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Peritoneal Tuberculosis

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Introduction

Peritoneal tuberculosis occurs most commonly following reactivation of latent tuberculous foci in the peritoneum established via hematogenous spread from a primary lung focus. TB peritonitis can also occur via hematogenous spread in the setting of active pulmonary TB or miliary TB. Much less commonly, tuberculous mycobacteria enter the peritoneal cavity transmurally from an infected small intestine or via contiguous spread from tuberculous salpingitis [1]. AFB Culture of peritoneal specimen might be the only positive result with negative AFB smear and tissue PCR. Necrotizing epithelioid granuloma is the hallmark of tuberculous lesion however non-necrotizing granuloma formation in the tissue could be encountered in some cases as in our case. We describe a 46 -year-old Mexican man with abdominal distention and pain that was found on CT of abdomen to have omental stranding and nodularity. Patient underwent diagnostic laparoscopy. Peritoneal and omental specimens showed non- necrotizing granulomas with negative AFB stain but positive Mycobacterium tuberculosis culture.

Case presentation

A 46 -year-old Mexican man with no significant past medical history was presented to our hospital with abdominal pain for 2 weeks. The pain is tearing in character, moderate in intensity, radiating to left leg, associated with nausea and decreased appetite. He has been constipated for past few days. He is originally from Mexico and has been living in US in the last 20 years. He works as a construction worker and denies any toxic habits. Also, he denies fever, night sweats, weight loss, recent travel, sick contact, shortness of breath, chest pain or cough. Upon arrival to ER, vital signs of the patients were in the normal ranges with 98.4 F body temperature, 133/83 arterial blood pressure, and slightly tachycardic with 109/min heart rate. Pertinent examination findings were distended abdomen with positive fluid thrill. Laboratory tests were remarkable for low albumin at 3.3 mg/dl, direct bilirubin at 1.3 mg, alkaline phosphatase at 186 U/L, AST at 73 U/L. Tumor markers were remarkable for elevated CA125 at 278 U/ml (normal <=38 u/ml). Viral hepatitis and other work up of chronic liver disease were unremarkable. Chest radiograph did not demonstrate features suggestive of pulmonary tuberculosis (fig 1). Plain upright abdominal X-ray showed nonspecific bowel gas dilatation in the mid abdomen. There is air overlying the rectum without presence of air fluid levels in the loops or free gas under the diaphragm (fig 2). Contrast enhanced CT of abdomen revealed marked hypodense left adrenal thickening, moderate to large volume loculated ascites with questionable mild omental stranding and nodularity and porcelain gallbladder (fig 3 A, B, C). Ascitic fluid analysis revealed lymphocytic predominance and low serum-ascites albumin gradient 1.1 g/L (SAAG). Acsitic fluid AFB stain, culture and PCR were negative. PPD test showed 13mm induration, Interferon gamma release assay was indeterminate initially and repeated test showed positive result. Whole body PET scan reported hypermetabolic left adrenal mass measuring 4.9 x 3.2 cm with intermediate attenuation, also metabolically active throughout the peritoneum with nodular thickening likely representing peritoneal carcinomatosis with large amount ascites. Work up of adrenal incidentaloma were unremarkable. Diagnostic abdominal laparoscopy was performed and revealed extensive peritoneal studding (fig 4 A, B), peritoneal biopsy was sent for AFB stain, culture, PCR, as well as histopathology evaluation. Biopsy of peritoneal lesion revealed non-necrotizing epithelioid granulomas with multinucleated giant cells which was negative for AFB stain (fig 5 A, B). Infectious disease team was consulted. They recommended to rule out pulmonary tuberculosis, three sets of AFB sputum cultures were negative. Patient was started on empiric antituberculous therapy (Isoniazid, Rifampin, Pyrazinamide and Ethambutol). Patient was discharged home awaiting for final culture's result. Few days later tuberculous PCR came back negative. The culture of the biopsied specimen grew Mycobacterium tuberculosis 6 weeks later that was pan-sensitive to 4 antituberculus drugs. A diagnosis of peritoneal tuberculosis was confirmed. After 2 months of treatment, patient reported good clinical response and ascites has been resolved gradually.

