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Epididymal Tuberculosis Mimicking Testicular Malignancy: A Case Report

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Abstract | **Case Report**

Introduction: Urogenital tuberculosis is the second most common form of extrapulmonary tuberculosis, and the epididymis is the most frequently involved site within the male genital tract. Its clinical and radiological presentation is often non-specific and may closely mimic a testicular malignancy, making preoperative diagnosis particularly challenging. ***Case presentation:*** We report the case of a 50-year-old man who presented with a painful right scrotal mass and fever, three months after epididymectomy and antituberculous therapy for epididymal tuberculosis. Physical examination revealed a 6cm ulcero-proliferative scrotal tumor with skin involvement, and scrotal ultrasound showed an isoechoic, hypovascular lesion. Given the strong clinical suspicion of malignancy, a right radical orchiectomy was performed. Histopathological examination demonstrated necrotizing granulomatous inflammation with caseous necrosis, confirming tuberculosis, with clear resection margins and no evidence of malignancy. Antituberculous therapy was subsequently reinitiated. ***Conclusion:*** Epididymal tuberculosis can closely mimic testicular malignancy both clinically and radiologically. It should be considered in the differential diagnosis of any scrotal mass, particularly in tuberculosis-endemic regions, and histopathological confirmation remains essential to establish the diagnosis, guide management, and avoid unnecessary radical surgery whenever possible.

Keywords: Epididymal tuberculosis, Genitourinary tuberculosis, case report, genital mass.

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INTRODUCTION

Tuberculosis (TB) remains a major public health problem worldwide, particularly in developing countries and among immunocompromised patients. While pulmonary involvement remains the most common manifestation, extrapulmonary forms account for approximately 15 to 20% of cases. Among these, urogenital tuberculosis is the second most common site after lymph node involvement [1]. Obtaining accurate epidemiological and clinical data on urogenital tuberculosis (UG-TB) remains challenging, largely due to the difficulty of establishing a definitive diagnosis, the wide range of non-specific clinical presentations, and limited clinical awareness of TB as a potential underlying cause. As a result, estimating the true prevalence of UG-TB across different geographic regions and patient populations is particularly problematic, since a substantial proportion of affected individuals remain asymptomatic and therefore undiagnosed. [2]

We present a case of epididymal tuberculosis that clinically and radiologically mimicked testicular malignancy. This case highlights the importance of considering tuberculosis in the differential diagnosis of a scrotal mass and demonstrates the role of tissue diagnosis in guiding management.

CASE PRESENTATION

A 50-year-old married man presented to our department with a painful right scrotal mass associated with fever. His past medical history was notable for a right epididymectomy performed for epididymal tuberculosis, following which he received a three-month course of antituberculous therapy.

Notably, the current presentation developed only three months after the completion of his initial surgical and medical treatment, suggesting either an inadequate therapeutic response or a rapid disease recurrence.

On physical examination, the right hemiscrotum revealed a sessile, ulcero-proliferative tumor measuring 6 cm in its greatest diameter, with a lobulated and irregularly mamillated surface. (Fig. 1) The lesion had a fungating appearance with surrounding scrotal skin involvement.

Laboratory investigations, including complete blood count, inflammatory markers, and renal function tests, were all within normal limits. Scrotal ultrasound demonstrated an isoechoic, hypovascular formation, without any features suggestive of a highly vascularized malignant process.

In light of the clinical presentation and imaging findings, the decision was made to proceed with a right radical orchiectomy. (Fig. 2) The postoperative course was uneventful, and the patient was discharged in good condition.

Histopathological examination of the surgical specimen revealed granulomatous inflammatory changes with caseous necrosis and foci of suppuration, consistent with a diagnosis of tuberculosis. (Fig. 3) Importantly, the resection margins were clear, and no evidence of malignancy was identified, effectively ruling out any superimposed neoplastic transformation.

Following the histopathological confirmation, antituberculous therapy was reinitiated and continued in the postoperative period. The patient is currently under regular follow-up, with close monitoring of his clinical response to treatment.



