

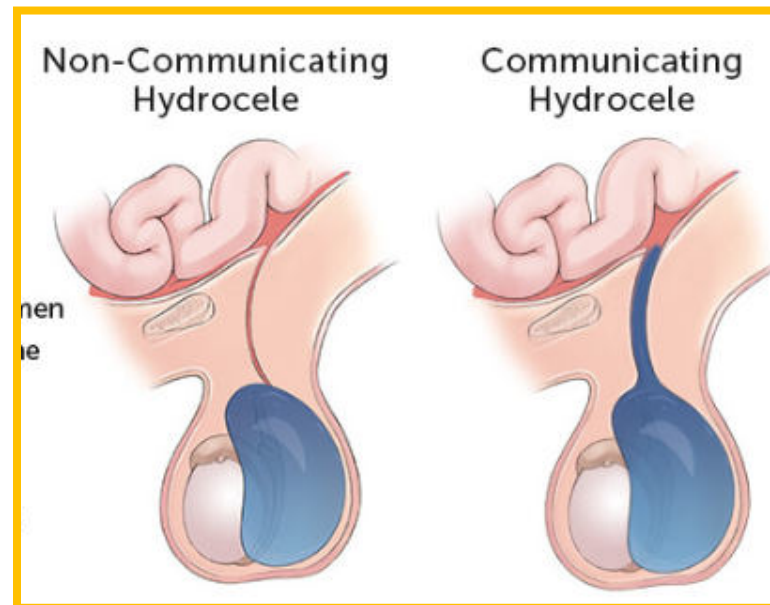
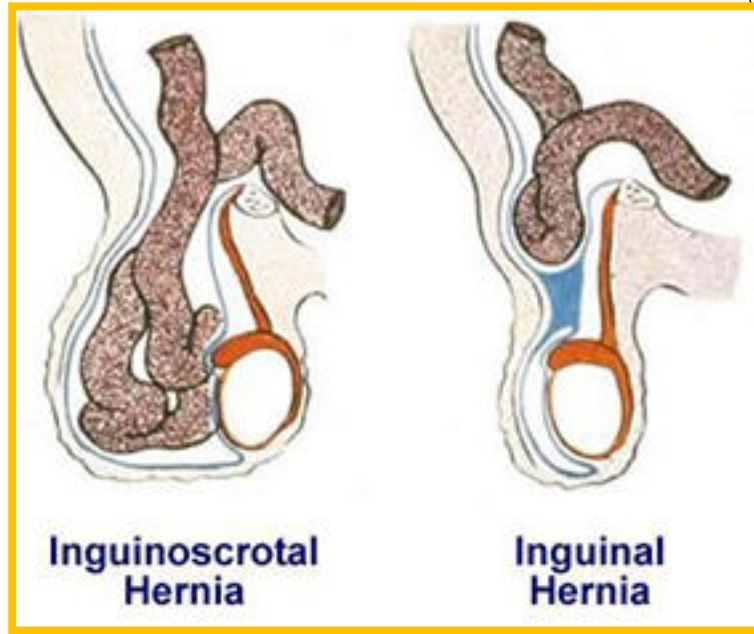
CONGENITAL HYDROCELE AND HERNIA



- 'Inguinal hernia and hydrocele have a common etiology, and the surgical correction of both pathologies is similar'.

DEFINITIONS

- Hernia : Protrusion of a part or whole of a viscus through a normal or abnormal opening in the wall of its containing cavity.
- Hydrocele : Collection of fluid in the tunica vaginalis sac.



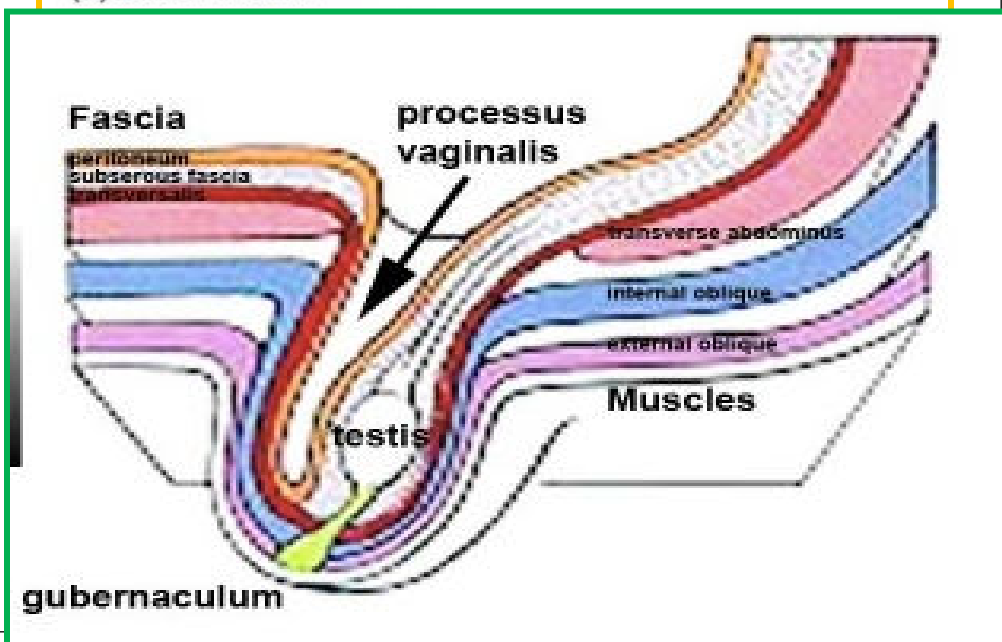
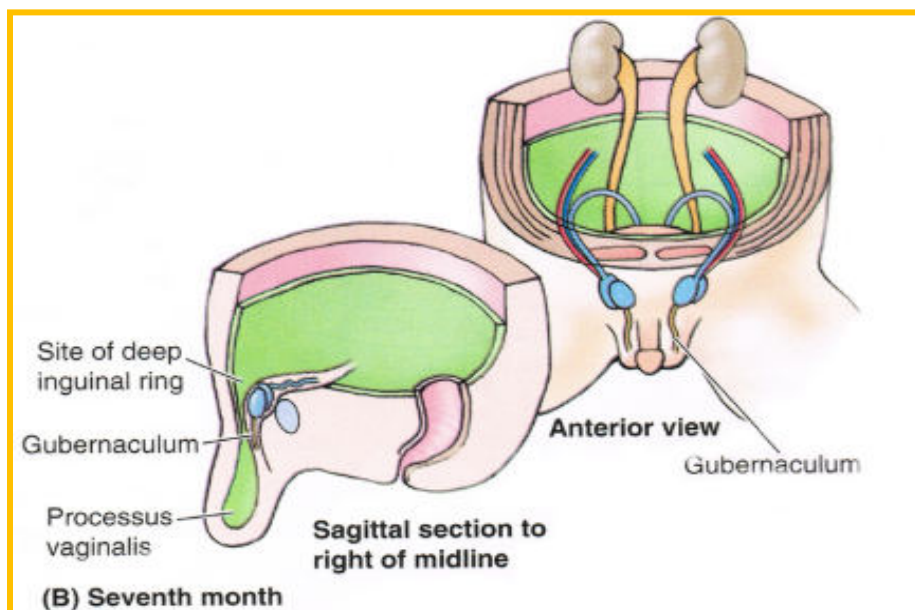
Must answer questions ?

- 1. Is it Reducible or Cough Impulse?
- 2. Is the swelling Confined Scrotal?
- 3. Can you identify the testes?
- 4. Can you get above the swelling?



