

Ultrasound Imaging in the Diagnosis and Assessment of Testicular Disease

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Abstract: *The Purpose of this study was to evaluate testicular disease using ultrasound, A total of 50 patients their age average was 38 years, using ultrasound with a 3.5 MHz transducer and 7.5 MHz at a King .F. Hospital, between March and November 2012. Five patients were examined with both static B scan and real time scanning instruments. All studies were performed with the direct contact method. The study showed that 4 (8%) epididymitis , 2 (8%) Calcifications (Calithiasis), 2 (4%) malignant tumors (Semiformal), 9 (18%) hydroceles, 13 (26%) Varicocele, 10 (20%) Epididymal cystic lesions, 2 (4%) Cryptorchidism (undecended testis), 2 (4%) Hydrocele+ Varicocele, 1 (2%) Scrotal hemia, 1 (2%) Lipoma benign tumor, 1 (2%) Seminocoele, 1(2%) Dilated vein and 2 (4%) normal patients with scrotal pain. Advances in ultrasonography instrumentation made it possible to differentiate the testes lesions from paratesticular lesions and evaluate the anatomical changes in scrotum. Therefore, decision making for medical approach has become much easier carefully.*

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

1. Introduction

Clinical evaluation of scrotal disorders has some difficulties. Diagnosis of scrotal disorders by (ultrasound (SUI) imaging has improved considerably due to technical developments [1, 2, 3]. In subclinical cases; such as hydrocele edematous or infiltrated tissue and painful scrotum; physical examination of scrotum may be difficult. In these cases SUI is very helpful for proper diagnosis .Ultrasound has been extensively used in medicine since its introduction. Mishkin et al. suggested it can be useful in diagnosis of acute and chronic scrotal pathologies. Advances in ultrasonography instrumentation made it possible to differentiate the testes lesions from paratesticular lesions and evaluate the anatomical changes in scrotum. Therefore, decision making for medical approach has become much easier [4,5]. Recently, numerous research and ,techniques have been developed for analyzing And diagnosing testicular tumors , beyond conventional B-mode imaging, including colour Doppler ultrasound, contrast-enhanced ultrasound (CEUS) and tissue elastography used in the characterization of both benign and malignant intratesticular lesion. The purpose of this study was to summarize the testicular disease and developed ultrasound techniques for analyzing and assessment of testicular disease. The use of ultrasonography 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 [6]. 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 [7]. The use of CEUS improves characterisation 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. Patient and Methods

We retrospectively analyzed the medical records of 50 patients their age average was 38 years, using ultrasound with a 3.5 MHz transducer and 7.5 MHz in clinical radiology department (Burayduh Al-Qassim)- at a King .F. Hospital, between March and November 2012. all patients were examined with both static B scan and real time scanning instruments. All studies were performed with the direct contact. Scrotal swelling, testicular pain, varicocele, scrotal trauma, erectile dysfunction and premature ejaculation underwent clinical evaluation and scrotal ultra Sonography at our department. Table 1 lists indications and percent of scrotal ultrasound for all patients. Machine used (SAL-32B Toshiba). A Sonographic bed between the transducer and the scrotal surface used to optimize beam focusing and to allow better visualization of very superficial areas. The patient laying in a supine position.

Table 1: Indications for scrotal ultra Sonography

Indication	Number of patient
Infertility	6 (12%)
Scrotal swelling	5 (10%)
Varicocele	12 (24%)
Testicular pain	12 (24%)
Scrotal trauma	2 (4%)
Erectile dysfunction	13 (26%)
Total	50 (100%)

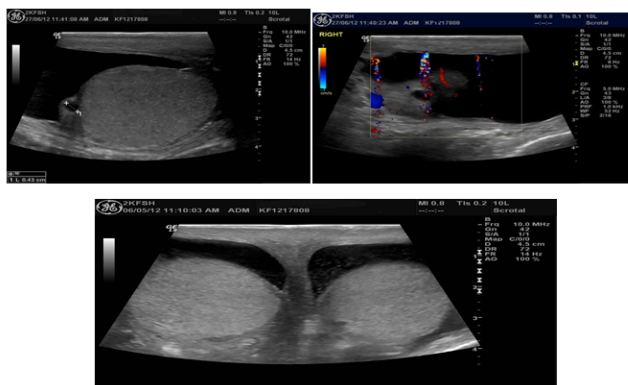


Figure 1: Shows Scrotal US: age 78 years both testicles are of normal size, texture & vascularity with a globular shape on the right. No intra or extra testicular soft tissue focal lesion seen. No significant varicoceles noted with evidence of bilateral hydroceles & evidence of septation on the left .A small subcentimeter epididymal head cyst noted on the right side with smaller left epididymal head than the right.

