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Case Report Open Access

Mini Review Over Peritoneal Tuberculosis in a Middle-Aged Man

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Abstract

Peritoneal Tuberculosis (pTB) is a rare manifestation of Mycobacterium tuberculosis. It may occur along with or in the absence of pulmonary TB. The presenting symptoms of ascites, weight loss, and abdominal pain are vague and can mimic that of abdominal malignancies. This report describes a previously healthy 31-year-old man with peritoneal pTB who presented for abdominal pain after a motor vehicle collision (MVC). A constellation of positive gross visualization of white tubercles, ascitic acid fast bacilli, noncaseating granulomas, elevated adenosine deaminase, and mycobacterium culture confirmed the diagnosis of pTB. This report will review the diagnostic approach to pTB.

Keywords: Tuberculosis; Peritoneal Tuberculosis; Case Report; Mycobacterium Tuberculosis; Clinical Pathology; Diagnostic Workup

Abbreviations TB: Tuberculosis; pTB**:** Peritoneal Tuberculosis**;** MVC: Motor Vehicle Collision; ED: Emergency Department; ADA**:** Adenosine Deaminase; AFB**:** Acid Fast Bacilli

Introduction

Peritoneal tuberculosis most often presents as abdominal pain and ascites. It can occur most commonly following re-activation of a latent focus of tuberculosis. Peritoneal tuberculosis is a disease which cans mimick malignancy especially in men who present with ascites and elevated CA125 levels.

Case Presentation

Tuberculosis (TB) is caused by infection of Mycobacterium tuberculosis and is commonly spread from an infectious pulmonary TB patient via aerosolized droplets from coughing, sneezing or speaking. Pulmonary TB makes up most United States (US) cases; infrequently manifestation can occur as extrapulmonary TB such as pTB. TB is rare in US born citizens, but there is a higher incidence seen in HIV patients, men, the African American community, and elderly whites with reactivation of latent TB. The nonspecific symptoms (abdominal swelling, abdominal pain, fever, and weight loss) can be similar to carcinomatosis, making pTB challenging to diagnose unless there is a high index of suspicion [1].

We report a 31-year-old African American male presented to the emergency department (ED) with nausea, vomiting, and severe abdominal pain hours after a motor vehicle collision (MVC). He reports the abdominal pain as constant and 10/10 intensity. On physical exam, the patient appeared in acute distress, alert and interactive. Vital signs of the patient were in the normal ranges. There was no evidence of blunt trauma to the head, chest or abdomen, but was diffusely tender to abdominal palpation with some guarding.

Results

CT imaging was performed in the ED with significant findings of diffusely increased density throughout the mesentery as well as ascites and concern of possible small bowel injury in Figure 1a, 1b.

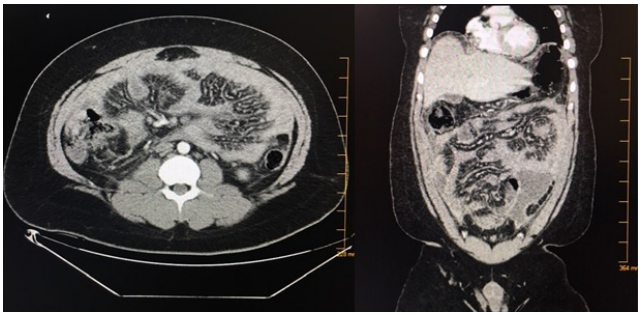

Figure 1a, 1b: Preoperative computed tomography abdominal scan with contrast in transverse & sagittal plane showing matted small intestine contents (a, b) and ascitic fluid (b, arrow).

The patient was then taken to the operating room for exploratory laparotomy. Upon visualization, numerous dense white tubercles were apparent, and it was noted the patient's peritoneum was adhering to the underlying viscera with a thick covering resulting in a frozen abdomen in Figure 2a, 2b.

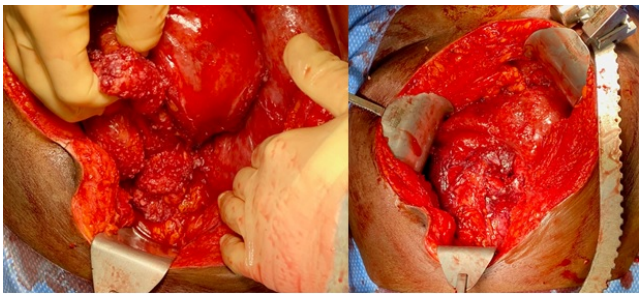

Figure 2a, 2b: Intraoperative exploratory laparotomy gross anatomy picture showing white tubercles diffusely spread throughout small and large intestines (a) & frozen abdomen and serosal tear (b, dashed lines).

At this time there was a great concern for diffuse carcinomatosis. Intraoperative frozen section biopsies of peritoneum, tubercles, and ascitic fluid were obtained for further evaluation. A small bowel serosal tear which was thought to be the cause of the patient's acute abdominal pain was discovered and repaired.

Postoperatively, further history was obtained from the patient. He reported two months of mild abdominal pain, increased fatigue, and an unspecified amount of weight loss. Past social history was significant for incarceration in August of 2020 given a PPD test with positive results. The patient reports a reaction to the PPD test but was told this was an "Allergy" and no treatment was offered.