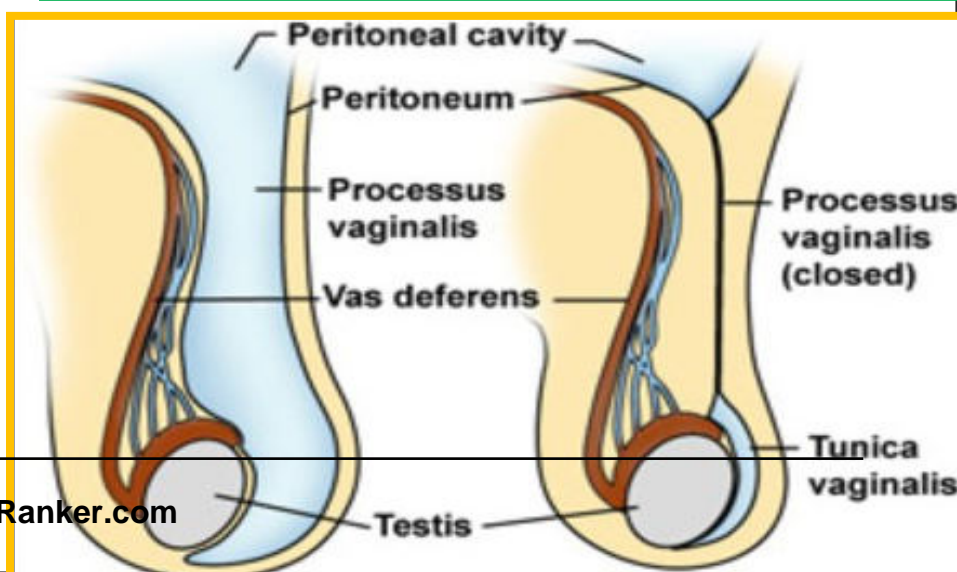
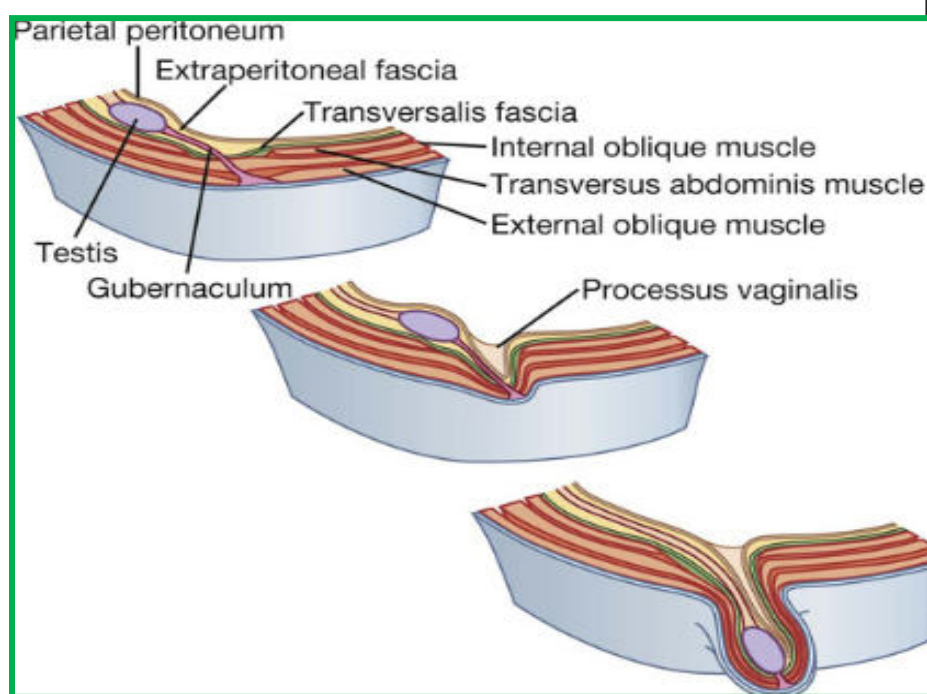
WHAT IS PROCESSUS VAGINALIS?

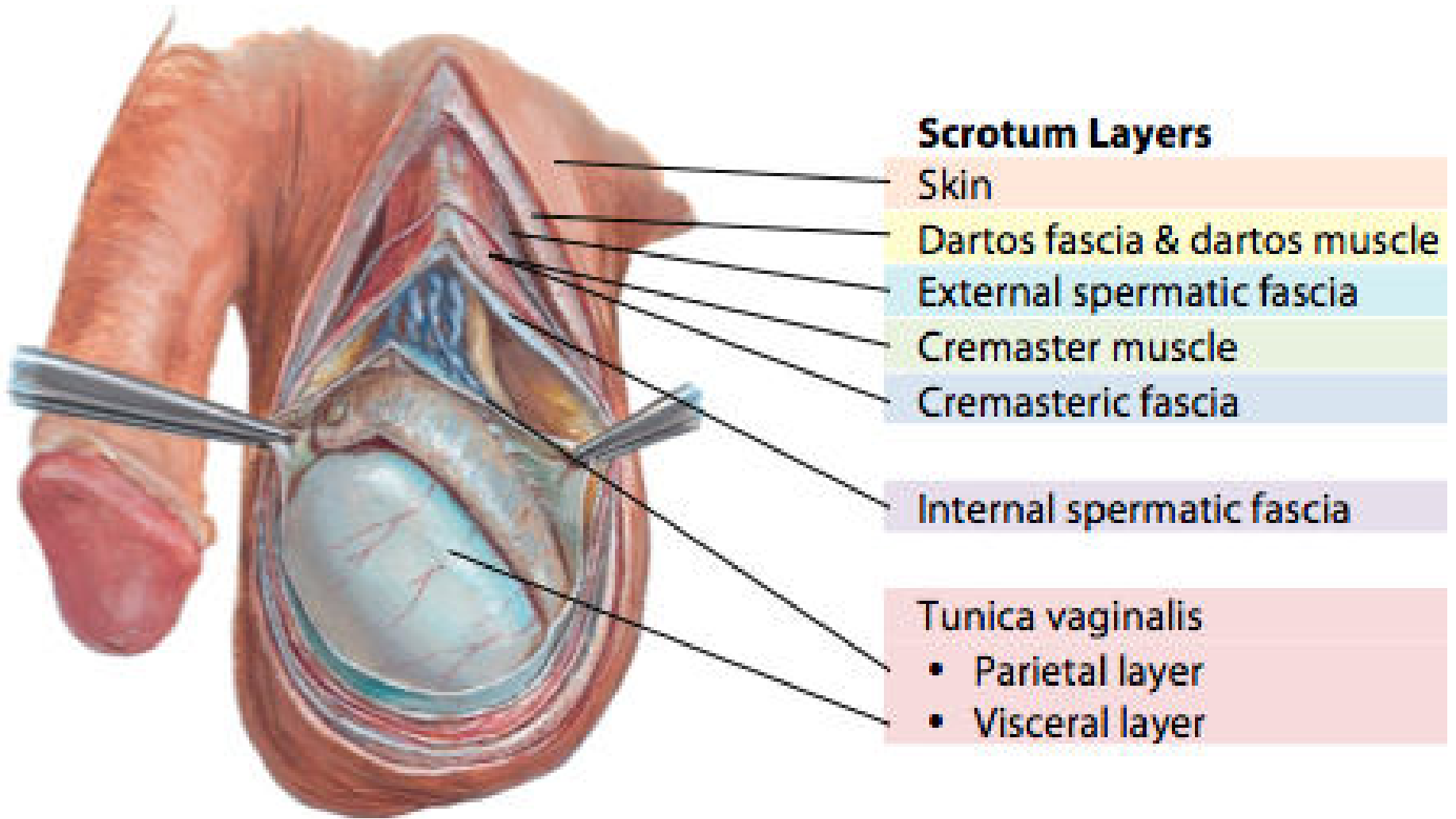
- **Outpouching** of peritoneum that extends through the inguinal canal.
- **First seen** during the 3rd month of intrauterine life.
- **It Follows** the gubernaculum and testis through the inguinal canal and reaches the scrotum by the 7th month of gestation.



What normally happens to PV after testicular descent?

