Pediatric Inguinal and Scrotal Conditions (351 Course)

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Pediatric Inguinal and Scrotal Conditions

Objectives:

-Introduction.

-Embryology.

-Inguinal hernia.

-Hydrocele.

-Undescended testis.

-Acute scrotum.

Pediatric Inguinal and Scrotal Conditions

Introduction:

-Inguinal hernia, hydrocele and undescended tesis are common groin condition in infants and children.

-They share a common embryological orgin.

-They may present in isolation or combination in the same patient.

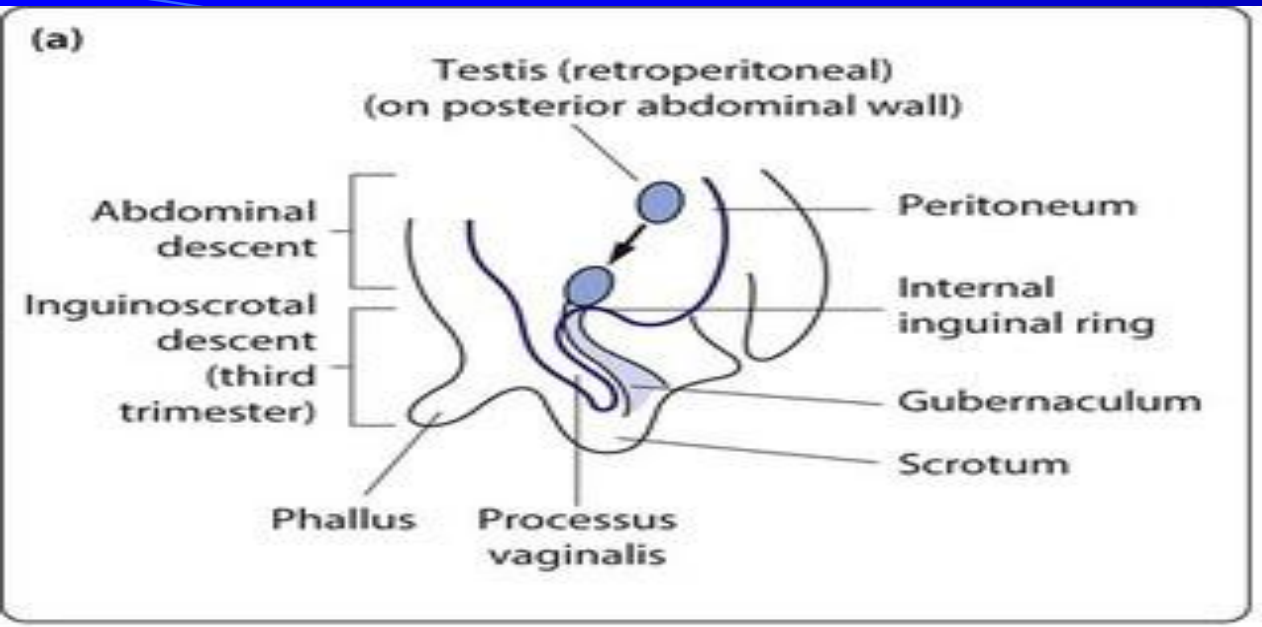
-Accurate clinical distinction is very important as the management and outcome is different in each condition.

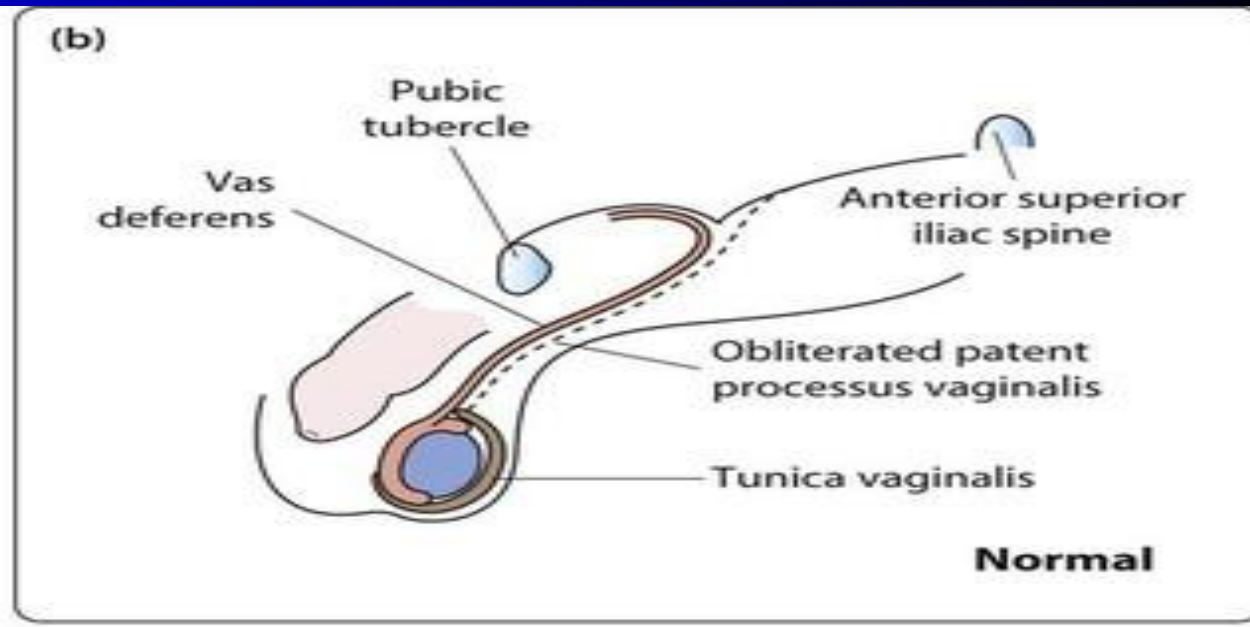
What is process vaginalis (PV) ?

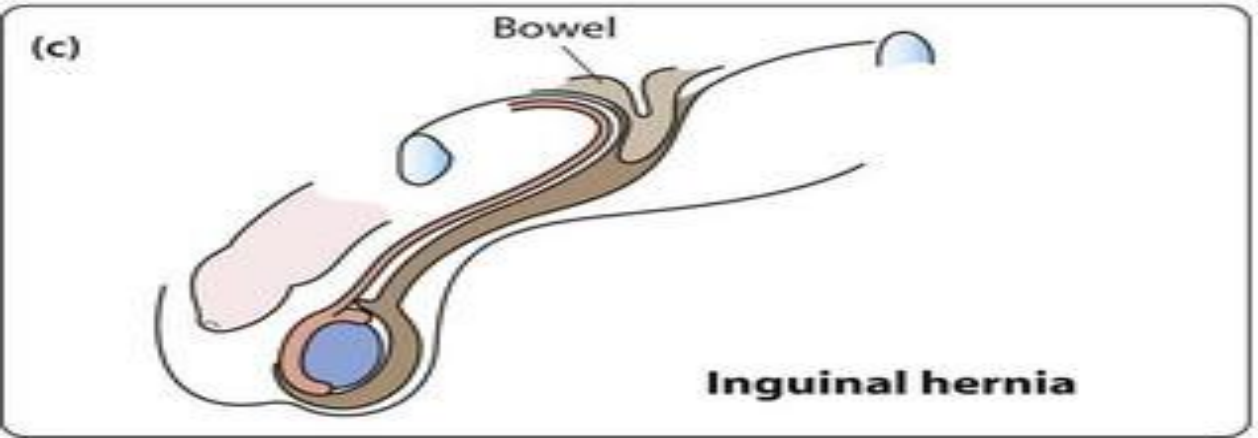
Is outpoutching of peritoneum at deep ring and extends through inguinal canal down to scrotum, associated with normal descend of testis. At 36-40 of gestation the testis reaches the scrotum and PV gradually obliterates.

