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40 pages

INGUINO-SCROTAL DISEASE

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- INGUINAL HERNIA AND HYDROCELE
- UNDESCENDED TESTIS
- ACUTE SCROTUM

INGUINAL HERNIA AND HYDROCELE

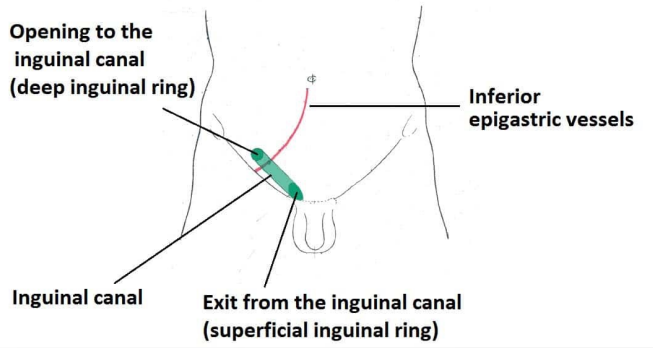
- 5% OF ALL CHILDREN
- MORE IN PREMATURE (¬ 10-30%)
- RIGHT>LEFT (RIGHT 60% , LEFT 30%)
- M>F IN FULL TERM BABIES , HOWEVER ITS 1:1 IN PREMATURE BABIES
- 10% HAS FAMILY HISTORY

ASSOCIATION

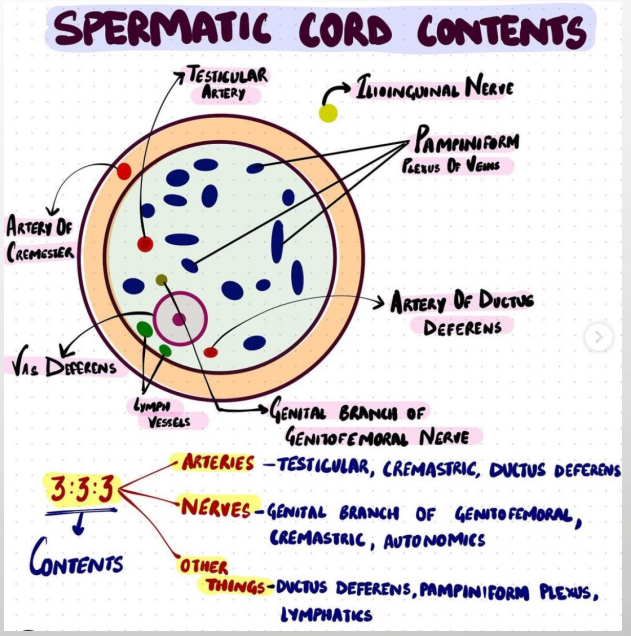
Box 50.1 Conditions Associated With Inguinal Hernia

Prematurity
Family history
Cystic fibrosis and meconium peritonitis
Hydrocephalus (ventriculoperitoneal shunt) ↑CSF → ↑ICP
Peritoneal dialysis
Ascites
Genitourinary abnormalities
Connective tissue disorders
Mucopolysaccharidoses
Glycogen storage diseases
Abdominal wall defects
Chronic lung disease

INGUINAL CANAL



- ANATOMY
- CONTENTS OF INGUINAL CANAL IN ♂ : ILIOINGUINAL NERVE + SPERMATIC CORD
  ♀ : ILIOINGUINAL NERVE + ROUND LIGAMENT
- SPERMATIC CORD STRUCTURES:
  - CREMASTERIC MUSCLE
  - TESTICULAR ARTERY
  - PAMPINIFORM PLEXUS
  - LYMPHATIC CHANNELS
  - VAS
  - GENITAL BRANCH OF GENITOFEMORAL NERVE
  - PROCESSUS VAGINALIS



PATHOGENESIS

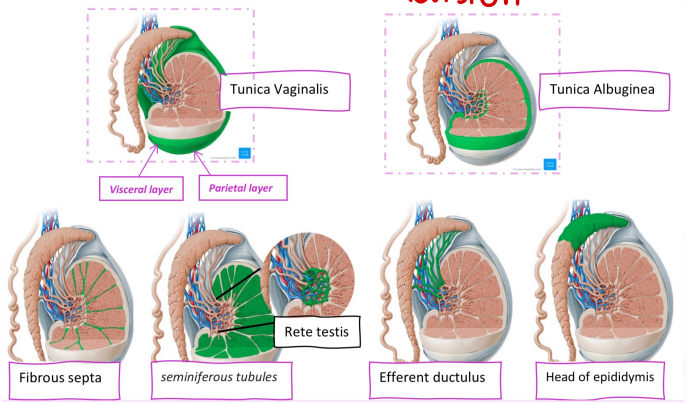
- Failed obliteration of patent process vaginalis

