

# Role of Laparoscopy in Diagnosis of Abdominal Tuberculosis.

A Mohamed, N Bhat, M Abukhater, M Riaz

## Citation

A Mohamed, N Bhat, M Abukhater, M Riaz. *Role of Laparoscopy in Diagnosis of Abdominal Tuberculosis.* The Internet Journal of Infectious Diseases. 2009 Volume 8 Number 2.

## Abstract

**Background:** Diagnosis of abdominal tuberculosis is difficult as well as its Histopathological confirmation because of suboptimal, noninvasive access to the intraperitoneal pathology. Laparoscopy provides minimally invasive access to the peritoneum. **AIM:** The aim is to analyze our experience with diagnostic laparoscopy in diagnosis of abdominal tuberculosis and to review the literature for the role and importance of laparoscopy in the diagnosis of condition. **Materials and Methods:** A retrospective study on 13 patients refers to surgeons from medical department at King Fahad Medical City for diagnostic laparoscopy for clinically suspected abdominal tuberculosis/Crohn disease in 3 years period. A video record diagnostic laparoscopy was performed in all patients with peritoneal biopsy, the clinical data regarding the presenting symptoms, blood and radiological investigations together with the laparoscopic finding and the pathological finding were reviewed. **Results** In all patients blood tests, imaging, and ascitic fluid culture failed to confirm the diagnosis of abdominal tuberculosis while diagnostic laparoscopy with peritoneal biopsy confirmed the diagnosis in 11 patients. One patient was found to have disseminated Adenocarcinoma; another patient had non specific inflammation. **Conclusion:** diagnostic methods of TB such as imaging, culture of ascitic may fail to confirm or exclude abdominal tuberculosis in clinically suspected cases. Laparoscopy with peritoneal biopsy provided rapid and correct diagnosis of abdominal tuberculosis and should be performed early in suspected cases.

## INTRODUCTION

Tuberculosis (TB) is a re emerging global emergency which is further complicated by AIDS/HIV infection and the use of immunosuppressant drugs. Prompt diagnosis allows an early start to anti-TB therapy, with advantages for the patient and savings to the health system. We studied of 13 of suspected abdominal tuberculosis to evaluate the role of laparoscopy in establishing the diagnosis of the disease.

bowel injures due to adhesions. A second 5 mm trocar introduced under direct vision in the right sub costal region in the mid clavicular line. 50 ml of ascetic fluid aspirated for Zeil Nelson staining, culture and cytology. 3 or 4 peritoneal biopsies taken by sharp biopsy forceps (figure 1) from different sites of the peritoneum and sent for histology examination. Trocars sites were closed with non absorbable sutures.

## MATERIALS AND METHODS

We retrospectively reviewed patient records and video recordings of patients who underwent video recorded diagnostic laparoscopy and peritoneal biopsy for suspected abdominal tuberculosis in the period from October 2004 to January 2008 at King Fahad Medical City Riyadh ,Saudi Arabia, With special emphasis on clinical presentation, investigations, visual laparoscopic appearance and histological results of peritoneal biopsies.

## LAPAROSCOPIC TECHNIQUE

Laparoscopy was done under general anesthesia in all patients. The first trocar (10mm) was introduced by open method in all patient in the subumbilical region to avoid

**Figure 1**

Figure 1: Biopsing the peritoneal nodules by sharp biopsy forcep.



**RESULTS**

A total of 13 patients were studied. Nine (69%) females and four males (31%). age range between 14 and 57 years with a mean age of 29 years. the mean duration of symptoms was 12 weeks (range between 2-28 weeks). The main presenting symptoms were abdominal pain (85%), weight loss (77%), nocturnal fever and sweating (61%), and gastrointestinal symptoms (nausea, vomiting and diarrhea) (70%).

2 patients were treated before for pulmonary tuberculosis. 3 patients had family history of tuberculosis. All patients had ascitis demonstrated clinically in 8 patients and ultrasonically in the remaining 5 patients. Palpable abdominal lumps felt in 6(46%) patients. Montoux test was positive in all patients (table 1). Peritoneal tap done in 8 patients in all of them it showed lymphocytosis and low sugar but staining for acid fast bacilli was negative in the 8 samples. Radiological studies including CT scan, barium follow through were not conclusive in all patients.

