



Tuberculosis of the Prostate: Four Cases and a Review of the Literature

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ABSTRACT

Objectives: Tuberculosis of the prostate is a very rare disease. Most urologists are not familiar with it. Here, we wish to present our experience with 4 cases of this disease and a review of literature.

Methods: This was a retrospective study in a tertiary care center from January 2001 to December 2009.

Results: All the patients were in their fourth or fifth decade of life. Irritative voiding (100%) followed by hemospermia (50%) were the common presenting symptoms. A history of pulmonary tuberculosis was absent in all cases. Three out of 4 cases (75%) had a suspicious prostate on the digital rectal examination. PSA assays were slightly elevated with a mean of 8.26 ng/ml. Urine analysis revealed sterile pyuria in all patients, and the urine culture was negative. The urine and seminal fluid positivity rate was 33.33% for the AFB test, 66.6% for the M. tuberculosis culture test, and 100% for PCR. The transrectal ultrasonogram showed hypoechoic areas with irregular outlines in 3 cases (75%) and calcification in 2 cases (50%). All patients were scheduled to receive 6 months of chemotherapy with isoniazid, rifampicin, and Ethambutol or pyrazinamide.

Conclusions: A high index of suspicion with a wide range of investigations may be required to achieve a complete diagnosis of prostatic tuberculosis. Although short-term multi-drug chemotherapy is an ideal mainstay of treatment, surgery has a definitive role in advanced disease.

INTRODUCTION

Tuberculosis of the prostate is an extremely rare disease [1,2]. It is mainly found in immune-compromised patients [3]. Many urologists are not familiar with the disease due to its rare incidence. Here, we present our experience of 4 cases of this disease in the last 10 years and reviews of the related literature.

MATERIALS AND METHODS

This is a retrospective study of a total of 4 patients who were diagnosed with prostatic tuberculosis between January 2000 and December 2009 in the Urology Department of I.P.G.M.E. & R & S.S.K.M. Hospital, Kolkata. The case records of these 4 cases were analyzed for clinical presentations; their urine and seminal fluid were analyzed for an acid-fast bacilli (AFB)

smear, M. tuberculosis culture, polymerase chain reaction (PCR) for M. tuberculosis, and a radiological and histopathological examination. Detailed clinical data of these 4 cases are summarized in Table 1. An online literature search was made from PubMed.

RESULTS

All patients were in their fourth or fifth decades of life. Irritative voiding (100%) followed by hemospermia (50%) were the common presenting symptoms. One case was incidentally diagnosed on histopathological examination after transurethral resection of the prostate (TURP) for lower urinary tract symptoms due to prostatic enlargement. A history of pulmonary tuberculosis was absent in all cases. Three out of 4 cases (75%) were suspected to be prostate tuberculosis

KEYWORDS: Chemotherapy, genitourinary, prostate, tuberculosis

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on the digital rectal examination. The PSA assay was slightly elevated with a mean of 8.26 ng/ml. The urine analysis revealed sterile pyuria in all these patients, and their urine culture was negative. Chest X-ray was normal, ESR was raised in 50%, and Mantoux test score was positive in 2 (66 %) out of 3 cases.

The urine and seminal fluid of 2 patients presenting with hemospermia and of 1 patient presenting irritative voiding symptoms with abnormal DRE were sent for an AFB smear, mycobacterial culture, and PCR. The test results were positive for at least 1 test; the positivity rate was 33.33% for the AFB test, 66.6% for the *M. tuberculosis* culture test, and 100% for PCR. A transrectal ultrasonogram (TRUS) showed hypoechoic areas with irregular outlines in 3 cases (75%) and calcification in 2 cases (50%) (Figure 1). The TRUS-guided prostate biopsy showed granulomatous infection with caseous necrosis (Figure 2, Figure 3). These areas of caseation in these 3 patients confirmed the diagnosis. Following this, an extensive search, including an IV pyelogram test for tuberculous foci in the body, was made but no lesions in another area were found. All the patients were scheduled to receive 6 months of chemotherapy with isoniazid, rifampicin, and Ethambutol or pyrazinamide according to the Centers for Disease Control and American Thoracic Society protocol. They showed improvement in their symptoms on regular follow-up. After 6 months of chemotherapy, all of them became negative for mycobacterium in their urine and seminal fluid analysis on an AFB smear, mycobacterial culture, and PCR.

