Peritoneal Tuberculosis in a Male with No Risk Factors

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Introduction

Peritoneal tuberculosis (TB) accounts for 6.1% of extrapulmonary TB cases in the United States and is associated with mortality of around 19%[1]. The diagnosis of peritoneal TB is difficult given its rarity in developed countries, insidious onset, and variable presentations. We present a case of a patient without TB risk factors who developed new onset abdominal ascites and was found to have peritoneal TB.

Case Description

A middle-aged man was sent to the hospital for intermittent fevers and newly elevated liver tests. He also reported a 100-pound intentional weight loss over the past 2 years. He had no known exposure to TB, was born in the US, had not travelled internationally, was never incarcerated, had never lived in a shelter, had no history of IV drug use, works as a bus driver, and lives in the Bronx, New York.

Initial labs were significant for AST 141 U/L, ALT 48 U/L, alkaline phosphatase 242 U/L, albumin 2.6 g/dL, total bilirubin 2.2 mg/dL, direct bilirubin 1.4 mg/dL, a platelet count of 79K/µL, and INR of 1.5. Computed tomography imaging showed left lung upper lobe micronodules (Figure 1), heterogenous-appearing liver, splenomegaly, and large volume abdominal ascites. Mediastinal, lower thoracic, and abdominopelvic lymphadenopathy was also present (Figure 2). Diagnostic paracentesis yielded WBC of 3,300 cells/µL with lymphocytic predominance (82%) and a low serum albumin ascites gradient (SAAG) of 0.8 g/dL. Fluid culture and cytology were negative for bacteria and malignant cells. Ceftriaxone was started for spontaneous bacterial peritonitis given presence of elevated ascitic neutrophils (363 cells/µL).

Liver biopsy revealed 40% macro-vesicular steatosis, mixed portal inflammation, and moderate fibrosis (stage 2/4) consistent with nonalcoholic steatohepatitis. Other tests to evaluate for underlying malignancy were normal. A bone marrow biopsy showed normocellular marrow.

Given presence of lung nodules and marked peritoneal lymphocytosis, a QuantiFERON-TB gold test was sent, which returned positive. Three AFB sputum smears were negative. Repeat paracentesis found an elevated adenosine deaminase (114.4 U/L), consistent with TB. Given concern for active TB, the patient was started on empiric RIPE therapy, after which the patient defervesced and remained afebrile. Three weeks after hospital discharge, the AFB culture from ascitic fluid became positive for growth of mycobacterium tuberculosis. Based on the susceptibility profile, RIPE therapy was de-escalated to isoniazid and rifampin.

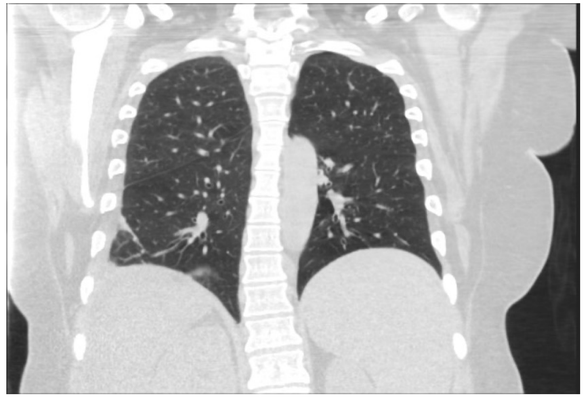

Figure 1: Chest CT showing left upper lobe micronodules

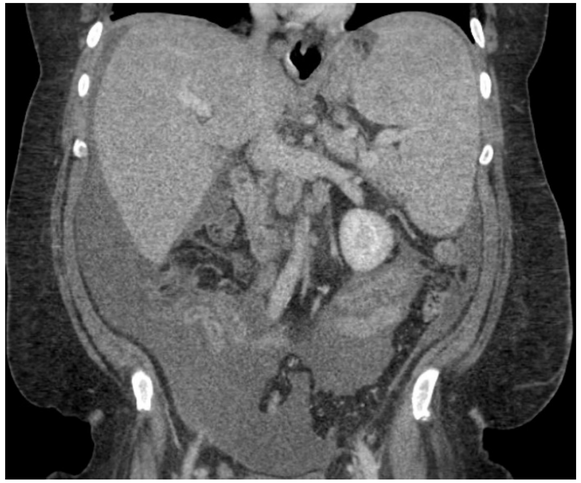

Figure 2: Abdominal CT showing heterogenous-appearing liver, splenomegaly, large volume ascites, as well as mediastinal, lower thoracic, and abdominopelvic lymphadenopathy

Discussion

This case illustrates peritoneal TB in an immunocompetent patient with no known risk factors. The only identifiable risk factor for TB is that the patient lives in the Bronx. In 2020, amongst the boroughs of NYC, the Bronx had the second highest incidence rate of 5.5 per 100,000[2].

Peritoneal TB is difficult to diagnose due to its insidious nature and varying clinical features. Ascitic fluid analysis usually shows lymphocytic predominance with SAAG below 1.1 g/dL. Diagnostic gold standard is the Mycobacterium culture from ascitic fluid samples or peritoneal biopsy specimen. However, sensitivity of AFB smear and mycobacterial cultures in ascitic fluid for diagnosing peritoneal TB is ~3% and < 20%, respectively[3-4]. Furthermore, these tests are not appropriate for prompt diagnosis because they typically require more than 3-4 weeks of incubation. Although peritoneal biopsy can be diagnostic in up to 95% of cases and pathologies revealing caseating granulomas have almost 100% sensitivity[1], it holds inherent procedural risks.

Multiple studies have shown that measurement of ADA can assist in the diagnosis of peritoneal TB. ADA level above 30 U/L is known to have a sensitivity of 94% in diagnosing peritoneal TB[4]. In a meta-analysis of 12 prospective studies, it was shown that by using cut-off values between 36 and 40 U/L, with an optimal value of 39 U/L, ADA levels had a 100% sensitivity and 97% specificity in diagnosing peritoneal TB[5].

Reaching the final diagnosis for this case was challenging as TB was not high on the differential due to lack of appreciable risk factors. Given its high mortality, early diagnosis and initiation of treatment are essential. Our case highlights the importance for clinicians to consider peritoneal TB in patients with lymphocytic ascites with a SAAG of < 1.1 g/dL. Furthermore, in cases where definitive diagnosis of TB is difficult, elevated ascitic fluid ADA may be helpful in initiating prompt treatment while awaiting culture results and helping to avoid invasive peritoneal biopsy.

References

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