Testicular, epididymal and adnexal ultrasound: a pictorial review. Part 1: Testicular ultrasound

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Pictorial Review

Testicular, epididymal and adnexal ultrasound: a pictorial review. Part 1: Testicular ultrasound

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Abstract

Diagnostic ultrasound is considered to be the gold standard imaging modality for testicular assessment. As a result, it is frequently encountered by general radiologists and sonographers on daily ultrasound lists as well as by radiology residents out of hours. The main strength of diagnostic ultrasound in testicular assessment is that the high-frequency linear transducers utilized reproduce high-resolution images allowing accurate assessment of the testicular parenchyma. The fact that no ionizing radiation is utilized is particularly important as many patients on whom a testicular scan is requested are young or middle aged and the testis as an organ is very radiosensitive. This pictorial review comprises a range of illustrated images of congenital, benign, malignant, infection, polyorchidism and prosthesis-related pathologies collated over a two-year period at our institution.

Keywords: Diagnostic imaging, orchitis, lymphoma, polyorchidism

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Introduction

Ultrasonography is invaluable in completing a scrotal assessment together with the clinical and physical examination performed by physicians in the paediatric and adult populations. One of the main strengths of diagnostic ultrasound is its ability to reproduce high-resolution images with the use of high-frequency linear transducers in the order of 7.5–15 MHz. Its wide availability and portability enables its use for routine work in the ultrasound department as well as at the bedside. The lack of ionizing radiation permits repeated safe usage, which is particularly important when examining the younger population, and is especially relevant to the radiosensitive testes.

A complete testicular assessment would include conventional B-mode imaging and colour Doppler assessment of each testis together with comparative side–side views to evaluate for asymmetrical sonographic characteristics. The practitioner should first image the asymptomatic side to be accustomed with the normal anatomical features of the patient and then go on to image the patient's symptomatic testis. This sonographic technique allows for an accurate differential diagnosis for the most frequently encountered clinical presentations of acute testicular pain, palpable masses and scrotal swellings to be made.

This pictorial review demonstrates an illustrated series of congenital, benign, malignant and infective pathologies, findings on scanning a normal testicular prosthesis and ultrasound findings following testicular prosthesis rupture collated over a two-year period at our institution.

Normal anatomy

On conventional two-dimensional ultrasound imaging, the normal testes appear as symmetrical, homogenous, low-level echogenic structures, which are oval-shaped on longitudinal section (Figure 1a) and spherical in shape on transverse section (Figure 1b) and typically measure $5 \times 3 \times 2$ cm in size in adults. The mediastinum testis, the site of tunica albuginea infolding, is identified as a hyperechoic linear structure in the centre of the testis. On colour Doppler, a homogenous level of Doppler signal is seen in both testes on comparison scanning (Figure 1c). The epididymis is seen to course along the posterior aspect of the testis, and is composed of a head, body and tail. The epididymal head is often noted to be of slightly higher echogenicity than the testis. The potential space between the parietal and visceral layers of the tunica vaginalis is the site of fluid accumulation for the formation of a hydrocele.

Anatomical variants

Polyorchidism

Polyorchidism is a rare congenital anomaly in which more than two testes are identified in the hemiscrotum, inguinal

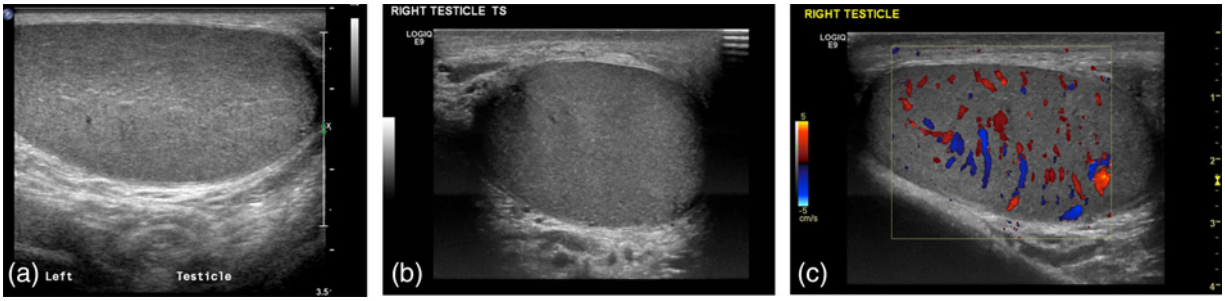

Figure 1 (a) Normal testis: a longitudinal section through the oval-shaped testis demonstrating the homogenous low-level echotexture of the testicular parenchyma. (b) Normal testis: in transverse section the testis demonstrates a more spherical appearance. (c) Normal testis: colour Doppler of the testis on a transverse section demonstrates homogenous vascularity upon scanning through the testis

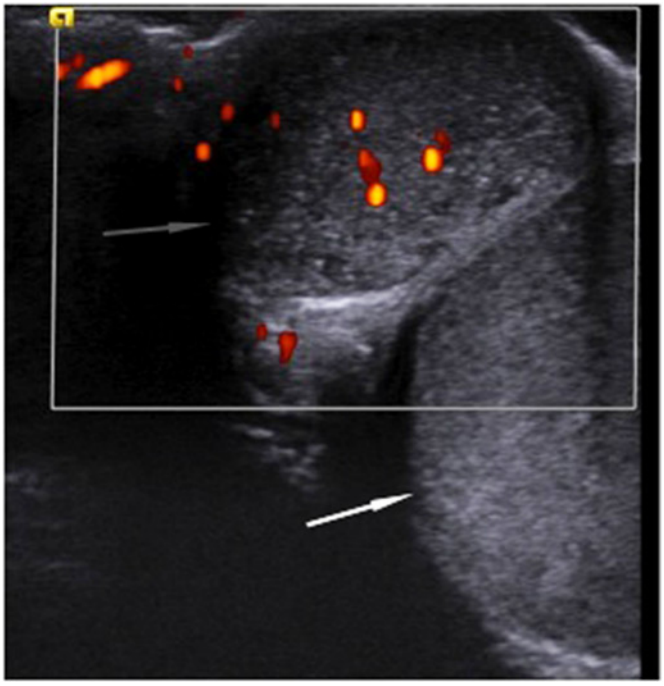

Figure 2 Polyorchidism with two testes seen in one hemiscrotum. Accessory testis (grey arrow), showing normal vascularity. 'Normal' testis (white arrow)

region or abdomen. Triorchidism is the commonest with a reported left-sided predominance, following analysis of such a finding in the adult population.[1] Approximately 190 cases have been reported in paediatric and adult populations in the literature.[1] Polyorchidism cases can be classified according to the classification set by Thum, which is based on embryonic development.[2]

