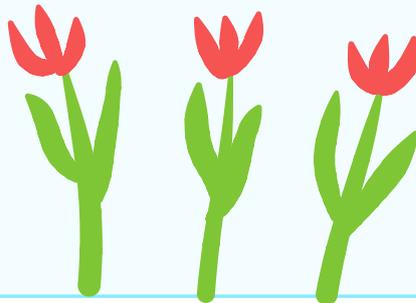


تبييض مخاطرة

Inguinoscrotal Swelling & Cryptorchidism in Children

د. أحمد عودة

Done by :



Inguinoscrotal Swelling in Children

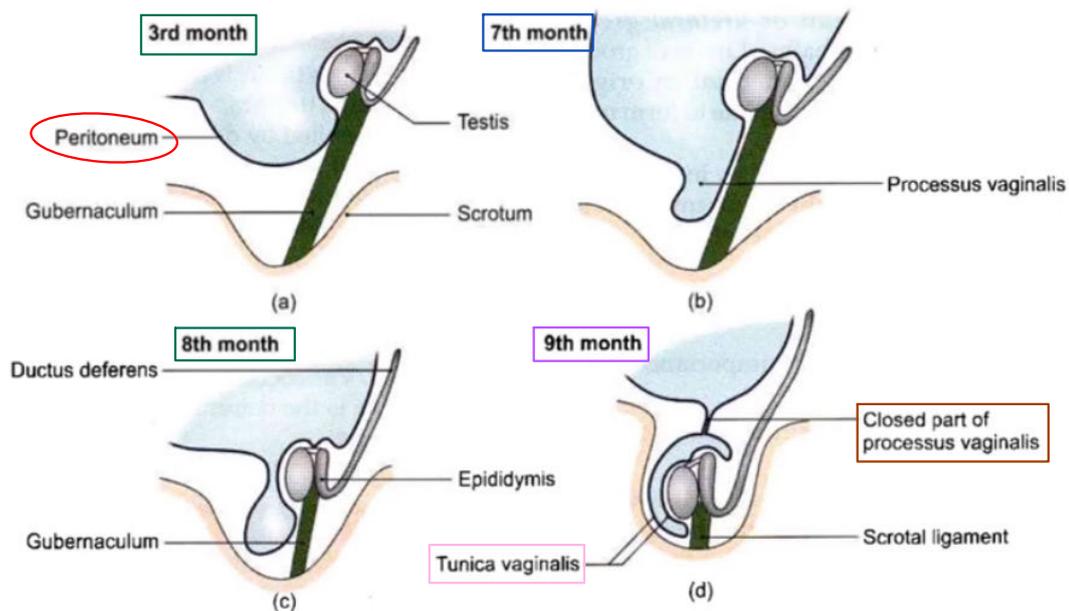
Processus vaginalis is a peritoneal diverticulum that extends through the internal ring at approximately 3 months gestation. As the testis descends between the seventh and ninth months of gestation, a portion of the processus vaginalis attaches to the testes and is dragged into the scrotum with the testes.

The portion of the processus vaginalis surrounding the testis becomes the tunica vaginalis. The remainder of the processus vaginalis obliterates, thereby eliminating the communication between the peritoneal cavity and the scrotum.

✘ Failure of obliteration or incomplete obliteration of the processus vaginalis is the **underlying pathophysiology of the development of hernias and hydroceles**



DEVELOPMENT OF TESTIS



Stages of descent of testis include formation of processus vaginalis

- processus vaginalis → if the distal part is patent → hydrocele
- if the proximal part of the whole cord is patent → hernia

↳ (inguinal swelling) ↳ (inguinoscrotal)

A **hydrocele** occurs with incomplete obliteration of the processus vaginalis so that fluid accumulates around the testicle or the cord structures. This fluid may or may not communicate with the peritoneal cavity.

