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Original Research Article

Spectrum of clinical presentation of abdominal tuberculosis and its surgical management

Samir Shukla, Krishna Kumar*

Department of Surgery, Gandhi Medical College, Bhopal, Madhya Pradesh, India

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***Correspondence:**
Dr. Krishna Kumar,
E-mail: krishna4285kundu@gmail.com

ABSTRACT

Background: Objective was to study the incidence, spectrum of clinical features, management-conservative or surgical and its outcome in patients of abdominal tuberculosis.
Methods: It is retrospective study including 262 patients were part of this study conducted from January 2013 to December 2017 with a diagnosis of abdominal tuberculosis carried out in Gandhi medical college associated Hamidia Hospital, Bhopal, Madhya Pradesh, India.
Results: The patients were mostly females and from age group 21-40 years. The most common clinical symptom was abdominal pain and the sign was tenderness, least common was lump in abdomen. Most patients were treated by operative procedure in comparison to conservative management. Most common intraoperative finding was ileal stricture while the least one being splenic abscess and the commonest procedure done was laparotomy with resection and anastomosis and the least was splenectomy. Most patients come in emergence rather than electively. The mortality was about 3.8% i.e. 10 patients.
Conclusions: In conclusion despite of so much advances in medicine incidence of abdominal tuberculosis seems to be increasing which is evident with current reports. The delay in treatment leads to increase morbidity and mortality because of difficulty in diagnosing the disease due to its varied clinical presentation mimicking other abdominal condition. A high index of suspicion should always be kept in mind for the early diagnosis of this completely treatable disorder.

Keywords: Abdominal tuberculosis, Exploratory laparotomy, Intestinal obstruction

INTRODUCTION

Tuberculosis (TB) is a common and major health problem, especially in developing countries where ignorance, poverty, overcrowding, poor sanitation and malnutrition are prevalent.[1] It has been declared as a global emergency by the World Health Organization (WHO) and is one of the most important communicable disease worldwide.[2,3]

Approximately one third of the world population is infected with tuberculosis and about three millions die each year from this disease.[1-3] Despite increased health standards in developed countries, the incidence of tuberculosis which was previously reported to be low in these countries, is again on the rise due to the influx of immigrants from third world countries, increasing incidence of human immunodeficiency virus (HIV) infection, an ageing population, alcoholism, increased use of immunosuppressive drugs, and the emergence of multi-resistant strains of *Mycobacterium tuberculosis*.[4]

Most cases of TB are caused by *M. Tuberculosis* and the reservoir of infection is humans with active TB. Most cases of TB are pulmonary and acquired by person to person transmission of air-borne droplets of organisms.

Abdominal TB may be contracted by drinking dairy milk contaminated with *M. bovis*.

Tuberculosis can affect any part of the body and abdomen is the next common site after lungs affected by the disease.[5] In the abdomen, tuberculosis may affect the gastro-intestinal tract, peritoneum, lymph nodes, and solid viscera. Approximately 1-3% of total TB cases are extra pulmonary.[6,7] Of these abdominal tuberculosis (ATB) accounts for 11%-16%.[8] In HIV positive patients the incidence of extra pulmonary TB is up to 50%.

The modes of infection of abdominal tuberculosis include hematogenous spread from a primary lung focus that reactivates later or miliary tuberculosis, spread via lymphatics from infected nodes, ingestion of bacilli either from the sputum or from infected sources such as milk products, or by direct spread from adjacent organs.[9]

Whereas intestinal (enteric) tuberculosis exists in one of the three main forms i.e. ulcerative, hypertrophic or ulcerohypertrophic, and fibrous stricturing form, peritoneal involvement (TB peritonitis) exists in four main forms namely ascitic, loculated (encysted), plastic (fibrous) and purulent forms.[1,10-11] The lymph nodes in the small bowel mesentery and the retroperitoneum are commonly involved, and these may caseate and calcify.[11] Disseminated abdominal tuberculosis involving the gastrointestinal tract, peritoneum, lymph nodes and solid viscera has also been described.[9-11]

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

The management of abdominal TB poses diagnostic and therapeutic challenges to general surgeons practicing in resource-limited countries. Late presentation of the disease coupled with ignorance, poverty, overcrowding, poor education, malnutrition and lack of modern diagnostic and therapeutic facilities are among the hallmarks of the disease in these countries. Despite advances in medical imaging, the early diagnosis of abdominal tuberculosis is still a problem and patients usually present when complications had occurred.