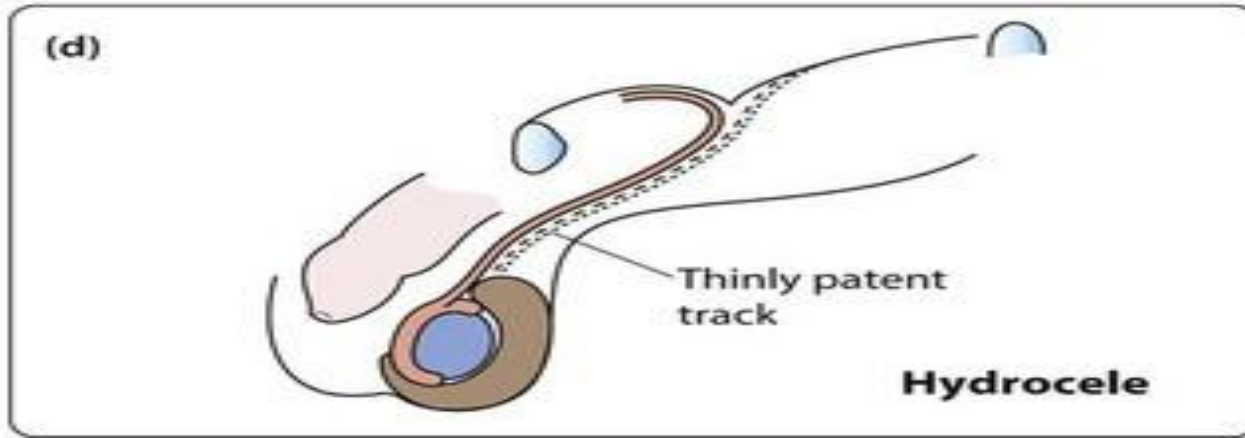
Pediatric Inguinal and Scrotal Conditions

Embryology:









Inguinal Hernia

Definition:

is an indirect hernia related to failure of closure of the patent processus vaginalis (PPV) at the deep inguinal ring. Intra-abdominal contents pass within a PPV, through the deep inguinal ring, inguinal canal, superficial inguinal ring and potentially into the scrotum (male) or via the canal of Nuck to the labium (female)

Inguinal Hernia

Incidence:

-Approximately 1-5% of all children will develop IH.

- Newborns incidence 3-5%.
- Over all incidence in premature infants 10-30%.
- Positive family history in about 10%.
- More common in boys than girls (5 :1).
- In boys, rt sided found in 60% ,lt sided in 30% and bilateral in 10%.
- In girls , laterality is equal.

Pediatric Inguinal and Scrotal Conditions

Inguinal Hernia:

Risk Factors:

-prematurity.

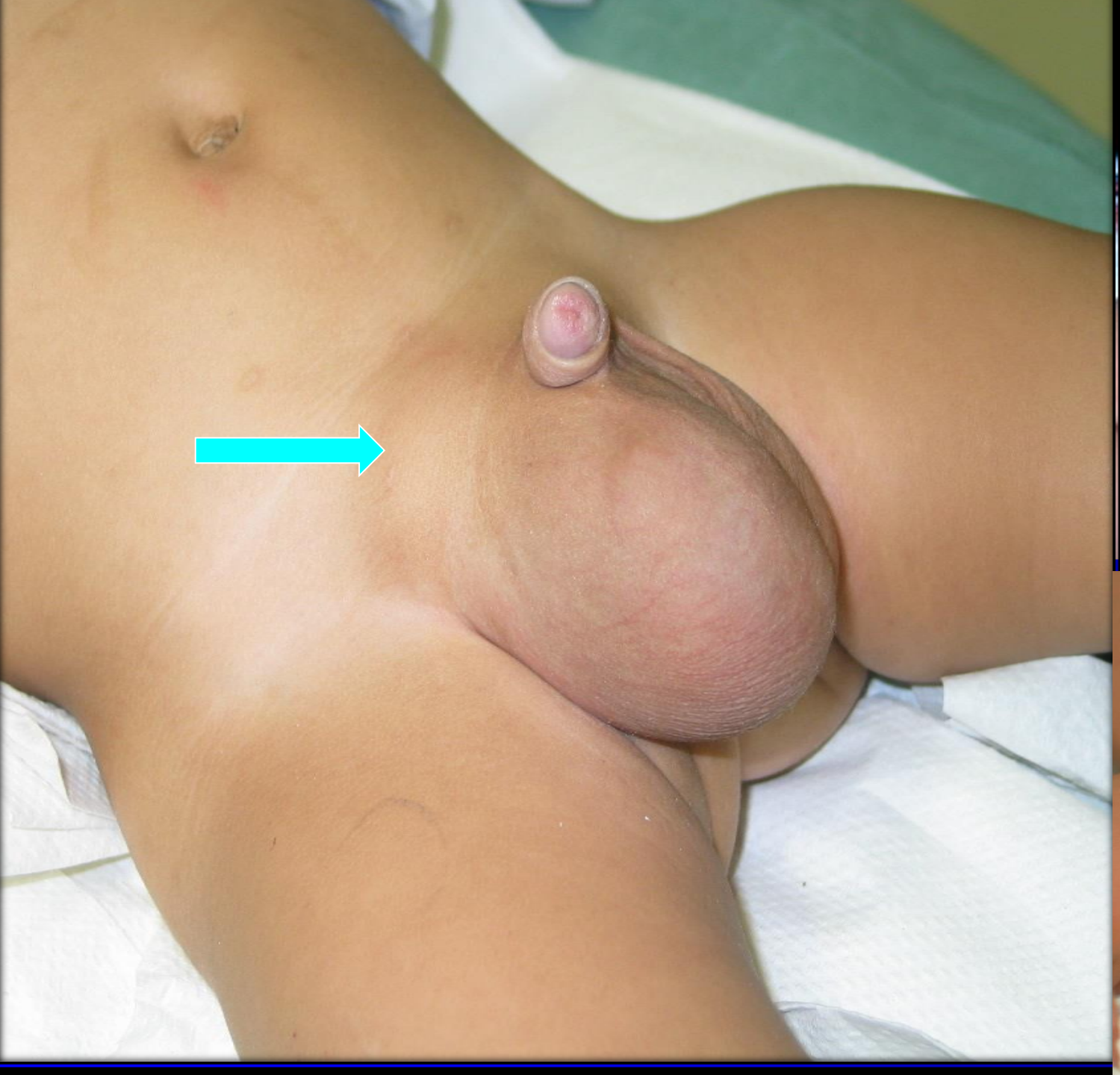
-connective tissue disorders.