With the newly understood history plus the intraoperative findings further studies were obtained to discern between peritoneal carcinomatosis versus peritoneal fungal infection. The peritoneum tubercles biopsy demonstrated necrotizing granulomatous inflammation and two acid fast bacilli (AFB) identified in giant cells, no malignant cells were noted. Tissue culture suggested presumptive mycobacterium other than Mycobacterium tuberculosis complex while broad-spectrum polymerase chain reaction (PCR) was negative. Adenosine deaminase (ADA) level in the ascites was 61.7 unit/L (normal range: <7.6 unit/L). QuantiFERON test was indeterminate and sputum AFB smear was negative. Chest X-ray and CT demonstrated no findings of pulmonary TB. Post-operative the patient was started on standard TB therapy and discharged home with clearance from the Department of Health.

pTB usually occurs via hematogenous spread from a primary lung focus. This latent infection will reactivate in the peritoneum, causing the clinical disease usually in the absence of active lung disease, but can rarely occur during active pulmonary or miliary TB [1]. pTB can also be secondary to lymph node rupture, transmural spread from an infected small intestine or continuous spread from tuberculous salpingitis in females [1].

The most common symptoms of pTB are abdominal swelling, abdominal pain, fever, and weight loss [1]. These symptoms will typically persist for several weeks to months. The most predominant clinical finding is ascites which occurs in 73% of patients [2]. Numerous studies state tuberculosis must be a differential when ascites is found especially in the absence of liver disease.

The workup of pTB with the common presenting symptom of abdominal pain is as follows. Initial abdominal imaging is performed with CT. CT can demonstrate ascites, hypodense center lymph nodes, thickening of the mesentery and omentum, thickening of the peritoneum, and agglutination of the intestinal loops. An ascitic patient observed on CT will typically undergo paracentesis for peritoneal fluid analysis. The fluid of pTB will typically have lymphocytosis and elevated ADA levels, with a cut-off of >30 U/L, with a sensitivity and specificity of over 90% in many studies [2,3]. If the ADA value is <30 this is suggestive of peritoneal carcinomatosis [3]. Also, histopathology of the ascitic fluid with the presence of caseating granulomas with or without AFB can highly suggest a diagnosis of pTB. If ascites is absent or if the ascitic fluid analysis is equivocal then peritoneal biopsy is suggested [3]. Peritoneal tissue biopsy can be performed laparoscopically or with a Cope's needle. Laparoscopic is preferred because it enables gross inspection, tissue specimen histology and culture analysis. Gross visualized findings can show thickened peritoneum with miliary yellow-white tubercles with or without adhesions or fibroadhesive pattern [4]. Laparoscopy yields a specificity and sensitivity of 93% and 98% [3]. Even in the absence of bacteriological confirmation, the gold standard, the characteristic gross appearance itself can be sufficient to diagnose pTB [4]. pTB diagnosis cannot be made with a single diagnostic study, but multiple diagnostic studies are essential to yield a definitive diagnosis. Nonetheless, prompt initiation of antituberculosis therapy is vital to reduce the risk of mortality in patients.

pTB should be treated with same therapy regimen of standard pulmonary TB. A two-month phase of isoniazid, rifampin (Rifadin), pyrazinamide, and ethambutol (Myambutol) followed by four months of isoniazid and rifampin (Rifadin). This pharmacological treatment will be sufficient to resolve the majority of uncomplicated pTB cases.

In our case the patient presented with abdominal pain following an MVC led to an incidental finding of pTB. The patient had symptoms of abdominal pain, malaise and weight loss for two months prior to presentation. If there wasn't an MVC his pTB might not have presented for several more months due to the insidious disease process. The exploratory laparotomy was favorable to enable an early diagnosis of pTB. The gross visualization of the frozen abdomen with multiple tubercles indicated a differential diagnosis of tuberculosis verse carcinomatosis. Further history was taken from the patient post operatively identifying his incarceration and positive PPD test led to a diagnostic workup for mycobacterium tuberculosis. The ADA of 61.7 unit/L (normal range: <7.6 unit/L) and the tissue histology demonstrating necrotizing granulomatous inflammation with two acid fast bacilli (AFB) identified in giant cells indicated tuberculosis, not carcinomatosis. The combination of patient history, gross peritoneal findings, ADA and histological diagnostic tests lead our team to diagnose pTB. In conclusion, in the case of abdominal pain with nonspecific symptoms, ascites found on CT should prompt peritoneal tuberculosis as a differential diagnosis especially in absence of chronic liver disease.

Discussion

pTB accounts for a small portion of tuberculosis cases, but it has seen a rise in cases throughout the world including in developed countries secondary to the rise in HIV cases. As more cases are documented physicians should be more aware of the presentation.

Conclusion

It is vital clinicians increase their index of suspicion of the nonspecific signs and symptoms of pTB. This emphasizes the value to obtain a thorough history and physical from the patient and family.

This report depicts a previously healthy 31-year-elderly person with peritoneal pTB who introduced for abdominal pain after a motor vehicle collision (MVC). A constellation of positive gross representation of white tubercles, ascitic acid fast bacilli, noncaseating granulomas, raised adenosine deaminase, and mycobacterium culture confirmed the diagnosis of pTB. This report will review the diagnostic approach to pTB.

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