


A Rare Case of Bilateral Scrotal Tuberculosis

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Jonathan Wen Yu Lam was involved in the collection of data, drafting and revision of the article.

Tian Mei Rebecca, Au was involved in the data collection of the article.

Nicole Kessa Wee was involved in the review of the manuscript.

Chau Hung Lee was involved in the conceptualization, reviewing, and approval of the article.

Disclosures

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Consent

Yes

Human And Animal Rights

Not applicable.

ABSTRACT

Genitourinary tuberculosis is the most common extra-pulmonary manifestation of tuberculosis. Isolated scrotal tuberculosis involvement is, however, rare and is challenging to diagnose due to similar imaging overlap with multiple conditions.

We present a case of a middle-aged man who initially presented with painless swelling of his right scrotum, for which a scrotal ultrasound demonstrated an extra-testicular hypoechoic mass involving the epididymis. A right radical orchidectomy was performed due to concerns of malignancy; pathology demonstrated no evidence of malignancy but necrotizing granulomatous inflammation, with evidence of acid-fast bacilli on Ziehl-Neelsen (ZN) staining, in keeping with tuberculosis.

The patient was referred for anti-tuberculosis medical therapy but defaulted treatment and returned 2 years later with new painless swelling of his left scrotum. A repeat scrotal ultrasound demonstrated an enlarged left testis with multiple hypoechoic nodules. The patient was subsequently referred for direct observation of anti-tuberculosis medical therapy.

This case illustrates the ultrasonographic features of scrotal tuberculosis, and radiologists should be aware of this rare differential diagnosis of scrotal masses.

CASE REPORT

BACKGROUND

The presentation of genitourinary tuberculosis as a lump in the scrotum is rare, and limited case reports have been described in the literature. Bilateral scrotal manifestations of tuberculosis occur more infrequently, and limited cases have been described. Scrotal tuberculosis often also presents a diagnostic dilemma due to the myriad imaging overlaps with other conditions, including neoplasm.

We describe a rare case of tuberculosis presenting as scrotal masses, first, as an extra-testicular hypoechoic mass involving the epididymis on the right, then as multiple hypoechoic nodules in the left testis. Through this, we hope to raise awareness of the imaging appearance of scrotal tuberculosis, and that radiologists will consider the differential of tuberculosis when appropriate.

CASE REPORT

A 57 year-old gentleman with no past medical history presented to the urology clinic with a 2-month history of painless swelling of his right scrotum. The patient did not smoke nor drink alcohol and worked as a newspaper collector. He denied any history of fevers, cough, or constitutional symptoms such as loss of weight or loss of appetite. There were no ancillary symptoms, including cough or chest pain.

The patient's lungs were clear on examination, and no lymphadenopathy was felt. The abdomen was soft, and no abdominal masses were felt.

The patient underwent a chest radiograph, which showed no focal lesion within the lungs and was only positive for cardiomegaly.

A scrotal ultrasound was performed which demonstrated an ill-defined heterogenous hypoechoic extra-testicular mass in the right scrotum with increased vascularity (Figure 1). The mass was inseparable from the adjacent epididymis and right testis. The right epididymis also appeared bulky and heterogenous and showed increased vascularity (Figure 2). The left testis and epididymis were unremarkable. Due to concerns for possible malignancy, a right orchidectomy was performed. Histology of the excised specimen showed florid granulomatous inflammation involving the testis, spermatic cord, and epididymis (Figure 3). A large number of the granulomas were necrotic (Figure 4). Acid-fast bacilli were detected on the Ziehl-Neelsen stain. The patient was diagnosed with scrotal tuberculosis; and was referred to the infectious diseases team for further treatment.

The patient, however, defaulted subsequent follow-up.

The patient re-attended the emergency department 2 years later with a complaint of a painless lump in his left testicle that was slowly growing over the preceding few months. He denied a history of fever or night sweats. A repeat scrotal ultrasound was performed, which demonstrated an enlarged left testis with multiple hypoechoic foci (Figure 5). There was increased vascularity of his left testis. The left epididymis was also enlarged with a heterogeneous hypoechoic in appearance and with increased vascularity (Figure 6).

The findings were presumed to be attributed to left testicular tuberculosis, given the history of contralateral right scrotal tuberculosis, and the patient was started on direct observed therapy (DOT).

