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Liver scalloping – An unusual presentation of a benign disease

Sara Neves Sintra, João Madaleno, Catarina Canha, Adélia Simão, Armando Carvalho

ABSTRACT

Introduction: Abdominal tuberculosis frequently mimics other conditions such as inflammatory bowel disease, sarcoidosis, advanced ovarian tumour, lymphoma, mesothelioma or carcinomatosis. Case Report: The authors report the case of a 19-year-old woman with fever, abdominal pain and history of right pleural empyema. Laboratory findings showed anaemia, lymphopenia and positive interferon-gamma release assay. Computed tomography findings included apical lung nodules, pleural thickening, right pleural effusion and ascites. Treatment for suspected tuberculosis was started. Two months later, computed tomography showed peritoneal thickening causing liver scalloping. Fluid collection from a peritoneal fluid-filled nodule confirmed the diagnosis. Conclusion: Visceral scalloping is a common finding of carcinomatosis and pseudomyxoma peritonei; only seven cases are reported in peritoneal tuberculosis. We emphasize the need for a high suspicion level and early sample collection.

Keywords: Ascites, Liver scalloping, Peritoneal thickening, Tuberculosis

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INTRODUCTION

Peritoneal and pleural effusions due to tuberculosis (TB) occur most commonly following reactivation of latent tubercular foci due to haematogenous spread from previous pulmonary TB [1]. As the disease progresses, the visceral and parietal peritoneum become studded with tubercles and ascites develop secondary to exudation of proteinaceous fluid from the tubercles [2]. Abdominal TB frequently mimics other conditions such as inflammatory bowel disease, sarcoidosis, advanced ovarian tumour, lymphoma, mesothelioma and carcinomatosis [1, 3].

CASE REPORT

A 19-year-old African female patient presented to the Emergency Department with intermittent fever and diffuse abdominal pain especially in the lower quadrants for the past four weeks, accompanied by distension,

unintentional weight loss of 1.3% in one month, nausea and anorexia.

The patient had a past history of right loculated pleural effusion associated with thickening and enhancement of both pleural layers, about nine months earlier, for which she was empirically treated with clindamycin and corticosteroids. The outcome was favourable with a substantial regression of the pleural effusion. A few months after discharge, she started complaining of right pleuritic chest pain and fatigue. By then, she had no respiratory symptoms. No chronic medication and no further relevant medical history were reported. She was born in Central Africa and moved to Portugal at the age of fifteen. She mentioned several visits to Central Africa in the previous year during which she has contact with family members diagnosed with malaria. On physical examination the patient presented tenderness of the lower abdominal quadrants. No peripheral adenopathies were palpable.

Laboratory findings were as follows: haemoglobin 11.0 g/dL (normal, 12–15), mean corpuscular volume 81.5 fL (normal, 83–101), leucocytes 2.7x10^9/L (normal, 4–10), lymphocytes 0.4x109/L (normal, 1–3), platelets 252 x109/L (normal, 150–400), ferritin 102 ng/mL (normal, 10–120), lactate dehydrogenase 237 U/L (normal, 125–220), C-reactive protein 2.19 (normal, 0–0.5), negative fourth generation HIV test and negative microscopic examination for plasmodium parasites. Further laboratory findings demonstrated positive interferon-gamma release assay and high serum adenosine deaminase of 35.5 U/L (normal, 4.8–23.1). Blood cultures were negative for acid-fast bacilli. Posteroanterior chest radiograph showed blunting of the right costophrenic angle due to a small pleural effusion. Abdominal and pelvic ultrasound demonstrated peritoneal effusion of moderate volume with no abdominal masses or abnormal gynaecological findings. Thoracic, abdominal and pelvic computed tomography (CT) showed one lung nodule with spiculated margins in each apex, with 11.5 mm and 6.9 mm; subpleural nodules in the right inferior lobe with the largest having 19.6 mm; small amount of right pleural effusion; moderate amount of peritoneal effusion; no adenopathies or other abnormalities. Ultrasound guided paracentesis was unsuccessful. She underwent bronchoscopy. Inflammatory cells and macrophages were seen in bronchoalveolar lavage. No acid-fast bacilli or tumour cells were found. Based on the patient's epidemiologic risk factors, laboratory and imaging findings, we assumed pulmonary and abdominal TB as a possible diagnosis and initiated standard antituberculous treatment with isoniazid, rifampicin, ethambutol and pyrazinamide.

