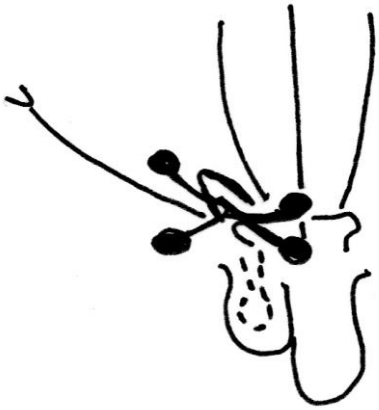
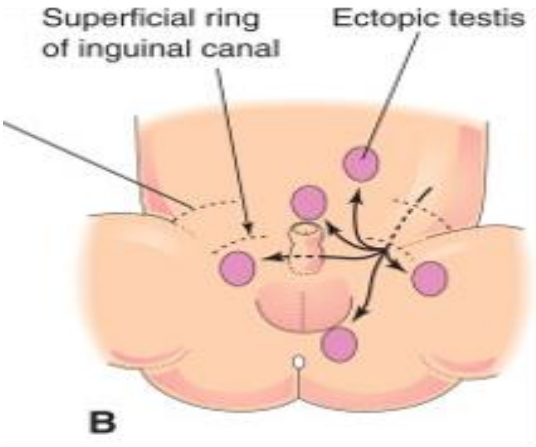
Ectopic Testis

- **Definition:** Testis descend normally until it pass through the external inguinal ring, then it passes subcutaneously to an abnormal position.
- **Aetiology :** Rupture of the main scrotal tail of the gubernaculum and the testis is pulled by one of its accessory tails .
- **Pathology :**
  - **Site:** Usually inguinal or less commonly in root of penis , femoral triangle or perineum .

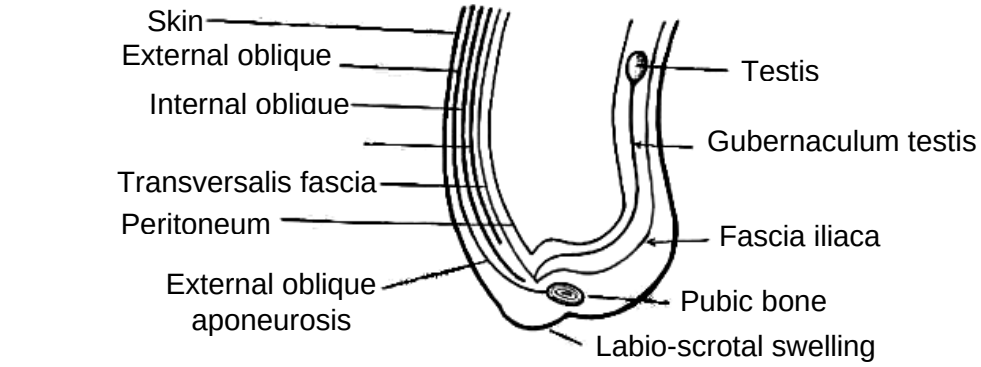




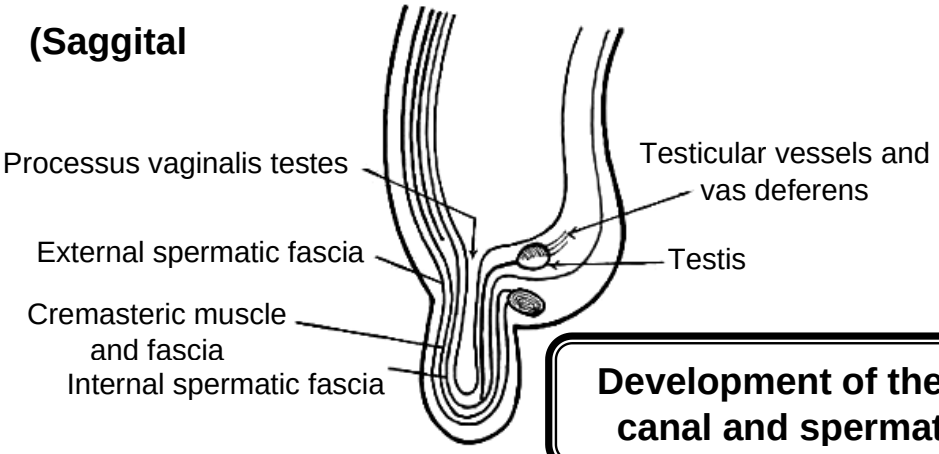
  - **Effects:** No effect on spermatogenesis or hormone production.
- **Complications :** Only psychological troubles & exposure to trauma .
- **Clinical picture :** One side of the scrotum is empty and the testis is felt subcutaneous in abnormal site .

