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Case Report

Peritoneal Tuberculosis: A Rare Mimic of Ovarian Malignancy

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Abstract

In this case, we discuss a 46-year-old female with peritoneal tuberculosis. Although, a rare diagnosis, incidence is on the increase and due to globalization, it is becoming a more common condition worldwide. The patient presented with vague abdominal symptoms namely abdominal distension and discomfort which further delayed the diagnosis. Ultimately, a diagnosis was achieved from histological findings and ascitic fluid analysis. This indicates the importance of having a high clinical suspicion for the condition since there no characteristic clinical features and investigations may be inconclusive.

Keywords: *Peritoneal Tuberculosis; Ascites; Ovarian Malignancy; CA125*

Abbreviations

CT: Computed Tomography; TAP: Thorax, Abdomen and Pelvis; TB: Tuberculosis; PCR: Polymerase Chain Reaction; MC&S: Microscopy, Culture and Sensitivity; FFPE: Formalin Fixed and Paraffin Embedded

Introduction

Peritoneal tuberculosis is a rare form of extra-pulmonary tuberculosis. Additionally, it is a clinically challenging diagnosis to make and its low incidence in developed regions may aggravate this challenge. A delay in diagnosis and treatment of peritoneal tuberculosis may worsen clinical outcomes. Patients with peritoneal tuberculosis may be misdiagnosed as having ovarian cancer, as similarly it commonly presents with ascites, abdominal pain and raised CA-125 levels. Moreover, ascites of tuberculosis is an exudative form like in malignancy. Thus symptoms, laboratory test and radiological investigations may be similar in the two conditions.

Case Report

A 46-year-old female Filipino healthcare worker with no previous medical history underwent a laparoscopic right salpingo-oophorectomy for a mature cystic teratoma in July 2020. There was no documentation of peritoneal tuberculosis, in her first surgery although histology showed non-necrotising granulomatous changes in the right fallopian tube mucosa.

Nine months later, the patient presented with a four-month history of worsening abdominal discomfort and distension. The patient was investigated with blood tests and radiological investigations. As part of the work up of the patient, a transvaginal ultrasound scan was done which showed an anterior sub-serosal fibroid measuring 3.8 cm x 4.5 cm as well free fluid in the pouch of Douglas and the left and right adnexa. A serum CA125 was taken with the impression that the ascites was secondary to a gynaecological malignancy. The CA125 was noted to be 132 miu/ml. A magnetic resonance imaging of the pelvis was also performed which showed a fibroid uterus with no evidence of uterine malignancy, nonspecific ascites and smooth thickening of the peritoneal lining was noted. An ultrasound guided drainage was performed and ascitic fluid was sent for cytology and biochemistry. Results showed no evidence of malignant cells and biochemistry analysis was inconclusive. Therefore, the initial suspicion of a gynaecological malignancy was excluded however the cause of the ascites was still unknown at this point.

In view of the initial high index of suspicion for malignancy, a staging computed tomography (CT) of the thorax, abdomen and pelvis (TAP) was ordered. This revealed incidental right lung apical and pleural nodules, small tree in bud changes, abdominal free fluid and diffuse peritoneal infiltration. The case was then discussed at a respiratory multi-disciplinary team meeting and it was concluded that the lung changes were in keeping with old tuberculosis (TB). To further confirm these findings, a quantiferon test was performed which turned out positive, and thus anti-tuberculosis treatment for latent tuberculosis was started.

Despite the patient being diagnosed with latent tuberculosis, the patient underwent a total hysterectomy and left salpingo-oophorectomy in view of a fibroid uterus. Operative findings included moderate ascites and multiple whitish nodules covering visceral peritoneum of uterus, left ovary, bowels and omentum (Figure 1 and 2). Histological examination showed disseminated, coalescent, non-necrotising granulomas and miliary tuberculosis was suggested as the most probable cause, with atypical mycobacterial infection, sarcoidosis and postoperative granulomatous peritonitis in differential diagnosis (Figure 3-5). Despite high suspicion of peritoneal TB at this stage, ascitic fluid sent for cytology, mycology, microscopy, culture and sensitivity (MC&S) and biochemistry was negative for mycobacteria. Only when repeated polymerase chain reaction (PCR) testing was done after DNA extraction method was amended, the *Mycobacterium tuberculosis* DNA was eventually detected on the formalin fixed and paraffin embedded (FFPE) hysterectomy samples and ascitic fluid cell blocks (Figure 6). A follow up CT TAP was done 5 months after the surgery which showed no abnormalities.

