

## Original Article



# Importance of Laparoscopy to Solve the Diagnostic Dilemma of Abdominal Tuberculosis

Md. Saiful Islam<sup>1</sup>, Md. Masudar Rahman<sup>2</sup>, M. Fardil Hossain Faisal<sup>3</sup>,

Md. Alamgir Jalil Pramanik<sup>4</sup>, . Muhammad Abdur Rouf<sup>5</sup>.

### Abstract

**Background:** Diagnosis of abdominal tuberculosis as well as histopathological confirmation is difficult because of suboptimal access to the intraperitoneal pathology. Laparoscopy provides minimally invasive access to the peritoneal cavity and materials can be collected for confirmation of diagnosis. **Objectives:** To study the importance of laparoscopy as a tool for the diagnosis of abdominal tuberculosis and initiation of appropriate treatment without delay. **Materials & Methods:** In this study 25 patients with suspected abdominal tuberculosis were selected within the period of May, 2014 to October, 2014. Diagnostic laparoscopy performed on all patients with biopsy of tissue from accessible sites. **Results:** Diagnostic laparoscopy with biopsy confirmed the diagnosis in 24 (96%) patients, 23 of these patients (96%) had nodules at different site of abdominal cavity and 19 of these patients (76%) had ascites. In two cases there were nodules over liver surface; biopsy was taken also from both liver nodules. One nodule revealed fibrosis and another nodule revealed tuberculosis. **Conclusion:** Imaging and culture of ascitic fluid may fail to confirm or exclude abdominal tuberculosis in clinically suspected cases. Laparoscopy with peritoneal tissue biopsy provided rapid and correct diagnosis of abdominal tuberculosis and should be performed early in suspected cases.

**Key words:** Abdominal Tuberculosis, Diagnostic Laparoscopy, Ascites, Biopsy, Histopathology.

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### Introduction

Tuberculosis remains a significant global threat, with compelling evidence of recent resurgence, not only in endemic areas, but in Western Europe and USA as well.<sup>1</sup> Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, with frequencies of 10-15% in human immunodeficiency virus (HIV)-negative patients and >50% in HIV-positive patients, and an overall mortality rate of 6%. Most patients with TB are in Asia (59%) and Africa (26%).<sup>2</sup> Tuberculosis remains a common health problem in Bangladesh. Tuberculosis can affect any part of gastrointestinal system.<sup>3</sup> and the abdominal form of TB is the sixth most frequent type of extrapulmonary TB, after lymphatic, genitourinary, osteoarticular, miliary and meningeal TB.<sup>4</sup> Although the triad of fever, ascites and abdominal pain is

present in 70% of patients, diagnosis is more difficult in patients who lack typical symptoms and laboratory and radiologic findings.<sup>5</sup> Abdominal tuberculosis may affect the gastrointestinal tract, peritoneum, lymph nodes, and solid viscera. Because of the non-specific symptoms and signs, its diagnosis is often delayed. A high index of suspicion therefore needs to be maintained for an early diagnosis and timely treatment.<sup>6</sup> The disease can present at any age but is seen most commonly in young adults. In children, the peritoneal and nodal form of tuberculosis is much more common than intestinal tuberculosis.<sup>7</sup> The clinical presentation depends upon the site of disease and the type of pathological involvement. Difficulties of diagnosis of abdominal tuberculosis including non-specific presenting features, unhelpful laboratory tests, negative results with tuberculin skin tests and Ziehl-Neelsen

1. Junior Consultant, Surgery, Upazila Health Complex, Niamotpur, Naogaon, Bangladesh.
2. Assistant professor, Department of General Surgery, Khwaja Yunus Ali Medical College & Hospital, Sirajganj, Bangladesh.
3. Assistant professor, Department of General Surgery, Khwaja Yunus Ali Medical College & Hospital, Sirajganj, Bangladesh.
4. Junior Consultant, Surgery, General Hospital, Gaibandha, Bangladesh.
5. Associate professor, Department of General Surgery, Khwaja Yunus Ali Medical College & Hospital, Sirajganj, Bangladesh.

