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Tuberculous Epididymo-Orchitis with Multifocal Extrapulmonary Tuberculosis: a Case Report

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Tuberculous epididymo-orchitis, a rare form of extrapulmonary tuberculosis, results from hematogenous dissemination or retrograde extension from the lower urinary tract. Herein, we studied the case of a 22-year-old male patient who presented with refractory left scrotal pain and inflammation. The patient also complained of multifocal pain involving the right buttock, posterior thigh, and right wrist, without trauma history. The patient was diagnosed with multifocal tuberculosis by sputum AFB study and right sacroiliac joint biopsy.

Keywords: Testicular tuberculosis; Extrapulmonary tuberculosis; Multifocal tuberculosis; Magnetic resonance imaging

Case Report

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INTRODUCTION

Pulmonary tuberculosis (TB) is the most common type of tuberculosis, accounting for about 70% of cases. Extrapulmonary tuberculosis (EPTB) constitutes about 20% of all cases of TB in Korea. EPTB is TB involving organs other than the lungs, such as lymph nodes, the genitourinary tract, abdomen, skin, joints and bones, and meninges. The reported proportion of EPTB is increasing, but the reason for the increase remains unclear. Even though reported cases of EPTB infection have increased, EPTB still presents a diagnostic challenge (1, 2).

Among genitourinary (GU) tuberculosis, testicular tuberculosis is extremely rare, representing only about 3% of GU tuberculosis (3). Tuberculous infection of the testis and epididymis results from retrograde extension from the lower urinary tract, but hematogenous dissemination can also be a route of tuberculous infection to the testis and epididymis. In most patients, the testis is initially spared and the epididymis alone is involved; testicular involvement occurs later, if the therapy is not appropriate (4). Here, we describe a case of a male patient with tuberculous infection of the testis and epididymis, accompanying multifocal EPTB infection.

CASE REPORT

A 22-year-old male patient was referred to our hospital because of refractory left scrotal pain and inflammation. On physical examination, we found scrotal swelling

and a hard palpable mass in the left scrotum. He also complained of multifocal pain involving the right buttock, posterior thigh, and right wrist, without trauma history. He was a non-smoker, with no remarkable past medical or surgical history, such as hypertension, diabetes mellitus, or dyslipidemia. Laboratory data were in normal range, except for a C-reactive protein (CRP) level of 7.03 mg/dl (normal range, 0-0.5 mg/dl).

The patient initially underwent gray and color-scale ultrasound (US) for testicular evaluation (Fig. 1). A longitudinal grayscale US (Fig. 1a) showed multiple small, well-defined hypoechoic nodular lesions in a slightly enlarged and heterogeneously hypoechoic left testis. The left testis showed hypervascularity on a color Doppler image (Fig. 1b). A grayscale US image of the left epididymis (Fig. 1c, d) showed diffuse extensive enlargement and heterogeneously hypoechoic change. The patient then underwent scrotum magnetic resonance imaging (MRI) using a 3-Tesla MRI scanner (Fig. 2). An axial T2-weighted image (Fig. 2a) showed a well-defined nodular low signal intensity (SI) lesion of about 3.5 cm beside the left testis, and multiple tiny, low-SI nodules in the enlarged left testis. The lesions showed low SI on an axial T1-weighted image (Fig. 2b) and showed strong enhancement on a contrast-enhanced T1-weighted image (Fig. 2c). A diffusion-weighted image revealed mild diffusion restriction (Fig. 2d, e). Our impression was narrowed down to two possibilities: an infectious condition, such as pyogenic epididymo-orchitis