Abdominal tuberculosis is characterized by different modes of presentation, viz, chronic, acute and acute-on-chronic, or it may be an incidental finding at laparotomy for other diseases.[12]

The clinical presentation depends upon the site and type of involvement. It usually runs an indolent course and presents late with complications especially acute or sub-acute intestinal obstruction due to mass (tuberculoma) or stricture formation in small gut and ileocaecal region or gut perforation leading to peritonitis.[13]

The management of abdominal TB poses diagnostic and therapeutic challenges to general surgeons practicing in resource-limited countries. Late presentation of the disease coupled with ignorance, poverty, overcrowding, poor education, malnutrition and lack of modern diagnostic and therapeutic facilities are among the hallmarks of the disease in these countries. Despite advances in medical imaging, the early diagnosis of abdominal tuberculosis is still a problem and patients usually present when complications had occurred.

Some patients will require immediate surgical intervention, whereas other will improve with conservative treatment. Mortality rate has come down to 3% from 20-50% after introduction of anti-tubercular chemotherapy and MDT. Surgical management of abdominal tuberculosis (intestinal tuberculosis) has changed considerably from bypass operations, hemicolectomy to conservative resection and stricturoplasty. The aim of surgery in case of intestinal tuberculosis is to overcome deleterious effect of the disease like tissue disorganization, obstruction and perforation. It is essential that all chronic infectious processes be considered as possible tuberculosis, and appropriate cultures and biopsy should be performed.

The systemic tuberculosis bacteria may involve any organ in the body. It is very difficult to make or confirm the diagnosis without investigation. The various ways of presentation with pulmonary tuberculosis lead to difficulty in management in absence of any single form of lesion and specific treatment. India has one of the highest incidence of tuberculosis, still we don't have accurate database.

METHODS

This retrospective study was conducted in a department of general surgery, Gandhi medical college associated Hamidia Hospital, Bhopal, Madhya Pradesh, India over period of duration of 5 years from January 2013 to December 2017 to include total of 262 patients.

Inclusion criteria

The patients included in the study were all cases admitted to hospital with acute /subacute/chronic intestinal obstruction with old history and risk factors for tuberculosis and compared to the study.

- Incidence of abdominal tuberculosis in reference to acute and chronic abdomen
- Various mode of presentation of acute and chronic cases.
- Degree of involvement of abdominal organ by Mycobacterium Tubercular bacteria

- Outcome on basis of treatment by operative procedure and Medical treatment.

Exclusion criteria

- The patients of pathology other than abdominal tuberculosis like inflammatory bowel diseases, other bacterial enteritis, pseudo-obstruction or malignancy.
- Patients those who are treated on OPD basis.
- Infants with intestinal obstruction due to congenital causes.
- Patients who refused admission.

The details of patients who presented from January 2013 to December 2017 were retrieved retrospectively from medical record department and operation theater records.

Case history and detailed clinical examination of patients were evaluated. Investigations viz. blood CBC, RBS, serum urea, creatinine, BT, CT, Electrolytes, HbsAg, HIV, urinalysis, ECG, X-ray chest P.A. view and X-ray flat plate abdomen in erect posture were carried out.

After admission in surgical ward or in surgical intensive care unit as per patient's general condition, all the patients were resuscitated by continuous nasogastric suction, intravenous fluids, intravenous broad-spectrum antibiotics and proton pump inhibitors. Adequate hydration achieved with urine output

After adequate resuscitation, laparotomy under endotracheal general anaesthesia was performed through midline incision.

Then cases of acute and chronic abdominal diseases were treated by appropriate surgical intervention and supplementation of respective drug regimen, to reduce the complication that may occur from acute to chronic stage of the disease.

Statistical analysis

All results were subjected to statistical analysis. Demographic and clinical data from the two groups were compared and intergroup differences among the parameters were recorded and were analyzed by paired t-tests, the Student t-test and chi-squared tests.

Student's t-test was used for intergroup analyses and the chi-square test was used to analyze the level of significance or differences in the incidence of complications. P value of less than 0.05 was considered statistically significant and p value of less than 0.001 was considered highly significant.

RESULTS

In this study out of 262 patients, 31.67% were males and 68.32% were females. The study revealed that, incidence was more in female sex (Figure 1).

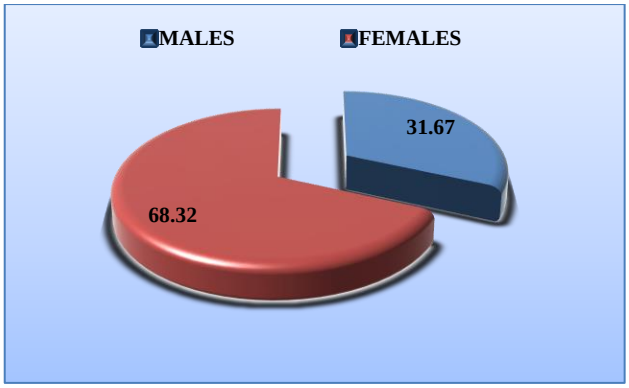

Figure 1: Sex distribution of tuberculosis indicating higher prevalence in females.