Figure Legend 1: Operative view of the right hemiscrotum revealing a sessile, ulcero-proliferative tumor measuring 6 cm in its greatest diameter, with a lobulated and irregularly mamillated surface and a fungating appearance with surrounding scrotal skin involvement

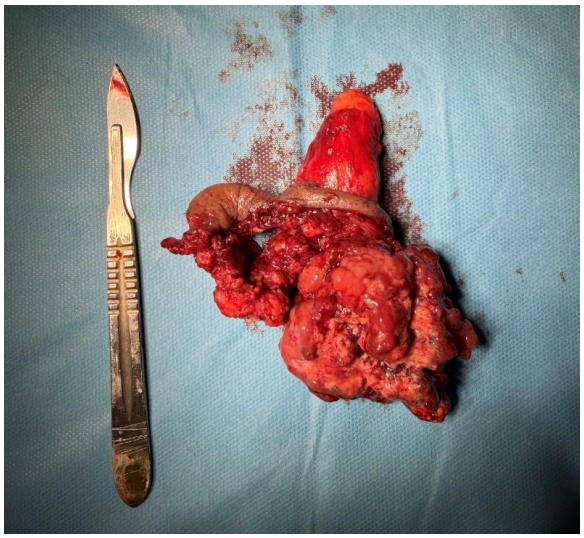
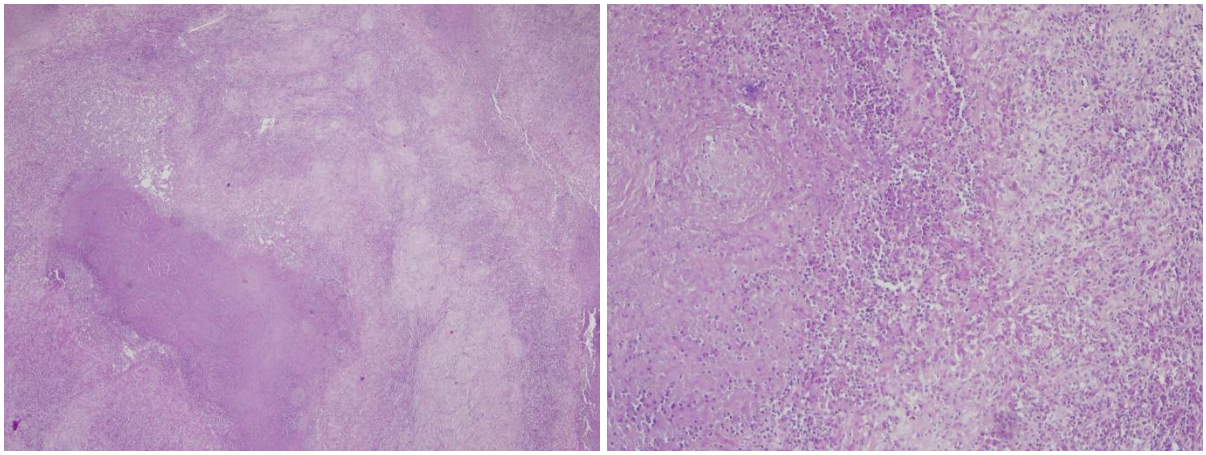


Figure Legend 2: Macroscopic appearance of the right orchiectomy specimen showing extensive epididymal involvement by tuberculosis



A B

Figure Legend 3: A) At low magnification, extensive involvement of the epididymal parenchyma by necrotizing granulomatous inflammation, with large confluent areas of caseous necrosis. (B) At higher magnification, the inflammatory foci consist of epithelioid histiocytes associated with a prominent suppurative component rich in degenerated neutrophils (H&E staining)

DISCUSSION

Urogenital tuberculosis (UG-TB) represents the second most common form of extrapulmonary tuberculosis after lymph node involvement, accounting for approximately 15 to 20% of all extrapulmonary cases. Within this group, epididymal tuberculosis is the most frequent manifestation of male genital TB, typically presenting as a painful or painless scrotal swelling, often accompanied by a characteristic beaded thickening of the vas deferens on physical examination. However, the clinical presentation can be highly variable and misleading, as illustrated by the present case.

