

# A Study on the Efficacy of an Open Peritoneal Biopsy for Abdominal Tuberculosis in a Tertiary Medical Centre: Analysis of 69 Cases

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## ABSTRACT

**Background:** The diagnosis of abdominal tuberculosis is often empirical, based on indirect evidences. A polymorphous clinical presentation, non-specific biological markers, a minimally contributive bacteriology and non-specific radiographic signs raise diagnostic difficulties in abdominal tuberculosis. A peritoneal biopsy may be useful in confirming the diagnosis of abdominal tuberculosis.

**Aims:** In this study, we evaluated the efficacy of an open peritoneal biopsy for the confirmation of abdominal tuberculosis.

**Methods and Materials:** We selected 69 cases of suspected abdominal tuberculosis. Among them, 28 cases were diagnosed by Ultrasound (USG) guided Fine Needle Aspiration Cytology (FNAC) from the abdominal lymph nodes or lumps and 38 cases were diagnosed by the examination of the lymphocytic exudative ascitic fluid with a high adenosine deaminase content. 3 cases could not be diagnosed by either means. All the 69 cases were subjected to open peritoneal biopsies.

**Results:** Abdominal pain and tenderness were the presenting clinical features in all the cases. The histopathological exam-

ination of the open peritoneal biopsy material confirmed the diagnosis by revealing caseating granulomas in 33 (47.83%) cases. These included 2 cases among 3 which could not be diagnosed by FNAC of the abdominal lymph node or by ascitic fluid examination. Mycobacterial cultures which were done from the biopsy materials were positive in 18(26.08%) cases and all of them had caseating granulomas. The peritoneal biopsies were confirmatory in 19 out of the 38(50%) cases with ascites and in 14 out of the 31(45.16%) cases without ascites. One case could not be diagnosed by either of these three means. She was put on empirical anti tuberculous drugs to which she responded.

**Conclusion:** The classical biological and radiological investigations are not specific and their contributions remain little in the diagnosis of abdominal tuberculosis. Open peritoneal biopsies are safe and helpful in confirming abdominal tuberculosis, particularly in the ascitic cases and the mycobacterial cultures did not improve the diagnostic yield over the histopathological examination of the biopsy materials.

**Key Words:** Peritoneum, Abdominal tuberculosis, Biopsy, Abdomen

## INTRODUCTION

Abdominal tuberculosis is quiet frequent in India, accounting for approximately 1/3<sup>rd</sup> of all the cases of tuberculosis in some series. The diagnosis of abdominal tuberculosis is difficult as its presentation is non-specific and as it is often masked by the manifestations of tuberculosis in other parts of body, mainly in the lungs. The clinical manifestations vary from acute abdomen and non-specific symptoms (vague abdominal pain and discomfort, diarrhoea, malabsorption syndrome and weight loss) to ascities and sub-acute intestinal obstruction. A diagnostic criteria was laid down by Ligenfelser et al in 1993, which is as follows:

1. Histopathological (H.P) evidence of caseating granulomas/ demonstration of acid fast bacilli (AFB).
2. The presence of Mycobacterium tuberculosis in sputum/ tissue/ascitic fluid and
3. The clinical/radiological/operative evidence of tuberculosis in any other site with a good therapeutic response.

This criteria is difficult to follow as the H.P evidence needs a surgical intervention in every case. M tuberculosis is rarely isolated

from ascitic fluid and active pulmonary tuberculosis is present in less than 50% of the cases of abdominal tuberculosis. Therefore, abdominal tuberculosis is usually diagnosed on the basis of clinical suspicion and it is confirmed by successful therapeutic trials.

Abdominal tuberculosis can present in two forms; 1) intestinal and 2) peritoneal. Peritoneal tuberculosis accounts for about 25% to 60% of the abdominal tuberculosis cases. The gross examination of the peritoneum shows multiple white tubercles and adhesion of the organs with the peritoneum or with the miliary nodules in the peritoneum. The mesentery is usually thickened and oedematous and there may be a collection of pus or caseous material. Peritoneal tuberculosis can be of two types; 1) the exudative or the moist type and 2) the plastic or the dry type.

In this study, our objective was to find out the role of open peritoneal biopsy in the diagnosis of abdominal tuberculosis .

