

# Clinics in diagnostic imaging (I34)

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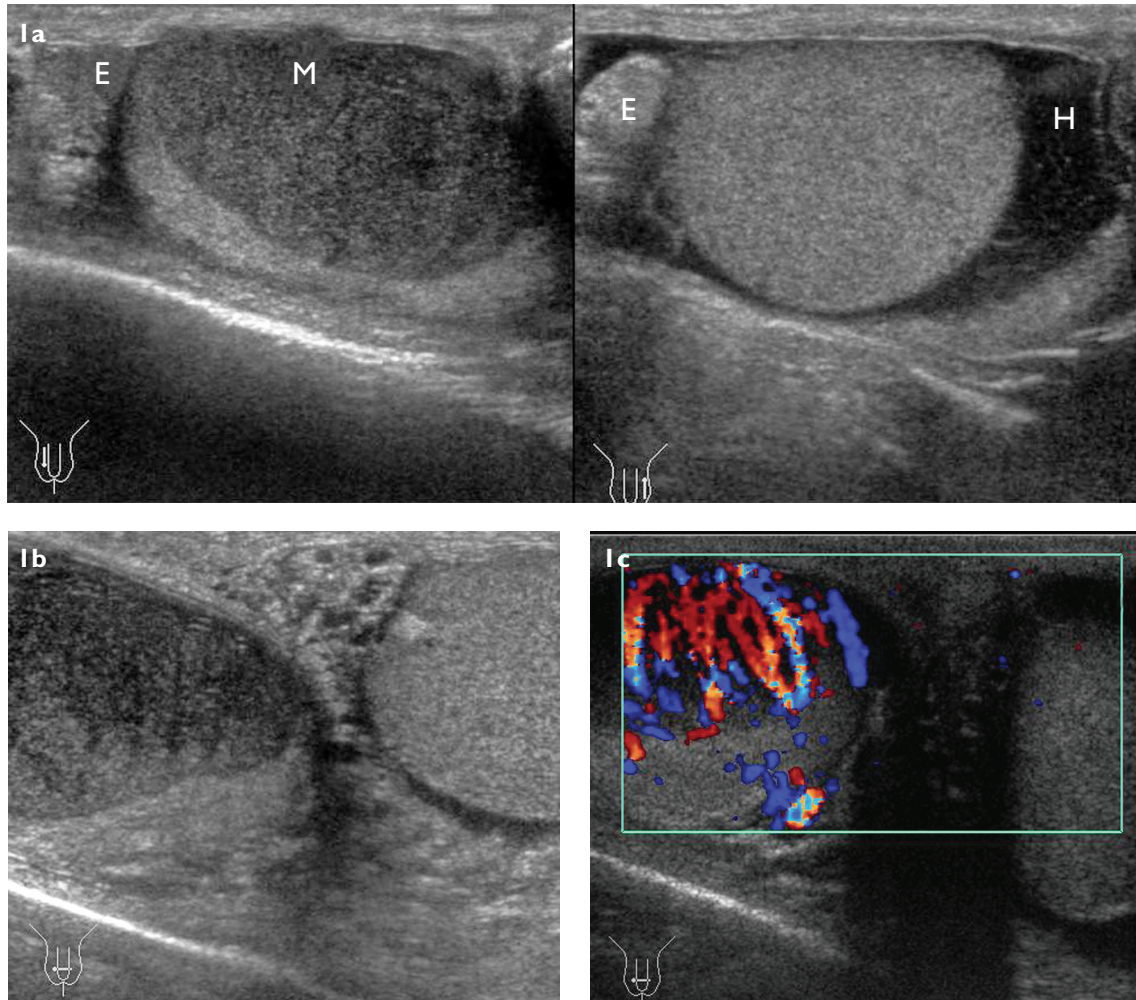


Fig. 1 (a) Longitudinal; (b) transverse grey-scale US; and (c) transverse colour Doppler US images of the scrotum.

