

BENIGN SCROTAL PATHOLOGY

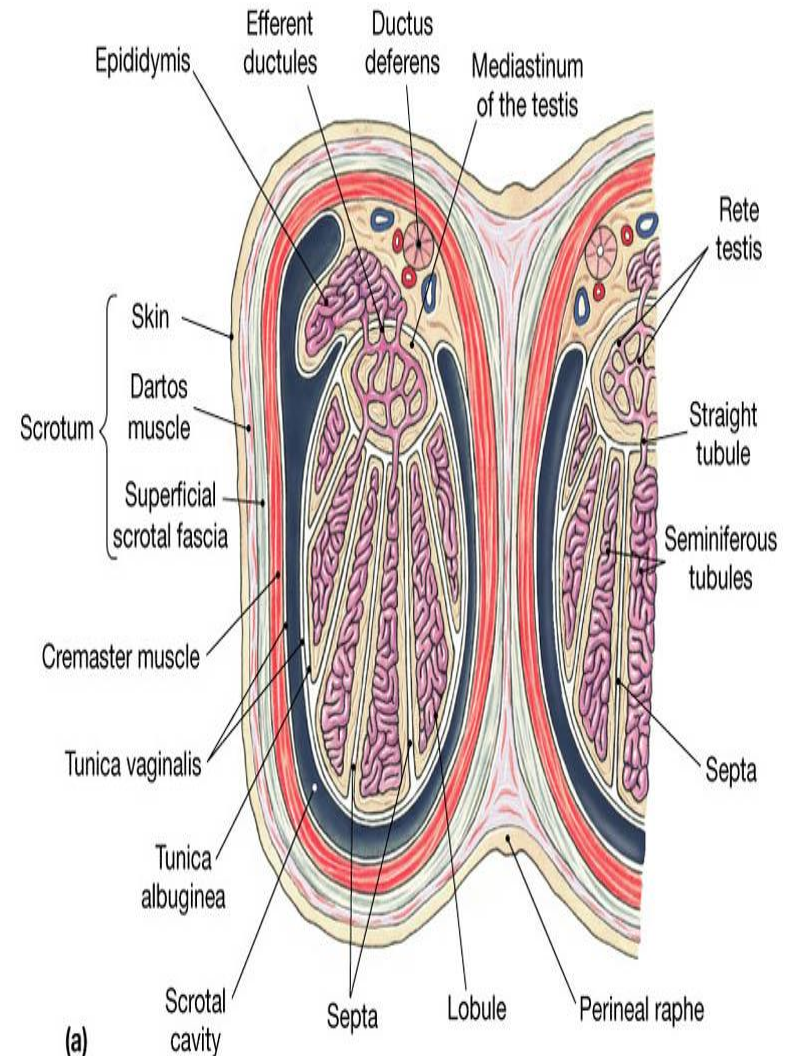
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Outline

- Anatomy of the scrotum, spermatic cord, testis, epididymis
- Differential diagnosis
- Approach to a patient with scrotal swelling
- Painful scrotal swelling
- Painless scrotal swelling

The wall of scrotum has the following layers

- 1-Skin
- 2-Superficial fascia (colles + dartos muscle fascia)
- 3-External spermatic fascia -- External oblique
- 4-Cremasteric muscle-- internal oblique
- 5- Internal spermatic fascia -- fascia transversalis
- 6-Tunica vaginalis



– **Tunica vaginalis:**

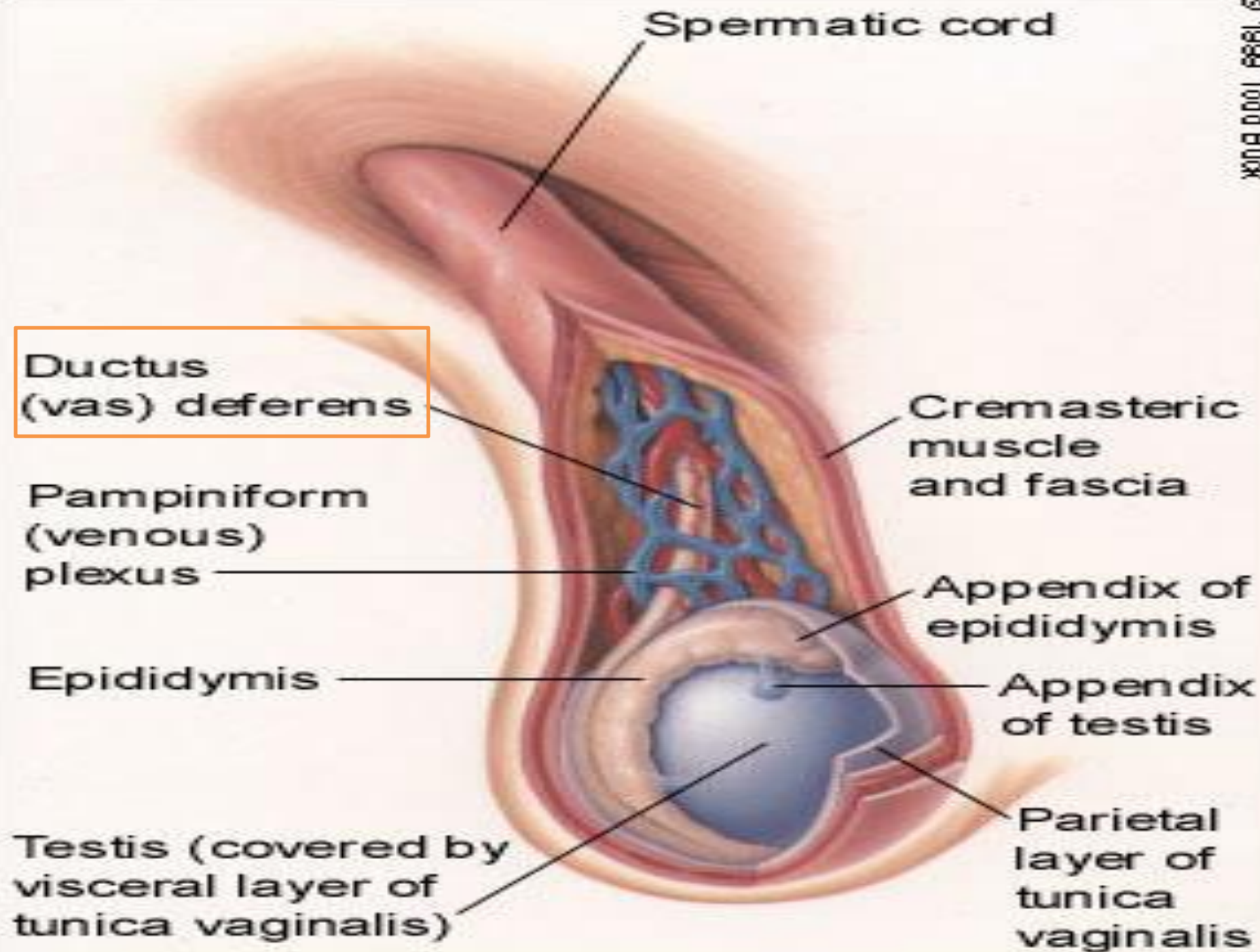
- Lower expanded part of the processus vaginalis
- Closed before birth thus it is closed sac,
- It is invaginated from behind by the testis (covers the **anterior, medial, and lateral surfaces** of testis).

– **Lymph Drainage:**

- The penis and scrotum, including the tunica vaginalis, drains into the **superficial inguinal L.N.**

