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CASE REPORT

Tubercular liver abscess: an uncommon presentation of disseminated tuberculosis

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Abstract We present a case of tubercular liver abscess with disseminated tuberculosis, associated with underlying HIV infection. The patient responded well to percutaneous drainage of the abscess and first-line quadruple antitubercular therapy. We report this case to highlight a rare manifestation of a common disease and to create greater awareness which may ensure timely diagnosis and avoid unnecessary surgical intervention.

Keywords Tuberculosis · Tubercular · Liver abscess · Hepatocellular carcinoma

Introduction

Tubercular liver abscess (TLA) is a rare clinical entity, normally associated with foci of infection in the pulmonary system or gastrointestinal tract [1]; a few cases of isolated hepatic abscess have also been described [2–4]. Tuberculous liver abscess is predominantly reported in patients with underlying immunosuppression, although can occur in immunocompetent individuals [5]. Clinical diagnosis is difficult due to the rarity of the disease and the non-specific presentation. As a result, it may be misdiagnosed as amoebic or pyogenic liver abscess or primary and metastatic carcinoma of the liver. Therefore, a high index of suspicion is required to diagnose in a timely manner and prevent needless surgical intervention.

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Case

A previously healthy 40-year-old man from Senegal was admitted to the Surgical Division of our hospital with persistent fever, abdominal pain, vomiting and dyspnoea. Physical examination on admission showed abdominal distension and widespread pain to deep palpation, with no abnormalities found on cardiovascular and respiratory examination. Laboratory evaluation revealed leucocytosis with high levels of C-reactive protein and procalcitonin. A thoracic and abdominal CT scan was performed showing cardiac dilatation with a small amount of pericardial effusion, minor fibrosis in lower lobes bilaterally, with no lymph nodes or focal lesions. Abdominal scans revealed a large uniloculated abscess, 65 mm × 35 mm, involving the left lobe of the liver with inflammatory lymph nodes present at the gallbladder and the hepatogastric ligament, and a small amount of peritoneal free fluid (Fig. 1). No other abdominal pathology was identified and the patient refused colonoscopic examination. Empirical therapy with piperacilline/tazobactam and metronidazole was started to cover a suspected amoebic or pyogenic abscess. A percutaneous drainage was performed and the aspirate was collected for parasitic examination, Gram stain and culture for aerobic and anaerobic bacteria; however, no pathogen was identified. Serology for *Entamoeba histolytica, Echinococcus granulosus* and *Salmonella typhi* and Quantiferon test all returned negative. HIV testing resulted positive with a high viral load of 339,069 cp/ml and low CD4 + cell count (34/μl).

The patient was then transferred to the Infectious Diseases Department and in the following days clinical condition

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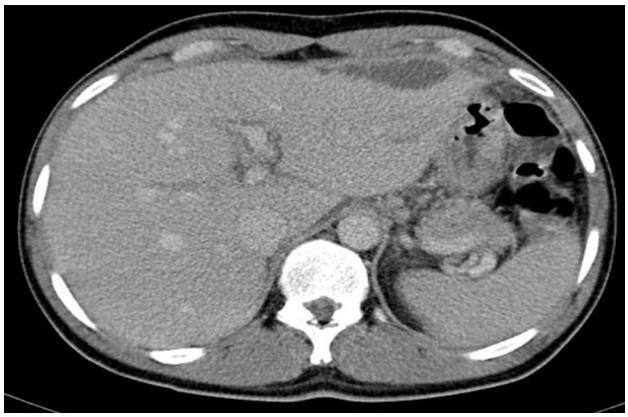

Fig. 1 CT scan (portal phase) showing hypodense subcapsular lesion in the *left lobe* of the liver

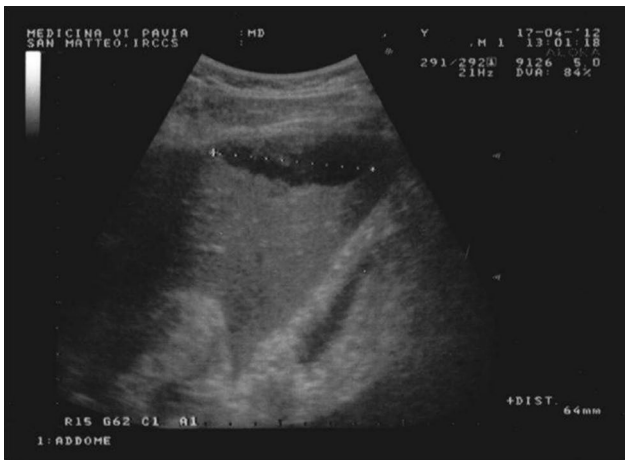

Fig. 2 Ultrasound appearance of the abscess (hypoechogenic image with well-defined margins)

worsened and no resolution was seen in the abscess (Fig. 2). Therefore, the lesion was re-aspirated and, as a broader microbiological spectrum was considered, this specimen was positive for acid-fast bacilli on Ziehl Neelsen stain. A more extensive diagnostic workup for tuberculosis was completed, with urine and sputum negative for acid-fast bacilli, whereas PCR of sputum was positive for *M. tuberculosis.* Cultures from abscess fluid, sputum and urine all grew multi-drug-sensitive *M. tuberculosis.*

A diagnosis of disseminated tuberculosis with TLA was made and first-line quadruple therapy of isoniazid, rifampicin, pyrazinamide, and ethambutol was started. In the following days, the patient's clinical condition gradually improved, the drainage was left in site for one week and then removed when no more fluid was present within the abscess. Antiretroviral therapy consisting of tenofovir, emtricitabine and raltegravir was started 10 days post-initiation of anti-TB therapy.