**Figure 2**

Table 1

variants	Number of patients	%
Males	4	31%
Females	9	69%
Pervious pulmonary TB	2	15%
Contact with TB	3	23%
GI symptoms (nausea, vomiting and diarrhea).	9	70%
Abdominal pain	11	85%
Loss of weight	10	77%
Fever & night sweating	8	61%
Palpable lumps	6	46%
ascitis	13	100%
Positive Montoux test	13	100%

The laparoscopic appearance was similar in all patients

which a combination of varying amounts of straw colored ascitis, small multiple whitish nodules scattered all over the peritoneum and the omentum with variable degrees of omental thickening and bowel adhesion (figure 2&3). There was no morbidity or mortality related to diagnostic laparoscopies.

**Figure 3**

Figure 2: showing typical appearance of abdominal tuberculosis including straw colored ascitis, small multiple whitish nodules scattered all over the peritoneum and the omentum with omental thickening.



**Figure 4**

Figure 3: Long fibrous band extending from the parietal to the visceral peritoneum “stalactic” which is characteristic of abdominal tuberculosis.



Histology of the peritoneal biopsies established the diagnosis of tuberculosis in 11 patients (85%). One patient was found to have a disseminated adenocarcinoma and another patient was found to have non specific inflammation.

All patients were commenced on antituberculous therapy. 10 patients showed good clinical response, one patient (female) died because of liver failure.

### **DISCUSSION**

Tuberculosis (TB) is a re-emerging global emergency which is further complicated by AIDS/HIV infection and the use of immunosuppressant drugs (1). Abdominal TB is common. It is being seen with increasing frequency, both in developed as well as developing countries (2).

Tuberculosis (TB) can involve any part of the gastrointestinal tract from mouth to anus, the peritoneum and the pancreatobiliary system. It can have a varied presentation, frequently mimicking other common and rare diseases (3).

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. (4)

Peritoneal TB is the most common form of abdominal TB and involves alone or in combination the peritoneal cavity, mesentery and omentum. Three types of peritoneal TB are described (5). A wet type with ascites or pockets of loculated fluid; a dry type with bulky mesenteric thickening and lymph adenopathy; and a third type with mass formation due to omental thickening which may be mistaken for a tumour.

The majority of cases of tuberculous peritonitis result from the reactivation of latent tuberculosis foci. These foci follow hematogenous dissemination from the primary disease in the lung and remain latent. Tuberculous peritonitis is the result of silent foci reactivation (6)

The diagnosis of abdominal tuberculosis is difficult. The clinical features of abdominal disease are vague and non-specific. The usual laboratory investigations and barium studies are often not helpful (7). Although the Mantoux test is freely available, its value in the diagnosis of active TB remains uncertain. Differentiation between abdominal tuberculosis and inflammatory bowel diseases on clinical basis and conventional radiological investigation is difficult and sometimes impossible.

Although several subtle features on barium studies have been shown to be more consistent with ileocaecal TB, there is no particular feature which enables one to diagnose gut TB confidently on radiology alone (8,9). 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 (10). Similarly, colonoscopy sometimes too, will not be able to distinguish intestinal TB from inflammatory bowel diseases (8).

Examination of ascitic fluid is helpful but usually not conclusive in diagnosis of the disease. The ascitic fluid in tuberculosis is straw colored with protein  $>3\text{g/dl}$ , and total cell count of  $150\text{--}4000/\text{mm}^3$ , consisting predominantly of lymphocytes ( $>70\%$ ). The ascites to blood glucose ratio is less than 0.9650 and serum ascites albumin gradient is less than  $1.1\text{ g/dl}$ . The yield of organisms on smear and culture is low. Staining for acid fast bacilli is positive in less than 3 per cent of cases. A positive culture is obtained in less than 20 per cent of cases, and it takes 6-8 wk for the mycobacterium colonies to appear. Singhet al advocated that processing of one liter of ascitic fluid may yield up to 80% positive results. (11).

Therapeutic trial with anti-tuberculosis chemotherapy, though recommended (12) is not really justified (13). Although systemic symptoms like fever, anorexia and weight loss may subside within 4 to 6 weeks of anti-tuberculosis chemotherapy, bowel symptoms take much longer to respond (14). Also, anti-tuberculosis chemotherapy, given for 4 to 6 weeks for purposes of trial, can alter the histological picture so much that subsequent differentiation from Crohn's disease becomes difficult. (15)

In TB peritonitis, histopathological examination is an appropriate method both for diagnosing TB and to rule out other diseases such as malignancy. Histopathological confirmation of abdominal tuberculosis because of suboptimal, noninvasive access to the intraperitoneal pathology is difficult. Blind percutaneous needle biopsy of the peritoneum, (16) laparoscopic biopsy (17) and peritoneal biopsy with a small grid iron incision in the right iliac fossa under local anesthesia have been advocated but are hazardous to carry out except in patients with ascites.