– **Cremaster muscle:**

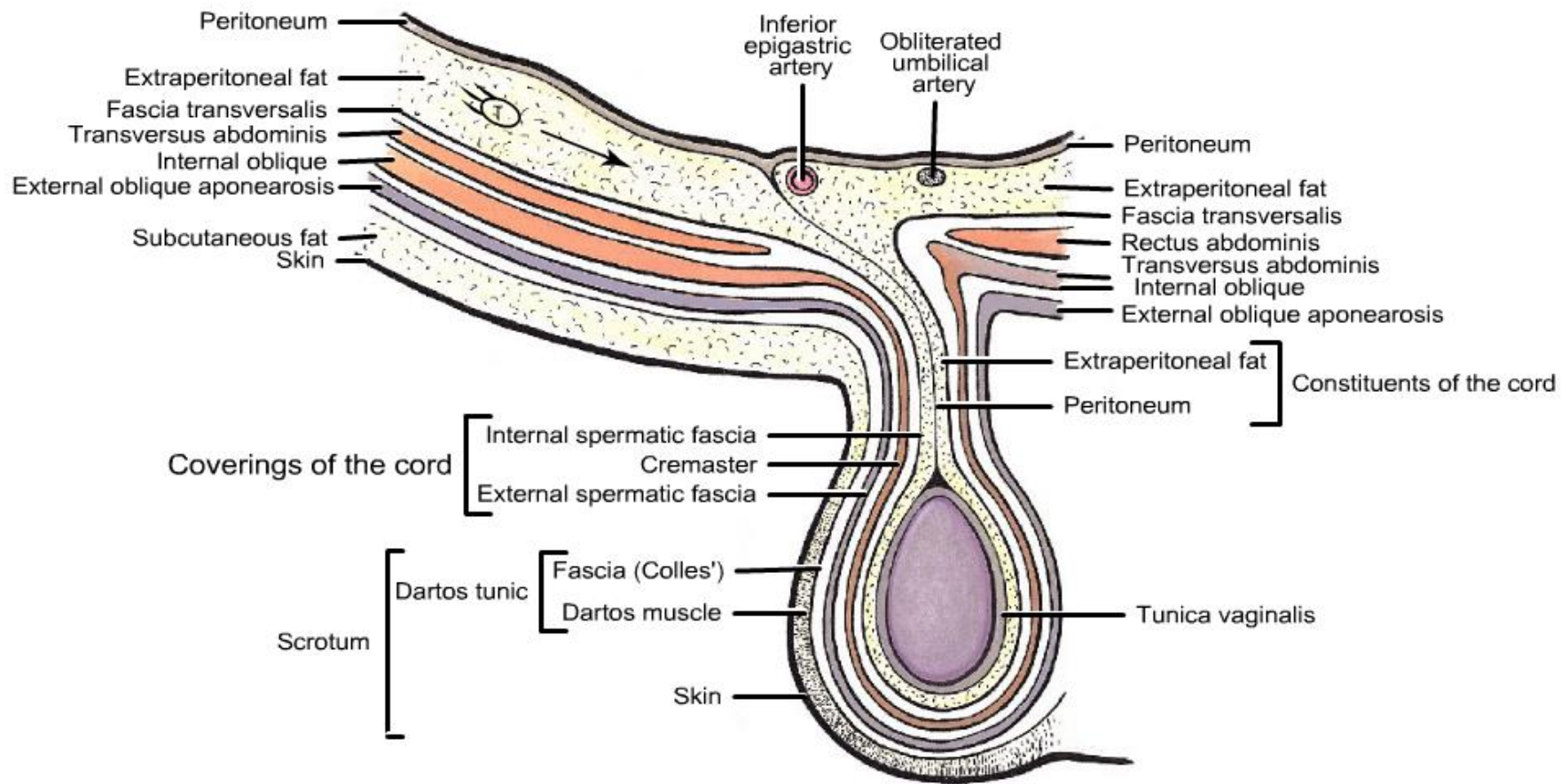
- Can be made to contract by stroking the skin on the medial aspect of the thigh i.e .**cremasteric reflex.**
- The function of the cremaster muscle is to raise the testis and the scrotum upward for warmth and for protection against injury.

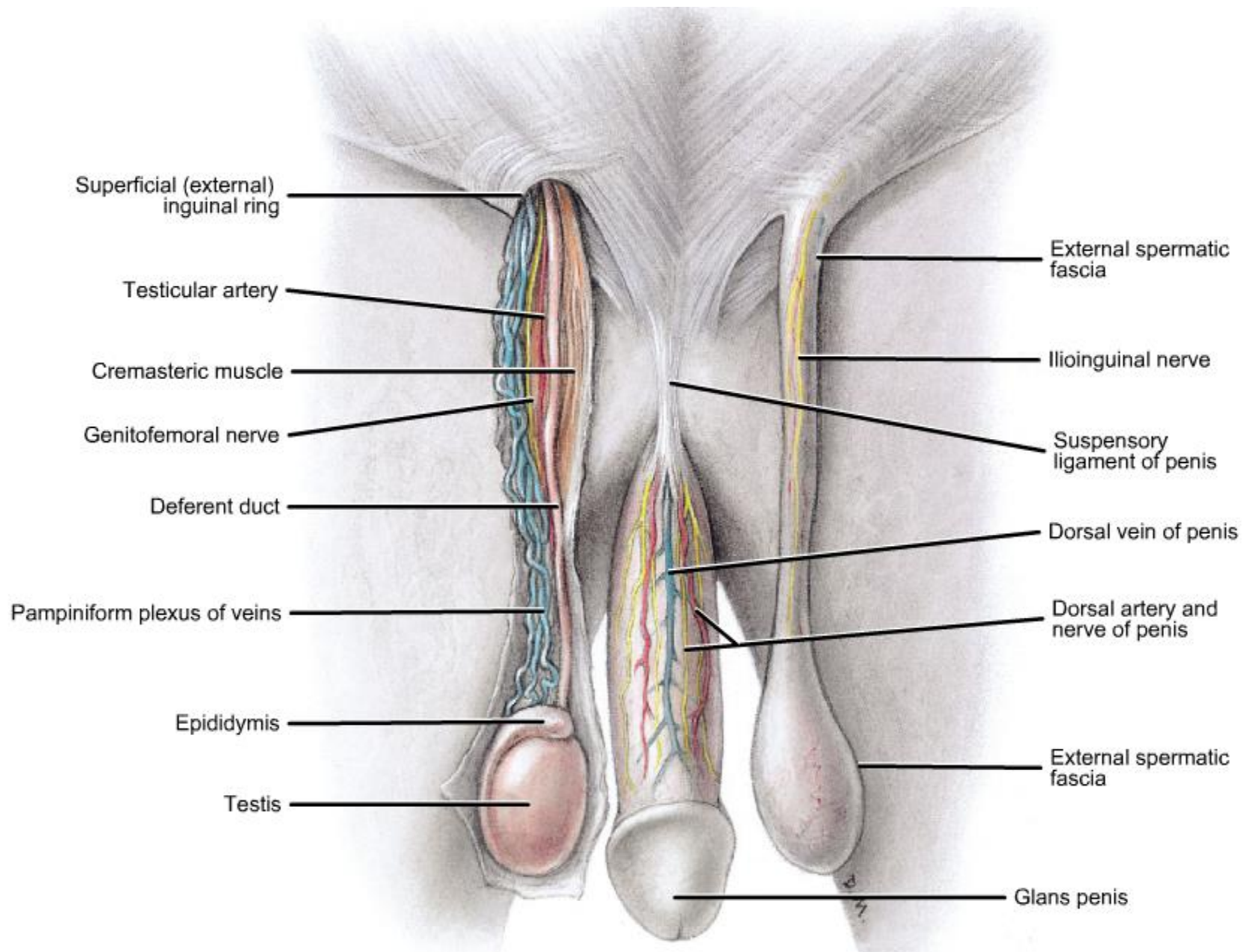


- **Coverings of the spermatic cord:**
 - * **Internal spermatic fascia**
(transversalis/endoabdominal fascia)
 - * **Cremasteric fascia/muscle** (fascia of internal oblique muscle)
 - * **External spermatic fascia** (aponeurosis of the external oblique muscle)

Contents of spermatic cord

- **Ductus deferens** (conveys sperm from the epididymis to the ejaculatory duct)
 - * **Arteries**
 - * **Testicular artery** (arises from the abdominal aorta at L2)
 - * Artery of the ductus deferens (arises from inferior vesical artery)
 - * Cremasteric artery (arises from the inferior epigastric artery)
 - * **Veins**
 - * Pampiniform plexus (formed by up to 12 veins, drain into right and left **testicular veins**)
 - * **Nerves**
 - * Sympathetic nerve fibers on arteries
 - * Sympathetic and parasympathetic nerve fibers on the ductus deferens
 - * Genital branch of the genitofemoral nerve supplying the cremaster muscle
 - * **Lymphatics**
 - * Lymphatic vessels draining the testis and closely associated structures
 - * lumbar lymph nodes