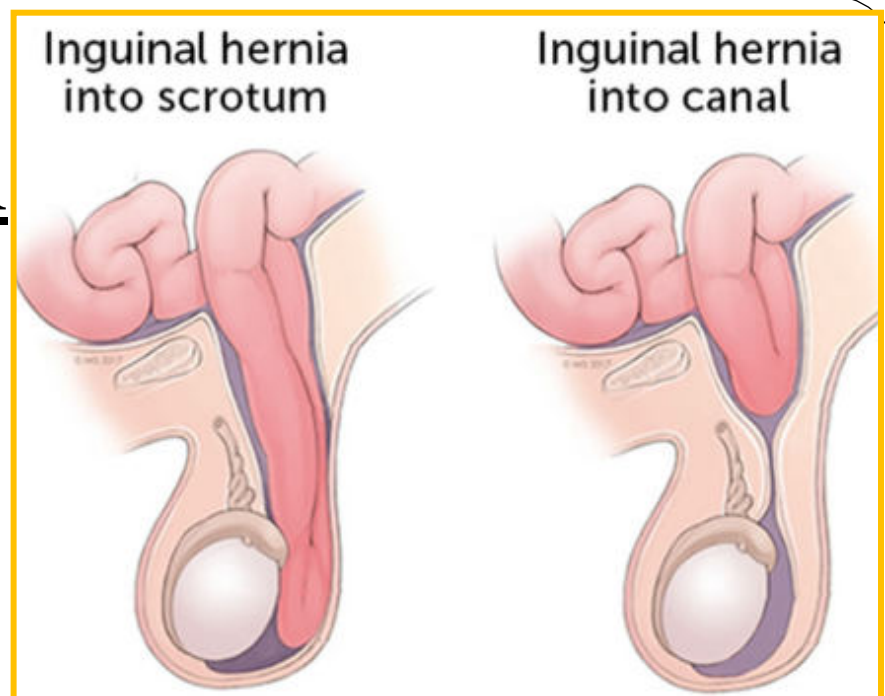
- **The portion of PV** surround the testis becomes tunica vaginalis.
- **PV Obliterate**, eliminating the communication between peritoneal cavity and scrotum.
- Up to **80%- 100%** born with a patent PV
- Closure- most likely to happen within the first 6 months of life
- **PPV**: up to 20% in adulthood





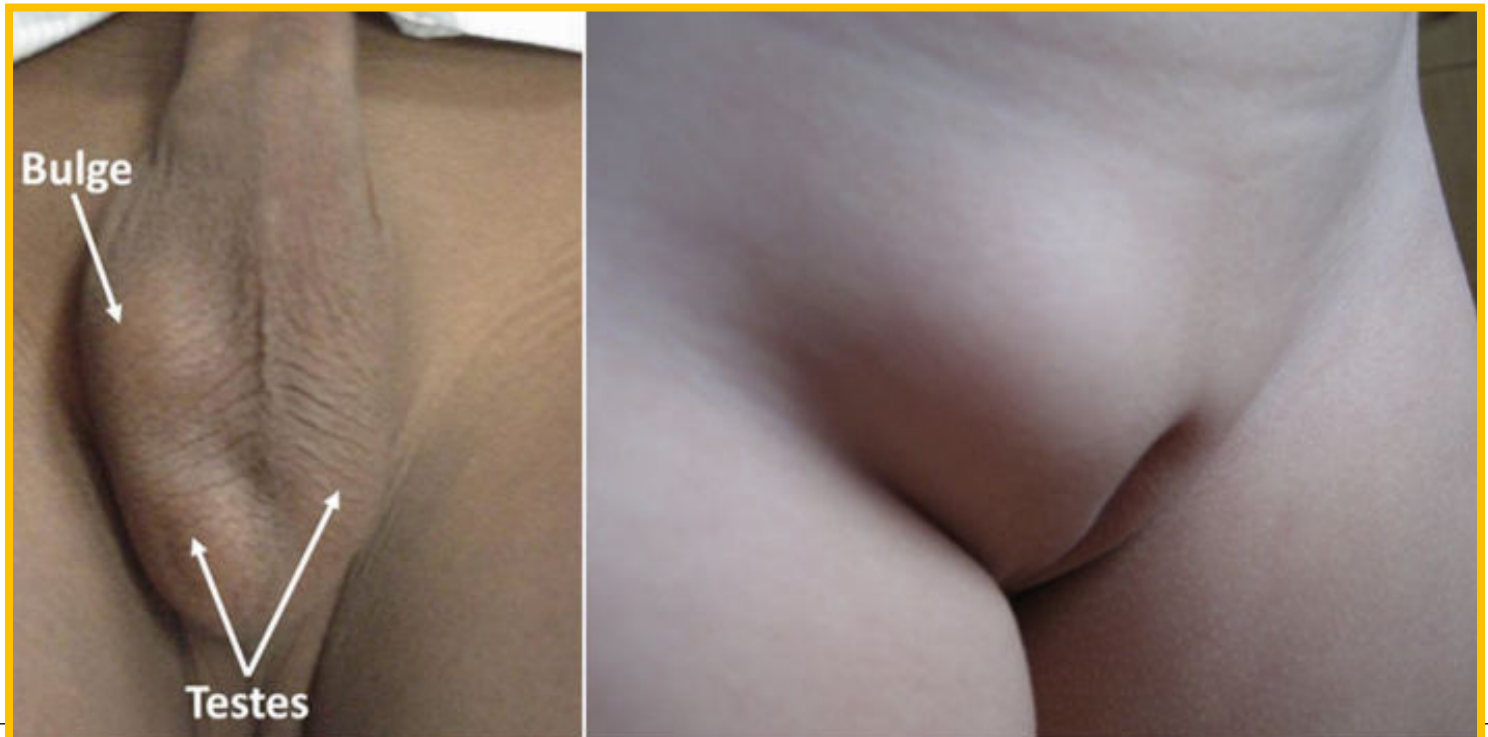
INGUINAL HERNIA

- Most common surgical condition in children
- Incidence : 0.8-4.4%
- Most commonly 1st year- peak in first 3 months of life.
- Almost always indirect hernias (through deep inguinal ring).
- Not resolved spontaneously.
- Risk of incarceration.
- Should always be repaired.



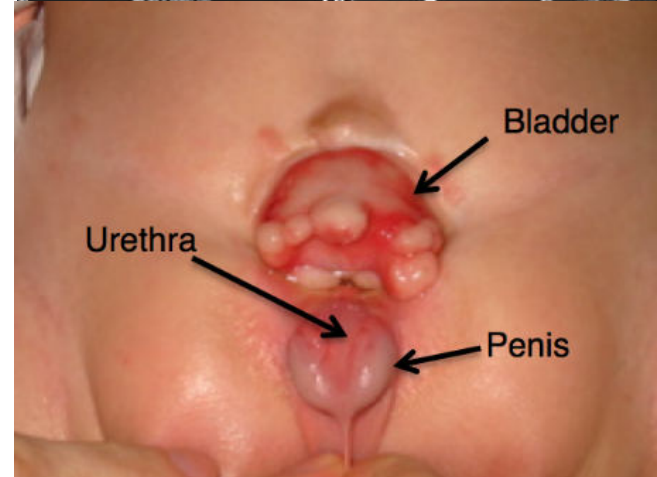
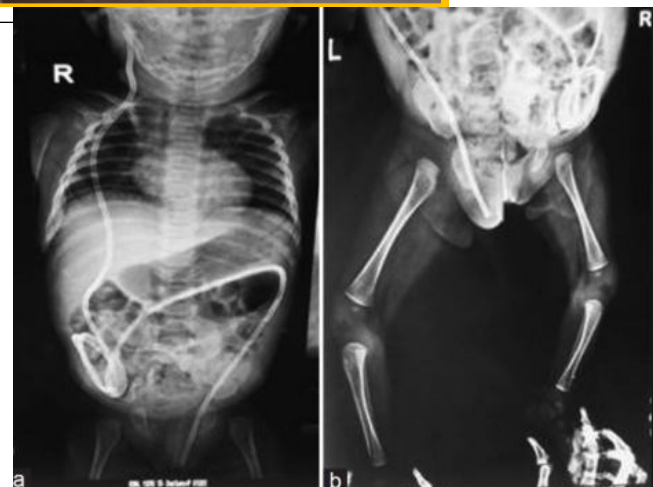
INGUINAL HERNIA

- Up to 5% in Fullterm; **16-25%** in Preterm
- Up to 30% in wt <1000g and **60%** in wt. < 750g
- Up to **10:1:: M: F** ratio
- **60%** right side; 30% left side; 10% bilateral



Increase incidence in:

- **Increased amounts of peritoneal fluid**
Ventriculoperitoneal shunts & Peritoneal dialysis.
- **Increased intraabdominal pressure**
Repair of Gastroschisis or Omphalocele, meconium ileus.
- **Associated urogenital conditions**
Undescended testis & Bladder exstrophy
- **Connective tissue disorders**
Ehler-Danlos, Marfan, Hunter Hurler syndromes.



