

The acute scrotum

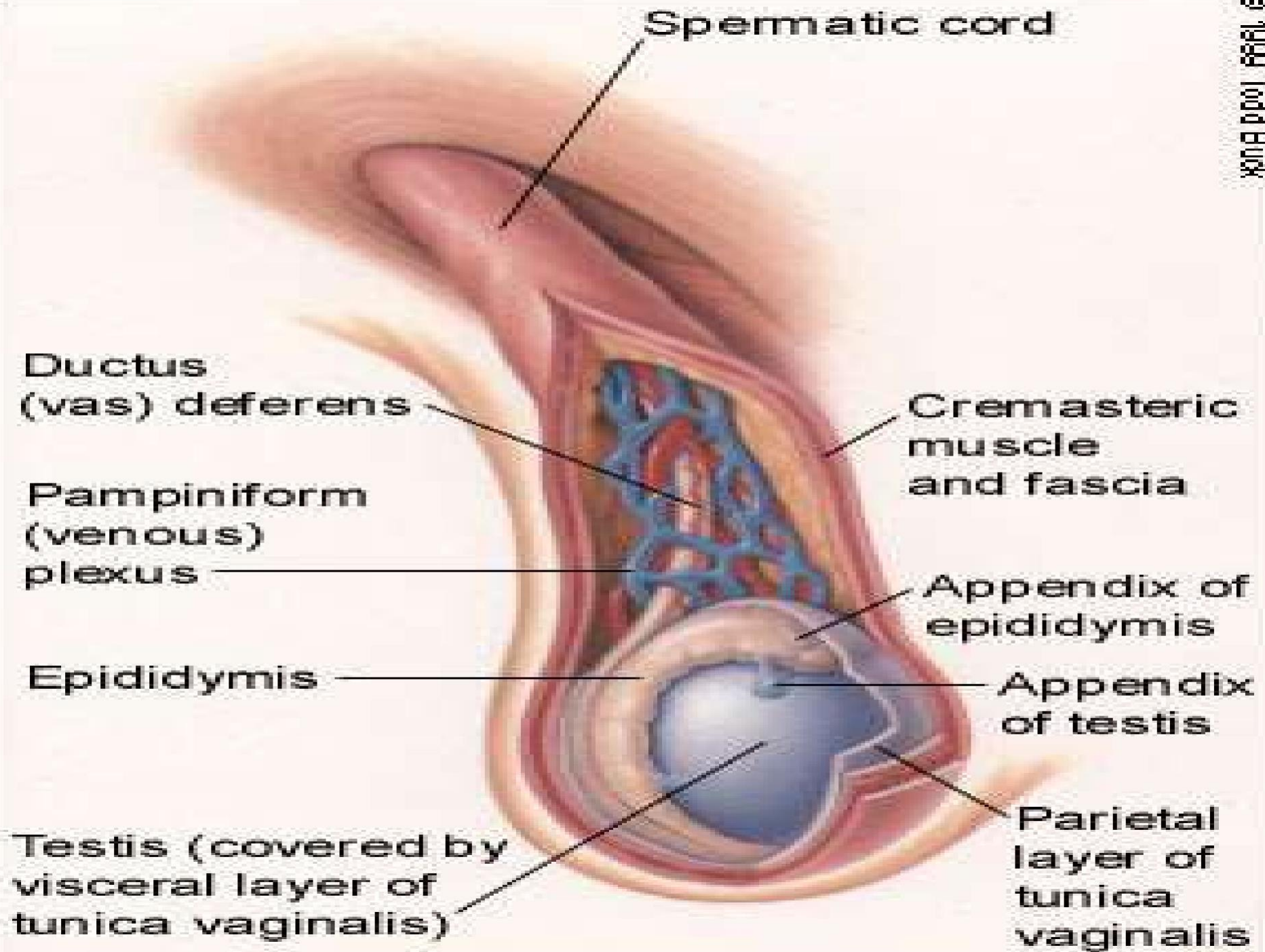
Introduction

The spectrum of conditions that affect the scrotum and *its contents ranges from incidental findings that may require patient reassurance only OR acute events that may require immediate surgical intervention.*

Normal anatomy

The *normal testis* is oriented in the *vertical axis* and the *epididymis* is above the *superior pole* in the *posterolateral position*.