Inguinal Ectopic testis

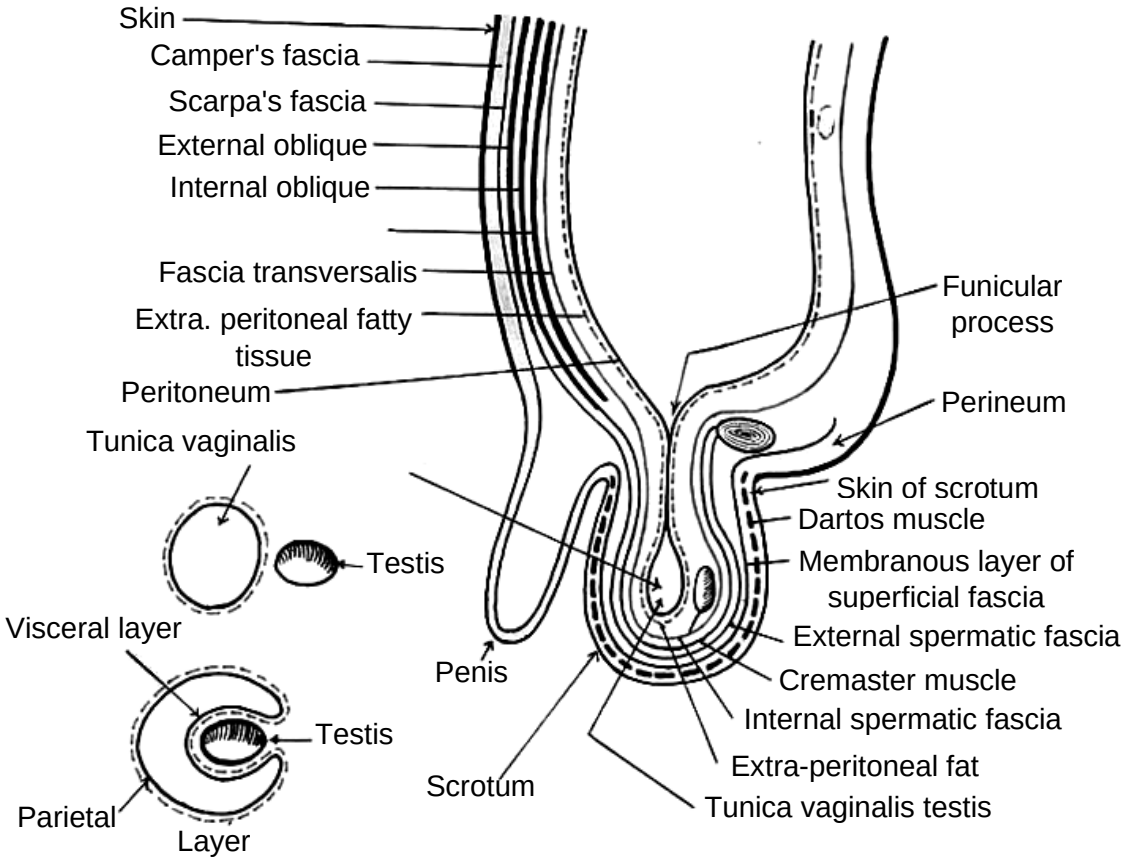
- **D.D :** Undescended inguinal testis .
- **Treatment : Orchiopexy** (very easy as the cord is long**)**



(Saggital



Development of the inguinal canal and spermatic cord.



Undescended Testis

* **Definition :** Arrest of the testis in its normal line of descent .

* **Aetiology :**

I) Mechanical cause :

- It represent 80% of cases and usually unilateral . It may be one of the causes :

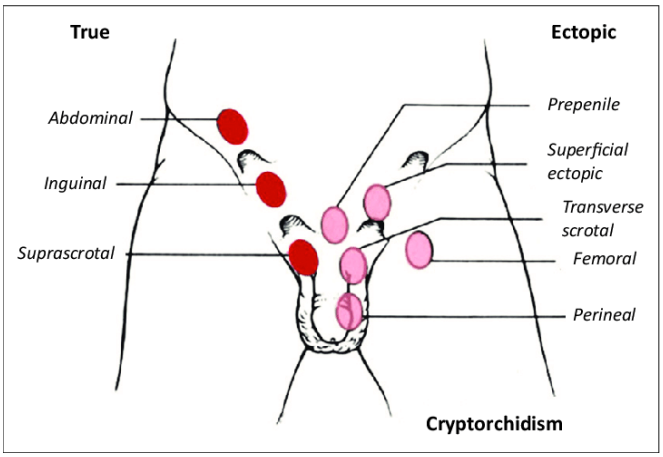
1- Short vessels or vas .