DIAGNOSIS

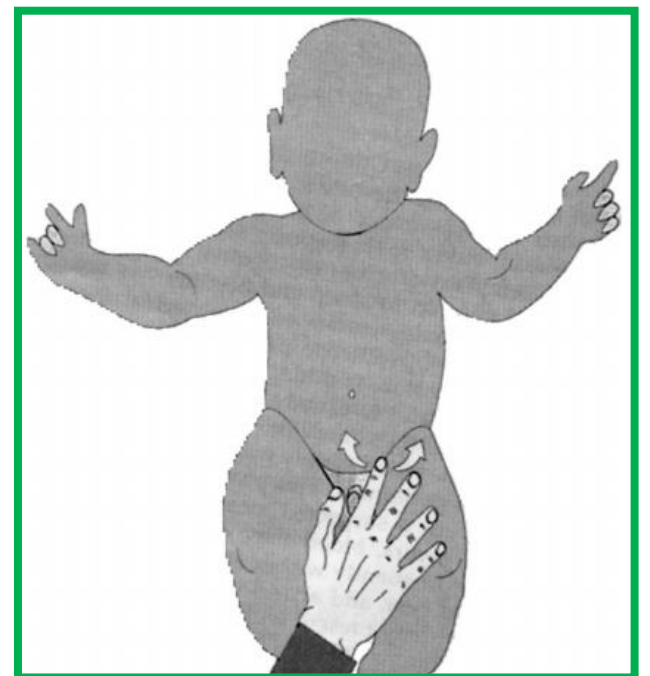
'The diagnosis of inguinal hernia is clinical'

- **Classical presentation:** Asymptomatic groin bulge which increases on crying & may disappear spontaneously if relaxed
- Older children often complain of groin or inguinal "pain" during exertion.
- If no mass can be identified, the older child - stand and do a Valsalva maneuver/ cough impulse.
- An infant may be allowed to strain or cry to provoke an inguinal bulge to appear.



- **Silk glove sign:** Index finger is lightly rubbed over the cord from side to side over the pubic tubercle- cord structures are thickened (feels like two silk sheets rubbing against one another, reflecting the smooth peritoneal sac edges).

Sensitivity of **93%** and specificity of **97%**.



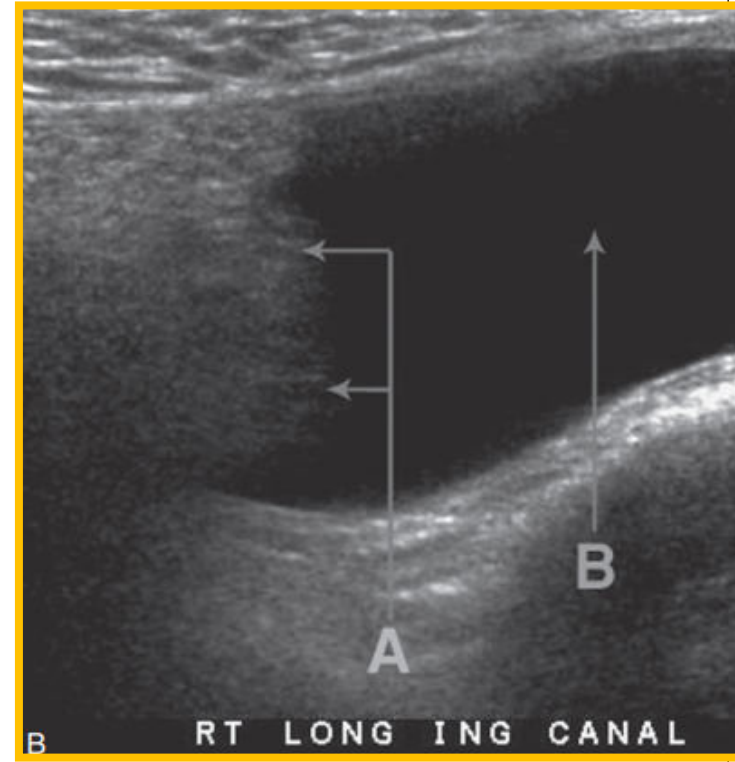
- Parent's digital images.



• **Inguinal Ultrasonography:**

When examination is equivocal and for preoperative evaluation of the contralateral groin in patients presenting with unilateral hernias.

- The upper limit of the normal diameter of the inguinal canal- 4 mm
- Diameter $4.9 \text{ mm} \pm 1.1 \text{ mm}$: **patent processus vaginalis.**
- Diameter $7.2 \pm 2 \text{ mm}$: **True hernia.**



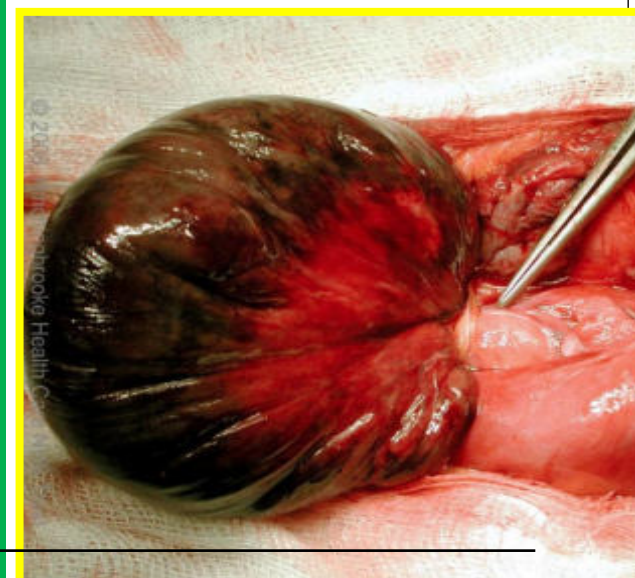
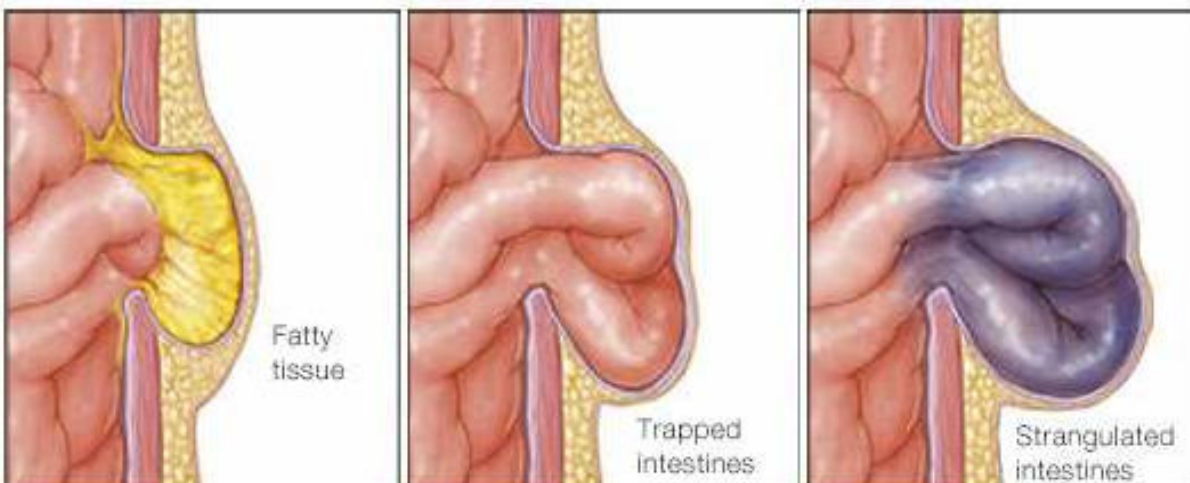
• **Incarceration**= contents of the sac cannot easily reduced (3-16%; upto 30% in preterm in 1st year of life.)

