Evaluation of Testicular Disease using Ultrasound

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Abstract: ***Recently, numerous research and, techniques have been developed for analyzing And diagnosing testicular tumors, beyond conventional B-mode imaging, including color Doppler ultrasound, contrast-enhanced ultrasound (CEUS) and tissue elastography used in the characterization of both benign and malignant intratesticular lesion. The purpose of this review study was to summarize the testicular disease and developed ultrasound techniques for analyzing and assessment of testicular disease. We researched electronic data bases of the Evaluation of testicular disease using ultrasound for diagnosing and assessment. This study describes some of the more common testicular disease, provides a description of diagnostic procedures in evaluation of some testicular disease such as Benign lesions, hydroceles, avaricoceles, Epididymitis ,Indirect inguinal hernias ,Ultra Sonography is also helpful in patients who present with chronic nonspecific symptoms, in whom a definitive diagnosis is not easily made. Ultra Sonography has been shown to decrease the number of emergency scrotal explorations and the length of hospital stay, and, thus, reduce the cost of management of the acute scrotum .This review provides a description Ultra Sonography for testicular disease, although clinical experience remains limited, careful evaluation of safety as well as validation of diagnostic and prognostic value of this technique in clinical trials is still needed.***

Keywords: Testicular tumors, ultra Sonography, Calcifications, Hydrocele, Varicocele

1. Introduction

Ultra Sonography is the primary imaging modality for evaluation of the scrotum. B-mode imaging combined with duplex Doppler interrogation provides valuable information in assessment of the acutely painful scrotum in addition to scrotal masses and male infertility. Advances in ultra Sonographic spatial and low-contrast resolution have improved our ability to more clearly define diagnoses for the referring clinician and have led to new observations, such as microlithiasis and seminiferous tubule sclerosis, which are currently being investigated and have yet to be fully understood. This article reviews the pertinent normal scrotal anatomy and the use of ultra Sonography in the evaluation and classification of acute scrotal pain, scrotal masses, and male infertility. The use of ultra Sonography in the evaluation of the scrotum benefits from an understanding of scrotal anatomy and familiarity with potential pitfalls of Color Doppler and pulsed Doppler evaluation .Ultrasound of the testis is still the most common way to diagnose testicular cancer. Testicular cancer can be differentiated form other testicular abnormalities such as fluid surrounding the testis in nearly 100% of cases. Blood markers such as alpha-Fetoprotein, beta-HGC, LDH and others can help monitor prognosis following surgical and chemotherapeutic management of testicular cancer. The highest risk factors for testicular cancer is being a white male and males between ages 15 and 35. A CT scan is a beneficial diagnostic tool to stage cancer in regards to metastasis. The chest, abdomen, and pelvis CT scan is used in staging testicular cancer confirmed by ultrasound. Prognosis is good for pure seminoma and decreases with other types, with choriocarcinoma having the lowest prognosis [1]. The use of CEUS improves characterization of testicular lesions, and confirms lack of vascularity in benign abnormalities such as epidermoid cysts, infarctions, abscesses and changes following trauma. Tissue elastography allows further evaluation of the cellular consistency of the abnormality. Familiarity with the appearances seen with these ultrasound techniques in both benign and malignant abnormalities should aid in improving confidence in arriving at the correct diagnosis.

2. Sonographic appearance

Testicular tumors contribute to approximately 1% of all malignancies in men. 90–95% of malignant intratesticulartumors are primary germ cell tumors. Germ cell tumors arise from spermatogenic cells and are almost uniformly malignant. Germ cell tumors are broadly divided into seminomatous and non-seminomatous types. Non-germ cell tumors represent the remainder of primary and secondary testicular tumors, and are made-up of sex cord stromal tumors (Leydig or Sertoli cell tumors), lymphoma and metastasis [2].

3. Seminoma

Seminoma is the most common pure germ cell tumor. It accounts for 35–50% of all germ cell tumors. It occurs in an older population, in comparison with non-seminomatous tumors, with an average patient age of 40.5 years. On B-mode ultrasound, seminomas typically appear as a solid round homogeneous low-reflectivity mass without calcification inside the tumor mass, reflecting their uniform cellular nature. On CDUS there is demonstrable vascularity within the lesion. With CEUS, there is a rapid enhancement in the tumor (higher than the surrounding normal testicular parenchyma) and loss of the normal linear vascular pattern. Washout of the contrast within the lesion may be rapid, but with persistence of the abnormal ‘‘crossing’’ vessels within the lesion. On TE a ‘‘hard’’ lesion will be clearly demonstrated. Non-seminomatous germ cell tumors of the non-seminomatous germ cell tumors, mixed germ cell tumors (Figure 1) are much more common than any of the pure histological forms. Embryonal carcinoma (Figure 2) is the most common component.