## MATERIALS AND METHOD

All the cases of suspected abdominal tuberculosis patients who attended the Chest Department of a tertiary medical centre in the

district of Bankura in West Bengal, India, from July 2001 to June 2004 were included in this study with a due concurrence sanction from the ethical committee. The diagnosis of abdominal tuberculosis in the patients with abdominal symptoms was corroborated by USG guided FNAC from the abdominal lymph nodes or from the mass which demonstrated AFB and/or from caseating granulomas and by ascitic fluid examination (lymphocytic exudative fluid with a high adenosine deaminase content (ADA)>60U/L). Those who had active tuberculosis in the lungs or in any other site, those who had disseminated tuberculosis, other associated diseases such as diabetes, HIV infection, etc., those who refused to give a informed written consent and those who had contraindications for surgery under general anaesthesia were excluded from the study. Finally, we selected 69 cases for the final analysis.

#### Every patient underwent the following protocol:

- i) A detailed history and clinical examination.
- ii) Routine laboratory investigations which included a complete haemogram, the tuberculin test, chest X-ray, sputum studies for AFB and smears from the DOT's centre.
- iii) Straight X-ray of the abdomen and USG of the whole abdomen.
- iv) Examination of the ascitic fluid for the cell type, cell count, protein, sugar, ADA, gram staining and Ziehl-Neelsen staining.
- v) USG guided FNAC from the lymph node or the abdominal mass.
- vi) A peritoneal biopsy, followed by a histopathological examination and a mycobacterial culture.

The peritoneal biopsy was done by open surgery through an infraumbilical midline incision under local anaesthesia.

The material which was obtained was divided into two parts. One half was sent in formalin solution for the H.P. examination and the other half was sent in normal saline without delay for the mycobacterial culture in Lowenstein-Jensen media. Once the diagnosis was established, the patients were referred to specialized centres to receive free treatment as per the RNTCP guidelines

## RESULTS AND ANALYSIS

In this study, we selected 69 patients who were suspected to have abdominal tuberculosis. Of them, 47(68.11%) were females and 22 (31.89%) were males. 12 patients(17.39%) were below 15 years of age, 39 (56.52%) were between 16 to 30 years of age, 12(17.39%) were between 31 to 45 years of age and 6 (8.70%) were above 45 years of age. The duration of the symptoms was less than 2 months in 30 cases (43.48%), it was between 2 to 6 months in 26 cases (37.68%) and it was more than 6 months in 13 cases (18.84%). All the cases had abdominal pain, 48(69.57%) cases had fever, 46(66.67%) cases had weight loss, 43(62.32%) cases had anorexia, 36(52.17%) cases had alternate bowel habits, 27(39.13%) cases had constipation, 14(20.29%) cases had nausea or vomiting, 13(18.84%) cases had cough and 8(11.6%) cases had diarrhoea.

A history of contact was present in 13(18.84%) cases and a past history of tuberculosis was present in 8(11.6%) cases. All the cases had abdominal tenderness, 12(17.39%) cases had abdominal distension and visible peristalsis, 29(42.03%) had a doughy abdomen, 3(4.35%) had an abdominal lump and 21(30.43%) cases had detectable ascites. A general survey revealed anaemia in 48(69.57%) cases and malnutrition in 42(60.87%) cases.

Haemoglobin values of less than 10 gm/dl were noted in 54(78.26%) cases, leucocytosis was noted in 9(13.04%) cases, leucopaenia

was noted in 3(4.35%) cases and a raised ESR was noted in 54(78.26%) cases, among whom 17 (24.63%) cases had an ESR of more than 100mm in the first hour. 9(13.04%) cases were found to have fibrotic lesions on chest X-ray. USG of whole abdomen revealed ascites in 38(55.07%) cases, abdominal lymphadenopathy in 36(52.17%) cases and abdominal lumps in 6(8.70%) cases. Ascites with abdominal lymphadenopathy and ascites with abdominal lumps were found in 6 and 2 patients respectively. The diagnosis of abdominal tuberculosis was confirmed by FNAC in 28 cases (40.59%) under image guidance. In 24 cases (34.78%), the FNAC was done from the abdominal lymph nodes and in 4 cases (5.79%), it was done from the abdominal lumps. In 38(55.07%) cases, the diagnosis was made by the examination of the ascitic fluid (lymphocytic exudative fluid with a high ADA content).