DISCUSSION

The term genitourinary tuberculosis (GUTB) was first introduced by Willbolz et al. It is the second most common form of extrapulmonary tuberculosis after lymph node involvement [1]. The primary organ affected in the urinary tract is the kidney and the epididymis in male genitalia [1]. Since prostatic tuberculosis is a rare disease, it is generally not properly diagnosed or it is under reported. Sporer [5] reported 728 autopsies of tuberculosis cases of which 100 showed prostatic involvement. In Medlar's [6] series of cases of genital TB, the prostate was involved in all.

Primarily prostatic tubercular lesions are very rare [2]. Tuberculous infection of the prostate is usually the result of hematogenous spreading [3]. It can also occur as a result of descending infection from the urinary tract or local spreading from the genital tract [4]. Although sexual transmission of *M. tuberculosis* has been reported, it is extremely rare [3]. Tubercular infection of the prostate results in chronic granulomatous inflammation. The resulting caseation necrosis then either heals by fibrosis or causes cavitations and sloughing (i.e., autoprostatectomy, as in the case with poor host defenses) [4].

Figure 1. A transrectal ultrasonogram showing a hypoechoic area of granulomatous lesions in the prostate.

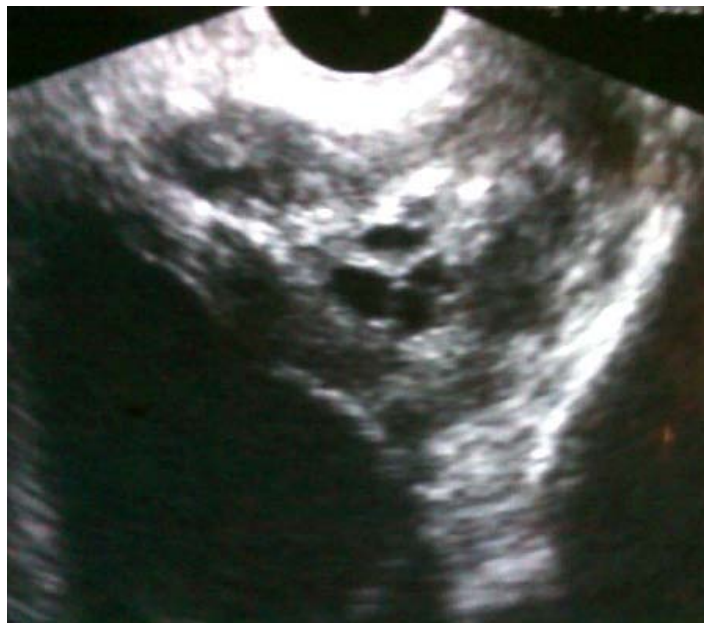
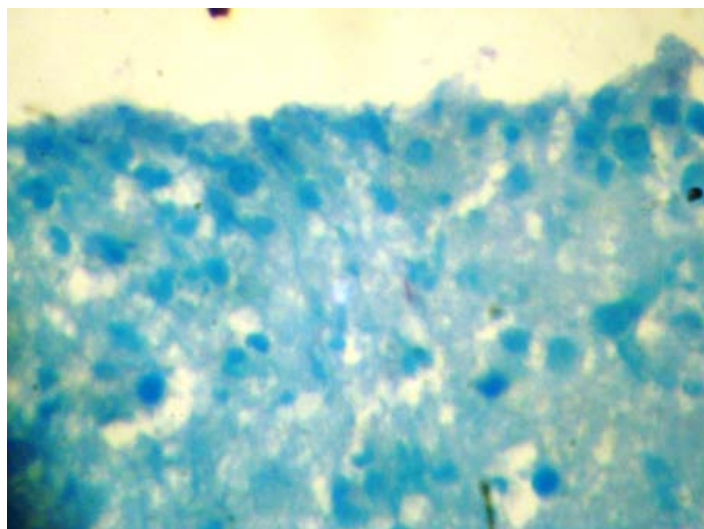


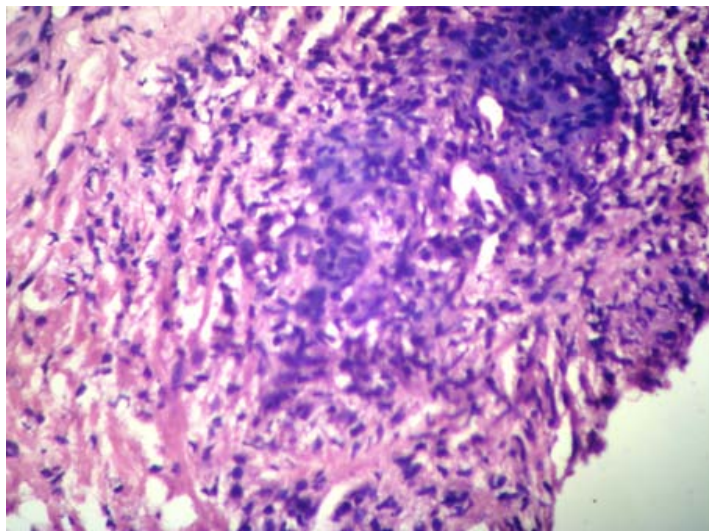
Figure 2. A low-power microphotograph showing chronic granulomatous inflammation and caesation in the prostate