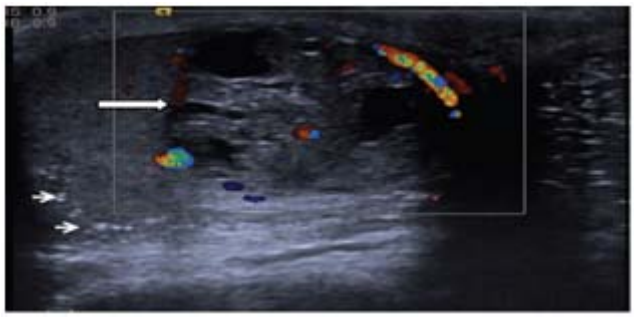


Figure 1: Shows, mixed germ cell tumorsA and cystic components (long arrow). Color Doppler demonstrates distortion of the normal vascular pattern by the lesion. Note is also made of background testicular microlithiasis (short arrows)

and is often combined with one or more components of teratoma, seminoma and yolk sac tumor. The imaging findings reflect the diversity of the components of these lesions. On B-mode images these tumors may be inhomogeneous, with areas of increased echogenicity, calcification and cyst formation. Increased vascularity may or may not be demonstrated, and therefore may be mistaken for a benign avascular abnormality, such as a segmental infarction of focal scarring. However, on CEUS, movement of individual micro bubbles may be seen within the lesion in a haphazard pattern, which suggests that the abnormal vascularity favours a malignant diagnosis to the differential of an infarct. The key point is that the microbubble contrast is truly and exclusively intravascular, and any movement is within a vessel.

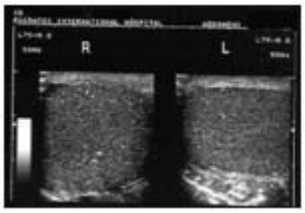


Figure 3: (a) Calcific foci per ultrasound image of the testes

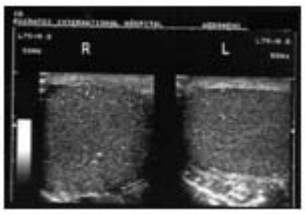


Figure 3: (b) sizes of the calcification is in the range 1 to 3mm.(bilateral involvement)

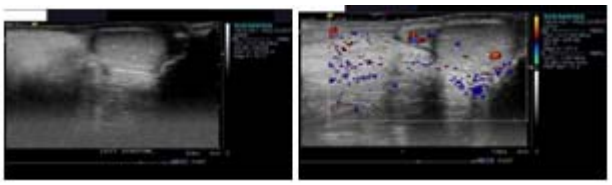


Figure 4: Microliths (left testis) in a new born baby

4. Non-primary malignant tumors

Non-primary tumors (Figure 5) such as lymphoma and metastasis can all manifest as an indeterminate testicular mass. Testicular lymphoma occurs in a much older population than those affected by primary germ cell tumors, and is the most common testicular neoplasm in men over 60 years of age. The epididymis and spermatic cord are commonly involved. Primary leukaemia of the testis is rare; secondary testicular involvement is more common. Sonographic findings in both lymphoma and leukaemia may be represented by focal or multifocal hypoechoic lesions, and may be indistinguishable from germ cell tumors. Correlation to relevant clinical history would be required in reaching correct diagnosis. Other metastases to the testes, which are rarely the presenting complaint, are most commonly seen in cases of widespread primary prostate and lung malignancies [4].