Cremasteric reflex: Stroking/pinching the inner thigh should result in elevation of *> 0.5 cm* of the ipsilateral testicle.



Spermatic cord

Ductus (vas) deferens

Pampiniform (venous) plexus

Epididymis

Testis (covered by visceral layer of tunica vaginalis)

Cremasteric muscle and fascia

Appendix of epididymis

Appendix of testis

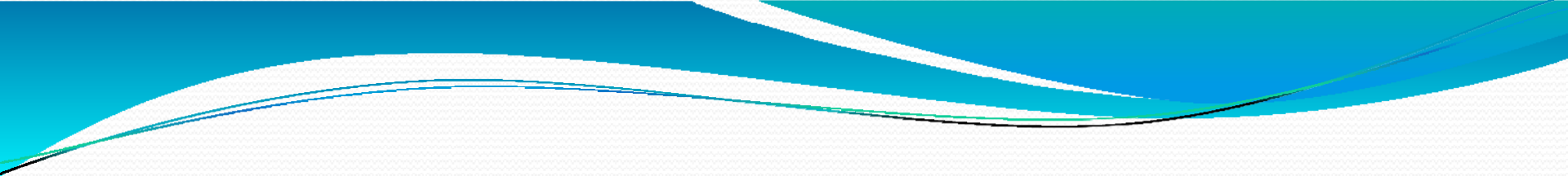
Parietal layer of tunica vaginalis

DIFFERENTIAL DIAGNOSIS

- *The **most common causes of acute scrotal pain** in pediatric are testicular torsion and epididymitis.*
- ***Other conditions** that may result in acute scrotal pathology include Fournier's gangrene, torsion of the appendix testis, trauma/surgery, testicular cancer, strangulated inguinal hernia, Henoch-Schönlein purpura, mumps, and referred pain.*

Testicular torsion

? *Testicular torsion* is a urologic emergency that is more common *in neonates* and *postpubertal boys*, although it can occur *at any age* [2].



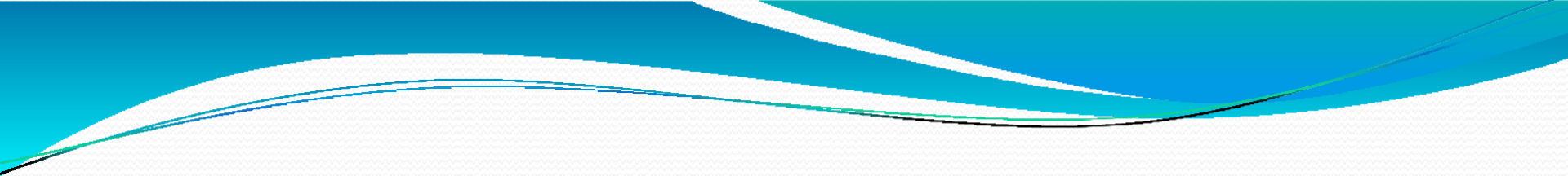
❑ Testicular torsion results from **inadequate fixation of the testis to the tunica vaginalis** producing ischemia from reduced arterial inflow and venous outflow obstruction.

❑ *Testicular torsion may occur after an **incidental event** (eg, trauma) or **spontaneously** [10].*

- It is generally felt that the testis suffers *irreversible damage* after 12 hours of ischemia due to testicular torsion [8,9].
- ***Infertility*** may result, even with a normal contralateral testis, because the disruption of the immunologic "*blood-testis*" barrier may expose antigens from germ cells and sperm to the general circulation and lead to the development of anti-sperm antibodies.

Clinical features and diagnosis

- *The diagnosis of testicular torsion is usually determined by **acute onset** of severe symptoms and characteristic physical findings, although ultrasound may be needed in equivocal cases.*
- *The onset of **pain** in testicular torsion is usually **sudden** and often occurs several hours after vigorous physical activity or minor trauma to the testicles [11].*
- *There may be **associated nausea and vomiting**.*



❓ *Another typical presentation, particularly in **children**, is **awakening with scrotal pain in the middle of the night or in the morning,***

*❓The classic finding on physical examination is an **asymmetrically high-riding testis** on the affected side with the long axis of the testis oriented transversely instead of longitudinally secondary to shortening of the spermatic cord from the torsion, also called the “**bell clapper deformity**”*

