Common Pediatric Inguino-scrotal Conditions

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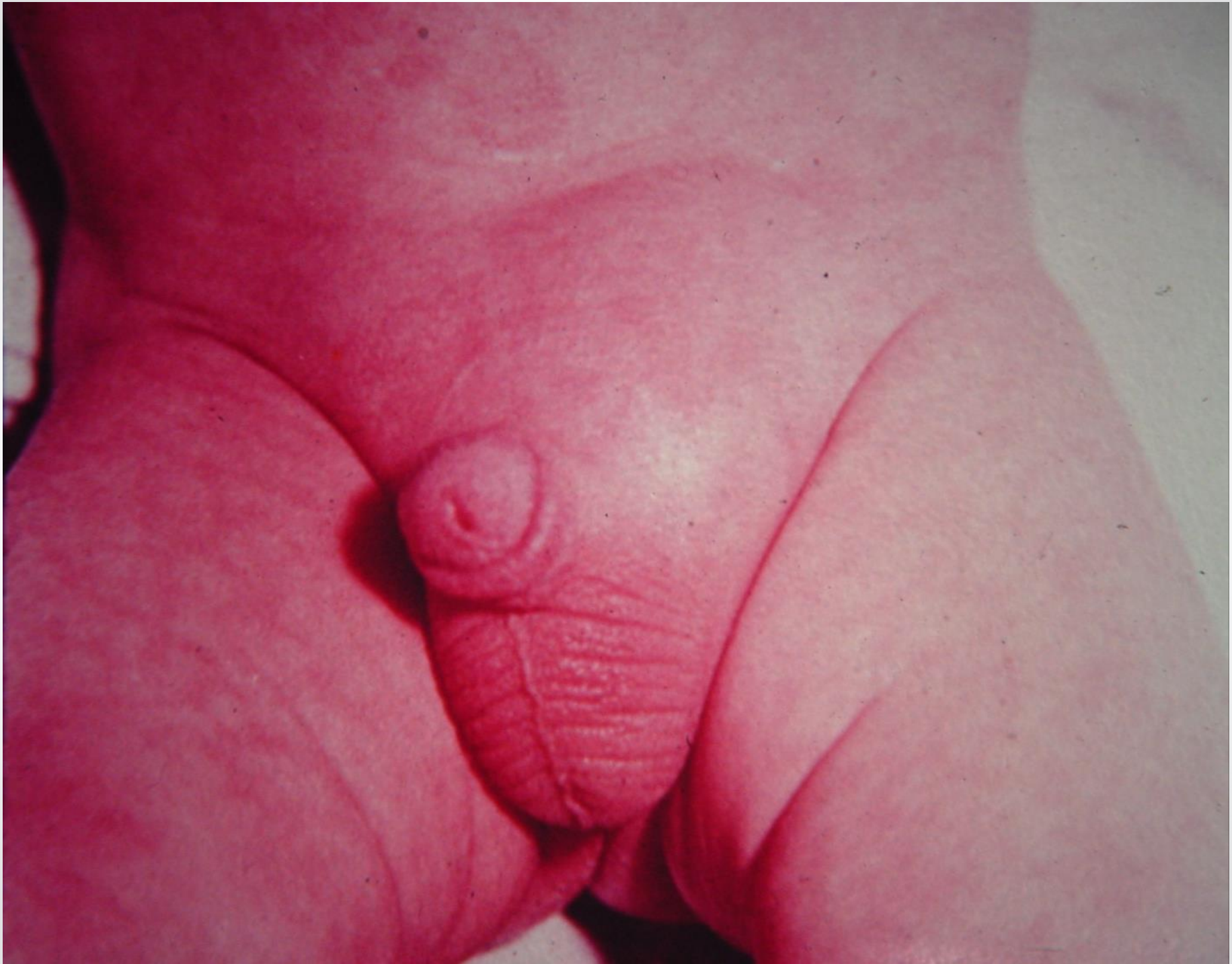
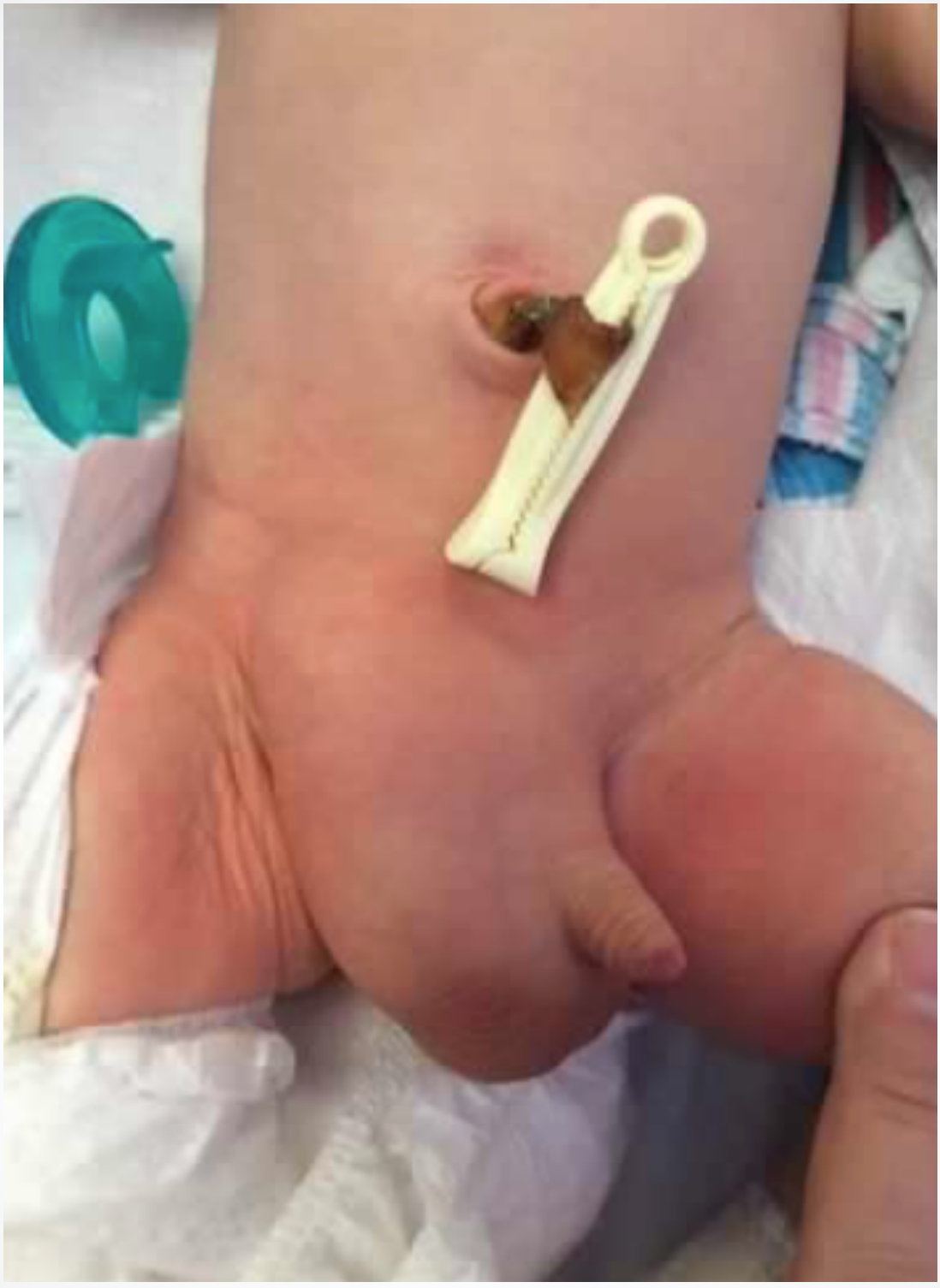
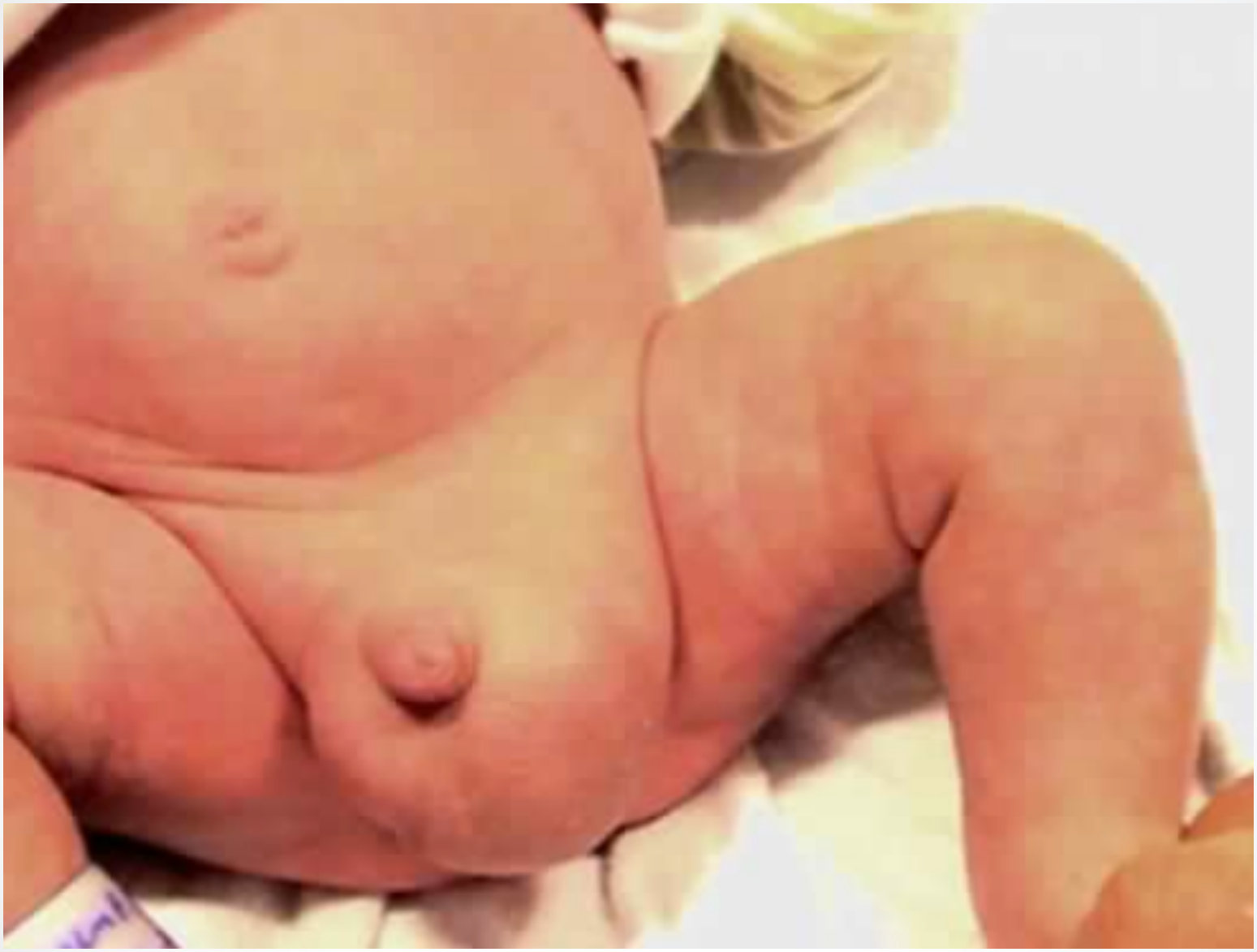
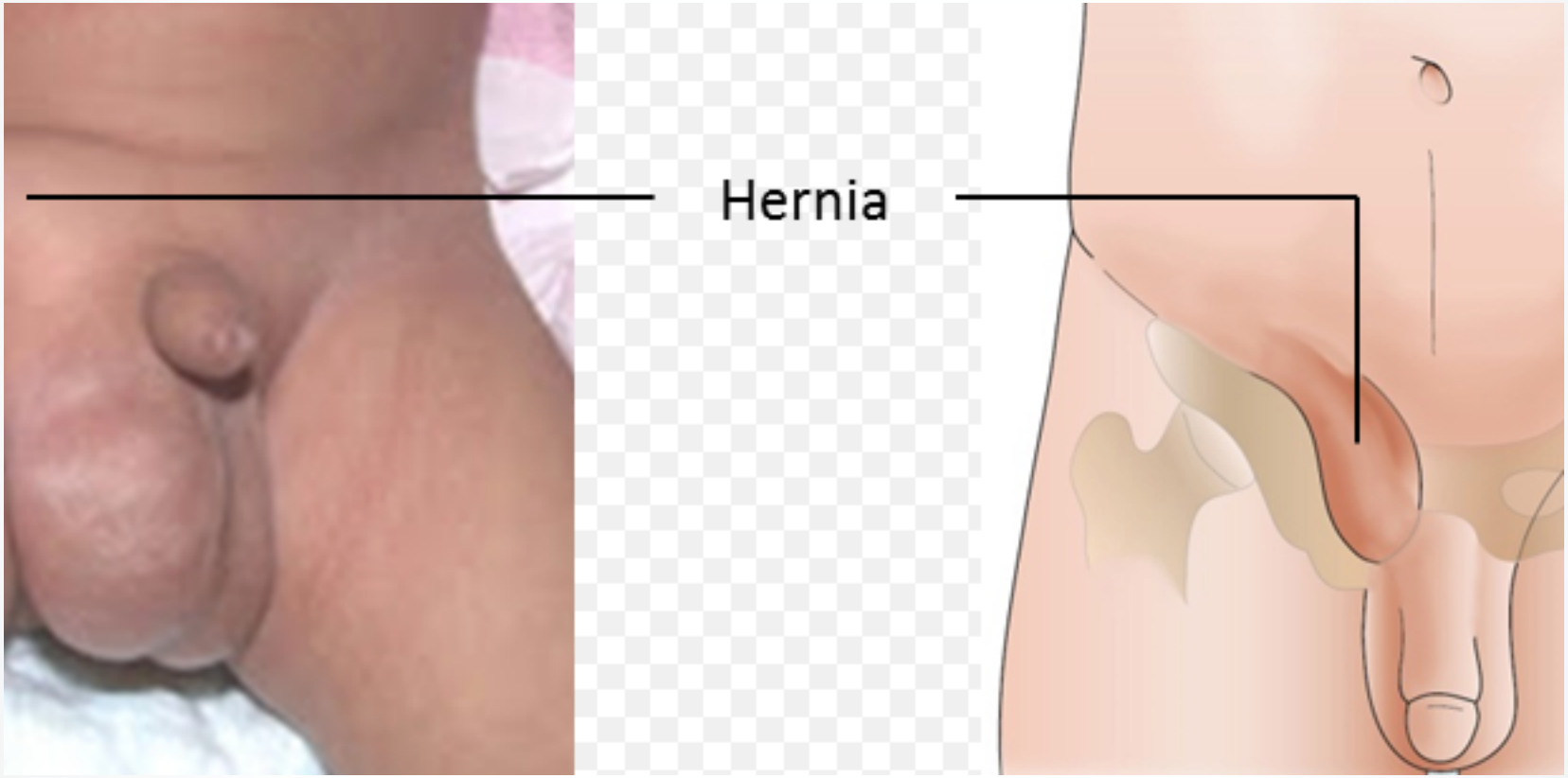
Outlines

