

## Scrotal Masses and Swellings

Scrotal swelling or a palpable mass/nodule is a moderately common occurrence. While clinical examination may at times be helpful in this situation, it is frequently difficult to reach a diagnosis by palpation alone. Imaging is a very valuable adjunct.

**Ultrasound scanning**, with colour Doppler, is the primary modality for scrotal imaging, with nearly 100% sensitivity in demonstrating palpable abnormalities, and in distinguishing cystic from solid lesions. There is also 98-100% reliability in distinguishing between intratesticular and extratesticular pathology. These distinctions are of importance as cysts are benign and soft tissue/solid intratesticular lesions are almost all malignant, while solid extratesticular lesions are almost all benign. Occasionally a mass on the surface of the testis, or extratesticular but indenting the surface contour, may not be definitively localised with ultrasound.

**MR Imaging** is seldom required, but can be a valuable problem solving tool in determining the precise location of, and further characterising, extratesticular solid masses.

### Causes of scrotal swelling, or a palpable mass, detectable with ultrasound consist of a wide range of pathologies including:

#### TESTICULAR-SOLID (95% will be malignant)

- **Malignant:**  
Germ cell tumours: seminoma and non-seminomatous (teratoma) comprise 95% of testicular malignancy. Some teratomas may have a cystic component.  
Non-Germ cell tumours: Leydig and Sertoli cell tumours
- **Benign**  
Epidermoid inclusion "cyst"- Germ cell origin, concentric layers of keratinised squamous epithelium- "onion" appearance on imaging.

#### TESTICULAR-CYSTIC:

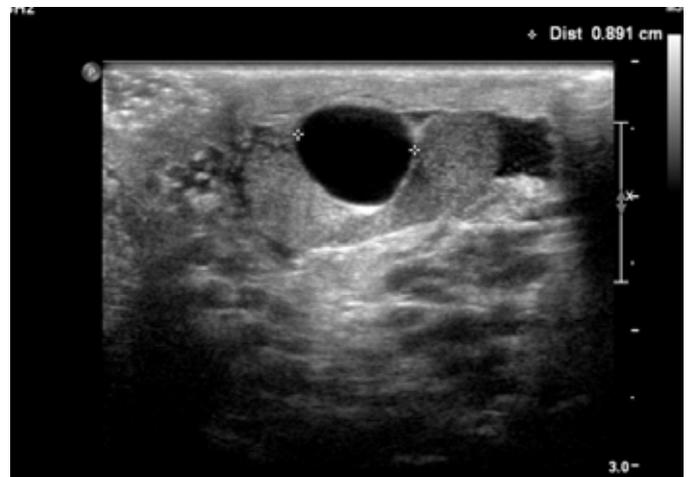
- Simple cyst within testis
- Cyst of tunica albuginea- up to 5mm, mesothelial origin

#### EPIDIDYMAL-CYSTIC:

- Simple cyst and spermatocele: Similar appearances. Common and may be multiple. Usually up to 10mm, but may reach several centimetres

#### EPIDIDYMAL- SOLID: (95% will be benign)

- **Benign**  
Adenomatoid tumour-most common tumour of the epididymis. Wide age range. Usually epididymal tail, but may also arise in spermatic cord and tunica albuginea. Typically 5-15mm but can be larger. Others: uncommon e.g. papillary cystadenoma and leiomyoma
- **Malignant**  
Very uncommon e.g. sarcoma, metastasis



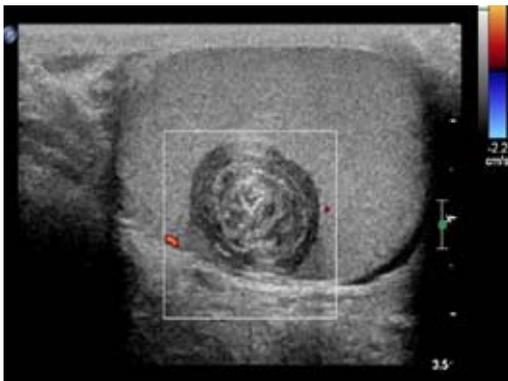
Epididymal head cyst

**HYDROCOELE:** Fluid may be simple or complex. Most often idiopathic but can be related to infection, trauma, or tumour (including rare mesothelioma). May contain palpable calculi (scrotal pearls). Ultrasound is valuable to assess for associated conditions.

**VARICOCOELE:** Dilated pampiniform venous plexus, more common on the left.

**SPERMATIC CORD/INGUINAL:**

- **Benign**  
Fatty tissue-true lipoma or fat containing hernia or increased fat in cord with obesity. Others include undescended testis, lymphadenopathy and sperm granuloma following vasectomy.
- **Malignant:**  
Rare, usually sarcoma



Testicular epidermoid inclusion cyst



Non-seminomatous germ cell tumour

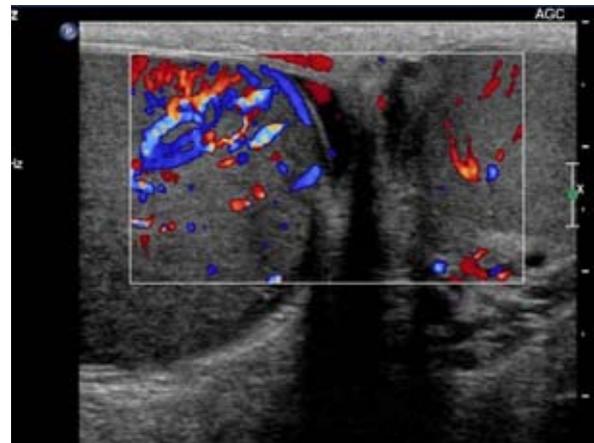
**INFECTION/INFLAMMATION:** Orchitis and epididymitis usually result in diffuse swelling of the affected area, with characteristic pain and tenderness, but may be focal and/or subacute with resulting difficulty in clinical diagnosis.

**SUMMARY:**

When there is scrotal swelling or a palpable lump, ultrasound can quickly and accurately determine if the abnormality is intratesticular (very high probability of malignancy unless a benign simple cyst), or extratesticular (very low probability of malignancy).

If extratesticular and cystic, a specific diagnosis can usually be made e.g. epididymal cyst, hydrocoele, varicocele.

Solid extratesticular lesions generally have less specific ultrasound features, but the vast majority will be benign in nature. Patient self examination combined with clinical or sonographic follow-up is usually sufficient to confirm stable/benign appearances, but if either patient or Doctor has significant worry/concern then surgery may be considered. In this situation MR Imaging can be helpful in alleviating concern, as it is more specific than ultrasound in characterising some extratesticular lesions.



Orchitis: enlarged right testis with hyperaemia

**References:**

Rifkin MD, Kurtz AB, Pasto ME, Goldberg BB. Diagnostic capabilities of high-resolution scrotal ultrasonography: prospective evaluation. *J Ultrasound Med* 1985; 4:13-19.  
Dogra VS, Gottlieb RH, Oka M, Rubens DJ. Sonography of the scrotum. *Radiology* 2003; 227: 18-36.  
Muglia V, Tucci S, Elias J, Trad CS, Bilbey J, Cooperberg PL. Magnetic resonance imaging of scrotal diseases: when it makes the difference. *Urology* 2002; 59: 419-423.

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