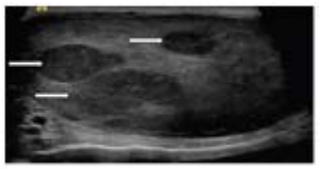


Figure 5: Shows, Prostatic metastasis. (a) B-mode ultrasound demonstrates multifocal hypoechoeic lesions (arrows)

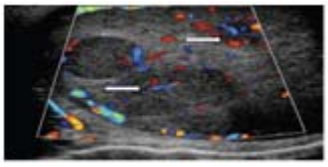


Figure 5: (b) Color Doppler ultrasound demonstrates internal vascularity within the lesions (arrows)

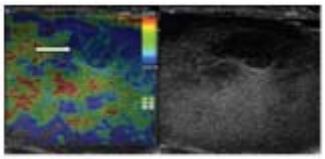


Figure 5: (c) The lesions appear ‘‘hard’’ on elastography (blue area arrow)

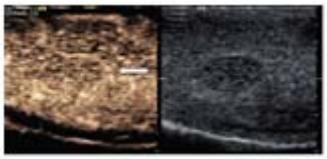


Figure 5: (d) Enhancement is noted within the lesion, confirming internal vascularity and peripheral contrast enhancement (arrow) wall

They are one of the few intratesticular masses that demonstrate no malignant potential. Four ultrasound appearances have been described N Type 1—classic ‘‘onion-ring’’ appearance with alternating hyper-echoic and hypo-echoic layers. N Type 2—densely calcified mass with an echogenic rim. N Type 3 - cyst with a rim and either peripheral or central calcification. N Type 4—mixed pattern, heterogeneous and poorly defined. Although the Sonographic appearances of epidermoid cysts are characteristic, it is not pathognomonic. The combination of absence of color Doppler flow, absence of vascular flow on CEUS and ‘‘hardness’’ on real-time elastography help further characterize these lesions [5]. Negative tumor markers with the above ultrasound

findings increase diagnostic confidence. The treatment for epidermoid cyst is either enucleation or orchidectomy, which is usually performed when malignancy cannot be completely excluded. Segmental testicular infarction is an infrequent finding in patients with acute testicular pain. Predisposing factors to segmental infarction include epididymo-orchitis trauma, hypersensitivity angiitis, intimal fibroplasia of the testicular artery, previous surgery polycythaemia and sickle cell disease .Ultrasound examination demonstrates an area of mixed or low reflectivity, which may be wedge- or round shaped. There is poor or absent color Doppler flow. CEUS will demonstrate any avascular testicular parenchyma. In the sub acute stage, CEUS may show a vascular lobules and in some cases perilesional rim enhancement [6]. Rim enhancement observed may be due to perilesional inflammatory changes around the infarcted areas, or mass effect secondary to intralesionaloedema in the infarcted area that displaces the surrounding testicular tissue and causes bundling of the perilesionalparenchymal vessels. After 1 month or more, CEUS may depict reduced size of the lesion, with intralesional vascular ‘‘spots’’ in areas of infarction .The ultrasound appearances, the absence of tumor markers and a change in the size or shape of the abnormality during follow-up will often establish the benign nature of the abnormality.

5. Epididymitis

Ultra Sonographic findings in epididymitis include an enlarged hypoechoic epididymis with hyperemic blood flow on color and pulsed Doppler imaging. However, scrotal wall thickening and reactive hydrocele are also commonly seen (Figure 6). In cases of isolated epididymitis, the testis has normal echogenicity, echo texture, and blood flow. Often this infection can progress, leading to epididymo-orchitis. In orchitis, the testicle is enlarged, and the affected areas are hypoechoic. Testicular hyperemia is also detected with color and pulsed Doppler imaging. Complications associated with epididymitis and epididymo-orchitis include abscess formation, infarction, and pyoceleformation (Figure7). A pyocele is pus filling the potential space between the layers of the tunica vaginalis and often contains internal loculations, septations, and debris [7].

Figure 6: Shows, epididymitis (a) Color and spectral Doppler image showing an elargedhypoechoic epididymis and hypermic blood flow

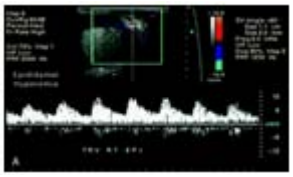


Figure 6: (b) Enlarged hypoechoicepididymal body (arrow heads) with associated hydrocele and scrotal wall thickening.