Normal testicle

Spermatic cord

Testicular torsion

Twisted spermatic cord

Urethra

Testicle

Epididymis

Urethra

Testicle

Epididymis

Normal

Testicular Torsion

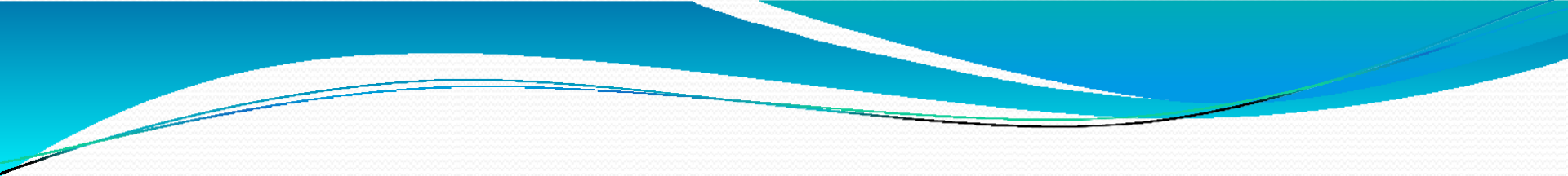






The cremasteric reflex

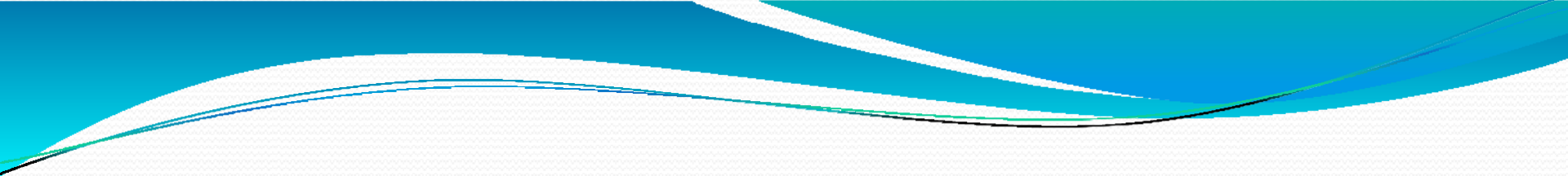
- A normal response is *cremasteric contraction* with elevation of the testis.
- The reflex is *usually absent* in patients with testicular torsion .
- This helps *distinguish testicular torsion from epididymitis and other causes of scrotal pain, in which the reflex is typically intact [1]*.



❓ **Prehn's sign**: Relief of scrotal pain by elevating testicle. **NOT**
a reliable way to distinguish epididymitis from torsion

