
CASE SERIES**Testicular tuberculosis: A clinicopathological case series of five cases***Monika Gathwal¹, Chiranjeev Gathwal², Tanu Priya^{1*},**Parveen Rana Kundu¹, Sunaina Hooda¹**¹Department of Pathology, ²Department of Radiology, Bhagat Phool Singh Government Medical College, Haryana- 131305, India*

Abstract

Tuberculosis remains a major global health problem, with Extrapulmonary Tuberculosis (EPTB) accounting for approximately 10–15% of cases. Genitourinary tuberculosis is the second most common form of EPTB. Isolated testicular involvement is extremely rare and may clinically and radiologically mimic testicular malignancy, posing a diagnostic challenge. A retrospective analysis was performed on five patients presenting with testicular or scrotal swelling at our institution. Clinical, radiological, and histopathological data were reviewed. All patients underwent orchidectomy. Histopathological examination was performed to identify features of tuberculosis, including granulomatous inflammation, caseous necrosis, and Acid-Fast Bacilli (AFB). All 5 patients demonstrated histopathological features consistent with testicular tuberculosis, characterized by granulomatous inflammation with caseous necrosis. AFB staining was performed for confirmation. The clinical and radiological findings mimicked testicular neoplasia, leading to orchidectomy in all cases. Postoperative recovery was uneventful, with no recurrence or complications documented during follow-up. Testicular tuberculosis should be considered in the differential diagnosis of unilateral testicular swelling, particularly in tuberculosis-endemic regions and in patients with an atypical or chronic testicular lesion.

Keywords: Testicular tuberculosis, Extrapulmonary tuberculosis, Genitourinary TB, Granulomatous orchitis, Orchidectomy

Introduction

Pulmonary tuberculosis (TB) represents the most frequent manifestation of the disease, whereas extrapulmonary TB (EP-TB) accounts for only about 10–15% of all cases. Among these, lymph node involvement is the predominant form of EP-TB in India. Genital tuberculosis is relatively uncommon, and infection of the testes is even rarer, constituting roughly 3% of all genital TB cases [1]. Testicular TB typically occurs as part of disseminated or miliary tuberculosis, while isolated testicular infection without systemic involvement is extremely unusual. Within the male genitourinary system, the prostate, epididymis, and seminal vesicles are most frequently affected. Testicular TB,

although rare, generally presents in men between 20 and 40 years of age and may manifest as swelling of the scrotum, tenderness, or the presence of a sinus with or without discharge [2]. Because of its nonspecific clinical features, testicular TB often poses diagnostic difficulties and is sometimes identified only after an orchidectomy and subsequent histopathological examination [3,4].

This study presents a series of five cases of testicular TB, highlighting the diagnostic challenges posed by its clinical and radiological resemblance to testicular malignancy and emphasizing the role of histopathological examination in establishing the definitive diagnosis.

Case series

A retrospective case series was conducted at a tertiary-care center over the period from July-December 2026. Patients were included if they presented with testicular or scrotal swelling and underwent orchidectomy, with histopathological

examination demonstrating granulomatous inflammation suggestive of tuberculosis. Patients with a known previous diagnosis of testicular TB were excluded. This study included five cases. Table 1 lists details of each case.

Table 1: Details of five cases

Age (years)	Clinical presentation	X-Ray	Hematological tests	USG	Operation	Histological finding	AFB	Follow up and outcome
63	Swelling left testis	Normal	Normal	Multiple hypoechoic areas	Orchidectomy	Necrotizing granulomatous inflammation	Negative	No recurrence occurred
73	Swelling right testis and discharge	Normal	Normal	Hypoechoic necrotic heterogenous areas	Orchidectomy	Granulomatous epididymo-orchitis	Negative	No recurrence occurred
75	Pain and swelling left scrotal region	Normal	Normal	Hypoechoic mass	Orchidectomy	Granulomatous orchitis	Negative	No recurrence occurred
66	Pain and swelling left testis	Normal	Normal	Multiple hypoechoic areas	Orchidectomy	Granulomatous inflammation	Negative	No recurrence occurred
42	Pain and swelling right scrotal region	Normal	Normal	Heterogenous parenchymal echo and ill-defined area	Orchidectomy	Necrotizing granulomatous inflammation	Negative	No recurrence occurred

USG – Ultrasonography; AFB – Acid fast bacilli

Case 1

A 63-year-old male presented with gradually progressive swelling of the left testis for several weeks. There was no history of fever, weight loss, trauma, urinary symptoms, or previous tuberculosis. General and systemic examinations were unremarkable, and hematological investigations and chest radiography were within normal limits. Scrotal ultrasonography showed multiple hypoechoic areas involving the left testis, raising suspicion of a

neoplastic or chronic inflammatory lesion. Left orchidectomy was performed. Gross examination revealed an enlarged testis with focal areas of necrosis. Histopathology demonstrated necrotizing granulomatous inflammation composed of epithelioid cell granulomas, langhan giant cells, and areas of caseous necrosis. Ziehl–Neelsen (ZN) staining was negative for Acid-Fast Bacilli (AFB).