## CASE PRESENTATION

A 55-year-old man presented with painless enlargement of the right hemiscrotum for the past three months. There were no complaints of fever, weight loss, malaise or perspiration at night. The patient had no history of trauma or voiding difficulties and no other medical problems. On physical examination, there was a non-tender mass measuring 6 cm in diameter in the right hemiscrotum, which did not transilluminate. The scrotal skin appeared normal. The left testis was also normal. There was no

clinical evidence of lymphadenopathy, organomegaly or an abdominal mass. Blood pressure was 134/87 mmHg and temperature was 37°C. Laboratory investigations revealed a serum haemoglobin level of 12.6 g/dL, haematocrit of 36.6%, white blood cell count of  $8.0 \times 10^9$ /dL, an alpha-fetoprotein level of 2.73 (normal range 0–15) ng/mL and a beta-human chorionic gonadotropin level of 0.288 (normal range 0–15) mIU/mL. Urinalysis was normal. What do the grey-scale and colour Doppler ultrasonography (US) of the scrotum show (Fig.1)? What is the diagnosis?

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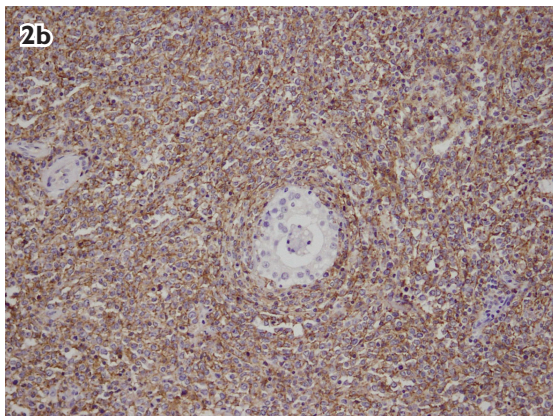
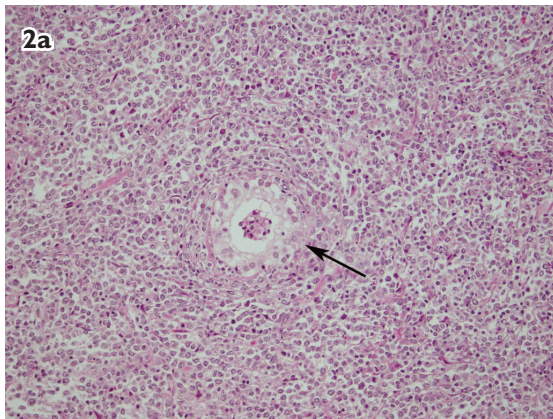
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**Fig. 2** (a) Photomicrograph shows diffuse infiltration of neoplastic lymphoid cells that are arranged around the seminiferous tubule (arrow). These cells are uniformly round-to-oval and contain distinct nucleoli (Haematoxylin & eosin,  $\times 100$ ). (b) Photomicrograph shows that the above mentioned cells are immunoreactive to CD 20 antibodies (Immunostaining CD 20,  $\times 100$ ).

### IMAGE INTERPRETATION

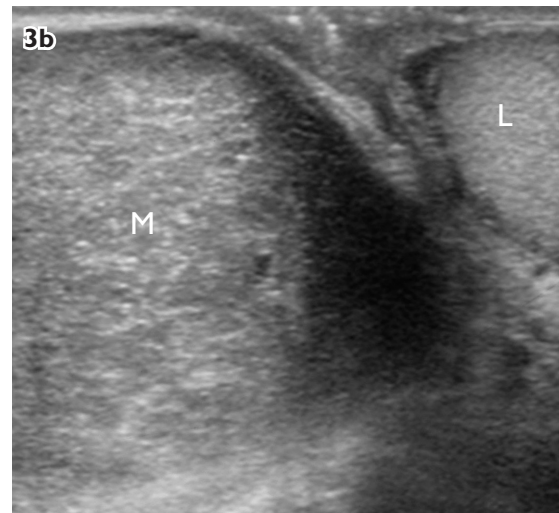
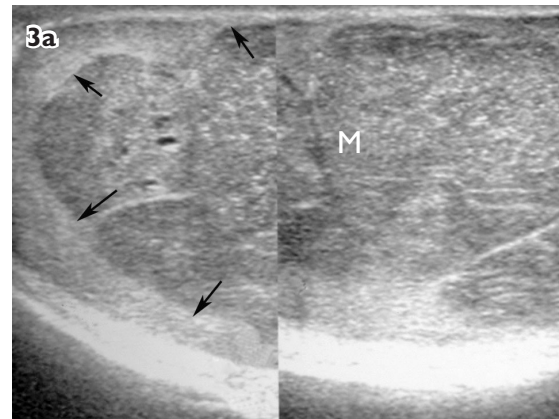
Longitudinal (Fig. 1a) and transverse (Fig. 1b) grey-scale US images of the scrotum show an enlarged right testis with a large circumscribed hypoechoic mass (M) occupying almost the entire right testis. The right epididymis (E) was normal. The left epididymis (E) and testis were normal with minimal hydrocele (H). The overlying scrotal skin was normal on both sides. Transverse colour Doppler US image of the scrotum (Fig. 1c) shows markedly increased vascularity of the right intratesticular mass.