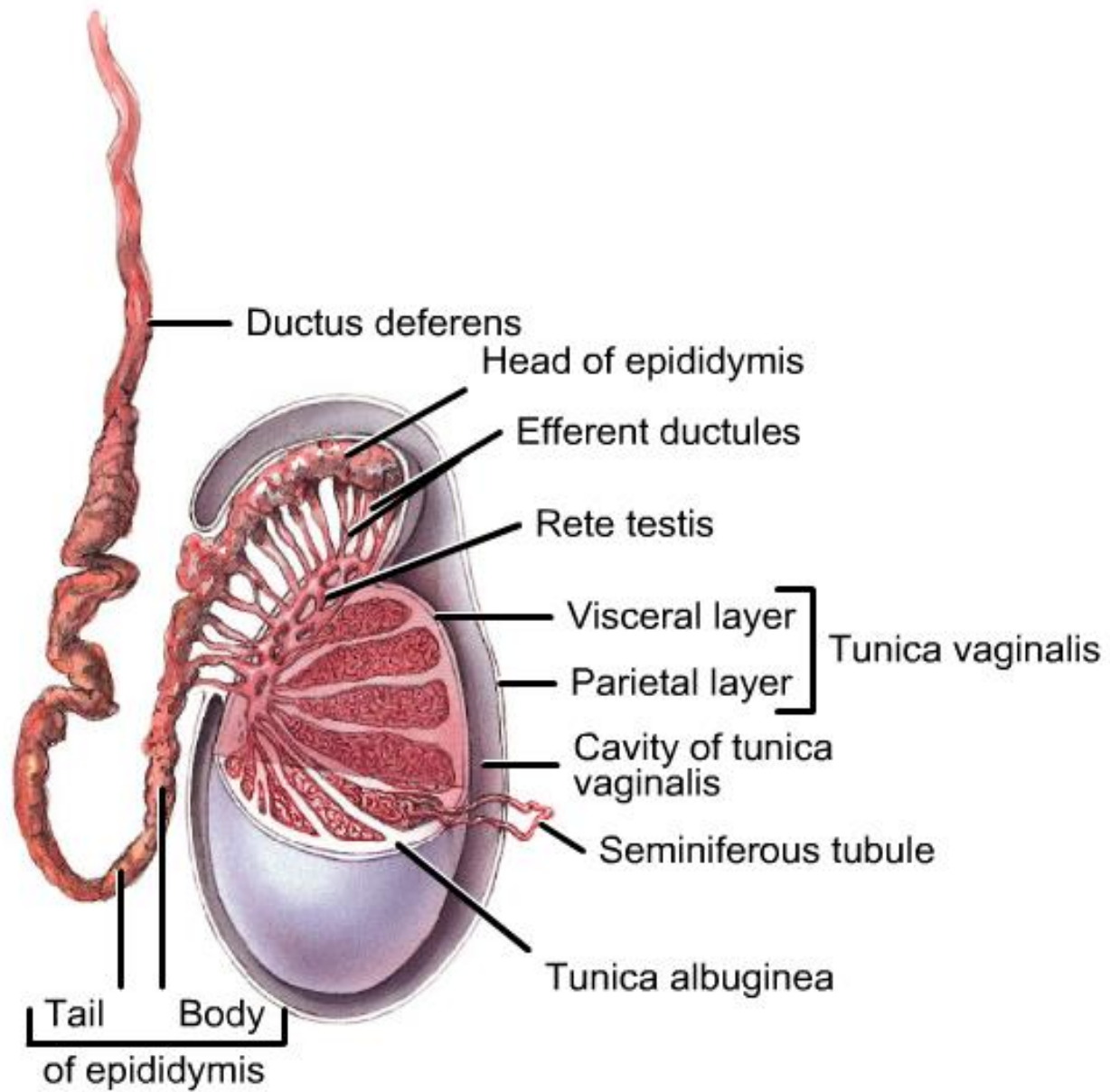




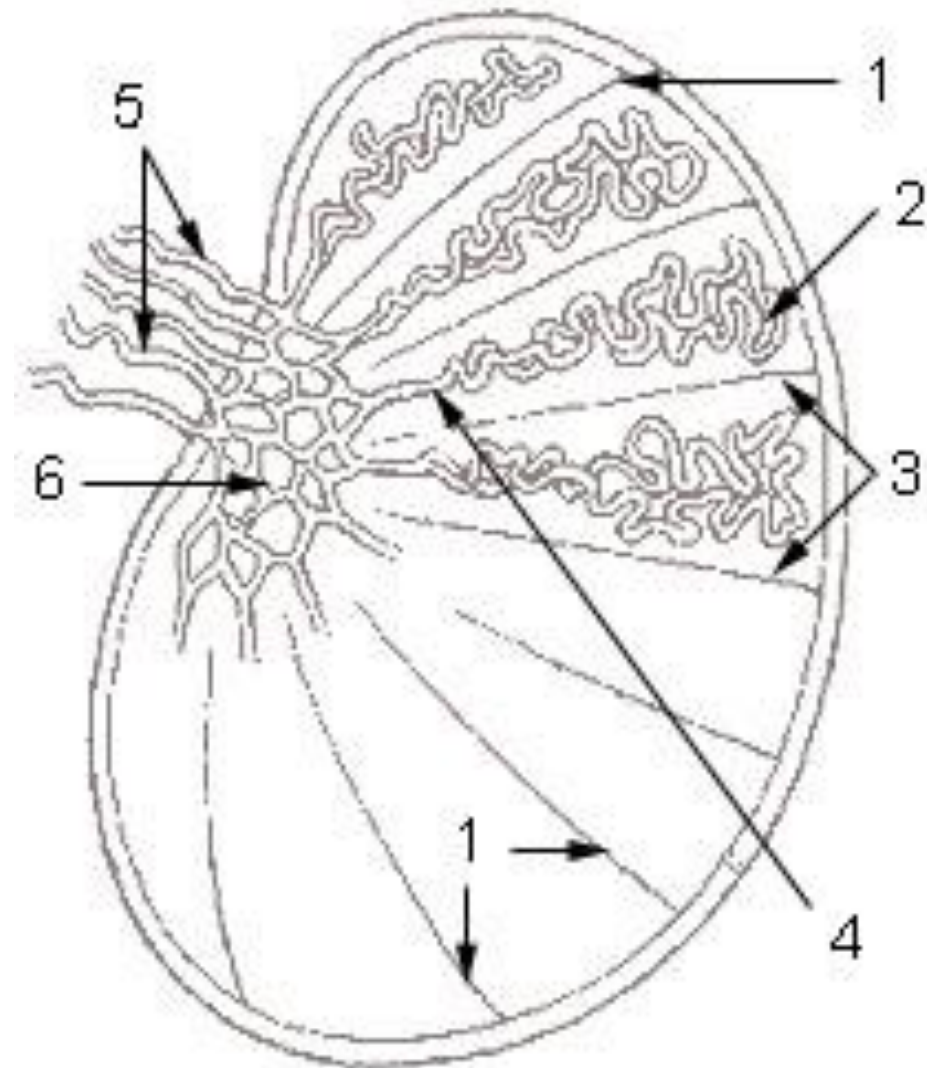
Testis

- ▶ Each testis is surrounded by a tough fibrous capsule, the **tunica albuginea**.
- ▶ Testis is divided into lobules; laying within each lobule are 1-3 **seminiferous tubules** that open into the **rete testis**.
- ▶ In the scrotum, the testes are at a temperature about **1-2°C lower** than the rectal temperature (imp. For spermatogenesis).
- ▶ Rete testis : is an anastomosing network of delicate tubules located in the hilum of the testicle (mediastinum testis) that carries sperm from the seminiferous tubules to the vasa efferentia.

- The **scrotum** acts as a thermostat, if it's cold then the scrotal skin will contract raising the testes closer to the abdominal area which is warmer and if it is hot the skin will relax so the size of the scrotum will increase causing more heat distribution.



1 : testicular septae
2 : convulated
seminiferous tubule
3 : testicular lobule
4 : straight
seminiferous tubule
5 : efferent ductule
6 : rete testis