The patient was discharged 25 days after admission to our Hospital and then followed up as an outpatient with monthly visits and abdominal ultrasound every three months. After six months the liver abscess showed complete resolution (i.e., it was no longer visible), and antitubercular therapy was continued for nine months (two months with four drugs and the remaining period with only rifampicin and isoniazid). A CT scan was repeated one year after the diagnosis of tuberculosis, showing complete regression of liver abscess and resolution of pericardial effusion, and no other signs of active tuberculosis were present.

Discussion

Hepatic involvement in tuberculosis can take either a localized form with primary hepatic involvement, as a TLA or a tuberculoma, or more commonly, hepatic involvement associated with systemic or miliary TB [6]. *M. tuberculosis* bacilli can be spread via haematogenous, lymphatic and choledochal routes in addition to direct dissemination, for example from direct invasion through the pleural layer to the liver. Haematogenous dissemination is most common via the portal vein or, in the case of miliary TB, the hepatic artery [7]. TLA may affect the left or right lobe of the liver and can present as either singular or multiple lesions. TLA is most commonly associated with miliary TB or foci of infection in the pulmonary system or gastrointestinal tract. However, TLA has also been reported to occur as an isolated infection, with no evidence of disseminated TB infection in both immunocompromised and immunocompetent patients [5].

Whilst the diffuse form of hepatic involvement is common in advanced tuberculosis, occurring in 60–80 % of patients dying with pulmonary tuberculosis, localized TLA remains a rare entity [2]. To date nearly 100 cases have been reported in the literature. In a large series from South Africa of 296 patients with hepatic tuberculosis, TLA accounted for only 0.54 % of the cases [2]. A previous work from the same hospital defines better the features of 200 cases of hepatic tuberculosis, including 57 children under the age of 11 years and 143 adults. In this study diagnosis was made by liver biopsy (29 cases) and on autopsy (171 cases). Within pediatric population only miliary tuberculosis of the liver was found, whereas in adult population hepatic TB was miliary in 86 % of cases and local in 14 % [1]. However, a more recent prospective study of 242 immunocompetent TB patients in India showed a higher prevalence; of 38 patients with hepatic involvement, 10 had TLA or "pseudotumours" (defined as central necrotizing lesions on imaging) [8].

TLA has been reported in patients with an age range of 6 months–72 years, an average of 39.2 years, with a 2:1

male to female predominance [9]. TLA usually presents with non-specific symptoms; in a review of 44 patients with TLA, reported symptoms were as follows: fever (61.4 %), abdominal pain (59.0 %), weight loss (29.5 %), abdominal mass (15.9 %) and lethargy (15.9 %) [9]. Hepatic impairment or jaundice is rarely seen in hepatobiliary tuberculosis [10]. The imaging features recognized with TLA are variable and imaging alone is not sufficient to establish a diagnosis, as the development of a capsule, formation of purulent exudate and local hepatic reaction are all related to length of infection [11]. Sonography findings in the majority of case reports are round, heterogenous, anechoic or hypoechoic lesions with irregular margins/borders, however, some case reports describe a hyperechoic mass [12]. Similarly, CT findings usually demonstrate hypodense lesions [13] with or without peripheral rim enhancement. MRI studies have been performed in a limited amount of cases and lesions demonstrate high signal on T1 and T2-weighted images but MRI remains unhelpful in further differentiating TLA from other liver pathologies [9, 13]. As a result of the non-specific presentation and variable imaging findings, TLA is often mistaken for amoebic or pyogenic liver abscesses or hepatocellular carcinoma [4].

Definitive diagnosis requires demonstration of *M. tuberculosis* bacilli in aspirate or biopsy tissue, or a positive result from culture or PCR of abscess contents [14]. Traditionally, most cases have been diagnosed on the basis of histological samples obtained by laparotomy or guided biopsy [9]. Increasingly more cases are diagnosed after aspiration of abscess contents and acid-fast bacilli are demonstrated by direct microscopy or molecular techniques. The sensitivity of direct microscopy of aspirate for AFB remains unclear. Quoted sensitivities for acid-fast staining and positive culture results are in the range of 0–45 and 10–60 %, respectively [15]. In an Indian series of 10 TLA patients, samples of abscess fluid were positive for AFB in 6 cases, whilst PCR of abscess contents was positive in all 10 cases [8]. However, larger studies of 41 TB hepatic granulomas show a lower sensitivity for PCR of 58 % [16].