Imaging

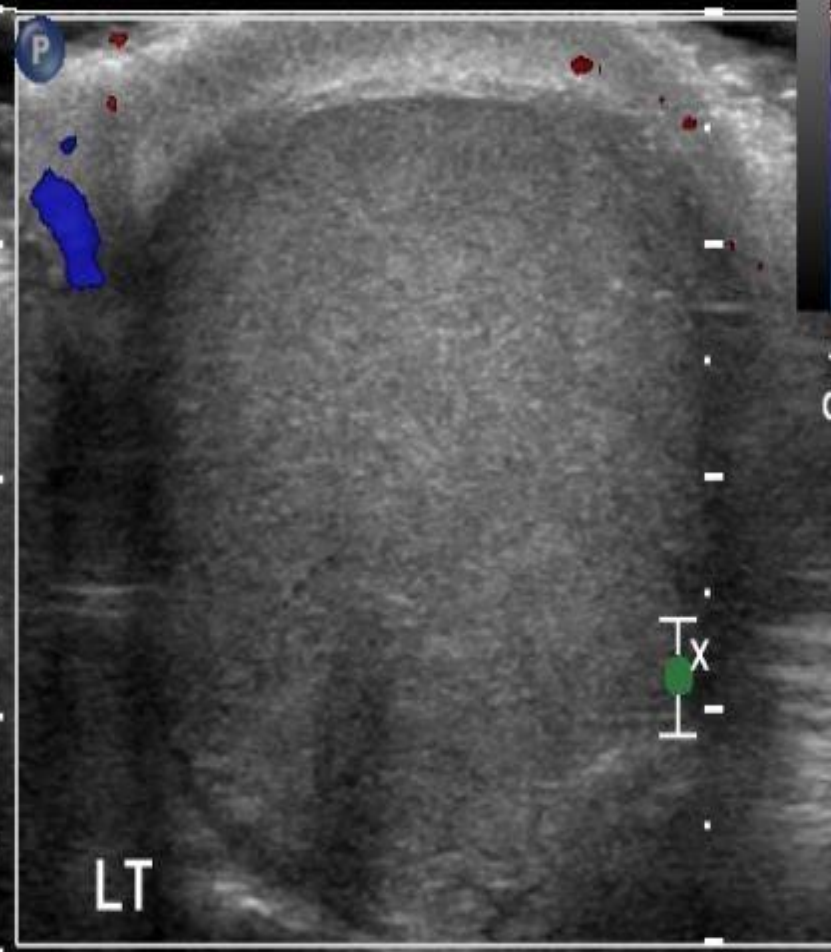
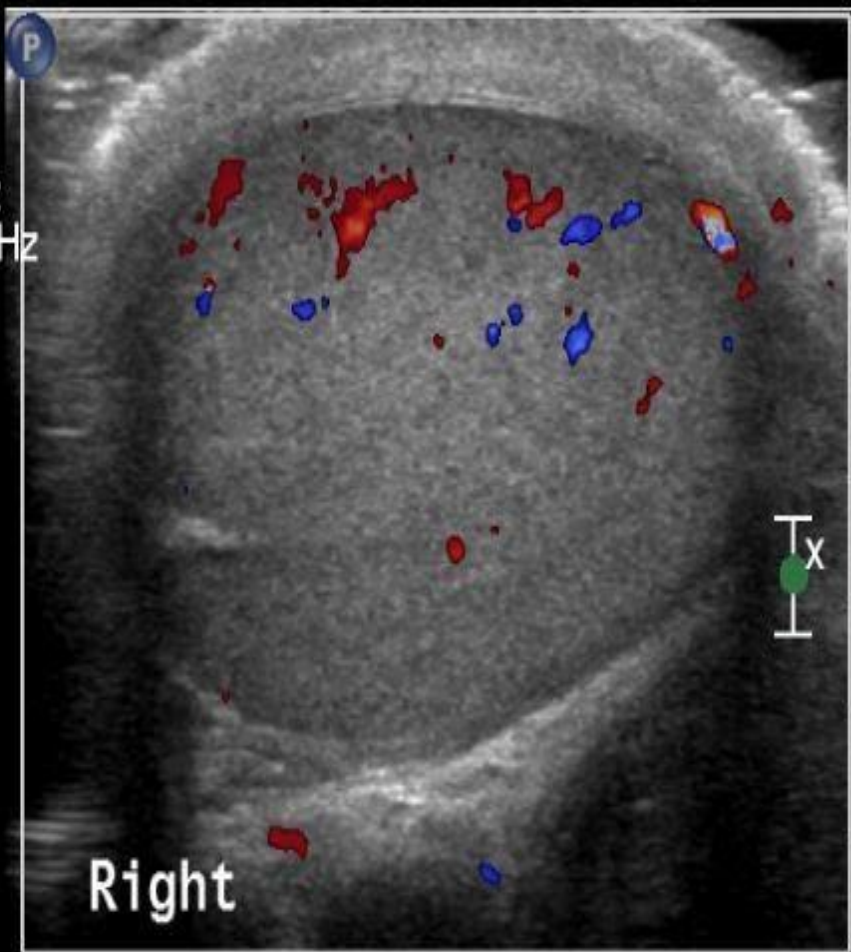
- *If the etiology of an acute scrotal process is equivocal after history and physical examination, **color Doppler ultrasonography is the diagnostic test of choice to differentiate testicular torsion from other causes**, including epididymitis.*
- *lack of immediate access to scrotal ultrasound should not delay surgical exploration.*



❓ In a study of 56 patients who underwent surgical exploration for acute scrotal pain and had Doppler ultrasound examinations performed preoperatively [4] (*sensitivity 100 percent and specificity 97 percent*).