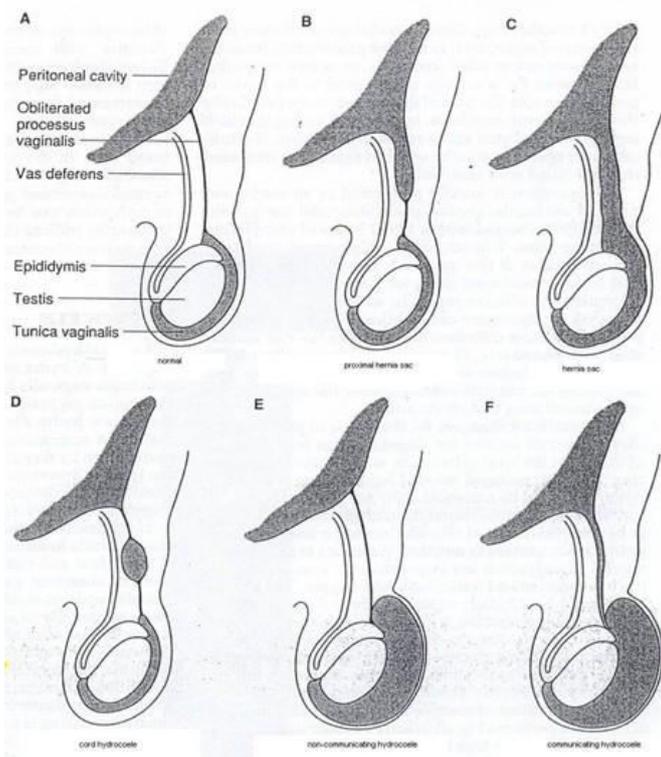
+ve transillumination sign
↳ not specific for hydrocele

A **hernia** occurs as a result of distal obliteration of the processus vaginalis with proximal patency or complete failure of obliteration so that both fluid and bowel may be present in the sac.

(-ve transillumination sign)
(+ve)



✗ IT IS NOT TRUE TO DO ASPIRATION



Almost all inguinal hernias in infants and children are **indirect**.

The hernia sac is located anterior and medial to the spermatic cord structures.

The incidence of groin hernias in infants and children is 1-5%.

Boys outnumber girls 6-10:1

Right-sided hernias are more common because the right testis descends later than the left testis; therefore, the right processus vaginalis obliterates at a later date than the left. (R 60%, L 30%, Bilateral 10%)

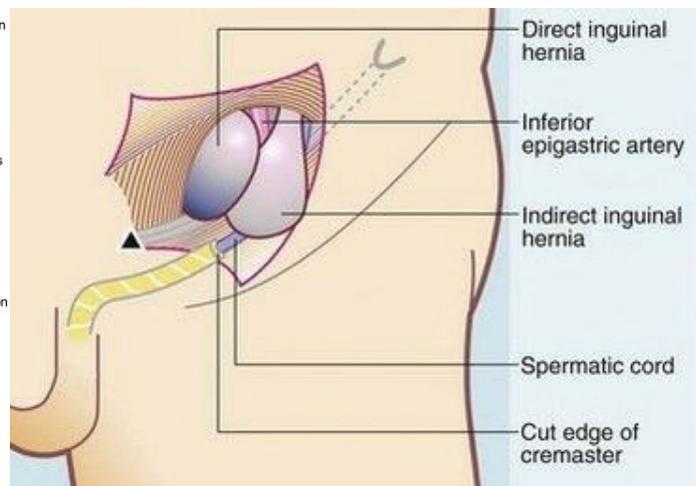
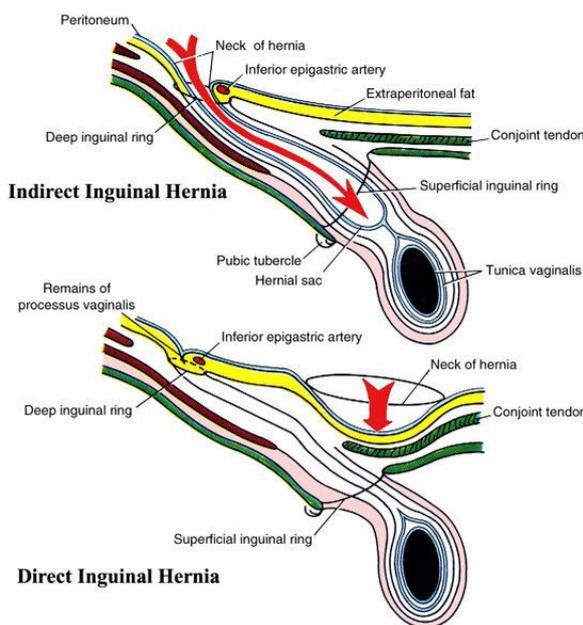
Consequently, patients who present with a left-sided hernia have a higher incidence of an occult right sided hernia.