- ventriculo-peritoneal shunt (VP shunt).
- -peritoneal dialysis(PD).
- Ascites (any conditions cause increase intra-abdominal pressure).
- Undescended testis.
- -others

Inguinal Hernia

Clinical presentation:

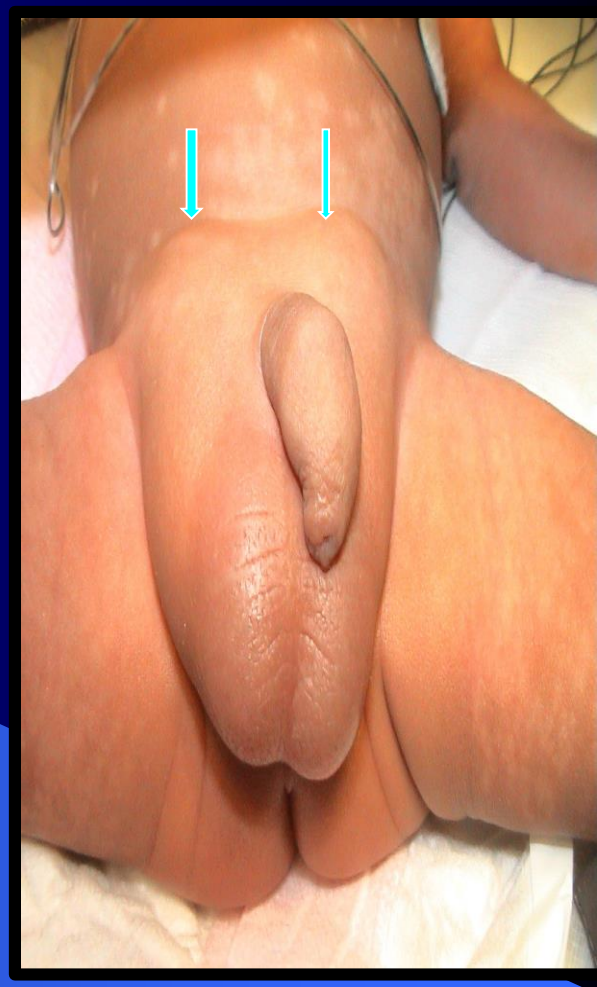
- Most hernias are asymptomatic except for intermittent inguinal bulging with straining (crying, coughing ,defecation ,etc.)
- They are often found by parents .
- Inguinal Pain is rare unless hernia gets complicated.
- On examination, often the hernia is reduced and no bulge is seen. Provocative manoeuver such as standing , coughing, laughing or jumping are required to elicit it.
- Examination should include scrotum and testes.



Inguinal Hernia

Clinical presentation:(Incareceration/Irreducability)

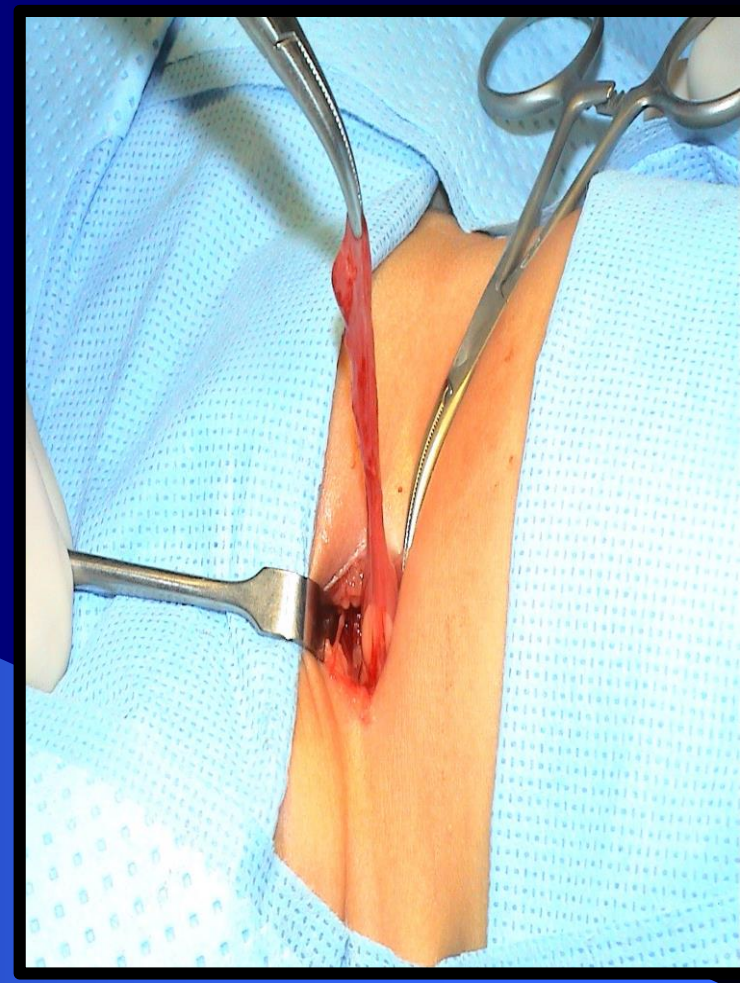
- The inciedence range from 12-17 %.
- Younger age(below 6 months) and prematurity are risk factors.
- As fussy infant with intermittent abdominal pain and vomiting.
- A tender and sometime erythermatous irreducible mass is noted in the groin.
- Incarceration may be the first presenting sign of the hernia.
- On examination , the infant is usually irritable, in pain, with tender groin swelling which can not be reduced with gentle pressure.
- Incarceration will result in bowel obstruction and if not treated will progress to strangulation(bowel ischemia).
- Severe pain , prolonged incarceration,fever, tachycardia, and vomiting are suggestive of strangulation (rare presentation)



Inguinal Hernia

Management:(Uncomplicated IH)

- IH will not resolve spontaneously and surgery is only the treatment .
- Open inguinal herniotomy (more common approach) .
- Laparoscopic herniotomy (less popular) .
- Preterm babies usually have their hernias repaired before discharge from nursery to avoid incarceration.
- - Infants and children should have their surgery done within weeks (OR availability) .