Table 1: Age wise distribution (N=262).

Age group (years)	No. of patients	Percentage
13-20	62	23.67
21-40	110	41.99
41-60	50	19.08
>60	40	15.26

Patients of abdominal tuberculosis where mainly from age group 21 year to 40year (41.99%). From 13year to 20 year comprises of 23.67% patients and from 41 years to 60 year comprises of 19.08%. Patients above 60 years of age comprises of 15.26%.

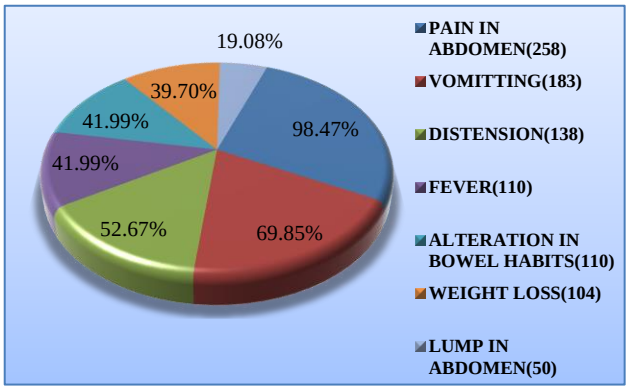

Figure 2: Chief complain as pain in abdomen in patients of tuberculosis.

The predominant symptom in our study was abdominal pain (98.47%) presents in 258 out of 262 patients followed by vomiting (69.25%) and distention (52.67%) and least common lump in abdomen present in 50 (21.92%) patients. Weight loss and alternation of bowel habits were also chief complaints along with fever.

Most common intraoperative finding was ileal stricture present in 48.24% of patients followed by ileocaecal mass in 21.92% patients while splenic abscess was least common presents in only one patients only. Adhesions and perforations were also present in 20 and 34 patients respectively in which 26 were stercoral perforations.

Table 2: Distribution of patients by intraoperative finding.

Finding	No.	Percentage
Ileal strictures	110	48.24
Ileocecal mass	50	21.92
Stercoral perforations	26	11.4
Adhesions	20	8.77
Plastered abdomen	18	7.89
Bands	11	4.82
Primary perforations	8	3.50
Colonic strictures	6	2.63
Jejunal stricture	4	1.75
Splenic abscess	1	0.43

Table 3: Groups of patients according to management.

Outcome	Number	Percentage
Operated	228	87.02
Conservative	34	12.97

In most of the patients have been treated operatively i.e. 228 patients out of 262 had taken operations finally while 34 were managed by conservative and most common operation done was resection and anastomosis done in 83(36.7%) patients and least was splenectomy done in only one patient.

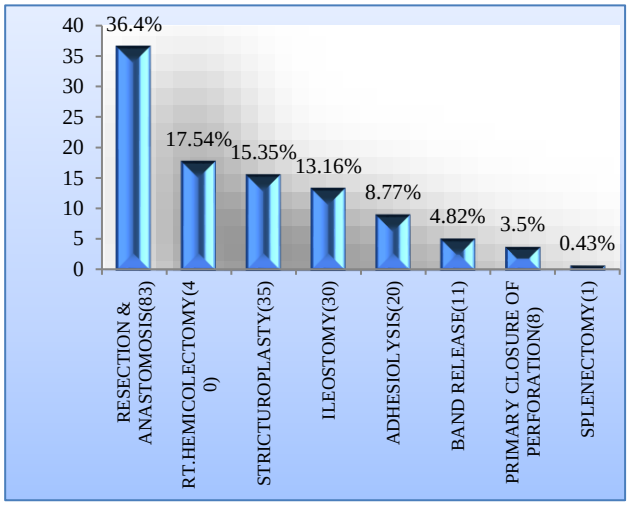

Figure 3: The commonest outcome according to surgery is resection and anastomosis.

Resection of the involved segment with re anastomosis of the viable bowel is now the surgical procedure of choice. With the availability of ATT, resection is a safer procedure. It has also brought down the overall mortality rate while the lowest procedure performed were splenectomy.

In this study it has been shown that mortality rate was in patients of abdominal tuberculosis was 3.81% i.e. 10 patients out of 262 died during treatment (Table 4).