Common presentations include that of a painless, palpable lump in the hemiscrotum or inguinal region or of testicular torsion. At times, cases of polyorchidism are associated with the presence of an inguinal hernia, testicular maldescent or torsion, a hydrocoele or varicocoele in descending order of frequency.[3]

A diagnosis of polyorchidism is raised following investigation with ultrasound or magnetic resonance imaging (MRI) when a soft tissue 'lesion' which is of similar grey-scale and colour Doppler appearance to the assumed normal testes is identified (Figure 2).

The management of cases of polyorchidism remains controversial. Assessment of a true association between the presence of a supernumerary testis and malignancy is difficult to prove due to the rarity of this condition and due to frequently associated conditions, which themselves carry a malignant potential, such as cryptorchidism.[4] Some clinicians are of the belief that if tumour markers are negative in a patient with a benign-appearing supernumerary testis on imaging, conservative surveillance with a six monthly clinical examination and an annual ultrasound is sufficient.[5]

Congenital adrenal rests

Ectopic adrenal rests represent fetal adrenal cortical cells that have failed to involute as a result of raised corticotrophin hormone levels.[6] Conditions associated with testicular adrenal rests include congenital adrenal hyperplasia (CAH) most commonly, Addison's disease and Cushing's syndrome.[7] Reports suggest that testicular adrenal rests are in fact found in all patients with CAH.[8] Patients with congenital adrenal rests may be completely asymptomatic or may present with diffuse testicular enlargement or with more focal nodular masses which may be tender, usually at the time of puberty.[6]

Characteristic features on ultrasound are of multiple, bilateral, usually hypoechoic lesions, which are centred around the mediastinum testes. More heterogeneous or hyperechoic lesions have also been described (Figure 3).[6] Sometimes these lesions are associated with acoustic shadowing.[9] In comparison with most other intra-testicular pathology, no surrounding or internal architectural distortion is seen (Figure 4); indeed, normal appearing testicular vessels are often seen to course through the adrenal rests.[10] Internal vascularity is variable, but when present is described as having a spoke-like pattern.[6,11] In the same patient, computed tomography imaging of the abdomen revealed bilateral adrenal hyperplasia (Figure 5).

In the right clinical setting, when testicular adrenal rests are suspected, follow-up imaging with ultrasound for monitoring purposes is recommended following the appropriate medical treatment with glucocorticoid replacement therapy.[8] Subsequent ultrasound imaging typically demonstrates stable size lesions or even regression of these masses.

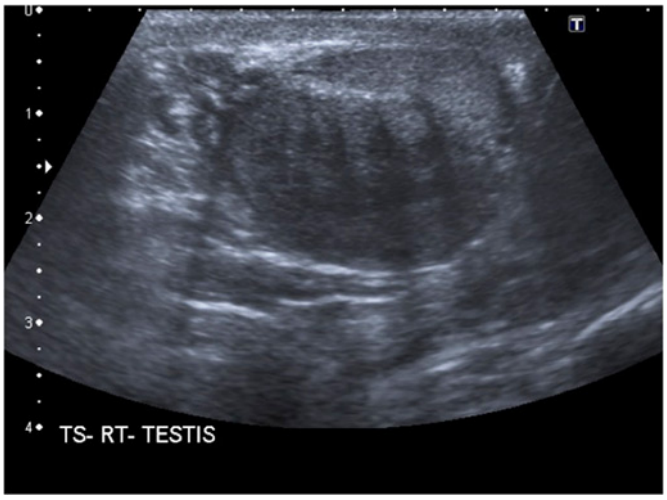

Figure 3 Congenital adrenal rests: a transverse ultrasound image through the right testis demonstrating multiple well-defined hyperechoic nodules centred on the mediastinum testis with a striated pattern of posterior acoustic shadowing

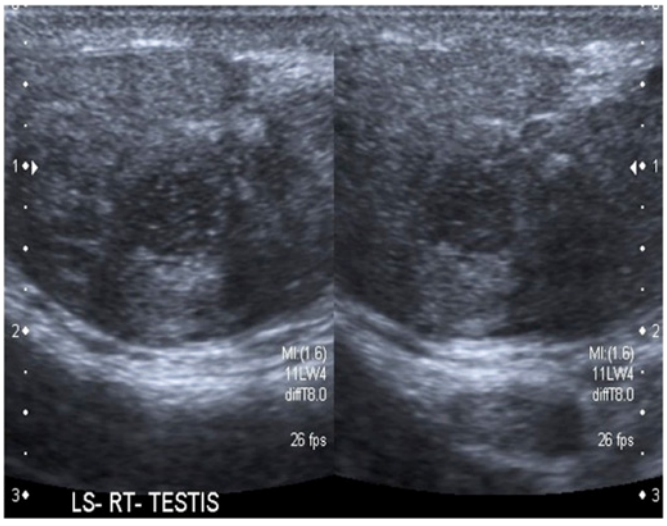

Figure 4 Congenital adrenal rests: a longitudinal ultrasound image through the right testis demonstrating well-defined, circular, hypoechoic lesions with distal acoustic enhancement and no associated architectural parenchymal distortion

