinal tract.

Of the 5 patients, two patients were on anti-tubercular treatment for pulmonary tuberculosis when they developed symptoms of GI tuberculosis.

V. Discussion

The exact incidence and prevalence of abdominal tuberculosis is difficult to establish, as we have no national registry for the disease. In our study there were 12 patients whose age was between 15-25 years (38.70%) followed closely by age group of 26-35 years (29.03%), which had 9 patients. Out of the 31 patients, 17 (54.83%) were males and 14 (46.16%) were females. In a study done in 2005 at Liaquat University Hospital, they concluded that out of total 112 cases of intestinal tuberculosis, 64 (57.20%) were male and 48 (42.80%) females.

Age ranged from 8 to 55 years with majority in 2nd and 3rd decades (6). Similar results were seen in study by AR Miah, out of the 53 patients, 33 were males and 20 females with age ranging 16-70 (Mean 30.01 ±11.7) years (7). The clinical presentation in our study was dominated by abdominal pain seen in 100% of the patients, followed by nausea and vomiting in 18 patients (58.06%) and the other presenting features were abdominal distension, constipation and bleeding per rectum. Anand in his study observed pain in all of the patients in the series while Abro et al., and Chalya et al., (93.8%) described it to be the main symptom of intestinal TB. Chalya et al., found distention in 36.7% of the cases. Abro et al. in his study of 60 patients found that majority of patients (46, 76.7%) had abdominal pain, 26 (43.3%) had vomiting; abdominal distension was seen in 22 (36.7%) cases, diarrhoea and constipation in 16 patients (26.7%) and abdominal mass in 14 patients (23.3%). (8,9,10).

In our study, out of 31 patients, most common mode of presentation was intestinal obstruction seen in 20 (64.51%) patients, followed by 9 (29.03%) patients who presented with perforation peritonitis and one patient presented with bleeding per rectum and one patient with acute appendicitis. In a recent study by Lal et al. in 2014, 32 out of 50 patients presented with obstruction and 6 patients presented with perforation peritonitis with rest as varied features (11). Tandon et al studied 186 patients over 5 years and observed an increase in patients with more protracted course and sub acute intestinal obstruction in recent years (12).

Bleeding per rectum in small amounts is common in intestinal tuberculosis especially of the ulcerative type, but massive bleeding is rare. Vimla et al reported that only 2 of 300 patients with abdominal tuberculosis seen over a 16-year period had massive lower gastrointestinal bleeding caused by ulcerated lesions in the ileo-caecal region and both these patients had previous recurrent attacks of melena (13).

Most common area of involvement was seen equally in ileo-caecal region and ileal alone region, which was equivalent to 16 (51.6%) patients, followed by 16.12% cases had involvement of the colon and one case each of jejunum and appendix. In another series of 300 patients, the ileocaecal region was involved in 162 and the ileum in only 89 patients (14). However, in study by Bhansali over 196 patients with gastrointestinal tuberculosis, the ileum was involved in 102 and caecum in 100 patients (15). Chalya et al in his study concluded that Ileo-caecal region was the most common bowel involved in 122 (57.5%) patients, followed by ileum and jejunum in 72 (34.0%) and 12 (5.7%) patients respectively.

The colon was involved in 6 (2.8%) patients (8).A study published in Bombay Hospital Journal, in 84.6% lesions were in distal ileum and ileo-caecal region and colonic and jejunal involvement was seen in 7.7% each and in our study colonic involvement was in 6.4% cases and jejunal in 3.2% cases (16). The appendix is rarely involved and Singh et al reported 17 cases seen over a 10-year period (17). Tuberculosis of the appendix may present as acute appendicitis and this was the same in our case in which a young male patient of 20 years presented with typical features of appendicitis.

Small gut perforation with tubercles was seen in total of 6 (19.35%) patients in which one case had gangrenous ileal segment and one was a case of mid-jejunal perforation. Ileal perforation with a distal stricture was seen in 2 (6.4%) patients and perforation with distal ileo-caecal mass was seen in one case. Contrary to our findings, in a study done by Arunima Mukhopadhyay over 64 patients, the most common pathology was single/multiple strictures in the small gut seen in 23.4% cases and then ileo-caecal mass was seen in 21.9% cases. Small gut perforation was seen in 7.8% cases and in our study it was seen in 19.35% cases. Also small bowel perforation with distal stricture was seen in 14.1% cases and in our study it was found only in 6.4% cases (17).

