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Case Report

Peritoneal thickening: It's not always carcinomatosis ☆,☆☆

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ABSTRACT

The peritoneal pseudotumor localization of tuberculosis is a rare clinical form, representing 1 to 3% of extrapulmonary site of tuberculosis. It represents the sixth most common extra pulmonary site of tuberculosis. It is a great mimicker with major overlapping clinical and imaging features. Differentiating peritoneal tuberculosis and peritoneal carcinomatosis in imaging remains challenging. We present a case of a 37-year old woman complaining of chronic abdominal pain and distension who has been diagnosed to have peritoneal carcinomatosis based on CT findings, histopathological study then revealed necrotizing, granulomatous inflammation consistent with tuberculosis. This case showed the interest to be aware of the common and uncommon imaging features of tuberculosis by radiologists to better assess for alternative differential diagnosis.

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Introduction

Peritoneal tuberculosis is a public health problem in endemic regions of the world and represent the sixth most common site of extrapulmonary tuberculosis [1]. Most of the clinical and imaging presentations lack specificity and histological analysis is required for definitive diagnosis. Although it is known to be a great mimicker, recognizing the spectrum of CT appearances of peritoneal tuberculosis is important for early diagnosis and treatment.

We present an unusual and interesting case of pseudotumoral peritoneal tuberculosis mimicking peritoneal carcinomatosis.

Case report

We report the case of a 37 year old woman with no prior medical or surgical comorbidities, presenting with a 2 months history of abdominal pain and distension, worsening fatigue and

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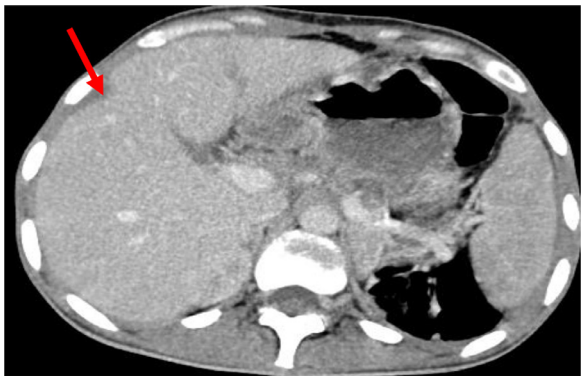

Fig. 1 – Axial contrast enhanced CT of the abdomen showing peritoneal fluid causing scalloping of the liver margins (arrow)

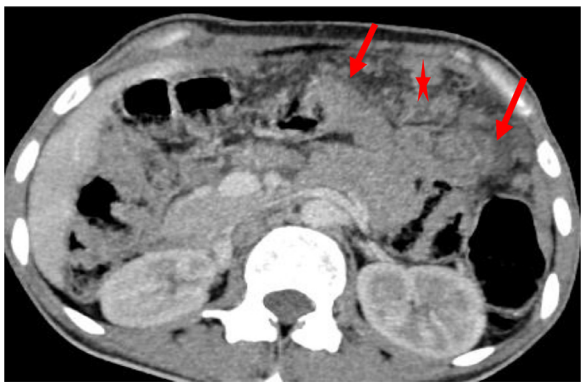

Fig. 2 – Axial contrast enhanced CT of the abdomen showing omental soft tissue infiltration (asterisk) with nodular peritoneal thickening (arrows)

weight loss with a deterioration of the general state and an 8 kg weight loss in 2 months,with a stating weight of 54 kg. Physical examination found abdominal dullness, without tenderness or palpable mass.

Relevant laboratory analysis included: blood cell count with elevated leucocytes, normal creatinine levels, elevated CA 125 with 414.60 U/ml.

She underwent a CT examination of the abdomen showing mild ascites of slightly high attenuation values (38UH) causing scalloping of the liver margins [Fig 1]; omental fat stranding and peritoneal thickening with a nodular infiltration [Fig 2]. Further examination revealed multiple mesenteric lymphadenopathies with underlying diffuse thickening and enhancing of the small bowel wall [Fig 3].

Based on these imaging features along with elevated CA 125 levels, peritoneal carcinomatosis of an ovarian epithelial carcinoma was the first-listed diagnosis.

Then, an ultrasound guided biopsy of a peritoneal nodule was performed.