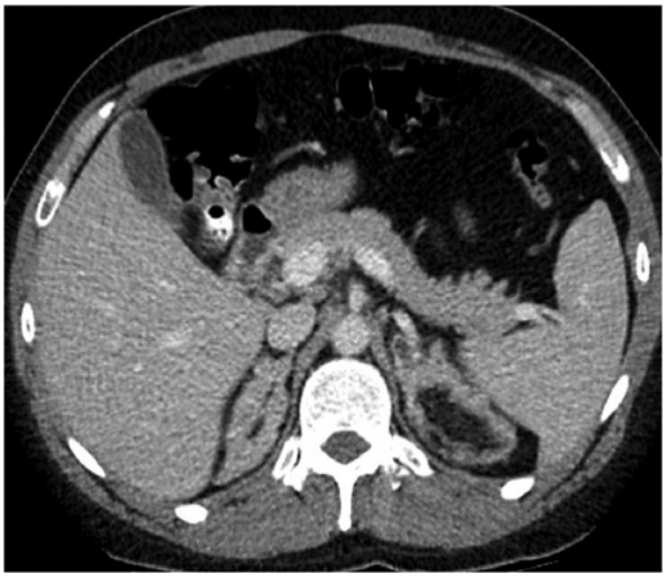

Figure 5 Congenital adrenal rests: an axial computed tomography image in a portal venous phase of intravenous contrast of the upper abdomen demonstrates bilateral diffuse enlargement of the adrenal glands in a patient with congenital adrenal hyperplasia

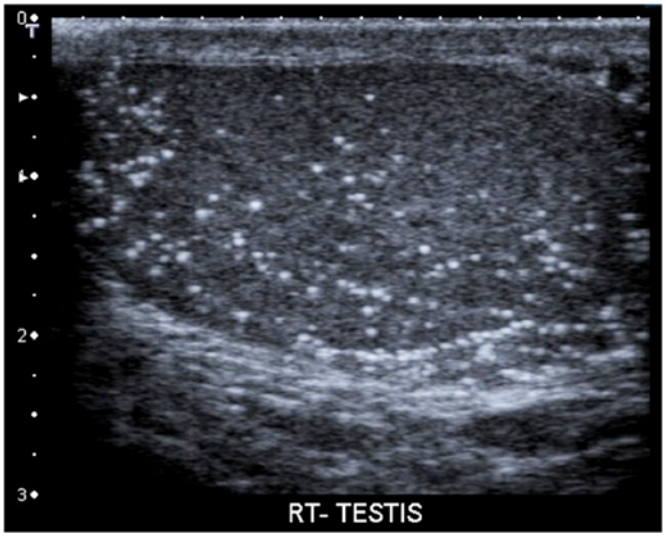

Figure 6 Testicular microlithiasis: an example of widespread tiny foci of increased echogenicity showing a 'snow-storm' appearance

Benign testicular lesions

Testicular microlithiasis

Testicular microlithiasis (TML) is a relatively uncommon radiological diagnosis of unknown aetiology. It is said to be present on approximately 0.6% of scrotal ultrasounds, usually as an incidental finding.[12] Histologically, endoluminal seminiferous tubule calcium deposits are demonstrated.[12] TML is known to be associated with Klinefelter's syndrome, Down's syndrome, testicular maldescent, subfertility, infertility, cryptorchidism, pseudohermaphroditism, testicular infarcts, granulomas, previous radiotherapy and pulmonary alveolar microlithiasis.

Characteristic TML appearances are of five or more, uniform, 1–3 mm foci of increased echogenicity on any single view, which do not cast a distal acoustic shadow.[13] The hyperechoic foci are usually present bilaterally and may be distributed throughout the testicular parenchyma or located in clusters. When the TML is widespread, it is described as a 'snow-storm' appearance (Figure 6).

Annual ultrasound screening for germ cell tumours (GCTs) in patients with TML remains controversial due to conflicting results from recently published studies. A study on 4819 patients carried out by Cast *et al.*[13] has suggested that TML is strongly associated with GCTs. Various other studies (albeit being composed of much smaller populations) have failed to demonstrate evidence of a high-risk association between TML and the

development of GCTs following ultrasound screening periods of up to approximately 45 months. These results therefore suggest that TML is a benign condition.[12,14] The exception is, however, in TML patients with any of the aforementioned associated conditions such as testicular maldescent, for which a higher risk of GCT incidence is proposed. Further discussion has also put into question the impact of early ultrasound diagnosis of GCTs on patient survival, given that the overall prognosis in such patients is very good, regardless of tumour stage at diagnosis.[15] The current trend appears to be of carrying out an annual surveillance on these patients, due to the relatively low incidence of TML and the wide availability and safety of ultrasound.

Intratesticular simple cysts

Cystic lesions in the testes can represent a wide range of pathologies, benign in aetiology, such as true intratesticular simple cysts, cysts arising from the tunica vaginalis, tubular ectasia also known as cystic transformation of the rete testis (a normal anatomical variant) or malignant, such as in cases of cystic teratoma. Accurate characterisation of such lesions is therefore important since the management of such a differential of lesions varies remarkably. Simple cysts in the testes are typically discovered incidentally on ultrasound and are therefore often not palpable on examination and are usually identified in patients of 40 years of age or older.[9] The postulated aetiology of intra-testicular simple cysts includes idiopathic/congenital, post-traumatic, postinfective or postsurgical manifestations.[16] They are most often solitary and frequently located adjacent to the mediastinum testes.

Ultrasound characteristics of intra-testicular simple cysts are identical to appearances of simple cysts in any other organ; a well-defined, imperceptible-walled anechoic structure with no internal echogenicities or vascularity and with posterior acoustic enhancement (Figure 7). Contrast-enhanced MRI is the investigation method of choice if there is clinical concern of more sinister pathology (such as a cystic teratoma) or if ultrasound appearances are inconclusive.[17] On contrast-enhanced MRI, the fluid MRI characteristics with no enhancing solid elements would confirm the presence of a simple intra-testicular cyst.

