Gastrointestinal radiology

Splenitic involvement of tuberculosis: US and CT findings

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Abstract. Tuberculosis (TB) of spleen is rare and usually occurs in miliary form. Macronodular form is extremely rare. Immunodeficiency associated with alcoholism, IV drug abuse, diabetes, cancer, corticosteroid therapy, and AIDS are prominent risk factors. Early diagnosis and treatment are important, because untreated abdominal TB carries a 50% mortality rate. We report US and CT findings of five cases with splenic TB. Our cases showed multiple small hypoechoic and hypodense nodules on US and CT, respectively, except one case whose US was normal. All cases also had extrasplenic involvement. The diagnosis of TB was established in two cases by cervical and in one case by submandibular lymph node biopsy, in one case by peritoneal biopsy, and in one case by a typical spinal lesion at L2-3. The US and CT findings are not specific for TB, but especially in endemic regions TB should be included in the differential diagnosis of splenic lesions.

Key words: Spleen – CT – US – Splenic tuberculosis

Introduction

Splenitic involvement of tuberculosis (TB) is rare [1, 2]. It usually occurs in miliary form as the result of hematogenous dissemination. Macronodular form and abscess formation is extremely rare [1]. Several reports have described findings of CT in abdominal TB, however, CT and US findings in splenic TB have not been well documented [1]. The US findings include multiple small hypoechoic nodules in miliary form [1–6]. On CT examination there are multiple well-defined round or ovoid low-density masses in spleen. In macronodular form focal masses are present. Splenomegaly without evidence of nodules and mass may be seen [1, 6]. Abdominal and mediastinal lymphadenopathy and pleural effusion may also be present [1]. Fine-needle-aspiration biopsy (FNAB) provides a definitive diagnosis. Also, resolution or calcification of lesions in a few months with effective anti-TB also confirms the diagnosis [1, 3, 6]. We report US and CT findings of five cases of splenic TB.

Materials and methods

Five patients admitted to our hospital between 1991 and 1992 with splenic TB were reviewed (three males and two females; age range 15–73 years). The presenting features and findings are summarized in Table 1. Three patients (cases 1, 2, and 3) had splenomegaly upon physical examination. One patient (case 4) had ascites and another (case 3) had pleural effusion. All had lymphadenopathy at different sites.

All patients had routine laboratory investigations and abdominal US and CT. Abnormal laboratory and radiologic findings are summarized in Tables 1 and 2. Two patients (cases 3 and 4) had suggestive laboratory findings. Analysis of pleural (case 3) and peritoneal fluid (case 4) showed an exudate with a lymphocytic cellular content. The fluid cultures for nonspecific and specific (acid-fast bacilli) microorganisms were negative, and no atypical cells were seen upon cytologic examination. Chest X-ray showed a miliary pattern in one case (case 1).

The US examinations were performed with 3.5 MHz linear and sector probes (Toshiba SAL 38B, Toshiba, Medical Systems, Europe). The CT scans were obtained with Tomoscan 350 (Philips, Hamburg, FRG) in two patients and Somatom HiQ (Siemens, Erlangen, FRG) in three patients. After noncontrast-continuous 10-mm scans, contrast-enhanced scans were obtained using IV bolus injection of 100 cc nonionic contrast material. None underwent splenectomy or FNAB. The diagnosis of TB was established in two cases (cases 1 and 3) by cervical lymph node biopsy, in one case (case 5) by submandibular lymph node biopsy, in case 4 by peritoneal biopsy, and in case 2 by typical spinal lesion at L2–3.

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Table 1. Complaints of patients and abnormal physical examination and laboratory findings

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (years)/gender</th>
<th>Complaints</th>
<th>Abnormal findings upon examination</th>
<th>Laboratory investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31/M</td>
<td>Weight loss, dyspnea, night fever</td>
<td>Cervical LAP, splenomegaly, retinal granulomas</td>
<td>ESR 75 mm/h, WBC 7000</td>
</tr>
<tr>
<td>2</td>
<td>73/M</td>
<td>Weight loss, back pain, night fever</td>
<td>Splenomegaly, pain over L2–3 spinous process, limited lumbar motions</td>
<td>ESR 85 mm/h</td>
</tr>
<tr>
<td>3</td>
<td>24/M</td>
<td>Weight loss, dyspnea, night fever</td>
<td>Cervical, axillary LAP, splenomegaly, pleural effusion</td>
<td>Rivalta +, WBC 500/mm, 90% L, 10% PNL</td>
</tr>
<tr>
<td>4</td>
<td>24/F</td>
<td>Weight loss, fever, abdominal distention</td>
<td>Ascites, inguinal LAP</td>
<td>Rivalta +, WBC 720 mm/h, Total protein 5.6 g, 99% L, 1% PNL</td>
</tr>
<tr>
<td>5</td>
<td>15/F</td>
<td>Weight loss, fever</td>
<td>Submandibular and cervical LAP</td>
<td>ESR 120 mm/h, PPD +</td>
</tr>
</tbody>
</table>

LAP Lymphadenopathy; L Lymphocyte; PNL Polymorphonuclear leukocytes; ESR erythrocyte sedimentation rate; WBC white blood cell count; PPD purified protein derivative

All patients underwent regular follow-up including sonographic examinations during treatment. During 6 months follow-up the size of the spleen returned to normal and lesions disappeared in all cases except case 1, whose splenomegaly persisted although the lesions had disappeared. All patients regained normal health and weight.

Results

Upon abdominal US examination four patients had splenomegaly and multiple hypoechoic nodules in the spleen (Fig. 1). No splenomegaly or splenic lesion was seen in case 4. Paraaortic lymphadenopathy was seen in three cases (cases 1, 3, and 5), at the splenic hilum in two cases (cases 1 and 4), and at the porta hepatis in one case (case 3).

Contrast-enhanced abdominal CT demonstrated similar splenic lesions. All of the cases had multiple hypodense small nodules ranging in size from 0.5 to 1 cm (Fig. 2). Lesions were not apparent on noncontrast scans. A paravertebral abscess with sclerotic bone destruction was also demonstrated in case 2.

Discussion

Infection of the spleen with Mycobacterium tuberculosis (MTB) usually occurs in a miliary form. Hematogeneous or lymphatic dissemination of tubercle bacilli from a distant focus results in miliary TB [6]. Miliary form is the most common form of splenic TB, and splenic involvement is found at autopsy in 80–100% of cases of disseminated miliary pulmonary TB [6]. Macronodular form and abscess formation is extremely rare. Among 300 cases of abdominal TB in Bhansali’s series no focal splenic TB was reported [2].

The US and CT findings have not yet been well documented. In miliary form nodules ranging from 0.5 to 3 mm in diameter may not be defined discretely with current CT resolution [1, 6]. Splenomegaly is common