In our patient Quantiferon test was negative, likely due to the patient's level of immunosuppression. However, Quantiferon is useful for diagnosing TLA when invasive procedures are not available. In 6 patients with hematological malignancy and concurrent TB hepatic or splenic abscess, Quantiferon test had a sensitivity of 75 % and a specificity of 81.3 % [17].

Management

Our patient responded well to first-line systemic anti-tuberculosis agents showing clinical improvement and follow-up ultrasound demonstrated reduction in size of abscess. The recommended therapeutic regimen is first-line anti-tuberculosis agents with or without aspiration under US or CT guidance. Prognosis is good with the majority of reported cases responding well to systemic therapy [13], however, refractory cases may benefit from transcatheter infusion of anti-tuberculosis agents. Transcatheter infusion of either isoniazid or a combination of isoniazid and rifampicin has been shown to both reduce the numbers of AFB [9] in aspirated samples and render those bacilli non-viable [18]. Optimal duration of treatment is still not agreed upon; some authors recommend antitubercular therapy for one year [3], whilst others report resolution with 6 months therapy [5], and should be dictated by clinical response and the presence or absence of disseminated *M. tuberculosis* infection

In summary, TLA is a rare manifestation of a common disease, which presents non-specifically, so requires a high index of suspicion. It should be actively considered as a differential diagnosis in the immunocompromised patient and in unresolving abscesses in areas of high TB prevalence.

Conflict of interests All authors have no conflicts of interest to declare.

References

1. Hersch C. Tuberculosis of the liver: a study of 200 cases. S Afr Med J. 1964;38:857–63.
2. Essop AR, Moosa MR, Segal I, Posen J. Primary tuberculosis of the liver-a case report. Tubercle. 1983;64:291–3.
3. Baveja C, Gumma V, Chaudhary M, Jha H. Primary tubercular liver abscess in an immunocompetent adult: a case report. J Med Case Rep. 2009;3:78.
4. Hassani KI, Ousadden A, Ankouz A, Mazaz K, Taleb KA. Isolated liver tuberculosis abscess in a patient without immunodeficiency: a case report. World J Hepatol. 2010;2:354–7.
5. Chen TC, Chou LT, Huang CC, Lai AB, Wang JH. Isolated tuberculous liver abscess in an immunocompetent adult patient: a case report and literature review. J Microbiol Immunol Infect. 2013. doi:10.1016/j.jmii.2013.09.003.
6. Purl AS, Nayyar AK, Vij JC. Hepatic tuberculosis. Ind J Tub. 1994;41:131e4
7. Oliva A, Duarte B, Jonasson O, Nadimpalli V. The nodular form of local hepatic tuberculosis: a review. J Clin Gastroenterol. 1990;12:166–73.
8. Amarapurkar DN, Patel ND, Amarapurkar AD. Hepatobiliary tuberculosis in western India. Indian J Pathol Microbiol. 2008;51:175–81.
9. Kubota H, Ageta M, Kubo H, Wada S, Nagamachi S, Yamanaka T. Tuberculous liver abscess treated by percutaneous infusion of antituberculous agents. Intern Med (Toyko, Japan). 1994;33:351–6.
10. Sonika U, Kar P. Tuberculosis and liver disease: management issues. Trop Gastroenterol. 2012;33:102–6.
11. Reed DH, Nash AF, Valabhji P. Radiological diagnosis and management of a solitary tuberculous hepatic abscess. Br J Radiol. 1990;63:902–4.
12. Chen HC, Chao YC, Shyu RY, Hsieh TY. Isolated tuberculous liver abscesses with multiple hyperechoic masses on ultrasound: a case report and review of the literature. Liver Int. 2003;23:346–50.

13. Koksal D, Koksal AS, Koklu S, Cicek B, Altiparmak E, Sahin B. Primary tuberculous liver abscess: a case report and review of the literature. South Med J. 2006;99:393–5.
14. Rai R, Tripathi VD, Rangare V, Reddy DS, Patel P. Isolated tubercular liver abscess in an elderly diabetic successfully treated with systemic antitubercular drugs. JPMA J Pak Med Assoc. 2012;62:170–2.
15. Kanagaraj A, Marthandam LR, Sriramakrishnan V, Rajesh A, Meenakumari P. Tuberculous liver abscess. J Assoc Physicians India. 2008;56:647–8.
16. Diaz ML, Herrera T, Lopez-Vidal Y, Calva JJ, Hernandez R, Palacios GR, et al. Polymerase chain reaction for the detection of Mycobacterium tuberculosis DNA in tissue and assessment of its utility in the diagnosis of hepatic granulomas. J Lab Clinic Med. 1996;127:359–63.
17. Kwon JC, Kim SH, Park SH, Choi SM, Lee DG, Choi JH, et al. Clinical characteristics and the usefulness of the Quanti FERON-TB Gold In-Tube test in hematologic patients with hepatic or splenic lesions. Korean J Intern Med. 2013;28:187–96.
18. Mustard RA, Mackenzie RL, Gray RG. Percutaneous drainage of a tuberculous liver abscess. Can J Surg J Canadien de chirurgie. 1986;29:449–50.