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CASE REPORT

Splenic tuberculosis: a case report

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Summary Splenic tuberculosis is an unusual clinical phenomenon, especially in immunocompetent hosts. It often demonstrates diagnostic complexity, which makes the identification of the agent difficult. We encountered the case of a middle-aged immunocompetent male who claimed to be suffering from pain in the left hypochondriac region without any indication of cough, hemoptysis, weight loss or fever. When physically examined, he had splenomegaly without any other clinical findings. This was further confirmed by imaging. A splenectomy was performed, and samples were taken for histopathological examination and microbiological analysis. Gross examination of the specimen showed multiple nodules coalescing to form a large yellowish-white mass of solid consistency. Histopathological examination showed large areas of caseation surrounded by multiple granulomas of epitheloid cells and Langhan's type giant cells throughout the splenic pulp. PCR verified the diagnosis of *Mycobacterium tuberculosis* infection. No primary focus of infection was detected in the lungs or any other organs.

Introduction

Tuberculosis (TB) continues to be a major health problem worldwide, despite considerable advances in the diagnosis and treatment of the disease.[1] This disease presents with diverse clinical symptoms, including both pulmonary TB and extrapulmonary TB. Extrapulmonary TB accounts for almost 15% of all cases. Among the extrapulmonary forms, splenic TB is unusual. This form of TB is normally seen as part of miliary TB. As this report reveals, splenic TB, undetectable in primary sites in the body, is a rare variant of extrapulmonary TB.

Case report

The medical history of a 47-year-old non-diabetic, non-smoking male from a middle-class family in northern Iran with a rural background revealed that his wife had TB three years previously and was completely cured. The patient complained of pain in the left hypochondriac region without cough, hemoptysis, weight loss or fever. Abdominal examination revealed an enlarged and tender palpable spleen. Routine investigations (i.e. hemogram and chest X-ray) were normal, except for an elevated ESR (50 mm/hr using Wintrobe's method). PPD was positive (>10 mm) and bone marrow examination was normal. There were no laboratory findings indicating immunodeficiency or HIV; the HIV serologic test was negative and CBC was normal. However, an abdominal CTscan showed diffuse lesions and multiple micronodules in the spleen, although the chest CTscan was normal.

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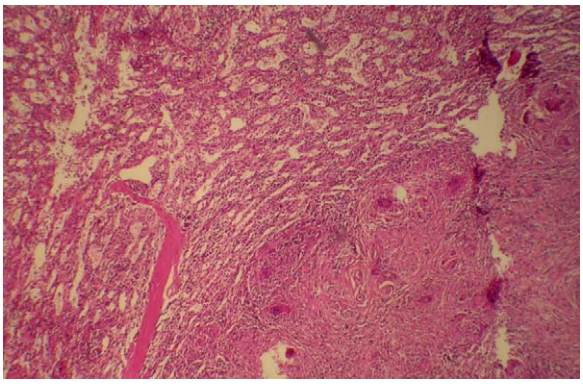

Figure 1 Hemotoxylin and eosin stained section of a nodule, showing large areas of caseation surrounded by multiple granulomas of epitheloid cells and Langhan's giant cells throughout the splenic pulp.

On the basis of radiological investigations, the provisional diagnosis was a possibly malignant mass in the spleen.

Because the spleen was enlarged and at risk of rupture, the use of fine-needle aspiration was excluded and a splenectomy was carried out. Moreover, preoperative diagnosis of TB of the spleen is difficult to establish and acid-fast stains of aspirates can be unremarkable.[2,3] Gross examination of the specimen revealed that the spleen size was $18.5 \times 13.5 \times 8$ cm and the weight was 860 g. The outer surface was creamy brown and multinodular; the many nodules were mainly at the convex surface. The slashed section showed multiple nodules coalescing to form a yellowish-white mass of solid consistency. Hemotoxylin and eosin stained sections of a nodule showed large areas of caseation surrounded by multiple granulomas of epitheloid cells and Langhan's giant cells throughout the splenic pulp. The surrounding splenic parenchyma was within normal limits (Figure 1). However, acid-fast staining showed the existence of numerous acid-fast bacilli (Figure 2).