**Correspondence:** Dr. Md. Saiful Islam, Junior Consultant, Surgery, Upazila Health Complex, Niamotpur, Naogaon, Bangladesh.  
Cell phone no: +8801762067063, E-mail: [drsaifulislam1980@gmail.com](mailto:drsaifulislam1980@gmail.com)

staining and false-negative ultrasound and CT scans<sup>8</sup>, therefore laparoscopy is the most specific diagnostic test for abdominal tuberculosis, with its advantage of histological confirmation.<sup>9</sup> In peritoneal tuberculosis, laparoscopic appearances of thickened peritoneum along with whitish to yellowish miliary tubercles studded over the peritoneum and other viscera have been found to be more helpful in diagnosis of tuberculosis than either histological or bacteriological examination.<sup>10</sup> The diagnosis can be accurately made with selective biopsy specimens and appropriate treatment can be instituted without delay.<sup>11</sup> Very few studies have so far been conducted in our country to evaluate the efficacy of laparoscopy in the diagnosis of abdominal tuberculosis. A prompt diagnosis allows an early medical treatment before any complication that necessitates surgical intervention can be avoided. This study has been carried out with a view to establish laparoscopy as a tool for earlier diagnosis of abdominal tuberculosis with minimum effort in our context.

## Materials & Methods

This cross sectional observational study was carried out in the Department of General Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, from May, 2014 to October 2014. Total 25 patients were selected who fulfilled the inclusion criteria. Proper patient selection was made based on history, complete physical examination and assistance from other diagnostic modalities unable to diagnose abdominal tuberculosis leading to laparoscopy as the only means for the diagnosis of abdominal tuberculosis and histopathological analysis for complete diagnosis. Laparoscopy was done under general anesthesia in all patients. 50 ml of ascitic fluid aspirated for Ziehl-Neelsen staining, culture and cytology, 3 or 4 peritoneal biopsies taken by sharp biopsy forceps from different sites of the peritoneum were sent for histological examination. After collecting information, data was checked, verified for consistency and edited for finalized result. After editing and coding, the data was analyzed by computer.

## Results

A total of 25 patients were studied. 14 (56%) females and 11 males (44%) with age range between 17 and 65 years with a mean age of 35 years (Table-I). Most patients presented with abdominal pain 22 cases, low grade fever 13 cases, weakness 13 cases and weight loss 10 cases (Table-II). The laparoscopic appearance was similar in most of the patients which showing a combination of varying amounts of straw colored ascites, small multiple whitish nodules scattered all over the peritoneum (Table-III), which was associated with peritoneal findings of tuberculosis. Biopsy was taken from all cases. Histopathology confirmed tuberculosis in 24 patients, peritoneal tuberculosis were 19 cases, intestinal tuberculosis 02 cases, genitourinary TB 02 cases and peritoneal TB with liver TB in 01 case (Table-IV). Out of 25 patients, 04 patients (16 %) underwent surgical interventions for Cholelithiasis(1), chronic Appendicitis(1) and Tuberculous stricture in ileum(2), 21 patients not required surgical intervention (Table-V). There was no morbidity or mortality related to diagnostic laparoscopies.

**Table I:** Distribution of patients by sex and age.

No of patients	25
Sex	
Male	11(44%)
Female	14(56%)
Mean age, years	35(17-65)

**Table II:** Distribution of patients by symptoms and signs.

Symptoms/signs	Frequency	Percentage
Abdominal pain	22	88
Fever	13	52
Weakness	13	52
Weight loss	10	40
Diarrhoea	07	28
Anorexia	05	20
Cough	01	04
Ascites	08	40
Anaemia ( Hb% <10 g/dl )	13	52
Abdominal distension	06	24

**Table III:** Distribution of patients by laparoscopic findings.

Findings	Frequency	Percentage
1. Ascites	19	76
2. Multiple whitish nodules over the peritoneum	21	84
3. Mesenteric Lymph Node	03	12
4. Multiple nodule over both Ovary & Fallopian tube	02	08
5. Stricture in terminal ileum	02	08
6. Nodule over liver surface	02	08
7. Fibro adhesive band	02	08
8. Mesenteric thickening	01	04

**Table IV:** Distribution of patients by type/category of abdominal Tuberculosis (n=25)

Type/category	Frequency	Percentage
1. Peritoneal tubercul osis	19	76
2.Intestinal tuberculosis		
Terminal ileum	02	08
3.Genitourinary tubeculosis		
Ovary and fallop ian tube	02	08
4. Peritoneal tuberculosis		
Associated with		
Liver TB	01	04
Liver cirrhosis	01	04

**Table V:** Distribution of patients by interventions needed during diagnostic laparoscopy (n=25).

Pathological findin gs	Intervention	No	Percentage
1. Cholelithiaias	Laparoscopic cholecystectomy	01	4
2. Chronic Appendicitis	Laparoscopic appendicectomy	01	4
3. Tuberculous stricture	Laparotomy and Resection	02	8
In ileum	& anastomosis		
4. No intervention		21	84