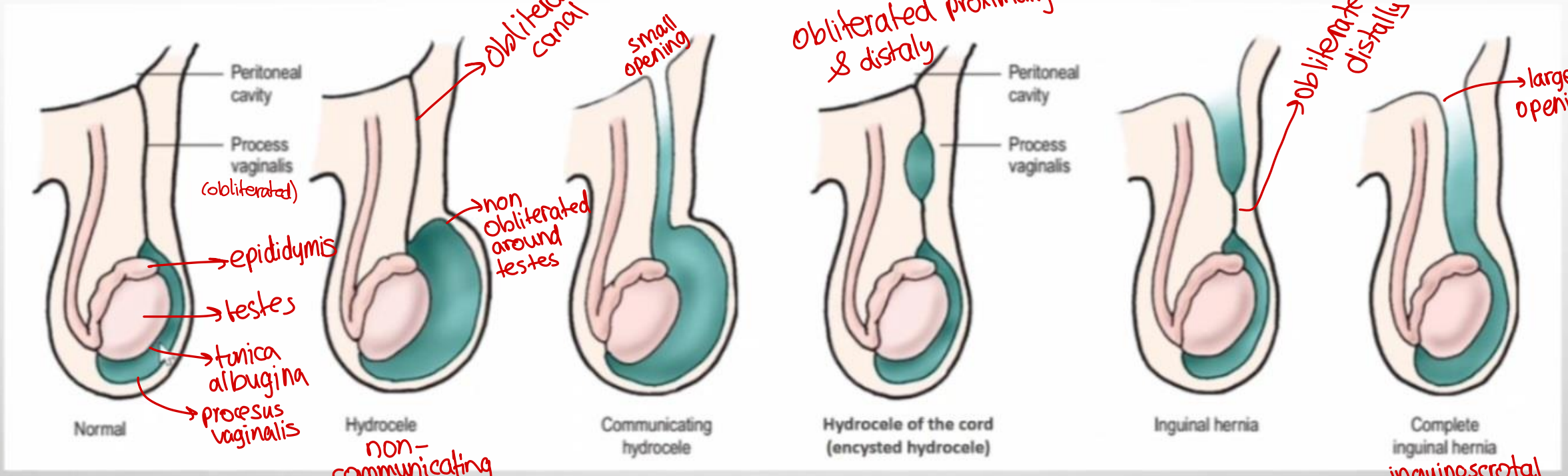
- What is Process vaginalis

- In the inguinal canal → gradually obliterates after birth
- In scrotum → forms the tunica vaginalis around the testis

Process vaginalis ⟶ tunica vaginalis

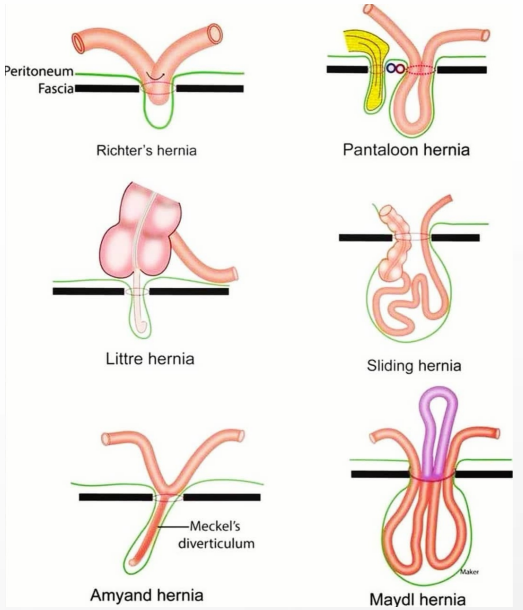
Revision:

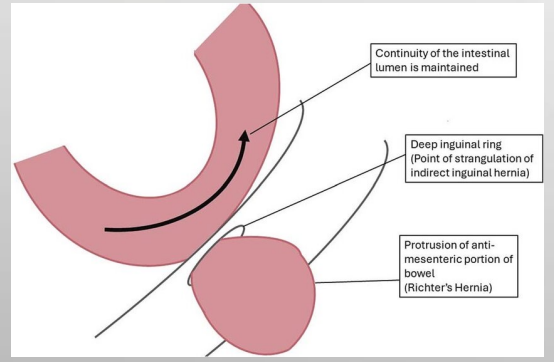

Tunica Vaginalis
Tunica Albuginea
Visceral layer
Parietal layer
Rete testis
Fibrous septa
seminiferous tubules
Efferent ductulus
Head of epididymis