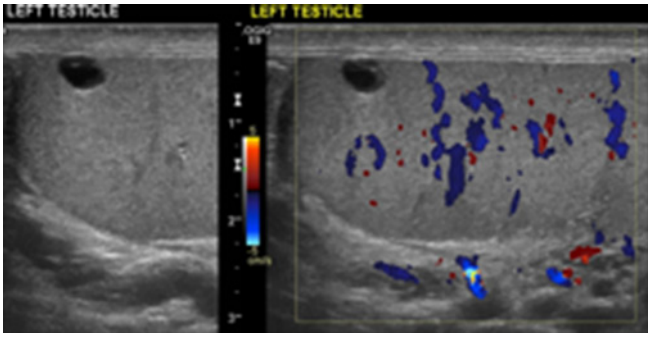

Figure 7 Intra-testicular simple cyst: greyscale and colour Doppler images of the testis demonstrating a well-defined, hypoechoic intra-testicular lesion with no internal echoes or vascularity

The general consensus regarding the management of intra-testicular simple cysts is understood to be that no follow-up is required for asymptomatic lesions with typical imaging characteristics. A follow-up ultrasound scan over an unspecified period of time, is however advised for symptomatic intra-testicular simple cysts so as to ensure that no interval increase in size or alteration in imaging characteristics occurs.[16]

Testicular epidermoid cysts

Testicular epidermoid cysts are the most common benign testicular lesions and represent approximately 1–2% of all testicular masses.[18] Patients typically present with an incidentally palpated, unilateral, non-tender testicular nodule, most commonly in the 2nd–4th decades. Epidermoid cysts have a slightly higher incidence of being right sided.[19,20] It is important to differentiate testicular epidermoid cysts from testicular teratomas since teratomas may metastasise and therefore necessitate an orchidectomy unlike the organ-preserving enucleation which is usually offered to patients with testicular epidermoids.[18]

On ultrasound, testicular epidermoid cysts are described as being well-defined lesions surrounded by a hypoechoic or echogenic rim, depending on whether the capsule is fibrous with calcification or composed only of squamous epithelium.[18] Descriptions include the typical onion-skin appearance with concentric alternating hypo- and hyperechoic rings, a target appearance of a central hyperechoic focus and a hypoechoic rim to the lesion, an isoechoic lesion with peripheral echogenicity and a hyperechoic lesion with distal acoustic enhancement (due to its calcific composition).[21,22] The internal characteristics of epidermoid cysts vary depending on the complexity of the internal contents. Posterior acoustic enhancement is not usually a feature due to the keratin and squamous components of its capsule; as a result these lesions can be differentiated from simple cysts.[16,21] Horstman *et al.* reported that most malignant tumours measuring 1.6 cm or larger in size reliably show a degree of internal vascularity and that an avascular lesion in lesions of this size or more is suggestive of a benign lesion (Figure 8).[18,23]

Infection

Orchitis

The aetiology of orchitis (acute inflammation of the testis), a common cause of acute scrotal pain in young males especially, is age-dependent. Sexually transmitted disease pathogens are the most common cause in the younger age group and urinary bacteria in the older age group, who may also have bladder outflow obstructive disorders. Orchitis most commonly results as an extension of epididymitis, which tends to commence in the epididymal tail, extending to the body and head of the epididymis with further involvement of the spermatic cord and testes in unresolved cases. Isolated orchitis (without epididymal involvement) is reported in only 10% of scrotal infections and when present is usually post-traumatic or of viral

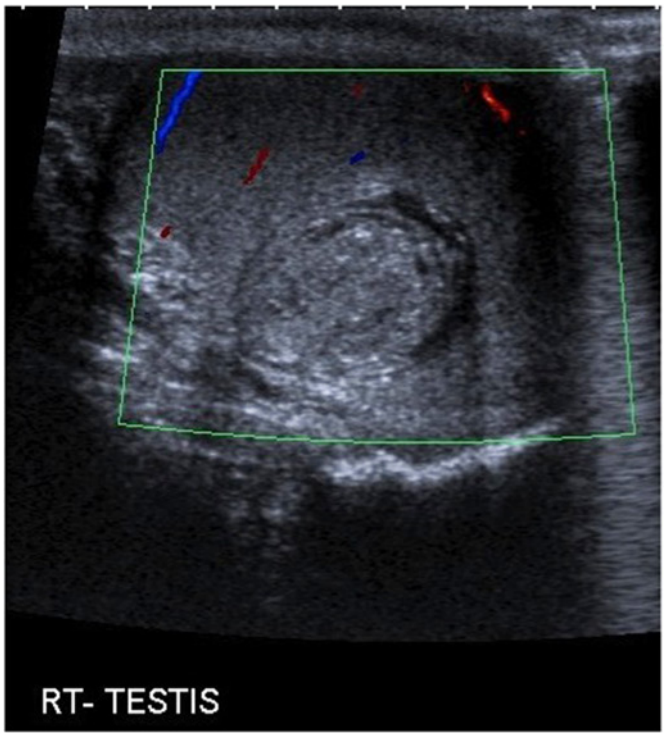

Figure 8 Testicular epidermoid cyst: a longitudinal colour Doppler image through the right testis showing the characteristic 'onion-skin' appearance of alternating concentric echogenicities in this avascular epidermoid cyst. Distal acoustic enhancement is not seen on this image

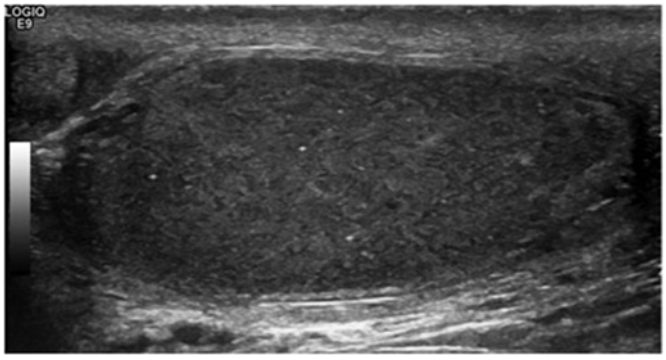

Figure 9 Orchitis: a longitudinal section through the testis demonstrates the generalized hypoechoic texture of the testicular parenchyma that was confirmed on comparison scanning with the contralateral testis. Note was made of microlithiasis in this patient

aetiology.[24,25] Hence, on ultrasound, orchitis is most frequently encountered with changes of epididymitis also and a diagnosis of isolated orchitis should be made with caution.

