***Case report***

**Tuberculosis Beyond the Lungs: A Rare Case of Penile Involvement**

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ABSTRACT

**Introduction**

Tuberculosis has been labelled as the leading cause of mortality among infectious diseases. Penile tuberculosis is a rare variant of genital tuberculosis in males, accounting for less than 1% of all cases.

**Case**

We present the case of a 65-years old man, who presented with several painful ulcerative lesions on the glans penis that had developed over the span of 1 year. Histopathological examination from a wedge biopsy revealed granulomatous inflammation. Based on these findings, a diagnosis of penile tuberculosis was established, and patient was enrolled under the RNTCP program. He received Anti-Tuberculous Treatment (ATT).

**Conclusion**

Penile tuberculosis is a rare clinical entity. Therefore, maintaining a high level of clinical suspicion is crucial for achieving a timely and accurate diagnosis, which facilitates the initiation of appropriate therapy.

*Keywords: Penile, Tuberculosis, Ulcer, Granuloma*

1. INTRODUCTION

The 2024 WHO Global Tuberculosis report labelled Tuberculosis as the leading cause of mortality amongst infectious diseases, with anticipated incidence of 10.8 million in the year 2023, thereby surpassing COVID 19 [1]. It still continues to pose a major burden on the health sector especially in developing countries. While the major contribution is by pulmonary tuberculosis, extrapulmonary manifestations account for almost 20% cases [2].These include lymph nodes, skeletal system, pleural manifestations, genitourinary tract and central nervous system [3]. Penile tuberculosis is a rarely reported subtype accounting for less than 1% of all male genital tuberculosis cases [4].

2. CASE REPORT

We present a case of a 65-years old man, who developed multiple painful ulcerative lesions on the glans penis, evolving over a period of one year. They were sudden in onset and developed initially as pustules, that later eroded to form ulcers. There was no history of trauma, weight loss, fever, cough or other constitutional symptoms. There were no associated urinary complaints or sexual dysfunction. He had no personal or family history of pulmonary tuberculosis. There was no history of contact with multiple sexual partners or high-risk sexual behaviour. He had undergone circumcision for phimosis 3 years back.

On general examination, he had a scar from the Bacillus Calmette–Guérin (BCG) vaccine. On local examination, he was found to have a punctate ulcer with undermined edges with unhealthy granulation tissue of size 1 x 1 cm over glans and multiple healed scars near the corona (Figure 1).



**Figure 1**: 1 x 1 cm punctate ulcer with undermined edges with unhealthy granulation tissue over glans and multiple healed scars near the corona

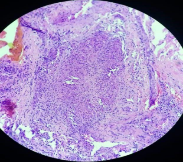
There was no significant inguinal lymphadenopathy. Other systemic examination were normal.

Blood investigations were within normal limits. Tests for HIV and syphilis were found negative. Urine routine was normal while urine culture showed no growth and Urine CBNAAT was negative. Chest X ray (Figure 2), Ultrasound abdomen and Intravenous urography were normal thus ruling out other foci of tuberculosis.



**Figure 2**: Chest X ray showing no abnormalities

Patient’s wife was also evaluated for genital tract infections, which were found negative. Wedge biopsy of the lesion showed granulomatous inflammation with epithelioid histiocytes with focal caseous necrosis and scattered Langhans type multinucleated giant cells (Figure 3), consistent with Kochs.



**Figure 3**: Granuloma with epithelioid histiocytes with focal caseous necrosis and scattered Langhans type multinucleated giant cells

Patient was diagnosed with penile tuberculosis and subsequently enrolled under RNTCP. He received Anti- Tuberculous Treatment (ATT) which included a four-drug regimen—rifampicin, pyrazinamide, isoniazid, ethambutol—for initial 2 months, followed by rifampicin as well as isoniazid to complete six-month course. By the end of therapy, lesions had completely healed, leaving behind depressed scars (Figure 4).