**Discussion**

Abdominal TB should be considered in the differential diagnosis for patients who present with non-specific abdominal complaints and weight loss over a long period.<sup>12</sup> Our findings also support previous work on the value of laparoscopy, the most specific diagnostic test for abdominal TB.<sup>13</sup> The characteristic intraperitoneal features such as white nodule, thicken omentum are high sensitivity (93%) and specificity(98%) combined with the histological findings.<sup>14</sup>

The usual laboratory investigations and Barium studies are often not helpful. The radiological differences between intestinal TB and Crohn’s disease have always been difficult. There are reports in which TB has mimicked Crohn’s disease.<sup>15</sup> Similarly, colonoscopy sometimes too, will not be able to distinguish intestinal TB from inflammatory bowel diseases.<sup>16</sup> Examination of ascitic fluid is helpful but usually not conclusive in diagnosis of the disease. Staining for acid fast bacilli is positive in less than 3 percent of cases. A positive culture is obtained in less than 20 percent of cases, and it takes 6-8 weeks for the mycobacterium colonies to appear.<sup>17</sup> Molecular diagnostic methods such as PCR are also very useful but are not widely available, particularly in less developed areas. Many research studies have been conducted for serological diagnosis of TB but their clinical utility, particularly in extra pulmonary TB, remains to be established.<sup>18</sup>

The value of laparoscopy in diagnosis of abdominal tuberculosis is well established. Some authors consider it as the most specific diagnostic test for abdominal TB.<sup>19</sup> This study showed that the routine investigation such as ultrasonography

of whole abdomen, x-ray chest, ESR, Mantoux test, CT scan of whole abdomen, Upper GI endoscopy, colonoscopy, Barium follow through did not provide any conclusive diagnosis, but diagnostic laparoscopy with tissue biopsy provided conclusive diagnosis of abdominal tuberculosis in 96 % cases. Tuberculosis (TB) can involve any part of the gastrointestinal tract from mouth to anus, the peritoneum and the pancreatobiliary system. In case of intestinal tuberculosis, the most common site of involvement is the ileocaecal region, 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.<sup>20</sup> Peritoneal TB is the most common form of abdominal TB and involves alone or in combination the peritoneal cavity, mesentery and omentum. In this study, the most common form of abdominal TB was peritoneal TB, which was 19 cases (76%), intestinal tuberculosis involving terminal part of ileum (two cases), genitourinary tuberculosis involving ovary and fallopian tube (two cases), peritoneal tuberculosis associated with liver TB in one case. The most commonly presenting symptoms of abdominal tuberculosis are reported to be abdominal distention (95%), abdominal pain (82%), weight loss (80%), weakness (76%), loss of appetite (75%) and fever (69%). In the same report, the most common physical findings are ascites (96%), fever (75%) and abdominal tenderness (43%).<sup>21</sup> In this study, most patients presented with abdominal pain and ascites (18 cases; 72%), abdominal pain without ascites (6 cases; 24%). Presenting symptoms in our study were abdominal pain in 22 cases (88%) abdominal distension in 06 cases (24%), weight loss in 10 cases (40%), weakness in 13 cases (52%), anorexia in 05 cases (20%) and fever in 13 cases (52%). Macroscopic examination by laparoscopy is the most useful method in the diagnosis of abdominal tuberculosis. The macroscopic diagnosis rate by laparoscopy was reported to be 78% in one study.<sup>22</sup> In our series, the macroscopic diagnostic rate was 84%. Although more definite methods for TB diagnosis such as culture or PCR were not utilized in our study, the clinical picture, histological findings of caseating granuloma and high prevalence of TB in our country, together seem sufficient to mark these patients as tuberculosis . In this study, out of 25 patients, 24 patients were diagnosed as abdominal tuberculosis. Among them two patients were diagnosed as intestinal tuberculosis with stricture involving in terminal ileum and resection and anastomosis was done by laparotomy. Thus prevent unwanted complication such as intestinal obstruction. One patient diagnosed as a chronic appendicitis and laparoscopic appendicectomy was done. Both cases patient were suffering from chronic abdominal pain. So, by diagnostic laparoscopy we can diagnose the disease early and appropriate step can be taken in time and prevention of unwanted complication not only for abdominal tuberculosis but also for all abdominal complaints.

**Conclusion**

Establishing a histological diagnosis in abdominal tuberculosis can be difficult, frequently delaying treatment. The visual appearances of abdominal tuberculosis during diagnostic laparoscopy are highly suggestive of the disease and should always be supported with histological examination of the tissue. Early Laparoscopy is safe and useful in establishing the

diagnosis of abdominal TB in suspected cases resulting in avoiding expensive, time consuming and sometimes fruitless investigations and allowing early institution of treatment.

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