- Hernia and hydrocele
- Undescended testis
- Acute scrotum
  - Testicular torsion
  - Torsion of appendix testis
- Umbilical hernia
- Circumcision



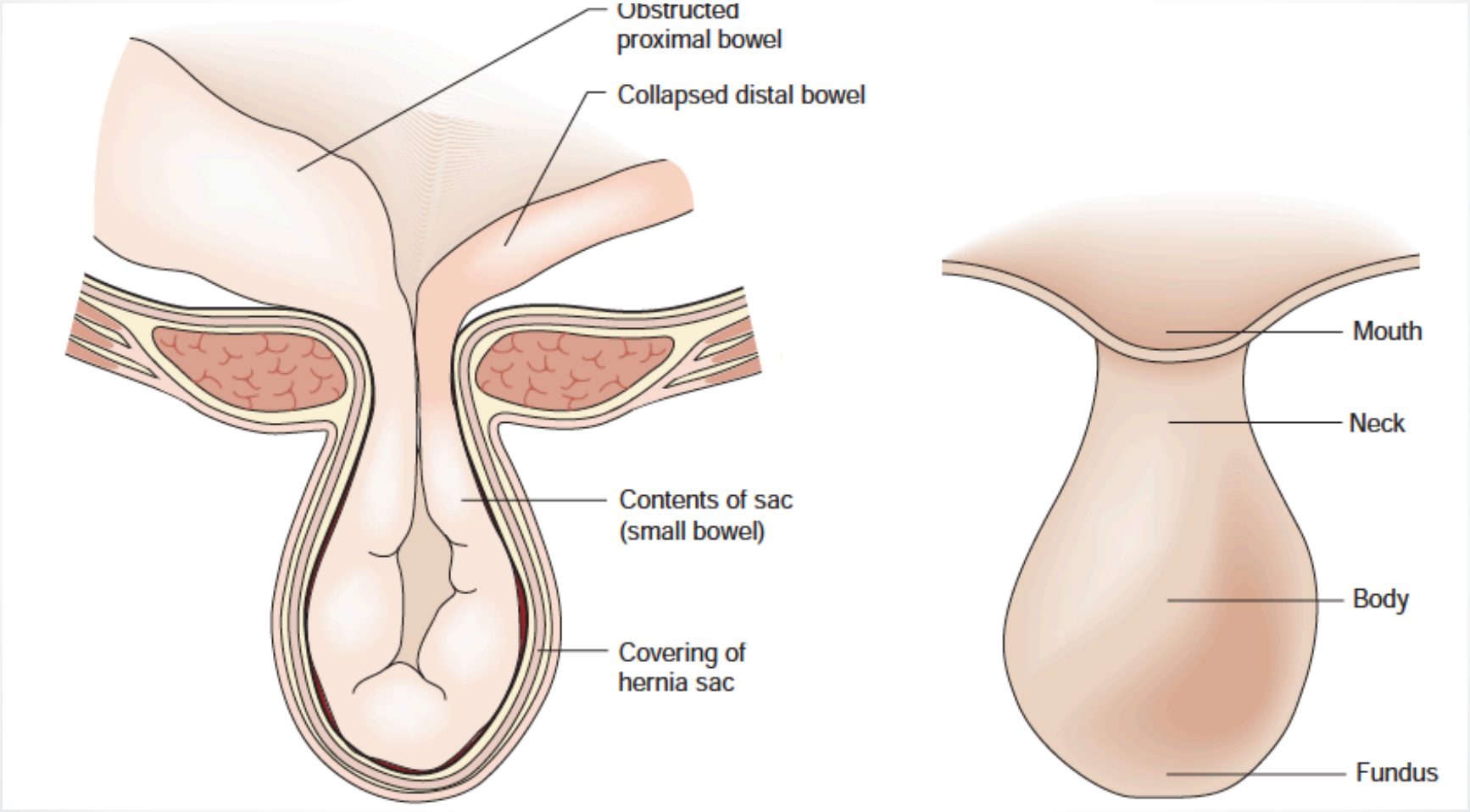


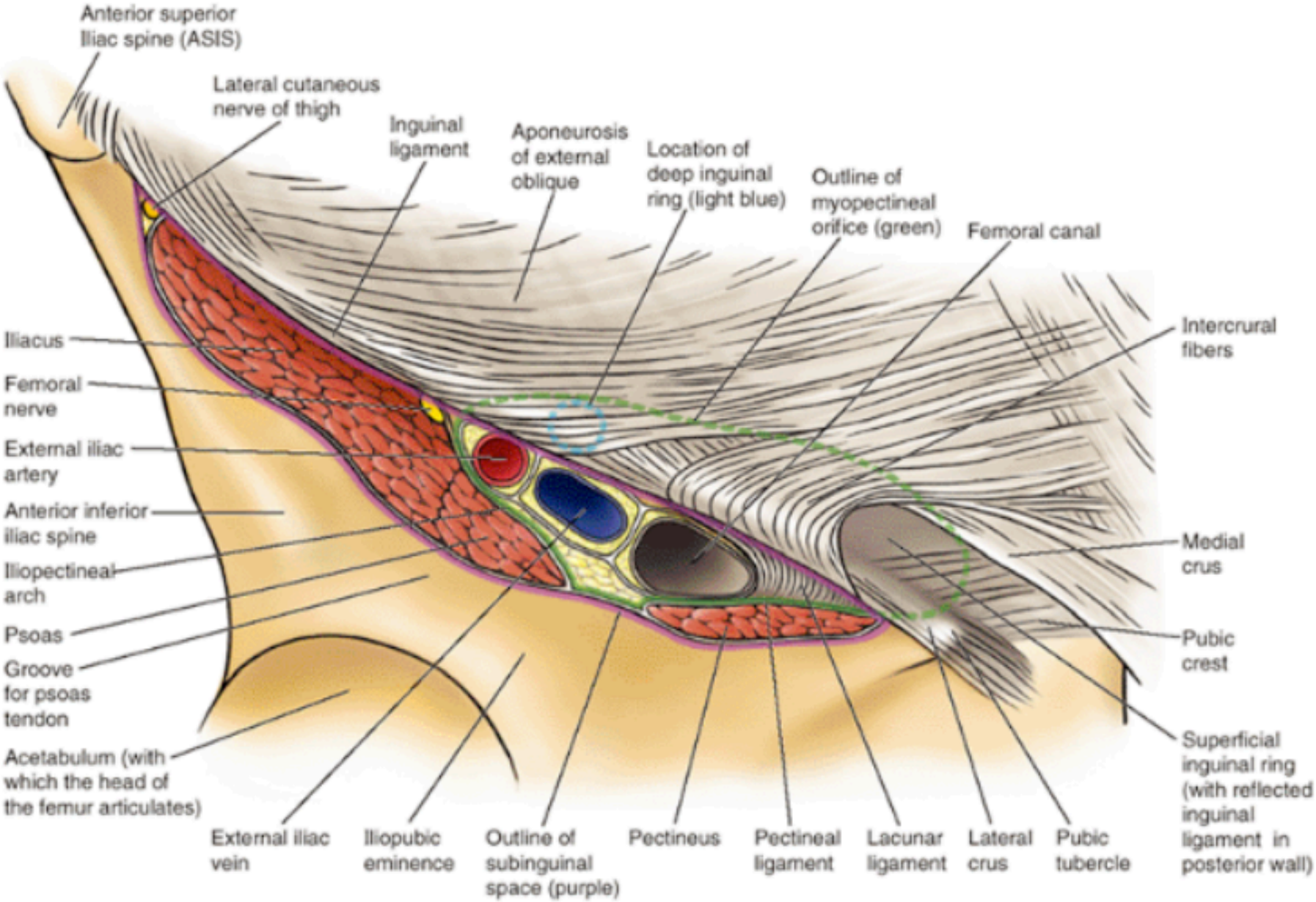



Hernia

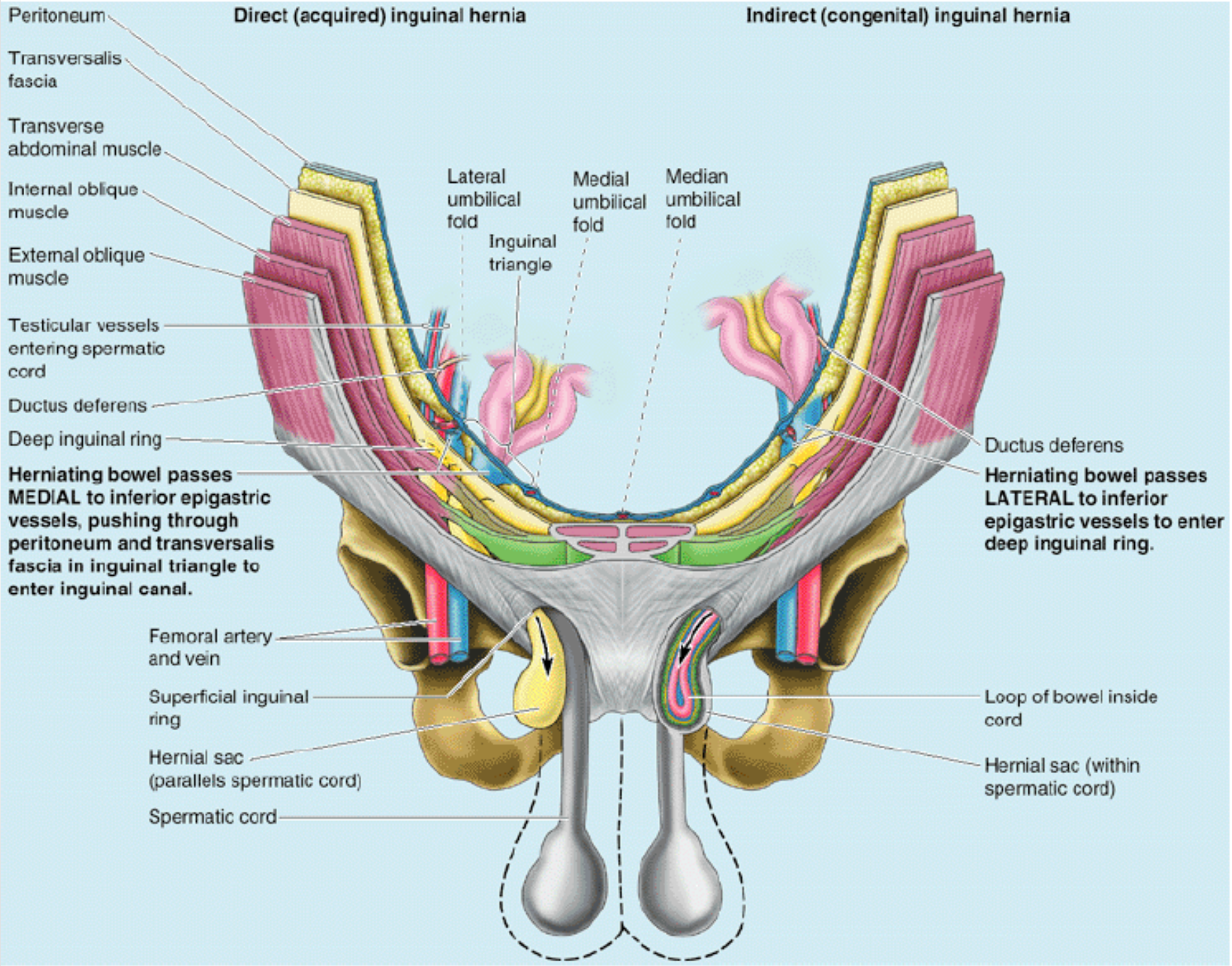
What is a hernia?

- A protrusion of a viscus (or part of a viscus) through an abnormal opening in the walls of its containing cavity


Obstructed proximal bowel
Collapsed distal bowel
Contents of sac (small bowel)
Covering of hernia sac
Mouth
Neck
Body
Fundus



Anteroinferior view


Direct (acquired) inguinal hernia
Indirect (congenital) inguinal hernia
Peritoneum
Transversalis fascia
Transverse abdominal muscle
Internal oblique muscle
External oblique muscle
Testicular vessels entering spermatic cord
Ductus deferens
Deep inguinal ring
Herniating bowel passes MEDIAL to inferior epigastric vessels, pushing through peritoneum and transversalis fascia in inguinal triangle to enter inguinal canal.
Lateral umbilical fold
Inguinal triangle
Medial umbilical fold
Median umbilical fold
Ductus deferens
Herniating bowel passes LATERAL to inferior epigastric vessels to enter deep inguinal ring.
Femoral artery and vein
Superficial inguinal ring
Hernial sac (parallels spermatic cord)
Spermatic cord
Loop of bowel inside cord
Hernial sac (within spermatic cord)

Inguinal Hernia

- Almost all pediatric hernias are indirect
- Occurs 1-5% of children
- Risk factors:
  - Premature babies
  - Increase intra-abdominal pressure (e.g., prolonged ventilation as a newborn, peritoneal dialysis, ventriculoperitoneal shunt, ascites)
- More common in boys
- 60%-R; 30%-L; 10% bilateral
- "Incarcerated"--viscera is stuck in sac
- "Strangulated"--visceral blood flow is compromised

Pathophysiology

- Hernia in children is due to
  - patent processus vaginalis

- "Processus vaginalis"--peritoneal diverticulum extending through the internal ring at 3 months gestation
- The processus vaginalis normally obliterates
- If the processus does not obliterate, a hernia or hydrocele occurs