Inguinal Hernia

Management:(Incarcerated IH)

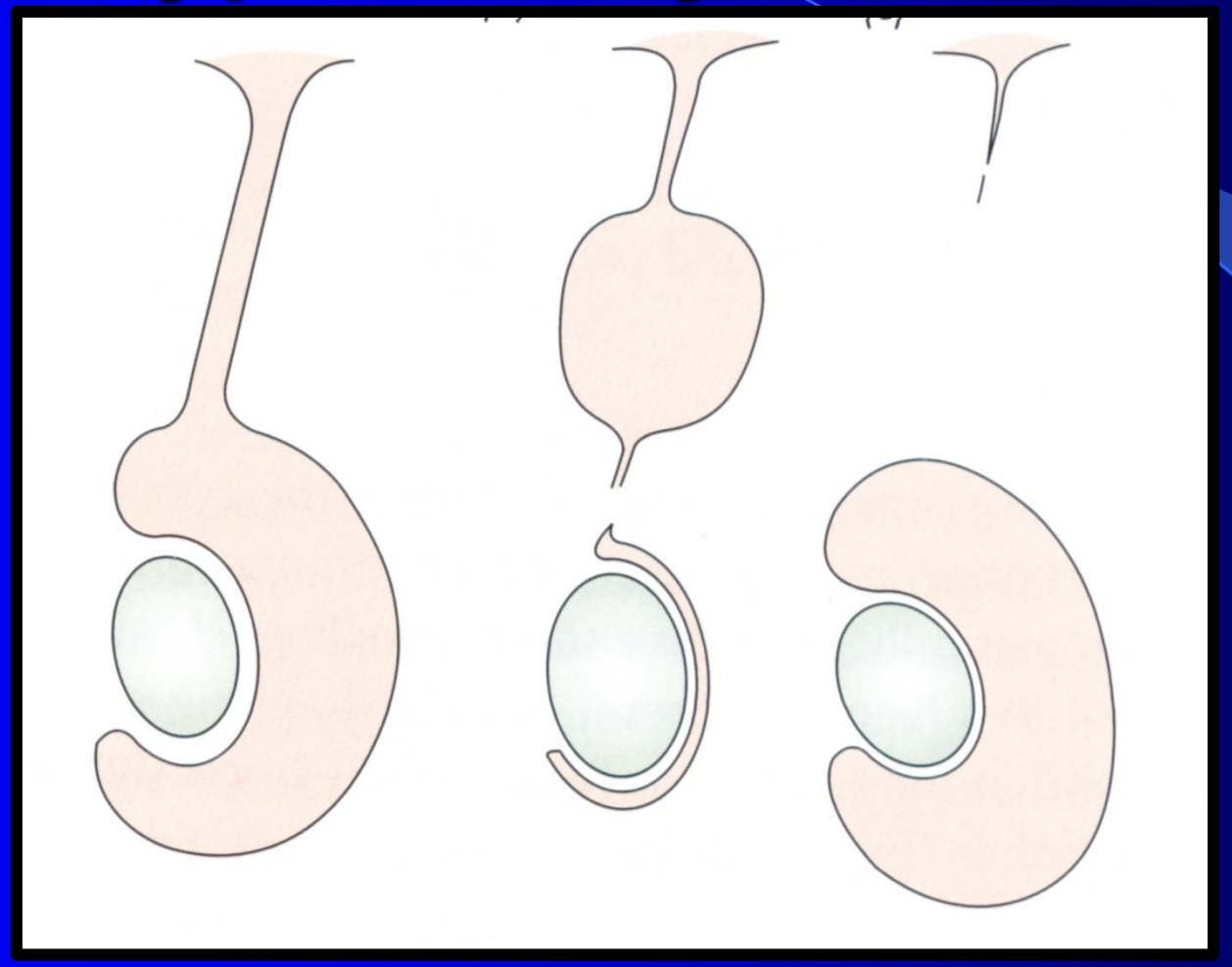
- The presence of peritonitis or septic shock is an absolute contraindication to attempted reduction.
- Intravenous access and rehydration.
- Monitored conscious sedation.
- Firm and continuous pressure is applied around the incarceration.
- Successful reduction is usually confirmed by sudden pop of contents back to abdominal cavity.
- Over 90-95% of incarcerated IH can be successfully reduced.
- Once hernia is reduced ,a delay of 24-48h is allowed before herniotomy (resolution of edema and inflammation)
- Urgent operation (Herniotomy) is necessary if reduction fails.

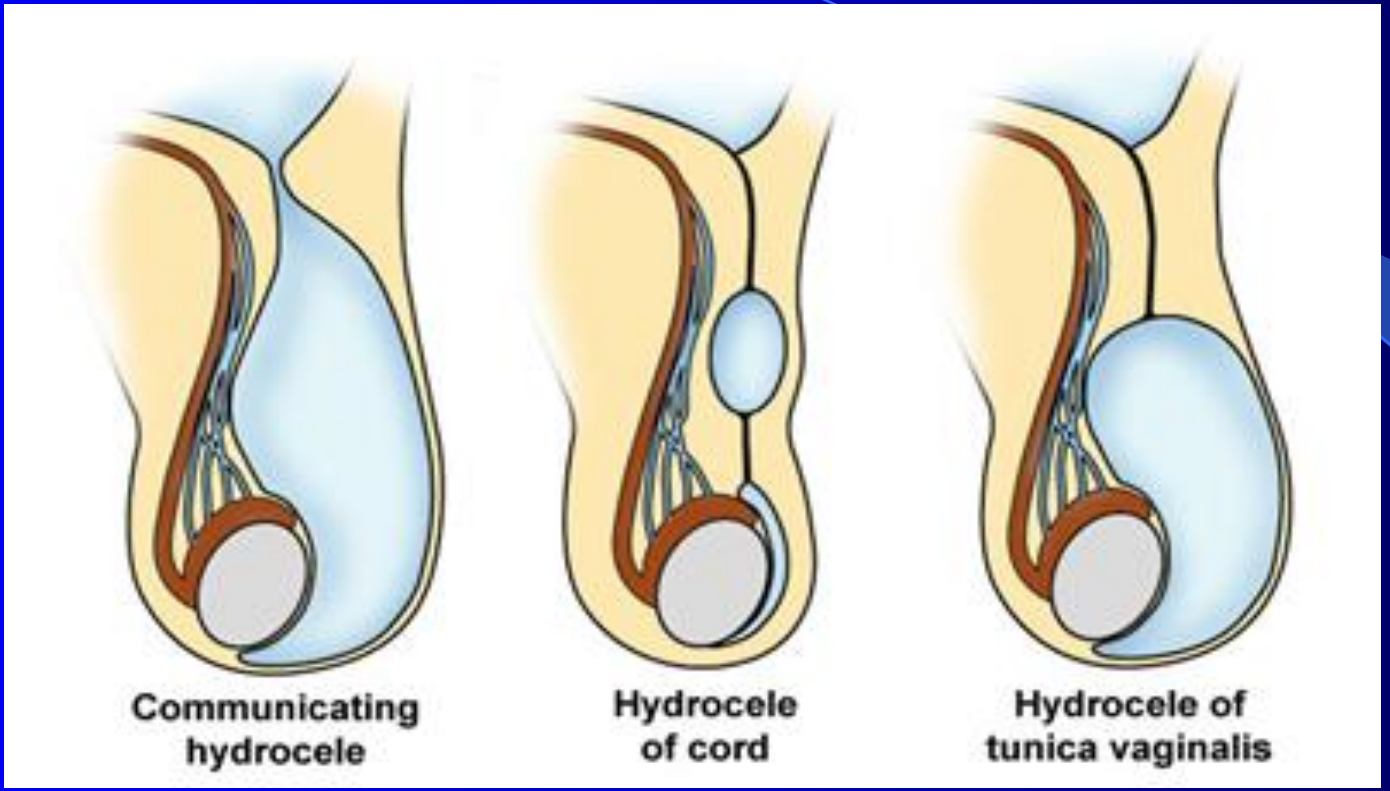
CONGENITAL HYDROCELE

Definition:

- An abnormal collection of fluid in the process virginals which fails to obliterate resulting in swelling in the scrotum and groin.
- Approximately 5% of boys at term have hydrocele.
- Less common in girls and known as a hydrocele of the canal of nuck.