Open peritoneal biopsies were done in all the cases. The histopathological examination [Table/Fig-1] revealed caseating granulomas in 33(47.83%) cases, non caseating granulomas in 8 (11.6%) cases, non-specific chronic inflammation in 17(24.64%) cases and no abnormality in 11(15.94%) cases. The Mycobacterial culture was positive in 18(26.09%) cases and all of them had caseating granulomas. Surprisingly, we did not find any additional benefit of the Mycobacterial culture in our study. The peritoneal biopsies were helpful in confirming the diagnosis in 33(47.83%) cases in 19 out of 38 ascitic cases (50%) with a high ADA content and in 14 out of 31(45.16%) non-ascitic cases. We found open peritoneal biopsy to be a safe method. Only one patient developed a mild form of paralytic ileus and another had a wound infection- both responded satisfactorily to the postoperative management.

Type of histology	Number of patients	Percent (%)	Male	Female
Caseating granuloma	33	47.82	8	25
Non-caseating granuloma	8	11.60	4	4
Non-specific changes	17	24.64	7	10
No abnormalities	11	15.94	3	8
Total	69	100	22	47

[Table/Fig-1]: Distribution of various histology (n=69)

## DISCUSSION

Open peritoneal biopsy has the advantage of direct visualization of the peritoneum and selection of the biopsy site, with a low operative risk [1]. The positive yield of the open peritoneal biopsy was around 50% in the ascitic cases, but it was only 45.16% in the non ascitic cases. Aguado et al., reported a similar observation with an increased yield of caseating granulomas (85-90%) [2]. P. Das et al., found that the open peritoneal biopsy was a safe procedure [3]. On the other hand, laparoscopic peritoneal biopsy has the advantage of direct inspection and sampling from the abnormal site. The diagnostic yield of laparoscopic peritoneal biopsy was found to be between 80%-95% and the biopsy specimens revealed AFB in 70% to 75% of the cases and caseating granulomas in 90% of the patients [4]. A review of the literature showed that peritoneal deposits were observed in 66%-100% of the patients [5]. A peritoneal biopsy can be done by a blind percutaneous needle insertion but it may involve the risk of bowel perforation and a chance of lowering the diagnostic yield because of the non visualization of the peritoneum.

We found that a chronic, non-specific, abdominal pain and diffuse abdominal tenderness were the reliable clinical manifestations of abdominal tuberculosis. The presence of other factors such as

general ill health, disturbed bowel habits, a present or past history of tuberculosis, a doughy abdomen, ascites, anaemia, malnutrition etc. augmented the probability of abdominal tuberculosis, particularly in India. USG of the abdomen was found to be a useful tool as we could detect abdominal lymphadenopathy or lumps in approximately half of the cases in which USG-guided FNAC could be performed. The ascitic fluid examination revealed a lymphocytic predominantly exudative fluid in all the cases. This finding was similar to that which was observed by Marshall GB et al., [6]. Mycobacterium could be isolated in 3 cases(4.3%) in our study and this was comparable with the reports of Mohammed El Abkari et al and Dhiman RK [5,7]. Khan R et al., observed that the mycobacterial culture was positive in 7 % [8] of the cases.

Name of author	Year	Number of patients	Caseating granuloma (%)	Non caseating granuloma (%)
H.S Shukla yet al [9]	1982	88	80	20
Nafeh MA et al[10]	1992	200	33	60
Md El Akbari[5]	2006	123	86.18	4.88
A . Mondal et al	2011	69	47.83	24.64

[Table/Fig-2]: Comparison of various study

When the findings of various studies were compared, the yield of the peritoneal biopsy under laparoscopy or laparotomy which detected the proportion of caseating and non caseating granulomas was found to vary from 47.83% to 86.18% and from 4.88% to 20% respectively [4,9]. It is apparent from [Table/Fig-2] that the yield of the caseating granulomas was higher as compared to that of the non caseating granulomas. Surprisingly, in one study which was done by Nafehma et al., the ratio between the caseating and the noncaseating granulomatous lesions was seen just in a reverse fashion [10]. In our study, the mycobacterial culture was positive in 18% of the cases, whereas Khan et al., [8] found that it was positive in 7% of the cases.

Overall, our yield by open peritoneal biopsy through a small incision below the umbilicus was 52.2% and this was comparable with the yield of Singh et al. They found caseating granulomas in 64% of the subjects by making incisions in the right iliac fossa. P.Das and Shukla et al found significantly better yields of 88% and 42% in the ascitic and the non-ascitic cases respectively. We found open peritoneal biopsy to be safe with a few incidences of manageable minor complications .

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