Epididymis

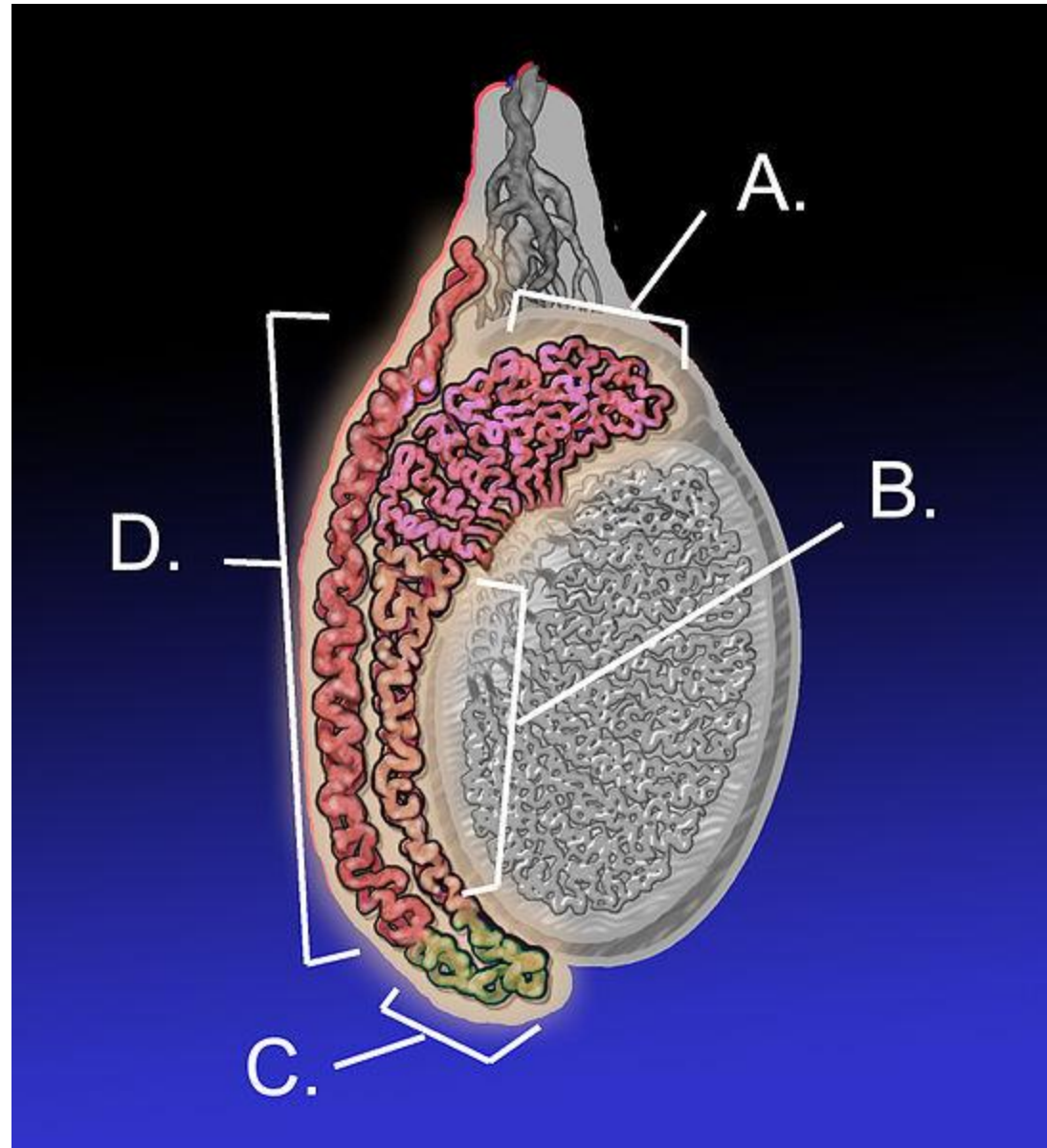
- ▶ The epididymis is a much coiled tube nearly **6m** long, with the vas deferens lying on its medial side.
- ▶ It lies on the posteriolateral aspect of the testes.
- ▶ It has: head, body and tail.
- ▶ **Function** :storage of spermatozoa and allows them to mature ;absorption of fluid, and nourishment of the sperm

A : Head

B: Body

C: Tail

D : Vas deferens



Blood supply & lymphatics

- **Testicular artery:** a branch of the abdominal aorta
- **Testicular veins:**
 - They form the pampiniform plexus, which becomes 1-2 testicular veins,
 - These drain into the left renal vein on the left side and into the inferior vena cava on the right side.
 - There is a collateral venous return from the testes through the cremasteric veins which drain mainly into the inferior epigastric vein.
- **Lymph vessels:**
 - **Testes:** drain to the paraaortic and intra aorto caval L.N at the level of L1.
 - **Coverings of the testis and spermatic cord:** Drains to the internal and common iliac LN.
- **Autonomic nerves:** sympathetic fibers arise from the renal or aortic sympathetic plexuses.

HISTORY

- **Age** of Patient helpful in limiting differential and determining responsible organisms :
- Nature of **Pain**:
 - Severity
 - Quality
 - Radiation
 - Alleviating/Aggravating factors
 - Dull aching>>testicular cancer
 - Epidydemitis>>acute worse with bowel movement and painful urination
- Sexual History
- Associated **constitutional** symptoms
- Associated **urinary** symptoms
 - Dysuria, frequency, hesitancy
 - Urethral Discharge- etc
 - Other
- **Activities** involved with:
 - Sports-lifting, trauma

EXAMINATION OF MALE EXTERNAL GENITALIA

- **Inspection:**

- Penis:

- Size, circumcised or not, scar of circumcision,
 - Site of urethral meatus, discharge from the meatus and on underwear.
 - If uncircumcised look for: phimosis and paraphimosis.

- Scrotum:

- Well-developed or not (undescended testes).
 - Swelling, redness, skin lesions,
 - Cough impulse,

- **Palpation:**

- **Penis:**

- Palpation of the shaft for tenderness and, fibrosis (peyronie's diseases).
 - Urethra discharge.

- **Scrotum:**

- Temp. and tenderness.
 - Presence and size of testes, consistency, tenderness,
 - Palpation of epididymis (head, body, tail), and spermatic cord.
 - In case of swelling:
 - Can you get above it?, Palpable cough impulse?, reducible or not?.
 - Can you palpate the testes?, is it tender or not?
 - Transilluminate or not?
 - If testes are not present:
 - Milking of inguinal canal?, is it retractile or not?.
 - Palpate the: root of the penis, perineum, femoral triangle and superficial inguinal pouch.

- - **Auscultation**; if we suspect an inguinal hernia to listen to bowel movements
- - **Transillumination**; if we suspect a hydrocele to differentiate between cystic and solid swellings

Scrotal swellings

Painless

- Hydrocele
- Spermatocele
- Varicocele
- Tumor (non hemorrhagic)
- Hernia

Painful

- Epididymo-orchitis
- Torsion
- Tumor (**hemorrhagic**)
- Hematocele
- Strangulated indirect Hernia

INVESTIGATION:

- **Urinalysis**: Bacteria, WBC's, crystals
 - commonly in epididymitis
- **Obtain urine culture**;(why ? If pt have +ve culture with epididymitis
- R/O congenital anomaly by **US or MCUG** (in pediatrics)
- **CBC** may be helpful
- **Radiographic studies**
 - Ultrasonography , Nuclear Scan(tc33)
 - US urinary tract, CT scan , IVU .

Diagnostic test

Color Doppler ultrasound

- Noninvasive assessment of anatomy and determining the presence or absence of blood flow.
 - Sensitivity: 88.9% specificity of 98.8%
 - Operator dependent.
 - Sensitivity for diagnosing torsion is only above 85%

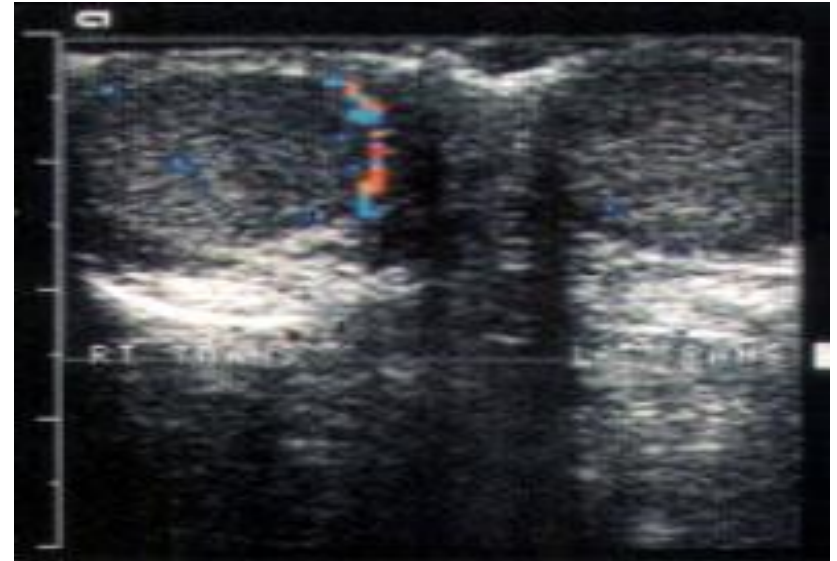


FIGURE 1. Color Doppler ultrasonogram showing **acute torsion** affecting the left testis in a 14-year-old boy who had acute pain for four hours. Note decreased blood flow in the left testis compared with the right testis