• **Strangulation**= vascular compromise

• Contents may be small bowel, caecum, appendix, omentum, ovary and fallopian tube.



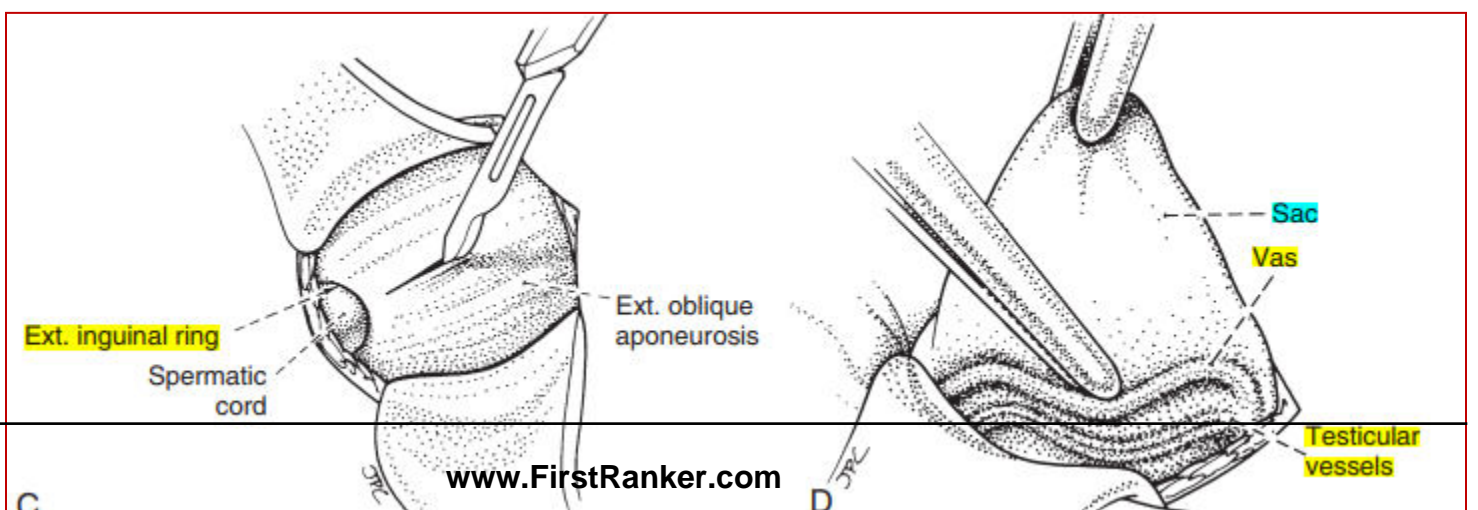
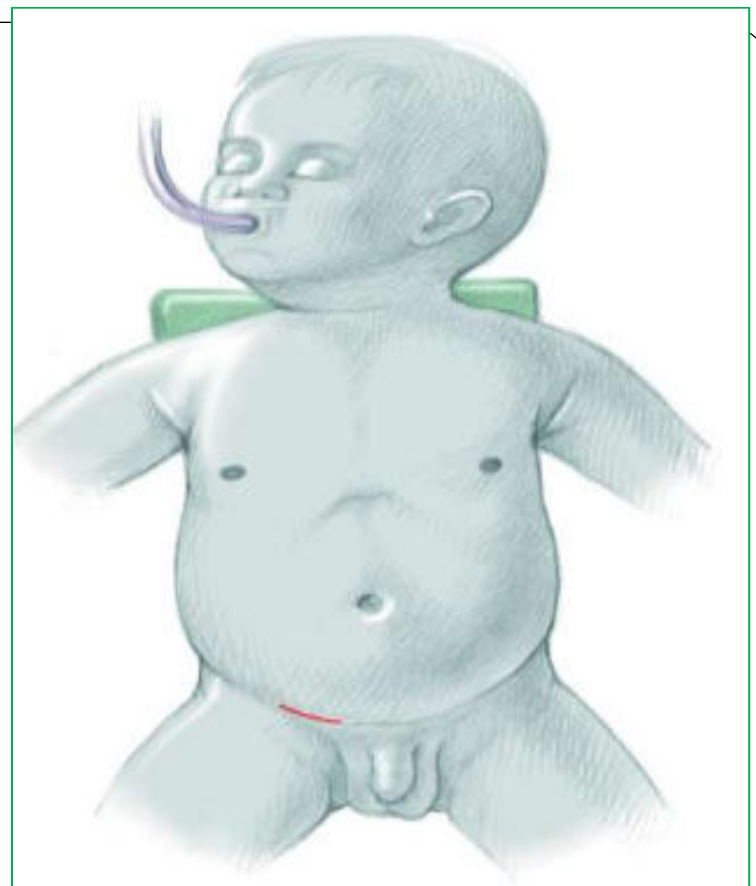
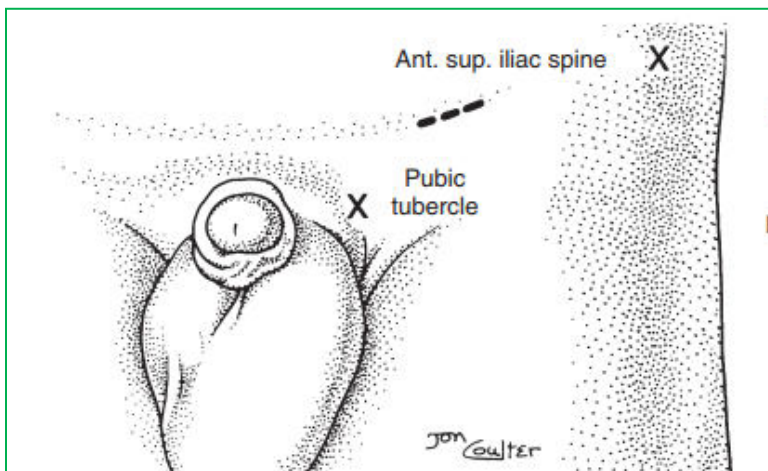
Hernia progression