FR 5Hz
RP
Z 1.2
2D
93%
C 64
P Med
Res
CF
77%
350Hz
WF 19Hz
Low

M3 M3
+2.2
-2.2
cm/s

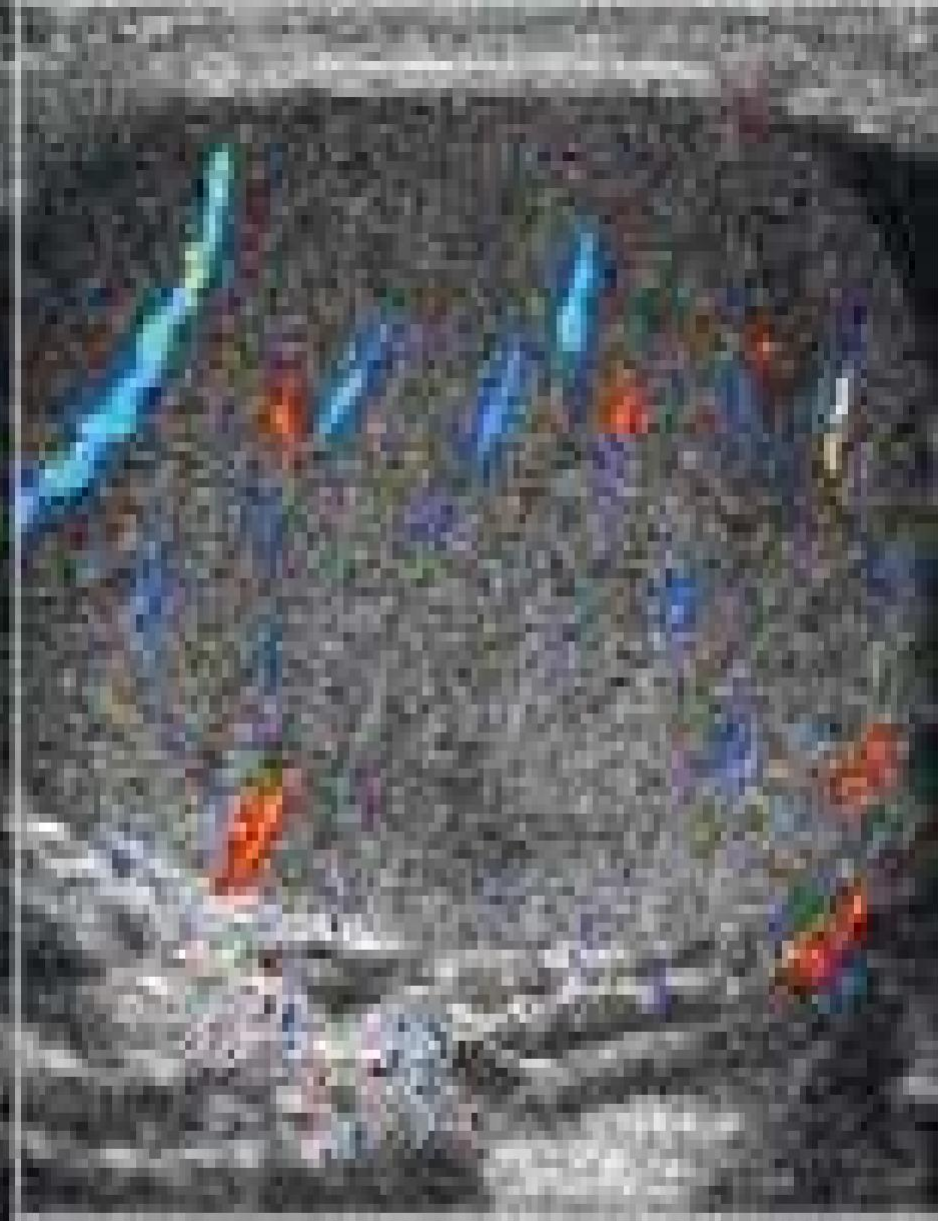


4.5

4.5

*

h



Treatment

- Treatment for suspected testicular torsion is **immediate surgical exploration with intraoperative detorsion and *fixation of the testes***.
- Delay in detorsion of a few hours may lead to progressively *higher rates of nonviability of the testis*.
- Manual detorsion is performed if surgical intervention is **not immediately available**.