Color Doppler ultrasound

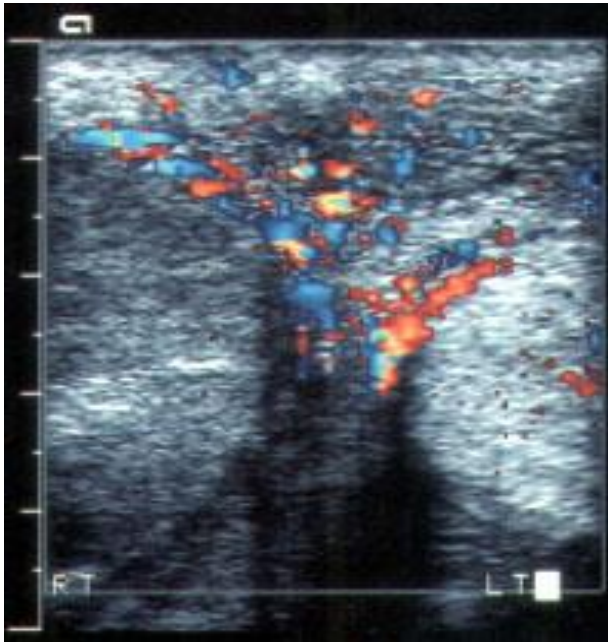


FIGURE 2. Color Doppler ultrasonogram showing late **torsion** affecting the right testis in a 16-year-old boy who had pain for 24 hours. **Note increased blood flow around the right testis but absence of flow within the substance of the testis.**

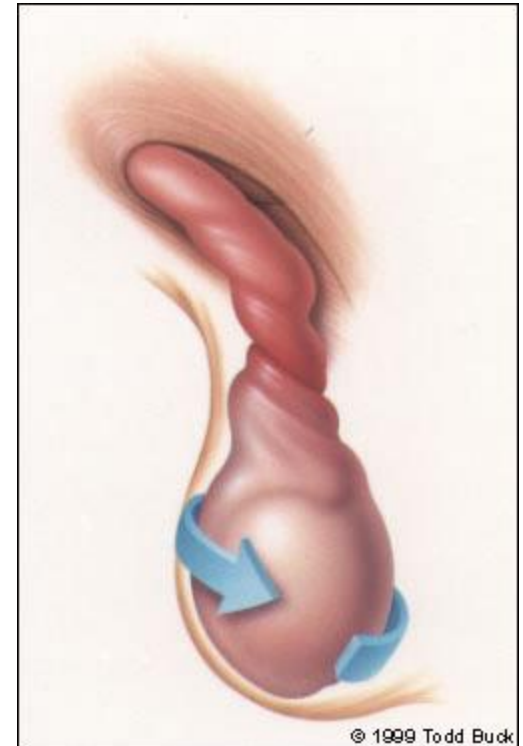


FIGURE 3. Color Doppler ultrasonogram showing inflammation (**epididymitis**) in a 16-year-old boy who had pain in the left testis for 24 hours. **Note increased blood flow in and around the left testis.**

PAINFUL SCROTAL SWELLING

1-Testicular torsion

- It is an **Emergency**.
- Due to twisting of the spermatic cord with interference to the **arterial** blood supply+**venous** occlusion, obstructing the blood supply and venous return and if blood supply isn't restored within 4-6 hours we will lose the testicle.
- May have torsion of Testes appendages.
- Incidence is highest between **10-16** y.o. but may happen at any age.



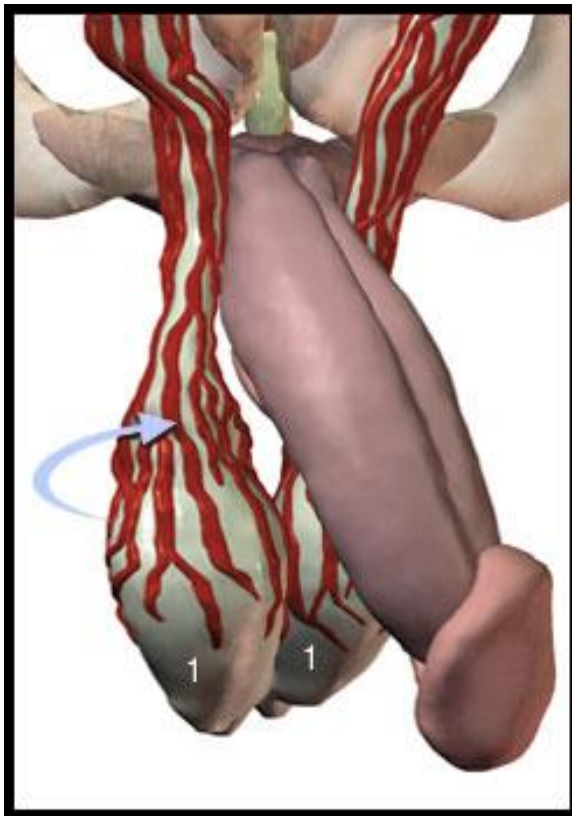
Clinical Feature

- Testicular pain & swelling (**Sudden**) radiating to the groin, loin, or epigastrium
- sometimes a **history of minor trauma** to the testis
- previous similar episode
- **Most cases spontaneous torsion(50% in sleep).**

Other causes(**bell clapper deformity, cryptorchidism**)



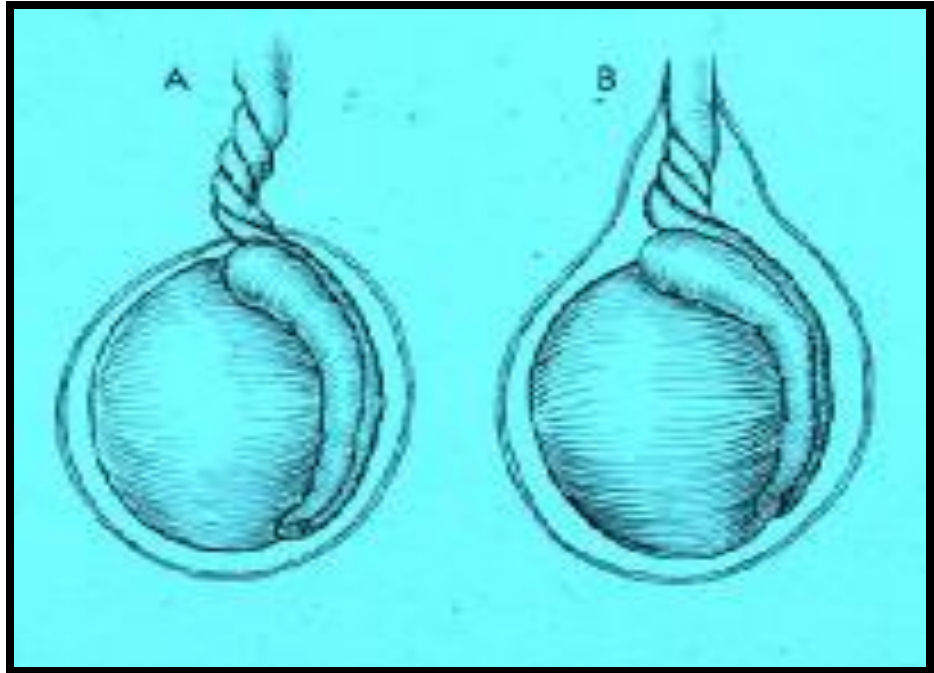
- Anterior surface of each testis run towards the midline.



Types:

● Extravaginal:

● Intravaginal: 90%
of adolescent age
group.



A) extravaginal; (B) intravaginal

- On Examination:
- Swollen, painful, testis **drawn up** to the groin-horizonta**l** lie .
- **Absent of cremastic reflex** on the affected site
- Elevation of scrotum doesn't provide relife of pain (**-ve prehn sign**)



- If you are in doubt in case of acute painful scrotum so the scrotum must be explored.
- If untreated infarction of testis will result(**within 5-6h necrosis**).
- Untwisting should be carried on within 6 hrs. of symptoms.



MANAGEMENT

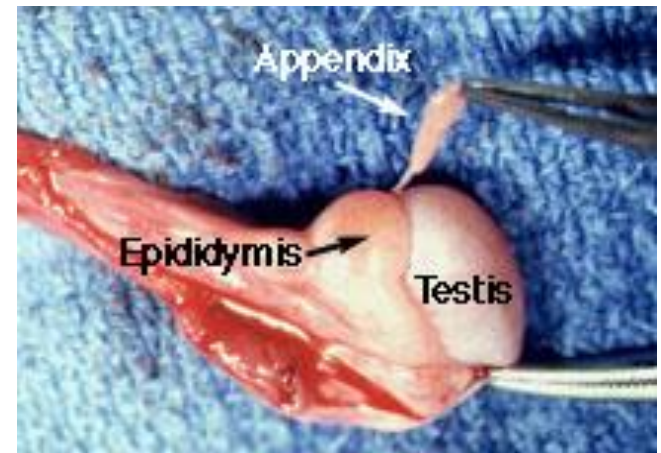
- Rx: EMERGENCY
 - ✓ Explore the testis.
 - ✓ Untwist the testis.
 - ✓ If viable we fix it by anchoring it to scrotal septum and if the other testis is abnormal fix it(orchiopexy).
 - ✓ If infarcted we remove it(orchietomy).