Types of Hydrocele




Communicating hydrocele
Hydrocele of cord
Hydrocele of tunica vaginalis

CONGENITAL HYDROCELE

Clinical presentation:

- Painless scrotal or groin swelling , but mostly scrotal.
- Increase in size following viral infection.
- On examination , tense , overlying skin is often has a blue tinge. Not reducable , transilluminte , difficult to palpate the testis separately.

CONGENITAL HYDROCELE

Management:

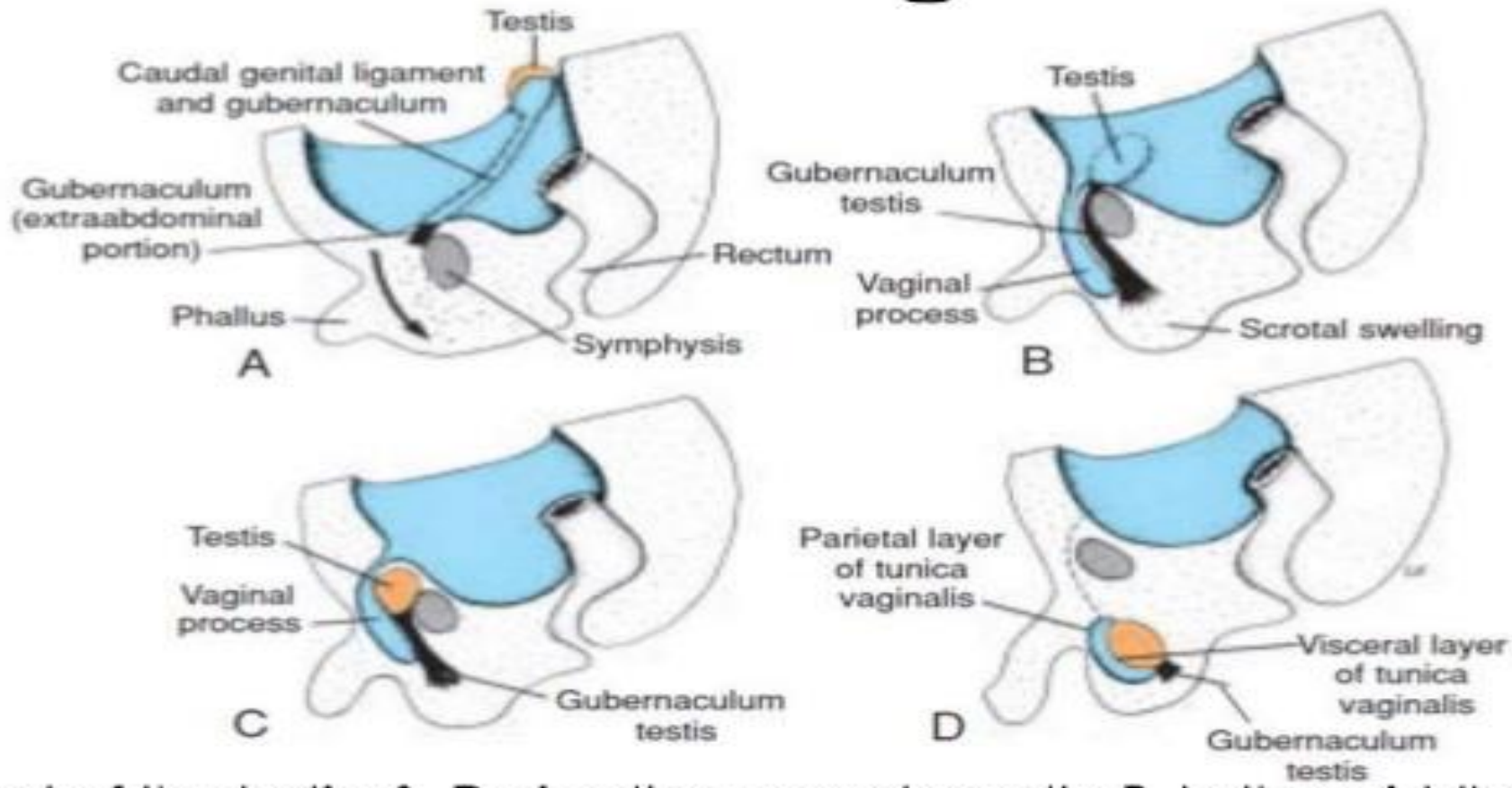
- Expectant management(observation) in the first two years of age.
- By the age of 2 years 90% of hydoceles will have resolved.
- Surgery (hydrocelectomy /high ligation of PPV) is indicated if the hydrocele fails to resolve by age of 2 years.

UNDESCENDED TESTIS (CRYPTORCHDISM)

Embryology:

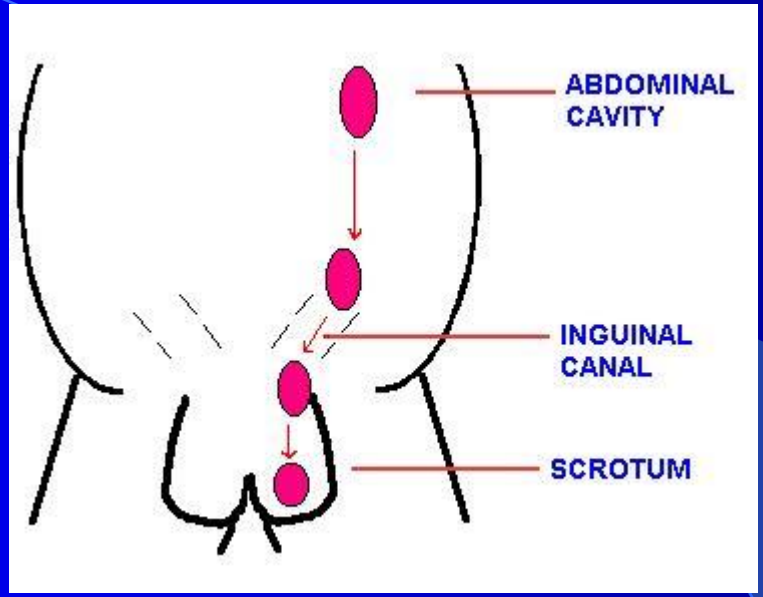
- Normal testis developed from gonadonephric ridge .
- Normal testis descends across the abdomen to deep inguinal ring between 8-15 weeks of gestation under control of AMH.
- Second phase of descent , the testis moves through the inguinal canal into the scrotum (25-35 weeks of gestation) under control of androgens.
- Testicular development and descent depend on interaction among endocrine, paracrine, growth and mechanical factors.