Initially, patients are usually asymptomatic or present with non-specific irritative voiding symptoms or hemospermia. Hemospermia gives a strong suspicion of tubercular infection

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Figure 3. A high-power microphotograph showing the granulomatous infection and caseous necrosis with acid-fast stain bacillus in the prostatic tissue.



and its sequelae in the prostate [2]. Sometimes the disease spreads rapidly and glandular destruction results, reducing the volume of semen. Advanced cases may present perineal sinus [4,5]. On palpation, most often the prostate was found to be non-tender, nodular, firm to hard, and rarely enlarged [4]. Prostatic tuberculosis may cause transient elevation of PSA levels that decreases with resolution of inflammation [7]. In our series, serum PSA came down to normal range after 6 weeks of anti-tubercular treatment.

A confirmed diagnosis required positive cultures, Ziehl-Nielsen staining, PCR, and/or histological examination [8]. However, staining has a low sensitivity (52.7% in one study), especially in extrapulmonary TB, and cultures require up to 8 weeks for maximal sensitivity [8]. PCR is highly sensitive and specific (the sensitivity and specificity of PCR of urine is 95.59% and 98.12%, respectively), but it is unable to detect whether the infection is biologically active or is in its latent phase [8]. The diagnosis can be confirmed only by prostate biopsy. In our series, although PCR sensitivity was 100%, the confirmatory diagnosis was made

Table 1. Showing the clinical data of all 4 cases.

Case No	Age	Clinical Feature	Digital Rectal Exam	Serum PSA	USG of Prostate	Semen for AFB Stain, Culture, and PCR for M. Tuberculosis	X-ray Chest	Montoux Test	IVU	Histo-pathological Exam	Treatment
1	39	irritative voiding symptoms with hemospermia	multinodular and firm prostate	13.67	multiple hypoechoic nodule with calcification	all 3 + ve	NAD	+ ve	NAD	TB	ATD
2	45	hemospermia	mild induration in left prostatic lobe	5.76	hypoechoic left nodule	culture and PCR + ve	NAD	+ ve	NAD	TB	ATD
3	34	irritative voiding symptoms	NAD	4.21	normal	PCR + ve	NAD	NAD	NAD	TB	ATD
4	49	lower urinary tract symptoms	asymmetrically enlarged prostate	9.41	heterogenous echotexture with calcification	—	NAD	—	NAD	TB	TURP + ATD

NAD: No abnormality detected

ATD: Antitubercular drug

after histopathological examination in all cases.

A transrectal ultrasonogram (TRUS) of the prostate revealed an enlarged irregular gland with solitary (rare) or multiple irregular hypoechoic zones of varying sizes. The irregularity disappears with medical treatment [6]. The TRUS findings are variable, usually showing a heterogenous echotexture and dystrophic calcification. The tuberculous lesions are typically located in the peripheral part and lateral lobes of the prostate [8]. Contrast-enhanced computed tomography (CT) demonstrates these lesions more clearly [6]. Granulomatous prostatitis lesions show low signal intensity in the peripheral zone on long TR/TE images. A prostatic abscess is seen as an area of intermediate signal intensity on short TR/TE images and high signal intensity on long TR/TE images [6].

Short-course combination chemotherapy (SCC) is the standard care for the treatment of this disease [9]. Six-month regimens containing rifampicin and pyrazinamide are very effective with the fastest rates of culture-conversion and the lowest rates of relapse [9]. However, extensive prostatic involvements may show resistance to medical treatment. In such cases, surgery is used as a second-line intervention [10].

CONCLUSION

Tuberculosis of prostate is a very, very rare disease. A high index of suspicion is necessary and a wide range of investigations may be required to achieve a complete diagnosis. Short-term, multi-drug chemotherapy is the ideal mainstay of treatment. It showed an excellent treatment outcome, but surgery also has a definitive role in advanced stages.

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