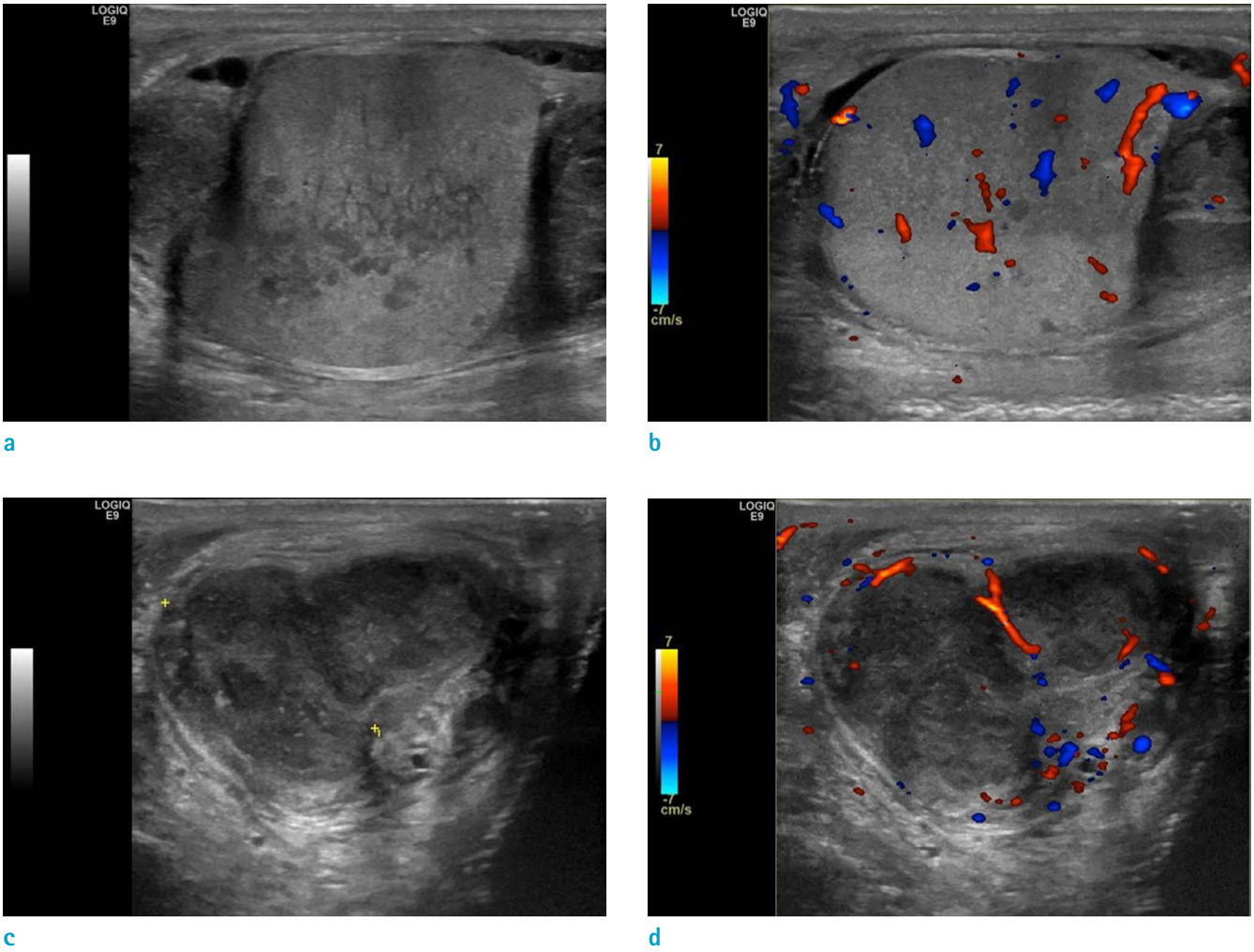

Fig. 1. A 22-year-old male with multifocal tuberculosis involving the right scrotum, right sacroiliac joint, right wrist, and lung. (a, b) Gray and color-scale US showed multiple small hypoechoic nodular lesions in the slightly enlarged right testis, with hypervascularity. (c, d) Grayscale US image of the right epididymis showed a nodular, enlarged, and heterogeneously hyperechoic lesion at the right epididymal head and tail, with hypervascular change in color Doppler US.

with an abscess, or tuberculous epididymo-orchitis rather than a tumorous condition, because of the multifocality and irregularity of the lesions. It was difficult to reach a final diagnosis, because it was not a common finding.

We next did pelvic computed tomography (CT) to evaluate the right buttock and posterior thigh pain (Fig. 3). An