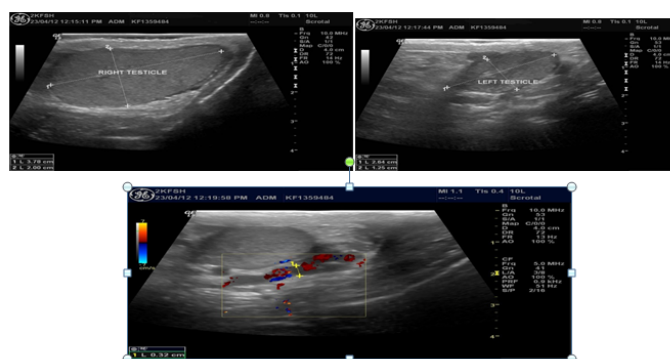


Figure 2: Shows Scrotum US–age 60 years Right testis: 3.8cm x 2cm, normal echogenic pattern and vascularity normal right epididymis, no varicocele or hydrocele. Left testis: 2.6cm x 1.3cm, normal echogenic pattern, reduced vascularity, no hydrocele and show grade 2 varicocele

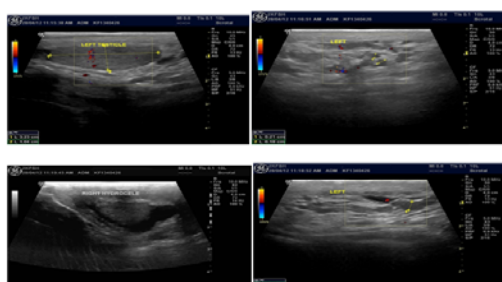


Figure 3: Shows Scrotum US –age 51 years Right testis: 2.4cm x 1.1 cm, normal echogenic pattern and vascularity normal right epididymis, no varicocele and mild hydrocele. Left testis: 3.2cm x 1.1 cm, shown some heterogeneity of its echogenic pattern, normal left

epididymis, mild hydrocele and grade 2 varicocele

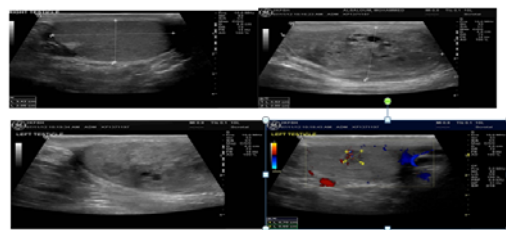


Figure 4: Show Scrotum US –age 23 years The left testicle: it measures 5*2.8cm it shows heterogeneous echopattern .there is well define heterogeneous, mainly soft tissue, mass seen within the parenchyma, it measures 3.9 *2.1cm.it shows cystic degeneration, micro calcifications, pathological vasculature. The lesion seen infiltrating the left tunica – vaginals. Another well defined hypoechoic focal lesion seen 0.7*0.7cm small cyst within the left epididymal head. Unremarkable right testicle and right epididymal head. Opinion:Such described sonographic findings are impressive of left testicular malignant focal lesions,Most probably seminoma rather than lymphoma, for further evaluation.