DISCUSSION

Etiology and Demographics

Tuberculosis remains a global health problem, especially in developing countries, where the incidence is on the rise, and in developed countries, where there is an increasing emergence of drug-resistant strains [1]. Extrapulmonary tuberculosis accounts for approximately 10 percent of cases, while genitourinary tuberculosis accounts for approximately 30 percent of extrapulmonary tuberculosis [2]. Within the genitourinary tract,

tuberculosis involvement of the male scrotum accounts for approximately 7 percent of extrapulmonary cases of tuberculosis [3].

Clinical and Imaging Findings

Patients with tuberculosis involvement of the scrotum typically present with painless swelling of the scrotum, mimicking a testicular mass. In rare occasions, testicular tuberculosis can also present with testicular torsion [4], hindering diagnosis.

Ultrasound remains the main imaging modality used in the diagnosis of testicular pathologies due to its ready availability, relatively low cost, and good soft tissue resolution. A variety of sonographic imaging appearances of scrotal tuberculosis have been described and include diffuse enlargement of the testis and epididymis, a heterogenous hypoechoic pattern; diffuse enlargement of the epididymis and testis with a homogenous hypoechoic appearance, nodular enlargement of the testis and epididymis and multiple hypoechoic miliary nodules [5].

Due to its greater blood supply, the epididymis, particularly the epididymal tail, is the most common site of tuberculosis infection in the scrotum [6]. In a Chinese study of 69 patients with scrotal tuberculosis, of which 58 patients had epididymal tuberculosis, 33 patients were found to have a diffusely enlarged heterogenous lesion in the epididymis, and this appearance was speculated to be characteristic of epididymal tuberculosis [7]. Our patient demonstrated these various features of scrotal tuberculosis, presenting with a predominantly extra-testicular / epididymal mass on the right and multiple intratesticular lesions on the left; as well as involvement of both epididymides in both instances.

These imaging appearances, however, overlap with a number of diagnoses, including sarcoidosis, testicular tumors, non-tuberculosis infective epididymal-orchitis, and lymphoma [6]. In particular, in this age group, the imaging appearances should also prompt exclusion of lymphoma, although lymphomatous involvement of the epididymis is extremely rare [8].

Treatment and Prognosis

Due to the vague imaging appearances of scrotal tuberculosis and overlap with imaging appearances of testicular tumours, an orchidectomy was performed for our patient for his right testis. Histology showed granulomatous inflammation with areas of caseating necrosis, with Ziehl-Neelsen (ZN) stain positive for acid-fast bacilli.

The treatment for testicular tuberculosis follows that of pulmonary tuberculosis and includes 6 months of pharmacological anti-tuberculosis therapy, with a typically good prognosis [9]. Failure to recognize and/or treat scrotal tuberculosis adequately, however, can lead to the spread of disease, as in our case, or long-term complications, including infertility in young patients [10].

Differential Diagnosis

The myriad imaging appearances of scrotal tuberculosis and imaging overlap with numerous conditions, making diagnosis difficult.

Testicular Tumours

Primary testicular tumours are more common in the second and third decades of life, and commonly present as a painless testicular swelling or lump, and must be ruled out in any intra-testicular mass that demonstrates intralesional vascularity [6]. However, bilateral or epididymal involvement is unusual and should point towards a non-neoplastic etiology. Serum tumour markers like alpha fetoprotein (AFP), human chorionic gonadotropin (HCG) and lactate dehydrogenase (LDH), may be useful to point towards a testicular origin, however lacks the sensitivity or specificity to diagnose the condition [11].

Lymphoma

Non-Hodgkin B-cell lymphoma is the most common testicular malignancy in men over the age of 60 [12]. Imaging appearances are that of focal hypoechoic lesions within the testis, and may be focal or diffuse, but typically show increased vascularity on Doppler [13]. Lymphomatous involvement of the epididymis is extremely rare [8].

Sarcoidosis

Patients with scrotal sarcoidosis typically present with a painless mass, but may also present with pain [6]. On ultrasound, multiple hypoechoic nodules are seen in the bilateral epididymis and testis [14]. Isolated involvement of the testis, without epididymal involvement is rare [6]. Systemic manifestations (pulmonary) are usually present and may help to point to the diagnosis.