Tuberculosis can involve the entire male genital tract, affecting the prostate, seminal vesicles, vas deferens, epididymis, Cowper's glands, penis, and testicles. Testicular involvement typically occurs through direct contiguity with the epididymis, as the blood-testis barrier confers a degree of protection against hematogenous spread. The pathogenesis of male genital tuberculosis follows two main routes: hematogenous dissemination, which primarily seeds the prostate and epididymis, and urinary tract spread, whereby mycobacteria reach the prostate and subsequently propagate retrogradely through the ejaculatory ducts to the seminal vesicles, vas deferens, and epididymis. [3]

The epididymis is involved in 10 to 55% of men diagnosed with urogenital tuberculosis, with scrotal abnormalities representing the predominant finding on physical examination. Epididymal tuberculosis presents bilaterally in approximately one-third of cases (34%). Clinically, it manifests as an epididymal nodule or scrotal induration in all affected patients, a scrotal fistula in nearly half of cases, and a hydrocele in only 5% of patients. The presence of a scrotal fistula is a particularly characteristic sign, highly suggestive of tuberculous etiology. [4]

Scrotal tuberculosis, encompassing tuberculous epididymo-orchitis, may present with either unilateral (66% of cases) or bilateral (34% of cases) scrotal involvement. The clinical presentation can be acute or chronic, and the scrotal swelling may be painful or painless, frequently accompanied by scrotal skin inflammation and edema. Findings suggestive of scrotal tuberculosis include a non-tender testicular mass, an enlarged and indurated epididymis, thickening or beading of the vas deferens, and scrotal edema. Chronic granulomatous inflammation and obstruction of the vas deferens may result in marked epididymal distension. Granulomatous involvement along the course of the vas deferens produces the characteristic beaded appearance, which is a well-recognized clinical hallmark of the disease. Importantly, distinguishing these features from malignant scrotal swellings can be particularly challenging in the clinical setting, underscoring the need for histopathological confirmation. Additionally, scrotal fistulae and sinuses discharging thin, odorless pus are highly suggestive of a tuberculous etiology.[5,6]

On scrotal ultrasonography, epididymal tuberculosis typically appears as a hypoechoic lesion with a heterogeneous echotexture, which may involve either the entire epididymis or be confined to its head. Concomitant testicular involvement is observed in approximately 38.9% of cases. [7]

Computed tomography (CT) and magnetic resonance imaging (MRI) can provide valuable additional information in the assessment of scrotal masses and may aid in differentiating testicular tuberculosis from other testicular conditions. On CT, testicular tuberculosis generally manifests as ill-defined, heterogeneous lesions, which may exhibit annular or multiloculated enhancement patterns. MRI offers superior soft-tissue resolution, allowing more accurate localization and characterization of scrotal abnormalities. However, despite their diagnostic value, specific data regarding the sensitivity and specificity of

CT and MRI for testicular tuberculosis remain lacking. Therefore, these imaging modalities should be considered complementary tools that can support the clinical diagnosis and assist in guiding subsequent diagnostic and therapeutic management. [8]

In up to 20% of patients, tuberculous epididymo-orchitis is only confirmed following orchiectomy and histopathological examination of the surgical specimen. When the diagnosis cannot be established through non-invasive means, fine-needle aspiration cytology or epididymal biopsy may be employed, given that Mycobacterium tuberculosis is not typically detectable in the urine in cases of isolated genital involvement. However, fine-needle aspiration should be used with caution and avoided when malignancy is suspected, due to the risk of tumor cell spillage and potential local dissemination. In cases where fine-needle aspiration proves inconclusive or when the patient fails to respond to antituberculous drug therapy, the European Association of Urology (EAU) recommends surgical exploration as a means of obtaining adequate tissue for definitive histopathological diagnosis. [9,10]

CONCLUSION

Epididymal tuberculosis, although rare in its isolated form, remains an important diagnostic consideration in any patient presenting with a scrotal mass, particularly in tuberculosis-endemic regions. As illustrated by the present case, its clinical and radiological features are frequently non-specific and may closely mimic a testicular malignancy, leading to diagnostic uncertainty and, at times, to radical surgical management. A high index of suspicion, together with the integration of clinical, biological, and imaging findings and, when needed, histopathological confirmation, is essential to reach the correct diagnosis. Early recognition allows the timely initiation of antituberculous therapy, which remains the cornerstone of treatment and may help avoid unnecessary orchiectomy. Finally, this case underscores the importance of an adequate treatment duration and close clinical follow-up, given the possibility of disease recurrence or an incomplete therapeutic response.

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