WATERPATH ULTRASONOGRAPHY IN THE DIAGNOSIS OF TESTICULAR SWELLINGS

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ABSTRACT

Twelve cases of testicular swellings which were difficult to diagnose on clinical grounds alone were evaluated by waterpath ultrasonography. Differentiation between extra- and intra-testicular pathology was accurate. Alterations of the normal echotexture specific to the underlying pathology are discussed.

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KEY WORDS : Testicular swellings; Waterpath ultrasonography.

Introduction

Most testicular swellings are easy to diagnose. However, some are difficult to diagnose on clinical grounds alone. Ultrasound evaluation of such cases is a welcome addition. The procedure is non invasive, causing little discomfort to the patient. Introduced by Miskin and Bain in 1974 [1], ultrasound imaging of the testis through a waterpath [2], testicular immersion [3], or directly [4], is used as an adjunct to clinical examination. The present study was carried out to evaluate usefulness of the procedure in our hands.

Material and Methods

Twelve cases of testicular swellings presenting difficulty in clinical diagnosis were the subject of this study. The examination was performed with the patient supine, the testis and scrotum supported by the examiner's hand, and the penis being retracted away from the field by the patient himself. Screening was performed through a waterpath [2]. This method proved to be advantageous since it permitted optimal positioning of the organ, and helped correlate the palpated lesion with the ultrasound image [5,6]. The method also permits simultaneous imaging of the contralateral organ, an elegant comparison of the anatomy. The examination was painless even

in the presence of inflammation or trauma. Criteria for diagnosis of various conditions encountered in this communication are summarised below :

Hydrocele, is sharply depicted as an anechoic fluid collection around the testis, between the two layers of the tunica vaginalis [4]. Haematocoele in comparison presents a complex fluid collection of variegated echogenicity [7].

Infection results in an altered echo pattern of the epididymis, which is thickened, and also of the testis if involved. These areas are usually hypoechoic with ill defined margins. A secondary hydrocele or an abscess, usually extra-testicular, may be in association. The latter appears as a localised cystic area of complex echogenicity [4,7].

Testicular tumors appear as intra-testicular hypoechoic areas, occasionally with mixed echo patterns, having irregular but well defined margins, surrounded by normal testicular parenchyma [7]. Cystic areas and calcification may also be encountered.

Sonographic appearance of testicular trauma depends on the extent of injury and the structures involved. Rupture of the tunica is revealed as a discontinuity of its normal highly echogenic line; whereas parenchymal injury results in an altered echotexture with

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areas of sonolucency in cases of intratesticular haemorrhage. Haematocoele may also be present [4,7].

Results

Echotexture of normal testis is shown in Fig. 1. Four cases with grossly thickened and edematous filarial scrotum, precluding detailed testicular examination were encountered. Ultrasound helped to delineate extra-testicular anechoic fluid collection in three, confirming a vaginal hydrocele (Fig. 2). The fourth, a hard painless testicular enlargement revealed the variegated echo pattern of a haematocoele (Fig. 2).

Three cases of chronic epididymo - orchitis were evaluated on the basis of sonographic findings. All revealed epididymis to be thickened, with an altered echotexture also involving the testicular parenchyma. In one case, an extra testicular localised cystic area of mixed echo-genicity was diagnosed as an abscess (Fig. 3).

On occasions, it may be difficult to clinically distinguish chronic orchitis from a testicular neoplasm. Four such cases were evaluated. Three revealed a diffuse hypoechoic pattern conforming to that of chronic infection, whereas the fourth case revealed well demarcated hypoechoic areas conforming to the pattern of testicular neoplasm (Fig. 4).

Fig. 1 : Echotexture of normal testis with the mediastinum testis delineated.

Fig. 2 : Hydrocele (right) seen as an anechoic area (F) and classical variegated echotexture of an organised haematocoele (left).

Fig. 3 : Chronic epididymo-orchitis with extra-testicular abscess (ABS).

In the instance of testicular trauma, the mixed echo pattern of the fluid surrounding the testis clearly depicted a traumatic haematocoele; the echogenic mass posterior to but separate from the testis being the avulsed epididymis (Fig. 5).

Discussion

Ultrasound is an integral aspect of the evaluation of testicular pathology particularly when associated conditions preclude a detailed clinical evaluation. The superficial location and the ease of comparison with the

Fig. 4 : Testicular tumor with altered echotexture of the enlarged testis.

contralateral side, make it an eminently suitable procedure.

The normal testis (Fig. 1) has a well defined homogeneous echo pattern of the parenchyma. The tunica albuginea appears as a highly echogenic structure enclosing the organ, though on occasions it may not be well visualised, especially in the absence of fluid collection [6]. Towards the posterior aspect lies the mediastinum testis visualised as a highly echogenic area anterior to the epididymis. The epididymis itself is seen as an area of mixed echogenicity, predominantly hypoechoic situated posterior to the testis.

Hydrocele, an increased fluid collection between the two layers of the tunica vaginalis, is identifiable as an anechoic fluid collection even when clinically not appreciable. Generally not difficult to diagnose, it may however prove problematic if associated with a thickened filarial scrotum. The procedure may be invaluable in the evaluation of a secondary hydrocele as imaging of the testis could bring to light an underlying neoplasm [4].

It may be difficult to differentiate a long standing haematocoele from a testicular tumor, especially as a history of trauma may also be forthcoming in the latter. The physical

Fig. 5 : Testicular trauma : haematocoele with avulsed epididymis.

characteristics of a firm to hard enlarged testis with loss of testicular sensation could also be present in both instances. The classical variegated echo pattern of a haematocoele (Fig. 2) clearly differentiates the two, as was seen by us.

Clinical differentiation between chronic orchitis and a tumor may be troublesome. Two conditions are, however, distinguishable on the basis of their sonographic patterns. Of the four cases of "chronic orchitis", one was detected to be a testicular tumor. Nonetheless, in doubtful cases sonographic follow up after adequate antibiotic therapy is recommended before a neoplasm is ruled out with certainty [8].

Chronic epididymo-orchitis usually does not pose a problem. Ultrasound may be helpful in demonstrating an abscess which could be the cause for the smouldering infection. Drainage of the same is facilitated by accurate localisation.

The greatest utility of this procedure is in the diagnosis of testicular malignancy. Ultrasound is extremely sensitive not only in the early detection of tumors, but also in their characterisation [4,6,7].

In testicular trauma, sonology accurately defines the extent of injury and the structures involved. Surgical intervention in these cases

is generally indicated when there is disruption of the tunica or injury to the appendages. Ultrasound may thus help plan the surgical approach to the case [4,7]. In the case reported, avulsion of the epididymis with haematocele was the indication for the surgical intervention.

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