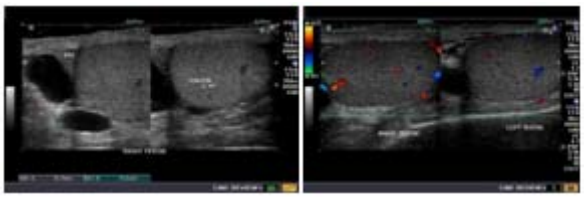


Figure 7: Shows, multiple cystic lesions of 1 to 1.6 cms in the region of the heads of epididymis bilaterally

6. Orchitis

Primary orchitis (Figure 8) is rare without associated epididymo-orchitis, but may be caused by human immunodeficiency virus or mumps virus. The process may be seen as diffuse or focal. Orchitis may manifest as multiple hypo-echoic abnormalities within the testicular parenchyma, with septal accentuation with foci of low reflectivity conforming to the lobular anatomy [8]. As the condition progresses, areas of venous infarction occur with associated haemorrhage, giving rise to areas of mixed or increased reflectivity. Increased blood flow to the epididymis and testis at CDUS and CEUS examination is a well-established criterion for the diagnosis of epididymo-orchitis. After treatment and healing, changes may resolve completely, or often there is loss of volume of the testis with fibrosis giving a heterogeneous pattern on ultrasound. The great variability in ultrasound appearances can cause diagnostic confusion, but awareness of the changes and progression may allow a more confident diagnosis to be made in the appropriate clinical setting.

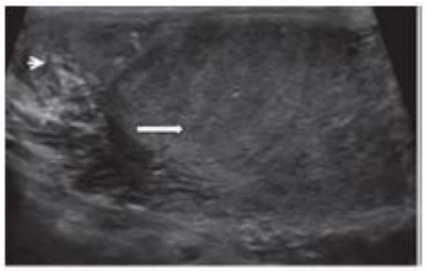


Figure 8: Shows Orchitis. Longitudinal ultrasound of the testis demonstrates patchy heterogeneous reflectivity within the testis (long arrow) and enlargement of the epididymis (short arrow).

7. Hydrocele

Hydrocele is the pathological collection of fluid within the tunica vaginalis of the scrotum (figure 9)

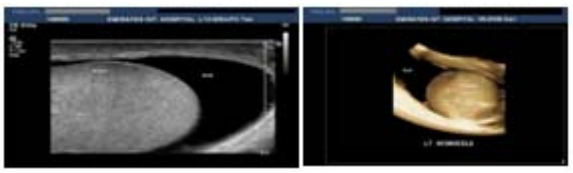


Figure 9: Shows fluid collection (hydrocele)

8. Spermatocele

These ultrasound findings suggest a diagnosis of spermatocele involving the head of right epididymis. Spermatoceles are formed by obstruction of the fine ducts within the epididymis or spermatic passages, resulting in outpouching or diverticuli formation with sperm

containing fluid collecting within the cystic lesion. It is often the presence of debris within the cyst that distinguishes (fig ure10)

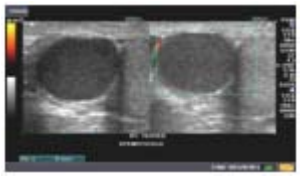


Figure 10: Shows the cyst is located in close relation to the head of right epididymis

9. Venous infarction

Venous infarction (Figure 11) of the testis may occur in cases of severe epididymo-orchitis where local swelling occludes the venous drainage of portions of the testis or the entire testis. Venous infarction may also occur in patients with hypercoagulable states. On ultrasound the testis is of low or mixed echo reflectivity. There is an absence of color Doppler flow and contrast enhancement. The diagnosis should also be suspected when reversal of intratesticular arterial flow in diastole is observed with an associated focal abnormality. CEUS demonstrates clear demarcation of a vascular area to allow for appropriate clinical management [9].

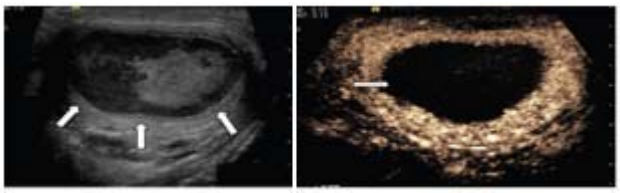


Figure 11: Show svenous infarction of the testis, A focal testicular abnormality with mixed reflectivity (arrows) is noted on B-modeultrasound. , No color Doppler signal is seen in the focal testicular abnormality (arrow). Following the administration of microbubble contrast, contrast flow is present in the normal testicular parenchymal, clearly absent from the infarcted portion of the testis (arrow). Tissue elastography demonstrates no focal ‘‘hard’’ lesions, and the area of abnormality appears ‘‘soft’’ (green on color scale, arrow)