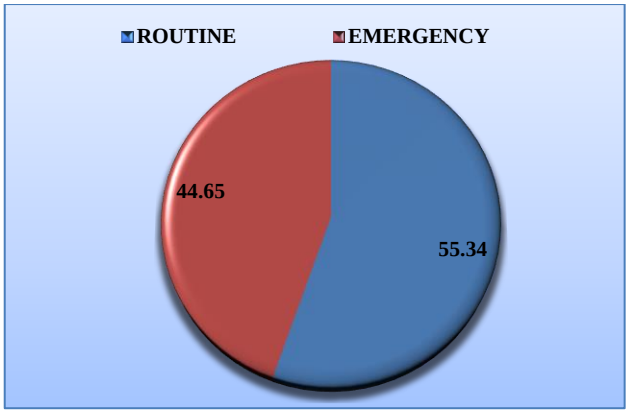

Figure 4: Distribution of operated patients by time of presentation showing major cases comes in emergency.

Table 4: Percentage of mortality in postoperative patients.

Total deaths	Percentage
10	3.81%

DISCUSSION

Between 1980-2005, 90 million TB patients were registered in national surveillance systems and reported to WHO globally. The global TB incidence rate peaked sometime between 2000-2005, although the total number of new cases is still raising each year. One-half of the world population is infected with *M. tuberculosis*, and it is the leading cause of infectious death, with approximately 1.6 million deaths annually.

Abdominal tuberculosis is one of the most prevalent forms of extra-pulmonary tuberculosis. The gastrointestinal (GI) tract, peritoneum, lymphatic system, and solid viscera are subject to differing degrees of tuberculosis involvement, which can occur alone or in combination. Tuberculosis has a wide spectrum of illness and can affect any system in the body. Tuberculosis of GI tract accounts for 50% of all gastrointestinal cases. The commonest site is distal ileum and caecum. Abdominal tuberculosis is an important but probably underestimated clinical problem. The diagnosis of abdominal tuberculosis is often delayed, increasing the morbidity associated with this treatable condition.

In the present study "spectrum of clinical presentation of abdominal tuberculosis and its surgical management", retrospective data of 262 patients was collected and observations were analyzed under various parameters. The objectives of the study were to reduce the mortality and morbidity in cases of acute and chronic abdominal diseases by appropriate surgical intervention and supplementation of respective drug regimen, to reduce the complication that may occur from acute to chronic stage of the disease, by diagnosing the problem at early stages and to reduce the number of cases of chronic

abdominal diseases by early detection and correct use of anti-microbacterial therapy, hence reducing the multi-drug resistance (MDR).

Patients were segregated as per sex, age group including from 13 years to age of >60, various presenting complaints, intraoperative findings, surgical management and patients taking antitubercular therapy.

Observations of the present study were compared to previous studies and results shows that in our study majority affected patients were less than 40 years of age (65.6 %) (p <0.001 which was statistically significant). Our data is consistent with other studies like by Wig JD et al and Ramesh C, Bharti et al in which most of the patients were less than 40 years of age with 65.76% and 59.9% respectively.[14,15]

In this study majority patients were females comprising 68.32% while males were 31.67%, so incidence was almost twice in females than that in males (2.1:1) (p value being <0.001 this incidence is statistically significant). According to Wig JD et al females comprised of 67.12% which is app twice higher than males (32.87%). Study by Das P and Shukla HS et al also showed higher incidence in females as they comprised 72% of the total patients.[14,16]

Intestinal tuberculosis has variable clinical presentation and diagnosis can be highly uncertain on the basis of clinical presentation. In the present study, most common presenting symptom was colicky pain in abdomen. Other presenting symptoms being vomiting, abdominal distension, alteration in bowel habits, weight loss, fever and abdominal mass. Data of the present study mostly coincides with previous studies by Das P, Shukla HS et al and Bhansali SK et al which also states most common symptom as pain in abdomen followed by vomiting, bowel disturbances, fever, abdominal distension, weight loss and lump in abdomen.[16,17]

In the present study author found that most common type of affection was found to be ileal strictures including the ileocecal region. This is supported by previous study by Mukherjee and Singhal et al which states multiple ileal strictures as more than 50%.[18] Hyperplastic affection of the ileocecal region was found to be 21.92% in this study while previous study by Wig JD et al states it to be 8.2%.[14] Thus through our study we find that the most common site of affection of intestinal tuberculosis is the ileocecal region. The striking prediction for this region is thought to be due to the abundance of lymphoid tissue (Peyer's patches). Increased physiological stasis, increased rate of fluid and electrolyte absorption and minimal digestive activity permitting greater contact time between the organism and the mucosal surface in the ileocaecal area render this region more vulnerable to the development of intestinal tuberculosis. The vulnerability of ileocaecal region has also been attributed directly to Peyer's patches and the associated M-cells.