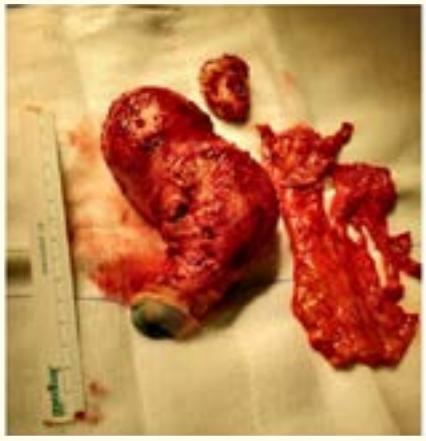

Figure 1: *Uterus, studded with granulomas (left), left ovary (top), omentum (right).*

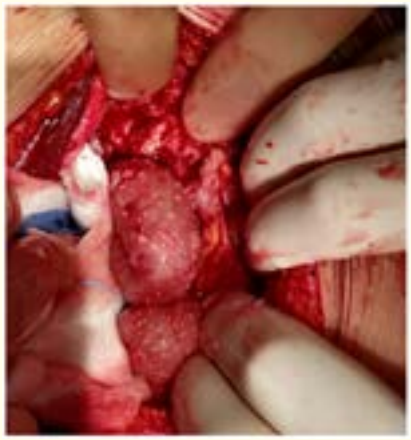

Figure 2: *Small bowel studded with granulomas.*

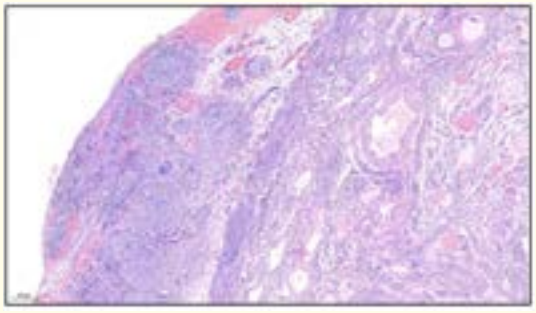

Figure 3: *Uterine body surface confluent but non-necrotizing granulomas (HEx20).*

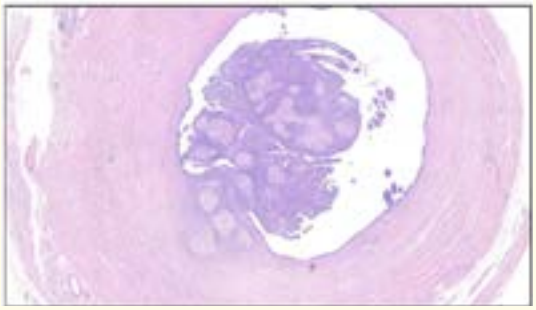

Figure 4: *Granulomatous process involving fallopian tube mucosa (HEx20).*

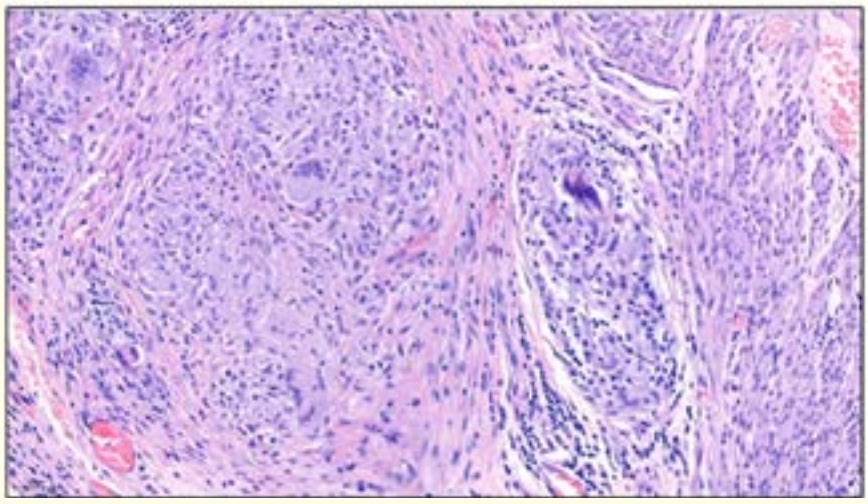

Figure 5: *Confluent non-necrotizing granuloma with multinucleated Langhans type giant cells, higher magnification (HEx200).*