### DIAGNOSIS

Testicular lymphoma.

### CLINICAL COURSE

The patient underwent right radical orchiectomy. Histological diagnosis was non-Hodgkin's lymphoma (NHL) (Fig. 2), diffuse large B-cell type confined within the tunica albuginea. He made a good postoperative recovery. Following this diagnosis, the patient underwent computed tomography (CT) of the chest and whole

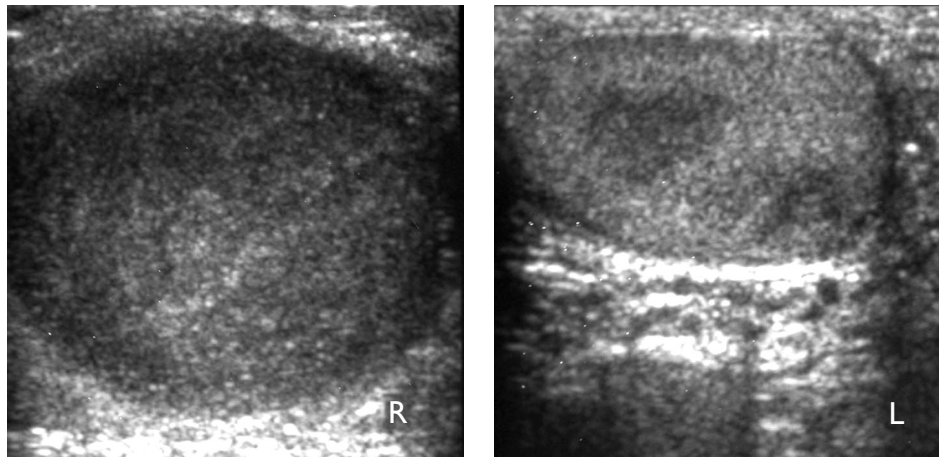


**Fig. 3** Seminoma in a 36-year-old man. (a) Longitudinal US image of the right hemiscrotum; and (b) transverse US image of the scrotum show an enlarged right testis with a large inhomogeneous hypoechoic mass (M) compressing the normal echogenic testis (arrows in 3a). The left testis (L) and the overlying scrotal skin appear normal.

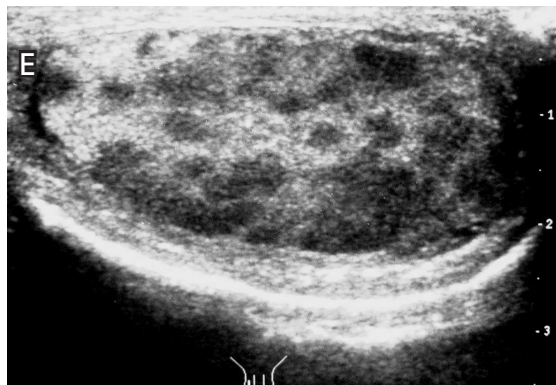
abdomen, which showed no evidence of disease. The patient's tumour stage was classified as I<sub>E</sub> (extranodal). Chemotherapy and radiation to the contralateral testis and regional lymph nodes were planned. Unfortunately, the patient preferred to have his further treatment in another hospital and was thus discharged.

### DISCUSSION

Primary testicular lymphoma (PTL) is rare, accounting for 1%–9% of all testicular neoplasms and 1% of NHL. However, PTL is the most common testicular malignancy in men above 60 years of age.<sup>(1)</sup> Testicular lymphoma commonly presents as a unilateral painless testicular mass, and less commonly, with systemic constitutional symptoms such as fever, night sweats and weight loss. Bilateral involvement, either synchronous or metachronous, has been reported in approximately 19.5% of cases.<sup>(2)</sup> Lymphoma is the most common cause of bilateral tumour of the testis.<sup>(1,3-5)</sup> PTL frequently



**Fig. 4** Lymphoma with testicular metastases in a 67-year-old man. Longitudinal US images of the right (R) and left (L) hemiscrotum show a large hypoechoic mass in the right testis and multiple hypoechoic masses in the left testis. The scrotal skin appears normal.



