Sonographic findings of epididymal masses

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Learning objectives

The aim of this study is to present the imaging findings of the epidiyymal masses and to analyse the role of US in the diagnosis

To become aware of common differential diagnosis
Background

Ultrasonography (US) is the modality of choice for characterization of palpable testicular lesions. It provides excellent spatial resolution and has been shown to be nearly 100% sensitive in the identification of scrotal masses. It is relatively inexpensive, is noninvasive and requires no ionizing radiation or previous preparation.

For these reasons sonography is the imaging modality of choice in detecting and characterizing pathologic conditions affecting the extratesticular space.

Most epididymal masses are benign. Accurate diagnosis is therefore essential and must be based not only on the sonographic findings but also on accurate clinical history and physical examination findings. The US findings of solid masses are often nonspecific.

We performed a retrospective study from the database between January 2000 to September 2014 at our institutions. All different sonographic features of epididymal lesions we reviewed.
Findings and procedure details

There are many kinds of masses in the epididymis. The disease entities include epididymal cyst, spermatocele, abscess, chronic inflammation, tuberculosis, spermatic granuloma, adenomatoid tumor, leiomyoma, metastases. This exhibit reviews sonographic findings of the different types of epididymal masses.

In this review, we try to determine the specific characteristics of testicular and extratesticular lesions detected by ultrasounds.

1. Epididymal Cysts and Spermatocele

Epididymal cysts may be either true epididymal cysts, which are lined with epithelium, contain clear serous fluid, and are likely of lymphatic origin, or they may be spermatocele, which form from obstruction and dilatation of the efferent ductal system and are filled with thicker, milky fluid containing spermatozoa, lymphocytes, and cellular debris.

The most common epididymal mass is a cyst (20-40% of asymptomatic men) and 30% have more than one cyst. On sonography, both epididymal cysts and spermatoceles appear as anechoic, well-defined masses with increased through-transmission and are indistinguishable with sonography. Large cysts may have septations and be confused with hydrocele. Epididymal cyst (Fig 1) are more common in the general population (75%) but in postvasectomy patients spermatoceles is more frequent. (Fig 2)

2. Sperm Granuloma

Sperm granuloma, a granulomatous reaction to extravasated sperm cells, occurs secondary to inflammation, trauma, and vasectomy. They have been reported in up to 45% of men who have undergone vasectomy but only 3% of these patients experience pain. They can range in size from microscopic up to 4 cm but the most are less than 1 cm. Some manifest painful nodules. They are well-defined, hypoechoic, solid masses at US most common at the cut ends. Although it can occur anywhere in the ductal system, it is most common at the cut ends of the vas deferens and can be multiple.

(Fig 3)

3. Epididymitis

3.1 Acute Epididymitis
Epididymitis is the most common cause of acutely painful scrotum. Sexually transmitted *Chlamydia trachomatis, Neisseria gonorrhoea* are common pathogens in men younger than 35 years. In men older than 35 years, epididymitis generally results from an underlying urinary tract infection by *E-coli* or *Pseudomonas*.

Epididymitis may be acute or chronic, depending on the inciting organism and duration of disease.

Infection is thought to occur from direct extension of pathogens retrograde, via the vas deferens, from lower urinary tract source. At US the epididymis appears enlarged and heterogeneous and it is often hypochoic compared with the testis. An earlier imaging findings is an increased flow on color or power Doppler images. Scrotal wall thickening and hydroceles are common associated findings. However, the involvement of the epididyymal lesion has been localized, the differentiation from epididymal tumor may be difficult.

(Fig 4 and 5)

### 3.2. Chronic epididymitis.

Is most frequently associated with a granulomatous reaction including tbc, brucellosis, syphilis, and parasitic infections. Approximately 25% of patients have bilateral involvement. At US the epididymis is enlarged and quite variable in appearance (hipoechoic to hyperechoic), these granulomatous masses can be very firm and occasionally making differentiation from a primary testicular mass difficult. Associated findings include calcifications, hydrocele, scrotal wall thickening and fistulas.

