Penile Mass Caused by *Mycobacterium tuberculosis*

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Tuberculosis of the penis is rare. The clinical features of penile tuberculosis are usually manifested as ulceration or scars. However, the authors encountered a case of penile tuberculosis that presented as a mass. A painless nodule at the base of the penis was noted in a 63-year-old male patient. Surgical excision was recommended, and pathologic finding revealed granulomatous inflammation in the mass. Acid fast bacilli stain and culture were negative, but a positive result was found in urine polymerase chain reaction for detection of *Mycobacterium tuberculosis*. He was diagnosed with tuberculosis of the penis and underwent anti-tuberculosis chemotherapy.

Keywords: Penis; Tuberculosis; Male genital tuberculosis

CASE REPORT

A painless nodule at the base of the penis was noted in a 63-year-old male, and he was referred to our institution for further evaluation. His past medical history included hypertension and diabetes, but no previous history of genitourinary infection or malignancy or surgical history. No penile deformity was associated with the mass, and he did not complain of any voiding dysfunctions or symptoms such as hematuria.

The patient noticed the mass about 1 month ago before making a visit to his local practitioner for the condition. The non-tender mass located at the dorsal aspect of the base of the penis was firm, mobile, and well-circumscribed. Routine chest radiography finding was insignificant, Leukocytosis was found on urine analysis, but bacteria were not evident on urine bacterial culture. High venereal disease research laboratory and human immunodeficiency virus (HIV) antigen tests were all negative. Imaging studies were recommended for further evaluation, Abdomen-pelvic computed tomography (APCT) and penile ultrasonography (US) showed a 15×15×17 mm sized non-enhancing cystic mass with enhancement of the wall on the dorsal aspect of the penile base (Fig. 1, 2). No lymphadenopathy was
found in the pelvic cavity and both inguinal areas. We recommended surgical excision to the patient for a pathologic diagnosis, and he underwent an excision procedure.

Intraoperatively, a single discrete mass was discovered, which was round in shape with a well demarcated wall that was adherent to the corpus spongiosum. Excision of the mass was performed without complication, and the wound was closed with primary repair. Cystoscopy was performed to determine its relation to surrounding structures. There were multiple diverticulum in the vicinity of the ejaculatory duct on verumontanum, but no other complications such as urinary fistula were observed on cystoscopy (Fig. 3).

Pathologically, the mass was a well-circumscribed nodule including chronic granulomatous inflammation and caseous necrosis (Fig. 4). Stains for fungi and acid fast bacilli (AFB) were negative. A rapid detection screening for *M. tuberculosis* using DNA polymerase chain reaction (PCR) was positive in urinary bladder washing, but negative in the specimen, Urine AFB yielded no mycobacterial organism.

The case was discussed with the patient and he agreed to start anti-TB treatment but refused to undergo a transrectal biopsy of the prostate.

He is currently on TB medication, Isoniazid (300 mg/day), rifampicin (600 mg/day) were maintained for 6 months and pyrazinamide (1,500 mg/day), ethambutol (900 mg/day) were added for the first 2 months.

No postoperative complication has been reported during a 6-month follow-up period.
DISCUSSION

TB, which is caused by an organism, *M. tuberculosis*, has affected mankind for over 5,000 years. The disease has been and continues to be a major cause of morbidity and mortality [1]. In the last two decades, the number of TB cases has been on the rise again in both developed and developing nations. This resurgence of TB cases is related to the spread of HIV. Since then, more incidences of EPTB as well as disseminated TB have been observed. Immune compromised status, immunosuppressive therapy, prolonged steroid use and diseases with poor immune mechanism are predisposing factors causing the development of EPTB [4]. EPTB cases include TB lymphadenitis, pleural TB, TB meningitis, osteoarticular TB, genitourinary TB, abdominal TB, cutaneous TB, ocular TB, TB pericarditis and breast TB, and it is reported that any organ can be open to infection [5].

Recent involvement of the genitourinary system has been reported in 5.8% of all EPTB cases, and the proportion is 1.5% for all patients with pulmonary TB [2]. Isolated genital involvement has been reported in 28% among these patients [6]. Nonspecific clinical presentations and variable radiographic presentations mimic other pathologic lesions [7], and male genital TB may present as a testicular mass that can be difficult to differentiate from malignant condition [2]. Penile TB is an even rarer entity, and the usual clinical manifestation is superficial ulceration of the glans penis. Both primary and secondary infections have been described. Primary cases generally include those who were previously uninfected and had direct inoculation such as sexual contact [2], and secondary infection is commonly found with other genitourinary foci [8]. In this case report, no specific finds were observed on the chest radiogram or APCT, but intraoperatively we found multiple diverticula on the site of the ejaculatory duct, and urine TB-PCR was positive on urinary washing specimen. Thus, we made a conclusion of possible secondary TB infection.

Genital TB in male is predominantly associated with TB of kidney, prostate, seminal vesicle, epididymis, testis, and scrotum [9]. Since multiple diverticula were evident surrounding the ejaculatory duct, we suspect that the penile TB in this case originated from the prostate.

Urine culture and/or biopsy are necessary to make the diagnosis of TB. Urine culture has been used traditionally to make the diagnosis because AFB smears are often negative. However, due to its slow growing nature, it takes between 6 to 8 weeks to grow *M. tuberculosis* with a doubling time of 15 to 20 hours [1], and it is intermittently excreted through urination.

Thus, at least three consecutive samples, but preferably five samples, of early morning urine must be collected for culture evaluation. Difficulty in making the diagnosis of EPTB stems from atypical presentation clinically. The infection has features similar to those of other inflammatory and malignant conditions that may result in improper or postponed treatment. However, in our patient, urine TB-PCR was positive so that the proper treatment could be administered, although we were unable to distinguish what organism of the Mycobacterium, Anti-TB chemotherapy and surgical excision are recommended for treatment of mycobacterial infection in the penis [2]. Our patient also underwent both chemotherapy and surgical excision. The causes of penile mass were epidermal cyst, abscess, sarcoma, carcinoma, etc. Because differential diagnosis for penile TB includes malignant condition, excisional biopsy is a must step to confirm the infection from other serious conditions. In addition, before undergoing surgical excision, US and APCT are further recommended when TB infection is not excluded and a malignant condition is suspected.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

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