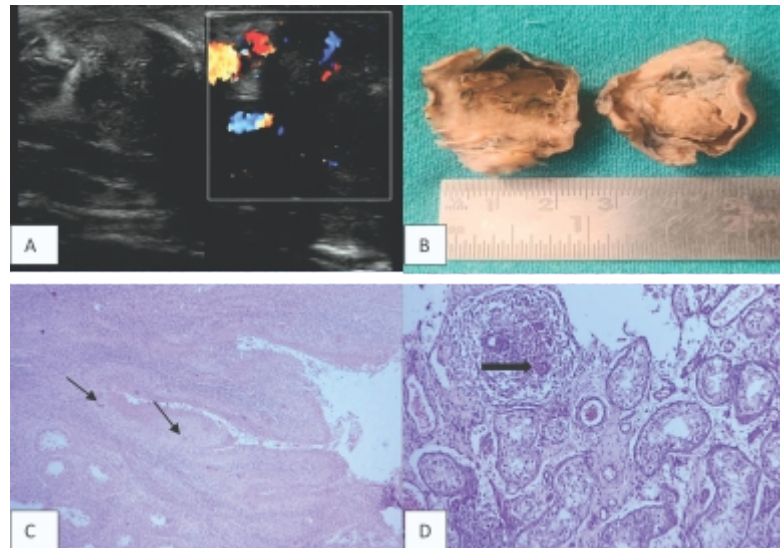


Figure 1: A) Ultrasonography showed hypo-echoic left testis and epididymis with heterogenous echo texture and increased internal vascularity suggestive of epididymo-orchitis; B) Gross specimen of testes with capsule showing areas of necrosis; C) H&E stained section show epididymal tissue with areas of necrosis, epithelioid cell granulomas and langhans type of giant cells (arrow) [H&E, 100X]; D) Section studied from testis show seminiferous tubules with epithelioid cell granuloma and langhan type multinucleated giant cells (arrow) [H&E, 400X]

Case 2

A 73-year-old male presented with right testicular swelling associated with serous scrotal discharge and mild discomfort. There were no constitutional symptoms or significant abnormalities on routine investigations, and chest radiography was normal. Ultrasonography revealed hypoechoic, necrotic, heterogeneous areas involving the right testis and epididymis. Chronic epididymo-orchitis with a possibility of malignancy was considered. Right orchidectomy was performed. Histopathological examination showed granulomatous epididymo-orchitis characterized by epithelioid histiocytes and multinucleated giant cells. ZN staining was negative for AFB.

Case 3

A 75-year-old male presented with progressively increasing pain and swelling of the left scrotal

region, associated with tenderness. There was no significant history of TB or other chronic illness. Hematological parameters and chest radiography were unremarkable. Ultrasonography demonstrated a hypoechoic mass lesion involving the left testis, raising suspicion of a testicular neoplasm. Orchidectomy was subsequently performed. Histopathology revealed granulomatous orchitis with dense inflammatory infiltrate, epithelioid granulomas, and multinucleated giant cells. No evidence of malignancy was identified. ZN staining was negative for AFB.

Case 4

A 66-year-old male presented with pain and swelling of the left testis. Clinical examination revealed an enlarged, tender testis without lymphadenopathy. There were no constitutional or urinary

symptoms, and laboratory investigations and chest radiography were within normal limits. Scrotal ultrasonography demonstrated multiple hypoechoic areas suggestive of chronic inflammatory pathology. Because malignancy could not be excluded, left orchidectomy was performed. Histopathological examination showed granulomatous inflammation comprising epithelioid granulomas and chronic inflammatory infiltrate. ZN staining was negative for AFB.