Two months later the patient complained of abdominal pain and underwent a second CT which showed nodules with lobulated contours and heterogeneous enhancement in each lung apex, measuring 16 mm at the left and 4 mm at the right apex; focal nodular pleural thickening; absence of pleural effusion; a small pericardial effusion; focal nodular contrast-enhanced and hypodense peritoneal thickening, the largest measuring 51 mm with a large central fluid component causing scalloping of the liver margins; absence of mediastinal, hilar, abdominal or pelvic lymph node enlargement; and a small amount of ascites (Figure 1). Purulent fluid was collected from a peri-hepatic peritoneal fluid-filled nodule (Figure 2). Laboratory evaluation revealed negative bacterial and fungal cultures but direct microscopic exam showed presence of 1 to 10 bacilli per 100 high power field. Liquid

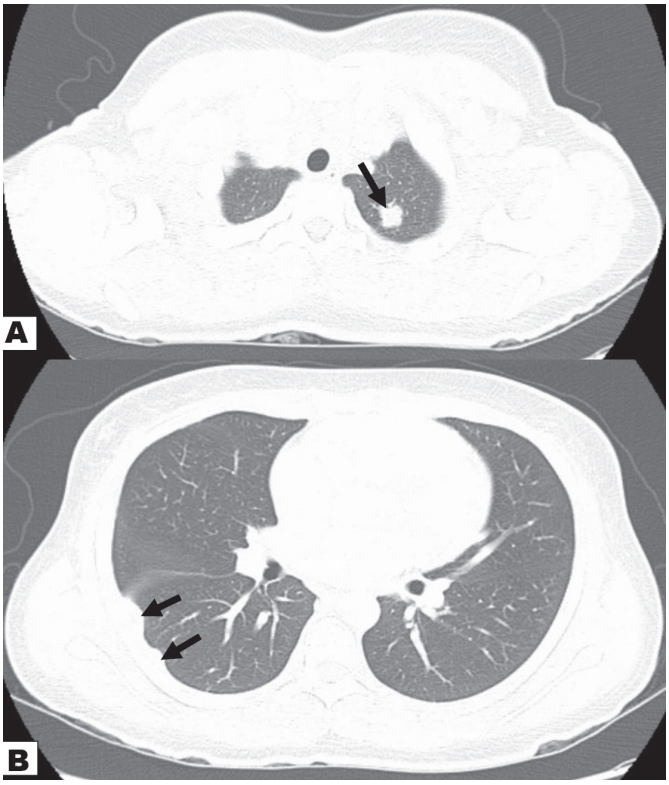

Figure 1: A) Axial chest CT image showing nodule with lobulated contours in the left apex, measuring 16 mm in diameter; B) Right focal nodular pleural thickening with a diameter of 22 mm and 14 mm.

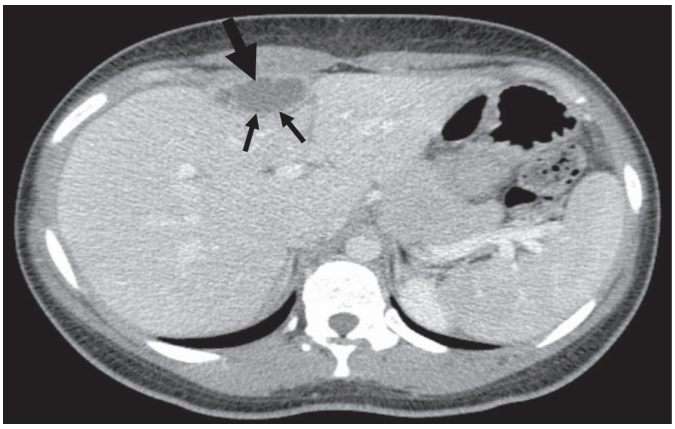

Figure 2: Axial abdominal CT image showing a focal hypodense peritoneal nodule with peripheral enhancement and a large central fluid component (large arrow), measuring 51 mm in diameter, causing scalloping of the liver margins (small arrows).