مسان هيك اوج ميتر
رئيه لحي ازاد من ادر side



السكس
for spermatic vesseles

- hernia → if medial to the epigastric vesseles : **Direct inguinal**
- if lateral : **indirect inguinal**



because the internal ring is narrow during
this duration

The risk of incarceration exceeds 60% during the first 6 months of life.

Most hernias are found either by parents or during a well-baby or preschool check.

Most patients have a history of an intermittent bulge in the groin or scrotum, especially with crying or straining. Most are asymptomatic.

Symptoms and signs of an incarcerated inguinal hernia:

- The patient may be irritable and complain of pain in the groin.
- Signs of intestinal obstruction, including abdominal distention, vomiting, and obstipation, may follow.
- Physical examination reveals a tender, sometimes erythematous, irreducible mass in the groin.
- With strangulation of the bowel, blood may be seen per rectum.

severe
constipation

when it's
strangulated or
gangrenous

(Perforation)



Most commonly the bowel become incarcerated in an inguinal hernia Sac.

In females, the ovary or fallopian tubes frequently become incarcerated.

Amyand's hernia: presence of appendix in an inguinal hernia sac.

Littre's hernia: protrusion of a Meckel's diverticulum into the hernial sac.

Transillumination is not reliable sign

Differential diagnosis of an inguinal hernia:

Hydrocele

Cryptorchidism

Testicular torsion

Torsion of the appendix testis

Inguinal lymphadenopathy



hernia repair is more easier in Female

What technique is used to repair pediatric hernias?

High ligation of the sac (herniotomy) فقط بالأطفال بشيها دونه Plasty or mesh

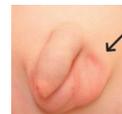
When should groin hernias be repaired?

- In premature infants, groin hernias should be repaired just before discharge from the NICU → الخراج
- *fullterm* Other infants should be scheduled electively within about 1 month *to avoid infection & Perforation*
- Incarcerated hernias that can be reduced in the emergency department **should be repaired within 24-48 hours.** *استن لرد فا → edema*
- Incarcerated hernias that cannot be reduced in the emergency department should be repaired **emergently.**



(0.5 - 1)%

< 1%



< 2%

Complications of groin hernia repair

- Bleeding
- Recurrence (0.5-1%)
- Infection (< 1%)
- Iatrogenic cryptorchidism
- Injury to cord structures (< 2%)

(Spermatik Vessels)



If it is a communicating hydrocele → You should wait until 1-2 years to resolve Spontaneously

Most congenital hydroceles will resolve by age 1-2

Surgery if concerns for infertility or unresolved by age 1-2

HYDROCELE

The presence of fluid in the scrotum or inguinal canal in boys or in the inguinal/labial area in girls

Communicating and non communicating (No obliteration for the distal processus vaginalis) → patent

→ Indications for surgery:

- Non communicating
- Communicating with failure to resolve by 1-2 years of age. (most obvious at the end of the day & in standing position)
- Unable to rule out hernia (bowel) component.



The causes of hydrocele

- Primary** (infants) عند الولادة
Idiopathic (without cause) → Patency of processus vaginalis
- Secondary** (old children), later on
- Trauma
 - Epididymo-orchitis
 - Tumour
 - Lymphatic obstruction
 - infection

→ Complications:

- Incarcerated inguinal hernia
- Large hydroceles may be bothersome



They do not pulsate and are not compressible → The fluid of a hydrocele surrounds the body of the testis, so that the testis impalpable.

The skin of the scrotum is freely mobile over the swelling.

Can get above it, irreducible

Management:

→ Surgical correction via orchiopexy.

Cryptorchidism

should be repaired before age of 1 Year

- Cryptorchidism (“hidden testis”) is the **most common** congenital genitourinary anomaly in males
- Results when the testis does not descend into its normal intrascrotal position during development. **80% found in inguinal canal.**
20% in the abdomen
- Unilateral (90%) or bilateral (10%); → when it is bilateral, You should Rule out DSD (disorder of sexual development)
- 70% of unilateral cases occur on the **right side.**
- In full-term infants, the incidence is 2.7-5.9% at birth but decreases to 1.2-1.8% by 1 year of age.
- The incidence is **10-fold higher** in premature infants.