descent of gonads

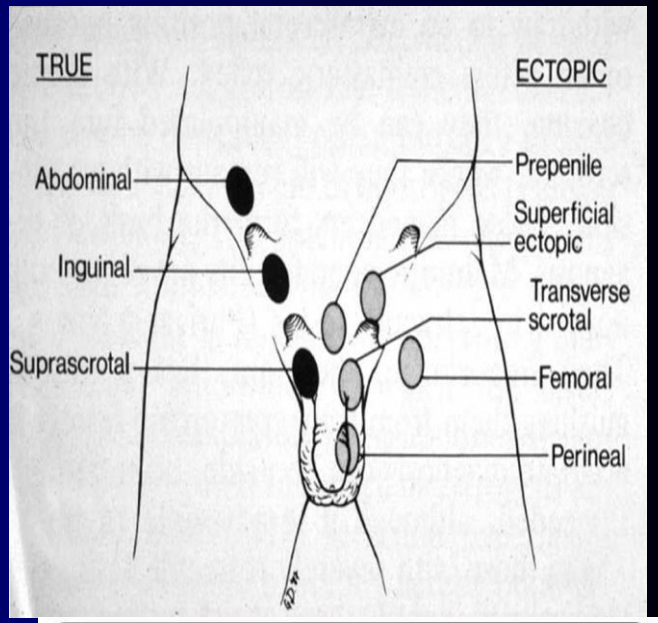


Descent of the testis. **A**. During the second month. **B**. In the middle of the third month. Peritoneum lining the coelomic cavity evaginates into the scrotal swelling,where it forms the vaginal process (tunica vaginalis**). C**. In the seventh month. **D**. Shortly after birth. *'langman Medical Embrology"*

Embryology:



UNDESCENDED TESTIS (CRYPTORCHDISM)

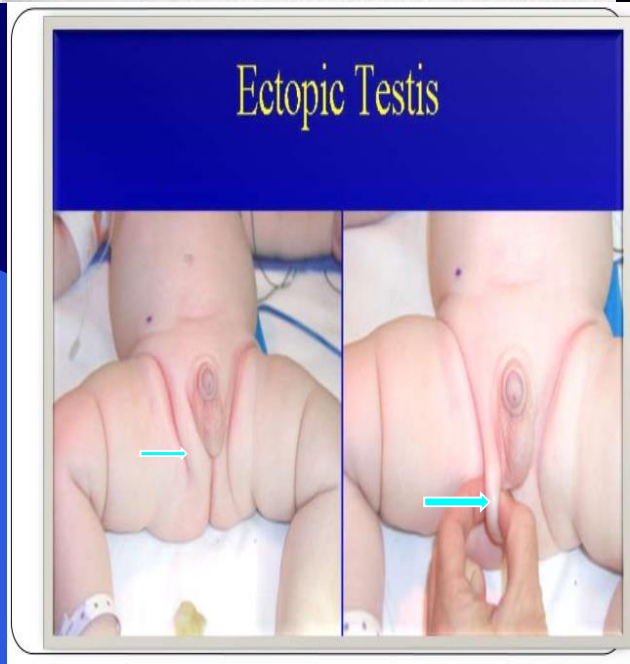


Definition:

Undescended testis (UDT): is arrested along its normal path of descent.

Retractile testis: is a testicle that may move back and forth between the scrotum and the groin .can be manipulated into scrotum where it remains without tension.

Ectopic testis: is located outside of normal path of descent.



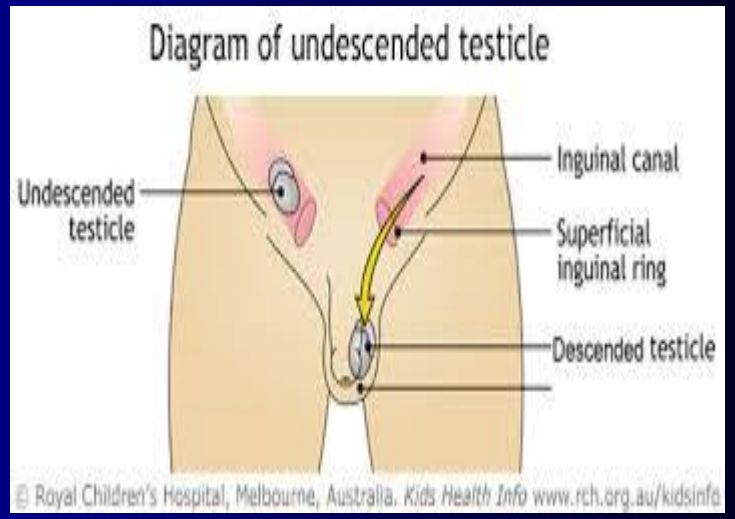
UNDESCENDED TESTIS (CRYPTORCHDISM)

Incidence:

-UDT occurs in approximately 1-3% of term infants and 33-45% of premature infants.

- Occurs on the rt side in 50% , lt 35%, bilateral 10-15%.

UNDESCENDED TESTIS (CRYPTORCHDISM)



Clinical presentation:

- Empty scrotum.
- -Absence of one or both testes.
- Swelling in the groin (testis or hernia).
- On examination, hemi-scrotum is underdeveloped/ hypo plastic
- Testis is palpable in the groin and fails to comedown to scrotum in 80% of cases.
- Testis is impalpable /non- palpable in the remaining 20% of cases (intra-abdominal , atrophied , or agenesis).

UNDESCENDED TESTIS (CRYPTORCHDISM)

Management:

A- Hormonal treatment:

The role of hormonal therapy is controversial.

LHRH and HCG are used with varying degree of success.

B- Surgical treatment (orchidopexy) the treatment of choice.

The best timing is between 6-12 months of age.

UNDESCENDED TESTIS (CRYPTORCHDISM

Management :

- B- Surgical treatment :
  - Palpable unilateral or bilateral → orchidopexy.
  - Impalpable/ nonpalpable :
  - ➢ Radiographic imaging (US , CT, MRI)
    is rarely helpful in locating nonpalpable testis .
  - ➢ Diagnostic laparoscopy is the preferred approach
    - If testis is intra-abdominal ⇒ Lap assisted orchidopexy .
    - If atrophic ⇒ inguinal exploration and excision.
    - if agenesis ⇒ nothing to be done


A
B
C

UNDESCENDED TESTIS (CRYPTORCHDISM)

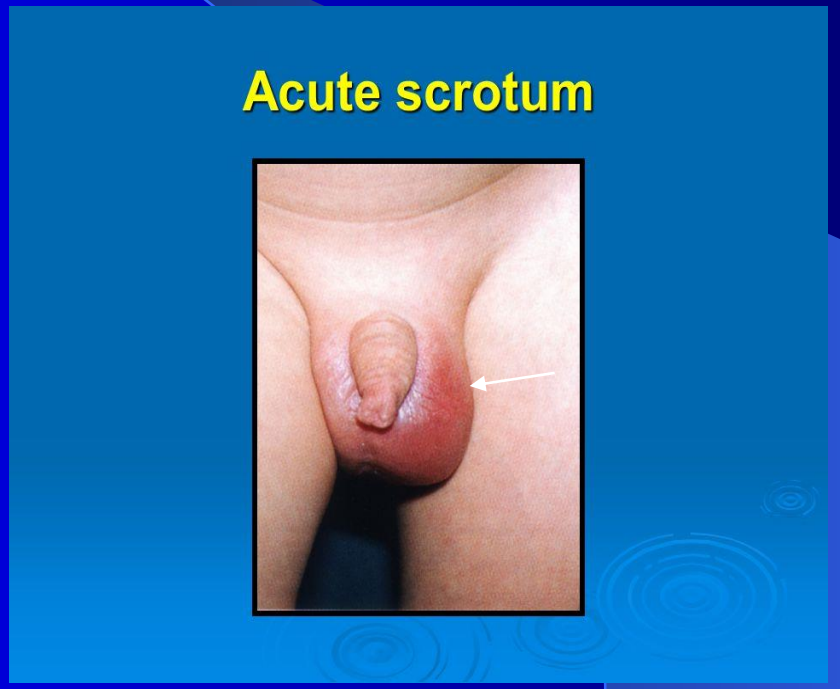
Indication for surgery : (benefit of orchidopexy)