10. Scrotal Trauma

Clinical history is usually sufficient for diagnosing scrotal trauma. Because scrotal edema and pain often limit the clinical examination, the role of ultra Sonography is to evaluate the extent of injury. Trauma can lead to scrotal or testicular edema, hematoma, hematocele, hydrocele, torsion, fracture, or rupture. Many of these findings are concurrent depending on the extent of injury. The most frequent fluid collection in the scrotum is the hydrocele, which consists of fluid between the layers of the tunica vaginalis. This anechoic fluid collection may limit the clinical examination, but it facilitates the ultra Sonographic examination by supplying an acoustic window for better visualization of the scrotal contents (Fig. 12). There are many sources of hydrocele, including congenital, trauma, infection, torsion, and testicular neoplasms (10).

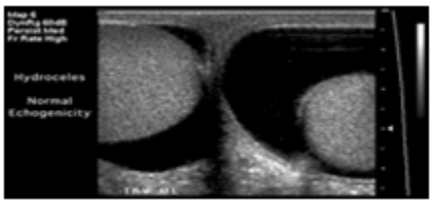


Figure 12: Shows bilateral hydrocele

11. Intratesticularhaematoma

A history of trauma should raise the suspicion of the differential of an intratesticularhaematoma. Acutely, the haematoma appears as patchy increased reflectivity. On follow-up it may appear as an area of low reflectivity, with size reduction as the haematoma retracts. The most important differential diagnosis is malignancy, and therefore an accurate history, lack of vascularity on both CDUS and CEUS, absence of tumormarkers, and reduction in the size of the abnormality on sequential scans is indicative of a benign entity (11).

12. Intratesticular abscess

Intratesticular abscesses (Figure 13) are unusual and are associated with severe epididymo-orchitis . It may also arise secondary to mumps, trauma or infarction. The ultrasound appearances are of a lesion of low reflectivity with irregular borders. Hyper-vascular rims may be visible surrounding a testicular abscess on CEUS and CDUS but no internal vascularity is present. The abnormality observed in testicular abscess does not conform to lobular distribution which may help to differentiate this from a segmental (12)

Figure 13: Shows, Testicular abscess. (a) On B-mode ultrasound a focal lesion with low internal echoes (arrows) is seen in a patient with history of resolving epididymo-orchitis

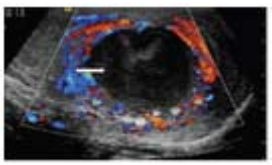


Figure 13: (b) On color Doppler ultrasound there is increased vascularity at the periphery of the lesion but none within the lesion (arrow)

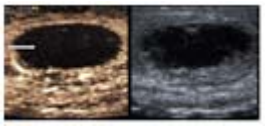


Figure 13: (c) Contrast-enhanced ultrasound image demonstrating increased absence of vascularity in the abscess (arrow) with some rim enhancement

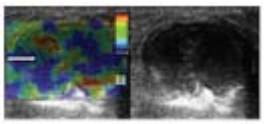


Figure 13: (d) Tissue elastography demonstrates a heterogeneous pattern of firmness but no focal ‘‘hard’’ lesion is demonstrated (arrow).

13. Varicocele

Varicoceles correspond to dilatation of the pampiniform plexus due to ineffectual venous valves. (4) (Varicoceles are more common on the left side. They have been found in up to 13% of asymptomatic healthy men at screening examinations. The prevalence is higher in infertile men, at 40%, and of those infertile men with varicoceles, 40% were found to have them bilaterally. On ultra Sonography, varicoceles appear as serpiginous anechoic tubular structures with diameters larger than 2 mm.7 They will often enlarge during the Valsalva maneuver and will show reversal of blood flow (Figure. 14). Some authors advocate examining the patient both supine and standing10; however, we find that evaluation with color and pulsed Doppler imaging in the supine position with and without the Valsalva maneuver is a sensitive means of detecting varicoceles. Some controversy remains as to the type and utility of treating varicoceles with regard to fertility [13]