↳ because the complete descending of testis occur in the last month of gestation



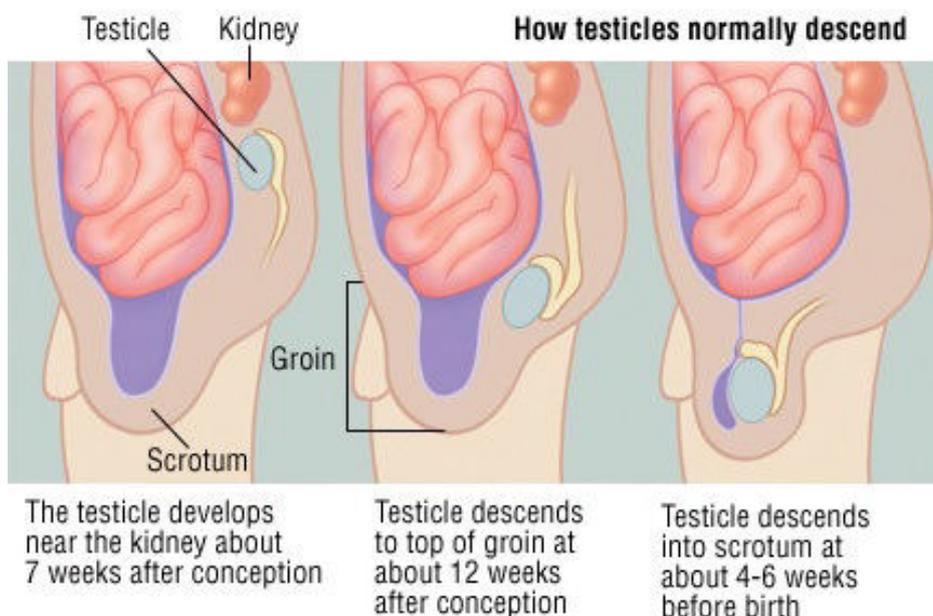
Complications: cause of higher-temperature environments

- Testicular cancer.
- Infertility.



Normal testis first found near the kidneys

+ then descend through the retroperitoneum to the internal ring → inguinal canal → external ring → scrotum



Maldescended testis

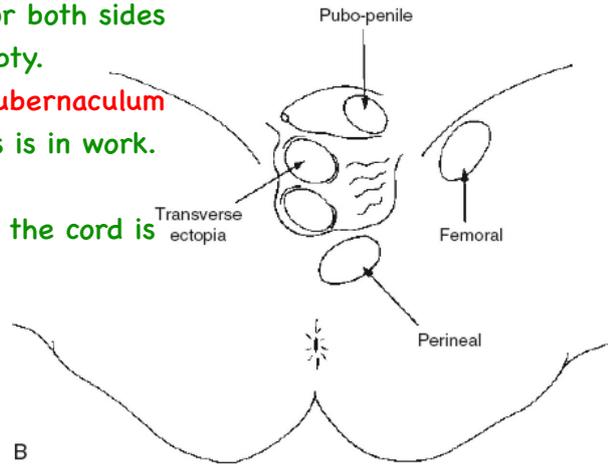
• **Ectopic testes** → Found outside the normal pathway of descend **اندرق**

- Testes found outside of the line of normal descent
- Can be found in femoral canal, perineum, contralateral scrotum, above the pubic bone

Mother complains that one or both sides of her baby scrotum are empty.

Caused by Rupture of the gubernaculum so one of the accessory tails is in work.

TT : Orchiopexy is easier as the cord is usually long.



• **Retractile testes** → Very mobile testis due to Hyperactive cremasteric reflex

- Retraction of testicles in response to cold temperatures and protection from trauma Or Scratch of the medial side of the thigh
- Later in childhood
- Secondary to abnormal response to cremasteric muscle contraction
- Can be brought down into the scrotum during physical examination

→ Does not need surgery (just reassurance) unless it doesn't return to normal status until puberty

• it is diagnosed by :

1. Scrotum is well developed.
2. The testis is of normal size.
3. Repeated examination in warm room.
4. Make the child squat this help the descend of retractile testis, which is milked down to touch the scrotum floor



Table Comparing
Retractile Testis
 &
Undescended Testis

Characteristics	Retractile Testis	Undescended Testis
Definition	Testis can move between the scrotum and groin.	Testis does not move down into the scrotum.
Symptoms	The testis retracts from the scrotum and back into the inguinal canal.	No testis is felt or imaged in the scrotum where the testis has not descended.
Causes	Overactive cremaster muscle.	Androgen hormone problems and short spermatic cord.
Prevalence	4 to 13 per 1000 boys.	1 in 100 boys.
Treatment	Usually resolves on its own when a boy reaches puberty.	Surgical orchiopexy.
Complications	There is a risk of the testicle becoming undescended.	There is a higher risk of testicular cancer in those with undescended testes. Testicular torsion and infertility are also complications.