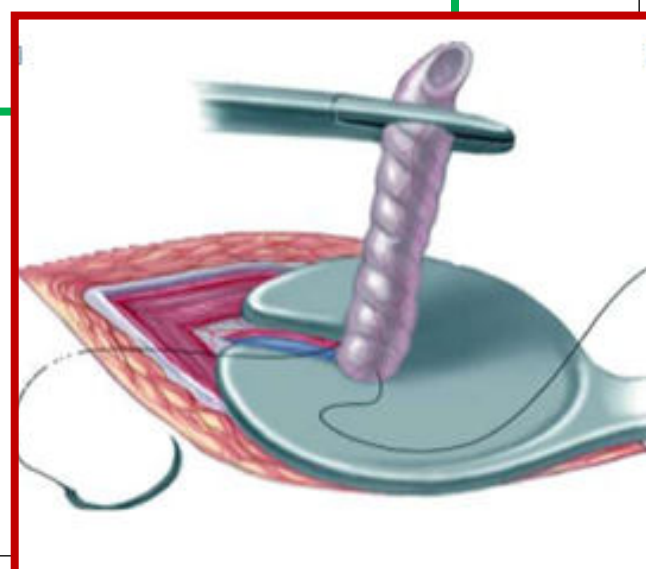
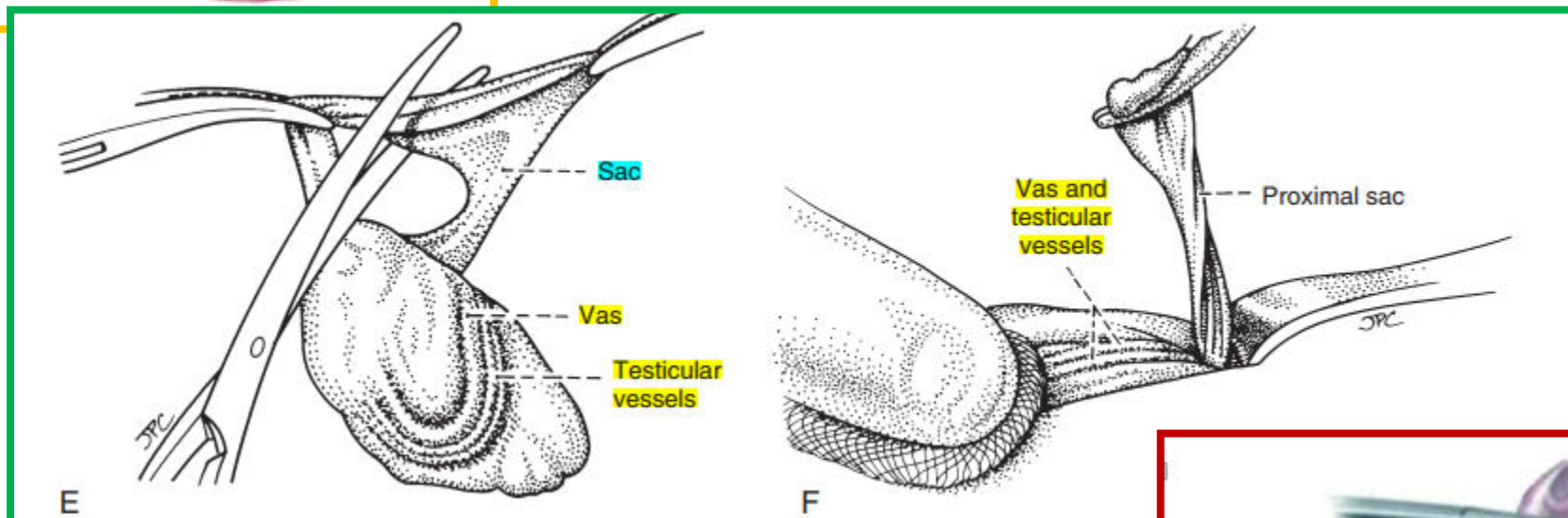
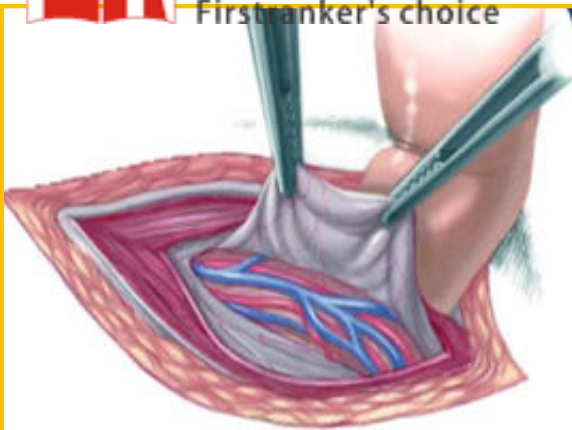


Management

- Will not resolve spontaneously, so surgical closure is always indicated- herniotomy.
- **Timing of surgery:**
 - In infants younger than 1 year of age, the risk of incarceration doubled with surgical wait times of more than 30 days.
 - Most surgeons currently recommend repair of the hernia soon after diagnosis.

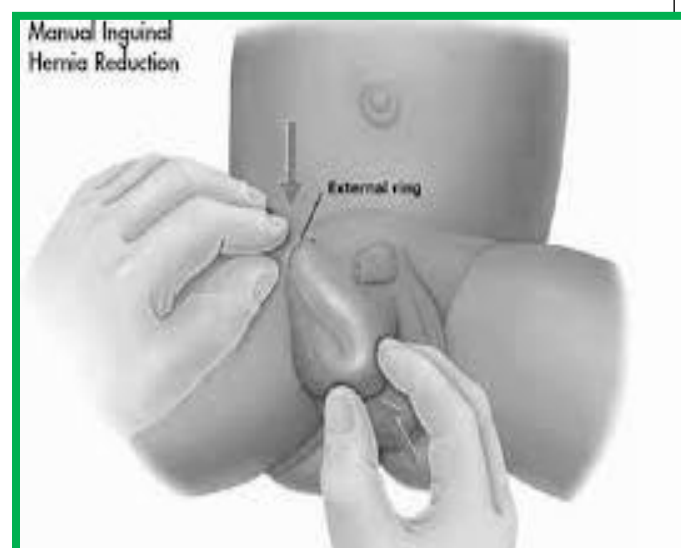
- The fundamental principle guiding pediatric inguinal hernia repair is **high ligation of the hernia sac.**





Incarcerated Hernia

- An attempt at reduction should be made-using analgesia and/or sedation.
- The hernia is palpated distally while the clinician's fingers are placed at the proximal neck of the hernia.
- Compression on hernia slowly and consistently until it is reduced.
- Risk of reincarceration 15% in 5 days.
- Subsequent surgical repair is attempted 24 to 72 hours later- allow edema to resolve



Contralateral Exploration

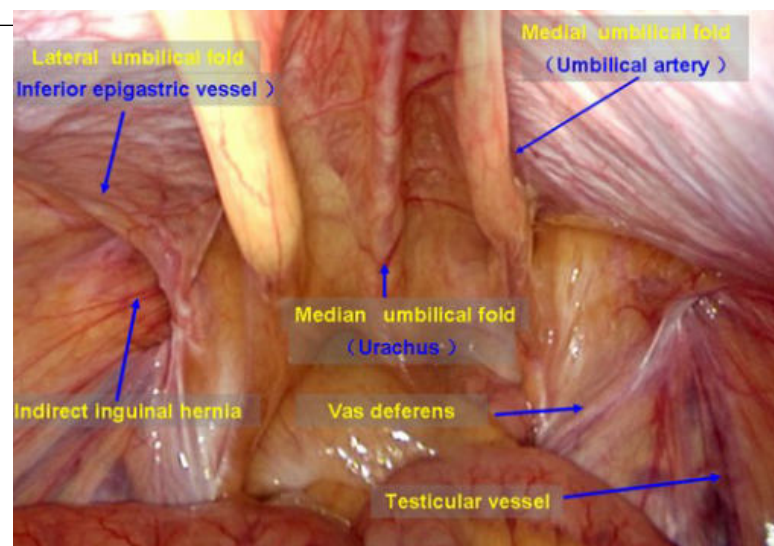
- One of the most contentiously debated issues in pediatric hernia surgery.
- While up to **60% to 80% < age 1** and **40% of older** children (by 2 yrs) with hernia will have a patent processus, half of these children will develop a clinical hernia on the other side.

~ Zavras, N., et al (2014) Current Trends in the Management of Inguinal Hernia in Children. *International Journal of Clinical Medicine*, 5, 770-777.

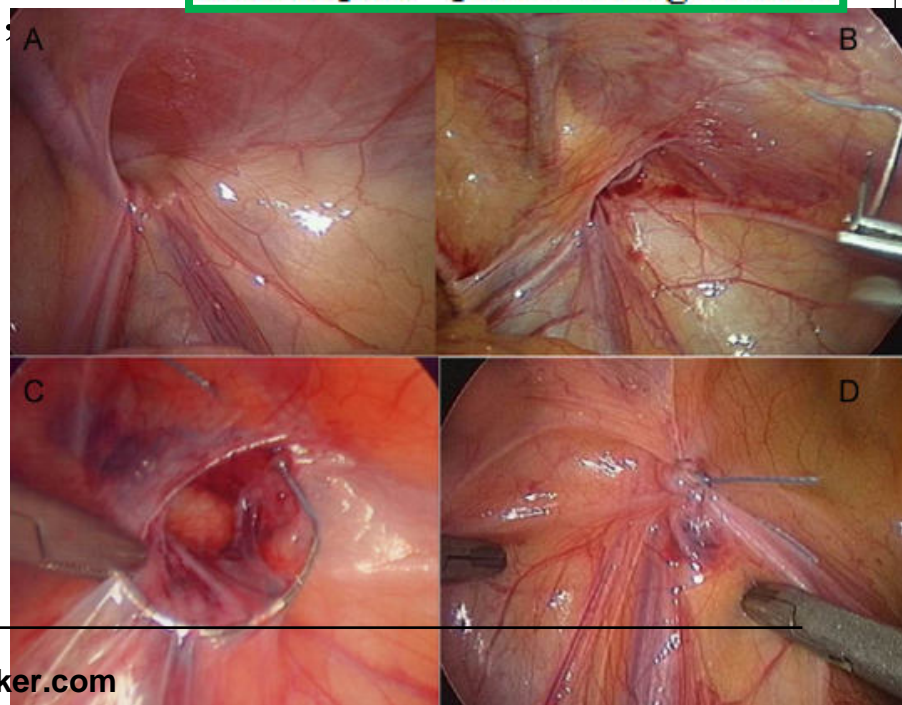
- A recent review- overall risk to develop later an IH is **5.7%**.
- Contralateral exploration has potential disadvantages- injury to the contents of the spermatic cord, wound infection, increased cost, increased pain and prolongation of the operation.
- To resolve this debate, multiple strategies have been introduced the more recent being ultrasound and laparoscopy.

