Research Article

Surgical management of abdominal tuberculosis: a retrospective study from Central India

Kailash Charokar*, Nitin Garg, Ajay Kumar Jain

Department of Surgery, People's College of Medical Sciences & Research Centre, Bhopal, M.P, India

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*Correspondence:

Dr. Kailash Charokar,

E-mail: kcharokar@gmail.com

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ABSTRACT

Background: Abdominal tuberculosis is a diagnostic and therapeutic challenge in resource limited countries. The vague clinical presentation is a barrier to early diagnosis. The study aims to highlight the role of surgery in the diagnosis and treatment of abdominal tuberculosis.

Methods: This is a descriptive study of abdominal tuberculosis cases, which were operated in the Department of Surgery, Peoples College of Medical Sciences & Research Centre, Bhopal from August 2010 to July 2015. Cases were analyzed in terms of demography, clinical features, investigations, operative treatment, and outcome.

Results: 72 cases of abdominal tuberculosis were operated during the study period. The median age was 30 years with male to female ratio of 3:2. Primary abdominal tuberculosis was 79.2%. Intestinal tuberculosis was the commonest with terminal ileum and ileo-caecal region being predominantly involved. 58% of the patients required emergency surgery. Surgical procedures performed were: resection of the diseased segment including right hemicolectomy 32 (44.44%), release of band/adhesions 23 (31.9%), perforation repair 11 (15.3%), stricturoplasty 4(5.5%), etc. In the presence of gross peritonitis, temporary ileostomy was performed. Complication and mortality rates were 33.3% and 2.6% respectively. No patient had post-operative intestinal-leak. The median duration of hospital stay was 14 days.

Conclusions: Early diagnosis is the key factor in avoiding systemic and local complications of intestinal tuberculosis. In emergency cases, prompt surgical exploration and vigilant care is met with good recovery. Resection-anastomosis in the form of right hemi-colectomy or segmental resection has largely been adopted instead of simple bypass of obstructive lesions with good results.

Keywords: Abdominal tuberculosis, Intestinal stricture, Bowel perforation, Resection anastomosis, Ileostomy

INTRODUCTION

Tuberculosis, especially in developing countries is a major health problem, and causes significant morbidity and mortality. These countries have problems of poverty, overcrowding, and poor sanitation. The population is ignorant and malnutrition is prevalent.¹ World Health Organization (WHO) declared it a global emergency and is the most important communicable disease worldwide.^{2,3} In India, tuberculosis is still considered as a

social disease, reflecting the standards of living in a community. According to WHO report in 2013, there were an estimated 8.6 million annual incidence of TB globally, and India has the world's largest tuberculosis cases which are around 26% of the world TB cases, followed by China and South Africa. Lungs are the most common site of infection. However tuberculosis can affect any part of the body.⁴ Approximately one-eighth of total TB cases are extra-pulmonary.^{3,5} Of these abdominal tuberculosis accounts for 11-16%.^{4,6} It is estimated that in

India extra-pulmonary tuberculosis constitutes 15-20 % of all cases of tuberculosis in immune-competent patients,⁶ and in HIV positive patients the incidence is up to 50%.^{1,7}

Abdominal tuberculosis includes affection of gastro-intestinal tract, peritoneum, lymph nodes, and solid viscera. The route of infection could be hematogenous spread from a primary lung focus that reactivates later or miliary tuberculosis, ingestion of bacilli either from the sputum or from infected milk, spread via lymphatic's from infected nodes, or by direct spread from adjacent organs.⁸ Intestinal tuberculosis exists in one of the three main forms i.e. ulcerative, hypertrophic or ulcero-hypertrophic, and fibrous stricture form.^{9,10} The peritoneum involvement exists in four forms:- ascitic, loculated (encysted), plastic (fibrous) and purulent forms.⁹ The mesenteric lymph nodes and the retroperitoneum comprise the nodal abdominal tuberculosis. The lymph nodes may caseate and calcify.¹⁰ In solid viscera like liver and spleen, focal granulomatous lesions are found which are generally multiple. Disseminated abdominal form includes combined involvement of the gastro-intestinal tract, peritoneum, lymph nodes or solid viscera.⁸⁻¹⁰