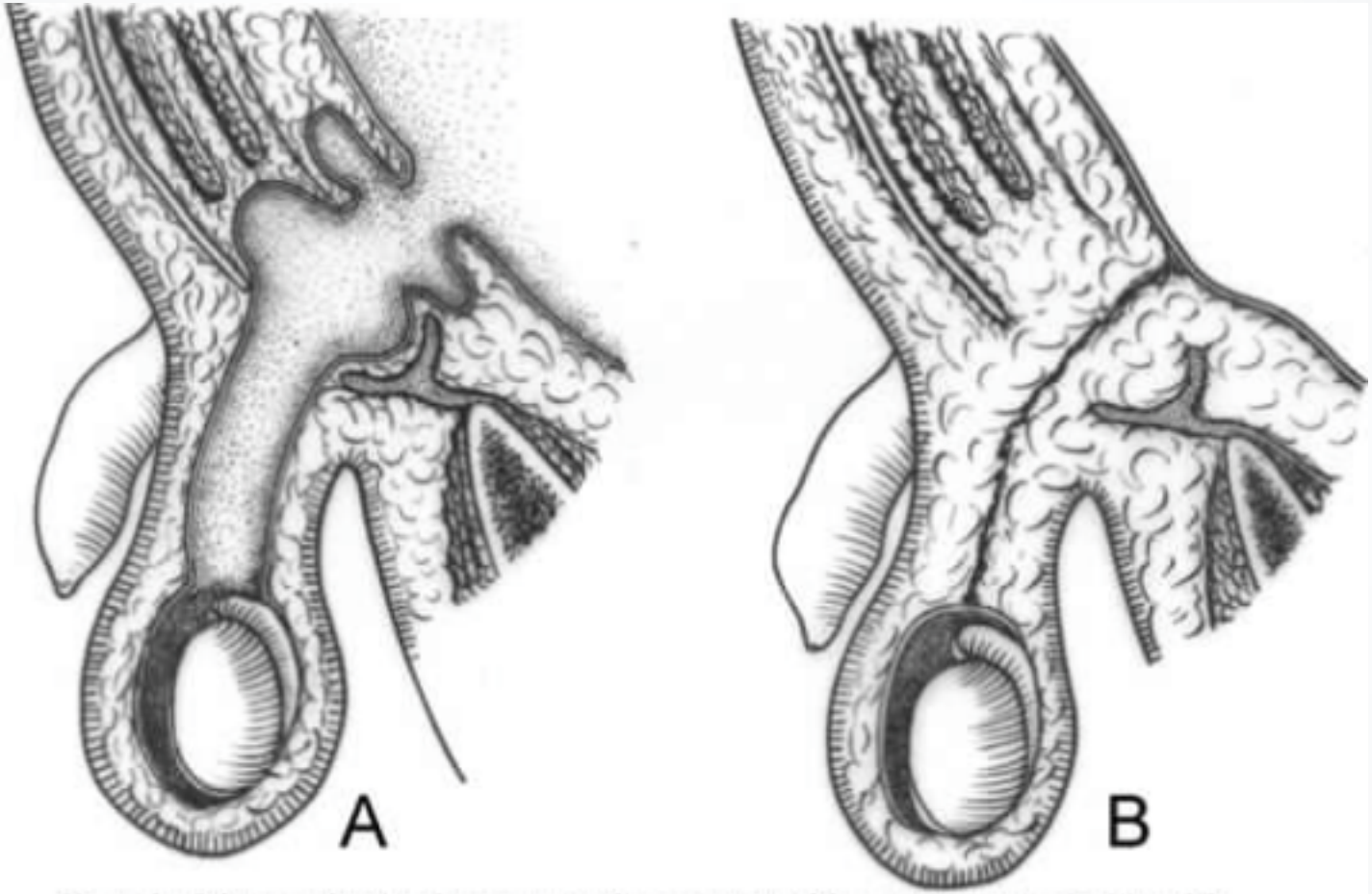
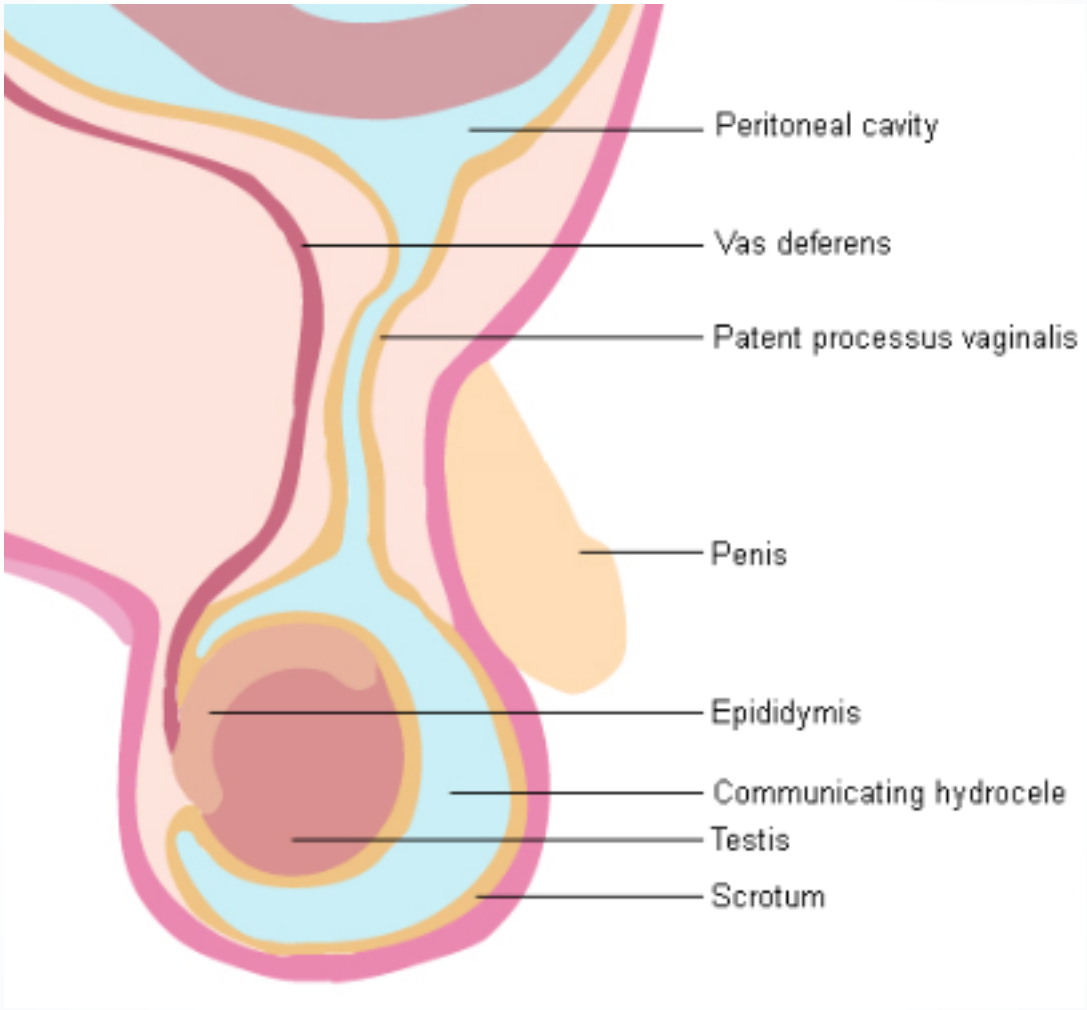
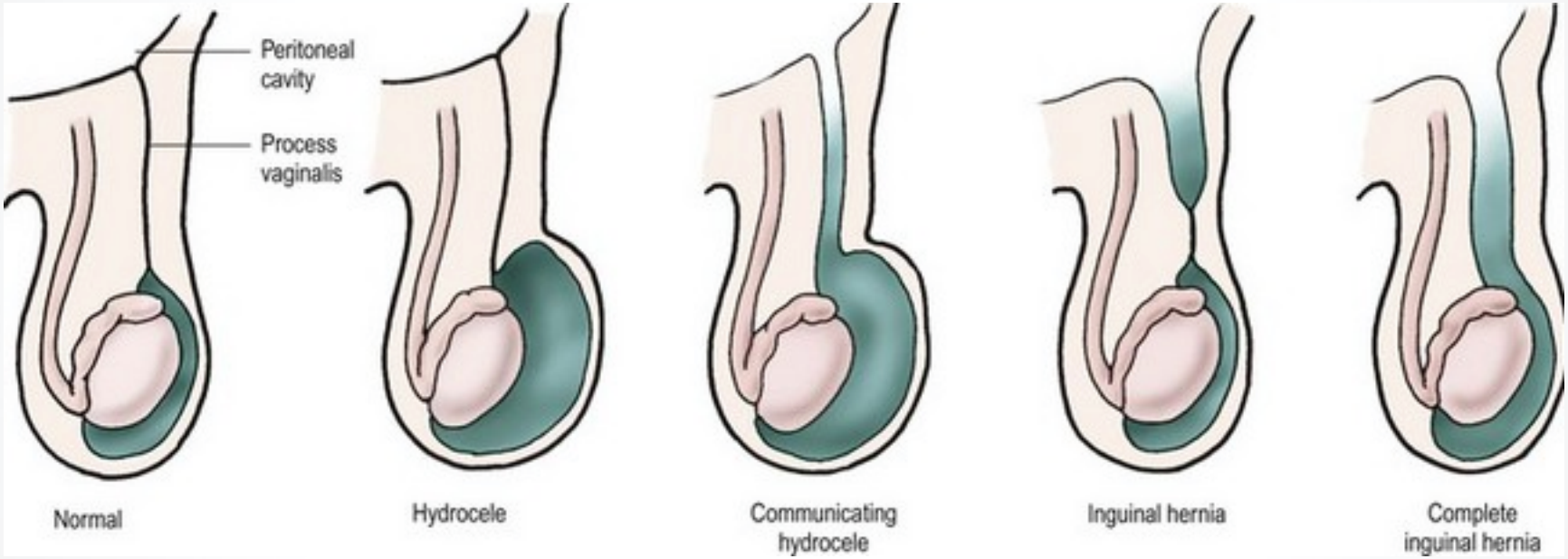


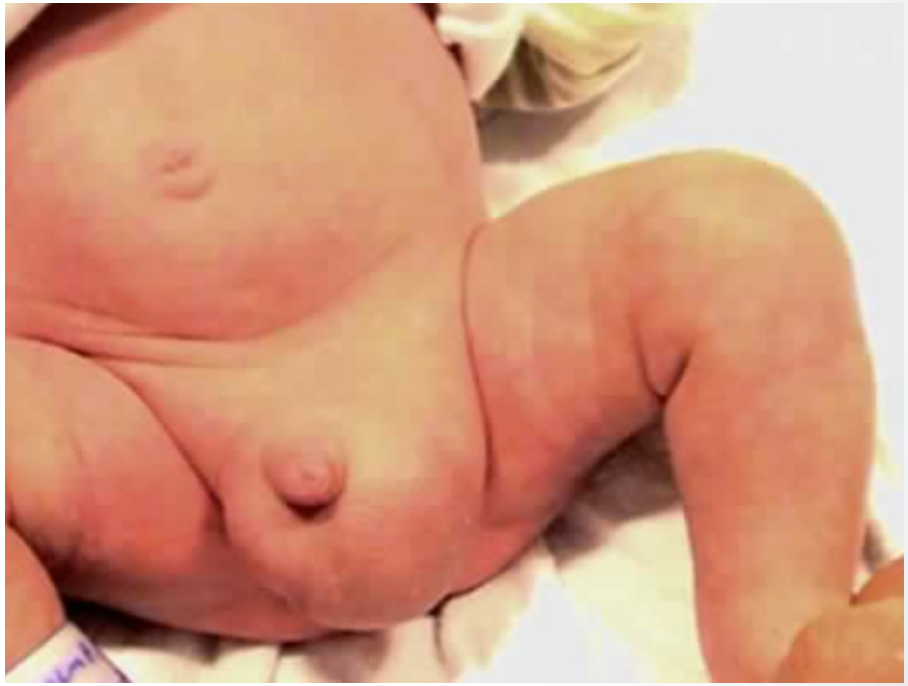
Figure 1 *– Schematic drawing demonstrating the persistence of the processus vaginalis (A) and the occluded processus vaginalis (B).*


Peritoneal cavity
Vas deferens
Patent processus vaginalis
Penis
Epididymis
Communicating hydrocele
Testis
Scrotum


Peritoneal cavity
Process vaginalis
Normal
Hydrocele
Communicating hydrocele
Inguinal hernia
Complete inguinal hernia

Clinical Presentation

- Painless, reducible, inguinal or inguino-scrotal swelling
- Bulges out with crying, straining, playing
- The child can present for the first time with incarceration, obstruction, or strangulation



Case Study

- 3 month old boy referred for a “groin bulge” during his well-baby check
  - Active baby
  - Vital signs are normal for age
  - Small umbilical hernia
  - Full right hemiscrotum with bilateral descended testes, fullness in the right groin

History Discussion

- Think incarceration/strangulation if there are symptoms of:
  - Irritability
  - Groin pain/tenderness
  - Abdominal distention
  - Vomiting (bilious vomiting indicates bowel obstruction)
  - Redness over the hernia (? Strangulation)

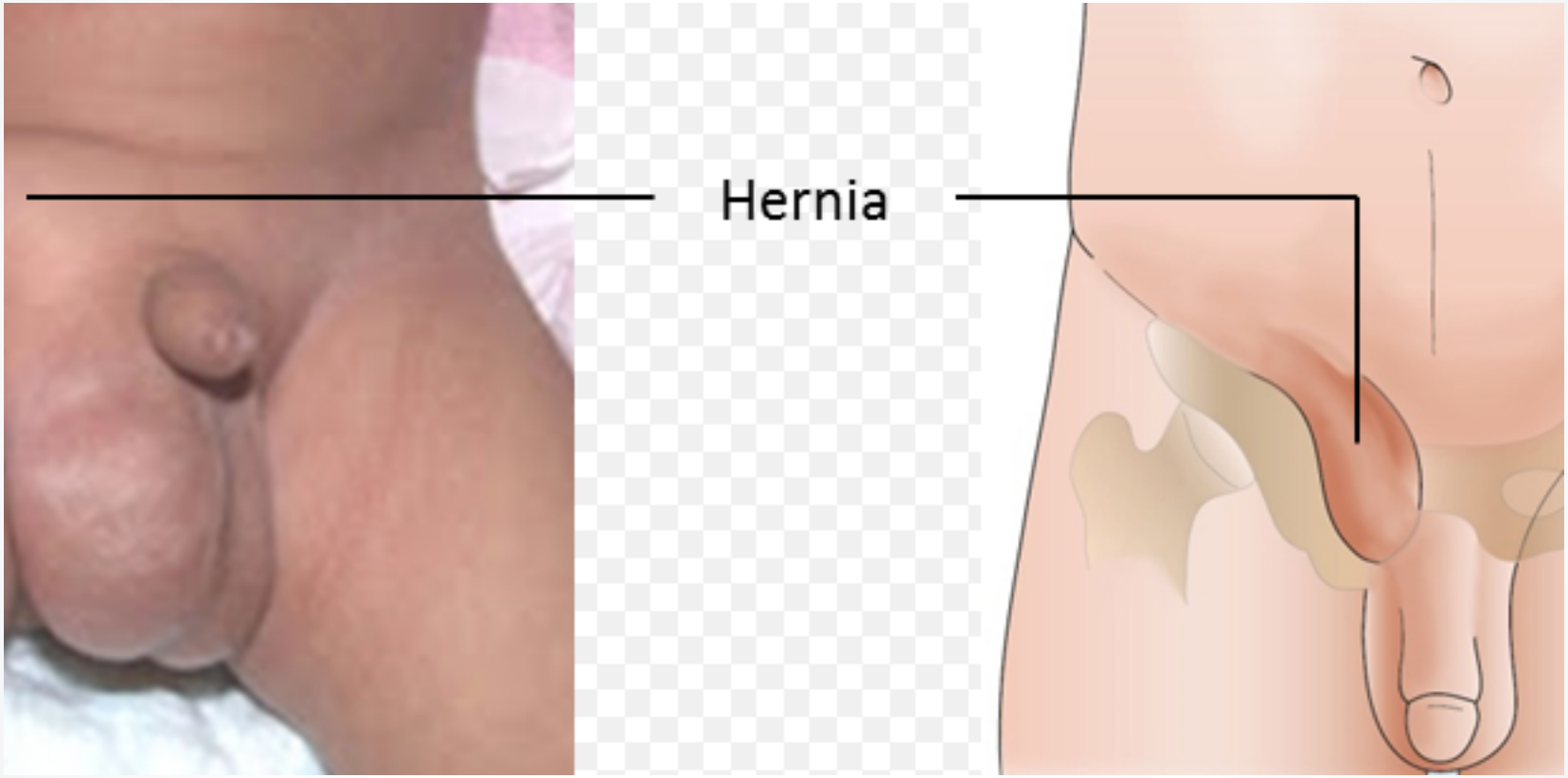
History Discussion

- When suspecting hydrocele, ask the caregiver whether there are changes in the volume of the scrotum:
  - Communicating hydrocele: if change is seen, there is a "communication to the abdominal cavity"-
  - Non-communicating hydrocele- if scrotal volume is stable throughout the day-