Diagnosis

- **Clinical** → Ask the patient if the testis is usually Found in the scrotum, if yes → retractile
- **Ultrasound**
- **MRI**
- **Diagnostic laparoscopy** → } for abdominal testis.



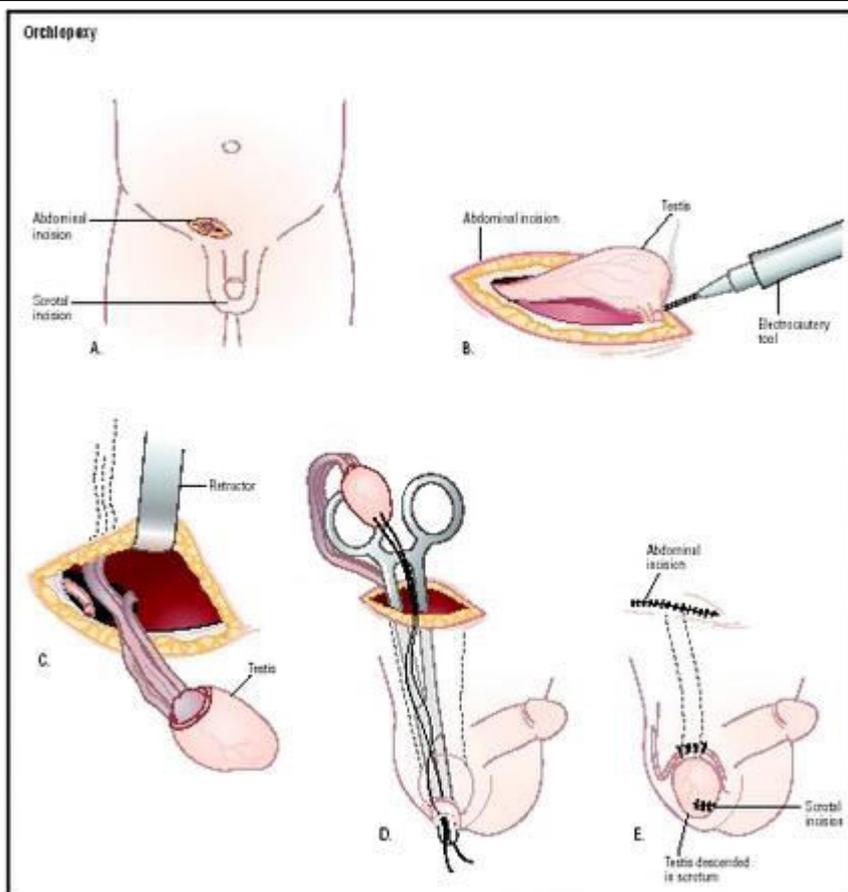
• Management

- Preop
 - <6 months of age → monitor for descent
- Operative
 - Orchiopexy between 6-9 months

- **Hormonal therapy** → usually used if the testis is in the abdomen (bilateral)
 - Testosterone – no longer used due to causing precocious puberty → تيسر البلوغ
 - hCG – 6% success rate
 - LHRH – 19% success rate
- Hormonal therapy **not recommended** by the American Urological Association guidelines due to lack of response and long term efficacy

Indications for Surgery (Orchiopexy)

- All undescended testes in patients >6 months
- Undescended testes at risk for:
 - Injury due to direct trauma
 - Epididymo-orchitis from repeated trauma
 - Sterility – 10% risk for unilateral and 38% for bilateral undescended testes
 - Malignancy



Testicular Torsion

testicular Doppler US shows impaired venous blood flow

Twists of the spermatic cord, causing venous congestion, edema, and eventual arterial obstruction, which, if not treated, lead to gonadal necrosis.

Most cases occur in late childhood or early adolescence.

It is pediatric urologic emergency → should be done within 6 hours (otherwise , You will lose the testis) (gangrene occur)

Present as acute, sharp unilateral scrotal swelling and pain. → may be with abdominal pain

Palpation of the inguinal canal may reveal a thickened or twisted cord.