Case 5

A 42-year-old male presented with insidious, progressively increasing pain and swelling of the right scrotal region. There was no history suggestive of pulmonary TB, and routine hematological investigations and chest radiography were normal. Ultrasonography revealed heterogeneous testicular parenchymal echotexture with an ill-defined hypoechoic area. Chronic inflammatory lesion versus neoplasm was considered, and orchidectomy was performed. Histopathological examination demonstrated necrotizing granulomatous inflammation with areas of caseation surrounded by epithelioid histiocytes and multinucleated giant cells. ZN staining was negative for AFB. Across all five cases, the clinical and radiological findings were nonspecific and a testicular neoplasm could not be confidently excluded preoperatively. Histopathological examination consistently demonstrated granulomatous inflammation, with necrosis or caseation in selected cases. AFB were not identified on ZN staining in any specimen.

None of the patients had a previous history of antitubercular treatment. Following surgery, all patients were started on standard Antitubercular Therapy (ATT). The intensive phase consisted of a four-drug regimen comprising rifampicin 150 mg, isoniazid 75 mg, pyrazinamide 400 mg, and ethambutol 275 mg, administered as four tablets

daily for a duration of 2 months. This was followed by a continuation phase with rifampicin 150 mg and isoniazid 75 mg, administered as four tablets daily for an additional 4 months.

All patients showed significant clinical improvement in EP-TB related symptoms following completion of therapy. The postoperative period was uneventful in all five cases, and no evidence of recurrence or disease progression was observed during follow-up.

Discussion

TB continues to be one of the most significant infectious causes of mortality worldwide, with its highest prevalence in developing nations such as India, which remains a TB-endemic region [1,4]. Within the spectrum of EP-TB, genitourinary involvement ranks among the more frequent presentations. However, isolated testicular TB, as seen in our patients, is exceptionally rare and often presents a considerable diagnostic challenge [1,5]. The rarity of this condition stems from the fact that infection of the testes generally occurs secondary to spread from adjacent structures—most often the epididymis, prostate, or seminal vesicles [2]. When the testis alone is affected, it can easily mimic other scrotal conditions such as torsion, infarction, or neoplasm, leading to misdiagnosis in the absence of histopathological evaluation [6]. The clinical presentation in our patients was largely nonspecific. The most common symptom was unilateral testicular swelling, occasionally associated with pain or scrotal discharge. None of the patients had constitutional symptoms such as fever, weight loss, or systemic features of TB, which are also reported to be uncommon in isolated testicular involvement. These findings align with previous studies that describe testicular TB as an insidious and often

localized process [7]. Radiological evaluation in our series was largely inconclusive. Chest X-rays were normal in all five patients, suggesting an absence of pulmonary TB. Ultrasonography revealed hypoechoic or heterogeneous lesions in all cases, which closely resemble the sonographic appearance of malignancy. Similar diagnostic ambiguity has been described in prior reports, where ultrasonography findings of testicular TB could not reliably distinguish it from neoplastic lesions (Shukla *et al.*, 2017) [8]. Hence, imaging alone remains insufficient for diagnosis, and histopathological evaluation is essential.

All patients in our series underwent orchidectomy. Histopathological examination revealed granulomatous inflammation with or without necrosis in all cases, consistent with TB. AFB staining was negative in all patients, a finding not uncommon in EP-TB due to the paucibacillary nature of such lesions. This underlines the importance of tissue diagnosis in cases where clinical and imaging findings are equivocal. The diagnosis was established based on the characteristic histopathological findings in conjunction with the clinical and radiological features. Microbiological investigations, including CBNAAT, may provide additional confirmation in suspected cases. None of the patients demonstrated recurrence during follow-up, and all showed satisfactory postoperative recovery. This suggests that surgical excision combined with

ATT (where indicated) yields favorable outcomes. Although the mainstay of treatment for genitourinary TB remains medical therapy, orchidectomy is often unavoidable when a malignancy cannot be excluded preoperatively or when significant destruction of the testis has occurred [9].

The predominance of older males in our series may reflect reactivation of latent infection or haematogenous spread from an undetected focus. The absence of pulmonary or systemic involvement in all cases underscores the possibility of isolated testicular TB, which remains a diagnostic rarity [10].

Conclusion

Testicular TB should be considered in the differential diagnosis of unilateral testicular swelling, particularly in TB -endemic regions and in patients with an atypical or chronic testicular lesion. Its nonspecific clinical and radiological presentation may closely mimic testicular neoplasia, making histopathological examination crucial for establishing the diagnosis.

Limitations

This case series is limited by its small sample size and lack of microbiological confirmation through culture or polymerase chain reaction testing. The uniform histopathological findings across the cases, supported by the clinical and radiological context, favored TB.

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