Epididymal-Orchitis

Patients with epididymo-orchitis are usually symptomatic, and present with scrotal swelling and fever. The diagnosis is usually apparent clinically. On ultrasound, there is an enlargement of the epididymis and testis, with increased vascularity. Secondary signs of inflammation, like overlying skin thickening or hydrocele, may be present. Involvement of both the epididymis and testis should prompt consideration of a possible infective aetiology to the scrotal pathology.

TEACHING POINT

Scrotal tuberculosis is a challenging diagnosis to make due to imaging overlap with many other disorders. Radiologists should be aware of the myriad imaging appearances of this entity and consider this diagnosis, particularly if there is involvement of both testis and epididymis, suggestive of an infective etiology, and in certain patient populations (patients who are immunocompromised, or from countries where tuberculosis is endemic).

QUESTIONS

Question 1: The most common extra-pulmonary manifestation of tuberculosis is in which system?

1. Genitourinary
2. Hepatobiliary
3. Gastrointestinal
4. Musculoskeletal
5. Neurological

Explanation:

The genitourinary system is the most common extra-pulmonary site of tuberculosis and accounts for up to 30 percent of extra-pulmonary cases.

Question 2: The best imaging modality to evaluate scrotal tuberculosis is via which modality?

1. Radiography
2. Computed-tomography
3. Ultrasound
4. Magnetic resonance Imaging (MRI)
5. Nuclear medicine

Explanation:

Ultrasound is the preferred modality to investigate scrotal tuberculosis due to its excellent soft tissue resolution, ready availability, and lack of ionizing radiation. Ultrasound can also detect vascularity, which aids in the diagnosis of the condition. MRI may be a possibility; however, the role of MRI is not well studied, it is not readily available, and it has a long scanning time compared to ultrasound.

Question 3: Which of the following describes possible imaging appearances for tuberculosis involvement of the testis and epididymis? (More than one option may be selected).

1. Extra-testicular mass lesion
2. Diffusely enlarged with an heterogenous hypoechoic appearance
3. Diffusely enlarged with a homogenous hypoechoic appearance
4. Miliary nodules
5. Nodular enlargement.

Explanation:

Scrotal tuberculosis can have a myriad of imaging appearances on ultrasound, and can present with imaging appearances of all the above options. The miliary pattern is the most specific and suggests the diagnosis, but is rarely seen.

Question 4: The most commonly affected structure in the scrotum by tuberculosis is ...

1. Epididymis
2. Testis
3. Pampiniform plexus
4. Testicular artery

Explanation:

The epididymis is the most commonly affected structure within the scrotum by tuberculosis, likely due to its good blood supply. In particular, the tail was found to be the most affected part.

Question 5: Treatment for testicular tuberculosis involves which of the following..?

1. Antibiotics
2. Conservative management
3. Surgery
4. Biopsy

Explanation: 1, 3, 4

The treatment of scrotal tuberculosis follows that of pulmonary tuberculosis and includes 6 months of anti-tuberculosis antibiotic therapy. Surgery may be performed in resistant cases in which the disease does not respond to antibiotics. A biopsy may be necessary in difficult cases in which the diagnosis is uncertain due to the myriad imaging appearances of testicular tuberculosis and its overlap with other conditions.