Laparoscopy repair

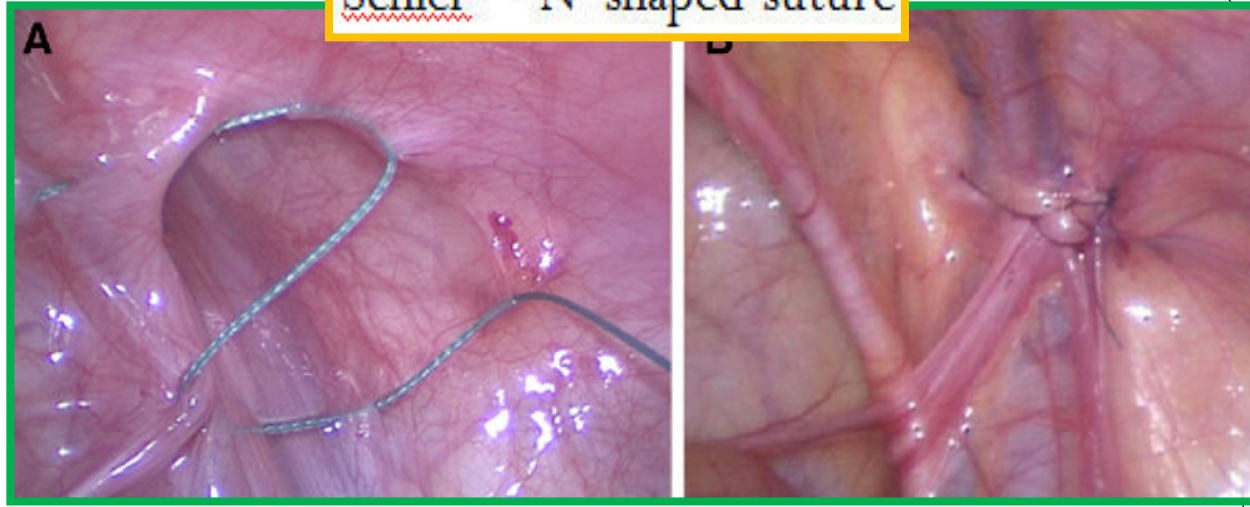
- Most pediatric surgeons consider it unnecessary.
- Only recently it has become an alternative.
- Gaining popularity with more and more studies validating its feasibility, safety, and efficacy.
- **Pros:** Contralateral side seen.
- **Cons:** More time, transabdominal.



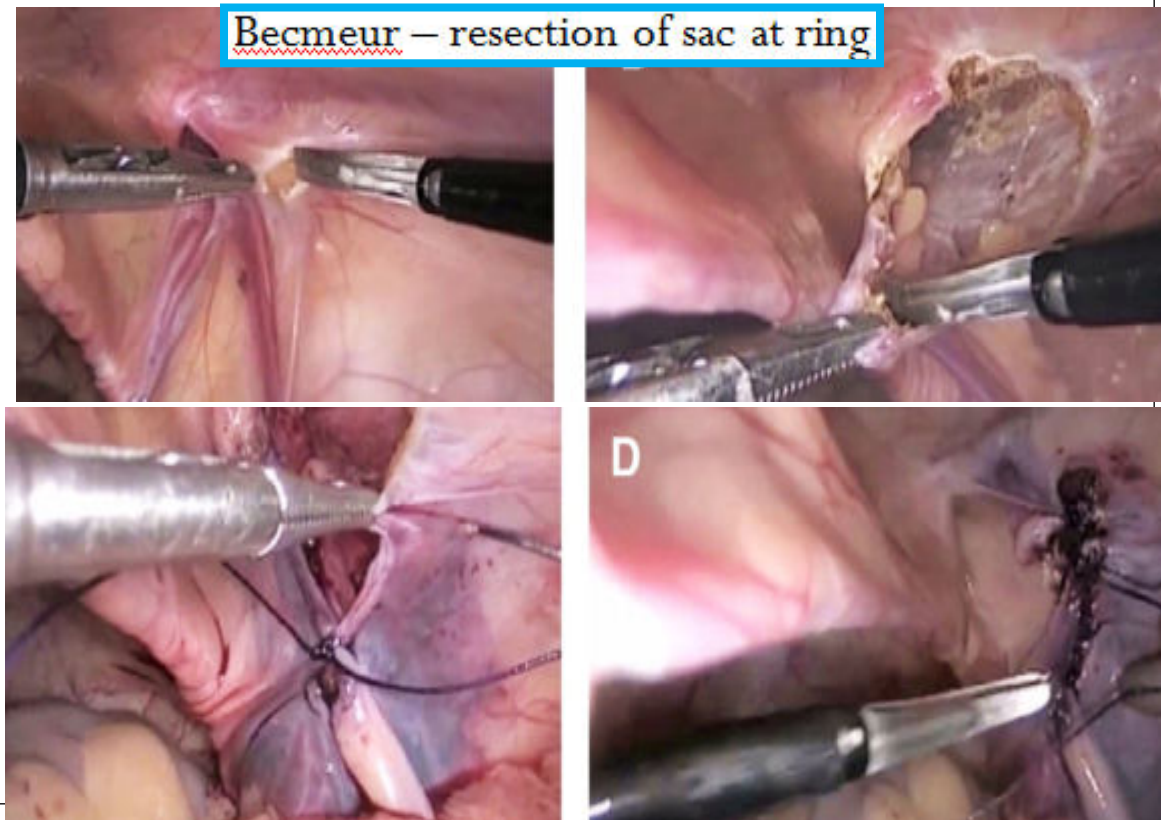
Montupet – purse string suture



- Insufficient evidence to support one approach over another.



- The peritoneal incision intentionally created at the internal inguinal ring, seems to result in a more durable repair.

