# Role of Laparoscopy in the Diagnosis of Abdominal Tuberculosis in Patients with Vague Abdominal Symptoms

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## Abstract:

***Background and Aim:*** Tuberculosis continues to be a common disease in Iraq and one of its presentations is abdominal tuberculosis which tends to present with non-specific features that can be hard to diagnose at times. Histopathological confirmation of abdominal tuberculosis is difficult because of suboptional, noninvasive access to the pathology. The aim of this study was to find out the efficacy of diagnostic laparoscopy in establishing the histopathological diagnosis of abdominal tuberculosis.

***Patients and Methods:*** A retrospective study conducted on 67patients with vague abdominal pain, with or without ascites, for whom diagnostic laproscopy was performed in Azadi Teaching Hospital in Kirkuk City over a period of six years (January 2007 - December 2012). Data were collected and statistically analyzed using SPSS software version 16.

***Results:*** A total of (67) patients with vague abdominal symptoms and an unsettled diagnosis were included in this study, of which 22(32.8%) of the patients were diagnosed with abdominal tuberculosis on laparoscopy. The common symptoms were abdominal pain, changing bowel habits, loss of weight, fever and generalized weakness. The most consistent laboratory finding (>86%) was a high ESR. Macroscopic findings of abdominal tuberculosis were whitish granulations over both peritoneal layers, inflammatory adhesions on the visceral or parietal surface, thickening, hyperemia and retraction of the greater omentum and stalactic band which is characteristic of abdominal tuberculosis. Direct visualization of the peritoneum and obtaining peritoneal biopsies provided the definitive tissue diagnosis to confirm the clinical diagnosis.

***Conclusion:*** Although other diagnostic methods of abdominal tuberculosis such as imaging, culture of ascites and polymerase chain reaction (PCR) are used today, laparoscopy with tissue biopsy provided efficient and reliable diagnostic tool for patients suspected with abdominal tuberculosis. Patients were saved from unnecessary laparotomies and were managed on anti-tuberculosis drug therapy.

***Keywords*:** Laparoscopy, Abdominal tuberculosis, Ascites.

## Introduction:

Tuberculosis continues to be a major health hazard throughout the world particularly in the developing countries. Extra-pulmonary tuberculosis constitutes a significant proportion of these infections and represents major diagnostic problems in the underdeveloped world where sophisticated medical facilities are scarce [(1)]. It has been reported that up to (5%) of tuberculosis (TB) patients may have abdominal tuberculosis and of these, (25-60%) may have peritoneal involvement[(2)]. Diagnosis of the disease is difficult due to lack of specific symptoms and pathognomonic findings. The clinical presentation tends to be non-specific and the symptoms are usually insidious with abdominal pain, swelling, fever, night sweats, anorexia, and weight loss; although symptoms may even be absent in some patients [(3)]. Diagnostic tools with high sensitivity and specificity are needed for early

recognition of the disease. Acid-Resistance Bacilli (ARB) in the ascitic fluid, laparoscopy and peritoneal biopsy, serum CA-125or adenosine deaminase levels (ADA) in the serum and ascitic fluid, ascitis/blood glucose ratio and mini-laparotomies have all been described as useful diagnostic tools [1-12]. Clinicians should maintain a high index of suspicion for TB peritonitis as missing the diagnosis can result in significant morbidity and mortality. The differential diagnosis will often include inflammatory bowel disease, malignancy or some other infection. Prompt diagnosis allows an early start to anti-TB therapy, with advantages for the patient and savings to the health system [13, 14].

Abdominal tuberculosis can originate from mesenteric lymph nodes or through hematogenous spread or from tuberculous salpintigtis [15,16].

The aim of this study is to find out the efficacy of diagnostic laparoscopy in establishing the histopathological diagnosis of abdominal tuberculosis.

## Patients and Methods:

The laparoscopies were performed in the 1st floor theaters at the department of general surgery, Azadi Teaching Hospital, which serves as a major general hospital for the central and peripheral regions of Kirkuk city in Iraq. Laparoscopic examinations were performed for patients with unexplained abdominal pain, prolonged fever, ascites of unknown origin, especially when peritoneal tuberculosis was suspected, unexplained jaundice and suspected intra-abdominal malignancy.

