

·Case Report·

## Tuberculous epididymitis: a case report and literature review

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### Abstract

Tuberculous epididymitis is a rare urological disease difficult to diagnose. The conventional methods for diagnosis are often time-consuming and invasive. The combined use of scrotal magnetic resonance imaging (MRI) and urinary polymerase chain reaction (PCR)-based assay for mycobacterial DNA (the latter because of its high sensitivity and specificity to demonstrate mycobacterial DNA) is a valuable method for rapid diagnosis of tuberculous epididymitis. We report a 79-year-old man who was admitted with the chief complaints of bilateral scrotal swelling and pain. The combined use of scrotal MRI and urinary PCR allowed prompt diagnosis of tuberculous epididymitis and adequate antituberculous therapy. (*Asian J Androl* 2005 Sep; 7: 329–332)

**Keywords:** magnetic resonance imaging; polymerase chain reaction; tuberculosis; epididymitis

### 1 Introduction

Tuberculosis (TB) is a major public health disease in developing countries. In Taiwan, China, the estimated incidence is 64.84 per 100 000 and the morbidity is 10 times more than that in USA and two times more than that in Japan. TB has resulted in a mortality rate of 5.81 per 100 000 people in Taiwan, China, and it is the twelfth leading cause of death [1]. Extrapulmonary TB accounts for 20.22 % of cases of all tuberculosis [1]. TB epididymitis is rare and therefore difficult to diagnose. However, in the appropriate clinical setting, especially

when a previous history of pulmonary TB is present, we should be aware of TB epididymitis in a patient with scrotal swelling. Solely based on clinical findings, tuberculous infection of the epididymis is hardly distinguishable from tumor and infarction [2].

Traditionally, because the culture of the *Mycobacterium tuberculosis* usually takes 6–8 weeks, it results in postponement of antituberculous therapy. Often the definitive diagnosis of the lesion depends upon histopathological examination of the resected specimen [3, 4]. Magnetic resonance imaging (MRI) of the scrotum has features specific for TB epididymitis. On the other hand, the polymerase chain reaction (PCR) is a technique used to amplify extremely small amounts of a specific genomic sequence rapidly. The presence of an extremely small number of acid fast bacilli may be demonstrated within 24 h–48 h. Direct detection of *M. tuberculosis* DNA by the urinary PCR technique is a rapid, non-invasive, and highly specific method for the diagnosis of genitourinary

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TB [5–7].

## 2 Case report

A 79-year-old man, who had a previous history of pulmonary TB, hypertension, angina pectoris and diabetes mellitus, presented with bilateral scrotal swelling and pain without urethral discharge for 1 week. He also had symptoms of lower urinary tract, such as frequency, urgency and nocturia. Physical examination revealed enlarged, hard and mildly-tender bilateral epididymes.

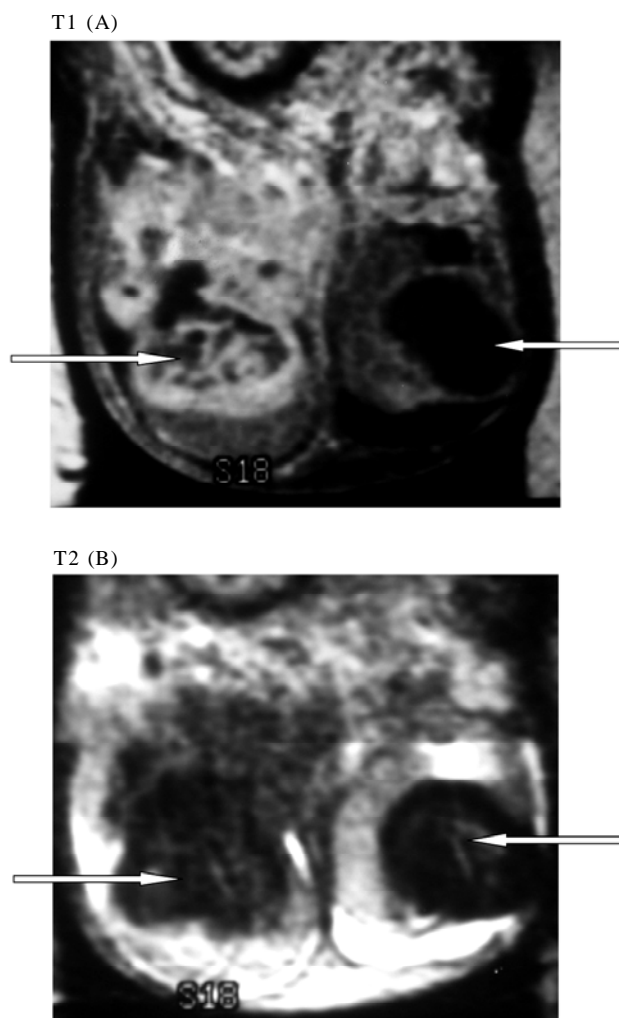


Figure 1. Magnetic resonance imaging (MRI) of scrotum showed enlarged bilateral epididymes (right side predominant) with heterogeneous low signal intensity on T1 (A) and T2 (B)-weighted images (arrows). There was slight contrast-enhanced.

Both testes were normal. There was no scrotal fluctuation on palpation. Digital rectal examination revealed an enlarged prostate without tenderness or nodularity. Urinalysis showed 14 to 16 white blood cells per high power field. Urine culture was negative;  $\alpha$ -fetoprotein and  $\beta$ -human chorionic gonadotropin (HCG) were within normal serum levels.

Intravenous urography was unremarkable except for an enlarged prostate. Scrotal ultrasonography demonstrated enlarged bilateral epididymes with heterogeneous echogenicity. An MRI of the scrota showed enlarged bilateral epididymes (right side predominant) with heterogeneous low signal intensity on T1(A)- and T2(B)-weighted images and slightly contrast enhanced (Figure 1). There was minimal hydrocele but no thickened scrotal skin. The bilateral testicles were normal.