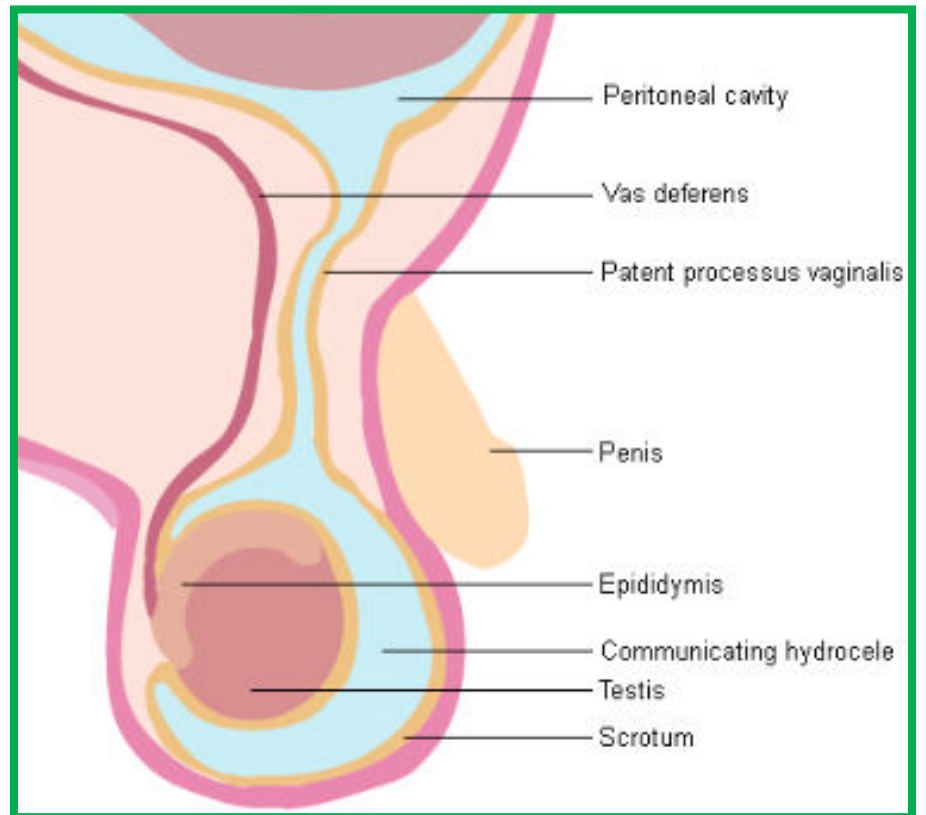


POSTOPERATIVE COMPLICATIONS

1. Scrotal Swelling
2. Iatrogenic Undescended Testicle
3. Recurrence: **0-0.8%**; Large hernia (0.8-4%), Preterm (15%) and incarcerated hernia (20%).
4. Injury To The Vas Deferens: **0.13-1.6%**
5. Testicular Atrophy: 1% ; incarcerated hernia 2.6-5%
6. Intestinal Injury: 1.4%
7. Chronic Pain

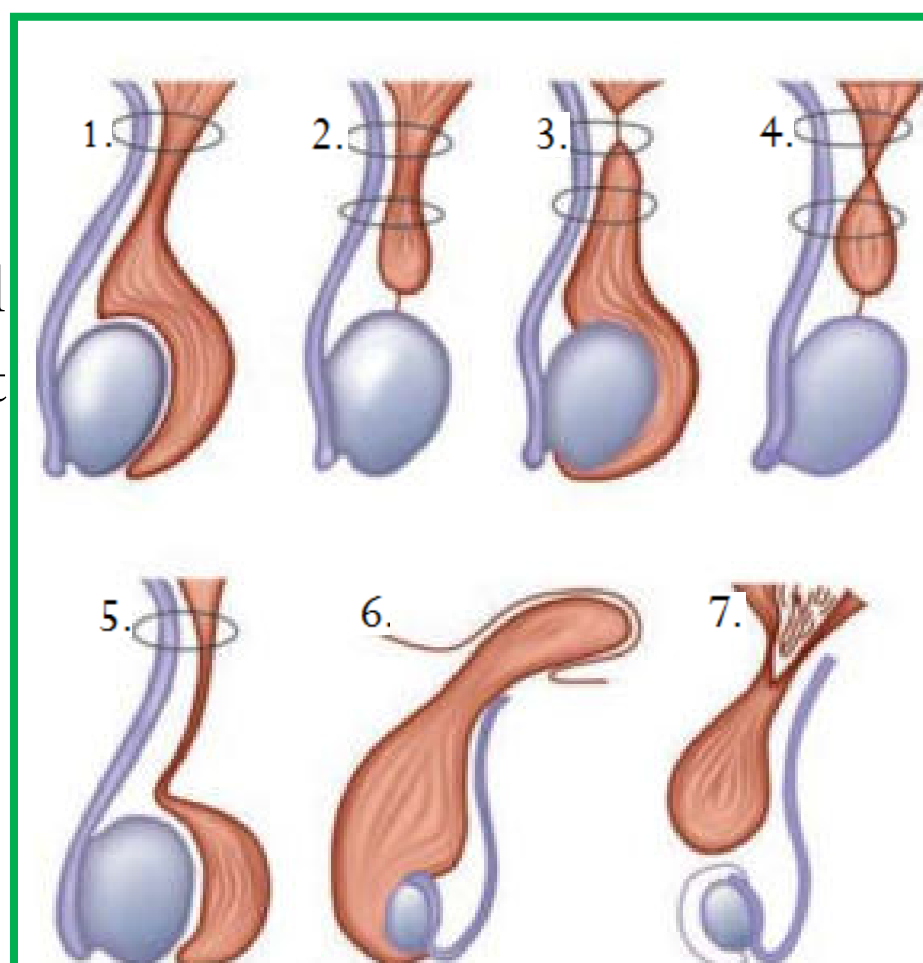
Congenital Hydrocele

- When the processus vaginalis remains patent, allowing fluid from the peritoneum to accumulate in the scrotum.
- 70% Scrotal
25% Cord
5% commune
- 60% right
30% left
10% bilateral.



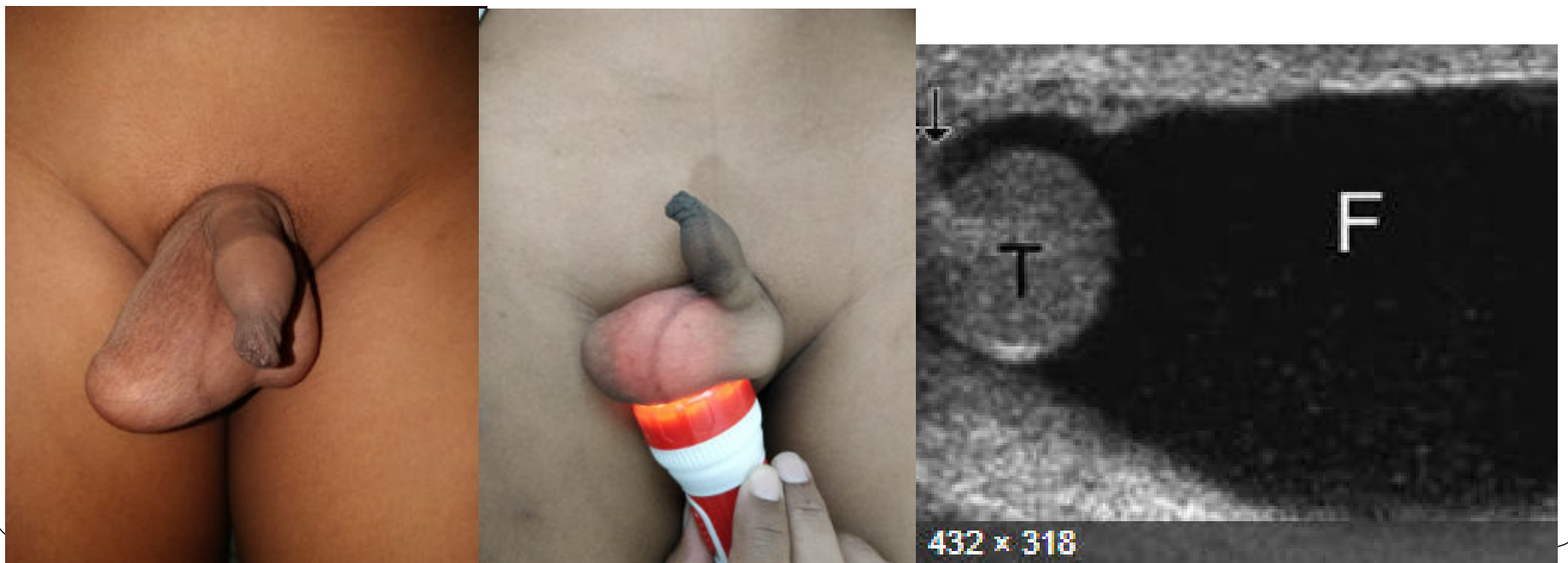
Primary Hydrocele - Types

- 1. Congenital hydrocele
- 2. Funicular hydrocele
- 3. Infantile hydrocele
- 4. Encysted hydrocele of the cord
- 5. Vaginal hydrocele- commonest
- 6. Bilocular hydrocele/ -en-bisac
- 7. Hydrocele of the hernial sac



Primary Hydrocele - Clinical features

- Moderate to big size swelling
 - Cough impulse negative ; Get above the swelling positive
 - Not reducible; Consistency- tensely cystic
 - Transillumination positive
 - Testis not felt separately
 - Transillumination negative in Hematocele, Pyocele, Chylocele and thick sac



TREATMENT

- Most surgeons advocate observation of hydroceles in infants <24 months.
- Others continue observation as the majority PPV will close within the first 24–36 months of life.
- Inguinal herniotomy