The affected testis is elevated within the hemiscrotum due to the twist (transverse and high-riding)

Absent cremasteric reflex, Pain improvement with upward scrotal support



pain in testicular torsion worsens with elevation of the scrotum (-ve Prehn sign)



Fixation should be bilateral

95%

منادب الجرس

Intra-tunical ←

• **Intravaginal torsion:** “bell-clapper” deformity. Most commonly 12-18-year-olds. Testis does not have normal fixation within the scrotum, so has higher risk of twisting in the processus vaginalis.

extra-tunical ←

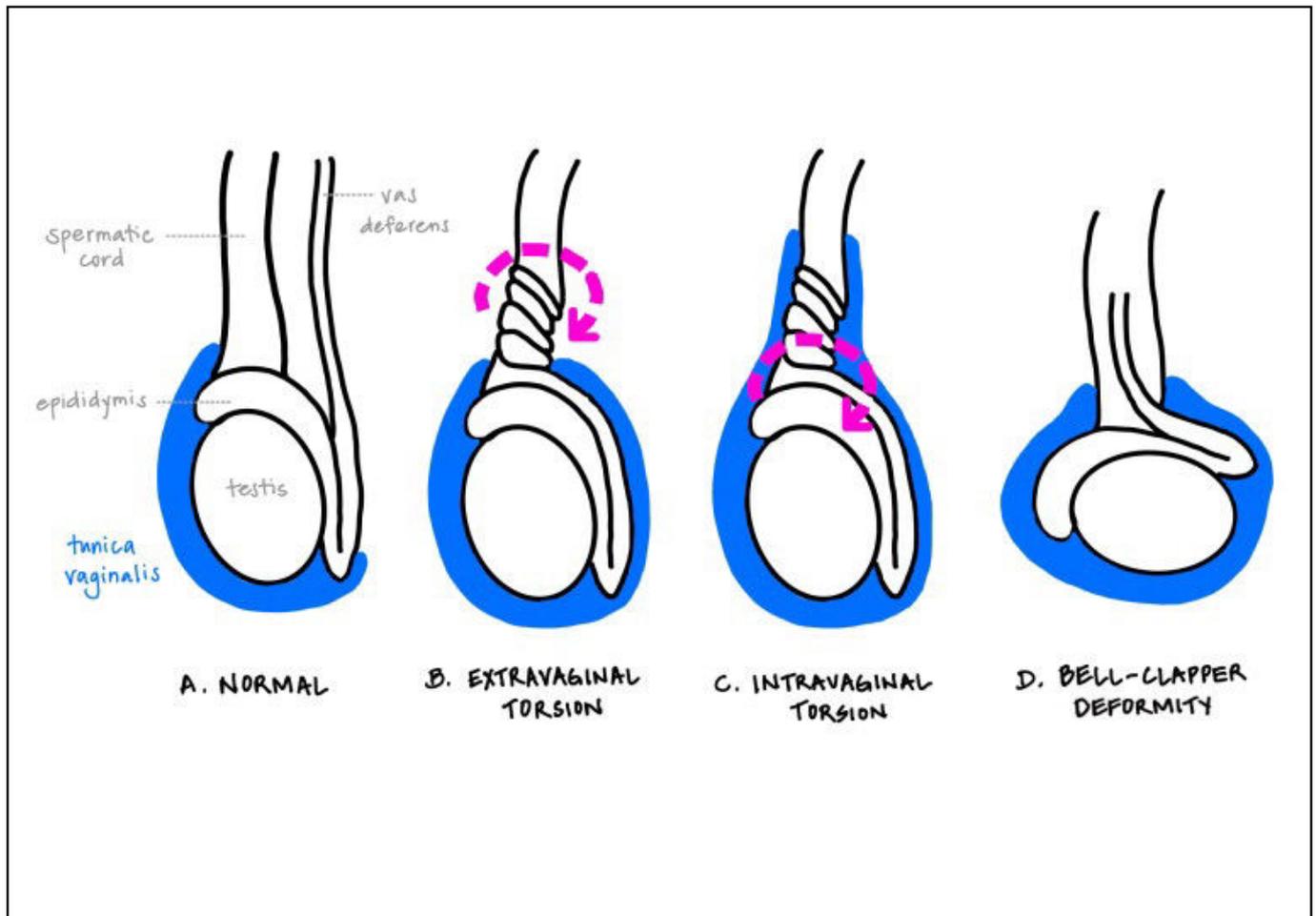
منادب الجرس
لو لو
fixation of

• **Extravaginal torsion:** seen in neonatal torsion. Entire spermatic cord twists, including the processus vaginalis.