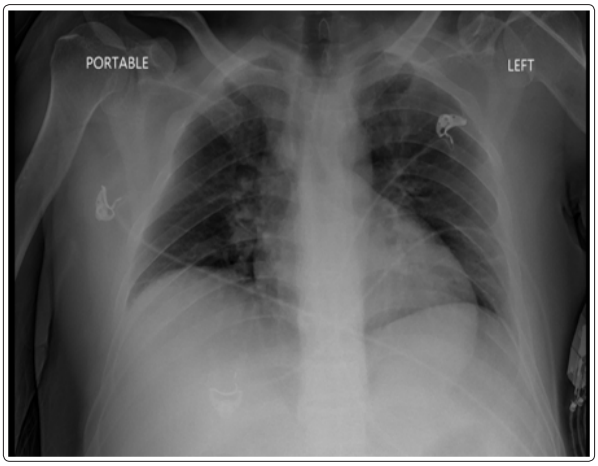

Figure 1: CXR shows no radiographic evidence of acute pulmonary disease

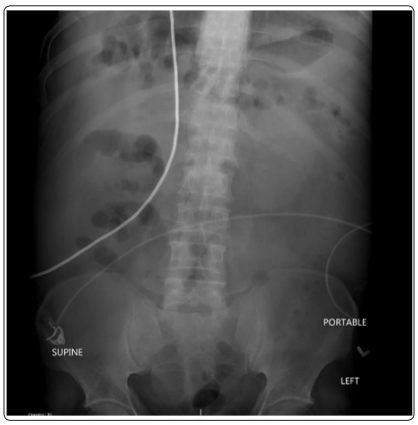

Figure 2: Plain XR shows nonspecific bowel gas dilatation in the mid abdomen. There is air overlying the rectum

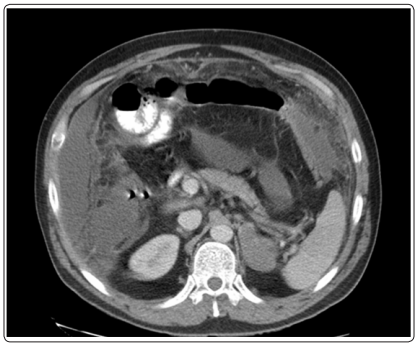

Figure 3 A: CT abdomen shows marked hypodense left adrenal thickening, likely secondary to benign hyperplasia or adenomas

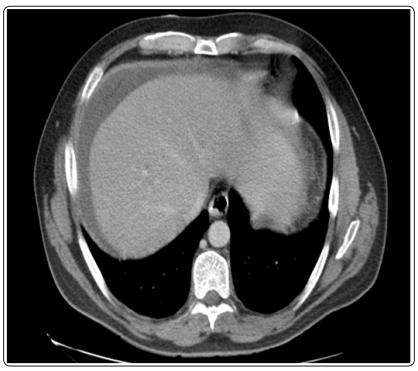

Figure 3 B: CT abdomen shows moderate to large volume loculated ascites with questionable mild omental stranding and nodularity