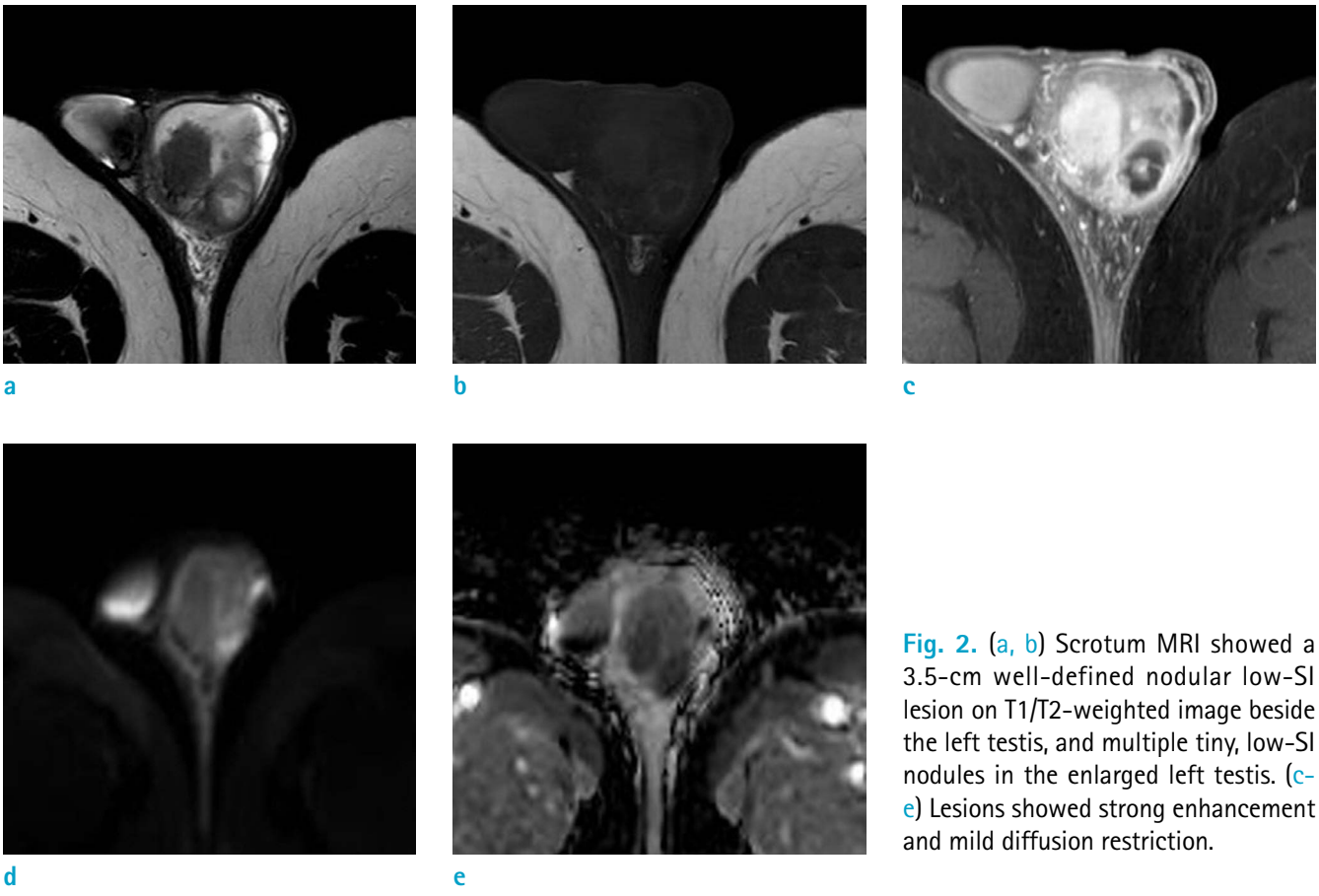

Fig. 2. (a, b) Scrotum MRI showed a 3.5-cm well-defined nodular low-SI lesion on T1/T2-weighted image beside the left testis, and multiple tiny, low-SI nodules in the enlarged left testis. (c-e) Lesions showed strong enhancement and mild diffusion restriction.

Fig. 3. (a) Pelvic CT and (b) MR sacral axial contrast-enhanced T1-weighted image showed bony erosion (round) at the right sacroiliac joint with nodular enhancement (arrow), suggesting infectious arthritis.

axial CT image (Fig. 3a) showed bony erosion at the right sacroiliac joint. An MR sacral axial contrast-enhanced T1-weighted image (Fig. 3b) showed nodular enhancement within the right scrotum, suggesting infectious arthritis.

The patient also underwent wrist MRI (Fig. 4), and a coronal T2-weighted image showed a low-SI lesion in the right hamate bone (Fig. 4a-c). A coronal T1-weighted image showed a diffuse low-SI change in the right carpal bone, with diffuse mild enhancement.

A chest X-ray taken before hospitalization showed ill-defined haziness with nodular densities in the bilateral upper and right middle lung fields, suggesting active pulmonary tuberculosis (Fig. 5).

The patient was confirmed to have pulmonary tuberculosis and tuberculous sacroilitis after a sputum AFB study and right sacroiliac joint biopsy.

