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Tuberculous Orchitis Mimicking Testicular Cancer: A Case Report and Literature Review

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Abstract

Background: Tuberculous orchitis is a rare form of genitourinary tuberculosis that can closely mimic testicular malignancy, particularly in endemic regions. Its nonspecific clinical and radiological features often lead to delayed diagnosis and unnecessary orchidectomy. **Case Presentation:** We report the case of a 37-year-old man presenting with a four-month history of progressive, painless testicular cancer with pulmonary metastases, leading to the left inguinal orchidectomy. Histopathological examination, however, revealed granulomatous inflammation with caseating necrosis, consistent with tuberculous orchitis. The patient responded favorably to standard anti-tubercular therapy, with resolution of contralateral epididymal involvement within four weeks. **Conclusion:** This case highlights the diagnosis dilemma of testicular tuberculosis and emphasizes the critical role of histopathological examination in distinguishing it from malignancy. Clinicians should maintain a high index of suspicion for tuberculosis in atypical testicular masses in endemic regions, as timely medical therapy may prevent unnecessary surgery and preserve testicular function.

Keywords

Tuberculous Orchitis, Differential Diagnosis, Testicular Cancer Histopathology, Orchidectomy, Anti-Tubercular Therapy

1. Introduction

Tuberculosis, caused by *Mycobacterium tuberculosis*, remains a major global public health concern and has been recognized as a worldwide emergency for more than

three decades. *Genitourinary tuberculosis* represents the second most common form of extrapulmonary tuberculosis after lymph node involvement [1]. Testicular localization, however, is rare and often mimics testicular malignancy, particularly in chronic and asymptomatic cases [2]. Consequently, the presence of a solid, indurated testicular mass with chronic evolution and poorly defined margins on ultrasonography in a young patient from a tuberculosis-endemic region presents substantial diagnostic challenges. Such scenarios may lead to misdiagnosis and potentially unnecessary orchiectomy.

Here, we report a case of isolated tuberculous orchitis that closely simulated testicular cancer, retrospectively confirmed by histopathological analysis after radical orchiectomy. This case underscores the diagnostic dilemma posed by tuberculous orchitis and highlights the crucial role of histopathology in preventing unwarranted surgical interventions.

2. Case Presentation

A 37-year-old male patient presented with a four-month history of progressively increasing swelling of the left testicle without associated pain and fever.

He also reported constitutional symptoms including weight loss, fatigue and anorexia.

His past medical history revealed close contact with a case of tuberculosis, although he denied cough, night sweats or evening fever.

On physical examination, the left hemiscrotum was enlarged and displayed a 1 cm ulceration of the scrotal skin with a yellowish base (**Figure 1**). The left testicle was firm and enlarged, not tender, and without palpable inguinal adenopathy. The right hemiscrotum and testis were normal.

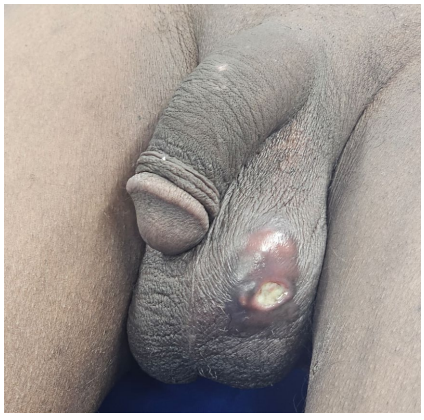

Figure 1. Preoperative image: enlarged left hemiscrotum with yellow-based ulceration.

The rest of general examination was normal. The remainder of the systemic examination was unremarkable. Transillumination test was negative.

Laboratory investigations revealed mild anemia (hemoglobin 11.7 g/dL). Urinalysis was sterile. Serum tumor markers, including Alpha-Fetoprotein (AFP) and

human Chorionic Gonadotropin (hCG), were within normal limits, while Lactate Dehydrogenase (LDH) was elevated at twice the upper limit of normal. Additional tests, including HIV serology and erythrocyte sedimentation rate, were unremarkable.