(Fig 6 and 7)

### 4. Tumors

#### 4.1. Benign Tumors

**A. Adenomatoid tumor**

Adenomatoid tumor is the most common epididymal tumor and represent 30% of all paratesticular neoplasm. The majority are patients aged 20-50 years and present with a painless scrotal mass. The tumors are smooth, round, and well-circumscribed and can vary in size from a millimeters up to 5 cm. Is most frequent in the tail but adenomatoid tumor may occur anywhere in the epididymitis. On sonography, they appear hyperechoic and homogeneous.
B. Leiomiomas

Epididymal leiomyomas are benign tumors that usually appear as slow growing, painless scrotal masses. They generally well-defined mass surrounded with a fibrous capsule and usually range from 1 to 4 cm. They usually involve the epididymal head.

C. Papillary cistoadenoma

Papillary cistoadneoma is a rare, benign tumors of the epididymis and have strong association with von Hippel Lindau disease. They generally present as a hard, palpable mass, and range from 1.6 to 5 cm in diameter.

D. Other rare tumors of the epididymis include lipoma, rhabdomyoma, lymphangioma.

4.2 Malignant tumors:

Are rare and include sarcomas, metastases, adenocarcinomas and lymphomas

Approximately 25% of solid tumors of epididymis are malignant, and the majorities are metastases from a tumor at another site. (Fig 10)

Primary adenocarcinomas of the epididymis are very rare. ( fig 11)

Genital tract lymphoma is predominantly seen in the testis, but it can involve the epididymis in 60% of cases and the spermatic cord in 40%.

5. Hematomas

Fig 12
**Fig. 1**

Epididymal cyst. Fig. 1. A 39-year-old man with epididymal cyst. Longitudinal sonography shows a large cyst in the head of the epididymis.

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Fig. 2. SPERMATOCELE 61-year-old man with spermatocoele. Longitudinal sonography shows a cyst in the head of the epididymis (arrow).
Fig. 3. 39-year-old man with sperm granuloma. Spermatic granuloma in postvasectomy patient with a well-defined, hypoechoic, solid masses at US with a calcification inside.
Fig 4. ACUTE EPIDIDIMYTIS  A. Longitudinal scrotal US: epididymal tail thickening with decreased echogenicity. (B) US demonstrates hypervascularity of the tail of epididymis

Fig. 4

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Fig 5. **ACUTE EPIDIDIMITIS**  
A. Longitudinal scrotal US: epididymal thickening with decreased echogenicity with a cystic areas. (B) US demonstrates hypervascularity of the head of epididymis

Fig. 5

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Fig. 6. **CHRONIC EPIDIDIMYTIS POST TBC** A 76 years old man. Longitudinal scrotal US images shows an heterogeneous and hypoechoic mass in the region of the tail with a calcification inside.
Fig 7. A - B. **TUBERCULOUS EPIDIDYMIS**: Chronic Epididymitis. A 26-year-old man with tuberculous epididymitis. Longitudinal color Doppler sonography shows a large hypoechoic lesion with a few flow signal in the epididymal tail (arrow). (B) Longitudinal US image shows an heterogeneous and hypoechoic mass in the region of the tail with a calcification inside.

**Fig. 7**

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Fig. 8. A 45-year-old man with adenomatoid tumor. Longitudinal gray-scale shows a slightly hyperchoic mass in the epididymal tail.
Fig. 9. **ADENOMATOID TUMOR**
(A). 23 years-old man. Longitudinal sonography shows a small hyperechoic mass in the epididymal head
(B). 49-year-old man with a hyperechoic mass in the epididymal tail

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Fig. 9. METASTASIS. A 67-year-old man with metastasis of epididymis from colonic adenocarcinoma. A. Transverse sonography shows hypoechoic metastatic masses, which surround the testis.
Fig. 11. **SARCOMA**. A 73-year-old man with sarcoma of the head of epididymis. Transverse sonography shows hypoechoic lobulated masses, which surround the testis.
Fig. 12. A - B. Epididymal hematoma postsurgical in a 67 years-old man

Fig. 12

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Conclusion

Knowledge of sonographic findings of various epididymal mass may be helpful for differential diagnosis.

Gray-scale US with color Doppler is currently the best imaging method to evaluate scrotal disorders. Familiarity of the US features is crucial for diagnosis and proper management.
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References