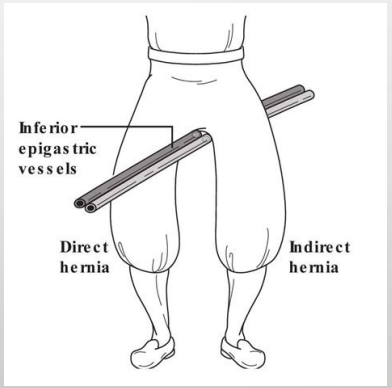

Peritoneal cavity
Process vaginalis (obliterated)
epididymis
testes
tunica albugina
processus vaginalis
Normal
Obliterated canal
non obliterated around testes
Hydrocele
non-communicating
small opening
Communicating hydrocele
Obliterated proximally & distaly
Peritoneal cavity
Process vaginalis
Hydrocele of the cord (encysted hydrocele)
Obliterated distally
Inguinal hernia
large opening
Complete inguinal hernia
inguinoscrotal hernia
indirect hernia

babies usually have indirect hernia

- SLIDING HERNIAS:
  - MAY CONTAIN: FALLOPIAN TUBE, OVARY, SIDE-WALL OF THE URINARY BLADDER
- APPENDIX IF HERNIATED : AMYAND'S HERNIA
- MECKEL DIVERTICULUM IF HERNIATED : LITTRE'S HERNIA
- RICHTER HERNIA : ISCHEMIC ANTIMESENTERIC BOWEL BORDER IN THE HERNIA
- PANTALOON HERNIAS : DIRECT AND INDIRECT INGUINAL HERNIAS . MORE COMMON IN NEONATES.







PRESENTATION :

- MOST ARE ASYMPTOMATIC
- OFTEN FOUND BY THE PARENTS OR PEDIATRICIAN ON ROUTINE PHYSICAL EXAMINATION
- THE DIAGNOSIS IS CLINICAL : scrotal swelling → reproducible / non-reproducible

transillumination +ve in hydrocele can be +ve in hernia too bc bowel wall is thin in babies

- IF ASYMPTOMATIC:
  - CAN SIMPLY BE OBSERVED FOR 1-2 YEARS OF AGE
  - 90% OF NON COMMUNICATING HYDROCELE RESOLVED
  - 65-70% OF COMMUNICATING HYDROCELE RESOLVED → can have hernia

- INDICATIONS OF SURGERY:
  - WHEN FAILS TO RESOLVE
  - IF A CLINICAL HERNIA IS APPARENT
  - IF SYMPTOMATIC (PAIN) → rare

HYDROCELE

- ACCUMULATION OF PERITONEAL FLUID A NON OBLITERATED PROCESS VAGINALIS

SURGERY

- HIGH LIGATION OF PROCESS VAGINALIS + DRAINAGE OF HYDROCELE
- LORD'S/BOTTLE /JABOULY'S PROCEDURE ← don't memorize

HERNIA

don't wait like hydrocele to prevent venous congestion & ischemia

- OPEN VS LAPAROSCOPIC PPV LIGATION → patent process vaginalis

- OPEN EXPLORATION OF THE CLINICALLY-FREE CONTRALATERAL SIDE IS JUSTIFIED IN:
  - PREMATURITY
  - YOUNGER AGE
  - FEMALE GENDER
  - LEFT-SIDED UNILATERAL HERNIA

- MESH IS ALMOST NEVER USED IN CHILDREN
  - EXCEPT IN: RECURRENT HERNIAS IN CHILDREN WITH CONNECTIVE TISSUE DISORDERS OR MUCOPOLYSACCHARIDOSES

weak abdominal wall

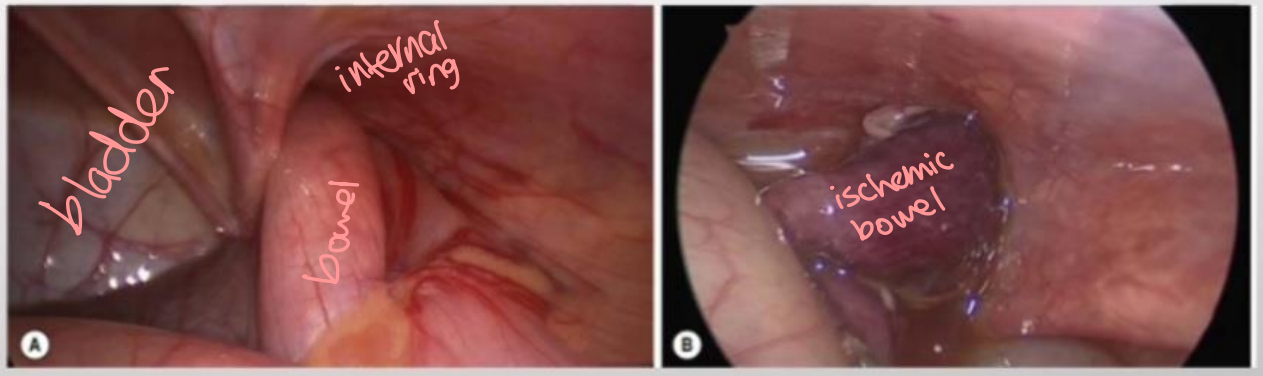
LAPAROSCOPIC VS OPEN

laparoscopic:

- NO DIFFERENCE IN RECURRENCE (< 0.5%)
- ↓ INCIDENCE OF METACHRONOUS HERNIA → A **metachronous hernia** refers to the development of a hernia on the opposite side of a previously repaired hernia, occurring at a different time.
- ↓ OP. TIME FOR LAP. BILATERAL REPAIRS
- ↑ OP. TIME WITH LAP. UNILATERAL REPAIR

unilat. side → open
bilate. sides → lap.

