Ultrasonography of the Scrotum: Extratesticular

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KEYWORDS

• Ultrasonography • Extratesticular • Epididymis • Scrotum • Testes

KEY POINTS

- Extratesticular lesions are mostly benign.
- Adenomatoid tumor of the epididymis is the most common solid extratesticular tumor.
- Differentiating between a spermatocele and an epididymal cyst is not clinically relevant.
- Sperm granuloma is an entity to consider more strongly in patients with previous vasectomy.
- When evaluating a suspected palpable lesion with ultrasonography, the examiner should palpate the lesion to ascertain firmness and help direct the examination.
- By virtue of the ascending nature of the infection, epididymitis may be limited to the epididymal tail, so sonographic evaluation of suspected acute epididymitis must carefully evaluate this region.
- Evaluation of suspected hernias and varicoceles usually requires provocative maneuvers; having the patient do a Valsalva maneuver may be sufficient, but in some cases upright positioning will be needed to better demonstrate the abnormality.

INTRODUCTION

The extratesticular scrotal structures consist of the epididymis, spermatic cord, and enveloping fascia, derived as the testis descends during its embryologic development through the abdominal wall into the scrotal sac. The epididymis is a crescent-shaped structure that lies along the posterior border of the testis, connecting the efferent seminiferous tubules in the testis to the vas deferens.

The efferent ductules pierce through the tunica albuginea of the testis and coalesce to form the head of the epididymis. The ductules then merge as they travel along the edge of the testis, forming the body and the tail of the epididymis, which is attached to the lower pole of the testes by loose areolar tissue. The tail continues onward as the vas deferens. The vas deferens loops superiorly in the spermatic cord to meet the duct from seminal vesicle and forms the ejaculatory duct, which connects to the urethra.[1,2] Knowledge of this anatomic course is valuable in understanding the retrograde progression of infection along the same pathway, which occurs in epididymo-orchitis.

The spermatic cord contains blood vessels (including the interconnected network of small veins, the pampiniform plexus), nerves, lymphatics, and connective tissue apart from the vas deferens.

High-resolution ultrasonography with color or power Doppler is the imaging modality of choice for patients with scrotal abnormalities. It has also demonstrated good reliability in differentiating between intratesticular and extratesticular lesions.[3–5]

Furthermore, ultrasonography is helpful in characterizing extratesticular lesions as cystic or solid, which is an important feature to consider when evaluating these lesions. Most extratesticular lesions are benign, although approximately 5% are malignant.

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TECHNIQUE AND SONOGRAPHIC ANATOMY

Although a detailed examination technique has been described elsewhere in this issue in the article "Sonography of Testis" by Vijayaraghavan, a few key points that enable improved evaluation of the extratesticular components are reviewed along with review of the normal sonographic anatomy of these structures.

- The initial task in evaluation of extratesticular anatomy is to identify the head of the epididymis (globus major) generally at the superior aspect of the testes; this is usually best achieved in the longitudinal plane (**Fig. 1**).
- While the head of the epididymis is kept in view at the superior aspect of the field of view, the bottom part of the transducer is gently rotated in a lateral or medial direction with the intention of locating the body (corpus) and the tail (globus minor) of the epididymis, thereby laying the epididymis out as one long crescent-shaped structure (**Fig. 2**).
- Sonographically, the epididymis is isoechoic or slightly more echogenic than the testis, with slightly coarse echotexture. The head measures approximately 10 to 12 mm in diameter. The body and tail tend to be slightly less echogenic than the head, and measure less than 4 mm in diameter.
- The transducer is then moved inferiorly to facilitate evaluation of the tail region and to visualize the epididymodeferential loop, where the tail of the epididymis with its convoluted tubules transforms into the vas deferens (**Fig. 3**).
- The vas deferens can then be traced up superiorly into the spermatic cord area and again evaluated in longitudinal and transverse planes. The vas in transverse plane generally has a doughnut appearance, is noncompressible, and measures less than 0.5 mm (**Fig. 4**).[6]

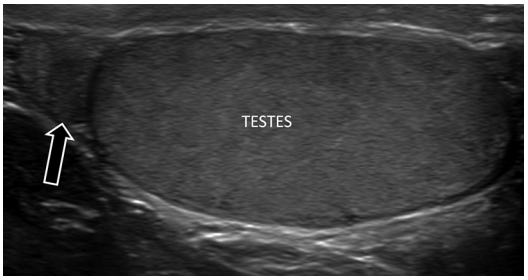

Fig. 1. Normal head of epididymis. Longitudinal sonogram showing the testes and the head of the epididymis (*arrow*).

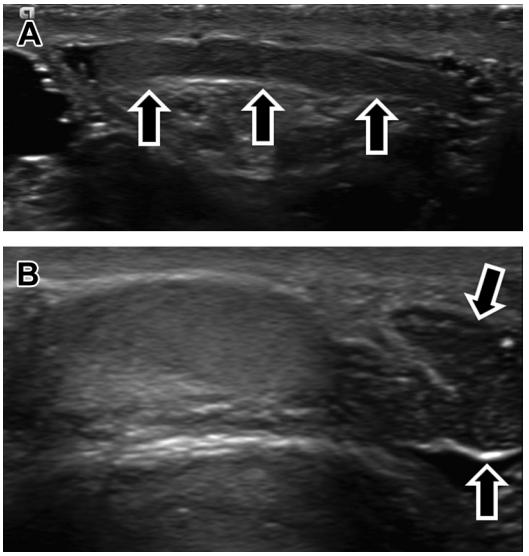

Fig. 2. Normal body and tail of epididymis. (*A*) Longitudinal sonogram of the body of the epididymis (*arrows*). (*B*) Oblique sonogram showing the convoluted tail of the epididymis (*between arrows*).

- Additional sweeps are made along the medial and lateral aspect of the testes to evaluate for any masses or fluid collections.
- Doppler is used to evaluate for the presence or absence of vascularity. It is particularly useful for documenting flow within the epididymis and for evaluating varicocele.

EXTRATESTICULAR LESIONS

Hydrocele, Hematocele, and Pyocele

Hydroceles, hematoceles, and pyoceles are collections of fluid, blood, and pus that are entrapped between the visceral and parietal layer of the tunica vaginalis, known as the scrotal sac. The visceral layer of the tunica vaginalis blends imperceptibly with the tunica albuginea.[7]

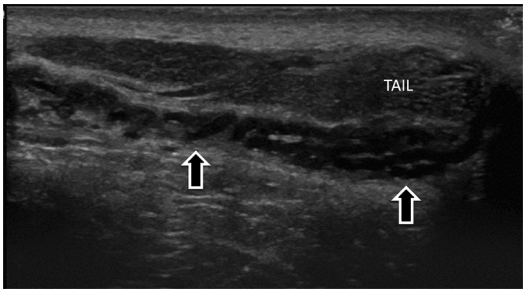

Fig. 3. Epididymodeferential loop. The epididymodeferential loop is the point where the tail of the epididymis leads into a convoluted tubule that represents the vas deferens (*arrows*). The vas deferens makes a 180° turn to course cephalad at this junction.