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**Original Research Article**

# Role of laparoscopy in treatment of tubercular pyoperitoneum

**Anubhav Goel[1]*, Ankur Bansal[2], Jitendra Rana[1], Chandrodaya Kumar[1]**

[1]Department of Surgery, Sarojini Naidu Medical College, Agra, Uttar Pradesh, India
[2]Department of Surgery, S. R. Hospital, Agra, Uttar Pradesh, India

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***Correspondence:**
Dr. Anubhav Goel,
E-mail: dranubhav1234@yahoo.com



## ABSTRACT

**Background:** Abdominal TB, which may involve the gastrointestinal tract, peritoneum, lymph nodes or solid viscera, constitutes up to 12% of extrapulmonary TB and 1-3% of the total. Tuberculosis can involve any part of the gastrointestinal tract and is the sixth most frequent site of extrapulmonary involvement. Both the incidence and severity of abdominal tuberculosis are expected to increase with increasing incidence of HIV infection. Peritoneal tuberculosis occurs in three forms: wet type with ascitis, dry type with adhesions, and fibrotic type with omental thickening and loculated ascites. Aim of the present study was to evaluate the role of laparoscopy in cases of pyoperitoneum.
**Methods:** In present study authors included the cases of pyoperitoneum which is diagnosed by ultrasound aspiration and no sign of perforation of bowel and is hemodynamic stable.
**Results:** A total of 14 cases of pyoperitoneum were included. All underwent diagnostic laparoscopy. 3 had underlying ruptured appendicitis and excluded from study. Rest 11 had no perforation associated with it. 7 were female and 4 were male. Through lavarge of peritoneum done and drain placed in pelvis. Fluid was sent for ADA estimation which was increased in all eleven cases. DOTS treatment was started in all cases and they respond well to treatment in 6 month follow up.
**Conclusions:** Tubercular pyoperitoneum is common entity in surgical setting. Laparoscopy has got encouraging role in these cases as it avoids laparotomy and complications associated with it.

**Keywords:** Laparoscopy, Pyoperitoneum, Tubercular

## INTRODUCTION

Tuberculosis (TB) is a re emerging global emergency which is further complicated by AIDS/HIV infection and the use of immunosuppressant drugs.[1] The disease may involve any body system and in the abdomen it can mimic many conditions, like inflammatory bowel disease, malignancy and other infectious diseases.[2,3] Untreated or delayed treatment can result in life long morbid complications. It is therefore necessary to recognize the disease early and initiate treatment for this curable disease. Approximately one-eighth of total TB cases are extra-pulmonary. Abdominal TB, which may involve the gastrointestinal tract, peritoneum, lymph nodes or solid viscera, constitutes up to 12% of extrapulmonary TB and 1-3% of the total. Tuberculosis can involve any part of the gastrointestinal tract and is the sixth most frequent site of extrapulmonary involvement. Both the incidence and severity of abdominal tuberculosis are expected to increase with increasing incidence of HIV infection. 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.[4]

Peritoneal tuberculosis occurs in three forms: wet type with ascitis, dry type with adhesions, and fibrotic type with omental thickening and loculated ascites.

## METHODS

This is a prospective, descriptive observational study conducted in department of surgery Sarojini Naidu Medical College, Agra. All the patients of abdominal pyopertoneum which is diagnosed by ultrasound aspiration and no sign of perforation of bowel and is hemodynamic stable between the periods January 2016 to July 2017 in various surgical units in the department were included for the study. Perforation peritonitis, appendicitis, pancreatitis, trauma, pus after ascetic fluid aspiration were excluded from the study. The demographic profile, clinical presentation, baseline and specific investigations, operative procedure and findings, histopathology, and anti-tubercular therapy administered were noted. Any complications during the course of hospitalization and final surgical outcome were also noted down. All data collected and recorded.

## RESULTS

A total of 14 cases of pyoperitoneum were included. All underwent diagnostic laparoscopy. 3 had underlying ruptured appendicitis and excluded from study. Rest 11 had no perforation associated with it. 7 were female and 4 were male. Age of the patients ranges from 21 to 63 years. 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. Out of 11 cases 8were underweight (BMI <18.5 Kg/m$^2$). Rest 3 were normal BMI (18.5 -24.99 Kg/m$^2$).

**Table 1: study parameters.**

| Particulars | Male | Female |
|---|---|---|
| Number | 4 | 7 |
| Age (median) | 31.6 years | 34.4 years |
| BMI (kg/m$^2$). | 18.2 | 18.1 |
| Haemoglobin (mean) gm% | 8.3 | 8.6 |
| ESR | 39 | 48 |
| Serum albumin level (mean) g/dl | 1.8 | 1.8 |
| Primary abdominal tuberculosis | 3 | 6 |
| Pulmonary tuberculosis | 0 | 2 |

The median haemoglobin level and ESR were 8.45 and 46 mm/hr respectively. Serum albumin was less than 2.5g/dl in 10 patients (90.9%), indicating low nutritional state. The median serum albumin level was 1.8 g/dl. Chest X-ray was done for all cases. Findings suggestive of pulmonary tuberculosis was present in two patients, both having apical lesions.