REFERENCES

1. Harding E. WHO global progress report on tuberculosis elimination. *Lancet Respir Med.* 2020; 8(1):19. PMID: 31706931.
2. Kulchavenya E, Kim CS, Bulanova O, Zhukova I. Male genital tuberculosis: epidemiology and diagnostic. *World J Urol.* 2012; 30(1): 15–21. PMID: 21604018.
3. Drudi FM, Laghi A, Iannicelli E, et al. Tubercular epididymitis and orchitis: US patterns. *Eur Radiol.* 1997; 7(7): 1076–1078. PMID: 9265679.
4. Almesned RK, Alseini DA, Bedaiwi KK. Testicular torsion as the initial presentation of testicular tuberculosis. *Urol Ann.* 2022; 14(4): 392–394. PMID: 36505988.
5. Das A, Batabyal S, Bhattacharjee S, Sengupta A. A rare case of isolated testicular tuberculosis and review of literature. *J Family Med Prim Care.* 2016; 5(2): 468–470. PMID: 27843865.
6. Nepal P, Ojili V, Songmen S, Kaur N, Olsavsky T, Nagar A. “The Great Masquerader”: Sonographic Pictorial Review of Testicular Tuberculosis and its Mimics. *J Clin Imaging Sci.* 2019; 9:27. PMID: 31448178.
7. Li S, Chen B, Fang X, et al. A better understanding of testicular and/or epididymal tuberculosis based on clinical, ultrasonic, computed tomography, and magnetic resonance imaging features at a high-volume institute in the modern era. *Quant Imaging Med Surg.* 2021; 11(6): 2465–2476. PMID: 34079716.
8. Suh J, Jeong H, Kim YA. Primary Malignant B-cell Lymphoma of the Epididymis. *Urol Case Rep.* 2016; 4: 27–29. PMID: 26793572.
9. Man J, Cao L, Dong Z, Tian J, Wang Z, Yang L. Diagnosis and treatment of epididymal tuberculosis: a review of 47 cases. *PeerJ.* 2020; 8: e8291. PMID: 31934504.
10. Kim JY, Kim JY, Cho DY, Yu JH. Bilateral epididymal tuberculosis causing abscess formation and male infertility: a case report and literature review. *Transl Androl Urol.* 2023; 12(6): 1033–1040.
11. Milose JC, Filson CP, Weizer AZ, Hafez KS, Montgomery JS. Role of biochemical markers in testicular cancer: diagnosis, staging, and surveillance. *Open Access J Urol.* 2011; 4: 1–8. PMID: 24198649.
12. Marko J, Wolfman DJ, Aubin AL, Sesterhenn IA. Testicular Seminoma and Its Mimics: From the Radiologic Pathology Archives. *Radiographics.* 2017; 37(4): 1085–1098. PMID: 28574809.
13. Bertolotto M, Derchi LE, Secil M, et al. Grayscale and Color Doppler Features of Testicular Lymphoma. *J Ultrasound Med.* 2015; 34(6): 1139–1145. PMID: 26014335.
14. Zeitouni L, Khan A, Almasri L, Gulati M, Reekhaye A, Hammadeh MY. Long term follow up of ultrasound diagnosed bilateral testicular sarcoidosis: Case report and literature review. *Urol Case Rep.* 2020; 33: 101427.

FIGURES

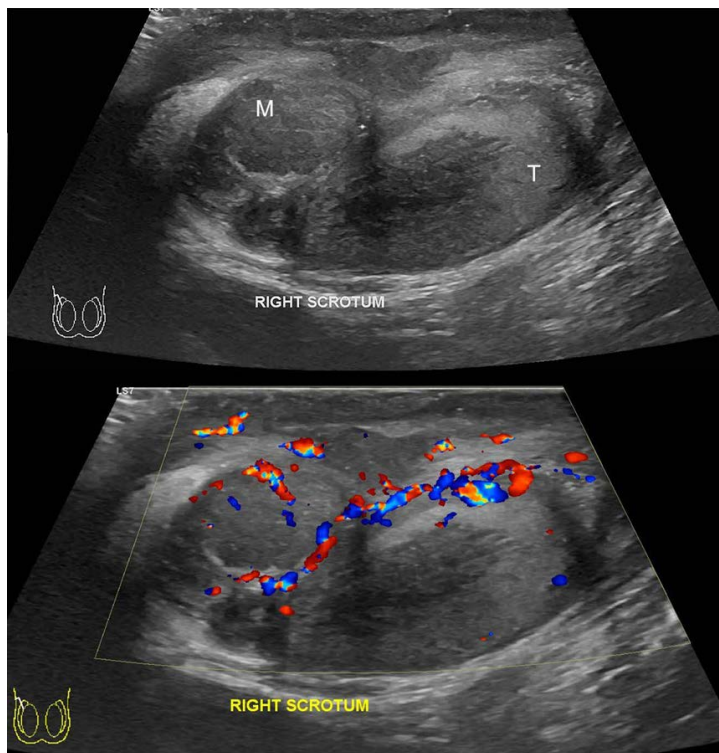


Figure 1: Ultrasound image of the patient’s right scrotum at the initial presentation. An ill-defined hypoechoic mass (M), predominantly which extra testicular, is seen as inseparable from the right testis (T). Colour Doppler image demonstrated increased vascularity of the mass lesion