After detorsion

2-Torsion of testicular appendage:

- **Most common** structure to twist is the appendix of the testis (pedunculated hydatid of morgagni)
- Usually a **more gradual** onset, pain **moderately** severe
- Clinically similler to testicular torsion but **vertical lie and cremastic reflex preserved**)
- **Blue dot sign.**
- Age:12 – 24 years age .

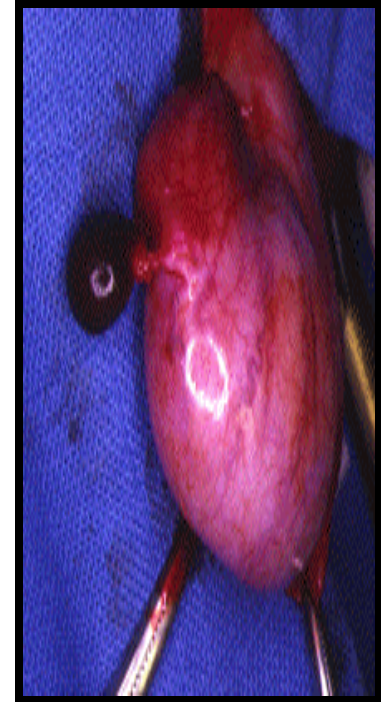


MANAGEMENT

- If the diagnosis is in **question or refractory pain** , we do a surgical exploration.

Rx ;

- **conservatively** –analgesia (most will subside over 5-7 day)
- immediate operation with ligation and amputation of the twisted appendage.
- when the appendix torsion is late in presentation, it could resemble testicular torsion



3-Testicular trauma

- Usually in sports injuries or violence.
- may result in bleeding into the layers of tunica vaginalis resulting in **haematocele**.
- S&S: severe pain, scrotal swelling, bruising, tender, enlarged testi, **no transillumination**.



Management

- Investigation:
 - scrotal ultrasound (beware of an underlying malignancy).
- Treatment: CONSERVATIVE
 - Bed rest, ice pack, surgical repair
 - Scrotal elevation
 - Surgical exploration may be needed if:
 - 1- Expanding scrotal hematoma
 - 2- To evacuate the haematocoele and to repair the split in tunica albuginea.

4-Epididymitis

- DEFINITION:
 - Inflammation, Pain, Swelling of epididymis
 - **Acute**: Symptoms usually lasting < 6 weeks
 - **Chronic**: Symptoms usually lasting > 6 weeks
 - May be acute sub-acute chronic
- EPIDEMIOLOGY:
 - **Most common cause of acute scrotal pain**
 - Age: 16-30 y/o & 51-70 y/o
 - Incidence **parallels incidence of Chlamydia & GC**

Epididymitis

- ETIOLOGY:

- Retrograde infection from the urinary tract.

- Sexually active – Chlamydia, Gonorrhea, E.coli

- Older men and children- E.coli

- Non-infectious – post surgery, drugs

- SIGNS/SYMPTOMS:

- Scrotal pain- slow onset

- Dysuria, frequency, Discharge,

- Fever, chills and rigor

- Tenderness and swelling epididymis

CLINICAL FEATURES :

- Pain, edematous, redness of the scrotum, often associated with Fever.
- Symptoms of UTI
- Enlarged tender testis and epididymis.
- In children differentiation from torsion is often difficult.

Prehn sign is +ve (prehn sign is when the pain is relieved by elevating the testicles)

Cremastric reflex +ve

- A **UTI** associated with high fever, chills & rigors you need to look for 3 organs:
- Pyelonephritis (kidneys)
- Prostatitis
- Epididymitis

MANAGEMENT

- Investigation:
 - CBC, Urinalysis, Urine Culture, Urethral Swab.
- Treatment:
 - Acute: Bed rest, Analgesia, antipyretic, IV fluid
 - Ceftriaxone
 - Doxycycline
 - Ciproflaxacin /Quinilones
 - Treat responsible organism
 - **Chronic**: TB-antituberculous drugs.
 - Possible Orchidectomy - Necrosis and Abscess .

Testicular torsion	Epididymorchitis
Mechanical twist of the testicle	Inflammatory process
Acute onset severe pain	Gradual onset mild pain that increase with time
Afebrile	Associated with high fever, chills and rigors
w/o urinary symptoms	Associated with dysuria and frequency
Negative Prehn sign	Positive Prehn sign
Negative Cremasteric reflex	Positive Cremasteric reflex
Non-tender prostate	Tender prostate
Doppler: Decrease testicular flow	Doppler : increased testicular flow
Testicular position: elevated and more horizontal	Testicular position : normal (vertical)
Associated with nausea and vomiting due to severe pain	Not associated with nausea and vomiting

	Testicular torsion	Epididymorchitis
Age	(10-30) years	(16-30) & (51-70) years
Pain	Sudden onset not affected by position	Gradual onset worse when standing
Onset	After exercise, sleep or minor trauma	Rarely after sleep
Time to presentation	< 6 hours	> 24 hours
Past episodes	Frequently >2weeks past	Only if previous infection
Severity	Peaks in hours	Peaks in days
Vomiting	Common from pain	Unusual
Fever	Up to 20%	Up to 95%
Swelling	After 12 hours	Common
Dysuria	Rare	Common
Urinanalysis	30% have wbc/bacteria, voiding complication rare	50% may be normal , voiding complication common
Physical exam	- Cremasteric reflex - Prehn sign	+ Cremasteric reflex + Prehn sign
Color Doppler	Decreased testicular flow	Increased testicular flow
Management	Antibiotics, if it fails, we do orchidectomy	Surgery (Orchidopexy or Orchidectomy)

5- Orchitis

- DEFINITION:
 - Inflammation or infection of the **testicles**
 - **may be related to epididymitis** with Extension to testes
- Etiology:
 - bacterial (E. coli, K. pneumoniae, P. aeruginosa, Staph. or Strep)
 - viral (**MUMPS VIRUS**, EBV, coxsackievirus, arbovirus, enterovirus) especially isolated orchitis

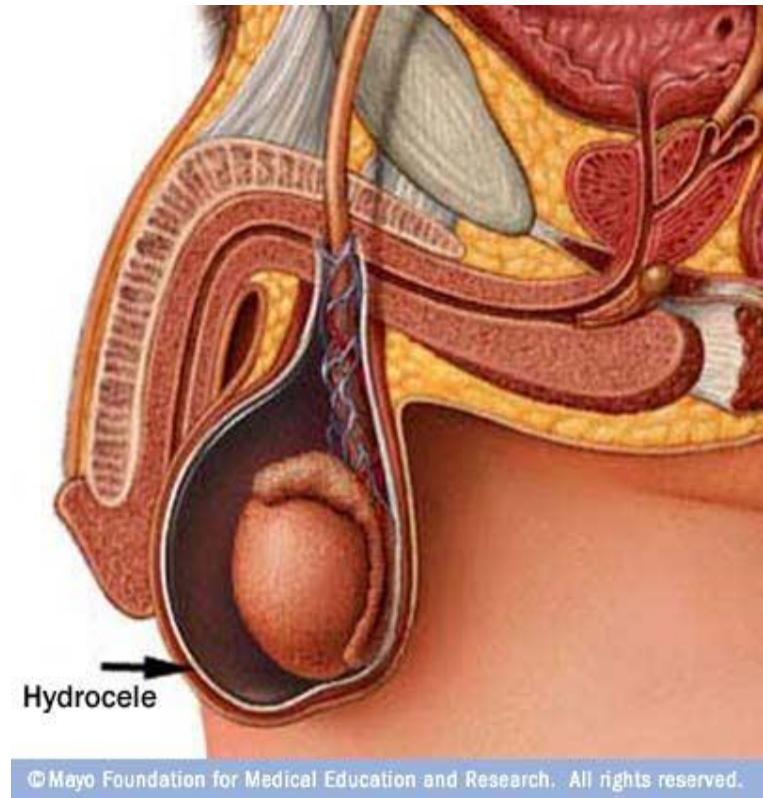
ORCHITIS

- SIGNS & SYMPTOMS:
 - similar to epididymitis
 - Pain
 - hematuria, ejaculation of blood
 - entire testes swollen- exquisitely tender
 - Systemic- fever chills, malaise

PAINLESS SCROTAL SWELLING

1- Hydrocele

- Is collection of abnormal quantity of serous fluid **in the tunica vaginalis** (between tunica albuginea & tunica vaginalis)
- If it contains pus or blood it is called **pyocele** or **haematocele** respectively.
- Hydrocele is more common than the two other varieties.



Etiology

1-Primary

The cause is unknown.