Surgery

- ❑ Detorsion and fixation of both the involved testis and the *contralateral uninvolved testis should be done since inadequate gubernacular fixation is usually a bilateral defect.*
- ❑ *Longer periods of ischemia (>12 hours) may cause infarction of the testis with liquefaction requiring orchiectomy.*

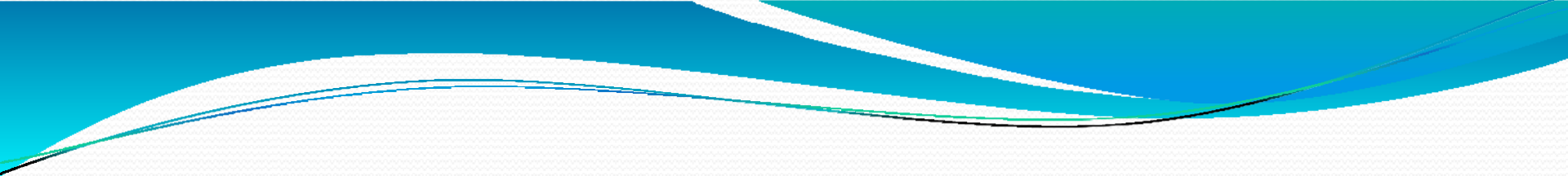




www.pediatricneurology.in

Manual detorsion

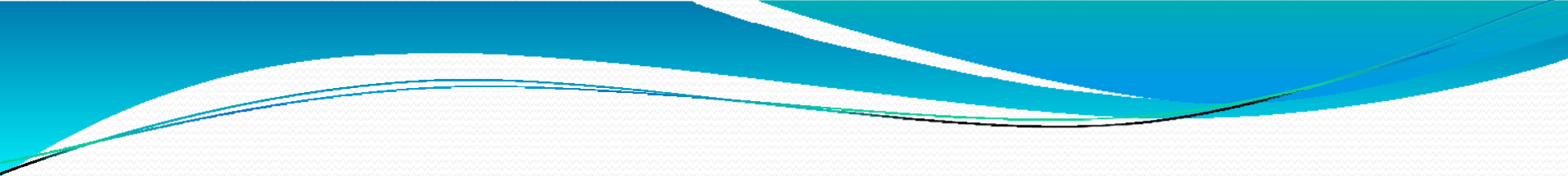
- If surgery is not immediately available (within two hours), it is reasonable to attempt to manually detorse the testicle [16].
- The classic teaching is that the testis usually rotates medially during torsion and can be detorsed by *rotating it outward toward the thigh.*



❓ However, in a retrospective analysis of 200 consecutive males age 18 months to 20 years who underwent surgical exploration for testicular torsion, lateral rotation was present in one-third of cases [17].

successful detorsion is suggested by [18]:

- *Relief of pain*
- *Resolution of the transverse lie of the testis to a longitudinal orientation*
- *Lower position of the testis in the scrotum*
- *Return of normal arterial pulsations detected with a color Doppler study*



*❑ Surgical exploration is necessary even after clinically successful manual detorsion because **orchiopexy** (securing the testicle to the scrotal wall) must be performed to prevent recurrence, and residual torsion may be present that can be further relieved [17].*

Torsion of the appendix testis

- Testicular pain from torsion of the **appendix testis** is usually more gradual than with testicular torsion. It **is the leading cause of acute scrotal pathology in childhood**. Torsion of the appendix testis rarely occurs in adults [29].
- It is not uncommon for patients to have several days of scrotal discomfort before they present for evaluation. Pain ranges widely from mild to severe.
- Careful inspection of the scrotal wall at this location may detect the classic **"blue dot"** sign caused by infarction and necrosis of the appendix testis .



Normal testicle

Testicular appendage torsion



management

- *Management of acute torsion of the appendix testis usually includes **conservative treatment**, which includes rest, ice, and NSAIDs.*
- *Recovery is generally slow with this approach, and pain may last for several weeks to months.*
- ***Surgical excision of the appendix testis is reserved for patients who have persistent pain.***

Summary

Distinguishing conditions responsible for acute scrotal pain in adults

	Symptom onset	Pain location	Cremasteric reflex	Other clinical findings
Testicular torsion	Acute	Testis	Negative	High riding testis, bell-clapper deformity, profound testicular swelling
Epididymitis	Acute or chronic	Epididymis	Positive	Epididymal induration and tenderness, positive urinalysis or culture
Fournier's gangrene	Acute	Diffuse	Positive	Tense edema outside of involved skin, blisters/bullae, crepitus, fever, rigors, hypotension
Appendiceal torsion	Subacute	Upper pole of testis	Positive	Blue dot sign, tenderness over anterosuperior testis