Clinically it may present in acute, chronic or acute on chronic form and sometimes may even be an incidental laparotomy finding.¹¹ Commonly it runs a chronic course with non-specific symptoms of fever (40-70%), pain (80-95%), diarrhoea (11-20%), constipation, alternating constipation and diarrhoea, weight loss (40-90%), anorexia and malaise.⁴ Acute presentation is secondary to complications like complete or partial intestinal obstruction due to mass formation in ileocaecal region or stricture(s) in small intestine, and bowel perforation causing peritonitis especially terminal ileum.¹² Diagnosis is usually confirmed after the laparotomy or laparoscopy, and histopathology examination. For those cases having been diagnosed with abdominal tuberculosis early in the course of illness and minimal symptoms, treatment is mainly conservative with anti-tuberculosis therapy. Surgical treatment is reserved for complications such as intestinal obstruction and bowel perforation with peritonitis.^{9,13} The aims of surgery are mainly to remove the focus of the disease and treat the mechanical effects which are causing the presenting morbidity.

But even with the advances in medical imaging, early diagnosis is a difficult task, with the clinical features being vague and there being no specific diagnostic test.^{4,9,10} In such situations, surgery plays an important role in the diagnosis and treatment of abdominal form of tuberculosis. Often surgical intervention is the only therapeutic option for the patients presenting with complications of abdominal tuberculosis. The present study intends to describe the demography, clinico-pathological profile, various surgical options and their outcome in the management of abdominal tuberculosis at

a large tertiary care centre in Central India and to compare it with the given data in literature.

METHODS

This is a retrospective, descriptive study conducted at the Department of Surgery, People's College of Medical Sciences & Research Centre, Bhopal. Ethical approval to undertake the study was obtained from the hospital authorities.

All the patients of abdominal tuberculosis who were operated between the periods August 2010 to July 2015 in various surgical units in the department were considered for the study. Out of these only those cases, which either had positive histopathology, or gross operative findings, or both conforming to the diagnosis of tuberculosis, were included in the study.

The hospital records of these patients were searched for demographic profile, clinical presentation, baseline and specific investigations, operative procedure & findings, histopathology, and anti-tubercular therapy administered. Any complications during the course of hospitalization and final surgical outcome were also noted down. For the follow up, the OPD records and re-admission records were perused. The results were tabulated and summarized. MS-Excel was used for the data processing and statistics. The results were analysed and compared with similar studies in the literature.

RESULTS

Socio-demographic profile

This study comprises of 72 patients wherein 44 are males (61%) and 28 are females (39%), with male to female ratio of 3:2 (Figure 1). The age of the patients ranged from 6 to 70 years with a median age of 30 year (IQR = 21.5 to 45). The modal age group is 21-30 year (Table 1). 51 patients (70%) were from the low socio-economic group. The patients were grouped according to the WHO BMI Classification (Table 2 & Figure 2). The BMI was calculated as weight in kilograms divided by the square of height in meters (kg/m^2). The majority of the patients were in the underweight category.

Table 1: Age and sex distribution in the group.

Age group (years)	Male	Female	%
Up to 10	2	0	2.7
11 - 20	10	6	22.2
21 - 30	7	13	27.2
31 - 40	9	5	19.4
41 - 50	9	2	15.2
51 - 60	5	1	8.3
61 - 70	2	1	4.2
	44 (61.11%)	28 (38.88%)	100

68% of the total patients were in underweight category with 78% in the female group and 61% in the male group. Median BMI was 18.29 while modal BMI group was between 17.00 -18.49.

Clinical profile

The duration of sickness prior to hospital admission in our study ranged from 4 days to 2 years (IQR=10 to 180 days) (Figure 3). 50% of the patients had symptoms within 2 weeks duration from the time of admission. The clinical presentation was acute in 55% cases, sub-acute in

10%, and chronic in 35%. A total of 29 patients (40.2%) presented with intestinal obstruction, 18 with perforation peritonitis (25%) and 25 with abdominal masses (34.7%). Co-existing diseases were observed in 11 patients (15.2%):- hypertension in four, diabetes in three, asthma in one and pregnancy in three. Past history of treatment for the pulmonary tuberculosis was present in 15 patients (20.8%), and a family history of tuberculosis was found in 8 patients (11%). The majority i.e. 57 of patients had primary abdominal tuberculosis (79.2%) and the remaining 15 were associated with pulmonary tuberculosis (20.8%). There were no HIV positive cases.

Table 2: Distribution of patients according to the BMI.