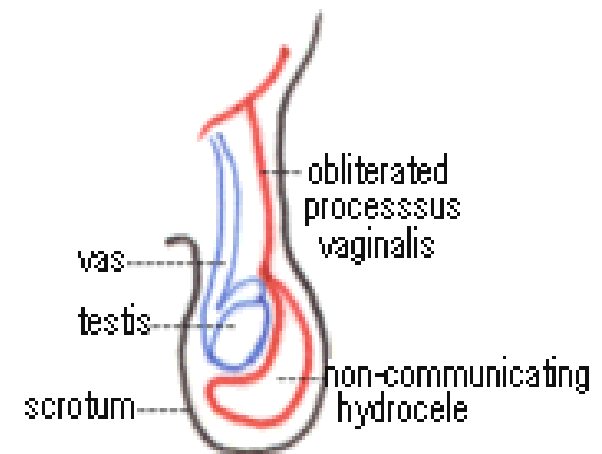
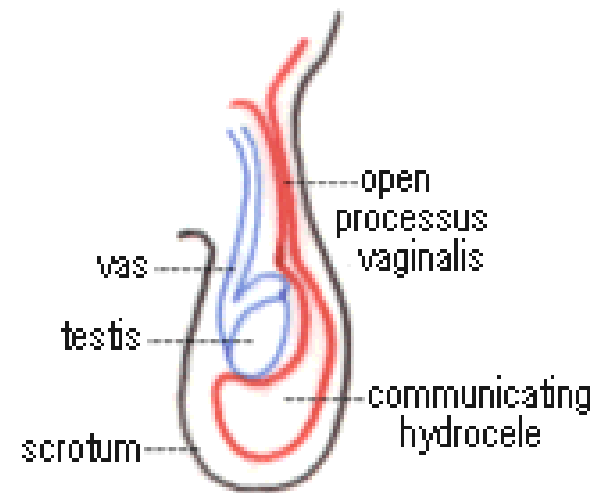
1- communicating;

it connect with the
peritoneal cavity, patent
procesus vaginalis

In pediatric, change size
during day (increase
during crying and
straining)

2- noncommunicating; it
dose not connect with
peritoneal cavity

In adult.



2- Secondary; where the fluid accumulate secondary to pathology inside the testis like epididymo-orchitis, testicular tumor 5-10% and trauma.

Clinical presentation;

❖ Age;

- ❖ primary hydrocele are most common newborns
- ❖ Secondary are more common between 20 to 40 years.

❖ Symptoms;

1-painless swelling

2-frequent and painful micturation may occur if hydrocele is secondary to epididymo-orchitis

❖ Hydrocele doesn't affect fertility

Clinical picture

❖ Examination;

- ❖ Position; the swelling usually **unilateral** but can be bilateral if communicating we **can't feel** the cord above the lump.
- ❖ Colour and temperature; normal
- ❖ Tenderness; primary are not tender but secondary may be tender
- ❖ Composition; fluctuant and have fluid thrill if large enough
- ❖ Reducibility; **can not reduced**
- ❖ **-ve cough impulse**
- ❖ transilluminate

Transillumination



MANGEMENT;

❖ Primary; Surgical excision of herinal sac

❖ Communicating;

- ❖ most neonatal hydrocele resolve in first 2 year of life if persists repair as herniotomy(inguinal incision).

Usually surgery done after 1.5- 2 years of age

EXCEPT in

- 1- very large amount –
- 2- if can't differentiate between it and hernia
- 3- increase intrabdominal pressure

NEVER do needle aspiration EVEN in the non-communicating type(cause it will reaccumulate)

❖ Noncommunicating;

- ❖ usually resolves spontaneously

- ❖ In adult; **surgical excision**; opening the tunica vaginalis longitudinally (**scrotal incision**), emptying the hydrocele, everting the sac after excising the redundant sac and suturing the sac behind the cord thus obliterating the potential space
- ❖ **Secondary** treatment of the underlying condition

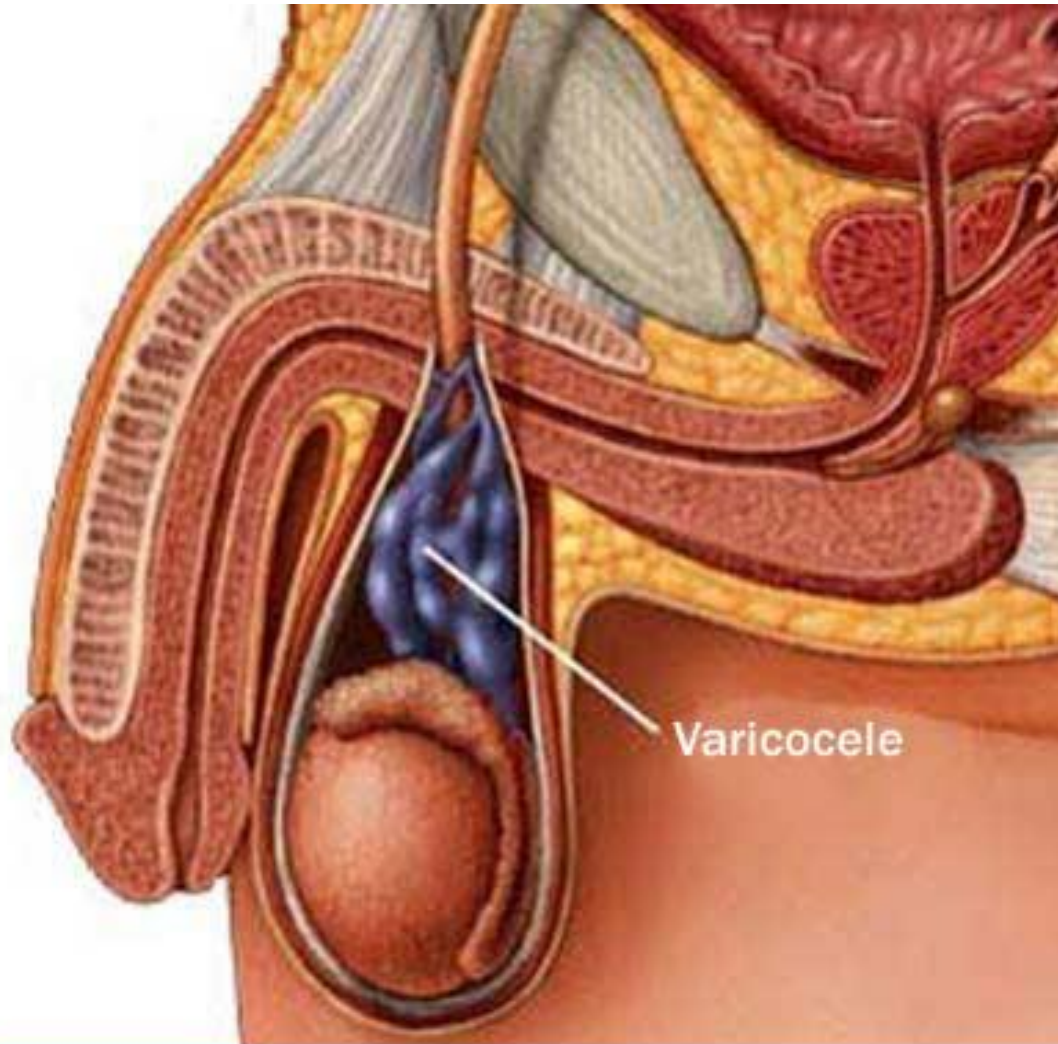
2- Indirect inguinal hernia:

- Most common (young , Rt. Side)
- 10% bilateral .
- Hernia in babies are a result of persistent processus vaginalis.
- If strangulated >> painful and may cause testicular atrophy
- Surgery is usually recommended .

Hernia / Hydrocele

	hydrocele	Reducible inguinal hernia	Incarcerated hernia
Age	Mostly < 1y	Any age	Any age
pain	-	-	+++
Diurnal changes	None or fluctuate	Protrudes on straining	Always protruded
site	scrotum	Groin+scrotum	Groin+scrotum
Ex	Can get above	Can't get above	Can't get above
Transillumination	++	- (except in infants)	- / +
reducible	No	Yes	No
Rx	Repair if persist > 1-2 y	Elective repair	Immediate reduction, urgent repair

3-Varicocele



Definition

- Is dilatation and tortuosity of the [pampiniform plexus](#), which is the network of veins that drain the testicle.
- Due to defective valve or compression of the vein by a nearby structure.
- Very common; about 15% of men will have some degree of varicocele.
- More common on left side in 90%(why?? The longer course of the left spermatic vein and its insertion at a 90° angle into the left renal vein, predisposes to slower drainage and increased hydrostatic pressure.) of cases.
- Bilateral in up to 50% of cases.
- Not painful but if long standing may cause a dull aching pain, fertility & subfertility issues, testicular atrophy and a mass (bag of worms)

Primary varicocele :

Secondary varicocele : Secondary varicocele could be a sign of a retroperitoneal mass like Renal Cell Carcinoma, Wilms tumor and phaeochromocytoma

- Do retroperitoneal US to rule out renal ca in 2 cases ;
 - 1- Varicocele on the Rt side
 - 2- Secondary .
 - 3- palpable abdominal mass
 - 4- acute onset``

Clinical feature

1. Appear on standing and disappear on lying down.
2. Heavy or dragging sensation in scrotum.
3. The veins often described as ‘bag of worms’
4. The affected testes may be small.
5. 25% of Bilateral varicocele may cause infertility.