Wig JD et al in their study state most common type of lesion as ileal perforations as much as 46.57% while present study finds incidence of primary perforation to be 3.05%.[14] In another largest series of study by Mukerjee and Singhal et al, overall incidence of free intestinal perforation in patients with abdominal tuberculosis is close to that of 2% recorded which is close to incidence in the present study.[18]

Present study also finds an uncommon presentation of tuberculosis as a single case of splenic tuberculosis presenting as splenomegaly and splenic abscess in an immunocompetent individual. Tubercular affection of the spleen is generally rare in immunocompetent patients. It presents as multiple splenic abscess in immunocompromised patients.

Type of surgical management

In this study most, common surgical procedure done was found to be resection of the involved segment and end to end anastomosis for various affections viz strictures, and perforations to be 36.40%. Primary repair of bowel perforations is not done routinely due to increased risk of leak and fistula formation. Prior study by Mukherjee and Singhal et al also supports most common management to be segmental resection and end to end anastomosis.[18] So resection and anastomosis of the involved segment was most commonly carried out procedure (40%).

Right hemicolectomy with ileocolic anastomosis was done in 17.58 % of patients. Ileostomy was made in 13.16 % of patients.Patients of plastered abdomen were started ATT postoperatively.20 patients had ascitis who were managed conservatively.

Mortality

Intestinal tuberculosis is an important clinical entity and is found worldwide, although prevalence rates are still highest in developing countries.[19] In this series, the mortality rate was 3.8%. Out of 10, 6 patients died due to septicaemia secondary to enterocutaneous fistula, and 4 patients succumbed to pulmonary complications. The mortality rate of this study is well consistent with other studies. In a similar study conducted by Marshal JB et al, a mortality rate of 1.5 has been reported which too correlates well with our study.[20]

Patients on antitubercular therapy

Pre antitubercular chemotherapy era involved bypassing the stenosed segment by enteroenterostomy or by ileotransverse colostomy as any resection was considered hazardous in active stage of the disease. However, with the introduction of antitubercular drugs, more radical procedures became prevalent in an attempt to eradicate the disease locally. This included right hemicolectomy with or without extensive removal of the draining lymph nodes and wide bowel resections. Repeated surgery in

abdominal tuberculosis is difficult and dangerous as chances of developing fecal fistula and further adhesions are more likely. During therapy, patient who is responding to drug therapy can also progress to intestinal obstruction due to fibrosis during healing stage needing surgical intervention.

Anti-tuberculous drugs are recommended for at-least 6 months. In uncomplicated cases, 4 drugs for 2 months and 2 drugs for 4 months. In complicated cases, 4 drugs for 2 months and 2 drugs for 7 months. But many patients need 1-year treatment. Because of complications and difficulty in managing recurrent cases of abdominal tuberculosis one year therapy is commonly used. Out of total 71 patients found taking antitubercular drugs previously, 63 patients were operated (statistically significant as $p < 0.001$).

Patients on ATT as a response during healing generally develop bowel adhesions, bands and strictures presenting later as acute abdomen demanding surgical intervention. But it cannot primary be assigned to ATT drugs for cause of such surgical conditions, for such are also the affections of tuberculosis primarily without ATT.

However, even with the availability of anti-tuberculous drugs, majority of patients present with complications demanding urgent surgical intervention. Patients started on medical therapy need constant follow up and monitoring by regular check-up of improvement in weight, appetite, reduction in abdominal pain and distention, absence of fever, normal bowel habits. Patients who do not respond to drug therapy on 6 weeks should be reassessed for drug resistance and other diseases mimicking abdominal tuberculosis.

CONCLUSION

As rightly said by Milton Rosenau “In man, the balance between immunity and susceptibility to tuberculosis is delicately adjusted. There is a small factor of safety”, tuberculosis is an entity of varied and vague presentation. Wide spectrum of its presentation makes it difficult to diagnose in early stages and difficulty in management in absence of any single form of lesion and specific treatment.

So, despite of so much advances in medicine incidence of abdominal tuberculosis seems to be increasing which is evident with current reports. The delay in treatment leads to increase morbidity and mortality because of difficulty in diagnosing the disease due to its varied clinical presentation mimicking other abdominal condition. A high index of suspicion should be kept in mind for diagnosing this completely treatable disorder.

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