

# Acute scrotum

## Etiology

- **Syndrome characterized by acute and intense scrotal pain**, which, depending on its etiology, may be accompanied by other symptoms, such as inflammation, vegetative symptoms, abdominal pain, and fever.

Testicular causes	Extratesticular causes
Testicular torsion	Inguinoscrotal hernia
Torsion of the testicular appendix	Panniculitis
Epididymitis	<i>Henoch-Schönlein</i> purpura
Scrotal trauma	Idiopathic scrotal edema
Mediterranean fever	<i>Fournier's</i> gangrene
Idiopathic testicular infarction	Acute appendicitis
Spermatic vein thrombosis	

## Diagnosis

- **Symptoms:** for the differential diagnosis of main testicular causes:

Presentation	Testicular torsion	Appendix torsion	Epididymitis
Onset of symptoms	Acute	Subacute	Subacute
Pain (location)	Diffuse	Upper pole	Epididymis
Cremasteric reflex	Negative	Positive	Positive
Other findings	Testicle ascended and horizontal	Blue-dot sign in the upper pole	Painful induration
Febrile syndrome	Absent	Absent	Frequent

- **Testicular Doppler ultrasound:** useful for evaluating acute scrotum with a sensitivity of 63.6-100% and a specificity of 97-100%. It is, however, operator-dependent and may be difficult to carry out in prepubescent children. It measures testicular blood flow and its recovery after the reparation of a twisted cord; it thus reduces the need for surgical exploration. Its efficacy can be increased with the use of high-resolution ultrasound to visualize the spermatic cord. It is used for diagnostic purposes only in inflammatory conditions, detecting an increase in vascularization with respect to the contralateral side. The presence of arterial fluid does not rule out testicular torsion (24% of patients with this condition present either increased or normal levels of fluid).
- **Scrotal scintigraphy (<sup>99m</sup>Tc):** detects hypocaptant (cold) areas with 80-100% sensitivity and 89-100% specificity. Does not provide morphological information and gives false positives in cases of spontaneous resolution or large inflammatory hydroceles. It is unreliable in testes <2 cm and with more than 24 h of evolution. Not practical for use as ER units are rarely equipped with this technology.
- **MRI:** useful for diagnosing scrotal pathologies in which neither clinical observations nor ultrasound provide conclusive data (1.4%), thus reducing the number of surgical interventions needed and the net cost of treatment.

## Spermatic cord torsion

It is estimated that 1/4000 males under the age of 25 suffer spermatic cord torsions, making it the most common cause of testicular loss among this demographic. In older patients it is usually anecdotal, but generally more severe and with a greater incidence of testicular loss.

- **Types:**

- **Intravaginal (94%):** the torsion of the testicle occurs inside the tunica vaginalis. The vast majority occur postnatally.
- **Extravaginal (6%):** affects the entire cord due to incomplete adhesion of the *gubernaculum* and testicular coverings. Most common in newborns and *in utero*.

- **Pathophysiology:** the most common rotation is from outside-in in a cranial-caudal direction. Develops gradually, first with partial, then total venous occlusion which finally evolves to ischemic infarction due to testicular artery occlusion.
- **Clinical symptoms:** acute and intense testicular *pain* that may radiate to the groin, testicular *swelling*, and (less frequently) *nausea, vomiting, or fever* (secondary to ischemic testicular necrosis). Upon examination, one testis is usually found to be elevated up to the superficial inguinal ring, oriented horizontally, tender and enlarged (due to venous congestion and edema). The testis is more painful when it is elevated by the explorer (positive *Prehn's sign*). Other significant data include the palpation of the epididymis in the anterior or lateral position (depending on the type of rotation), and a soft, congested cord.
- **Initial treatment of choice** involves manual detorsion in an inside-out direction (when looking from the feet, the left testicle is turned clockwise, changing the direction if pain increases). Reperfusion is confirmed with Doppler ultrasound imaging (up to 32% of residual torsion is found in surgical explorations after a successful manual detorsion).
- **The definitive treatment of choice** is surgical exploration with bilateral orchidopexy, which can either be deferred for several hours if manual detorsion has been effective or be urgent in case of failure. The recurrence rate after surgery is 4.5% and can occur several years later.
- **Evolution:** the viability rate depends on the time elapsed from the onset of symptoms and the degree of torsion. Testicular atrophy is common in full torsions (>360°) lasting over 4 hours. Incomplete torsions (180-360°) lasting 12 h are generally resolved satisfactorily.
- **Prognosis:**
  - *The hormonal function* of the testicular axis usually remains normal after torsion.
  - *The risk for developing testicular cancer* is 3.2 times higher and remains so for 6-13 years after intervention.
  - *After a testicular torsion, the spermiogram* is normal in 5-50% of patients over the long term. Early surgery (<12 h) helps maintain fertility while delaying surgery can have a serious negative effect on fertility.

## Torsion of the hydatid of Morgagni

- **Definition:** a torsion of the testicular appendix. Peak incidence occurs at 11-12 years; rare in adulthood.
- **Clinical symptoms:** sudden testicular *pain* with a lower intensity than that of testicular torsion and without causing malaise. Upon examination the appendix is found to be twisted in the upper testicular pole. *Transillumination* can reveal a characteristic bluish nodule in the pole.
- **Treatment:** conservative, with analgesics and anti-inflammatories. If an associated testicular torsion is suspected, surgical exploration is warranted.

## Epididymitis

- **Definition:** a clinical syndrome lasting less than 6 weeks and characterized by inflammation and usually *fever, pain, and swelling* of the epididymus. Results from the spread of infection from the urethra or bladder. It is the most prevalent cause of acute scrotum in patients over 18 years of age (see chapter on *Orchiepididymitis*).
- **Prepubescent epididymitis:** its etiology is unclear, but in most instances, antibiotic therapy is not indicated (when sediment and urine culture are normal). It is a self-limiting process with no after-effects. Treatment includes rest and administration of anti-inflammatories.

## Other causes

- **Testicular trauma** (see chapter on *Testicular and Scrotal Trauma*).
- **Testicular tumors** (see chapter on *Testicular Tumors*).

- **Idiopathic scrotal edema:** sudden onset of scrotal redness and swelling; no pain. Upon examination, local erythema is found with swelling extending to the perineum and groin. The pathogenesis is an allergic reaction.