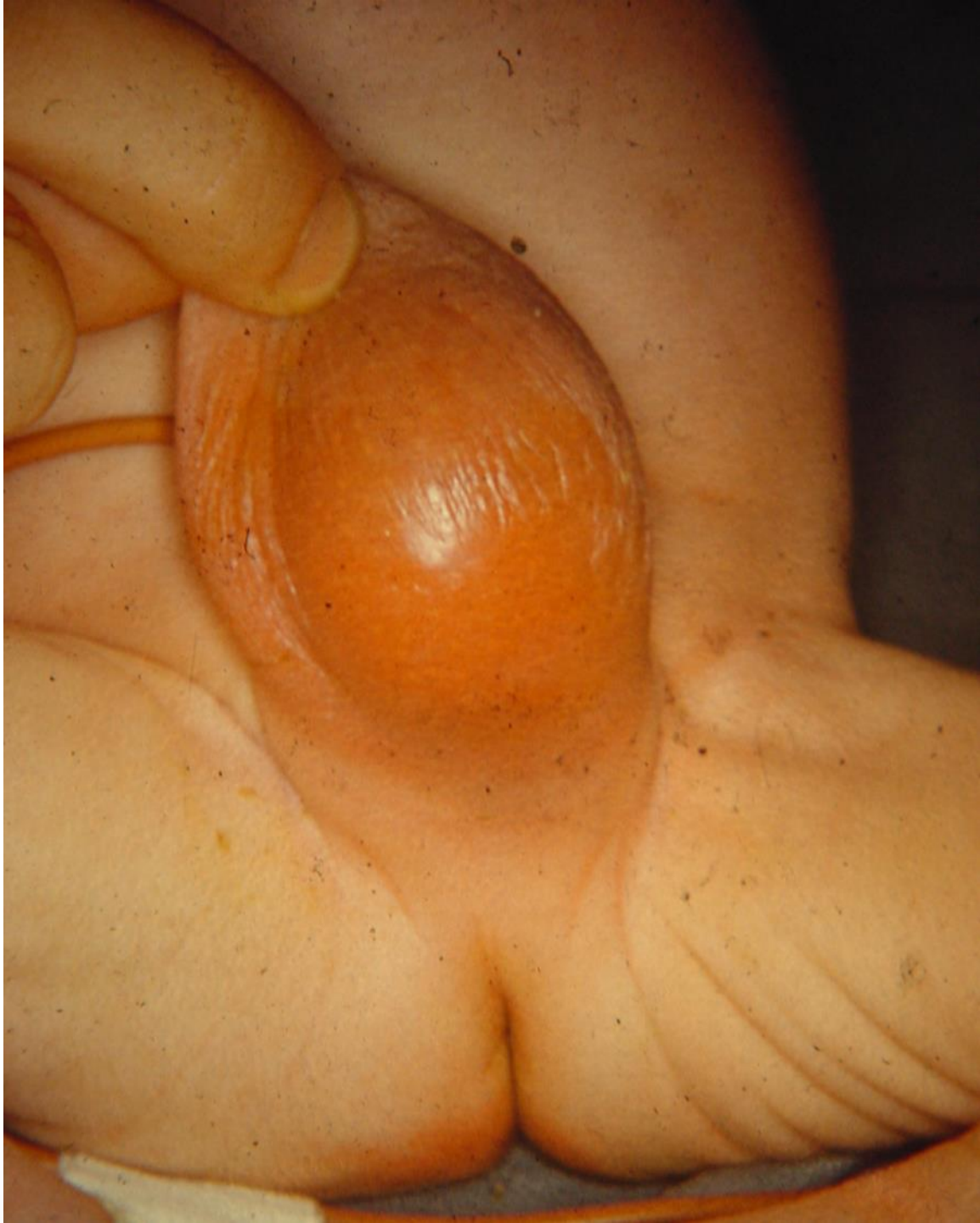
Physical Examination

- General appearance (irritability)
- Swelling features:
  - Size
  - Location
  - Consistency
  - Tenderness
  - Feel for bowel
  - Reducibility
  - Skin color change
- Assess whether the swelling is :
  - Scrotal in origin: you can get above it
  - Inguinal: you can not get above it

- If the bulge is not obvious, try maneuvers to increase abdominal pressure:
  - In a baby, gently straightening their legs to may make them cry
  - Examine while baby is held upright or standing
  - Ask a cooperative child to cough


Hernia

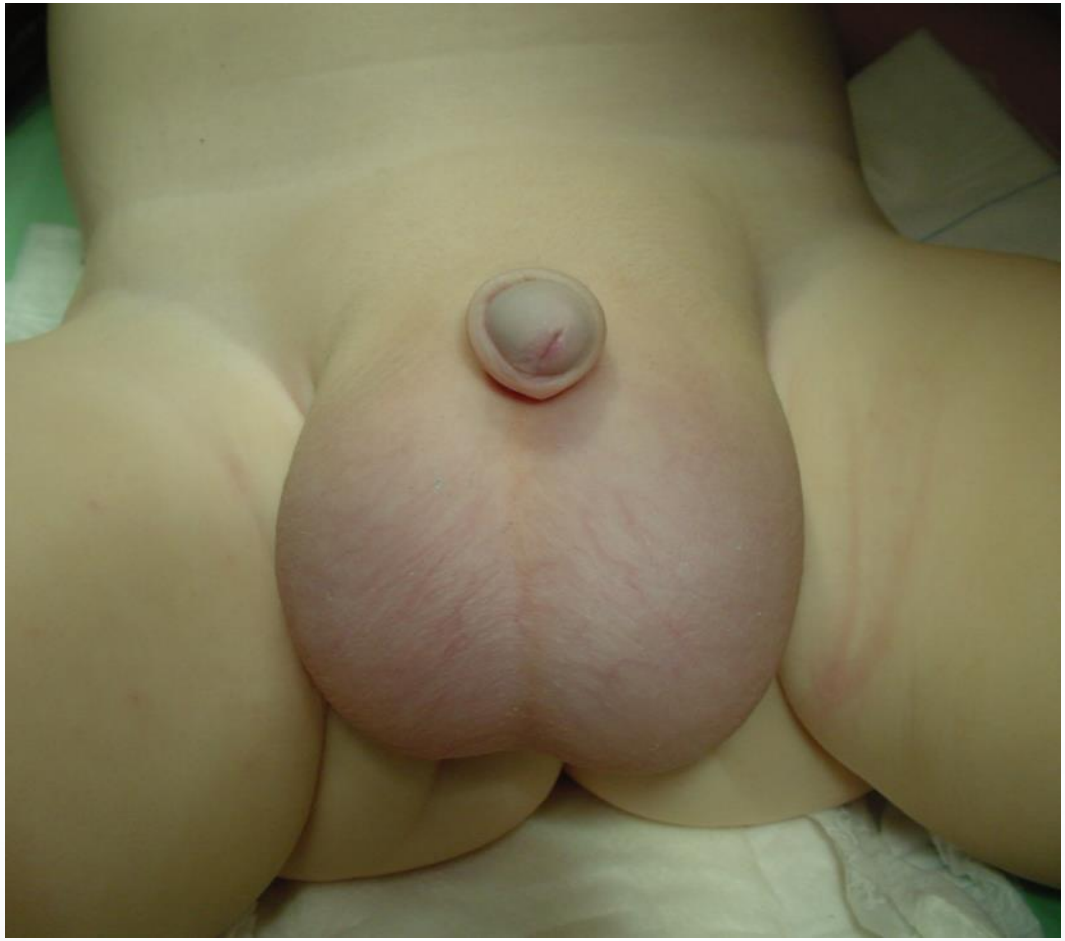
Strangulated Hernia



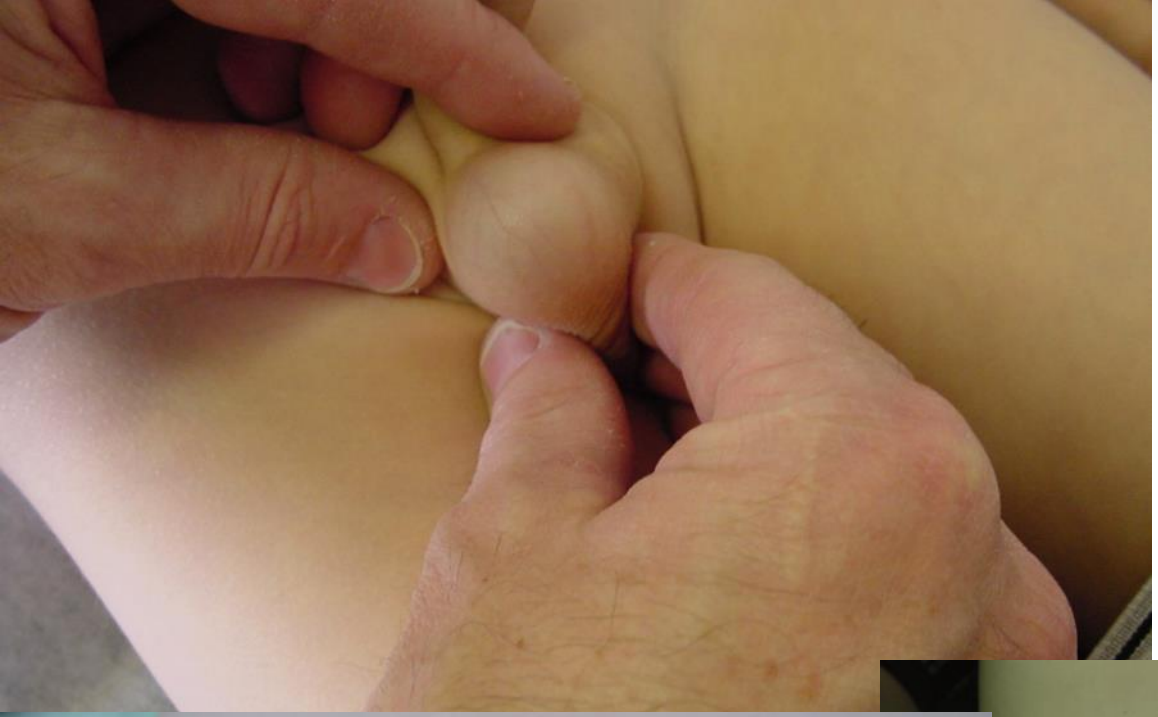
Differential Diagnoses

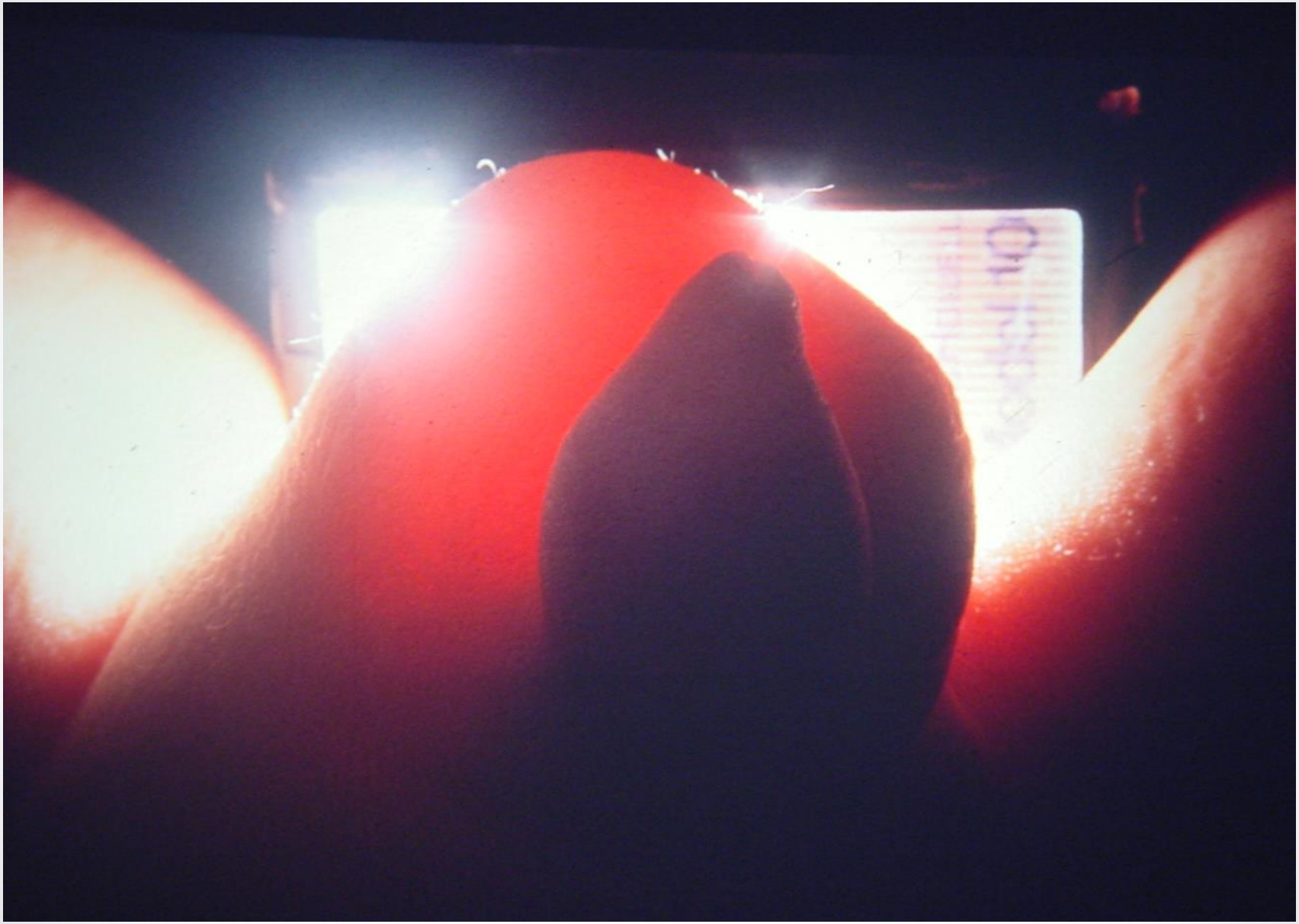
- Hernia:
  - Will be coming from the inguinal region (deep to superficial inguinal rings)
  - If large, may go down to the scrotum (not always)
  - You may feel bowel loops
- Communicating hydrocele:
  - History of progressively increasing swelling over the day to become worse at night as fluid accumulate. Fluid drains back to the abdomen during sleep.
- Non-communicating hydrocele:
  - Scrotal swelling (no inguinal component)
  - You can get above it/ separate from the groin (important clinical signs)
  - Trans illuminate using flash light
- Undescended testis:
  - Always examine testes to make sure they are in the scrotum
- Lymph node
  - Always present
  - More firm than hernia
- Testicular tumor
  - Scrotal origin
  - You cant feel the testes