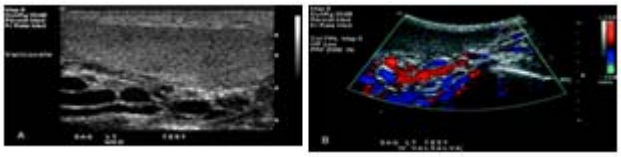


Figure 14: Shows VaricoceleA,serpiginous anechoic tubular vessels of a varicocele. B, color Doppler image during the Valsalva maneuver showing flow

14. Rete testis

The rete testis (Figure 15) is a system of numerous seminiferous tubules located at mediastinum testis, which drain to the epididymal head. On ultrasound the rete testis has a spectrum of appearances ranging from a faintly visible ill-defined area of decreased reflectivity to a coarse tubular appearance with finger-like projection into the parenchyma .No vascular flow is demonstrated within rete testis. They may resemble a hypoechoic mass when viewed in cross-section. As long as ultrasound appearances remain typical with no soft tissue component or abnormal color Doppler signal or enhancement on CEUS, no further investigation is usually required. Although this is a benign entity, it may be of significance in a patient suffering from azospermia as this implies there is obstruction of the ipsilateral spermatic ducts [14]

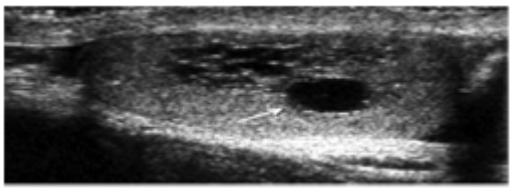


Figure 15: Shows Rete testis, Localised area of tubular ectasia of the rete testis, with a further testicular cyst (arrow)

15. Testicular Sarcoidosis

Involvement of the genital system by sarcoidosis is rare (Figure 16). It more commonly affects the epididymis but can also involve the testis. On ultrasound the lesions of sarcoidosis are typically multiple, small, bilateral low-reflectivity masses. Differentiation from malignancy may be difficult, and clinical evidence of sarcoidosis elsewhere is required for diagnosis to be made more confidently [15].If there are no associated symptoms or features, then ultimately tissue

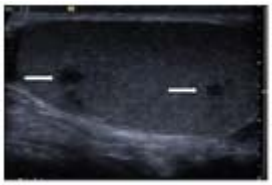


Figure 16: Shows,Testicularsarcoidosis. (a) B-mode ultrasound demonstrates multiple low-reflectivity focal testicular lesions (arrows) in a patient with a recent clinical diagnosis of sarcoidosis

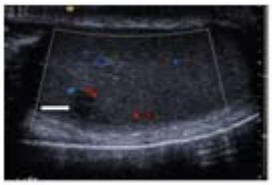


Figure 16: (b) On the color Doppler study the focal lesions do not clearly demonstrate vascular flow, but it is difficult to be certain due to size of the lesions

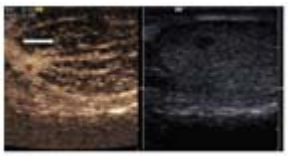


Figure 16: (c) Contrast-enhanced ultrasound clearly confirms some vascularity within the lesion (arrow)

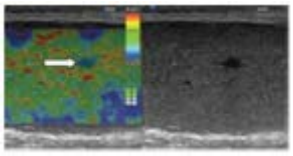


Figure 16: (d) Tissue elastography demonstrates a moderate degree of ‘‘hardness’’ of these lesions (blue on color scale, arrow) Post-trauma testicular devascularisation

Devascularisation of the testis may occur following significant traumatic injury to the scrotum (Figure 17). On B-mode images the testis may appear heterogeneous and

may not assume the normal testicular configuration. An associated haematocele may be present. On CDUS little vascular flow will be appreciated within the devascularised segment. The extent of the abnormality, however, is best appreciated with CEUS, where there may be a sharply demarcated non-enhancing area in contrast to the normally vascularised testicular tissue [12]

Figure 17: Shows Post-traumatic testicular devascularisation. (a) On B-mode images demonstrates the testis appears very heterogeneous and appears to be ‘‘shattered’’

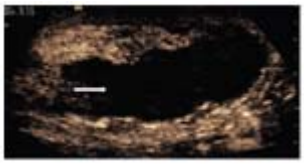
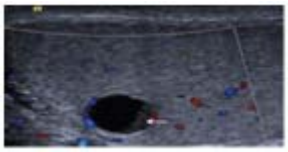


Figure 17: (b) Following administration of microbubble contrast, the testis is seen to be predominantly devascularised. The abnormality is much better demarcated on contrast-enhanced ultrasound (arrow).