**Fig. 5** Testicular metastases in a 56-year-old man. Longitudinal US image of the right hemiscrotum shows multiple hypoechoic masses in the testis. The epididymis (E) and overlying scrotal skin appear normal.

invades the epididymis, spermatic cord or scrotal skin, and has a tendency to metastasise to extranodal sites such as the central nervous system (CNS), Waldeyer's ring, skin and lung.<sup>(1)</sup>

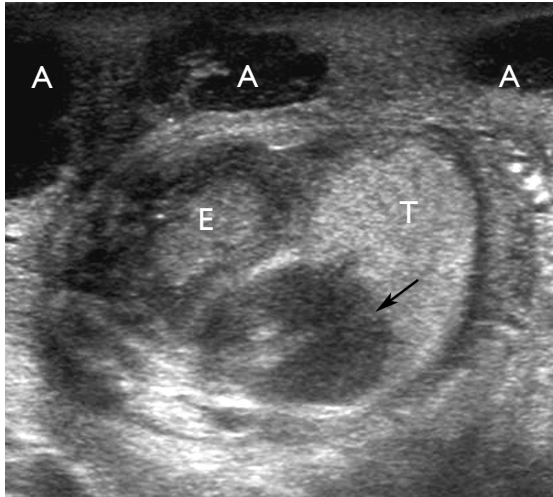
The clinical stages of the disease are designated by the the Ann Arbor classification system as follows:<sup>(6)</sup> Stage I: Involvement of a single lymph node region (I) or a single extralymphatic organ or site (I<sub>E</sub>); Stage II: Involvement of two or more lymph node regions on the same side of the diaphragm (II), or localised involvement of extralymphatic organ or site, and one or more lymph node regions on the same side of the diaphragm (II<sub>E</sub>). An optional recommendation is to indicate the number of node regions involved with a subscript (e.g. II<sub>3</sub>); Stage III: Involvement of lymph node regions on both sides of the diaphragm (III), which may also be accompanied by localised involvement of extralymphatic organ or site (III<sub>E</sub>), or by involvement of the spleen (III<sub>S</sub>) or both (III<sub>SE</sub>); and Stage IV: Diffuse or disseminated involvement of one or more extralymphatic organs or tissue with or without associated lymph node enlargement. The reason for classifying the patient as

stage IV should be identified further by defining the site by symbols.

A majority of patients have either stage I<sub>E</sub> or II<sub>E</sub> disease at presentation. Hence, it is difficult to differentiate stage VI testicular lymphoma from advanced stage nodal lymphoma with testicular involvement, as approximately 10%–29% of advanced stage nodal lymphomas have testicular involvement.<sup>(5)</sup> Diffuse large B-cell lymphoma (DLBCL) is the most common histological type of PTL.<sup>(5)</sup> Our presented case also had DLBCL and the disease was stage I<sub>E</sub>.

The imaging modality of choice to evaluate patients with scrotal enlargement is US, as it can aid in localising intratesticular vs. extratesticular abnormalities.<sup>(7,8)</sup> Its ability to determine if a scrotal mass is extra- or intratesticular is important, since most extratesticular lesions are benign, while most intratesticular lesions are malignant. The reported US features of testicular lymphoma include focal or diffuse hypoechoic enlarged testis with hypervascularity.<sup>(9-11)</sup> The US features of testicular lymphoma need to be differentiated from those of other testicular tumours (Fig.3), leukaemia, sarcoid, tuberculosis, orchitis and testicular abscess.<sup>(7-12)</sup> Testicular germ cell tumours usually occur in men aged 20–35 years, whereas metastases to the testis usually occur in men over 50 years of age.<sup>(7,8)</sup> Patients with testicular metastases usually have known advanced malignancy, and the primary tumours can be from the prostate, kidney, lung, gastrointestinal tract, skin, myeloma, plasmacytoma or lymphoma. Testicular metastases are often multiple and bilateral (Figs. 4 & 5).

