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SHORT ABSTRACT

Adult Scrotal Multiparametric US – Tips and Tricks

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Keywords: Testicle; epididymis; ultrasound; Doppler; CEUS

Scrotum is one of the human body regions best suited to ultrasonographic exploration: accessibility and superficiality of the tissues are particularly adapted to the use of high frequency probes that provide very high quality images containing a large number of anatomical details.

Color Doppler sonography is the first choice of imaging technique to answer clinician questions. Recently, contrast enhanced ultrasound (CEUS) has modified the strategy of imaging, particularly in case of acute ischemic disease or trauma [1]. Furthermore, parametric analysis of CEUS signal may provide complementary information that can be useful to precisely determine the nature of intratesticular focal anomalies. Other new US modalities like elastography or ultrafast Doppler are still under evaluation.

Because of the different scrotal anatomical compartments, scrotal ultrasound need to be systematic and precise with B-mode and color Doppler settings well adjusted.

Probe selection

The use of very high frequency probes (12 to 15 MHz), even if theoretically needed for very thin details and to optimize the detection of vascular signal, must be limited to very superficial structures such as the scrotal wall. Indeed, detection of color Doppler signal can be limited particularly when looking for testicular vessels. So, it is recommended to use a 9 MHz probe with sufficient Doppler sensitivity and better penetration.

Systematic ultrasound approach of the scrotal content

1. ***Measurement of testicular volume*** using the simplified ellipsoid formula length × width × thickness × 0.52. To avoid underestimation of the volume by the ellipsoid method, a correction factor of 0.67 can be applied [2].
2. ***Analysis of testicular echogenicity*** looking for hypoechoic intratesticular change (geographic, zonal, complete or nodular) (**Figure 1**).
3. ***Analysis of testicular vascularization*** using color Doppler, spectral Doppler and new, dedicated modalities (CEUS, ultrafast Doppler) (**Figure 2**).
4. ***Exploration of the excretory tube*** looking for the most frequent changes (**Figure 3**):
   - *swelling + hypervascularization (+/– abscess)*
   - *dilatation*
   - *nodule*
   - *absence of vas deferens*
5. ***Exploration of scrotal wall and spermatic cord*** using a systematic approach, multiparametric ultrasound including conventional sonography, spectral and color Doppler and CEUS allows the radiologist to solve clinical scenarios [3].

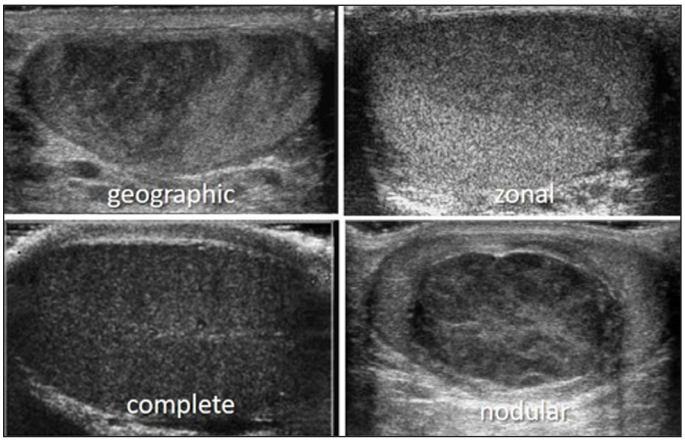

Figure 1: Geographic, zonal, complete or nodular decrease of testicular echogenicity.

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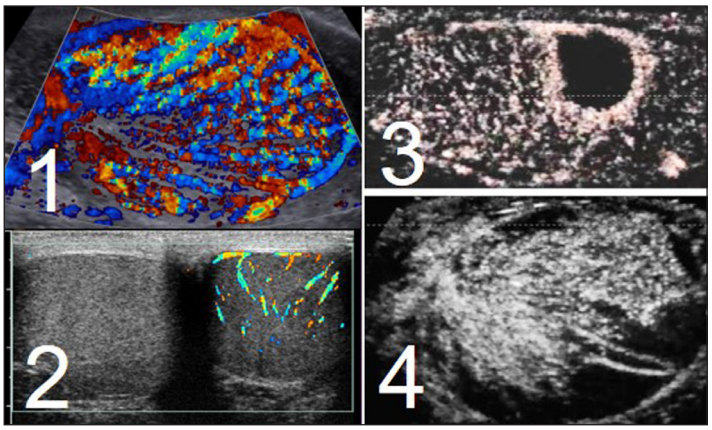

Figure 2: Testicular vascular analysis: hypervascularization at CD in case of acute orchitis **(1)**, absence of CD signal in case of acute torsion **(2)**, typical absence of perfusion at CEUS in case of segmental ischemia **(3)** or in case of trauma **(4)**.

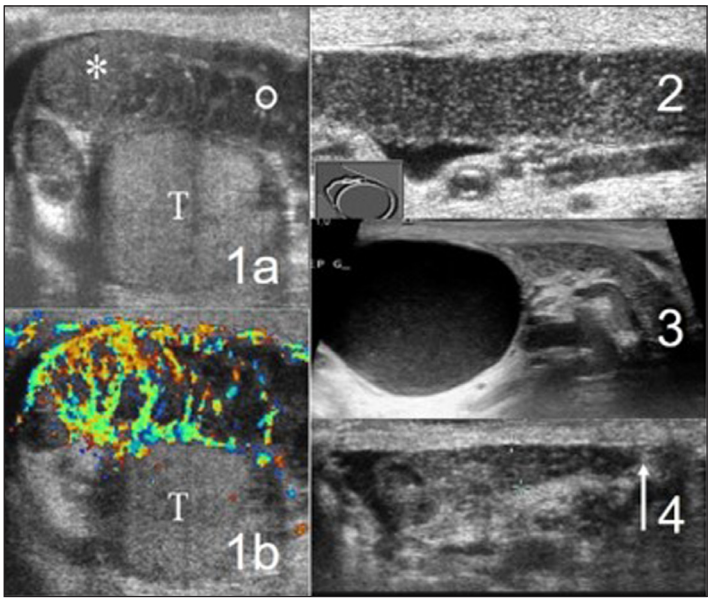

Figure 3: Excretory tube analysis: typical acute epididymitis **(1a, 1b)**, dilatation of the epididymal body **(2)**, cyst of the epididymal head **(3)**, absence of vas deferens **(4)**.

Competing Interests

The author has no competing interests to declare.

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