lap. advantages:
→ you can check the other scrotum by the same surgery



resect this bowel segment

INCARCERATED HERNIA

- **TRY TO REDUCE IT :** trial of reduction
  - WITH SEDATION
  - FIRM AND CONTINUOUS PRESSURE APPLIED AROUND THE INCARCERATION
  - IF REDUCED (90–95%) ,ADMIT AND REPAIR WITHIN 24-48HRS
  - IF FAILED OR INCOMPLETE REDUCTION OR CONTRAINDICATED, ADMIT FOR EMERGENT SURGERY

↳ if strangulated (ischemic)

- **DON'T REDUCE IF:**
  - SIGNS OF PERITONITIS
  - SEPTIC SHOCK

* can die if reduced ischemic segment!!!

SURGICAL COMPLICATION

RECURRENCE (<1%)

- HIGHER IN:
  - PREMATURE INFANTS
  - CHILDREN WITH INCARCERATED HERNIAS
  - ASSOCIATED DISEASES (E.G., CONNECTIVE TISSUE DISORDER, VPS)

INJURY TO THE SPERMATIC CORD OR TESTIS (RARE)

WOUND INFECTION (SSI) surgical site infx.

HEMATOMA

PERSISTENT HYDROCELE

CHRONIC PAIN (UNCOMMON IN CHILDREN)

LOSS OF DOMAIN (DUE TO A HUGE HERNIA) → small abdomen

IATROGENIC CRYPTORCHIDISM

loss of domain

UNDESCENDED TESTES (UDT)

INCIDENCE OF UDT

- 3% OF TERM MALE NEWBORN
- 33–45% OF PREMATURE OR LOW BIRTH WEIGHT (<2.5 KG)
- THE MAJORITY OF TESTES DESCEND WITHIN THE FIRST 6–12 MONTHS SUCH THAT AT 1 YEAR, THE INCIDENCE IS DOWN TO 1%.

CLASSIFICATION

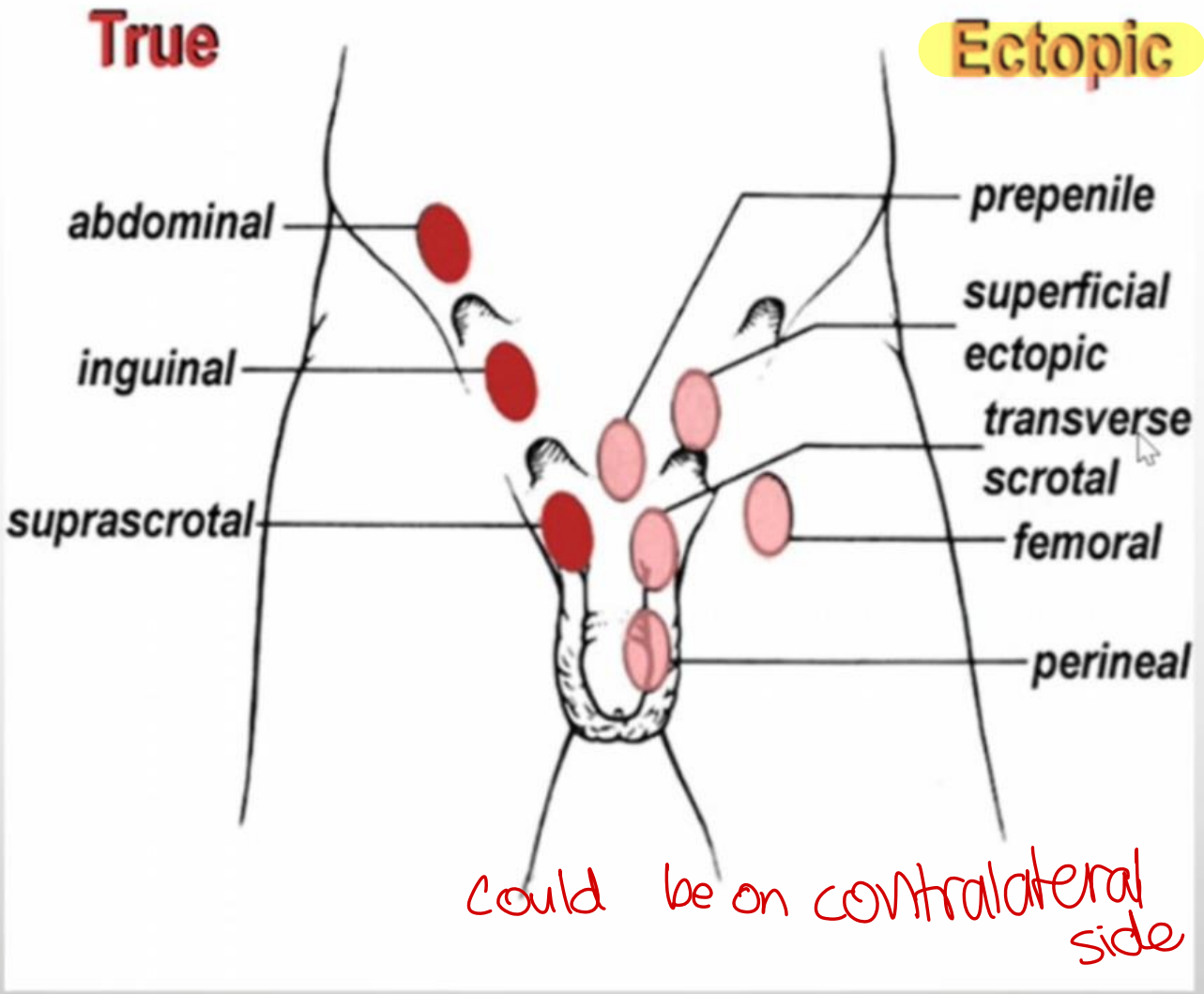
- NON-PALPABLE UDT
  - TESTICULAR AGENESIS
  - INTRA-ABDOMINAL UDT
  - VANISHED TESTIS (ATROPHIED DUE TO PREV. VASCULAR INSULT AS PERINATAL TORSION, TRAUMA, OR IATROGENIC)
  - SMALL TESTIS, OBESE CHILD, OR NON-EXPERIENCED EXAMINER