Through lavage of peritoneum done and drain placed in pelvis. Fluid was sent for ADA estimation which was increased in all eleven cases. The majority i.e. 9 of patients had primary abdominal tuberculosis (81.8%) and the remaining 2 were associated with pulmonary tuberculosis (18.2%). There were no HIV positive cases.

DOTS treatment was started in all cases and they respond well to treatment in 6 months follow up.

## DISCUSSION

The causative organism for abdominal TB is usually mycobacterium tuberculosis or mycobacterium avium – intracellularie, the latter being more common in immuno-compromised hosts.[5] Abdominal TB is usually caused by injestion of bacilli in infected sputum or contaminated food. The bacilli cause caseation necrosis in the intestine, followed by spread to the mesenteric lymph nodes that may rupture into the peritoneum causing TB peritonitis.[6-8] Another mechanism behind is the hematogenous spread of the bacilli from localized foci of recent or old infection.[9,10]

World Health Organization (WHO) declared it a global emergency and is the most important communicable disease worldwide.[11] 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.

Peritoneal TB is the most common form of abdominal TB and involves alone or in combination the peritoneal cavity, mesentry and omentum. Three types of peritoneal TB are described.[7-9] 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.

In Africa, about 70% of patients with abdominal tuberculosis present with ascites; in India only about 10% of them do.

Tuberculous peritonitis was first described in 1843.[12] It is especially common in those patients with risk factors such as an immunocompromised state, chronic kidney disease, or cirrhosis/liver disease.

Diagnosing this condition is difficult, given the subacute nature of the disease and its nonspecific and variable complaints. Additionally, comorbid conditions (for example, cirrhosis) and/or age may mask the symptoms or lead to an atypical presentation. Most commonly, patients present with ascites (93%), abdominal pain (73%), and fever (58%). In addition, many patients present with distended, tender abdomens, but otherwise physical examination signs are typically nonspecific. Diagnosis is typically via ascitic fluid analysis with SAAG calculation, microbiological tests (mycobacterial

culture growth), peritoneal biopsy, laparoscopy, or minilaparotomy.[13]

CT analysis of the pattern of abdominal TB revealed peritoneal involvement in 38/49 (77.5%) cases and was classified as "wet peritonitis" defined as free or loculated ascites of large or small volume, depending upon the depth of ascites (whether more or less than 3 cm respectively; or "dry peritonitis" represented by peritoneal mesenteric or omental thickening or mass but without ascites. Wet peritonitis [21/38 cases (52.3%)] and the the "dry" type [17/38 (45.7%)] were both commonly seen.[14] CT demonstrates the ascitic fluid to have higher attenuation values, a thickened peritoneum diffusely, and omental changes (such as irregular soft-tissue densities).[15] Mesenteric lymph nodes may be evident as well. CT can also help distinguish between this condition and peritoneal carcinomatosis, which typically has more nodular implants and a more irregular peritoneal thickening pattern. US is better at revealing the multiple small septations in the peritoneum.[13]

Ultrasound usually shows findings of a mesenteric thickness of >15mm, an increase in mesenteric echogenicity, and mesenteric lymphadenopathy.[16] Another study concluded that both CT and US should be used together for an accurate diagnosis, with CT showing omental thickening more accurately and US showing the fine, mobile septations in the peritoneum more accurately.[17]

Adenosine deaminase (ADA) activity in ascitic fluidis a sensitive and specific marker for tuberculosis.[18] ADA is an enzyme present in T-lymphocytes and macrophages, hence, its levels increase due to stimulation of T-lymphocytes in response to CMI to mycobacterial antigens. Dwivedi, et al have shown a sensitivity and specificity of 100 and 97% respectively when the cut off value of 33U/L was taken.[18] Similarly, ascitic fluid to serum ADA ratio >0.985 was also found to be suggestive of tuberculosis. Falsely low levels of ADA can be found in immunocompromised individuals.

The treatment of abdominal tuberculosis is on the same lines as for pulmonary tuberculosis. Conventional antitubercular therapy for at least 6 months including initial 2 months of HREZ (e.g. isoniazid, rifampicin, ethambutol and pyrazinamide) followed by 4 month HR is recommended in all patients with abdominal tuberculosis. However, previously, the antitubercular therapy was extended upto 8 to 12 months, but recently, a 6 month short course chemotherapy regimen has been found as effective as standard 12 months regimen. However, many physicians still extend the duration of treatment to 12 to 18 months.[19]

## CONCLUSION

Tubercular pyoperitoneum is common entity in surgical setting. Laparoscopy has got encouraging role in these cases as it avoids laparotomy and complications associated with it.

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