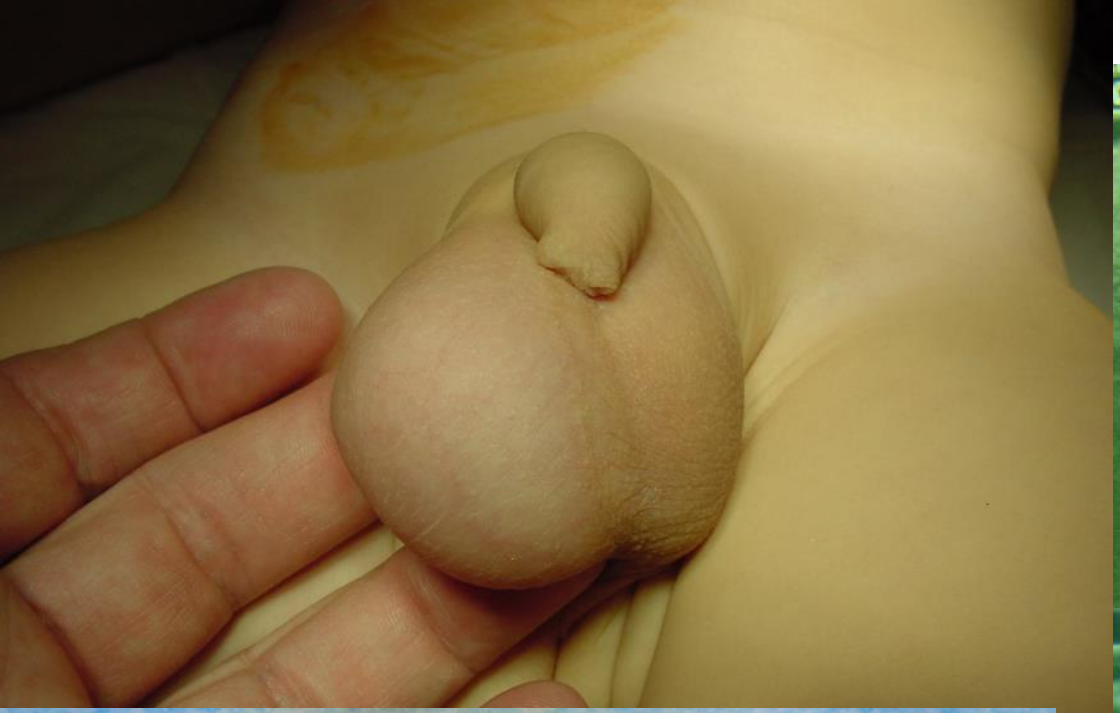
Hernia vs Hydrocele

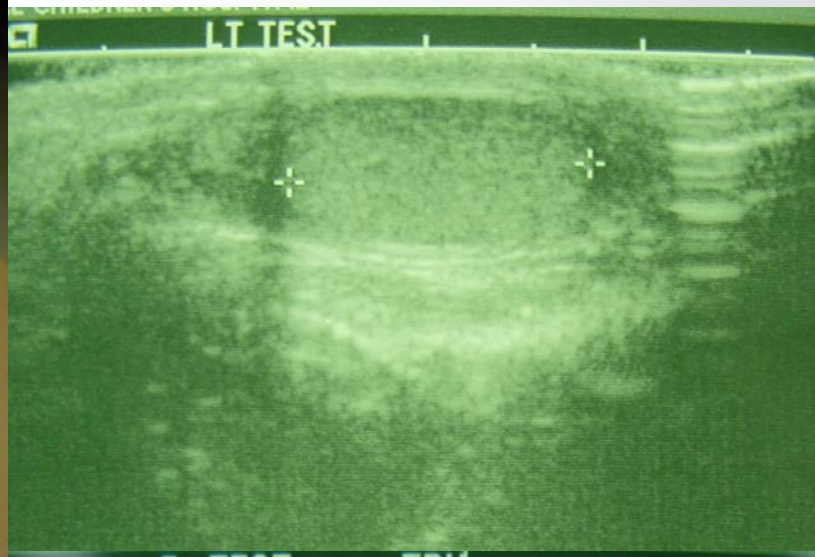


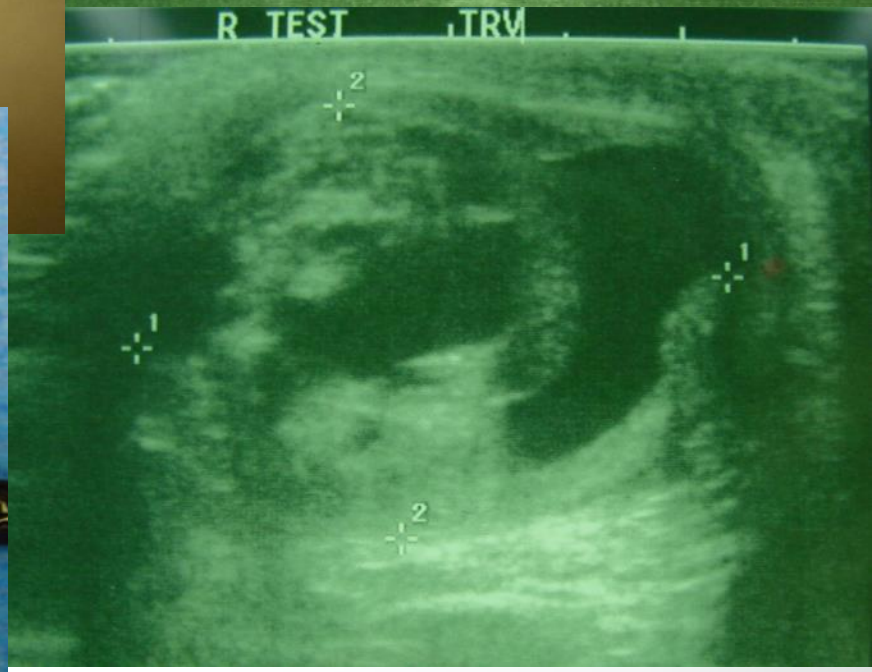
Various Hydroceles

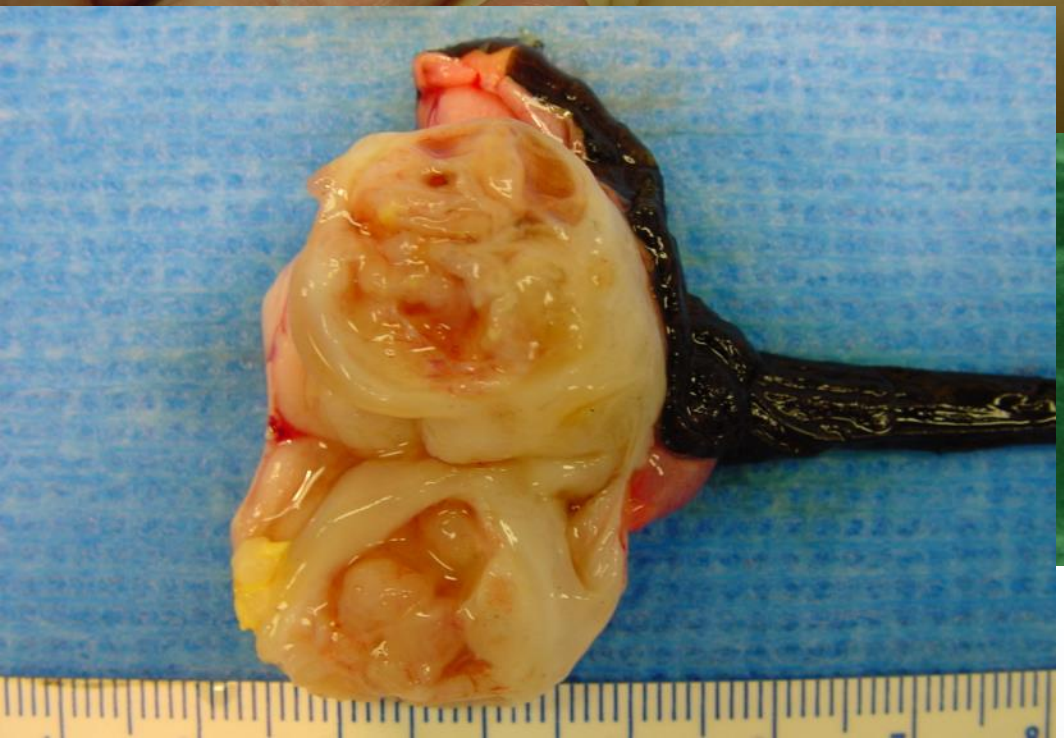







LT TEST


R TEST
TRV
2
1
1
2



Investigations

- What is the most accurate investigation to diagnose inguinal hernia?

Good physical examination

Investigations

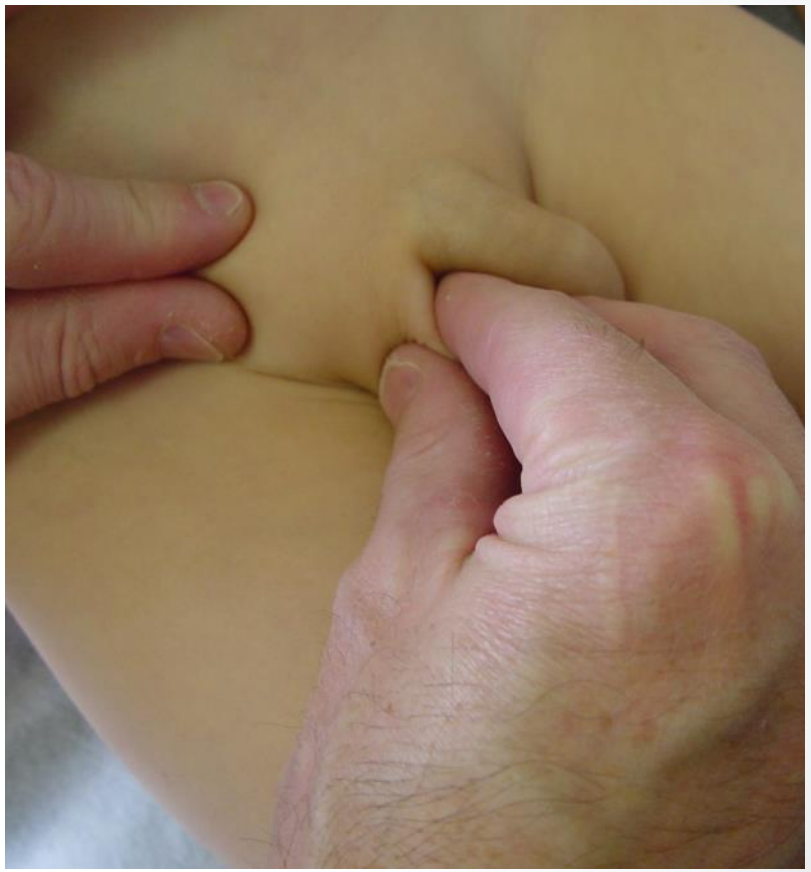
- No labs or imaging are necessary to diagnose inguinal hernia (common mistake!)

Inguinal Hernia Management

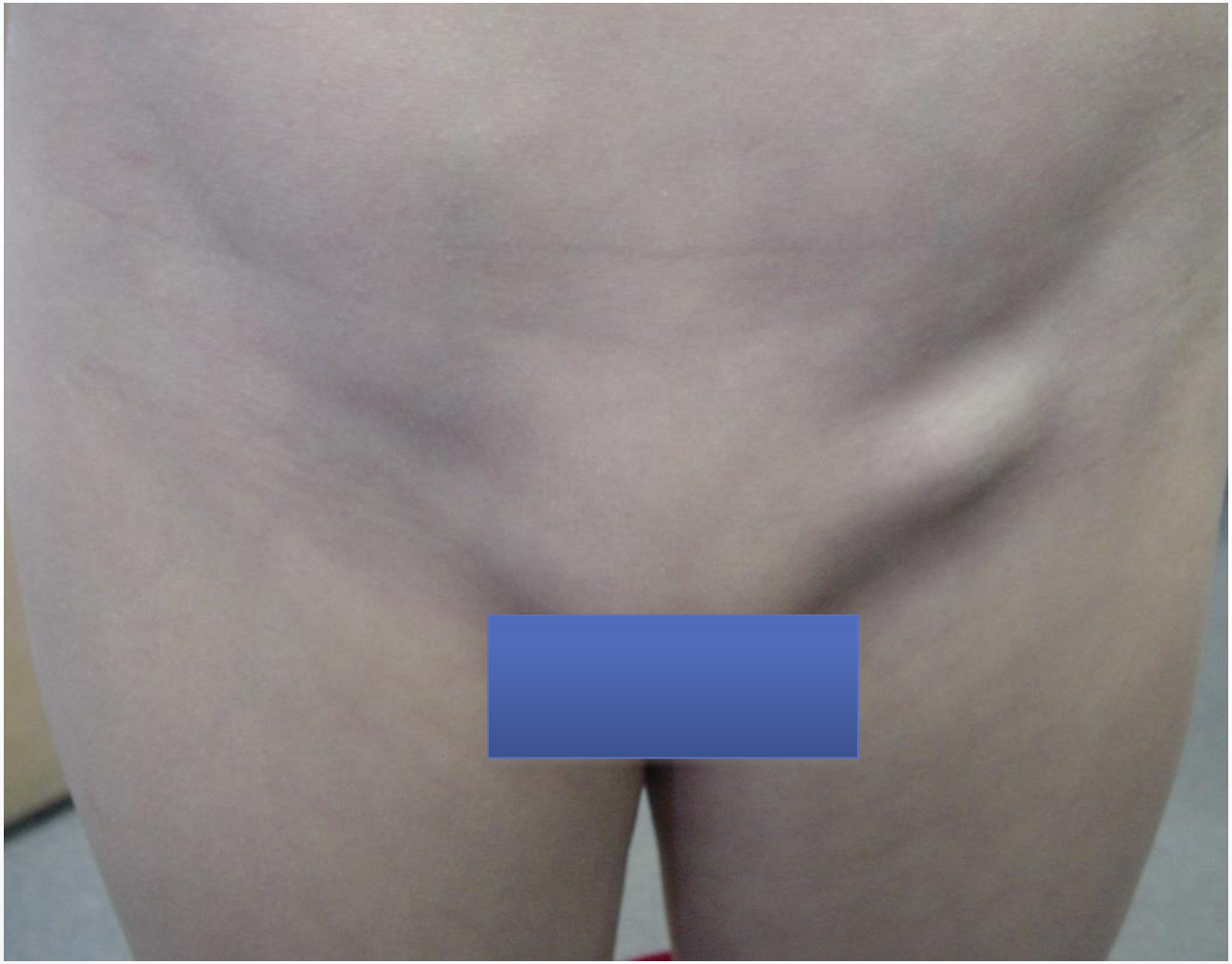
- Asymptomatic, easily reducible hernia: elective repair in the earliest possible time (within one month is preferred)
- Incarcerated hernia: Attempt of reduction and repair within 24 hours (preferred). If reduction is not successful: urgent repair to avoid ischemia
- Strangulated hernia: IV hydration, antibiotics, emergent operation (bowel gangrene will need resection)
- Surgical procedure:
  - Herniotomy with high ligation of the hernia sac (no mesh)