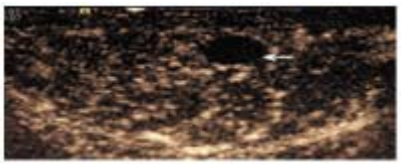
16. Simple testicular cyst with debris

Simple cysts are detected incidentally and usually occur in men over 40 years of age, with a size range from2mm to 2cm in diameter (Figure 18). The cysts are usually solitary, and may be associated with spermatoceles. On B-mode ultrasound, a simple cyst would appear an anechoic centre surrounded by a thin wall, with a degree of posterior acoustic enhancement [16].

Figure 18: Shows, Cyst with debris. (a) A 6-mm anechoic lesion (long arrow) is noted in the testicle with a thin clear demonstrated. A ‘‘fluid-debris’’ level is noted (short arrow)



(b) No internal color Doppler signal is demonstrated within the debris present in the lower aspect of the cyst (arrow)



(c) On contrast-enhanced ultrasound, there is clear absence of enhancement in the debrispresent in the lower aspect of the cyst (arrow), and a cystic tumor is unlikely

Ultrasound image shows a rounded complex mass with a characteristic "onion peel" appearance due to layers of hypoechoic and hyperechoic tissue elements alternating with each other figure-19-. This ultrasound image with the typical onion peel appearance of the mass is diagnostic of epidermoid cyst of the testis. Some epidermoid cysts do not have this typical onion peel appearance but rather a heterogenousechotexture. Other cases of epidermoid inclusion cysts may have a hypoechoic appearance with echogenic ring of calcification. Epidermoid inclusion cysts or epidermoid cysts are benign and can occur at any age group, though they are more common in the age group 20 to 40 years. Epidermoid cysts of the testis are extremely rare with an incidence of 1 % of all testicular masses. They are a variant of teratodermoid tumors with a primary epidermal tissue element. Though keratin is usually present in epidermoid cysts of the testes, these lesions do not contain hair or sebaceous cysts.

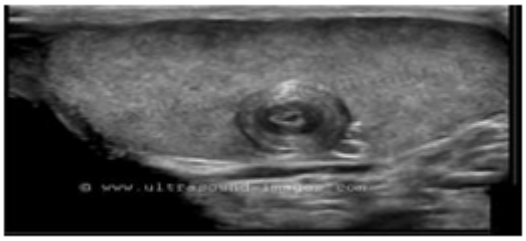


Figure 19: Ultrasound image shows a rounded complex mass with a characteristic "onion peel" appearance due to layers of hypoechoic and hyperechoic tissue elements alternating with each other

Color Doppler ultrasound—or, more precisely, CEUS—could exclude presence of complex features such as internal vascularity or enhancement. Post-biopsy scar tissue following testicular biopsy or partial orchiectomy may appear as a low-reflectivity lesion that corresponds to the site of surgery (Figure 20). There may be some enhancement following CEUS and on TE the scar tissue may appear slightly ‘‘harder’’ than the surrounding normal tissue. Clear understanding of the site where biopsy was performed, and close ultrasound surveillance at 1–3 month intervals to monitor progression, would allow increased confidence in the diagnosis and prevent unnecessary further intervention.

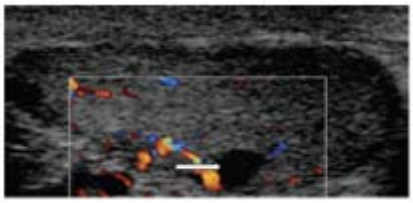


Figure 20: Post-biopsy scar. (a) No internal color Doppler vascular signal is demonstrated (arrow)

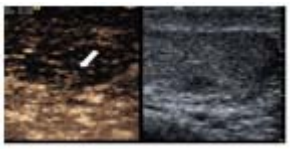


Figure 20: (b) There is some subtle enhancement (arrow) on the contrast-enhanced ultrasound examination (arrow)

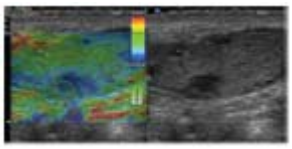


Figure 20: (c) Tissue elastography suggests the area is slightly ‘‘harder’’ than the adjacent normal parenchyma (blue area, strain ratio of 1.33). Follow-up ultrasound 1 year later demonstrated no interval changes in appearances of the lesion.