The histopathological examination of tissue revealed a typical granulomatous reaction associated with tuberculosis infection, showing epitheloid granulomas, with caseating necrosis, giant cells, as well as a chronic inflammatory infil-

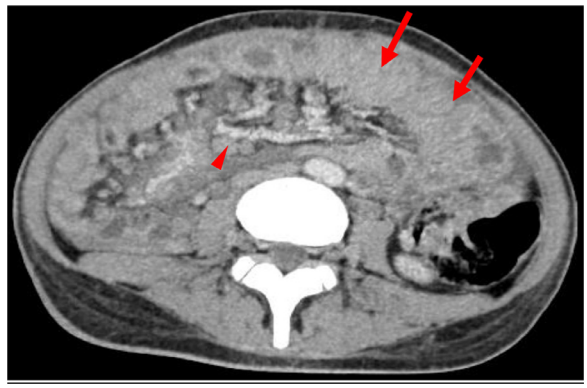

Fig. 3 – Axial contrast enhanced CT of the abdomen showing extensive peritoneal infiltration with omental cake appearance; with diffuse underlying bowel wall thickening (arrows) associated with multiples mesenteric nodules and enlarged lymph nodes (arrow heads)

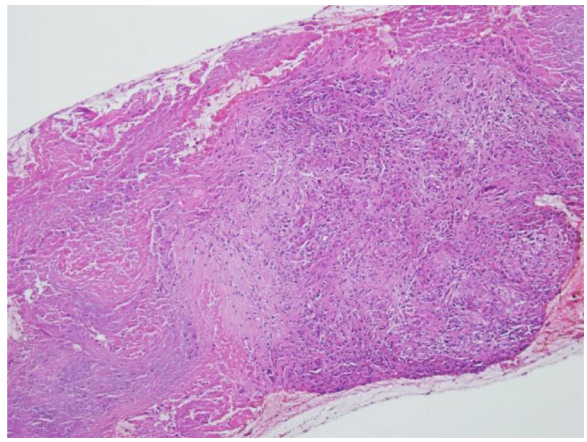

Fig. 4 – Histological examination showing granulomatous inflammation with caseous material (Hematoxylin and eosin stain, original magnification x100)

trate (Fig. 4 and 5). Culture and polymerase chain reaction of tuberculosis were not performed. Moreover, there was no histopathological evidence of malignancy. The diagnosis of peritoneal pseudotumor localization of tuberculosis was established.

The patient is being treated with daily administration of Isoniazid, Rifampicin, Ethambutol and Pyrazinamide for two months, followed by four months of daily dual therapy combining Isoniazid and Rifampicin. She is in the third month of treatment with clinical improvement.

Discussion

Abdominal tuberculosis occurs in 11%-12% of the patients with extra pulmonary disease [2], and may involve the hepatobiliary system, pancreas, gastrointestinal tract, genitourinary tract, and lymph nodes. In that matter peritoneal tuberculosis

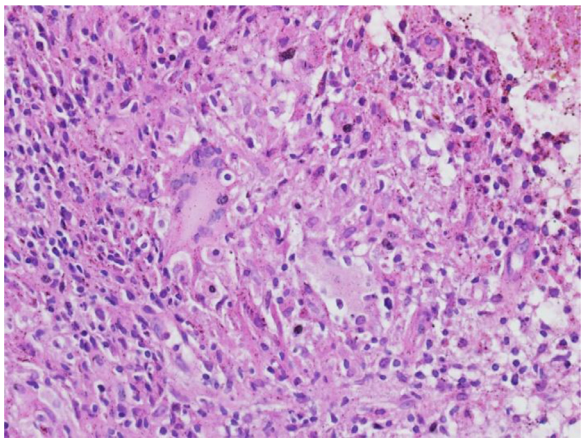

Fig. 5 – Photomicrograph shows a granuloma surrounded by epithelioid histiocytes and multinucleated giant cells (Hematoxylin and eosin stain; original magnification x400.)

accounts for 1% to 3% of the cases [1] and imaging features are frequently overlapping with other conditions, making for frequent misdiagnosis and delays in treatment [3].

It is believed that the peritoneal involvement is due to hematogenous spread or lymphatic routes from the primary site[4] or may be secondary to lymph node rupture or gastrointestinal deposits or even fallopian tube dissemination in women [2].

Patients usually present with abdominal pain, distension, fever, night sweats, weight loss and anorexia; these clinical signs are suggestive but not specific to this condition [4].

Computed tomography with contrast media administration remains the imaging modality of choice to document both the peritoneal, omental and mesenteric changes [5].

The most common mesenteric involvement includes micronodular (<5 mm) and macronodular (> or = 5 mm) lesions, thickening of the mesentery leaves and soft-tissue or fluid infiltration [6].

Omental involvement can be either nodular, smudged with an ill-defined infiltration, can appear as "caked" and as irregular or regular thickening [1].

The smudged type with a regular omental line is the most common finding on CT.

The "caked" type is uncommon and makes the differential with peritoneal carcinomatosis challenging.

Most of the time, CT shows avid enhancement of a smooth regularly thickened peritoneum.