- ✓ To optimize fertility.
- ✓ To potentially reduce malignancy rate (controversial)
- ✓ To place testis in examinable position to detect malignancy early.
- ✓ To reduce risk of torsion.
- ✓ To reduce risk of trauma.
- ✓ To optimize hormonal function.
- ✓ To repair the associated hernia(90% of UDT)
- ✓ For cosmetic and psychological reasons.

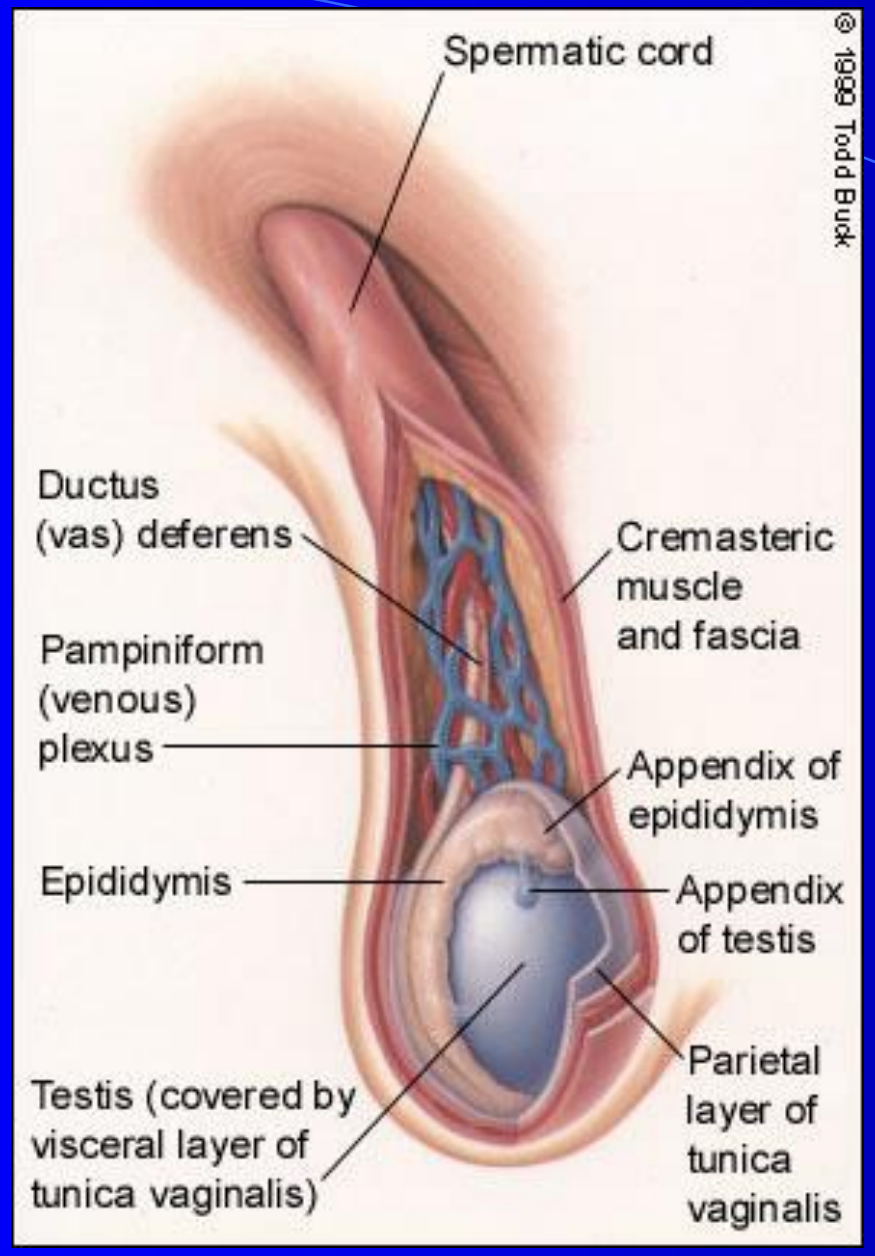
ACUTE SCROTUM

Definition:

Acute scrotal pain with or without swelling and erythema.



Anatomy



Anatomy of the normal (right) testis and spermatic cord.

ACUTE SCROTUM

DDx of an acute scrotum

- Torsion of the testis.
- Torsion of the appendix testis /epididymis.
- Epididymitis / orchitis.
- Idiopathic scrotal edema (dermatitis, insect bite)
- Inguinal hernia (incarcerated).
- Trauma /sexual abuse.
- Vasculitis (Henoch-schonlein purpura).
- Cellulitis.
- Others.

ACUTE SCROTUM

Approach to acute scrotum:

Early recognition and prompt managent are very important because of the possibility of testicular torsion as the etiology with permanent damage to the testis.

1- History :

- Timing (time of onset and length)
- Pain character, onset and course (sudden vs gradual, constant vs intermittent)
- Location (testes, scrotum or abdomen)

Quality (sharp, dull)

- History of trauma.

ACUTE SCROTUM

Approach to acute scrotum:

2- Examination:

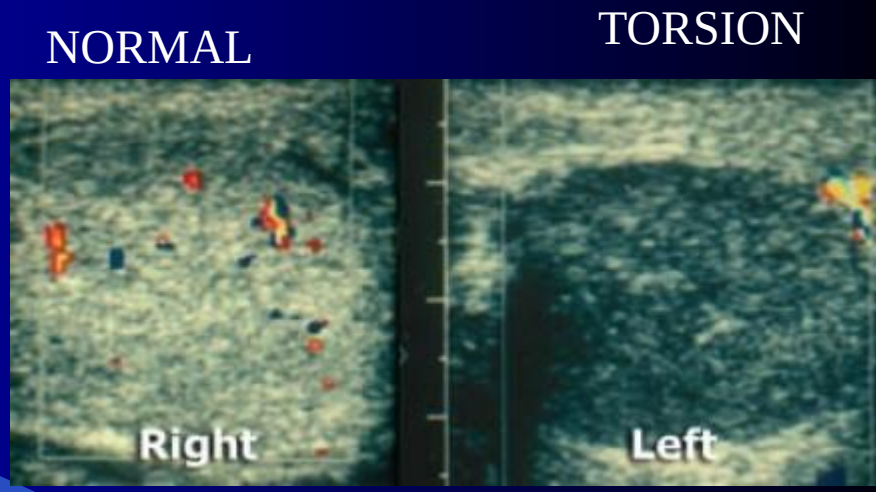
- Overall inspection of patient and comfort level
- Abdominal, inguinal, and genital exam required
- Test the cremasteric reflex first

  Absence of reflex may be most sensitive indicator of torsion of the testes
- Begin with unaffected side
- Palpate testes, spermatic cord, epididymis and inguinal region.
- Evaluate lie, size, masses and mobility of testis.