- PALPABLE UDT (70%)
  - INGUINAL UDT
  - RETRACTILE TESTIS (CREMASTERIC OVERACTIVITY)
  - ASCENDING TESTIS (ACQUIRED UDT)
  - PEEPING TESTIS *
  - ECTOPIC TESTIS*

Previous

خصية نطاطة

* migrate back & forth at internal inguinal ring, could be palpable or non-palpable


True
Ectopic
abdominal
inguinal
suprascrotal
prepenile
superficial ectopic
transverse scrotal
femoral
perineal
could be on contralateral side

ASSOCIATIONS

- **ASSOCIATED ANOMALIES:**
  - PATENT PROCESSUS VAGINALIS → hernia or/& hydrocele
  - EPIDIDYMAL ABNORMALITIES
  - PRUNE-BELLY SYNDROME → abdominal wall defect + renal tract abnormalities + UDT
    - ↳reflex of ureter m/c
  - GASTROSCHISIS
  - BLADDER EXSTROPHY → bladder open to abdominal wall
  - PRADER–WILLI, KALLMAN, NOONAN SYNDROMES
  - TESTICULAR DYSGENESIS → hormonal problems or problem in gonadal formation
  - ANDROGEN INSENSITIVITY SYNDROMES → no androgen production or problem with androgen receptors

↳gastroschisis

WHY WE ARE CONCERNED

- MALIGNANCY RISK

× 2-3 increased risk

- FERTILITY

* unidescendant testes:
  fertility like normal population

1% with inguinal UDT

5% with abdominal UDT
↳ seminoma type

* bilateral undiscendant testes:
  ×6 times they become infertile

* infertility
  abdominal > inguinal

* when correcting the problem, risk of malignancy doesn't decrease → easier for self examination & detection since it becomes palpable