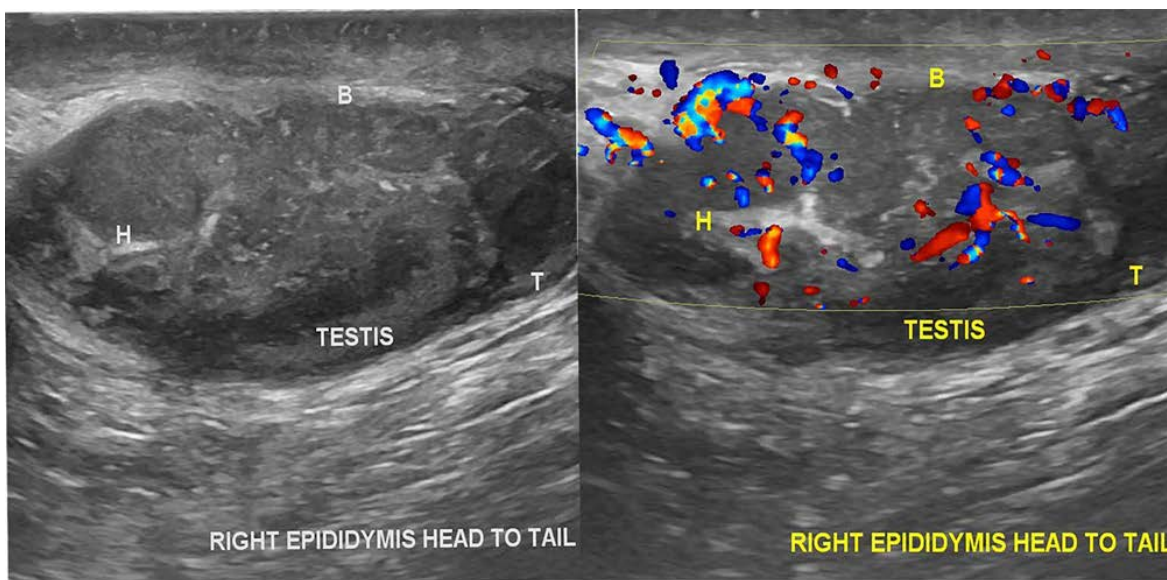


Figure 2: Grey-scale ultrasound and color Doppler images of the patient’s right scrotum at the initial presentation. The right epididymis is involved by the mass and appears bulky, with an abnormal heterogenous hypoechoic appearance. (B – body of epididymis, H – head of epididymis and T- tail of epididymis). Colour Doppler image demonstrates increased vascularity of the right epididymis.

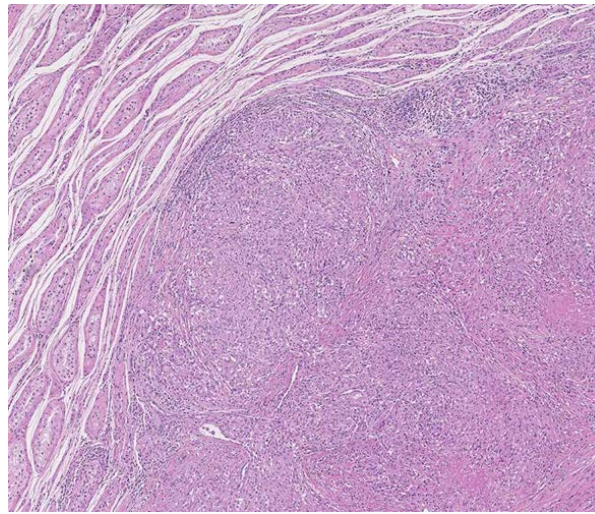


Figure 3: Histology of the excised right extra testicular mass. There is florid granulomatous inflammation seen adjacent to normal seminiferous tubules of the right testis.