Category	BMI range	Subjective assessment	Male	Female	Total	Grand total	Percentage
Underweight	< 16	Severe thinness	4	7	11	49	68%
	16 - 16.99	Moderate thinness	11	7	18		
	17 - 18.49	Mild thinness	12	8	20		
	Total		27 (61%)	22 (78%)	49		
Normal	18.5 - 24.99		15	6	21	23	32%
Pre-obese	25 - 29.99		2	0	2		
Grand Total			44	28	72	72	100%

Laboratory and radiological investigations

The median haemoglobin level and ESR were 9.65 (IQR=9.2 to 10.0 g/dl, range=6.42-12.7 g/dl) and 44 mm/hr (IQR=34 to 58.25 mm/hr) respectively. Serum albumin was less than 2.5g/dl in 51 patients (70.8%), indicating low nutritional state. The median serum albumin level was 2.2g/dl with IQR=2 to 2.6g/dl.

Chest X-ray was done for all cases. Findings suggestive of pulmonary tuberculosis was present in six patients, two patients having apical lesions, one case of bilateral apical tuberculosis, one had miliary mottling and two demonstrated right sided pleural effusion. Plain radiograms of the abdomen revealed multiple dilated small bowel loops with air fluid levels in 34 patients (47.2%). Free air under the right dome of the diaphragm was seen in 16 patients (22.2%). Abdominal sonography was performed in 59 cases (82%), which reports thickening of the small bowel and caecum in 32 patients (44.4%) and mesenteric lymphadenopathy in 11 (15.27%). Enteroclyss (Figure 4) was done in 10 cases (14%) with findings of cicatrized ileo-caecal junction and pulled up caecum seen in 9, and small bowel stricture in 6 cases. CT scan abdomen (Figure 5) was done for 6 cases, which reported cocoon formation in 4, and mesenteric thickening in 4 cases.

Figure 1: Age and sex distribution.

Figure 2: BMI Category.

Site of abdominal tuberculosis

The various types of the abdominal tuberculosis are shown as below (Table 3 and Figure 6).

Table 3: Types of abdominal tuberculosis.

Types of tuberculosis	Number of patients	Percentage
Intestinal	48	67%
Peritoneal	12	17%
Nodal	11	15%
Solid organ	1	1%

Figure 3: The Clinical presentation.

Figure 4: Enteroclyss showing stricture of the ileum.

Figure 5: CT scan with cocoons involving the ileum.

Histopathological examination was suggestive of abdominal tuberculosis in 59 of the patients (82%). In the remaining cases clinical features and operative findings were suggestive of tuberculosis and all of them responded positively to the anti-tubercular therapy (Figure 11).

Operative findings and procedure

Diagnostic laparoscopy and adhesiolysis was done in 6 patients (8.3%). 66 patients (91.7%) had undergone laparotomy with surgical procedures (Figure 7 – 10). 58% of the cases required emergency surgery (Table 4 and Table 5).

Figure 6: Types of abdominal tuberculosis.

Treatment outcome and follow up of the patients

The overall complication rate was 33.3% (n=24). Surgical site infection (SSI) was the most common complication, with occurrence rate of 29.1% (n=21). No patient had anastomotic leak (fistula) following primary intestinal repair. The various complications have been summarized in Table 6.

A total of 70 patients (97%) were discharged having recovered and improved. The overall length of hospital stay ranged from 4 to 45 days with a median of 14 days (IQR=12 to 20 days). Patients who developed complications stayed longer in the hospital. Total two deaths (3%) occurred post-operatively. Of the 70 patients, only 36 (51.42%) were available for the follow up over a variable time period from 3 months to 1 year. Most of them had 1 year follow up.

All the patients were continued on the anti-tubercular therapy from our institutional DOT center under the RNTCP. It comprised of isoniazid, rifampicin, ethambutol, pyrazinamide and streptomycin as per standard Category I or II regime for a period ranging from 6-12 months. Complete course of anti-tubercular therapy rendered cure from the disease. The cases of ileostomy were in regular follow up. All of them had stoma closure done within 8-12 weeks duration after the discharge. Two patients had low output entero-cutaneous

fistula following the stoma closure. Both were managed conservatively and it healed in 3-4 weeks.

DISCUSSION

In the developing countries abdominal tuberculosis is a significant cause of morbidity and mortality. It is one of the major health problems.^{1,2} A total of 72 cases have been analysed in this study. The male to female ratio was 3:2. This is in accordance with work of other authors.^{7,9} However some authors have quoted female dominance in their studies.^{10,11} In the western countries the disease is more common in the males, mainly occurring in the migrated Asian population.¹² In literature, we could not find the reasons for this gender difference. The mean age was found to be 32.6 years, which is consistent with the mean age of 33 years, as found by AD Wells in their study of 30 cases.¹³ The disease is more common at peak of the productive life.¹⁴ Eventually it causes considerable financial losses to the individual and family with the added burden of the cost of treatment it needs.