* after orchidopexy type of malignancy:
  non-seminoma germ cell tumor

PRESENTATION

- EMPTY HEMISCROTUM DURING NEONATAL CHECKUP OR LATER VISITS

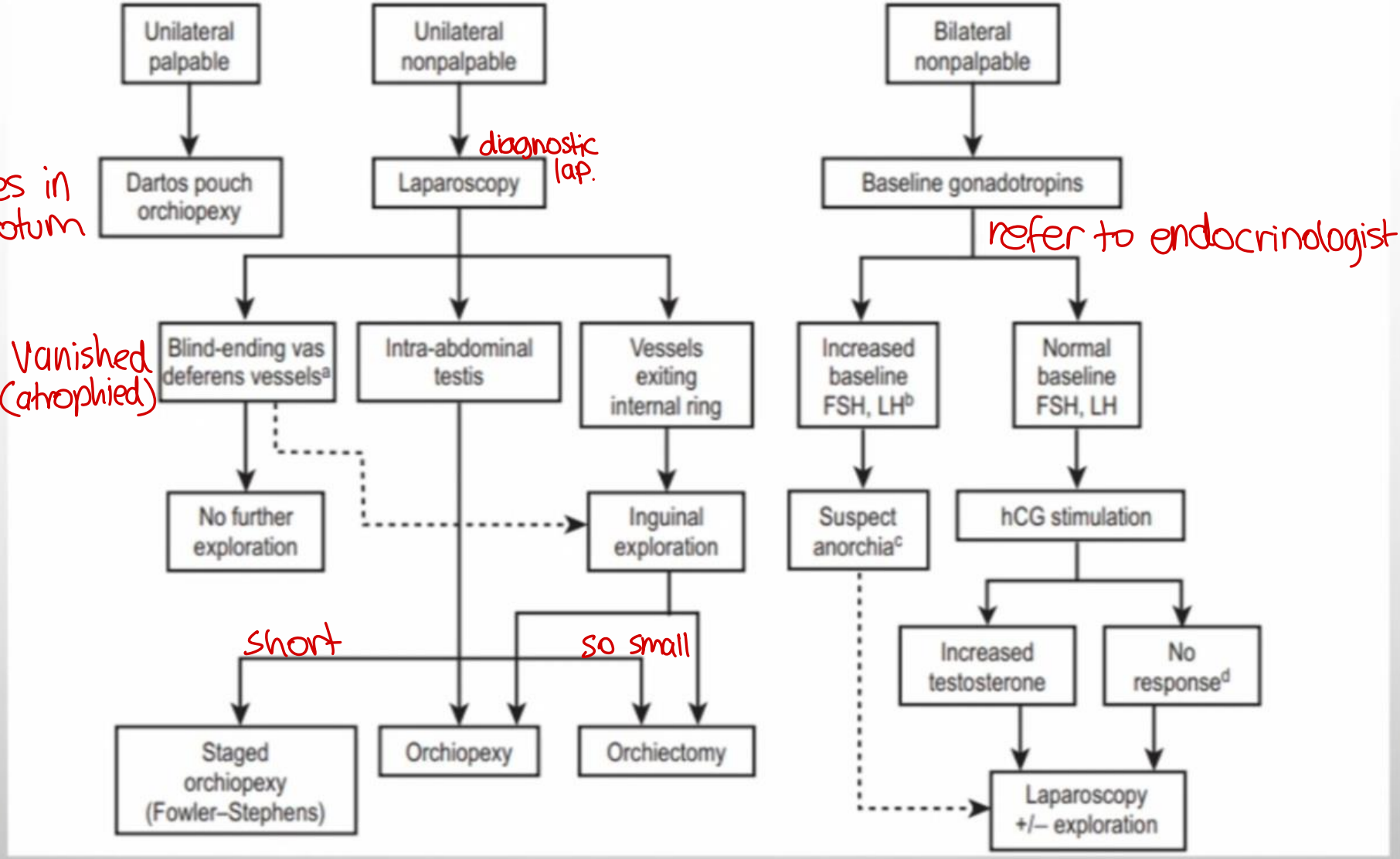
- HISTORY IS IMPORTANT (GESTATIONAL AGE, PRESENT AT BIRTH, HISTOY OF TRAUMA/TESTICULAR TORSION , PREVIOUS INGUINAL SURGERY)

ON EXAM

- INSPECT : SCROTUM , PHALLUS
  - SIGNS OF SCROTAL DEVELOPMENT (DARKER SKIN COLOR AND PRESENCE OF RUGAE)
  - SCROTAL SIZE

- PALPATE : SCROTUM , TESTIS (BILATERALLY), INGUINAL REGION

MANAGEMENT



fix testes in scrotum

diagnostic lap.

refer to endocrinologist

Vanished (atrophied)

short

so small

MANAGEMENT

HORMONES (LH-RH AGONIST)

CONTROVERSIAL

SURGERY

WHY WE DO SURGERY ?

- REDUCES THE RISK OF MALIGNANCY AND INFERTILITY
- REDUCES THE RISK OF TORSION
- EASIER EXAMINATION
- PSYCHOLOGICAL : NORMAL-APPEARING SCROTUM
- ENHANCE ENDOCRINE FUNCTION

Acute scrotum

Dr.Abeer Aldiab . MD,JBGS, JBPS,EBPS,FRCS Eng(Paediatric surgery)

- Acute scrotal pain with or without swelling and erythema
- Most conditions are nonurgent .But, it's critical to differentiate between them & testicular torsion
- Age at presentation is an important clue

(torsion of the appendix testis/epididymis → prepubertal boys • testicular torsion → neonates and adolescents)

- **DDx:**
  - Torsion of the testis
  - Torsion of the appendix testis/epididymis
  - Epididymitis/orchitis → inflammation of the testes
  - Hernia/hydrocele
  - Trauma/sexual abuse
  - Tumor
  - Idiopathic scrotal edema (dermatitis, insect bite)
  - Cellulitis
  - Vasculitis (Henoch-Schönlein purpura

TESTICULAR TORSION

Results from twisting of the spermatic cord which compromises the testicular vasculature and results in infarction

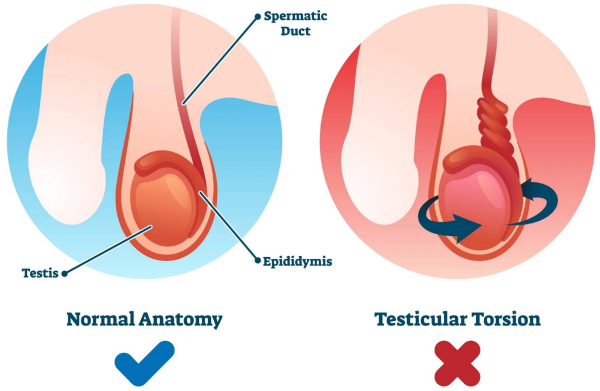
Probability of testicular salvage declines significantly beyond **6 hours** → golden window