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, (18,19) with its advantage of histological confirmation. (20) Unfortunately this investigation still tends to be used as a last resort, (21,22)

Bhargava et al (23) studied 87 patients with high protein ascites, of which 38 were diagnosed as having tuberculosis.

They found visual appearances to be more helpful (95% accurate) than histology, culture or guinea pig inoculation (82, 3 and 37.5% Sensitivity, respectively). Macroscopic signs suggestive of abdominal tuberculosis in laparoscopy are small whitish tubercles over the visceral and parietal peritoneum; inflammatory adhesions on the visceral and parietal surface; thickening, hyperemia and retraction of the greater omentum and a long fibrous band extending from the parietal to the visceral peritoneum termed "stalactic" which is characteristic of abdominal tuberculosis (24)

In their case series of 36 patients with clinical suspicious of abdominal tuberculosis, Rai and Thomas outline the difficulties in diagnosing abdominal tuberculosis and suggest that early laparoscopy may aid diagnosis and reduce time for it to be made(25).similarly Ibrarullah M, and Mohan performed diagnostic laparoscopy in 23 patients with suspected Peritoneal tuberculosis .The diagnosis was confirmed in 19 patients they concluded that Laparoscopy was safe and helped in the diagnosis of peritoneal as well as intestinal tuberculosis in 87% of patients.(26).of the few papers coming from the middle east a retrospective study on laparoscopy in Razi hospital of Rasht (in northern Iran) over a period of ten years showed that diagnostic laparoscopy 28 cases out of 29 who had laparoscopic picture of abdominal tuberculosis were confirmed histologically. (24)

In our study the diagnosis was confirmed in 11 out of 13 patient (84.6%) which well correlated with pervious studies. Similarly A. A. Al-Mulhim studied TB in the western province of Saudi Arabia in his study histological confirmation was obtained in 17 patients out of 22 patients who had diagnostic laparoscopy for suspected peritoneal tuberculosis. (27)

### CONCLUSION

Establishing a histological diagnosis in abdominal tuberculosis can be difficult, frequently delaying treatment. The clinical features of abdominal disease are vague and non-specific. The usual laboratory investigations and barium studies are often not helpful. Therapeutic trial with anti-tuberculosis chemotherapy is not really justified. The visual appearances of peritoneal tuberculosis during diagnostic laparoscopy are highly suggestive of the disease and should always be supported with histological examination of the peritoneal biopsies. Early Laparoscopy is safe and useful in establishing the diagnosis of peritoneal TB in suspected cases resulting in avoiding expensive, time consuming and sometimes fruitless investigations and allowing early

institution of treatment.