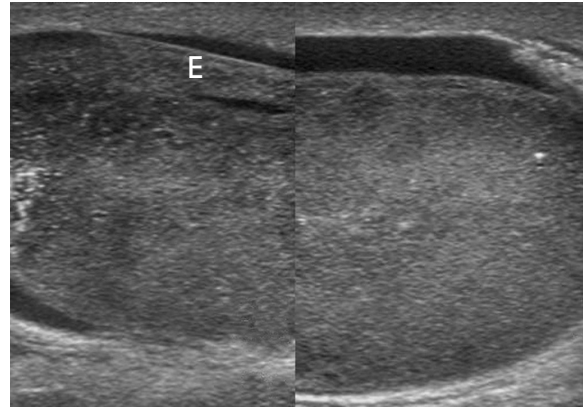
Leukaemic involvement of the testis is most often seen in childhood and is rarely clinically evident in adults.<sup>(10)</sup> The affected patients have a prior history of treated leukaemia. Sarcoid of the genitourinary tract usually involves the epididymis and rarely extends to the



**Fig. 6** Tuberculous epididymo-orchitis in a 67-year-old man. Longitudinal US image of the right hemiscrotum shows nodular enlargement of the epididymis (E), hypoechoic mass (arrow) in the testis (T) and multiple hypoechoic abscesses (A) in the thickened scrotal wall.

ipsilateral testis. The involved epididymis is seen as a nodular mass.<sup>(1,2)</sup> Tuberculous or bacterial orchitis usually results from direct spread of the epididymis. The involved epididymis is enlarged with increased vascularity. Associated signs of inflammation, such as reactive hydrocele or pyocele with scrotal skin thickening, are often present.<sup>(7,8)</sup> Therefore, the presence of epididymal involvement and scrotal skin thickening are suggestive of infection rather than tumour. Bacterial epididymo-orchitis usually presents with painful scrotal enlargement and should not be difficult to differentiate from lymphoma, unlike tuberculous epididymo-orchitis, which may present with painless scrotal enlargement. Involvement of the epididymis and skin is helpful to differentiate epididymal and skin involvement from lymphoma (Fig. 6). Although testicular lymphoma can infiltrate the epididymis, the scrotal skin is usually normal (Fig. 7).

Standard treatment of PTL has not yet been established. The mainstay of treatment includes orchiectomy and systemic chemotherapy. Orchiectomy not only provides a histological diagnosis but also removes a potential sanctuary site, as the blood-gonadal barrier inhibits the accumulation of chemotherapeutic agents in the testicular tumour.<sup>(1,5)</sup> Prophylactic radiation therapy to the contralateral testis and regional lymph nodes is usually offered to patients with stage I<sub>E</sub> and II<sub>E</sub> disease. The prognosis for patients with PTL is poor. Most of these patients experience relapses, which usually occur in extranodal sites such as the CNS, skin, lung, pleura, soft tissue and Waldeyer's ring.<sup>(6)</sup> Widespread dissemination usually occurs within the first two years of treatment.



**Fig. 7** Lymphoma with involvement of the epididymis in a 56-year-old man. Longitudinal US image of the left hemiscrotum shows an enlarged hypoechoic testis occupying the entire testis and uniform mild enlargement of the epididymis (E).

Unfortunately, our patient did not receive complete treatment from our hospital.

In summary, testicular lymphoma should be considered in a patient above 50 years of age who presents with a painless testicular mass and whose US shows intratesticular hypoechoic mass with increased vascularity and no epididymal or scrotal skin involvement.

#### ABSTRACT

**A 55-year-old man presented with a painless right scrotal mass for the past three months. Scrotal ultrasonography showed a large circumscribed hypoechoic mass with marked hypervascularity occupying almost the entire right testis. The epididymis and scrotal skin were normal. Right radical orchiectomy was performed. Histopathology revealed lymphoma, diffuse large B-cell type confined within the tunica albuginea. The patient made a good postoperative recovery. No evidence of lymphoma in other organs was demonstrated. We discuss the differential diagnosis of ultrasonographic intratesticular masses and highlight various cases of intratesticular lesions in this article.**

**Keywords:** lymphoma, testicular neoplasms, ultrasonography

*Singapore Med J 2011; 52(3): 204-208*

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