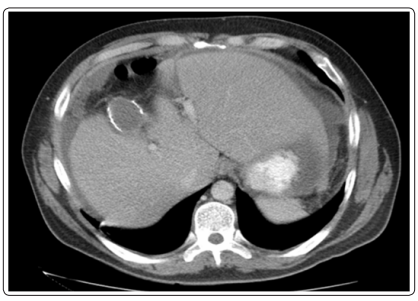

Figure 3 C: CT abdomen shows Porcelain gallbladder

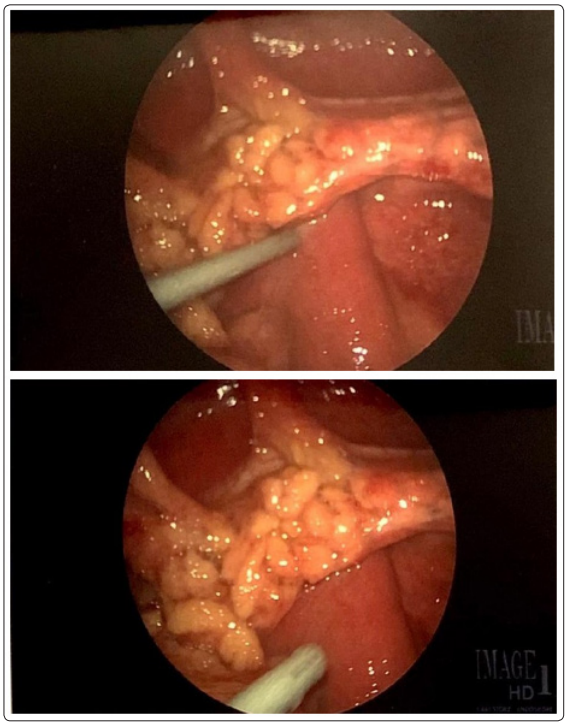

Figure 4: Abdominal laparoscopy shows extensive peritoneal studding

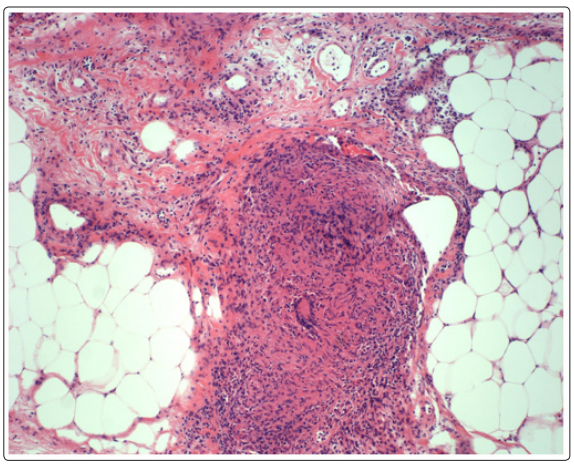

Figure 5 A: Histopathologic finding of non-necrotizing epithelioid granuloma involving the peritoneal tissue (H&E stain, original magnification X100).

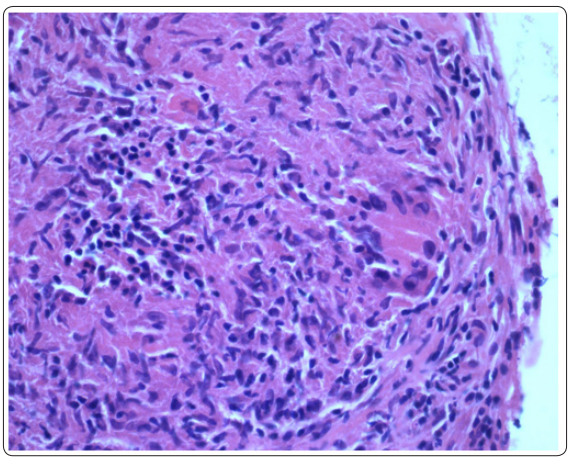

Figure 5 B: Higher magnification of the same lesion showing multinucleated giant cells, epithelioid cells, plasma cells and lymphocytes (H&E stain, original magnification X400)

Discussion

Peritoneal tuberculosis is a very rare disease in developed countries butalways should be considered in developing countries. It accounts for 0.1% to 0.7% of tuberculosis cases [2]. Abdominal tuberculosis is a disease that poses a diagnostic challenge, as the nonspecific features of the disease may lead to diagnostic delays and development of complications. This condition has a vast range of symptomatology that mimics other abdominal pathology (e.g. Crohn's disease, colon cancer). ADA level above 30 U/L is known to be 94% sensitive in diagnosis of peritoneal tuberculosis; however, the sensitivity is much lower in patients with cirrhosis [3]. By using cut-off values between 36 and 40 IU/L it was shown that the ADA levels had 100% sensitivity and 97% specificity in a meta-analysis of 12 prospective studies [4]. In our case serum CA-125 concentrations was elevated but no evidence of malignancy was found, so elevated CA-125 cannot differentiate between peritoneal tuberculosis and malignancy [5]. AFB smear is positive only in about 3% of cases and has very low yield. PCR analysis in body tissues has 95% sensitivity in smear positive patients, but sensitivity is 48% in smear negative patients, however, PCR does not replace the roles of AFBsmear and culture in the diagnostic algorithm for TB; culture is required for confirmation of identification and for drug susceptibility testing [3]. By histopathology, the presence of necrotizing granulomas, with or without demonstration of AFB, is suggestive of tuberculosis but is not pathognomonic. Peritoneal tuberculosis can present in various nonspecific forms including non- necrotizing granulomas with a positive culture for Mycobacterium Tuberculosis and should undergo pharmacological therapy immediately with appropriate anti-tuberculosis medications after other causes have been excluded [6].

Conclusion

In any patient with abdominal pain, fever, and lymphocytic dominant ascites with SAAG < 1.1 g/L, TB peritonitis should be considered in differential diagnosis. The negative result of PCR does not exclude tuberculous disease.

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