2- Rupture gubernaculum.

3- Large testis or epididymis .

4- Septum in inguinal canal .

5- Adhesions fixing the testis .

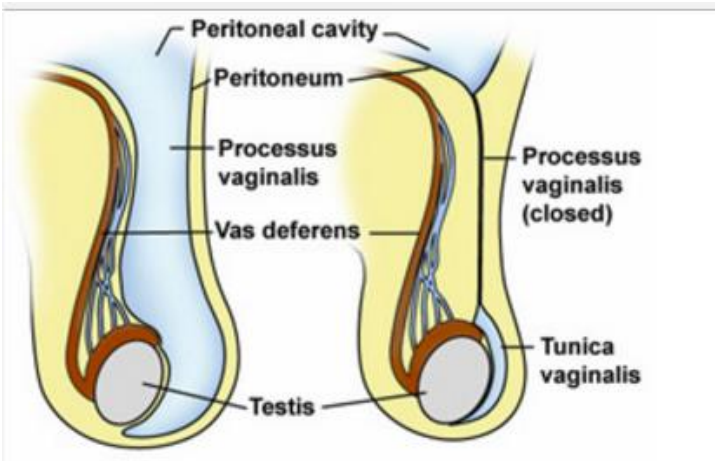


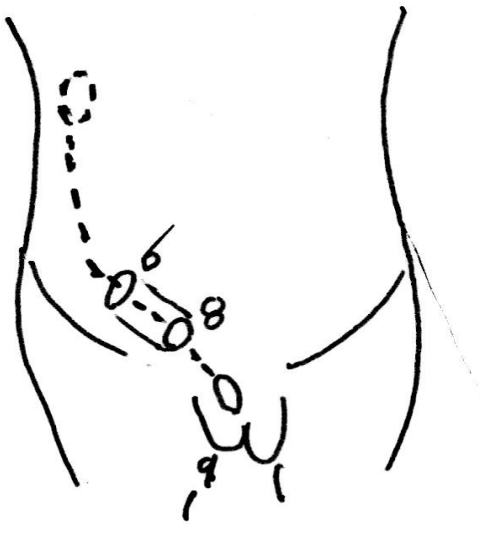
II) Hormonal causes :

- It represents 20% of cases , usually bilateral , due to deficiency of maternal chorionic gonadotrophins .

* **Incidence :**

- It affects 1% of males .
- More in premature
- More common in the right side .





* **Pathology :**

I) Site: in the neck of scrotum , external inguinal ring , inguinal canal , internal inguinal ring , iliac fossa or lumbar region in descending order of frequency .

II) Effects: The remain normal till the age of 12-18 months, but after that time, due to exposure to body temperature , the following occur :

1- **Irreversible histological** damage of the testis starts 12-18 months after birth.

2- The **testis stop** to develop , not grow and finally becomes soft and atrophic .

3- Failure of **spermatogenesis** .

4- **Hormonal** production is not affected → normal secondary sex characters.

* **Complications : (hip+3T)**

1- Associated congenital oblique inguinal **hernia in 80%** of cases .

2- **Infertility** in bilateral cases.

3- **Psychological** disturbance.

4- **Trauma:** the most important is internal trauma.

5- **Tumour** is more than in normal testis . It is genetically determined and occur even after successful orchidopexy .

6- **Torsion** of the testis .

* **Clinical picture :**

I) Symptoms :

1- The condition may be discovered **incidentally** by a doctor during routine exam. of newly born .

2- The mother discover that one or both sides of the scrotum are **empty** .

3- Manifestations of **complications** .

II) Examination :

1- General : to detect any associated congenital anomalies

2- Local :

- **Scrotum** : empty , not developed and its skin is thick & rugae .
- The testis felt in **abnormal site** as oval , firm , slippery structure with testicular sensation on squeezing .
- Examine for associated inguinal hernia or other local complications or associated anomalies.

* **D.D :** (causes of cryptorchidism)

1- **Ectopic testis .**

2- **Retractile testis:** The commonest cause for missed testis in infants & children due to strong contraction of dartos & cremasteric muscles .The condition disappears at puberty.