**Figure 4**: Healed lesion post ATT with depressed scars

3. discussion

Penile involvement of tuberculosis is a rare occurrence. The first case reported in 1848 was by Fournier [5]. The most common sites involved in genital tuberculosis are Epididymis (42%) followed by seminal vesicle (23%), prostate (21%), testis (15%) as well as vas deferens (12%) [6]. Penile tuberculosis can present in two forms - primary or secondary. Aggressive sexual contact with a female with active genital tuberculosis (vigorous contact is considered causative, as normal mucosa is resistant), auto infection in infected patients by their own ejaculate, or fomite spread are thought to be the plausible factors for Primary penile tuberculosis. A case of penile tuberculosis, wherein the wife had endometrial tuberculosis, has been reported by Gupta et al. Thus, in such cases, the female partner should always be examined for genital tuberculosis [7]. Another associated factor that has been reported is Intravesical BCG, given as a part of treatment for bladder carcinoma [8]. The secondary form is due to the subsequent involvement from pulmonary or other sites of the genitourinary tract, with the most common route of spread being hematogenous.

The lesion begins as an inflamed papule or a keratotic plaque which subsequently ulcerates and can spread to the cavernous tissue. Corresponding to the coalescing granulomas, pea-sized nodules can also be palpable in the cavernous bodies and urethra. These nodules are usually hard and painless or may even present as a fungating mass. They pose a diagnostic dilemma as they can mimic malignancy. Erectile dysfunction is a late presentation, which can arise due to fibrosis leading to penile distortion [9].

Orificial tuberculosis is found in immunocompromised patients. They are associated with necrotic lesions and can occur due to autoinoculation with infected stool or urine and rarely due to hematogenous or lymphatic spread. Painful ulcers coated with pseudo membrane are the usual presentation. These can complicate further by destruction of the deeper tissues.

Papulonecrotic tuberculid is another extremely rare variant, wherein the tuberculids that develop, are painless red papules which erupt on the skin, ulcerate, and then undergo varioliform scarring. These tuberculids represent hypersensitivity reactions to the tuberculous antigens, hence they do not contain tubercle bacilli.

Genital ulcers can have multiple other differential diagnosis and these need to be carefully assessed. These include infectious, non-infectious and neoplastic lesions. Infectious causes encompass herpes simplex virus infection, syphilis, sexually transmitted lymphogranuloma venereum, Epstein–Barr (EB) virus-related genital ulcers as well as disseminated histoplasmosis. Non-infectious causes encompass lichen sclerosis, pemphigus vulgaris, lichen planus, necrotizing fasciitis, Crohn’s disease, fixed drug eruption as well as nodular polyarteritis. Neoplastic conditions encompass squamous cell carcinoma, Kaposi’s sarcoma, lymphoma, basal cell carcinoma, Langerhans cell histiocytosis, as well as metastatic carcinoma.

The routine investigations may show elevated ESR. It is important to identify the presence of any other source of tuberculosis. Hence respiratory system evaluation, Urine CBNAAT, Tuberculin skin test along with interferon gamma release assay may serve as adjuncts for making the diagnosis. However, the confirmation is provided by histology. The pathological hallmark is epithelioid cell granuloma. Additional findings like multinucleated giant cells, caseous necrosis, neutrophilic abscesses, as well as dermal fibrosis are also supportive of the diagnosis [10].

According to the NTEP guidelines (ICD-A18.10), the treatment consists of an intensive phase of four-drug combination therapy – rifampicin, pyrazinamide, isoniazid and ethambutol for 2 months, followed by rifampicin as well as isoniazid for another 4 months for the continuation phase. Since transmission from one mucosal surface to another during intercourse is a hypothesis, the patients are advised to refrain from intercourse for at least 1 month after treatment [11].

It is imperative to make a correct diagnosis in such a case as it helps to guide the further management. A case has been reported where penile amputation was performed due to high suspicion of cancer but final diagnosis revealed penile tuberculosis [12]. Therefore, we present this case to highlight the significance of considering penile tuberculosis as differential diagnosis in patients presenting with genital ulcers.

4. Conclusion

Penile tuberculosis is a rare clinical entity. Therefore, maintaining a high level of clinical suspicion is crucial for achieving a timely and accurate diagnosis, which facilitates the initiation of appropriate therapy.

Consent

All authors declare that ‘written informed consent was obtained from the patient for publication of this case report and accompanying images.

Ethical approval

All authors hereby declare that this case report was made in an ethical manner.

Disclaimer (Artificial intelligence)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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