### References

1. Dye C, Scheele S, Dolin P, Pathania V, Raviglione MC: Consensus statement. Global burden of tuberculosis: estimated incidence, prevalence, and mortality by country.WHO Global Surveillance and Monitoring Project. JAMA 1999, 282:677-686.
2. Marshall JB. Tuberculosis of the gastrointestinal tract and peritoneum. Am J Gastroenterol 1993; 88:988-99?
3. Peda Veerajuu E. Abdominal tuberculosis. In: Satya Sri S, editor. Textbook of pulmonary and extrapulmonary tuberculosis. 3rd Ed. New Delhi: Interprint; 1998 p. 250-
4. M.P. Sharma & Vikram Bhatia, Abdominal tuberculosis. Indian J Med Res 120, October 2004, pp 305-315.
5. Hanson RD, Hunter TB: Tuberculous peritonitis: CT appearance.AJR Am J Roentgenol 1985, 144:931-932
6. Perkins MD, Conde MB, Martins M, Kritski AL. Serologic diagnosis of tuberculosis using a simple commercial. Chest.2003; 123:107-12.
7. Thoeni RF, Margulis AR: Gastrointestinal tuberculosis. Semin Roentgenol 1979, 14:283
8. Lungenfelter T, Zak J, Marks IN, Steyn E, Halkett J, Price SK. Abdominal tuberculosis: still a potentially lethal disease. Am J Gastroenterol 1993; 88:744-50?
9. Lewis EA, Kolawaole TM. Tuberculous ileo-colitis in Ibadan: a clinicopathological review. Gut 1972; 13:646-53.
10. Healy JC, Gorman S, Kumar PJ. Case report: tuberculous colitis mimicking Crohn's disease. Clin Radiol 1992; 46:131-2.
11. Singh M.M., Bhargava A.N., Jain K.P., Tuberculous peritonitis. An evaluation of pathogenetic mechanisms, diagnostic procedures and therapeutic measures. N. Engl. J. Med. 1969,281, 1091-4
12. Anand B.S., Nanda R, Sachdeva G.K. Response of tubercular strictures to anti-tuberculosis treatment.Gut, 1988, 29, 62-9.
13. Schofield P.F. Abdominal tuberculosis. Gut, 1985, 26, and 1275-8.
14. Anand B.S. Distinguishing Crohn,s disease from intestinal tuberculosis. Natl. Med. J. India.1989, 2,170-5.
15. Tandon H.D., Prakash A. Pathology of intestinal tuberculosis and its distinction from Crohn,s disease. Gut, 1972, 13, and 260-9.
16. Levine H. Needle biopsy diagnosis of tuberculous peritonitis. Am. Rev. Resp. Dis.1968.97, 889-94.
17. Wolfe J.H.N., Behn A.R., Jackson B.T. Tuberculous peritonitis\* and role of diagnostic laparoscopy. Lancet; 1979, 1, 852-3.
18. Rodriguez de Lope C, San Miguel Joglar G, Pons Romero F.Laparoscopic diagnosis of tuberculous ascites. Endoscopy 1982;14:178-9
19. Semenovski AV, Barinov VS, Kochorova MN.Laparoscopy in the complex diagnosis of abdominal and genital tuberculosis. Problemy Tuberkuleza 1999; 3:36-9
20. Wolfe JH, Behn AR, Jackson BT. Tuberculous peritonitis and role of diagnostic laparoscopy. Lancet 1979; i: 852-3
21. Inadomi JM, Kapur S, Kinkhabwala M, Cello JP. The laparoscopic evaluation of ascites. Gastrointest Endosc Clin N Am 2001;11:79-91
22. Bhargava DK, Shriniwas, Chopra P, Nijhawan S, Dasarathy S. Peritoneal tuberculosis: laparoscopic patterns and its diagnostic accuracy. Am J Gastroenterol 1992;87:109-12
23. Bhargava DK, Shriniwas, Chopra P, Nijhawan S, Dasarathy S, Kushwaha AK. Peritoneal tuberculosis:

laparoscopic patterns and its diagnostic accuracy. Am J Gastroenterol 1992; 87: 109-12?

24. Safarpor Faizollah, Aghajanzade Menochehr, Kohsari Mohammad Reza R, Hoda Saba, Sarshad Ali, Safarpor Delaram, Role of laparoscopy in the diagnosis of abdominal tuberculosis, Saudi cij Year : 2007,13 ,3 ,133-135

25. Thomas WM. Diagnosis of abdominal tuberculosis: the

importance of laparoscopy. J R Soc Med 2003; 96:586 –8

26. Ibrarullah M, Mohan A, Sarkari A, Srinivas M, Mishra A, Sundar TS. Abdominal tuberculosis: diagnosis by laparoscopy and colonoscopy. Trop Gastroenterol. 2002 Jul-Sep; 23(3):150-3.

27. A. A. Al-Mulhim. Laparoscopic diagnosis of peritoneal tuberculosis, Surg Endosc (2004) 18: 1757–1761

**Author Information**

**Abbas A. R. Mohamed, MBBS, FRCSI, FICS**

Consultant General and Laparoscopic Surgeon, Department of Surgical Specialties, King Fahad Medical City

**Nadeem Ahmad Bhat, MBBS,MS,MRCSEd**

Assistant Consultant General Surgeon, Department of Surgical Specialties, King Fahad Medical City

**Muhammad Abukhater, MBBS, FRCSI**

Department of Surgical Specialties, King Fahad Medical City

**Muhammad Masood Riaz, MBBS FICS MRCS**

Department of Surgical Specialties, King Fahad Medical City