Technique for Reduction

- Frog-leg position
- Push down towards pubis w/ left fingers
- push up towards canal w/ right fingers
- maintain gentle pressure along the inguinal canal



Femoral Hernia



Outcomes after Surgery

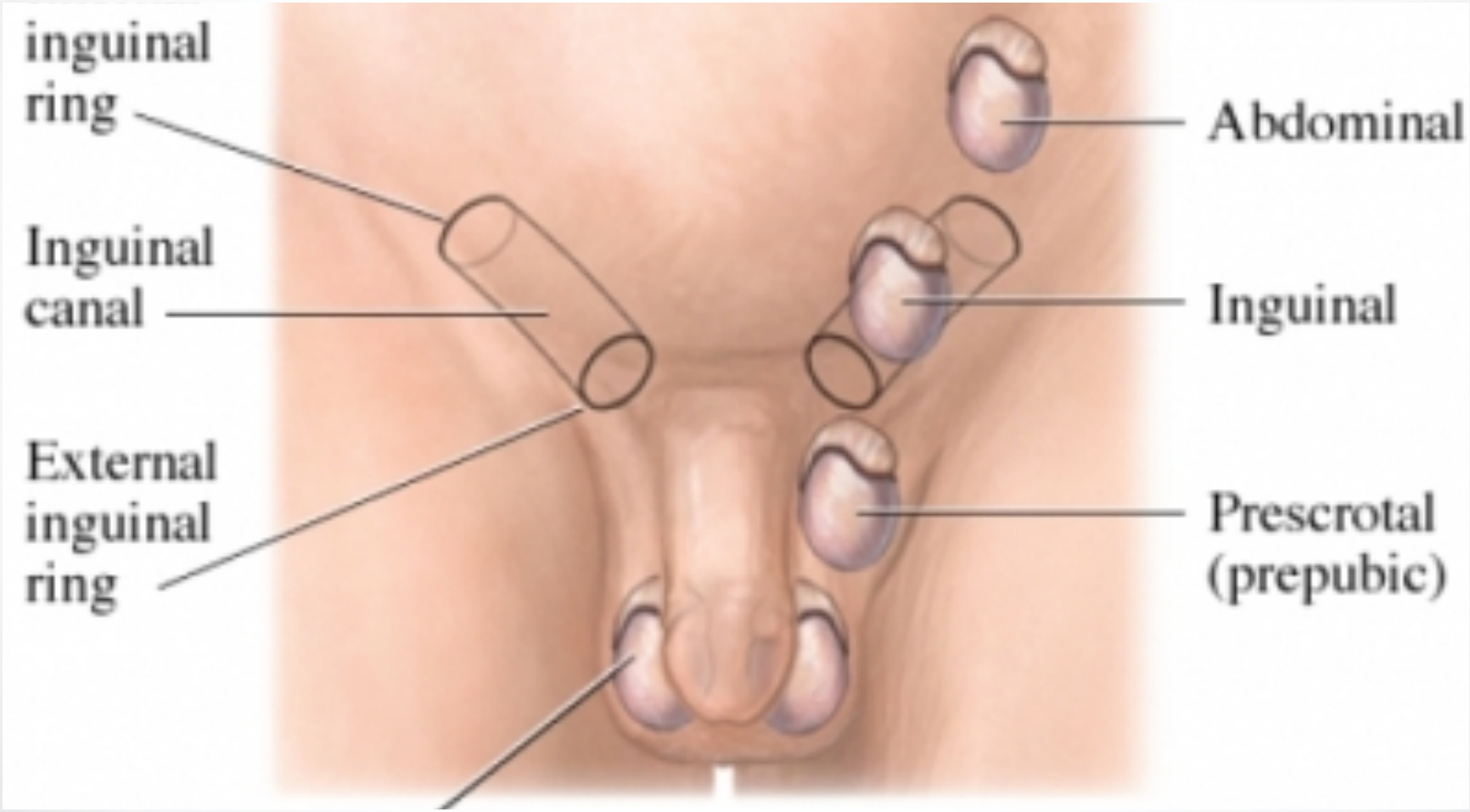
- Day surgery, to go home in the same day
- Return to normal activities within 1 week
- Operative complications
  - Bleeding
  - Wound infection (<1%)
  - Injury to cord structures (<2%)
- Recurrence 0.5-1%

Management of Hydrocele

- Most= non-communicating
- Communicating hydrocele: treat like hernia
- Non-communicating hydrocele:
  - Observe until 1-2 years of age for spontaneous resolution
  - Surgery if not resolved at 2 yrs
- Surgical Rx:
  - Evacuation of hydrocele with high ligation of the sac

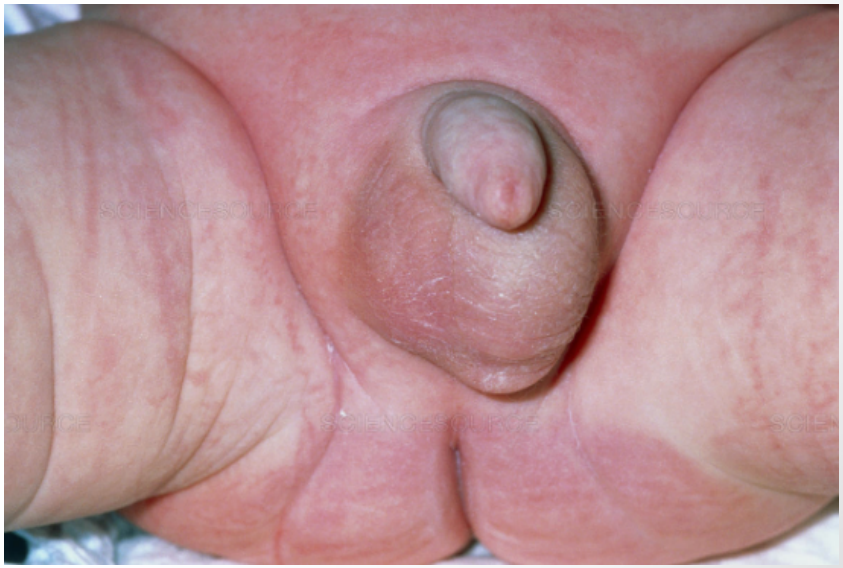
Undescended Testis

- Fetal testes develop in the retroperitonium from genital ridge
- Descend down to the scrotum before birth
- Failure/arrest of descent = undescended testis
- More common in premature babies
- Testicular degeneration (if not repaired):
  - Biopsies normal at birth
  - changes start 9-12 months (decreased spermatogonia, increasing interstitial fibrosis)


inguinal ring
Inguinal canal
External inguinal ring
Abdominal
Inguinal
Prescrotal (prepubic)

History/ Exam

- Empty scrotum since birth (unilateral or bilateral)
- P/E:
  - Hypoplastic scrotum
  - Empty scrotum
  - You must look for the testis along the line of descent
- Possible location of the testis:
  - **Superficial inguinal pouch**
  - **Inguinal canal (canalicular)**
  - Intrabdominal
  - Ectopic
  - Vanshing



Management of UDT

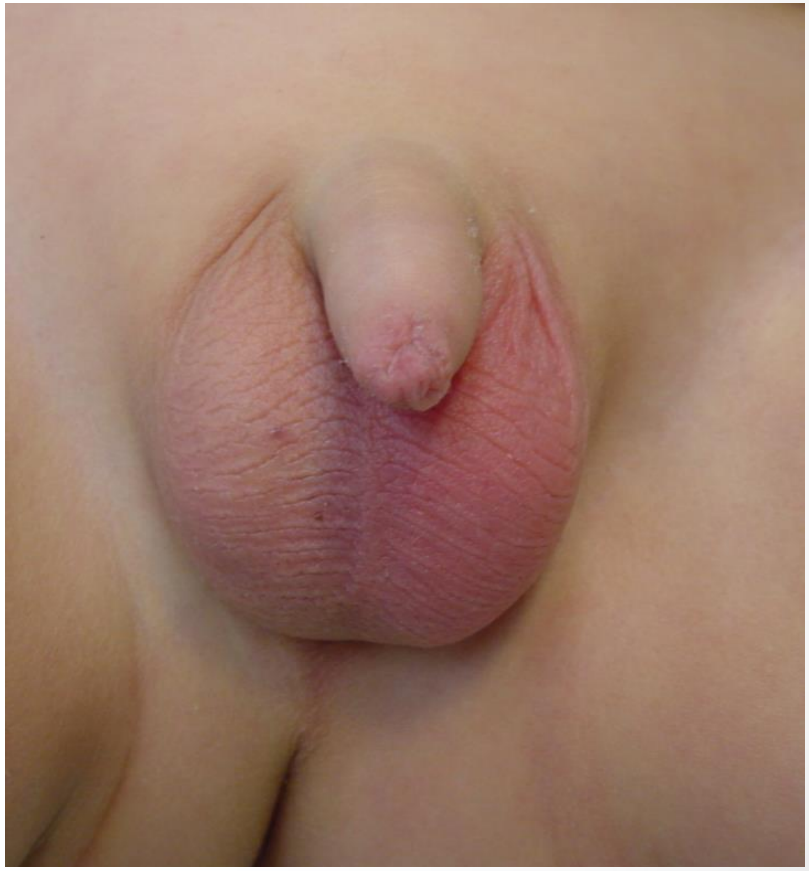
- No investigations needed (common mistake!)
- Wait for spontaneous descent until 6 months of age
- If no descent : orchidopexy at 6-9 months of age
- Delay will result in decrease in the testicular function

Complications of UDT

- Decrease fertility
- Cancer
- Testicular torsion
- Trauma

Acute Scrotum

- 8 year-old boy
- left scrotal pain
  X 2 hours
- P/E:
  - Swelling, erythema, tenderness



Acute Scrotum

History-taking in the acute scrotum

- Age
- Past medical history
- General symptoms
- First local symptom: pain before swelling?
- Pain: where? what kind? sudden onset?
- Trauma
- Prior surgery
- Nausea and vomiting
- Fever
- Dysuria
- Petechiae

Physical examination of the acute scrotum

- Position and orientation of the testes
  (Brunzel sign = secondary high position of a testis)
- Size of the testes
- Cremasteric reflexes
- Site of maximal tenderness
- Color of the scrotum
- "Blue dot sign"
- Inguinal and abdominal examination

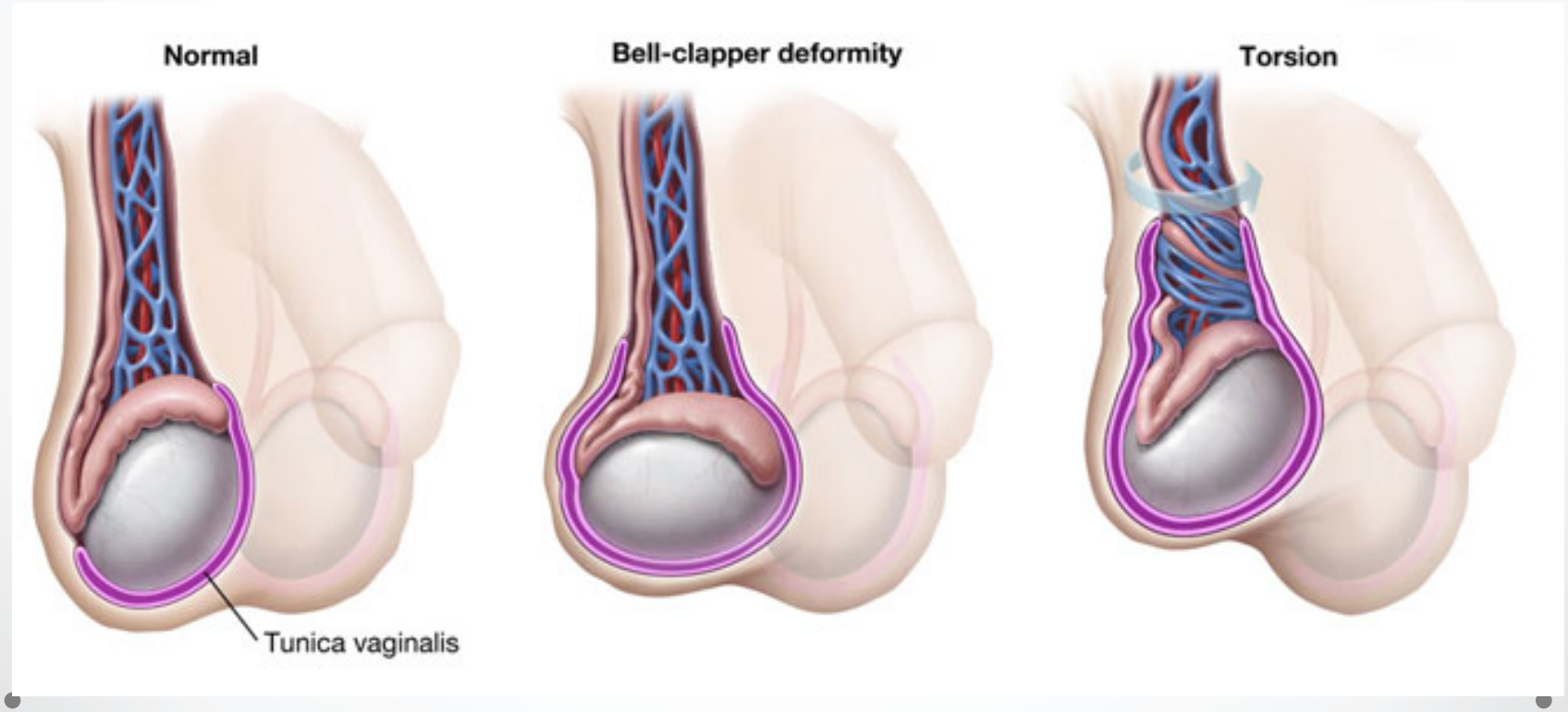
Acute scrotum

The differential diagnosis of the acute scrotum in childhood and adolescence

Torsion	Infection	Trauma	Systemic disease	Other causes
– hydatid torsion	– epididymitis	– hematoma	– Henoch–Schönlein purpura	– incarcerated inguinal hernia
– testicular torsion	– orchitis	– hematocele	– lymphoma/leukemia	– scrotal edema
		– testicular rupture		– scrotal emphysema
				– appendicitis
				– testicular tumor