Regarding ascites it can be free or loculated with typically higher attenuation values (25-45HU) relative to water due to its high protein and cellular content [1].

Most authors describe three types of peritoneal tuberculosis: the "wet" type, fibrotic and "dry" type [7].

The "wet" type is the most common with up to 90% of cases, featuring abundant ascites of slightly increased density and can be loculated.

The "fibrotic" or "fixed fibrotic" representing 60% of cases, is characterized by large peritoneal masses adherent to the adjacent bowel loops occasionally associated with loculated ascites.

The "dry" or "plastic form", less common, includes mesenteric thickening and fibrous adhesions in the peritoneum that can appear as an "omental cake".

An important overlap often occurs between these different forms.

Finally, the abdominal 'cocoon' or sclerosing encapsulating peritonitis usually presenting with intestinal obstruction can be considered a fourth type given its specific therapeutic implications [2].

Furthermore, the concomitant thoracic tuberculosis is highly suggestive, although present in only 15% of patients with abdominal disease [8].

Considering the lack of specificity of these imaging features, peritoneal tuberculosis should not be confused with other medical conditions with overlapping clinical presentation. In fact, differentials include peritoneal carcinomatosis, pseudomyxoma peritonei, peritoneal lymphoma.

Peritoneal carcinomatosis, as reported in our case, remains a major differential [9].

Nonetheless, there are some guiding signs to consider, like the presence of mesenteric macro nodules, regular thickening and enhancement of the parietal peritoneum and possible splenomegaly in tuberculosis.

Also, the presence of lymphadenopathies or an increase number of lymph nodes with or without central caseation thathas low attenuation on CT. Lymph nodes may conglomerate in large masses. Calcification and fibrosis are mostly seen in healing stagesbut unfortunately are not specific since they may be indicative of metastasis from ovarian cancer or a mucous-secreting gastric cancer [1].

Nevertheless, like mentioned in our case, peritoneal tuberculosis mimicked peritoneal carcinomatosis in several ways. Both show multiple peritoneal nodules and irregular omental thickening and soft tissue attenuation [10], as well as a misleading elevated serum levels of CA 125 [11].

The CA 125 is a coelomic epithelial glycoprotein, and a non specific marker of a peritoneal inflammation process such as ovarian carcinoma [12], endometriosis, pelvic inflammatory disease. Therefore, it can be elevated in peritoneal tuberculosis like in our case, and may be further used to monitor treatment response [13].

Pseudomyxoma originating from neoplastic mucin-secreting cells in the peritoneum, often appears as a gelatinous peritoneal fluid, responsible for extrinsic compression of the liver called scalloping, and loculated effusions. The presence of a fluid or soft tissue mass on the appendix is highly suggestive, and the serous membrane of the digestive system is rarely involved [1].

Peritoneal lymphoma, on the other hand have a frequent lymph node involvement, with intra and retroperitoneal conglomerating lymphadenopathies. It is characterized by bulky, non-obstructing, homogenously enhanced, masses encasing the mesenteric vasculature, featuring the ''sandwich'' sign [14].

In doubtful cases, imaging guided needle aspiration or biopsy can be performed to confirm the diagnosis.

Abdominal paracentesis usually shows elevated leucocyte count with predominance of lymphocytes and high protein levels [15].

Adenosine deaminase activity (ADA) is an enzyme involved in the proliferation and differentiation of T lymphocytes, an increased ADA activity in the ascitic fluid (≥30 U/L) is highly suspiciousoftuberculosis.

However, ascitic fluid analysis has some limitations given its 20% to 30%false-negative rate [3].

Therefore, histopathological analysis is required for definitive diagnosis [16] like presented in our case. It includes the presence of epithelioid macrophages and Langhans giant cells along with lymphocytes, plasma cells, fibroblasts with collagen, and characteristic caseous necrosis in the center [17].

Treatment is essentially based upon the association of rifampicin, isoniazid, pyrazinamide and ethambutol with satisfactory results [17]. The timely diagnosis is paramount since delayed treatment is associated with severe morbidity.

Conclusion

In conclusion, peritoneal tuberculosis can be a great mimicker of many other diseases. Differentiating peritoneal tuberculosis and peritoneal carcinomatosis remains challenging.

Although there are no pathognomonic radiological findings, mesenteric macronodules, omental regular thickening and infiltration, lymphadenopathies with low-density center and calcification, increase the ability tomake the correct diagnosis.

In the majority of the cases, biopsy or culture specimens are necessary to confirm the diagnosis. Therefore, it is essential for radiologists to have a knowledge of the common and uncommon imaging features to better assess for alternative differentials. It is in fact crucial, as peritoneal tuberculosis, if promptly diagnosed, has an effective therapy and a substantially better prognosis.

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