culture was also positive and molecular biology isolated drug-susceptible Mycobacterium tuberculosis complex. Culture on Löwenstein-Jensen medium and Ziehl-Neelsen smear were negative. She received standard anti-tuberculous treatment for two months followed by an extended continuation phase with isoniazid and rifampicin for seven months instead of four, as there were still lung nodules at two months of treatment. She has shown good clinical and laboratorial response since then, with no relapse within the first twelve months following completion of therapy.

DISCUSSION

The diagnosis of extrapulmonary TB can be difficult, mostly due to its insidious nonspecific presentation and absence of characteristic imaging signs, leading to delays in treatment and, hence, increasing the risk of morbidity and mortality[2]. As CT findings of peritoneal TB include peritoneal thickening, ascites with fine septations and omental caking, differentiation should be mainly done between neoplastic and inflammatory processes [2]. Three patterns of peritoneal TB have been described: i) wet type, the most frequent one (90%), which is characterized by abundant ascites, ii) dry type (3%) characterized by loculated ascites with predominant adhesions, fibrosis, peritoneal thickening and caseating nodules iii) fibrotic type (7%) which is associated with low-volume ascites and intestinal adhesions to the mesentery with omental mass [4,5]. However, peritoneal TB may present as a combination of all 3 types [5]. The presence of a smooth peritoneum with minimal thickening and pronounced enhancement on CT suggests tuberculous peritonitis, whereas nodular implants and irregular peritoneal thickening are seen in carcinomatosis [6].

Visceral scalloping, characterized by indentations of the visceral margins by intraperitoneal collections, is a common and suggestive finding of peritoneal carcinomatosis and pseudomyxoma peritonei, but it has also been rarely demonstrated on CT of peritoneal TB [7,8]. It is most commonly observed along the margins of the liver and spleen [7,9].To the best of our knowledge, only seven cases of abdominal TB with visceral scalloping have been reported in the English literature so far [7]. Computed tomography findings demonstrated presence of ascites in four patients, collections in five patients, lymphadenopathy in one patient, peritoneal involvement in four patients, pleural effusion in three patients and ileo-cecal thickening in two patients [7]. The diagnosis was based on evaluation of fluid in four patients, ileo-cecal biopsy in one patient, fine needle aspiration from omental thickening in one patient and sputum positivity for acid fast bacilli in another patient [7]. Despite thorough investigation, it might not be possible to rule out malignancy or confirm abdominal TB without laparoscopy or laparotomy [2]. Therefore the presence of visceral scalloping on CT may not discriminate peritoneal carcinomatosis or pseudomyxoma peritonei from peritoneal tubercular involvement [7].

In our case, the diagnosis of TB was initially suspected due to the presence of pleural and peritoneal effusion and relevant epidemiologic risk factors for TB, namely past residence in and recent travel to an epidemic area, and confirmed after ultrasound-guided fluid collection from a caseating nodule. Hence, radiological investigations play a pivotal role in the diagnosis of abdominal TB in conjunction with clinical presentation and cytological and immunological investigations [8].

CONCLUSION

In conclusion, visceral scalloping may be rarely associated with peritoneal tuberculosis. This case illustrates the need for a high index of suspicion and the importance of obtaining samples as early as possible in order to establish an accurate diagnosis. This condition has a good prognosis, if promptly diagnosed and treated.

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Author Contributions

Sara Neves Sintra – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
João Madaleno – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Catarina Canha – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Adélia Simão – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Armando Carvalho – Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor of Submission

The corresponding author is the guarantor of submission.

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Consent Statement

Written informed consent was obtained from the patient for publication of this case report.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.