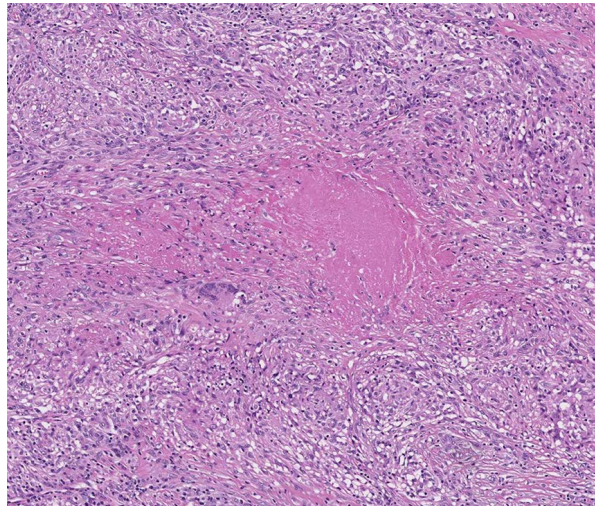


Figure 4: Histology of the excised right extra testicular mass. Scattered necrotizing granulomas were seen within the area of granulomatous infection, suggestive of tuberculosis.

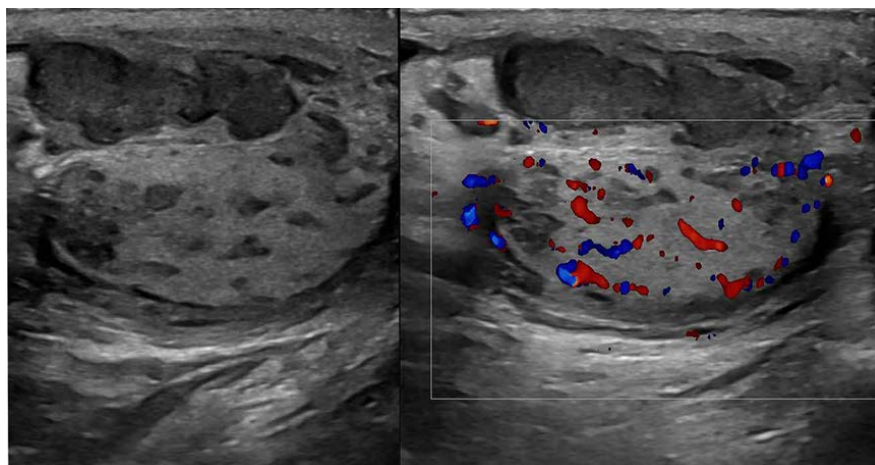


Figure 5: Ultrasound image of the patient's left testis after re-presentation 2 years after defaulting referral to the infectious diseases team. (A) The testis appears hyperechoic, with increased vascularity and with multiple hypoechoic nodules, in keeping with a miliary pattern of tuberculosis. The epididymis (E) is also bulky with an abnormal heterogenous hypoechoic appearance.

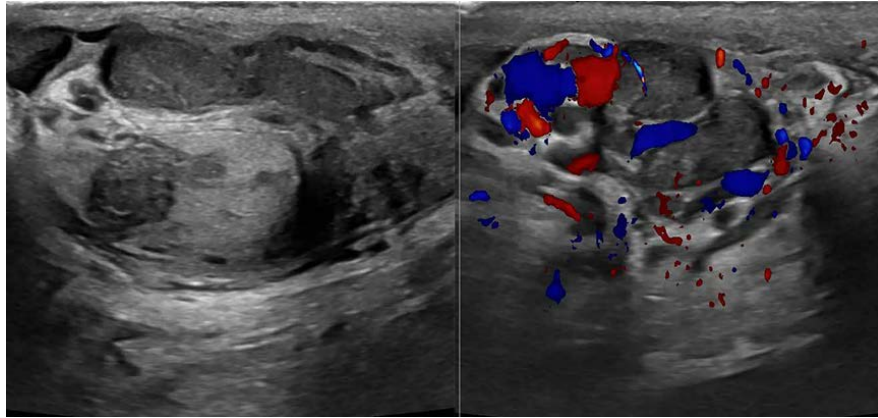


Figure 6: Ultrasound image of the patient's left scrotum. The epididymis is bulky with an abnormal heterogenous hypoechoic appearance, and with increased vascularity.

KEYWORDS

Tuberculosis; Scrotal tuberculosis; Testicular tuberculosis; Ultrasound; Scrotum; Epididymo-orchitis

ABBREVIATIONS

ZN = ZIEHL-NEELSEN

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