the other (normal) testis

difference between extravaginal and intravaginal testicular torsion is whether the spermatic cord twists outside of or within the tunica vaginalis





Diagnosis

- Mainly clinical
- Nuclear scintigraphy (isotope scan)
- Doppler sonography *u/s* detect obstruction of blood flow in testicular vessels
- urine analysis : to exclude epididymo-orchitis

However, urgent treatment of the patient believed to have testicular torsion should not be postponed

لازم بسریع !!

Differential Diagnosis

- Prehn sign: Relief of pain with elevation of testis.

- Epididymitis (Fever and Pyuria) *+ve prehn sign*
- Orchitis (Fever and Dysuria)
- Appendiceal torsion (gradual pain, blue dot)
- Urethral stones
- Referred renal colic



Treatment of testicular torsion

- *دقی لو شکاک دعو متأكد و همیشه open*

Surgery involves initial detorsion of the testis.

If the testis is *early cases* **viable**, it is fixated within the tunica vaginalis - Untwist the cord
- Orchiopexy

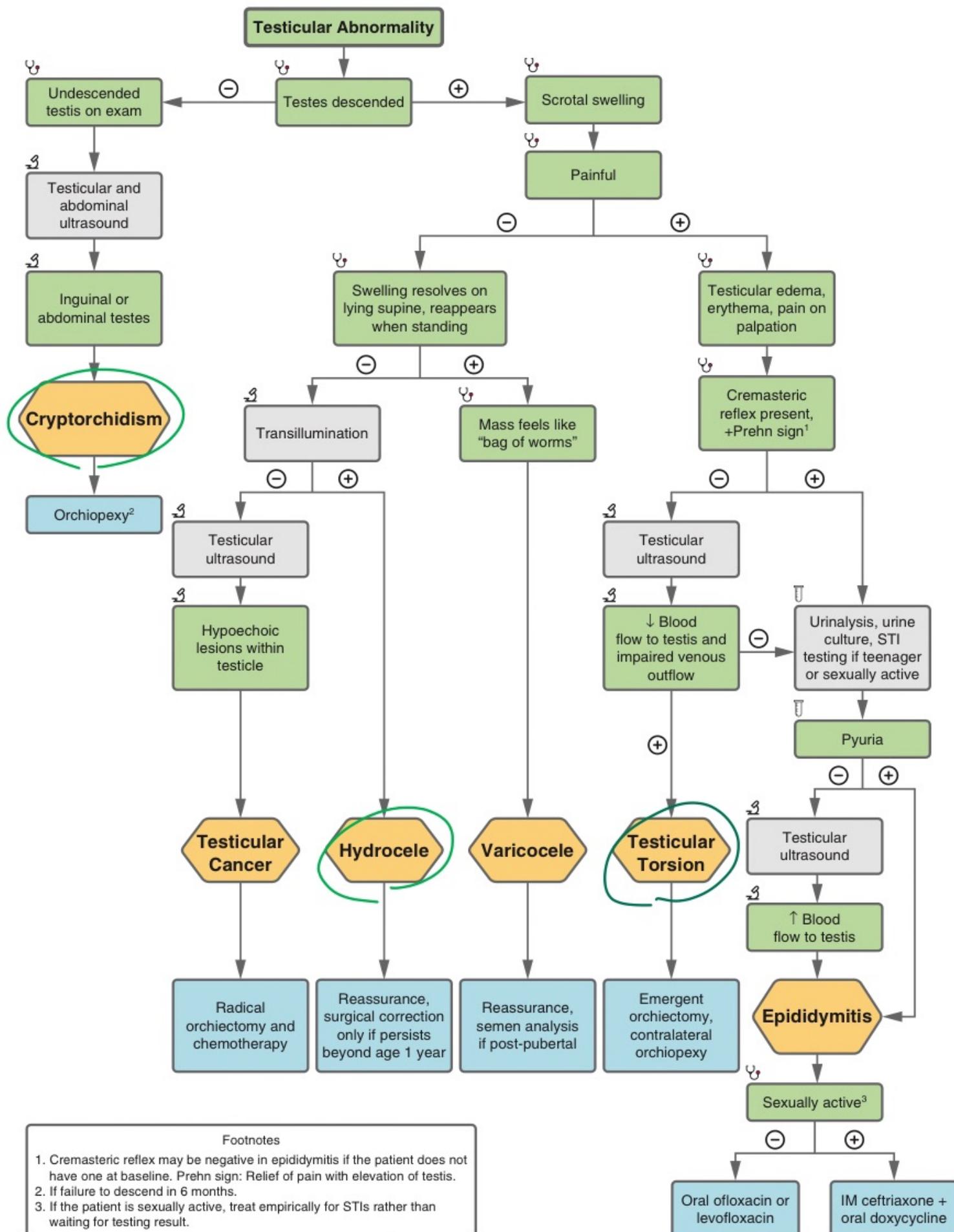
If the testis is *late cases* **nonviable**, it should be removed. (*where the testis is gangrenous*): orchiectomy