Scrotal ultrasonography demonstrated a heterogeneous left testicular mass with a normal epididymis. Renal, ureteric, and bladder ultrasonography was normal.

Preoperative chest radiography (Figure 2) showed bilateral pulmonary opacities resembling cannonball metastases. Computed tomography of the chest (Figure 3) revealed cavitary lesions suggestive of metastatic disease.

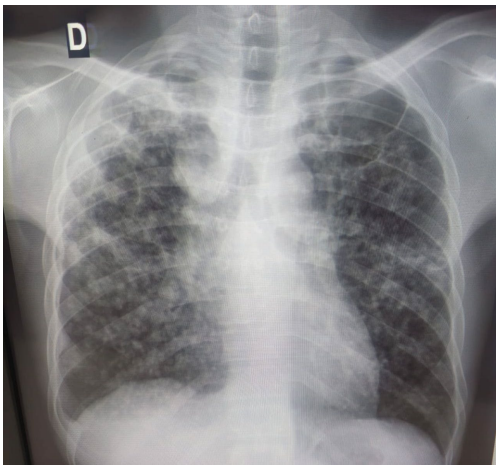

Figure 2. Chest X-ray: bilateral opacities suggesting balloon release pattern.

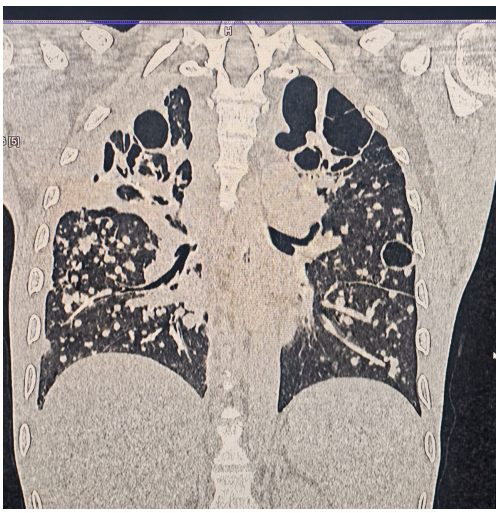

Figure 3. Chest CT: multiple cavitary pulmonary lesions.

Based on these findings, a presumptive diagnosis of testicular cancer with pulmonary metastases was made. The patient subsequently underwent a left inguinal orchidectomy with excision of the scrotal ulceration (Figure 4).

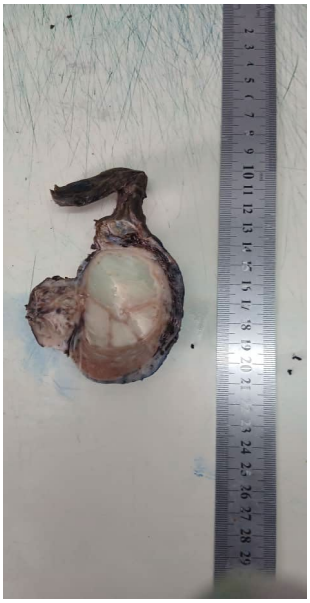

Figure 4. Surgical specimen.

The postoperative course was notable for painful enlargement of the right hemiscrotum one week after surgery. Magnetic Resonance Imaging (MRI) of the right testis (**Figure 5**) revealed an enlarged right epididymis with a normal testis.

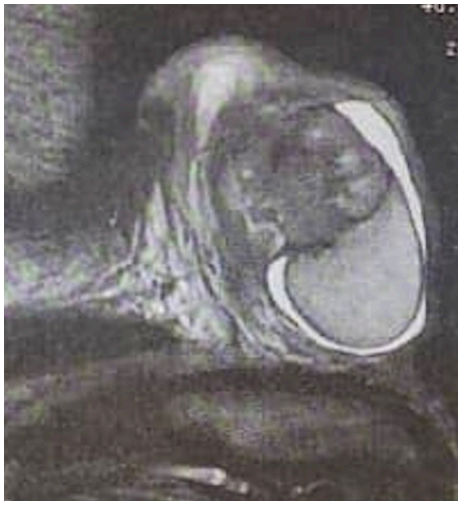

Figure 5. MRI of the right testis: the red arrow showing heterogeneous hypertrophy of the right epididymis above a normal-looking right testicle (yellow arrow).