On ultrasound, acute orchitis, which can be of the diffuse or focal type, first manifests as generalized oedema in the form of heterogenous diffuse or ill-defined focal hypoechogenicity (Figure 9).[10] Areas of hyperechogenicity in keeping with haemorrhagic foci may also be identified. After a variable amount of time, the areas of low echogenicity change become better defined. Colour Doppler reveals increased vascularity within the areas of abnormality

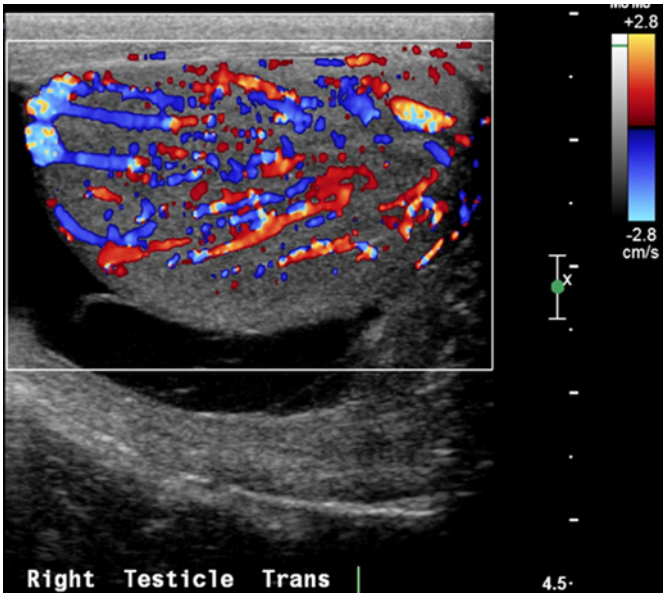

Figure 10 Orchitis: colour Doppler imaging on a longitudinal section of the testis demonstrates diffusely increased vascularity of the testis

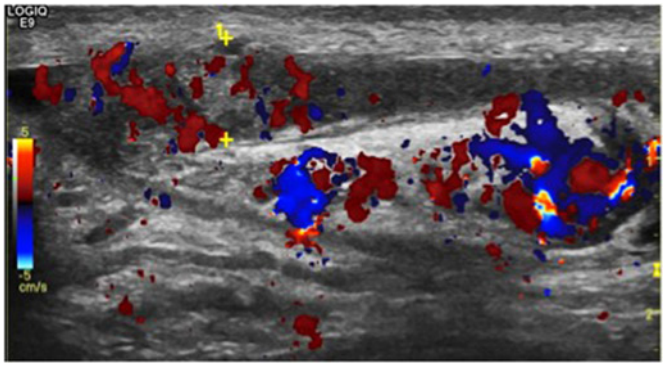

Figure 11 Epididymo-orchitis: colour Doppler imaging of the body of the epididymis in the same patient demonstrates diffuse thickening and increased vascularity of the epididymis

(Figure 10); indeed this may be the only abnormality in certain cases with entirely normal appearances demonstrated on greyscale ultrasound imaging.[25] If the epididymis also appears hypoechoic, of increased calibre and vascularity as compared with the contralateral epididymis, acute epididymo-orchitis is then present (Figure 11). A pyocele, manifesting as a complex hydrocoele containing thin septations and internal hyperechoic debris, is sometimes seen in the acute infective episode (Figure 12).

Often the ultrasound changes seen during the acute episode of epididymo-orchitis resolve completely following the appropriate treatment. However, in 50%, complications such as abscess formation, infarction and testicular atrophy occur.[10] Common clinical practice is to repeat the ultrasound examination (in our practice 6–8 weeks) following antibiotic therapy commencement so as to ensure resolution of the abnormal appearances and also since malignancies can sometimes have similar clinical presentations.[17]

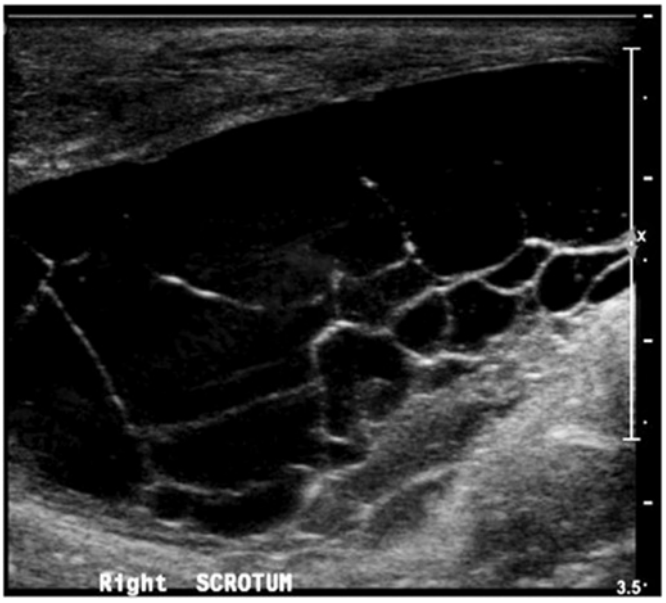

Figure 12 Pyocele: greyscale imaging demonstrates a right sided multi-loculated hydrocoele complicating a previous right epididymo-orchitis

Testicular torsion

Torsion of the testicle centred on the spermatic cord, results in vascular insufficiency (venous followed by arterial) and infarction if timely clinical intervention does not occur (4–6 hours following the onset of torsion). The diagnosis of testicular torsion should be made on clinical grounds since time is of the essence so as to prevent end stage death of the testis. However, the diagnosis is often not as clear-cut and a differential diagnosis for the patient's clinical presentation is sometimes present. In these cases, ultrasound is utilised so as to help in confirming or dismissing this diagnosis.