Figure 7: Concentric tubercular stricture in the ileum.

Figure 8: Perforated tubercular ulcer with distal stricture in the ileum causing purulent peritonitis.

The majority (70%) of the patients were from the low socio-economic class families. This is consistent with other similar studies.¹⁵ Patients coming from the rural areas had low awareness of the disease and accessibility to the surgical health care. 68% population in the study was in the underweight category (WHO BMI Classification). Abdominal tuberculosis significantly affects the nutrition of the patients. Undernourishment was more prevalent in the female group (78%) as compared to the males (61%). In the study of RK

Tandon, biochemical evidence of malabsorption was reported in 75% of patients with intestinal obstruction and in 40% of those without it.¹⁶ The cause of malabsorption in intestinal tuberculosis is postulated to be bacterial overgrowth in a stagnant loop, bile salt de-conjugation, diminished absorptive surface due to ulceration, and involvement of lymphatic and lymph nodes.

Figure 9: Soft tissue membrane (cocoon) producing encapsulating peritonitis in the ileum.

The duration of sickness in the study population before hospital admission ranged from 4 days to 2 years, with mean of 4 months. Generally the symptoms were abdominal pain, low grade fever, weight loss, anorexia, disturbed bowel habits, and abdominal distension. 97.2 % patients presented with pain abdomen in our series, which is comparable to studies of SK Bhansali and A Mohammed reporting pain abdomen as primary symptom in 94% cases and 98% respectively.^{12,17} Low literacy rates, lack of awareness about the disease, personal bias due to low level of acceptance at the time of diagnosis, lack of accessibility to appropriate health care facilities and the vague symptoms of this disease, all account for the delayed presentations. The patients are often diagnosed once complications occur, like intestinal obstruction or intestinal perforation and peritonitis. In our study population poor resources, difficulty in initial diagnosis, and low affectivity of patient transfer mechanism from the peripheral areas, further added to delayed presentation to the hospital. The studies in the literature also support similar findings.^{18,19}

Figure 10: Extensive peritoneal tubercles.

Acute presentation of the disease was the common mode of presentation which essentially brought them for the hospitalization and treatment. The more number of acute presentations in the present series is in accordance with studies in the literature.¹¹ In the study of A Mukhopadhyay, abdominal tuberculosis constituted a significant percentage (10%) of all cases attending the emergency with an acute abdomen.²⁰ The majority of the patients were admitted with intestinal obstruction and peritonitis. They all underwent emergency laparotomy. This further supports the view of delay in diagnosis of abdominal tuberculosis, till the development of complications.

79% of the patients in our study had primary abdominal tuberculosis. Similar is the observation of other studies conducted in developing countries.²¹ 21% of the patients had co-existing pulmonary tuberculosis. This is in agreement with the findings of the authors who have quoted approximately 15-25% of the cases with abdominal tuberculosis have concomitant pulmonary

TB.^{22,23} The presence of co-existing medical conditions in the study group was 15%. There were three cases of pregnancy apart from hypertension, diabetes mellitus, and asthma.

Figure 11: Histopathology of the intestinal tuberculosis: Epithelioid cell granuloma with caseation.

Table 4: Operative Findings in the Study Group (N=72).

Procedure	Operative Findings	Sites	Frequency	Percentage
Diagnostic laparoscopy			6	8.3%
	Ascitic fluid	Peritoneal Cavity	5	
	Adhesions & Bands	Peritoneum	4	
	Tubercles	Peritoneum	2	
Exploratory laparotomy			66	91.7%
	Bowel Perforation		24	33.3%
		Ileum	23	31.9%
		Jejunum	0	0
		Colon	1	1.3%
	Stricture(s)		21	29.1%
		Ileum	19	26.3%
		Jejunum	2	2.7%
	Bands & Adhesions	Peritoneal surfaces	18	25%
	Ileocaecal Mass & Mesenteric Thickening	Terminal ileum & caecum	14	19.4%
	Mesenteric Lymphadenitis		11	15.2%
	Peritoneal adhesions with cocoon formation	Peritoneum	6	8.3%
	Focal Granuloma	Liver and Gallbladder	1	1.3%

The blood investigations revealed haemoglobin values less than 9.6mg/dl in 44% of the patients. This corroborates the findings of other authors.²³ Serum albumin was less than 2.5 g/dl in 70.8% patients, suggestive of low nutritional state. No patient was found positive for HIV, however the reviewed literature mentions the possibility of co-existence in about 10% of cases.²⁴ In the recent years various molecular and

immunological techniques are used as a new approach for the rapid diagnosis of abdominal TB.^{25,26} The use of Polymerase Chain Reaction (PCR), and serum & peritoneal fluid ADA was not done in any of the patients. The cost of the ADA and PCR tests are its main barrier limiting its use, and it's availability is also in limited centres only.