17. Adenomatoid lesion

Extratesticular lesions, although almost always benign, may cause a diagnostic challenge clinically and significant patient anxiety. An adenomatoid tumor (Figure 21) is the second most common extratesticular tumor (cysts are the most common), followed by a lipoma. The ultrasound appearances of an adenomatoid tumor consist of a hyperechoic rounded tumor most commonly at the epidydimal tail. Following CEUS the focal epididymal lesion demonstrates enhancement and early washout of microbubble contrast.

Figure 21: Shows, Extratesticularadenomatoid lesion. (a) A heterogeneous lesion (arrow) measuring 12mm is noted within the right epididymal head

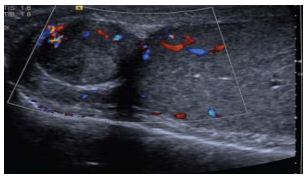


Figure 21: (b) Color Doppler signal is demonstrated within the lesion

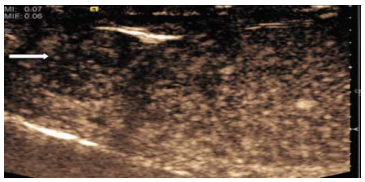


Figure 21: (c) Following contrast administration the focal epididymal lesion demonstrates enhancement and early washout (arrow)

18. Cryptorchidism

Cryptorchism is the failure of the testis, on one or both sides, to descend from the abdomen to its proper position within the scrotum. This is broadly classified into 2 types: Ectopic testis: here the testis may be located in an abnormal position- femoral, transverse scrotal, perineal and prepenile. True undescended testis is either: abdominal, inguinal (within the inguinal canal), or suprascrotal=(just above the scrotum), Figure-22 and figure-24.

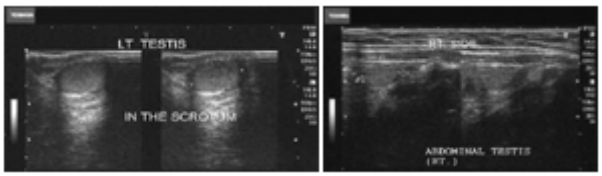


Figure 22: Sonography of the scrotum showed the left testis in its normal position within the scrotum. The right testis was not visualized within the scrotum but located just above the right inguinal canal (abdominal testis) (arrows)

Figure 23: The left testis (T) is seen within the abdomen in close proximity to the urinary bladder (BL) s/o abdominal testis. The testis is seen as a hypoechoic structure with mediastinal echoes. The two main complications/ sequelae of undescended testes are: infertility and increased risk of malignancy. (A= Left external iliac artery; V= Left external iliac vein) Snapshot of case-2: The left abdominal testis is visualized

19. Bilobed testes

Sonographic images show a deep horizontal cleft (see arrows) (figure 24) passing partially through the testicles on both sides. The tissue on either side of the cleft, bilaterally, shows the same echogenicity and echotexture as the normal testes. This appearance is similar to duplication of testes (polyorchism or polyorchidism).The main difference is that in duplication, the supernummerary testes is much smaller in size than the main testicle. Thus these ultrasound images are suggestive of bilateral bilobed testicles (bilobed testes).

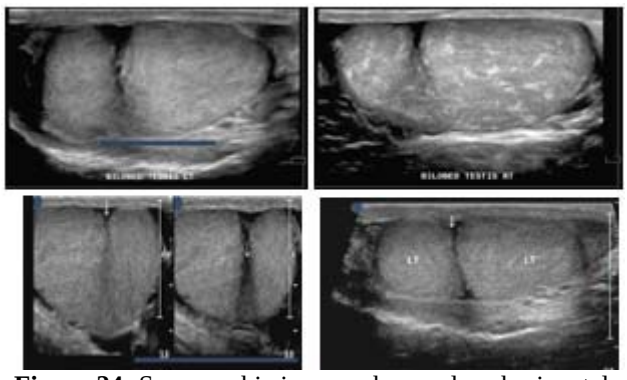


Figure 24: Sonographic images show a deep horizontal cleft (see arrows) passing partially through the testicles on both sides

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