Gross pathological examination of the surgical specimen demonstrated a whitish, multicystic gelatinous mass with areas of hemorrhage. Histopathological analysis revealed granulomatous inflammation characterized by epithelioid cell aggregates, Langhans-type multinucleated giant cells, lymphoplasmatic infiltrates, and

eosinophilic caseating necrosis (Figure 6 and Figure 7). No malignant cells were identified. A diagnosis of tuberculous orchitis at the caseo-follicular stage was therefore established.

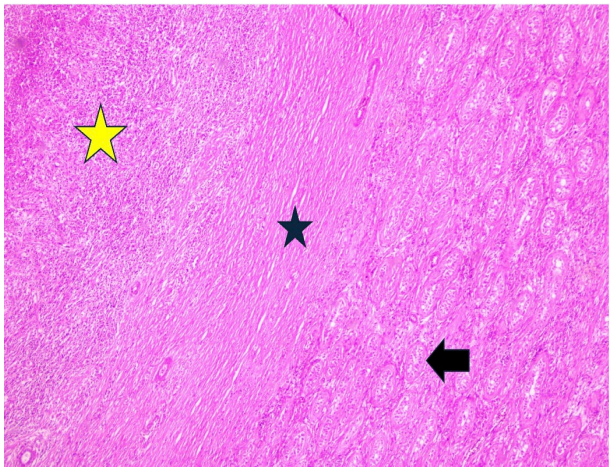

Figure 6. (H&E ×10): epithelioid granulomas (yellow star) with residual seminiferous tubules (black arrow), separated by fibrosis (black star).

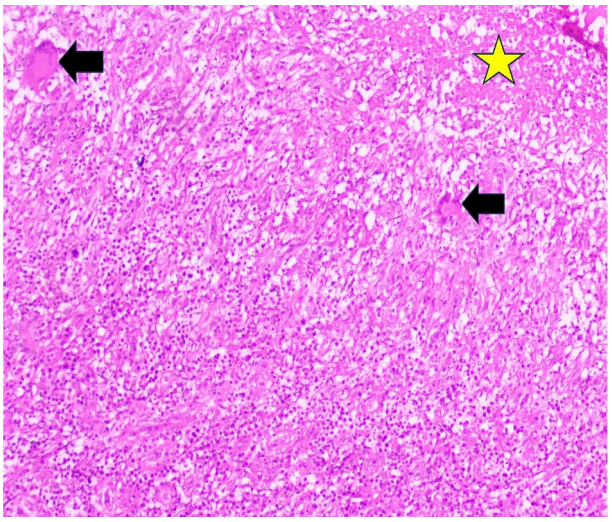

Figure 7. (H&E ×40): Langhans-type multinucleated giant cells (black arrow) and caseous necrosis (yellow star) surrounded by inflammatory cells.

The tuberculin skin test was strongly positive. The patient was commenced on a standard six-month course of antitubercular therapy with rifampicin, isoniazid, pyrazinamide, and ethambutol. After four weeks of treatment, the epididymal swelling and associated pain had completely resolved.

3. Discussion

Genitourinary Tuberculosis (GUTB) is the second most common form of extrap-

ulmonary tuberculosis after lymph node involvement, accounting for 20% - 40% of cases in endemic regions [1]. However, testicular localization is exceptionally rare, representing less than 3% of GUTB cases [1] [3]. The disease predominantly affects young men in their reproductive years, which increases its clinical impact, especially in endemic countries [4]. Our patient, a 37-year-old male, falls within this at-risk group.