On comparing the different procedures, right hemi- colectomy including the limited right hemicolectomy was the most common procedure performed in 16 cases (51.61%) and one case had associated stricturoplasty, and similar results were seen in a study by Ramish Kumar in Karachi in which it accounted for 34% cases. Resection anastomosis of the small bowel and large bowel was done in 13 cases (41.9%), which also included additional procedures like loop ileostomy done for diversion in 2 cases, stricturoplasty done in two with one case of gastro-jejunostomy also done while the study by Ramish had resection anastomosis done in 24% cases (18).

The results in study by M. Rajput had resection anastomosis done in 58.92%, right hemicolectomy was done in 19.64% cases and right limited hemicolectomy done in 10.71% cases. In intestinal tuberculosis involving small intestine in the form of single stricture, stricturoplasty is an option, however, when multiple strictures or perforation is present resection and end- to-end anastomosis is required. Also ileostomy was done in 1.78% cases but in our study it was 19.35%, which is significantly higher (19).

We have noticed in many studies of the trends towards a more conservative surgery. This is because of the shift in the morphology of the intestinal tuberculosis as less and less cases of ileo-caecal are coming into evidence. Since the disease has so many various presentations on laparotomy, it is difficult to suggest a single procedure, which could encompass all stages and presentations of the disease. Given the diverse morphology of the disease, no surgical procedures can be regarded as standard. The choice of surgical procedure, therefore, may vary depending on the site and the extent of disease, nutritional and general condition of the patient, expertise available, local protocols and surgeon's preference. In our study, the selection of the procedures was more radical than being extremely conservative, in view of the advent of effective anti-tubercular drugs so as to eradicate the disease completely.

Enterocutaneous fistula develops after bowel surgery, in patients with active disease or because of caseous tuberculous abscess formation on the serosal surface of intestine. The occurrence of stricture formation, perforation, bleeding or fistula formation results into frequent clinical presentation as intestinal obstruction or perforation peritonitis. Despite recent advances in surgery and the availability of specific anti-tuberculous chemotherapy, the morbidity of intestinal tuberculosis is high due to delay in diagnosis and under dosage or irregular anti-tuberculous treatment.

In hospital mortality in our series was 3.2%. The mortality reported by Baloch NA et al, Rajput MJ et al, Malik KA et al was 2.3%, 3.57% and 10% respectively (19,20,21).

Our study found concomitant pulmonary tuberculosis in approximately 16.12% of patients. Arif AU et al and Rajput MJ et al have observed pre-existing pulmonary tuberculosis in 20% and 33.95% of their patients respectively. Sircar S et al from India have also reported concomitant pulmonary tuberculosis in significant number of patients with abdominal tuberculosis (19,22,23). Homan et al observed that a normal chest X-ray excludes a diagnosis of abdominal tuberculosis but chest X-ray is positive in only 25% of patients (24). While findings of tuberculosis (active or healed) on chest X-ray support the diagnosis of abdominal tuberculosis, a normal chest X-ray does not rule it out. In Prakash's series of 300 patients, no patient had active pulmonary tuberculosis but 39% had evidence of healed tuberculosis on X-ray (14).

VI. Conclusion

Inspite of specific antituberculous drugs and vast measures against the disease, including chemoprophylaxis and pasteurization abdominal tuberculosis remains a fairly common disease even today. Commonly presentation is by non-specific symptoms, laboratory and radiography findings that make it difficult to diagnose and only histopathological diagnosis is the most sensitive. Young adults between 20-40 years are the most commonly affected. The ileum and ileo-caecal junction is the most commonly involved and Rt hemicolectomy is the surgery of choice. 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 diseased segment and primary anastomosis is safe and has largely been adopted in place of simple bypass of obstructive lesion. Resection and anastomosis in form of right hemi colectomy or limited resection for ileo-caecal lesions has been largely adopted in place of simple bypass of obstructive lesions with proven good results and also for the histopathological confirmation. Prompt surgical exploration, vigilant postoperative care and administration of ATT helped to treat the patients successfully with their complete cure and rehabilitation.

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