ACUTE SCROTUM

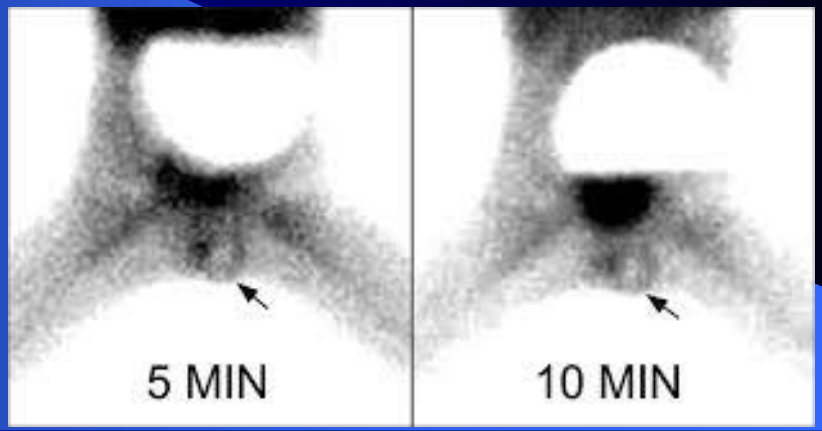
Approach to acute scrotum:

2- Investigations:



Done when testicular torsion is difficult to diagnosis.

- Urine analysis.
- Us with color flow Doppler. (sensitivity 90% specificity 99%).
- radionuclular imaging (Sensitivity 90-100%)



Imagimg studies should not delay scrotal exploration when there is a high suspicion of torsion.

ACUTE SCROTUM

MANAGEMENT:

Testicular torsion:(the only surgical cause)

- Testicular torsion is a clinical diagnosis.
- Imaging studies usually are not necessary and ordering them may waste valuable time when the definitive treatment is surgical.
- Timing is critical 4-6 H.
- Scrotal exploration if any doubt.
- If testis is viable untwist anticlockwise and fix both sides.
- If testis is is not viable needs excision and fix the other side.

Fixing contralateral testis to reduce the torsion in the future.

ACUTE SCROTUM

MANAGEMENT:

Other causes:(non-surgical)

- Epididymoorchitis : Antibiotics.

- Torsion of appendix testis/epididymis :self limiting condition , if discover before exploration can be treated conservatively ,but if found at exploration needs excision.

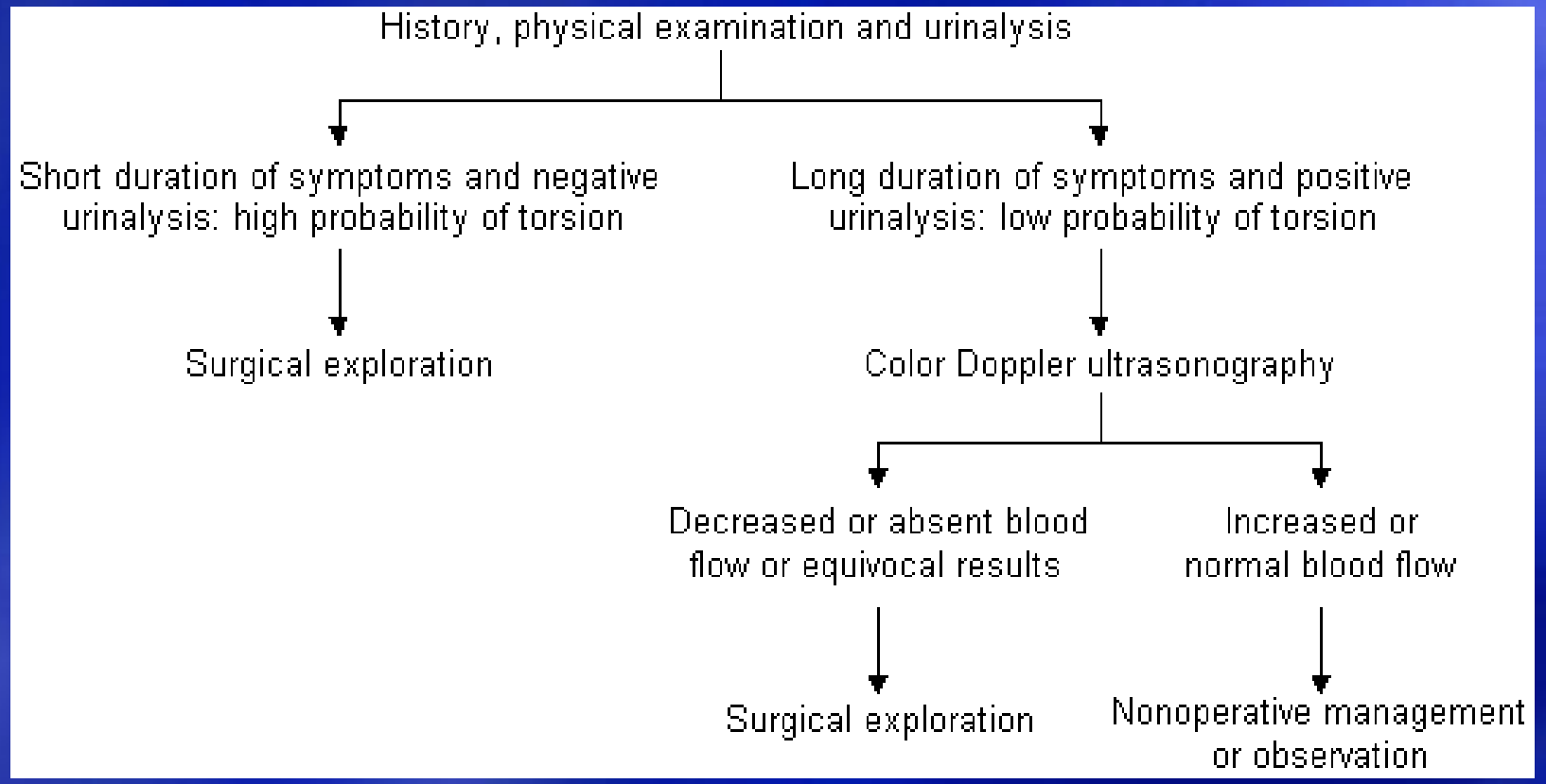
ACUTE SCROTUM

MANAGEMENT:

Other causes:(non-surgical)

- Idiopathic scrotal edema: Self limiting condition treated with analgesia and observation.
- Traumatic orchitis : conservative treatment.

Go By



Protocol for the diagnosis and treatment of the acute scrotum.

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References:

1-Ashcraft's Pediatric surgery. 6 edition By Holecomb etal.

2- Congenital inguinal hernia, hydrocele and undescended testis. By A Kate khoo and Stewart j cleeve. Surgery . May , 2016 v34 issue 5 page 226-231.