The presumptive diagnosis of abdominal tuberculosis is based on radiological investigations. The Chest X-rays, Ultrasound abdomen, Enteroclysis and CT scan of the abdomen contribute to variable extent in making the diagnosis. Chest X-rays showed evidence of pulmonary tuberculosis in 8.3% of the cases, which is in wide contrast with study of A Manohar and N Machado, who found the positivity rate in 40.8% and 43.2% respectively.^{27,28} The ultrasonography gives useful supportive findings:- terminal ileum & caecal wall thickening, loculated ascites with free-fluid, interloop ascites producing 'sliced bread' sign, and mesenteric lymphadenopathy.²⁹ In the present study abdominal sonography was done in 82% cases which revealed almost similar findings. Enteroclysis is a useful investigation. It was done for the 14% of the cases. Findings of the enteroclysis were: increased small bowel

transit time, multiple strictures with segmental dilatation of the bowel loops, and matting of the bowel loops. CT scan gives a better imaging of the intestines and other structures. Early cases show symmetric circumferential thickening of caecum and terminal ileum. In more advanced disease gross wall thickening, adherent loops, large regional nodes and mesenteric thickening can together form a soft tissue mass centred around the ileo-caecal junction.²⁸ CT scan can also pick up ulceration or nodularity within the terminal ileum, along with narrowing and proximal dilatation. In the colon, involvement around the hepatic flexure is common. Complications of perforation, abscess, and obstruction are also seen. However, its cost is its main limiting factor. In the present review only 8.3% of patients had undergone CT scan abdomen due to the high cost. This is comparable to similar studies in the literature.^{30,31}

Table 5: Operative procedure performed (N=72).

Procedure	Frequency	%
Release of Bands and Adhesiolysis	22	30.5%
Right Hemicolectomy with Primary Anastomosis	14	19.4%
Bowel Perforation Repair	12	16.6%
Segmental Bowel Resection with Primary Anastomosis	10	13.8%
Segmental Bowel Resection with Ileostomy	9	12.5%
Strictureplasty	4	5.5%
Perforation Loop Exteriorized	2	2.7%
Colon Perforation Repair + Ileostomy	1	1.3%
Cholecystectomy	1	1.3%
Stoma Closure	9	12.5%

The definite diagnosis of abdominal tuberculosis is made on demonstrating tuberculosis granulomas in the tissues removed surgically. In our study, histopathology was the basis of diagnosis in 82% of patients. The typical granuloma with central caseation was seen in 25% patients. R Khan has reported similar biopsy pattern.³² The remaining patients had operative findings in support of abdominal tuberculosis. All of them exhibited positive response to anti-tubercular therapy.

Diagnostic laparoscopy is a useful tool to diagnose abdominal tuberculosis in patients with chronic presentation. In the present review laparoscopy was done in 8.3% of the patients. It has yielded positive findings and diagnosis of the peritoneal tuberculosis. The laparoscopic findings were ascitic fluid, thickened peritoneum (lack of its usual shiny luster) with or without tubercles (multiple, yellowish white, tubercles distributed over the peritoneum), and fibro adhesive peritonitis with thick adhesions fixing the viscera. The omentum, liver and spleen can also be studded with tubercles. DK Bhargava studied 87 patients with high protein ascites, of which 38 were diagnosed as having tuberculosis.³³ They

found visual appearances to be more helpful (95% accurate) than histology, culture or guinea pig inoculation (82.3 and 37.5% sensitivity respectively).

Table 6: Complications in the group.