Comparison of appearances with the asymptomatic contralateral testis forms an imperative part of the evaluation of the testis in any clinical scenario, most especially in this one. Ultrasound findings vary according to the time of onset of torsion. Typical early ultrasound findings are of an increase in size of the testis, which appears homogenously hypoechoic (Figure 13a) – hence these appearances are said to represent a torted yet salvageable testis.[26] Later, the testis appears of heterogenous echotexture with hypoechoic areas corresponding to necrotic foci and hyperechoic areas, which may represent haemorrhagic foci following re-perfusion (in the case of spontaneous de-torsion). In early and later presentations, decreased or absent vascular flow on Colour Doppler is the key feature (Figure 13b).

Malignant testicular tumours

Testicular GCT represent only 1% of neoplasms in men, but are the most common malignancy in males aged 15–35 years.[27] The worldwide incidence has doubled in the past 40 years.[28] Several risk factors for developing GCT have been identified, including past history of a

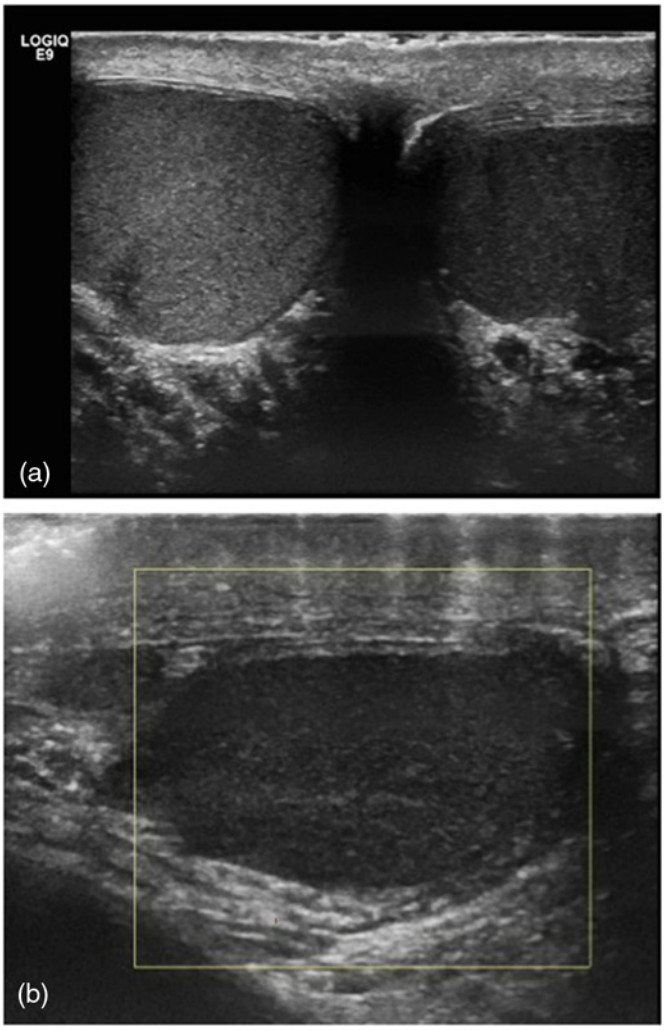

Figure 13 (a) Testicular torsion: comparative view of both testes demonstrating a diffusely hypoechoic homogenous echotexture to the left sided testis in keeping with testicular infarction which was secondary to torsion. (b) Testicular torsion: a longitudinal view of the testis demonstrating absence of vascularity on colour Doppler imaging in a diffusely hypoechoic testis

GCT, positive family history, cryptorchidism, testicular dysgenesis and Klinefelter's syndrome. GCTs are classified as seminoma, or non-seminomatous GCT.[25]

A painless solid testicular mass is reported to be pathognomonic for a testicular tumour.[29] However, patients with malignant testicular tumours can also present with testicular swelling or discomfort, which may initially be suggestive of acute epididymitis or orchitis. In these patients a trial of antibiotics is therefore suggested and a follow-up ultrasound evaluation in two months should be recommended to ensure full resolution of the changes seen on ultrasound.[25]

Ultrasound will confirm the presence of a testicular mass and allows direct evaluation of the contralateral testis to assess for synchronous tumours, which do occur in a small number of patients.[26] GCTs appear as well-defined hypoechoic lesions, which demonstrate a spectrum of heterogeneity on ultrasound.[26] Although calcification is commonly encountered, its presence and distribution is not pathognomonic for a specific cell type.[30,31]

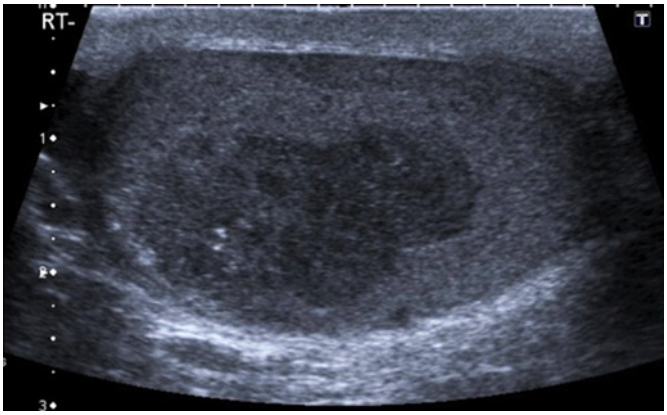

Figure 14 Seminoma: a longitudinal ultrasound image through the right testis, which demonstrates a well-defined heterogenous lesion containing two small foci of calcification

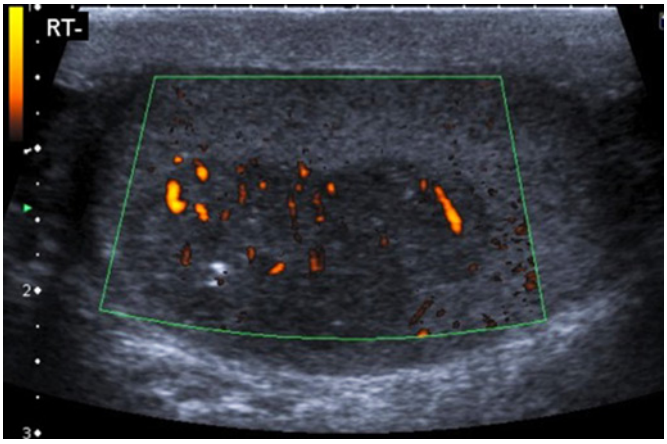

Figure 15 Seminoma: power Doppler on this longitudinal ultrasound image reveals the lesion to be hypervascular