3- **Testicular agenesis .**

4- **Testicular atrophy** e.g. after mumps orchitis .

5- **Hermaphroditism** should be excluded in bilateral cases .

Inguinal undescended tesis	Inguinal ectopic testis
1-Can be **pushed** up but not down	1- Can be pushed down not upwards.
2- **Contraction** of muscle hide the testis .	2- Testis is more prominent by muscle contraction .

Undescended tesis	Retractile testis
1-**Scrotum** is not developed .	1- Scrotum is well developed .
2-**Testis** can't pulled down to scrotum.	2-Testis can pulled down to scrotum.
3-**Squating** →testis doesn't descend to the scrotum .	3-Squating →testis descend to the scrotum .

* **N.B: Imperfect descend of testis** includes undescended testis , ectopic testis & retractile testis .

* **Investigations :** to detect the site high **impalpable testis**
  1- **Abdominal ultrasound & CT scan .**
  2- **Diagnostic therapeutic laparoscopy is the gold standard** for abdominal testis .
* **Treatment :**

I) Surgical treatment : (main line of treatment)

- **Indication :**
  - Failure of spontaneous descent of the testis 6 months after birth.
  - High (abdominal) undescended testis .
  - Failure of hormonal treatment in bilateral cases .
- **Time of operation:** 6-12 months after birth to preserve normal development of the testis .
- **Method : Orchiopexy = Orchidopexy**

  A) Low palpable undescended testis :

  ❖ Inguinal **Orchidopexy is the standard treatment which includes :**

  1-Through **inguinal incision** : **herniotomy** is performed

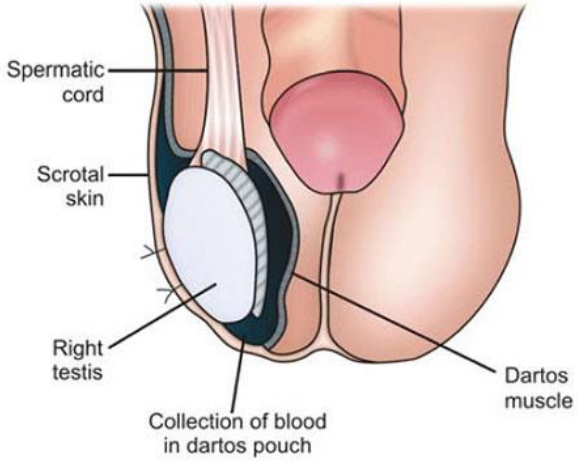
(if present) .

2- **Mobilization** of the testis and elongation of the cord by the followings :

- **Division** of all coverings , fibrous adhesions or small unimportant vessels .
- **Dissect** testicular vessels & vas deferens from the surrounding structures and adherent peritoneum and abolish its wide lateral curve .

3- Stretch the **scrotum**.

4- **Fix** the mobilized testis , in a pouch created between the skin of the scrotum and dartos muscle , to avoid its retraction .



B) High impalpable (abdominal)undescended testis :

❖ Laparoscopic (**the standard** treatment nowadays) or Open **Orchidopexy**

- If there is failure to bring the testis downwards , one of the following is done :

♣ **Staged orchiopexy** : After maximum mobilization of the testis , it is fixed and after 6 months another mobilization is tried .

- ♣ **Microvascular technique** :Division of testicular vessels which re-anastomozed to the inferior epigastric vessels .
- ♣ **Flower Stevens operation :** If the anastomosis between testicular artery and artery to the vas is perfect (put vascular clamp on the testicular artery and examine the testis) , divide the testicular artery .
- ♣ Orchidectomy : (= orchiectomy) is done only if the affected testis is atrophic and the other testis is completely normal .