Testicular Torsion

- Ischemia of the testis due to sudden spontaneous twist
- Usually because of deformity in the embryogenesis of the testis (Bell-clapper deformity: long meso-orchium)

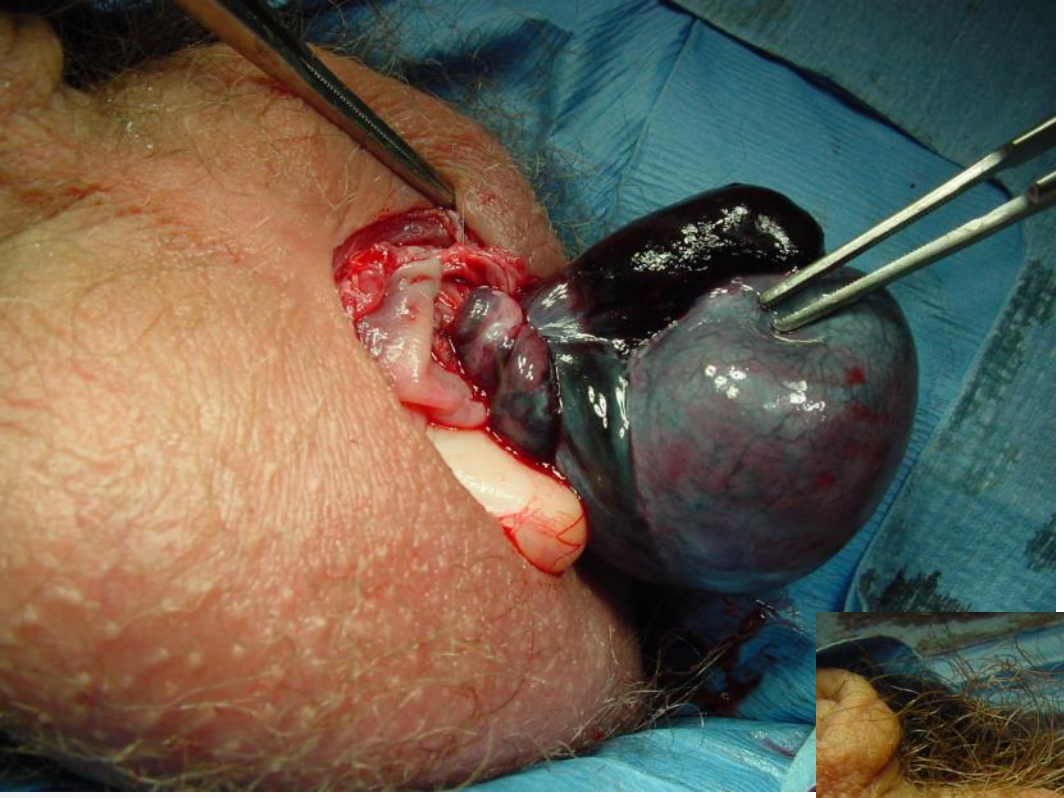


Investigations

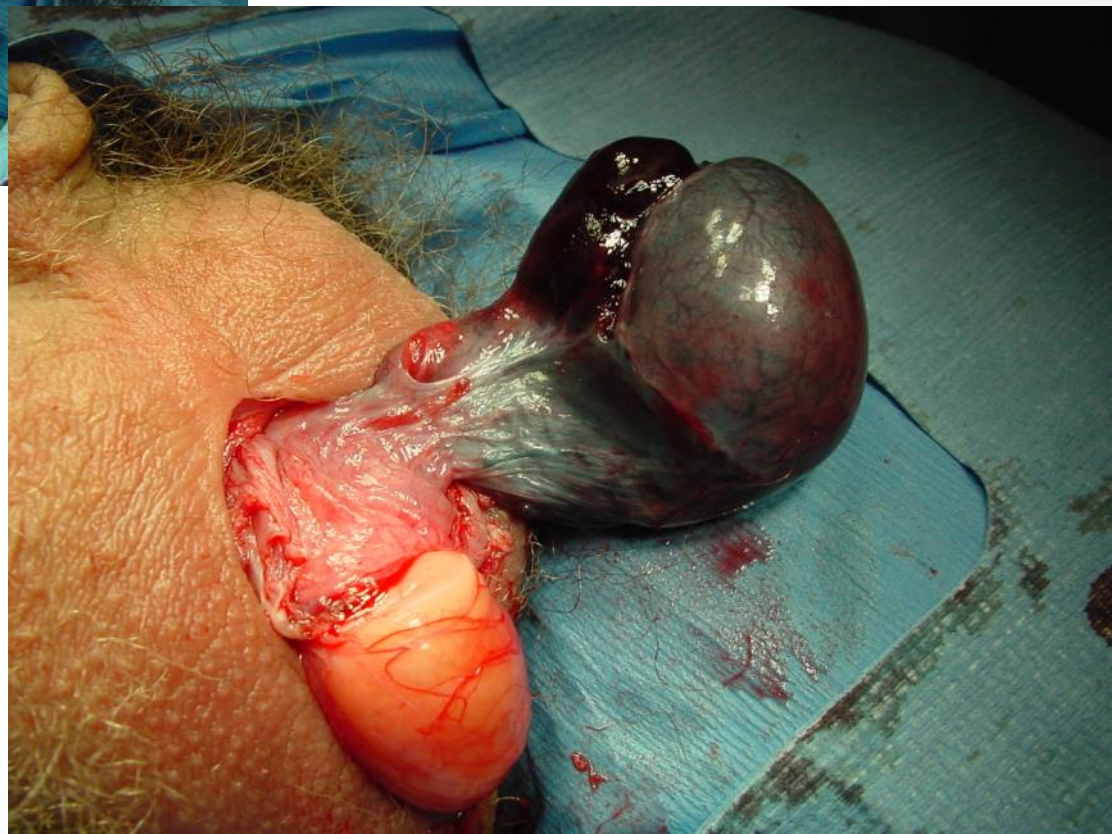
- Must not delay surgical consultation
- Urinalysis
- Ultrasound + Doppler:
  - To assess blood flow to the testis
  - Not very accurate
  - Will result in delaying surgery
- Technicium nuclear scan:
  - Theoretical
  - Not used because it takes very long time

Management

- The only thing you should do when suspecting torsion is to call the surgeon ASAP
- Immediate surgical exploration to untwist the testis + orchiopexy (+ contralateral orchiopexy)
- Orchiectomy (if the testis is dead)
- Delay of Rx for 24hrs= testis will be most likely dead!!



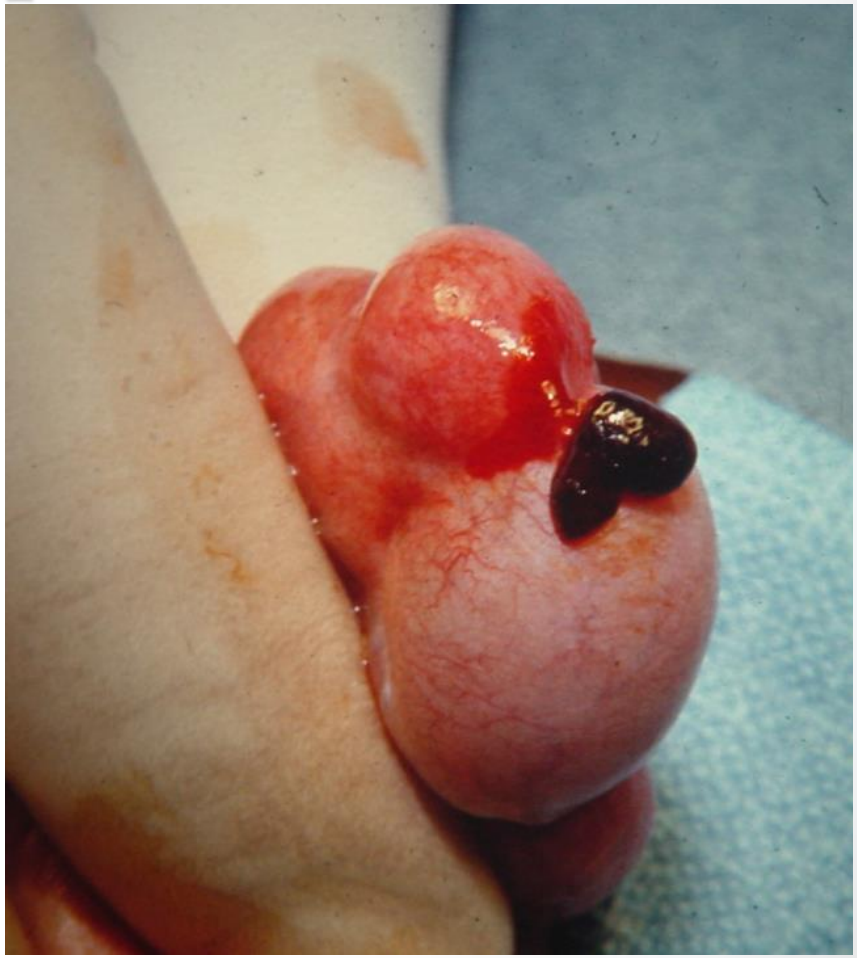
Golden period
< 8 hours since
onset of pain



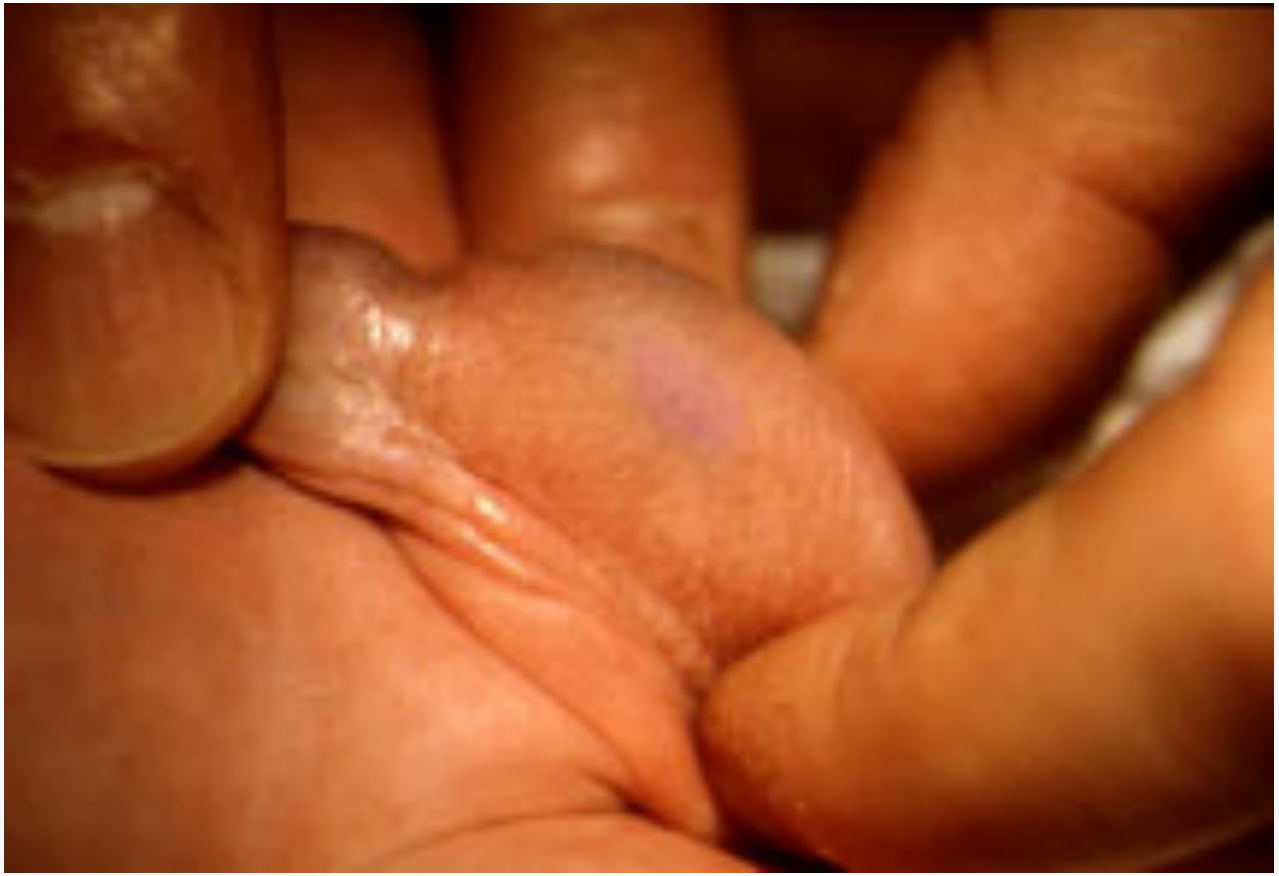
Torsion of Appendix Testis

- Testicle is not tender
- Palpable tender localized mass 2-3 mm, usually at the superior pole

- Appendix testis may be gangrenous or black and appears through the scrotum as the "blue dot sign”
- Rx: NSAIDS
- Improve in 5-10 days