Subsequently, urinary PCR was performed, which showed the presence of mycobacterial DNA. Six weeks later, *M. tuberculosis* was confirmed on culture. Treatment was started with triple antituberculous therapy (-isoniazid, rifampin and ethambutol). Since then, the patient has been regularly followed up for 6 months. He has remained well and symptoms have gradually been relieved.

## 3 Discussion

Genitourinary TB accounts for 30 % of cases of all extrapulmonary TB [8]. It occurs more in men than in women (approximate ratio 2:1), with ages from 25 to 44 years [3]. Human immunodeficiency virus infection may increase the risk of genitourinary TB [4, 9]. Kidneys are often the primary organs infected by tuberculous bacilli and then spread down the ureters into the bladder [3, 8]. The infecting organism, *M. tuberculosis*, reaches the epididymis by retrograde extension from the prostate and seminal vesicles, but lymphatic and hematogeneous spread are also possible. Cinman [3] has proposed there is a time lag between the onset of pulmonary TB and the development of genitourinary TB that may range from 2 to 20 years. In our patient who had the history of pulmonary TB, the accurate time for development of scrotal symptoms was difficult to trace. Wolf and Mcaninch [4] have reported an unusual case of TB epididymitis infected via female-to-male venereal transmission. The disease appears to be more commonly unilateral, but bilateral involvement was present in our patient. Tuberculosis usually starts in the epididymal tail. Testicular in-

involvement may occur later by direct extension from an epididymal infection [2, 9–11].

Clinically, patients present with a painless or slightly painful scrotal mass frequently. The irritative voiding symptoms are not as common as other genitourinary TB [2, 4]. Urinalysis shows sterile pyuria, as in our case, but secondary bacterial infection is commonly present [3]. If the initial treatment is not appropriate, TB epididymitis may be associated with minor complications such as intrascrotal abscess, scrotal fistula, perineal sinus and infertility [3, 12].

Scrotal ultrasonography usually shows diffuse or focal, heterogeneous and hypoechoic lesions in the enlarged epididymis. The associated pictures included hydrocele with septation, extratesticular calcification, scrotal abscess and scrotal sinus tract [2, 9, 10]. However, these sonographic findings are non-specific and may be seen with nontuberculous infection, tumor or infarction.

In cases of acute epididymitis, the MRI usually demonstrates an enlarged unilateral epididymis with heterogeneous and most commonly high signal intensity (similar to the adjacent testis) on T2(B)-weighted images. Hypervascularity, thickened scrotal skin and reactive hydrocele can be detected. Acute epididymitis also demonstrates marked enhancement on postcontrast T1(A)-weighted images. In chronic epididymitis, the epididymis is enlarged and demonstrates darker signal intensity than normal testis on T2(B)-weighted images [13–15]. In TB epididymitis, Mattrey [14] indicated that epididymal changes on MRI were less severe than those seen with acute bacterial epididymitis and the degree of hypervascularity was less prominent. The diagnostic value of MRI for TB epididymitis is scantily described in English-language published reports. But in our patient, the associated features of scrotal MRI including bilateral epididymal involvement with heterogeneous low signal intensity, minimal hydrocele and no thickened scrotal skin, were not like the acute bacterial infection but were compatible with the chronic inflammatory process. Because of the previous history of pulmonary TB, reactivation of TB with involvement of the epididymis was considered in the differential diagnosis.

The diagnostic criterion of genitourinary TB is the identification of *M. tuberculosis* from urine. The direct smears are often negative as the numbers of organisms in the urine are few. In a series reported by Hemal *et al.* [6], *M. tuberculosis* was isolated in the urine acid fast bacilli culture in only 37.14 % of patients with genitouri-

nary TB. Cousins *et al.* [5] reported that the sensitivity of culture can be as low as 50 %.

In the past, making a definitive diagnosis of TB epididymitis was only based on biopsy material obtained from fine needle aspiration or even epididymectomy [3, 4, 10].

The use of urinary PCR allows a direct detection of mycobacterial DNA in urine samples. The PCR is more sensitive than the culture method; the PCR detection limit is as low as 10 organisms, while smear examination requires 10 000 organisms per milliliter [5–7]. Hemal *et al.* [6] also proposed that the urinary PCR was the most sensitive indicator for detection of *M. tuberculosis* and was positive in 94.29 % of patients with proven genitourinary TB in his studies. According to recently published literature, the sensitivity of urinary PCR for genitourinary TB varies from 83.78 % to 97.00 %, and the specificity was 76 % to nearly 100 % [5–7]. There was a case with TB epididymitis confirmed by epididymal fine needle aspiration with PCR examination [6].

The treatment of the TB epididymitis is essentially conservative. The recommended triple-drug combined regimen consists of isoniazid, rifampin and ethambutol, and they are given orally daily. The duration of suggested therapy varies from 2 months to 2 years [3, 11]. But Gow *et al.* [16] suggested that it is unnecessary to extend chemotherapy beyond 4 months. If there is no sign of resolution within 2 months or in the event of an intrascrotal abscess being identified, surgical intervention is required [12, 16]. Shafik [11] has reported an invasive procedure that has delivered satisfactory results; this involves a Rifampin (Alphapharm Pty Ltd., Carole Park Old, Australia) injection into the tunica vaginalis sac, which also avoids the side-effects of oral therapy.

It is a challenge for urologists to diagnose TB epididymitis. Undoubtedly, in comparison with conventional methods, the combined use of scrotal MRI and urinary PCR for the noninvasive diagnosis of the TB epididymitis is more valuable, especially in the patient with the previous history of pulmonary TB.

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