Typically occurs before age 3 years or after puberty

Less common in prepubertal boys and after age 25 years

Success rate of surgery <6 hrs:
95-100%

TESTICULAR TORSION

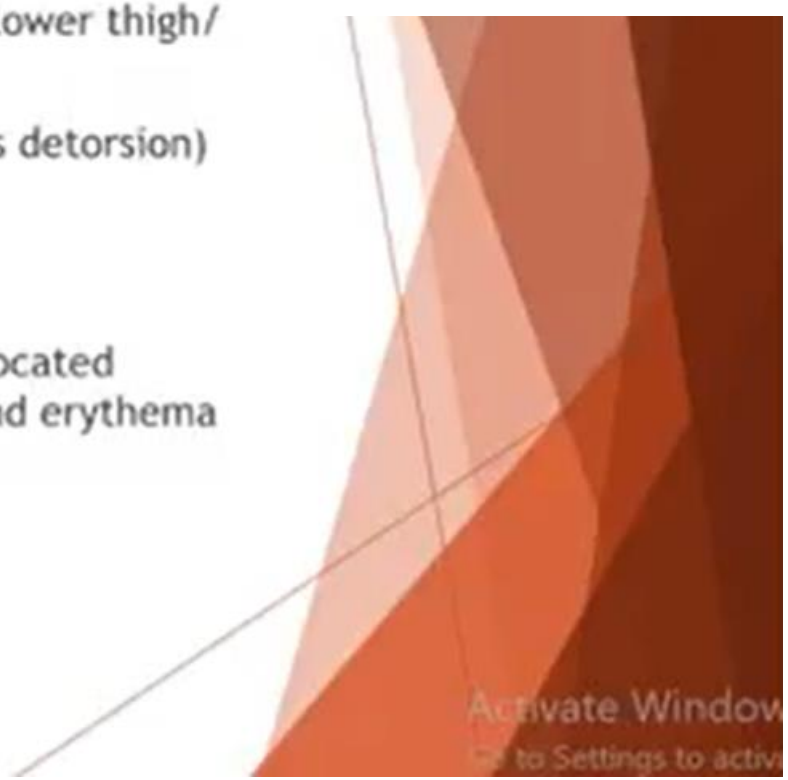


- **Presentation:** sudden onset of severe, unilateral testicular pain /lower thigh/ or lower abdominal pain , nausea and vomiting

(Intermittent testicular pain → incomplete torsion with spontaneous detorsion)

- enlarged testis, retracted up, transverse orientation, anteriorly located epididymis, severe generalized testicular tenderness , swelling and erythema , cremasteric reflex is often absent

↳not specific or sensitive



- Two types of torsion:

Extravaginal : occurs perinatally neonate or anteratally

spermatic cord twists proximal to the tunica vaginalis

the tunica and testis to spin on the vascular pedicle

Intravaginal : more common in children and adolescents

spermatic cord twists within the tunica vaginalis

'bell-clapper' deformity

free floating testes within tunica not fixed

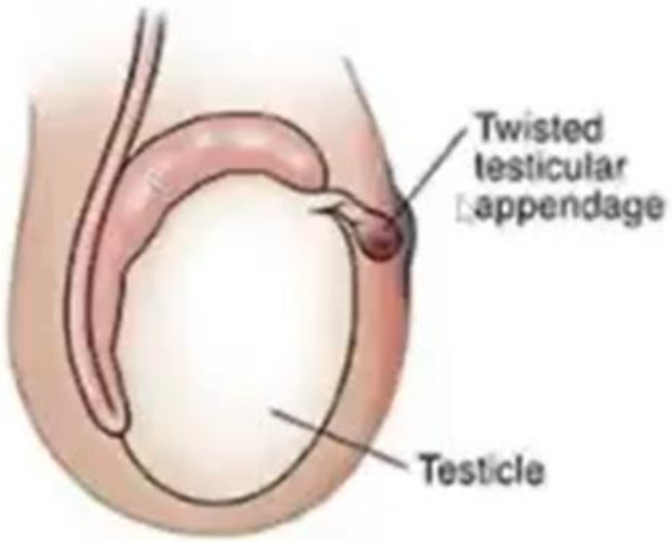
→ for reperfusion

- Exploration under GA, detorsion, placement in warm saline/gauze, and fixation , in addition to contralateral fixation → risk of torsion in future
- If the testis is clearly nonviable, it should be removed

↳ dusky & didn't reperfuse

Torsion of Testicular Appendages

- Torsion of the appendix testis or appendix epididymis is the most common cause of an acute scrotum
- Most commonly between ages 7 and 10 years (? prepubertal hormonal)
- Presentation: sudden onset of pain and nausea , appendage can be palpated/ focally tender (blue dot sign)
- Self-limited
- Management : NSAIDs, restricted activity, and warm compresses



if not sure of testicular torsion
do exploratory surgery

blue dot sign

tenderness focally (localized)