Between January 2007 and December 2012, 67 laparoscopic examinations were performed under general anesthesia using 2 or 3 port technique. The diagnosis of tuberculous peritonitis was made in the presence of discrete or confluent uniform, white or yellow miliary nodules over the peritoneum, liver, omentum, spleen with or without adhesion bands between the bowel loops and abdominal wall. Ascitic fluid and/or tissue material obtained during laparoscopic examination were subjected to acid-fast staining and culture for *Mycobacterium tuberculosis*. When microbiological confirmation of the diagnosis was not forthcoming a positive response to anti-tuberculous chemotherapy was regarded as evidence of presence of tuberculous infection in the peritoneum. In addition, a peripheral lymph node or aspirated tissue material was examined for *Mycobacterium tuberculosis*, where peritoneal biopsy was not adequate or inconclusive.

## Results:

Out of the (67) diagnostic laparoscopic examinations, 26(38.8%) patients had different type of malignancies; secondary metastasis from unknown origin in 4(6%) patients, ovarian tumor origin in 5(7.4%) patients, pancreatic tumor origin in 6(9%) patients, colon cancer in 3(4.4%) patients, gastric carcinoma in 3(4.4%) patients, liver malignancies (hepatocellular carcinoma) in 2(3%) patients, visceral and parietal carcinomatosis in 2(3%) patients, omental cake with unknown origin in 1(1.5%) case. The other valuable findings of our investigation consisted of abdominal tuberculosis in 22(32.8%) patients, liver cirrhosis in 8(12%) patients; pelvic inflammatory disease (PID) in 5(7.4%) cases, fatty liver in 2(3%) patients, and haemangioma in two (3%) patients, the investigation was inconclusive in (2) patients (Table 1). Among the (22) patients with abdominal

tuberculosis, 12(54.5%) were male and 10(44.5%) were female. The mean age of all patients was 28.2 ±14.4 years (range 8-69 years). Of all cases, 3(13.6%) patients gave a family history of tuberculosis (Table 2).

The most frequent symptoms and clinical findings at admission for patients with abdominal tuberculosis were abdominal pain in 20(91%) patients, ascites in 18(82%), night sweat in 7(31%), fatigue in 15(68%), fever in 13 (59%), anorexia in 8(36%), loss of weight in 16 patients (73%), abdominal mass in 2(9%), peripheral lymph node enlargement in 2(9%) patients (Table 3).

The most consistent laboratory findings were elevated ESR in 19 patients (86%), anaemia in 8(36%), increased lactate dehydrogenase levels in 7(32%), hyponatremia in 4(18%) and increased liver function tests in 2(9%) patients.

In the laboratory investigation of the ascitic fluid, exudates and predominance of lymphocytes were present, but no malignant cells were detected. Acid-fast bacilli of the ascitic fluid were positive in 3(13.6%) patients. The diagnosis was confirmed microbiologically by production of *Mycobacterium tuberculosis* at Löwenstein Jensen medium in the ascitic fluid of one patient only(4.5%).

Chest X-rays were evaluated: 2(9%) patients had lung infiltrate, one patient had fibrocalcific lesion, and another 2(9%) patients had pleural effusion. Abdominal ultrasonographic examination was performed in all 22 patients and showed intra-abdominal lymph node enlargement in three patients (14%) and ascites in 14 patients (63%). CT revealed ascites with fine septations as the most common finding in 20(91%), thickening of peritoneum in 15 patients (77%), thickening of mesentery and omentum in 8(31%), intra-abdominal lymphadenopathy in 6(23%), hepatosplenomegaly in 2(15%) patients (Table 4).

Histological examination of the peritoneal tissue was performed in all 22 patients (100%) and demonstrated caseating granuloma consistent with tuberculosis in 20(91%). Only in three of these patients acid fast bacilli were confirmed by Ziehl-Neelson staining. In two patients peritoneal tissue was uninformative, but their clinical features were suggestive of tuberculosis and they responded to antituberculos chemotherapy.

The complications following laparoscopy were few. Two patients had minor oozing of ascitic fluid through the wound for more than 24 hr. Two patient's extensive ecchymosis were noted in the surrounding area around the laparoscopic wound, and in another oneomental haematoma was noted due to injury while introducing the trocar of the laparoscope. This patient was closely followed with no further untoward event. None had a serious complication due to the laparoscopy.