In addition, contralateral testicular fixation should be performed to prevent future contralateral torsion. (*bilateral*)

Maximal success rates are obtained when surgery is performed within 6 hours of torsion.



23-39 Testicular Abnormality



Footnotes

1. Cremasteric reflex may be negative in epididymitis if the patient does not have one at baseline. Prehn sign: Relief of pain with elevation of testis.
2. If failure to descend in 6 months.
3. If the patient is sexually active, treat empirically for STIs rather than waiting for testing result.

Archive

* **Not disease of inguinoscrotal:**

Hydrocele of the Canal of Nuck (Female Hydrocele)

* **Regarding scroto-inguinal Wrong?**

Non-Communicating hydrocele regress spontaneously

* **Orchidopexy is indicated for children with undescended testicle for all the following reasons except:**

- a. Higher incidence of accompanying hernia.
- b. Increased chance of testicular trauma.
- c. Psychological factors.
- d. development of malignancy.
- e. Lower future fertility

* **which of the following is true of testicular torsion?**

- a. It is the most common cause of acute scrotum in an 8-year old boy
- b. In children it can be reliably diagnosed by ultrasonography
- c. In neonates it is due to intravaginal torsion
- d. Scrotal inflammatory change is a late sign associated with necrosis
- e. Contralateral testicular fixation is rarely performed in case of unilateral torsion

* **Wrong regarding testicular torsion :**

conservative and antibiotics

* **The commonest cause of acute scrotal pain in a 12 years old child with no fever and normal urine analysis is:**

- A. Epididymitis
- B. Orchitis
- C. Varicocele
- D. Torsion of testis
- E. Hydrocele

* **Wrong about torsion of testicles:**

A. Surgery can be delayed up to 6 weeks.

*** In cases of torsion testis all are TRUE, EXCEPT:**

- A. Orchidopexy of the affected side only
- B. Undescended testis is more liable for torsion
- C. Orchidopexy of both testis must be done
- D. It affects young age males
- E. Clinically it simulates acute epididymo-orchitis

*** Concerning undescended testicle, all of the following are TRUE, EXCEPT:**

- A. The testis may be incompletely descended or in an ectopic site
- B. The condition may be unilateral or bilateral
- C. In neglected bilateral cases sterility usually occurs
- D. The affected testis is more liable to trauma, torsion and malignancy
- E. In unilateral cases surgical treatment has to be done just after puberty

*** The true statement concerning scrotal swelling in children.**

- A. A hydrocele usually has multiple septae.
- B. Needle drainage of a hydrocele usually provides long term resolution.
- C. Inguinal hernia in a child is treated by herniorrhaphy.
- D. Orchitis can be always treated by orchidopexy.
- E. A hydatid cyst of Morgagni is a small cystic remnant at the upper Pole of the testis.

*** Concerning torsion testicle all of the following are TRUE, EXCEPT:**

- A. The highest incidence is between 40 and 50 years of age
- B. Although acute straining is a predisposing factor some cases occur during sleep
- C. Clinically it simulates epididymo-orchitis or strangulated inguinal hernia
- D. The condition develops more commonly in the incompletely descended testicles
- E. After dealing surgically with the affected side exploration and fixation of the opposite side should be done

*** Which of the following simulates clinically torsion of the testicle:**

- A. Encysted hydrocele
- B. Communicated hydrocele
- C. Varicocele
- D. Acute epididymo-orchitis (Epididymitis)
- E. Indirect inguinal hernia