Seminoma

The diagnosis of a seminoma is restricted to pure seminoma histology and a normal serum AFP. The commonest histological subtypes of malignant testicular GCTs, seminomas, typically appear as a homogenous testicular mass with low echogenicity on ultrasound; however, larger seminomas can appear more heterogenous[26] (Figure 14). The mass is usually well defined in the absence of local invasion, and colour Doppler analysis may demonstrate increased vascularity (Figure 15). It is uncommon to find calcifications or cystic areas in seminomas. This is in contrast to embryonal mixed GCTs and teratomas, which are usually more heterogeneous and commonly contain foci of increased echogenicity due to calcification or necrosis.[28,29]

Non-seminomatous GCT

Non-seminomatous GCT is the more clinically aggressive tumour, and can often be composed of multiple cell subtypes, including embryonal cell carcinoma, yolk sac tumour, teratoma and choriocarcinoma.

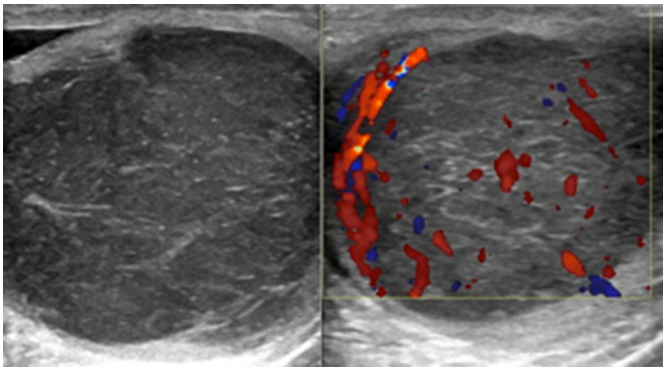

Figure 16 Teratoma: a transverse section through the testis demonstrates diffuse abnormality of the testis in the form of mixed echogenicty, microcalcification and septations. Colour Doppler demonstrates disorganized foci of increased vascularity in a diffusely abnormal testis

Malignant non-seminomatous tumours tend to be more heterogeneous in appearance than seminomas, and typically have irregular or ill-defined margins. The ultrasound appearance of the internal architecture reflects their complex origin; well-differentiated squamous cysts are filled with hyperechoic bone, cartilage, mucous glands, smooth muscle and neural tissue. Teratocarcinoma, the most common mixed GCT, is an aggressive tumour that often contains highly reflective focal areas of microcalcification within a mass of mixed echogenicity (Figure 16).[28]

Occasionally, primary testicular tumours may undergo spontaneous regression, producing an acoustic shadow; these lesions are usually called 'burnt-out' GCTs.

In patients presenting with a retroperitoneal GCT, normal testes on palpation and calcific foci within the testis on ultrasound have been found to contain histological evidence of a regressed testicular tumour.[32]

Testicular lymphoma

Testicular lymphomas constitute up to 9% of all testicular neoplasms with Non-Hodgkin's lymphoma being the most common testicular malignancy in the elderly.[33] Testicular lymphoma is the main differential diagnosis to consider in the setting of bilateral testicular lesions or epididymal involvement.[34]

The sonographic appearances described include a focal hypervascular, hypoechoic mass without a defined capsule and diffuse enlargement with hypoechogenicity of the entire testis, in contrast to the hyperechogenicity of the normal testis[35] (Figure 17a).

Testicular lymphoma tends to be locally aggressive with infiltration into the epididymis (Figure 17b), spermatic cord and scrotal skin sometimes occurring. Systemic dissemination to the contralateral testis, central nervous system, skin, Waldeyer's ring, lung and soft tissue have been described.[36]

The normal testicular prosthesis and testicular prosthesis rupture

The earliest testicular prostheses were composed of vitallium and were first used in 1941.[37] Modern-day testicular