All of our patients with confirmed diagnosis and others suggestive of tuberculosis of the peritoneum were treated with anti-tuberculous therapy for 6-9 months. Five patients were lost to follow-up after 3 months. The remaining 17 patients had an average follow-up period of 24 months with complete resolution of symptoms and satisfactory weight gain.

None of the patients required surgery due to complications such as intestinal obstruction, fistula formation or intra-abdominal abscess. None of the 17 patients died during the follow-up period.

**Table (1):** Results of Diagnostic laparoscopy: (n = 67).

| finding | No. of patients | % |
|---|---|---|
| Malignancies | 26 | 38.8 |
| • Pancreatic tumour origin | 6 | 9 |
| • Ovarian tumour origin | 5 | 7.4 |
| • Secondary metastasis without known origin | 4 | 6 |
| • Gastric carcinoma | 3 | 4.4 |
| • Hepatocellular carcinoma | 2 | 3 |
| • Colonic carcinoma | 3 | 4.4 |
| • Visceral and parietal carcinomatosis | 2 | 3 |
| Omental cake | 1 | 1.5 |
| Abdominal tuberculosis | 22 | 32.8 |
| Liver cirrhosis | 8 | 12 |
| Pelvic inflammatory disease | 5 | 7.4 |
| Liver haemangioma | 2 | 3 |
| Fatty liver | 2 | 3 |
| inconclusive | 2 | 3 |
| Total | 67 | 100 |

**Table (2):** Demography of patients with abdominal TB (n = 22).

| Gender | No. | % | Age (range) | Age (mean) |
|---|---|---|---|---|
| Male | 12 | 54.5 | 16-69 | 32.4 |
| Female | 10 | 45.5 | 8-62 | 26.2 |
| Total | 22 | 100 | | |

**Table (3):** Presenting complaints of patients with abdominal TB (n =22).

| Symptoms | No. % |
|---|---|
| Abdominal pain | 20(91%) |
| Fever | 13(59%) |
| Weight loss | 16(73%) |
| Abdominal swelling | 10(45%) |
| Anorexia | 8(36%) |
| Night sweat | 7(32%) |
| Fatigue | 15(68%) |

| Signs | No. % |
|---|---|
| Ascites | 18(82%) |
| Abdominal tenderness | 8(36%) |
| Peripheral lymph node | 2(9%) |
| Hepatomegally | 4(18%) |
| Abdominal mass | 2(9%) |
| | |
| | |

**Table (4):** Positive laboratory and imaging studies in patients with abdominal tuberculosis (n = 22).

| | No. of patients | Percentage % |
|---|---|---|
| *Ascitic fluid examination* | | |
| • Exudate | 22 | 100 |
| • Lymphocyte Predominance | 18 | 81.8 |
| • Presence of malignant cells | 0 | 0 |
| • Presence of acid fast bacilli | 3 | 13.6 |
| • Production of M.tuberculosis | 1 | 4.5 |
| *Chest X-rays* | | |
| • Lung infiltrate | 2 | 9 |
| • Fibrocalcific lesion | 1 | 4.5 |
| • Pleural effusion | 2 | 9 |
| *Abdominal ultrasonography* | | |
| • Intra-abdominal lymphadenopathy | 3 | 13.6 |
| • Ascites | 14 | 63 |
| *Abdominal CT-scanning* | | |
| • Ascites with fine septations | 20 | 91 |
| • Thickening of peritoneum | 15 | 68 |
| • Thickening of mesentery and omentum | 8 | 36 |
| • Intra-abdominal lymphadenopathy | 6 | 27 |
| • Hepatosplenomegally | 2 | 9 |

## Discussion:

Tuberculous infections have increased significantly during recent years due to several factors such as poor socioeconomic status, ill-informed diagnosis and treatment, and HIV infection. However, abdominal TB is relatively infrequent particularly in developed countries [(1)].

Tuberculous peritonitis usually occurs secondary to rupture of caseous lesions of the adjacent lymph nodes and less frequently by direct invasion from the intestinal focus; or by the hematogenous route. Abdominal tuberculosis is usually overlooked due to changing and non-specific findings at differential diagnosis of abdominal diseases. Some investigators recommend considering abdominal tuberculosis when patients have abdominal pain, weight loss and ascites in regions of high TB incidence [(2-6)].