Grading

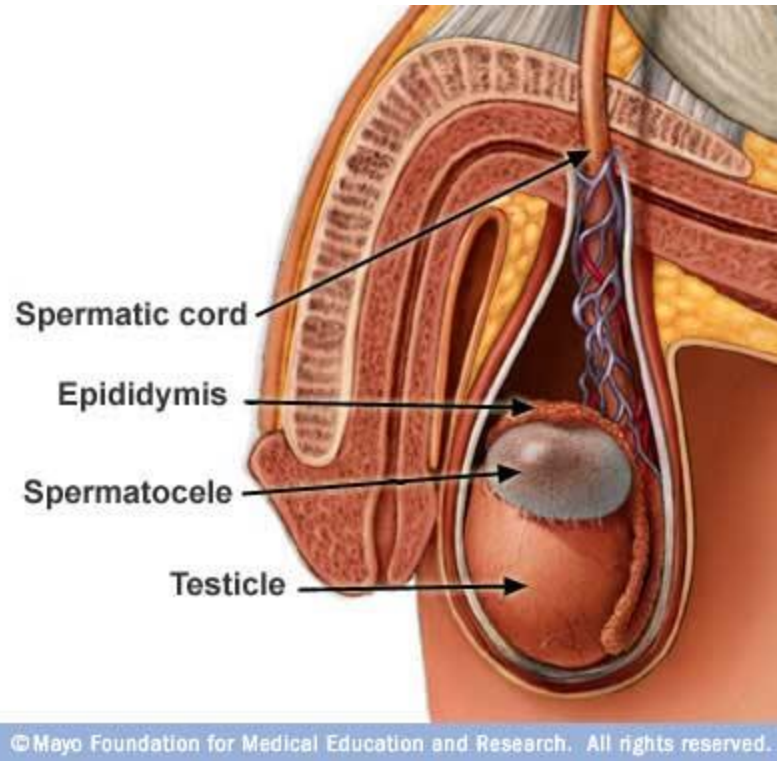
- **Grade 0** - Subclinical varicocele, Dx by US
- **Grade 1** – Palpable with Valsalva maneuver on standing
- **Grade 2** - Easily detected without Valsalva maneuver on standing
- **Grade 3** - Detected visually at a distance

Varicocele



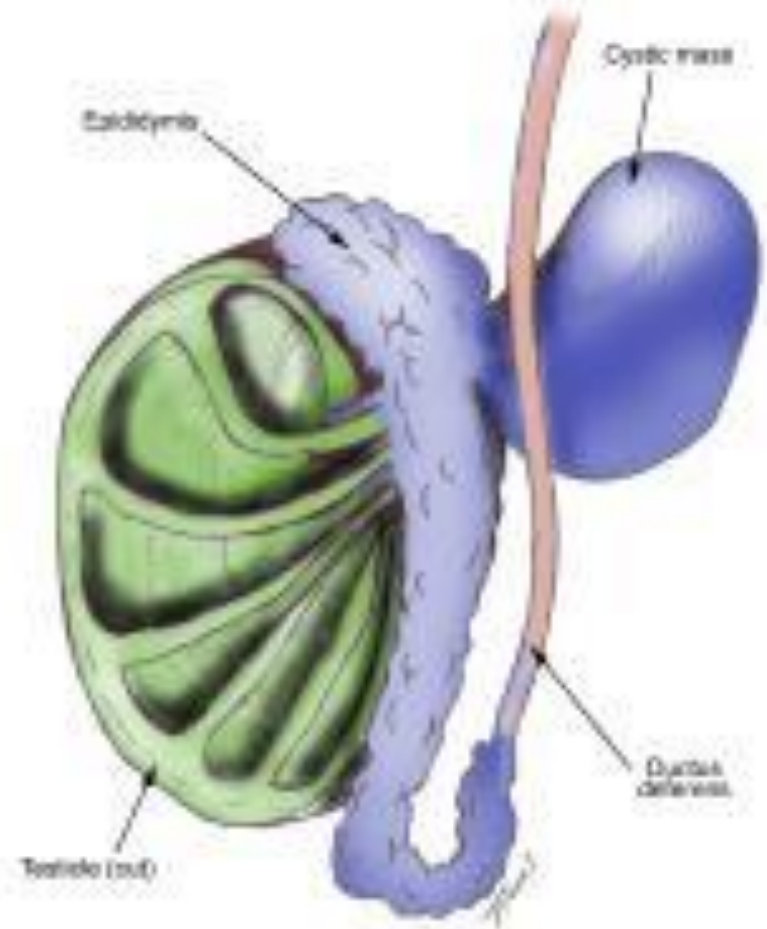
- Diagnosis:
 - Clinical and US.
- Treatment:
 - ✓ No treatment required in asymptomatic.
 - ✓ Indication of treatment :
 - 1- Impaired sperm quality or quantity (fertility & subfertility issues)
 - 2- Pain or dull ache affect quality of life
 - 3- Affected testis fail in grow in adolescent causing testicular atrophy
 - 4- Discripancy in size more than 20%
 - 5- Cosmtic indication

4- Epididymal cyst



Epididymal cyst (spermatocele)

- Cysts arise from diverticula of the vasa efferentia, they are **fluid /sperm filled** cysts connected with epididymis.
- THEORIES:
 - 1- distal obstruction
 - 2- aneurysmal dilation of epididymis
 - 2-agglutinated germ cell
- May be small ,large ,multiple, uni or bilateral.
- S&S: Scrotal swelling, slowly enlarges, painless.
- Lie above and slightly behind the testes.
- You can get above it.
- Transluminated



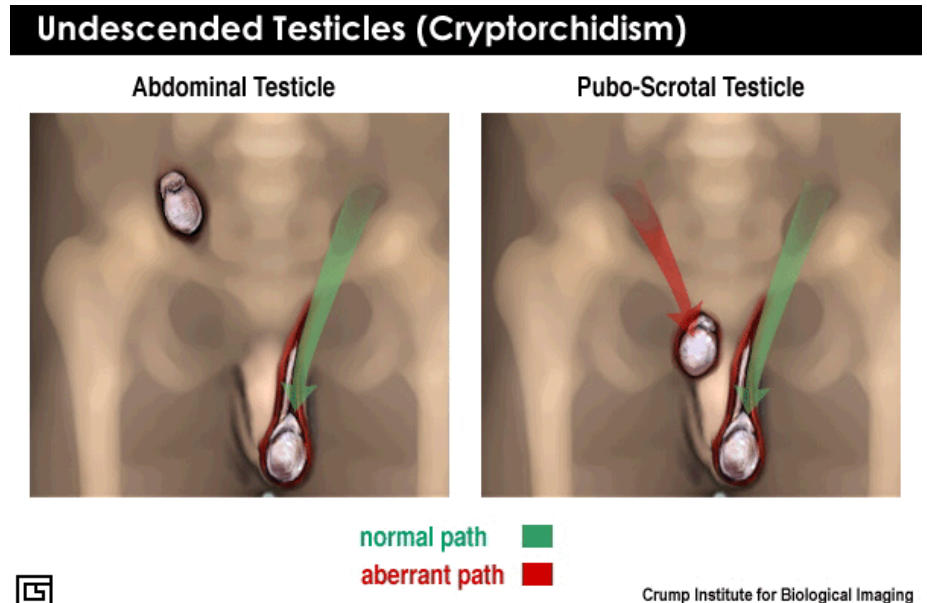
Epididymal cyst

- Usually smooth and lobulated, fluctuant,.
- US TO RULE OUT MALIGNANCY
- Rx : none unless **large or painful** ; surgical excision, and that will compromise the fertility of the testis. In consent form we have to inform the patient about the sideeffect which is infertility.
- AVOID NEEDLE ASPIRATION AS IT CAN LEAD TO INFECTION AND SPILLING OF IRRITATING SPERM WITHIN SCROTUM



CRYPTORCHIDISM

- DEFINITION:
 - Undescended or “Hidden testis”
- EPIDEMIOLOGY:
 - Incidence-
 - 0.7-1% at age 1.
- ETIOLOGY:
 - Uncertain
- COMPLICATIONS:
 - Can lead to **infertility** and has a higher incidence of **malignancy**.
- Tx- Orchiopexy



Thank You