Epididymitis/Orchitis

Bacterial (rare in children) : Retrograde bacterial infection (from the bladder and urethra)

Scrotal pain and swelling typically have a slow onset, worsening over days Progressive

On exam : induration, swelling, and tenderness of the hemiscrotum , positive urinalysis and culture, or urethral swab in sexually active adolescents suggests the diagnosis

Treatment : antibiotic therapy

Viral :Mumps orchitis (rare) , Adenovirus, enterovirus, influenza, and parainfluenza virus infections

Treatment : supportive (self-limited)

Idiopathic Scrotal Edema

Scrotal swelling +erythema

Unknown etiology

Boys 5 to 9 years of age

characterized by: Insidious onset of swelling and erythema that begins in the perineum or inguinal l region, and spreads to the hemiscrotum , Pruritus

Testis is not tender

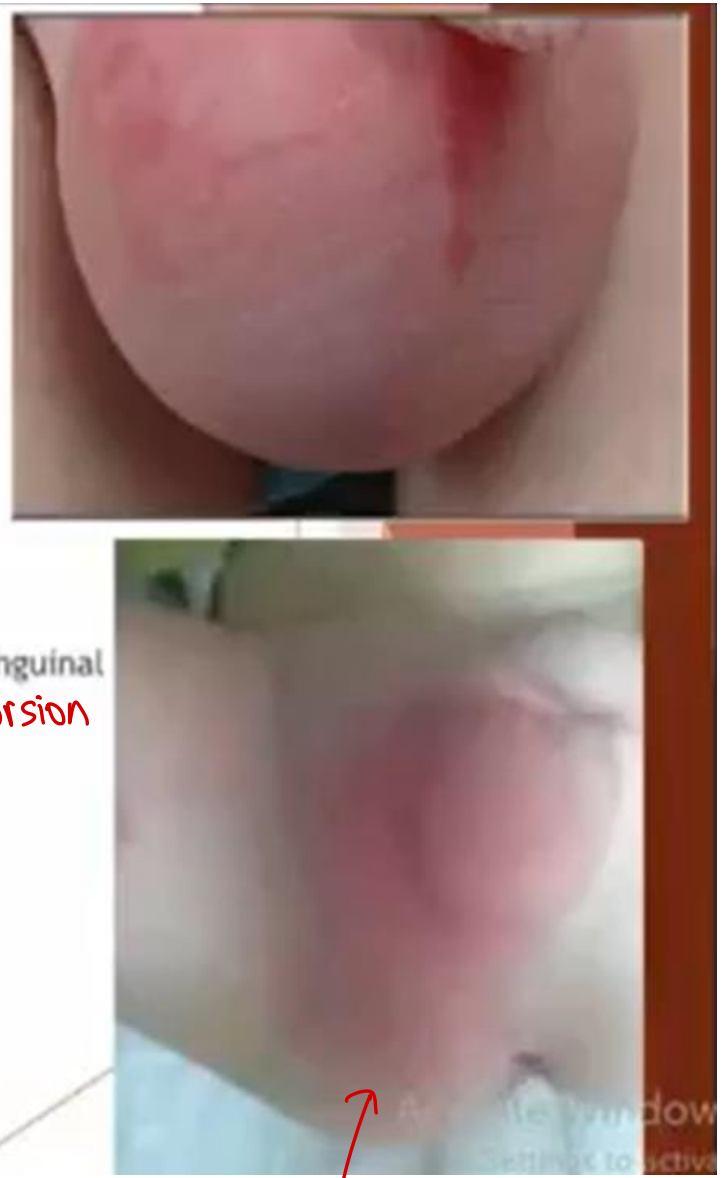
US shows normal testicular blood flow

DDx: Contact dermatitis ,insect bites ,minor trauma ,cellulitis from an adjacent infection

Treatment: anti-histamine or topical corticosteroids.

*differentiate btwn test. torsion:
- non-tender
- normal size
- normal consistency
(pain in skin not scrotum)

→ different than torsion Presentation



antibiotic?

could be peri-anal abscess

Henoch-Schönlein Purpura (HSP)

A vasculitis syndrome that involve the skin, joints, and GI and GU systems

Symptoms :scrotal and spermatic cord pain, erythema, and swelling (in 1/3) , skin purpura, joint pain, and hematuria
↳ rash

Most commonly in boys younger than 7 years of age

Doppler US: normal blood flow to the testis

Management :conservative

DDx: testicular torsion

TESTICULAR TRAUMA

- Rare

- **Dx:** History of trauma , don't forget to check sexual abuse

- **Exam:** injured testis is swollen and markedly tender ,swelling and bruising of the scrotum

- **US:** evaluate for rupture of the tunica albuginea

Management : exploration +/- repair of the ruptured tunica albuginea

blunt trauma