A part of the spleen was processed for microbiology and PCR to rule out the possibility of mycobacterial infection. The specimen was minced in sterile saline. The minced tissue was used to prepare smears that were then stained by the standard Zeil Nelson staining technique. The remaining tissue was subjected to the standard phenol chloroform DNA-extraction process and cultured.[4] The extracted DNA was then amplified. PCR was carried out using IS 6110 insertion sequence based primers, giving a 390 bp product.[5] The amplified DNA revealed the 390 bp product, indicating the existence of *Mycobacterium tuberculosis* infection (Figure 3). *M. tuberculosis* was grown after 40 days in Lowenstein—Jensen medium. The lymph node biopsy contained a few connected nodes of a creamy brown color and firm consistency, with a total size of $2 \times 1 \times 0.4$ cm. A hemotoxylin and eosin stained section of a lymph node showed chronic granulomatous lymphadenitis, but no typical caseation. Acid-fast staining failed to reveal any acid-fast bacilli in the lymph node sections. Immediately after the splenectomy, oral antituberculous treatment with four drugs was started (isoniazide 300 mg/daily; rifampin 600 mg/daily; pirazinamide 1.5 g/daily; ethambutol 1 g/daily) for two months and continued with two drugs (isoniazide 300 mg/daily; rifampin 600 mg/daily) for four months.

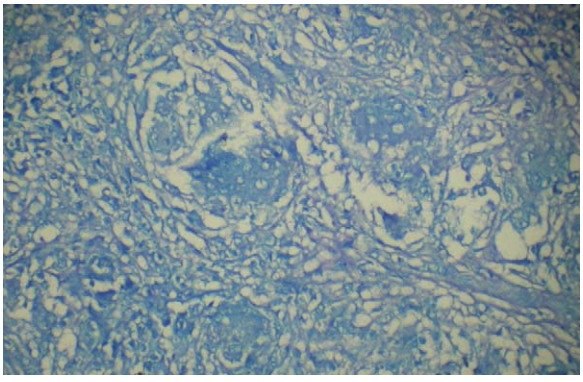

Figure 2 Acid-fast staining of spleen section, showing the presence of numerous acid-fast bacilli (Zeil Nelson staining technique).

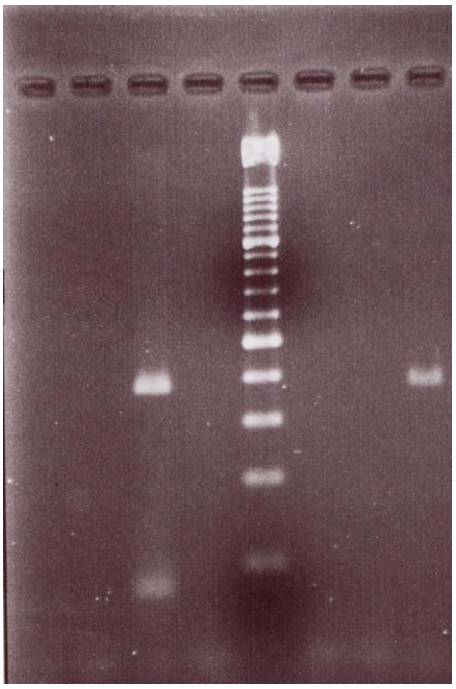

Figure 3 PCR was carried out using IS 6110 insertion sequence based primers, giving a 390 bp product specific for *M. tubercu-*