The clinical manifestations of testicular tuberculosis are often nonspecific and may mimic other conditions such as testicular cancer, testicular torsion, or bacterial epididymo-orchitis [5]. Common symptoms include scrotal swelling, pain, or ulceration, often accompanied by systemic signs such as weight loss, anorexia, or fever [6]. In our case, the absence of fever and pain, despite significant testicular enlargement, contributed to the diagnostic challenge.

Ultrasonography typically demonstrates a heterogeneous hypoechoic mass, which is difficult to distinguish from malignancy [7].

Advanced imaging such as CT or MRI may reveal associated lesions or suggest disseminated tuberculosis, but findings often overlap with metastatic disease [8]. Our patient's imaging studies suggested testicular cancer with pulmonary metastases, a misinterpretation commonly reported in the literature [9] [10].

Histopathology remains the gold standard for diagnosis. The presence of epithelioid cell granulomas, Langhans-type giant cells, and caseating necrosis is a pathognomonic feature [11]. Similar findings were observed in our case, confirming the diagnosis of tuberculous orchitis.

Minimally invasive diagnostic techniques, such as Fine-Needle Aspiration Cytology (FNAC) or core needle biopsy, have been investigated as alternatives to radical orchidectomy. FNAC can provide rapid cytological evidence of granulomatous reactions from other causes (e.g., sarcoidosis, fungal infections, or even tumor necrosis), which may lead to inconclusive results [12]. Core needle biopsy has the theoretical advantage of providing more tissue for histological architecture, thereby improving diagnostic accuracy. Nonetheless, both techniques carry risks, including tumor seeding in cases of malignancy, false negatives, and delays in definitive management.

Therefore, although FNAC and biopsy may help differentiate tuberculous orchitis from malignancy in selected cases, especially in endemic regions, their limitations explain why radical orchidectomy is still often performed under suspicion of cancer. Tissue examination of the surgical specimen remains the most reliable approach for definitive diagnosis.

Radical orchidectomy is often performed under the suspicion of malignancy, as in our case. However, once the diagnosis is established, standard anti-tubercular therapy remains the cornerstone of treatment [1]. A six-month regimen including rifampicin, isoniazid, pyrazinamide, and ethambutol is generally effective, with good clinical outcomes [13]. Organ-sparing approaches may be considered when diagnosis is achieved preoperatively.

The prognosis of testicular tuberculosis is generally favorable under adequate

therapy. Clinical and radiological resolution is usually achieved within weeks to months of treatment initiation [13] [14]. In our case, the contralateral epididymal involvement responded completely after four weeks of anti-tubercular therapy, consistent with published reports [15] [16].

4. Conclusions

Tuberculous orchitis is a rare manifestation of genitourinary tuberculosis that can closely mimic testicular malignancy, particularly in endemic regions. This diagnostic challenge often results in unnecessary radical orchidectomy when the diagnosis is established only retrospectively by histopathological examination. Our case illustrates the importance of considering tuberculosis in the differential diagnosis of atypical testicular masses, especially in patients with epidemiological risk factors or systemic symptoms suggestive of tuberculosis.

Although imaging and minimally invasive diagnostic procedures such as fine-needle biopsy may provide valuable information, their limitations reduce their reliability in excluding malignancy. Thus, histopathology remains the gold standard for definitive diagnosis. Early recognition and timely initiation of anti-tubercular therapy are essential to ensure favorable outcomes, avoid unnecessary surgery, and preserve fertility whenever possible. This case highlights the need for increased awareness among clinicians to balance oncological vigilance with consideration of infectious etiologies in testicular masses.

Authors' Contributions

Gnabro Alain drafted the manuscript and assisted with the clinical data collection and interpretation.
Vodi Clément performed surgery and participated in collecting data.
Ehui Yannick contributed to pathological examination and diagnosis.

Availability of Data and Materials

All data generated or analyzed during this case are included within the article.

Consent for publication

All authors consent to the publication of the manuscript in Journal of Case Report and Images in Urology.

Ethical Statement

The patient provided informed consent for the publication of this case report, including the use of clinical and paraclinical images. All necessary measures were taken to ensure the patient's anonymity.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this pa-

per.

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