DISCUSSION

After lymphatic involvement, GU tuberculosis is the most common infection among EPTB. Male genital TB is an uncommon subset of GU tuberculosis and occurs more frequently in association with renal TB. It includes GU tuberculosis involving the prostate, seminal vesicles, vas deferens, testes, epididymides, or penis (5). The epididymis and prostate are the most frequently involved sites among genital TB. In some literature, the spread of tuberculosis to the genital area occurs more frequently through hematogenous spread (6, 7). The prostate is the most frequent site involving tuberculosis, and tuberculous infection of prostate extends along the vas deferens or through the perivasal lymphatics to affect the epididymis (7). But our patient's case did not reveal prostate involvement. Instead, the testis and epididymis were involved. In fact, testicular involvement is less common than is tuberculous epididymitis and is usually a result of direct invasion of tuberculous epididymitis. This can be applied to our patient, who showed diffuse involvement of the left epididymis, and multifocal nodularity with partial normal-appearing echogenicity in the left testis.

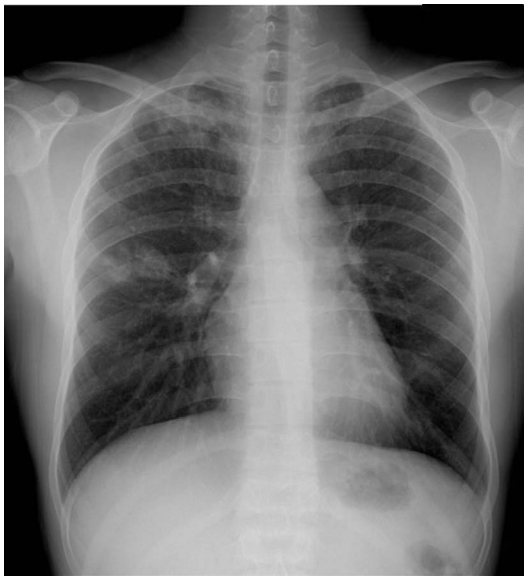

Fig. 5. Chest X-ray showed ill-defined haziness with nodular densities in the bilateral upper and right middle lung fields, suggesting active pulmonary tuberculosis.

a b c

Fig. 4. (a) Wrist MR showed a low-SI lesion in the right hamate bone on coronal T2-weighted image, and (b, c) a diffuse low-SI change in the right carpal bone on a T1-weighted coronal image with diffuse mild enhancement.

Several image findings showed tuberculous epididymitis and orchitis. At US, a heterogeneous and enlarged epididymis is shown, and irregular hypoechoic nodules appear in the involved testis. The most compatible US findings of TB epididymitis are an enlarged epididymis, predominantly in the tail portion, and marked heterogeneity of the involved epididymis (8). Although US findings of TB epididymitis and orchitis are well described, there are few references describing MRI findings (9). In most cases, multiple low-SI nodular lesions on T2-weighted images in the involved epididymis and testis are observed (5, 9, 10). But sometimes, male genital TB presents as a testicular mass on US, CT, or MR images, and is difficult to differentiate from malignancy. Several differential diagnoses should be considered, including infection (typical bacterial epididymitis or epididymo-orchitis), non-infectious disease (testicular torsion, hematocele, spermatocele), or a tumorous condition (seminoma or nonseminomatous tumor). In our patient's case, diffuse swelling and hypoechoic change of the left epididymis on US was revealed, and the corresponding lesions showed a low-SI change on T1/T2-weighted image. At this condition alone, the exact diagnosis is considerably tough.

As laboratory finding, abnormal urinalysis, such as sterile pyuria or proteinuria, is presented in 77-90% of patients (7). Early-morning urine sampling for AFB culture is helpful for diagnosis; but in our patient's case, there was no abnormal finding at urinalysis. Oncofetal markers usually reveal a normal range.

Male genital TB often presents with involvement of several sites within or outside the GU area, and patients may have several signs or symptoms referred from that site. As in our patient's case, a palpable mass or tenderness are the most frequent presenting symptoms in epididymitis or orchitis, although several patients present with pain radiating to the groin or thigh (10). Also, our case showed multifocal symptoms and image findings; the patient complained of non-traumatic right buttock, posterior thigh, and right wrist pain. Pelvic CT and MR images showed bony erosion at the right sacroiliac joint with nodular enhancement, and wrist MR showed a diffuse low-SI change in the right carpal bone. These multifocal bony erosive changes and nodular enhancement increased the possibility of tuberculosis, and ill-defined haziness and nodular densities on the chest X-ray suggested active tuberculosis.

The patient discussed here had several typical findings of male genital TB. Although male genital TB is an uncommon EPTB and remains challenging to diagnose, knowledge of the pathophysiology and image findings in each involved organ can increase the detection and diagnostic rates. The presence of several accompanying signs and symptoms can improve diagnosis. Because EPTB can occur in healthy people, as in our case, TB should always be considered as a possible diagnosis, especially when the patient complains about multifocal systemic signs and symptoms.

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