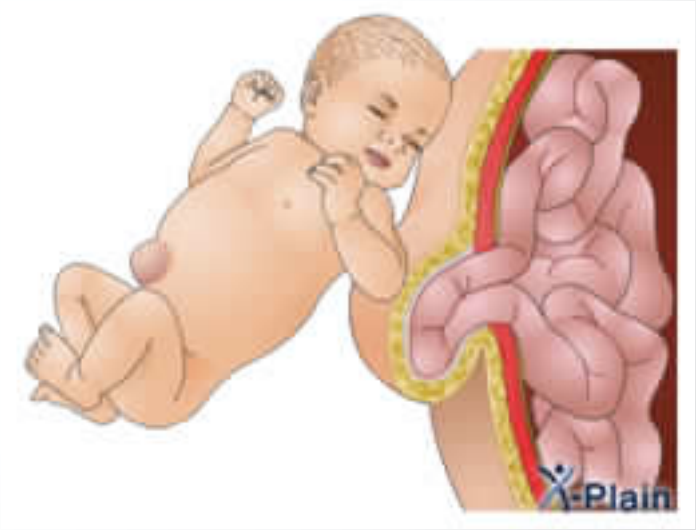


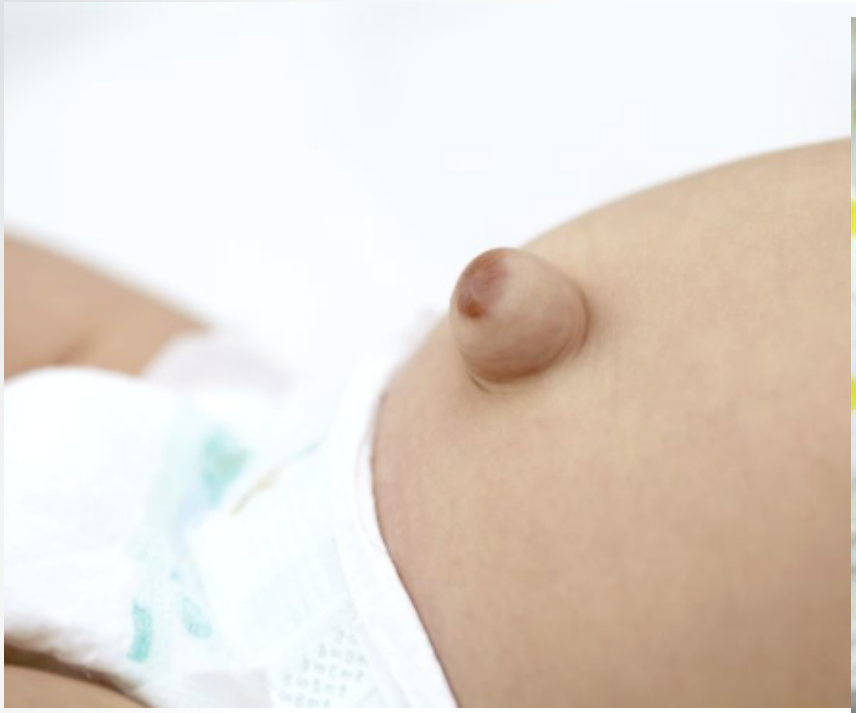
Torsion of Appendix Testis

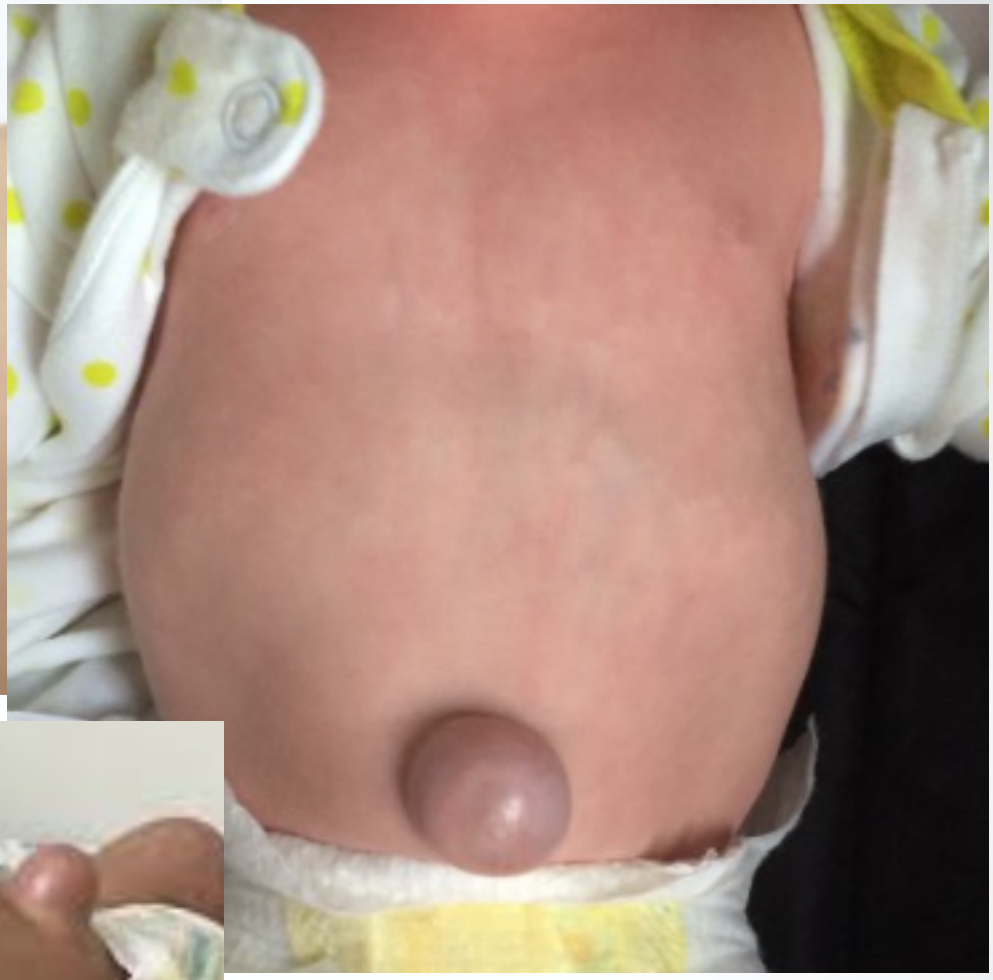


Umbilical Hernia

- Incidence
  - More common black neonates
  - Premature > term babies
- Defect in the umbilical fascia with herniation of pre-peritoneal fat and bowel
- Painless reducible umbilical bulge since birth
- More prominent with crying, straining
- Incarceration is rare
- Management:
  - Observation for spontaneous closure (95% will close)
  - Surgical repair a age of 4-5 yrs if not closed
  - Regular care (no need for hernia belt!)







What is Circumcision?

- Removal of redundant foreskin (prepuce)

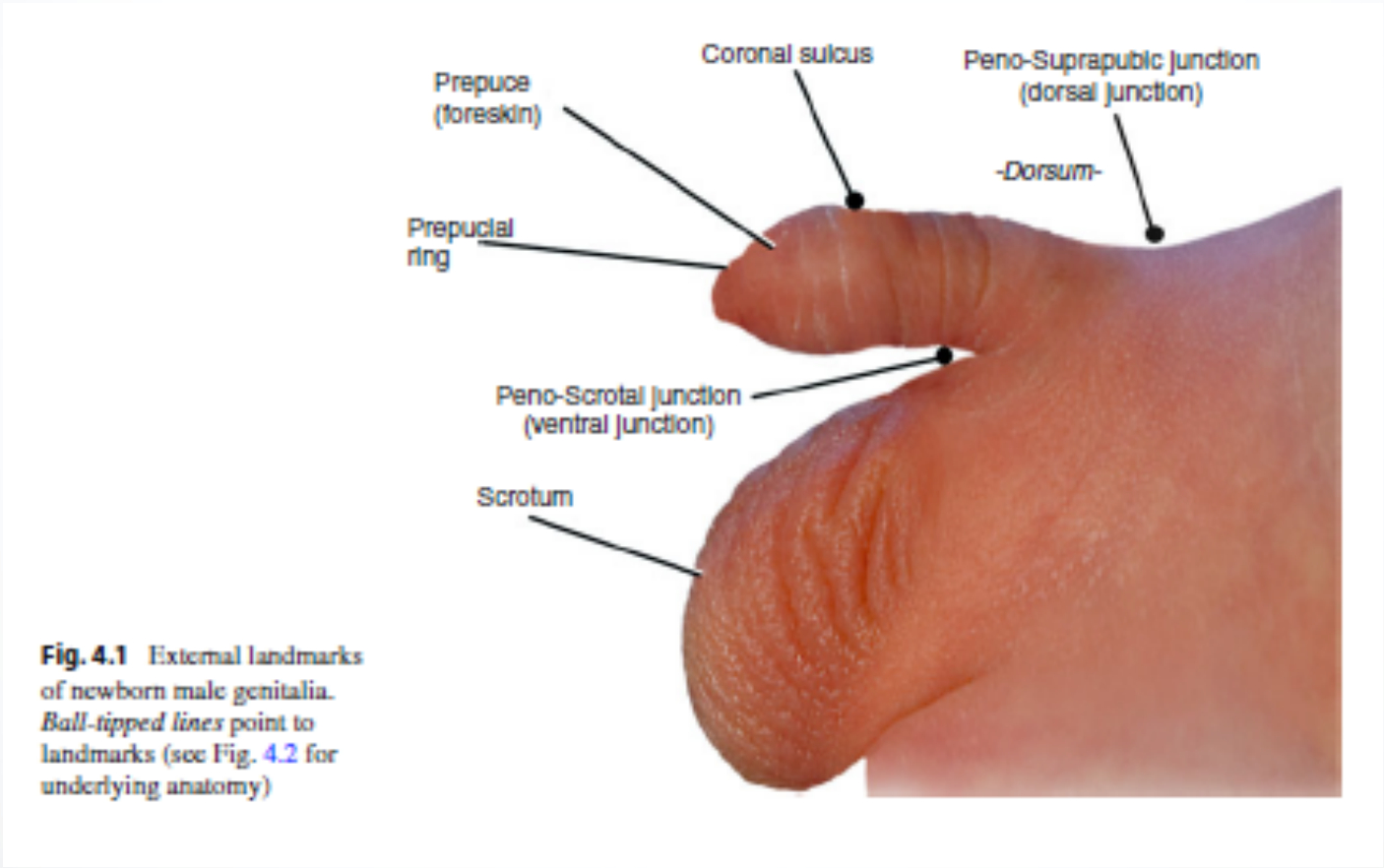


Fig. 4.1 External landmarks of newborn male genitalia. *Ball-tipped lines* point to landmarks (see Fig. 4.2 for underlying anatomy)

Medical Benefits

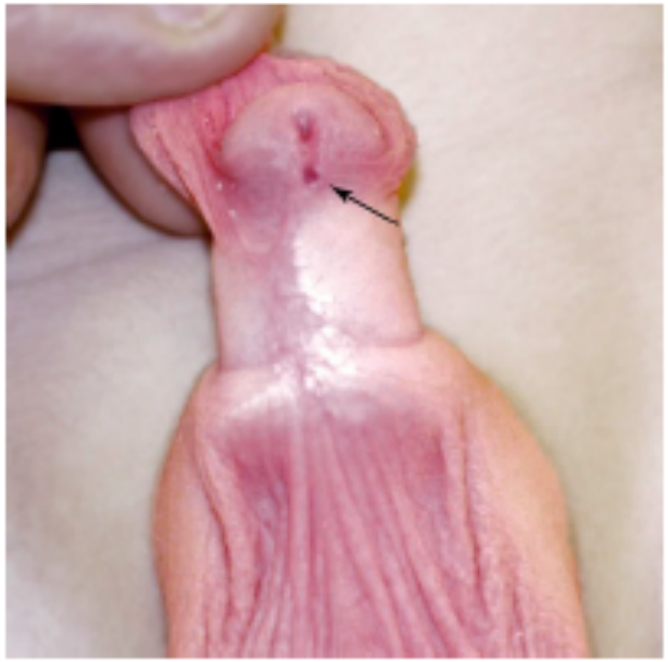
- Reduce urinary tract infections (UTIs)
- Reduce transmission of HIV
- Reduce transmission of sexually transmitted diseases (STDs) e.g. HPV, Herpes
- Reduce risk of penile cancer

Indications for Circumcision

- Religious or cultural
- Pathologic phimosis: inability to retract the foreskin
- Paraphimosis: inability to reduce retracted foreskin
- Balantitis xerotica obliterans
- Recurrent balanitis
- Recurrent posthitis

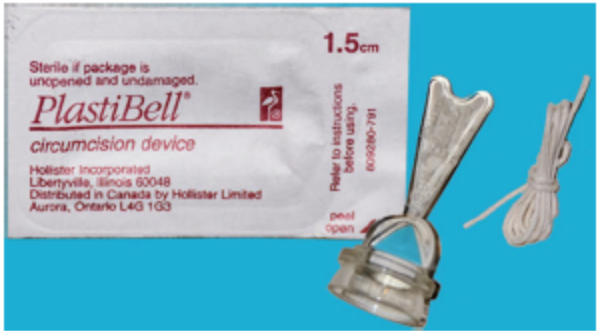
Contraindications to Circumcision

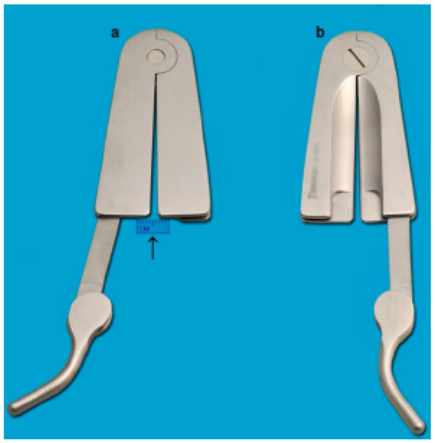
- Very short penis
- Hypospadias
- Epispadias
- Chordee
- Burried penis

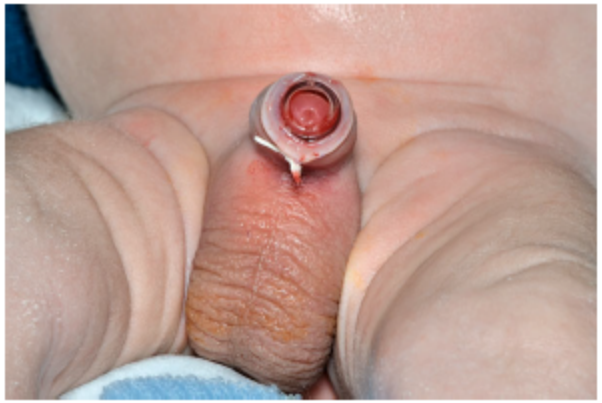


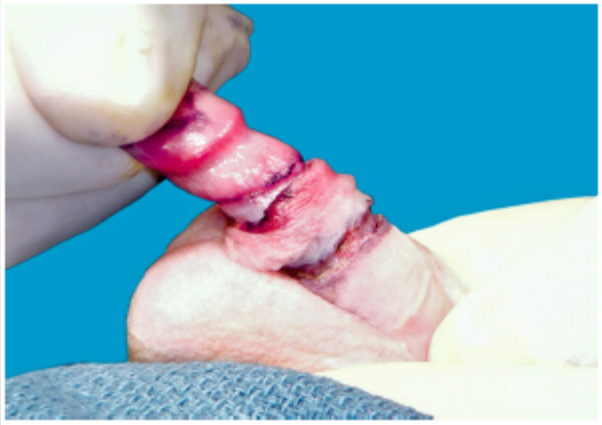
Techniques

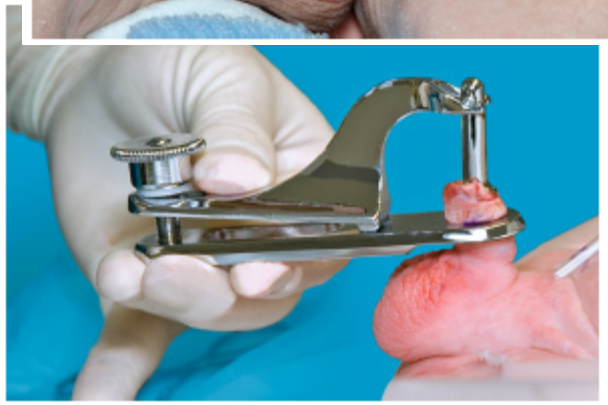
- Plastibell (newborn)
- Gomco clamp
- Mogen clamp
- Sleeve technique











Complications

- Bleeding
- Infection
- Penile adhesions
- Inclusion cysts
- Urethral fistula
- Amputation
- Penile necrosis (Never use monopolar electrocautery!!)

Questions