Complications	Frequency	Percentage
SSI	21	29.1%
Paralytic Ileus	9	12.5%
Sepsis	8	11%
Intra-Abdominal Abscess	4	5.5%
Pulmonary Complications	4	5.5%
Enterocutaneous Fistula	2	2.6%
Wound Dehiscence	2	2.6%

Tuberculosis can affect any part of the gastrointestinal tract, including the associated digestive system glands, lymph nodes and peritoneum. In our study commonest site was small intestine and that too terminal ileum and ileocaecal region. It was seen in 2/3rd of the patients in

this series, followed by the peritoneal tuberculosis. Intestinal obstruction was the commonest mode of presentation, followed by perforation. This is consistent with other studies.^{7,19} The ileum and ileo-caecal region preponderance is postulated to be due to abundant lymphoid tissues in this region and being the terminal part of small intestine is subjected to complete digestion and absorption of ingested food.⁴ Peyer's patches have the M cells, which phagocytes BCG bacilli.³⁴ Liver and gallbladder tuberculosis is rare. The case in our study had focal areas of tubercular granuloma in the liver and chronic ulcerative tuberculosis with gall-stones. The tuberculosis of the liver as described in the literature occurs in two forms: local or miliary form. The local form is either focal or nodular conglomerate granulomas leading to mass formation/abscesses; or tubular involving the bile duct system. In 1908, Simmonds collected 8 cases of tuberculosis of the gall-bladder; he described two types, chronic ulcerative type with or without gall-stones, and an acute form associated with generalized miliary tuberculosis.³⁵

Majority of our patients required emergency surgery. Various surgical procedures performed in the descending order of frequency were: segmental resection of the diseased segment including right hemi-colectomy, release of band and adhesions, repair of the perforation, stricturoplasty, exteriorization of the perforation loop and cholecystectomy. This goes similar to the findings of other authors.^{11,36} Right hemi-colectomy was done for the cases with ileo-caecal mass or stricture. Segmental small bowel resection with primary anastomosis was done in the cases with multiple ileal strictures or long tubular stricture. This achieves excision of the diseased segment with strictures and low risk of leak and fistula formation. In the presence of gross peritonitis and severe sepsis, temporary ileostomy was performed after the resection of diseased intestine or simple exteriorization of the perforated loop, thus avoiding primary anastomosis. In the present series few cases had undergone stricturoplasty. This is in contrast to a study by M Akbar in which stricturoplasty was the common surgical procedure.¹⁹ 9 cases had stoma closure after optimum recovery (8-12 weeks). Anti-tubercular therapies was given to all the patients postoperatively.

Postoperative complications occurred in 33.3% patients. Surgical site infection was the commonest complication. This is similar to the finding of other authors.^{11,18} No patient had post-operative anastomotic leak (fistula) following primary intestinal repair. The pulmonary complications were managed with appropriate antibiotics and intensive chest physiotherapy. One patient required chest tube drainage for the recurrent pleural effusion. All of them recovered except one patient, who developed type II respiratory failure with MODS secondary to severe sepsis and died. There were three cases of pregnancy. First two had perforation peritonitis with gross contamination and were taken up for emergency laparotomy: segmental resection and ileostomy was done

in both the cases. They had spontaneous abortion and stormy postoperative course with severe sepsis. One of them died of MODS. The third case was uncomplicated acute intestinal obstruction. She improved on conservative management; at 38 weeks had elective caesarean section and as conjunct surgery underwent release of bands and adhesiolysis for the regional cocoon in the terminal ileum. Overall postoperative mortality rate was 2.6% in our study which is comparable to as described by other authors.^{18,32} The overall median duration of hospital stay was 14 days which is similar to the findings of other authors.^{18,19} Being a retrospective study, it has its limitations, but it doesn't interfere with the objective of the study. Secondly, the PCR test was not done due to its high cost and availability at limited centres only.

CONCLUSION

Abdominal tuberculosis remains a diagnostic challenge, having diverse and nonspecific symptomatology, and there being no specific laboratory tests. Early diagnosis is the key factor in avoiding systemic and local complications of intestinal tuberculosis. Hence a high index of clinical suspicion is needed. Laparoscopy can serve as an important diagnostic tool, as well as means to obtain fluid and tissue for further confirmatory tests. Proper identification of symptoms and signs at primary care level and timely referral can save many lives. For those patients presenting in emergency, prompt surgical treatment is necessary to avoid further life threatening complications. A definitive procedure in the form of resection of diseased segment and primary anastomosis is safe and has largely been adopted in place of simple bypass of obstructive lesion. But in presence of gross peritonitis, a two-stage procedure with a temporary ileostomy is preferable. Finally administration of anti-tubercular therapy is necessary to treat the patients successfully with a complete cure.

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