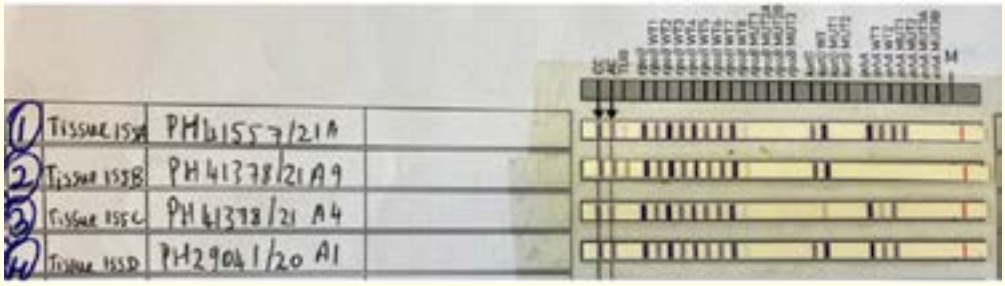

Figure 6: *Banding pattern of Mycobacterium TB resistant to rifampicin and low resistance to isoniazid for several tissues submitted for the patient.*

Discussion

Peritoneal tuberculosis accounts for 0.1 - 0.7% of tuberculosis cases. It is a rare form of tuberculosis, even more so in developed countries [1]. Given the low prevalence of the disease added with the similarity in presentation to abdominal malignancy, peritoneal tuberculosis presents a great diagnostic challenge. As happened in this case, Acid-fast bacilli cultures, can take several weeks for growth, and paracentesis fluid gives poor diagnostic yield (3%) [2]. Whilst there are radiological similarities between peritoneal tuberculosis and carcinomatosis, histology can also offer diagnostic dilemmas [1]. In our case, histologic examination revealed disseminated Langerhans cell type granulomatosis with practically no caseous necrosis and it was reported as suspicious for miliary tuberculosis. Atypical mycobacterial infection should also be considered in the differential diagnosis as well as very uncommon conditions like postoperative granulomatous peritonitis and sarcoidosis [3-6].

A diagnostic dilemma is often experienced when testing for antimicrobial susceptibility from FFPE specimens indicative of *M. tuberculosis* as it is often not feasible via microbiological culture. For this reason, it is ideal to identify or confirm the presence of *M. tuberculosis* and if required, rifampicin and/or isoniazid resistance through nucleic acid amplification. Routinely, DNA is isolated directly from culture or pulmonary/sputum specimens using a rapid manual technique. In this case, however, due to the inability to culture the suspected bacteria from the specimen provided, DNA was directly isolated from FFPE specimens using a magnetic-bead-based automated extraction technology to produce high-quality genomic DNA. Following this, the purified DNA was amplified by means of PCR and the result was interpreted by hybridisation using a DNA-STRIP technology [7]. This molecular line probe assay is able to detect the *Mycobacterium* TB complex, as well as common rifampicin and isoniazid resistance-conferring mutations via specific probes [8]. The probes are highly specific to the amplified complementary DNA strands and therefore discriminate various sequence variations in the gene regions examined, making detection of tuberculosis infection highly accurate.

For this reason, if the clinical suspicion for peritoneal tuberculosis is high, obtaining a peritoneal biopsy and performing MTBDR plus assay should be the gold standard in diagnosing peritoneal TB.

Conclusion

Establishing a diagnosis of peritoneal tuberculosis requires a high index of clinical suspicion. It should be considered as a differential diagnosis in patients who present with symptoms suggestive of abdominal malignancy, especially younger patients and those from a tuberculosis endemic region. This case highlights the diagnostic challenge associated with peritoneal tuberculosis and the importance of the multi-disciplinary approach in reaching an accurate diagnosis. Occasionally, the granulomas seen in TB do not show typical tuberculoid type granulomas with central caseous necrosis. As with the other laboratory tests, one should be aware of potential pitfalls and interpret the negative TB results with caution, even when coming from a sophisticated and well validated tests.

Conflict of Interest

The authors have no conflict of interest to declare.

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