Discussion

Clinically, TB might present as a pulmonary or extrapulmonary disease. Splenic TB occurs in two forms. The first form presents itself during miliary TB, especially in immunocompromised patients; it is not rare. Its treatment includes classic antituberculous therapy, which might improve the patient's overall immunity. This form requires surgical intervention as a rare exception.[6] The spleen is the third most commonly infected organ in miliary TB (lung 100%, liver 82%, spleen 75%, lymph nodes 55%, bone marrow 41%).[7] The second, and unusual, form of splenic TB is the primary involvement of the spleen, as in our patient. Only six cases were reported in the English, French and German literature from 1965 to 1992.[8] In Iran, one case was reported in 2002.[9]

These patients were immunocompetent, but there was usually another site infected by TB. These cases also presented with fever of unknown origin (FUO).[7] Our patient was immunocompetent and without FUO. Additionally, there was no other affected site. When the spleen is involved as an isolated organ, the patient may have solitary TB or a tubercular abscess. Sharma et al. and Gupta et al. reported rare cases of splenic abscess in an immunocompromised and an immunocompetent patient, respectively.[10,11] In our case, the damage was solitary and multinodular, not a tubercular abscess (in an abscess, the damage does not appear to be multinodular). Many reported cases of splenic tubercular abscess are found to have underlying HIV infections,[1,12] so splenic involvement had been thought to be seen only in immunocompromised hosts. However, there are sporadic case reports of splenic TB in immunocompetent patients.[13] Adil et al.[14] reported a series of ten immunocompetent individuals with splenic TB. All of them had at least one other site or organ affected by TB infection. However, in the present case, the patient had neither a history of TB nor showed evidence of TB in any other organ. However, his wife had been infected by TB three years earlier and was completely cured. Singh et al. reported four non-HIV patients with isolated splenic TB. Some of them had an abnormal hematogram with thrombocytopenia, but the present case had neither an abnormal hematogram nor evidence of thrombocytopenia.[2] In these cases, the bacteriologic findings were confirmed only by histopathology and acid-fast staining; in our case, culture and PCR was included.[2] A case of splenic TB reported by Ho et al. presented with weight loss and fever, but without any indication of pain in the hypochondriac region.[15] By contrast, in our case, the chief complaint was pain in the hypochondriac region, without fever or weight loss.

Although the histopathological examination of the lymph node in this case was nonspecific for TB, acid-fast bacilli were demonstrated in the splenic nodule specimen.[16] Diagnosis of isolated splenic TB is difficult and often delayed because of imprecise clinical manifestations. In almost all the reported cases, the diagnosis was first made by radiological findings followed by pathological examination of a fine-needle aspirate, splenic biopsy or splenectomy specimen. In our case, the CT scan demonstrated a multinodular hypodense area in the spleen that contained diffuse lesions. Because the spleen was enlarged and at risk of rupture, a splenectomy was carried out. Therefore, a histopathological examination was necessary for etiological diagnosis. Tubercular infection can be histopathologically identified by typical caseation along with granuloma of epitheloid cells and Langhan's giant cells, but these observations cannot differentiate between an infection due to *M. tuberculosis* and one caused by atypical mycobacteria. This is important, because an atypical mycobacterial infection might not respond to routine antituberculosis drugs. In addition, the histopathological report is only available three days after submission of tissue. Therefore, in the current study, attempts were made to confirm the radiological diagnosis by microbiological investigation and by advanced technology; identification of the etiological agent up to the species level was done by PCR. The advantages of PCR include its rapidity, sensitivity and specificity.[17] In the present case, the underlying cause of the imprecise clinical symptoms could be identified within a few hours of submission of the specimen following splenectomy.

Case reports of isolated solitary splenic TB in which microbiological and molecular examinations have been carried out are rare. Our case, confirmed by microbiological and molecular examination, shows that solitary splenic TB can occur without cough, hemoptysis, fever or weight loss. We believe that solitary splenic TB with diffuse lesions and multiple nodules should not be treated by only antituberculous antibiotics and early splenectomy, as has been suggested by some authors.[7,18] It is a better approach to follow these treatments with oral antituberculous drugs,[2,3,7] because the focus of the tubercular infection is in an unusual place and multinodular.

Conflict of interest: No conflict of interest to declare.

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