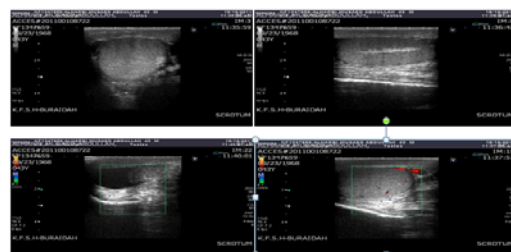


Figure 5: Shows Scrotal US: age 44 years Left testicles & epididymises are of normal size & vascularity.-Evidence of testicular microlithiasis seen for follow up. Calcific changes seen in the epididymis & testicular appendage.-Ductectasia of the rete testis seen with similar changes in the epididymis.-Turbid minimal hydrocele

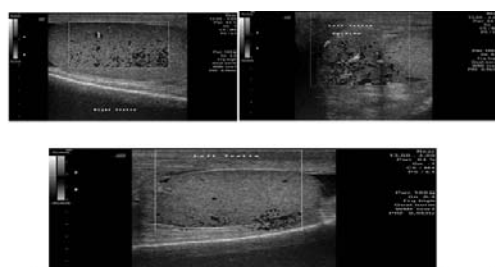


Figure 6: Shows scrotal ultrasound : age 85 years Both testis show normal size , uniform echopattern and intact capsules .Lt testis shows increased vascularity with increased vascularity and size of the left epididymis. Normal appearance of right testis and epididymis.Mild degree of hydrocoel with debris is seen in left scrotum.No evidence of varicocele

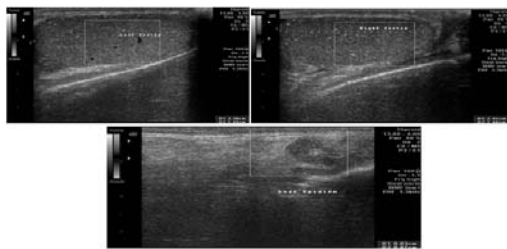


Figure 7: Shows scrotal ultrasound : age 62 years Both testis show normal size , uniform echopattern with diffuse microcalcifications and intact capsules .Normal appearance of both epididymi .No evidence of vaginal hydrocele .No evidence of varicocele .Conclusion : Diffuse microcalcification

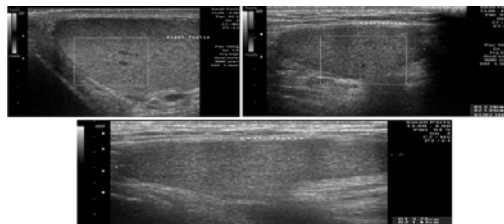


Figure 8: Shows Scrotum –age 23 years Right testis show normal size , uniform echopattern and intact capsules .Left testis show normal size and echo pattern, in inguinal canal position. Normal appearance of both epididymi .No evidence of vaginal hydrocele .No evidence of varicocele

3. Discussion

This prospective observational study (case series) was carried out over a period of 10 months on 50 patients in the age range of 14 to 85 years old, who presented with scrotal pain and swellings. After adequate history taking and examination-B –mode and CDUS was performed. The diagnosis of the radiologist were compared with final outcome, which was based on course and outcome of the disease, no fine needle aspiration cytology, nor operative findings is done. Array transducer with pulsed Doppler investigation and a color and power Doppler capability. Testicular diameter and volume were evaluated, as were the whole epididymis and the echotexture of the testicular parenchyma. All focal intratesticular echotexture anomalies were described, including site, echotexture and dimensions. Vascularization was evaluated by color Doppler ultrasonography. Ultrasonographic reference points were the testicular pole (on sagittal scan) and the depth from the tunica albuginea on transverse scan. Focal alterations in testicular echotexture were deemed hypoechoic, hyperechoic or mixed according to the degree of gray scale ultrasonographic findings relative to the normal contralateral testicle or of the remaining testicular parenchyma. Mixed lesions showed hypoechoic and hyperechoic characteristics. Two patients scheduled for chest x-rays, blood tests and tumor markers (–fetoprotein, human chorionic gonadotropin and lactate dehydrogenase). The final diagnoses were showed that epididymitis (4) , Calcifications (Calithiasis) (2), malignant tumors (Seminoma) (2), hydroceles (9) ,Varicocele (13) ,Epididymal cystic lesions (10), Cryptorchidism (undescended testis) (2) , Hydrocele+

Varicocele (2) , Scrotal hernia (1) , Lipoma benign tumor (1) , Seminoma (1), Dilated vein (1) and normal patients with scrotal pain (2).

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