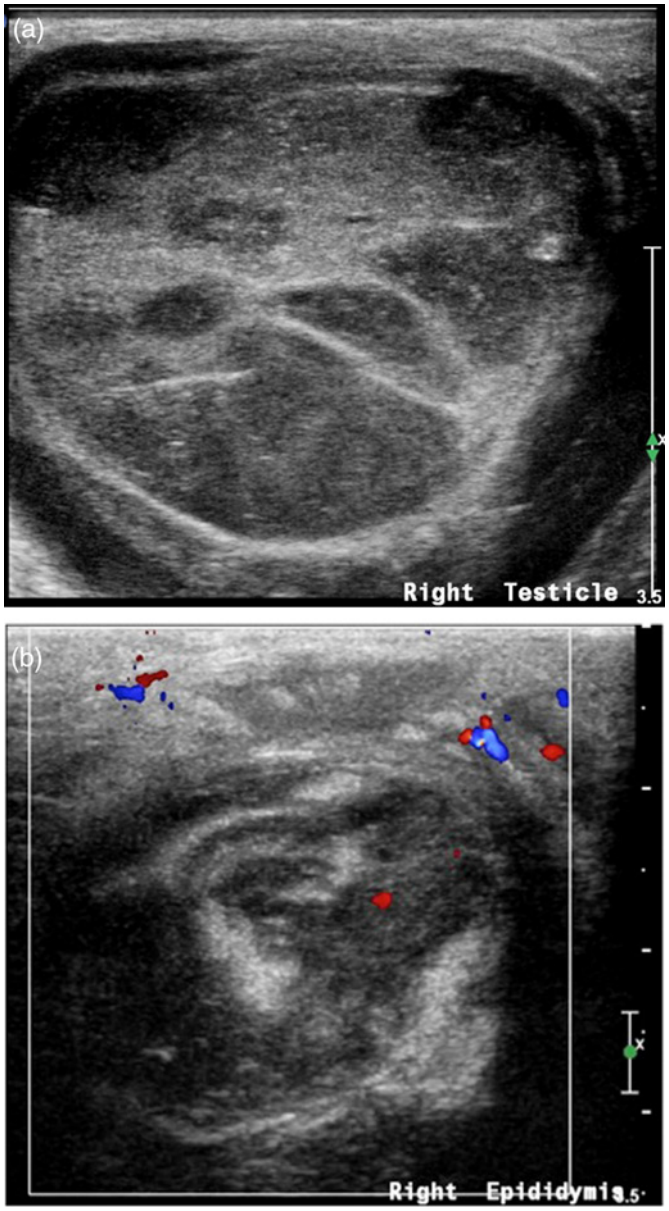

Figure 17 (a) Testicular lymphoma: a transverse ultrasound image through the right testis demonstrating multiple hypoechoic lesions causing generalized enlargement of the entire testis. (b) Testicular lymphoma: in the same patient as Figure 17(a), an ultrasound image of the right epididymal head demonstrating global increase in size of the epididymal head, which also contains irregular areas of hypoechogenicity. No significant vascularity demonstrated within. Appearances were in keeping with lymphomatous infiltration of the epididymal head

prostheses are either saline-filled or silicone gel-filled implants.[35,38] Testicular prostheses provide paediatric or adult patients with a cosmetically normal scrotum and can be inserted in patients with congenital abnormalities or following orchidectomy.

On ultrasound, intact testicular prostheses demonstrate a well-defined, smooth superficial contour that is echogenic and casts a distal acoustic shadow (Figure 18).

Complications associated with testicular prosthesis include implant extrusion, implant migration into the inguinal canal, pain, infection and infrequently, rupture.[36]

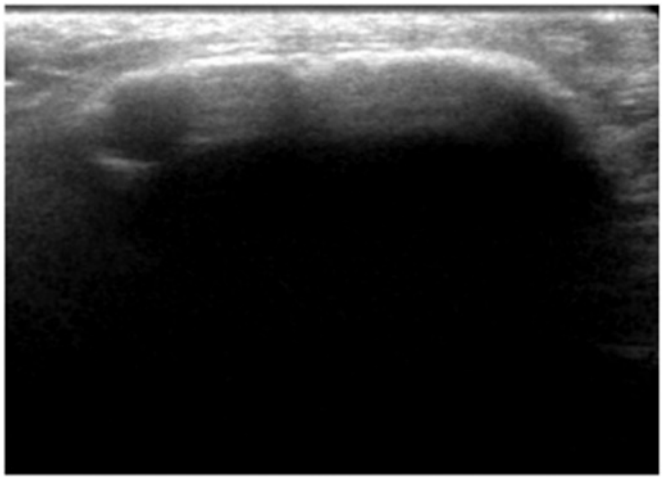

Figure 18 Normal testicular prosthesis: a longitudinal ultrasound image of an intact testicular prosthesis that demonstrates the smooth hyperechoic superficial contour of the prosthesis with distal acoustic shadowing

Figure 19 Ruptured testicular prosthesis: a longitudinal image through a ruptured testicular prosthesis demonstrating the characteristic 'stepladder' undulating linear appearance inferior to the hyperechoic superficial testicular contour. The posterior aspect of the scrotum is also visible in the presence of a ruptured testicular prosthesis

In cases of testicular rupture a characteristic 'stepladder' appearance with numerous undulating echogenic lines is seen superficially within the lumen of the prosthesis (Figure 19).[36]

Conclusion

Testicular ultrasound is a frequently performed routine investigation and is occasionally requested out of hours. As a result, classification of testicular abnormalities into benign or malignant, infective and congenital categories together with an understanding of typical modes of presentation and characteristic ultrasound findings for the various

Table 1 Typical modes of presentation and characteristic ultrasound findings for the various described intra-testicular pathologies

Condition	Most common mode(s) of presentation	Characteristic ultrasound finding(s)
Polyorchidism	• Painless palpable lump • Torsion of the supernumerary testis	• Lesion of similar echotexture and internal vascularity to the native testes
Congenital adrenal rests	• Isolated incidental finding/incidental finding in association with CAH • Diffuse testicular enlargement/more focal nodular masses ± tenderness	• Multiple, bilateral, hypoechoic lesions centred around the mediastinum testes • No surrounding architectural distortion • Spoke like pattern of internal vascularity (when internal vascularity is present)
TML	• Isolated incidental finding/in association with certain conditions	• Five or more, uniform, 1–3 mm echogenic foci on any single view • No distal acoustic shadow
Intratesticular simple cysts	• Incidental finding	• Well-defined, anechoic structures • Distal acoustic enhancement • No internal vascularity
Testicular Epidermoid Cysts	• Non-tender testicular lump	• Well-defined lesions with a hypoechoic/echogenic rim • Onion-skin appearance
Orchitis	• Acute scrotal pain	• Heterogenous diffuse/ill-defined focal hypoechogenicity which becomes more well-defined in time • Increased vascularity
Testicular torsion	• Acute scrotal pain	• Appearances vary according to time of symptom-onset • Acutely: hypoechoic, enlarged testis • Later: more heterogenous • Decreased/no internal vascularity
Seminoma	• Painless testicular lump	• Well-defined, homogenous, hypervascular lesion
Non-seminomatous GCT	• Painless testicular lump	• Heterogenous, ill-defined lesion • Sometimes contain foci of calcification
Testicular lymphoma	• Unilateral/bilateral testicular lumps	• Focal, well-defined, hypervascular, hypoechoic mass • No defined capsule • Diffusely enlarged and hypoechoic testis
Intact testicular prosthesis	• N/A	• Well defined, smooth, echogenic, superficial contour • Distal acoustic shadow
Ruptured testicular prosthesis	• Patient often asymptomatic	• Stepladder appearance

CAH, congenital adrenal hyperplasia; TML, testicular microlithiasis; GCT, germ cell tumour

pathologies (as illustrated in Table 1) by the practitioner is important in determining management pathways.

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