Three steps can be used to assess the diagnosis of abdominal TB. The first two steps are evaluation of the clinical and radiological findings, which supply indirect information. The last step includes invasive techniques following peritoneal biopsy, which is usually needed for confirmation of the diagnosis [(7-10)]. In this study; most of the patients (91%) were diagnosed by peritoneal biopsy. Mohamed A.A et al.[(8)]; have reported a ratio of histopathologically proven diagnosis in (61%) of their patients, in another series in Turkey, Apaydin B. et al.[(12)]; reported the method of diagnosis to be laparotomy and laparoscopy in 50(74%) of their patients. laparoscopic examination and

peritoneal biopsy should be the preferred method of diagnosis, but in most series there are some patients treated with antituberculous therapy without biopsy, but only after a careful evaluation of all other findings [1,6,7,8].

Long-lasting abdominal symptoms, familial history of exposure to TB, having no prior BCG vaccination, positive tuberculin skin test, elevated ESR and findings of ultrasonography and CT scan have all contributed well to the diagnosis [2, 3, 4, 5, 6, 9, 11]. In our study, vague abdominal pain, weight loss, abdominal swelling, elevated ESR, and presence of ascites on abdominal ultrasonography and CT-scanning were the most helpful diagnostic aids. Patients with abdominal TB frequently have history of TB in the past (43%) or family history of TB (25-50%) [13, 14, 16], which may alert the physician. In this study, only 3(13.6%) patients gave family history of TB. these findings strengthen the evidence that, in patients with a relevant background and clinical history, laparoscopy is the investigation of choice.

The most common symptoms in patients with abdominal tuberculosis are fever, abdominal pain, abdominal distension and weight loss [4, 5, 9, 10, 11]. In the present study, abdominal pain (91%), ascites in (82%), weight loss (73%), and fever (59%) were the most common presenting features. Most patients would not have presented to a hospital unless they have marked weight loss and ascites were evident.

The most common ultrasonography and CT scan findings have been reported to be ascites, lymphadenopathy and thickness of the mesentery and peritoneum [4, 7]. Abdominal ultrasonography and CT of the present patients revealed ascites with fine septations as the most common finding in 20(91%), thickening of peritoneum in 15 patients (77%), thickening of mesentery and omentum in 8(31%). However, intra-abdominal lymphadenopathy was seen in 6(23%), hepatosplenomegally in 2(15%). These findings were comparable to other findings obtained in other series [4,9,11,12].

Culture and acid fast bacilli (AFB) positivity of the peritoneal fluid are rarely seen, [3, 5, 10, 11], in the present study, three (13.6%) patients had AFB positivity in the microscopic evaluation of the ascetic fluid and 1(4.5%) had culture positivity for *Mycobacterium tuberculosis* in the ascetic fluid.

The most common complication of the abdominal TB is intestinal obstruction with an incidence of (20%). The mechanism is the thickening of the intestinal wall secondary to the inflammation [9, 10]. Intestinal perforation and fistula may be seen in (5%) of the patients [10]. In the current study none of our patients developed such complication.

Our findings also support previous work on the value of laparoscopy, the most specific diagnostic tool for abdominal TB [1, 6, 7, 8, 12, 16] with its advantage of histological confirmation[11]. Unfortunately this investigation still tends to be used as a last resort [11, 15] and our series was no exception. In former times its function was served by laparotomy [10, 11] and a reluctance to intervene might then have been more reasonable. With the growing availability of experienced operators, the morbidity of laparoscopy is much less of an issue. Our findings encourage the use of laparoscopy as a most useful tool for the diagnosis of patients with suspected abdominal tuberculosis. Although more definite methods for TB

diagnosis such as culture or polymerase chain reaction (PCR) were not utilized in our study, the clinical picture, granulomatous peritonitis finding in pathology, high prevalence of TB in Iraq and good response to anti-TB therapy together seem sufficient to mark these patients as TB peritonitis patients. In all of our patients, anti-TB treatment was instituted promptly and the symptoms of all patients disappeared very soon.

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