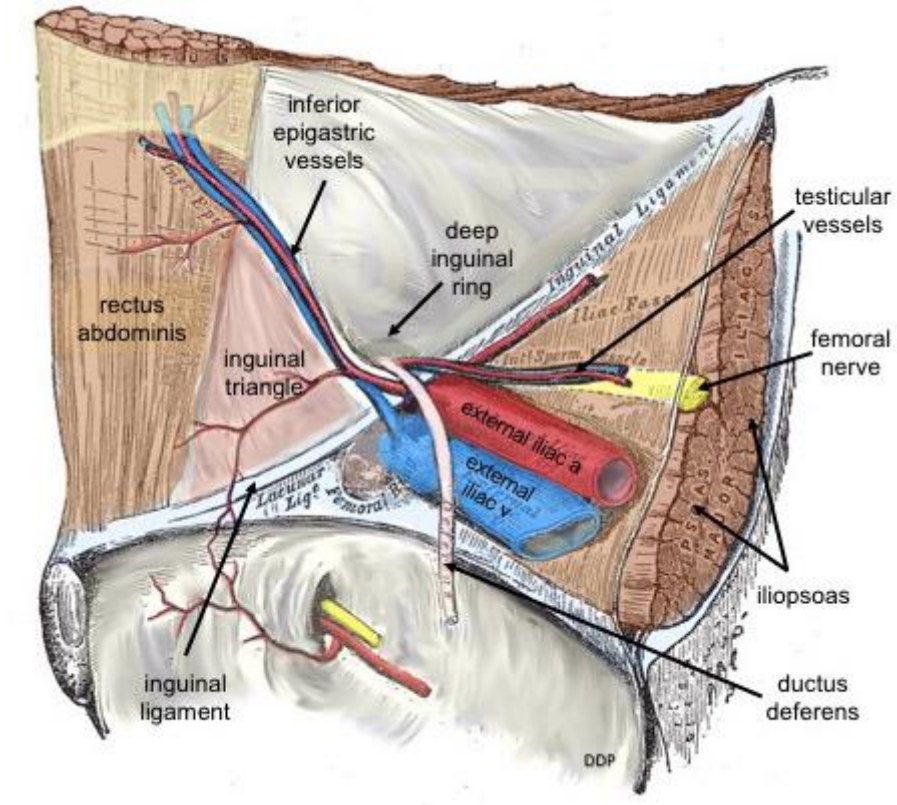
II) Observation :

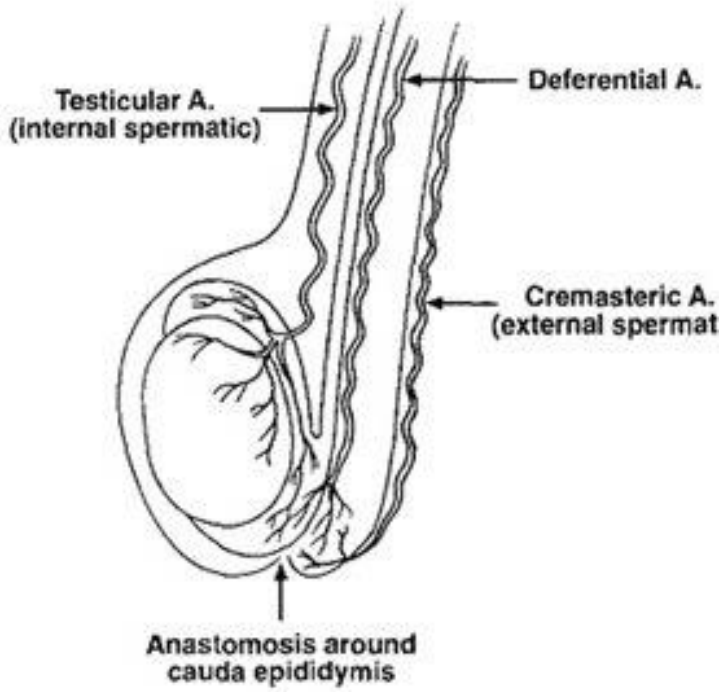
- Spontaneous descend of **unilateral low** palpable undescended testis may occur during the **first 6 monts** after birth, therefore observation of the patient is enough in this period .

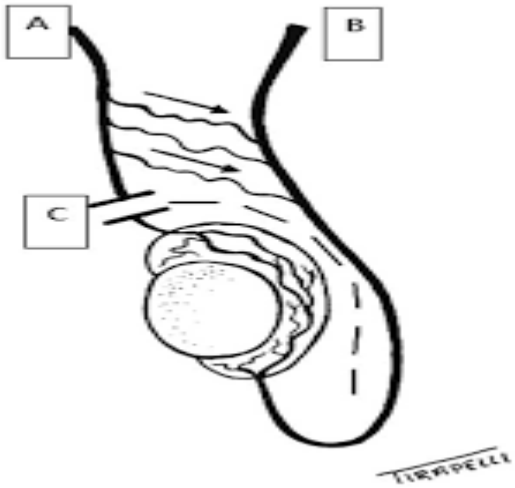
III) Hormonal treatment is indicated in **bilateral** cases.

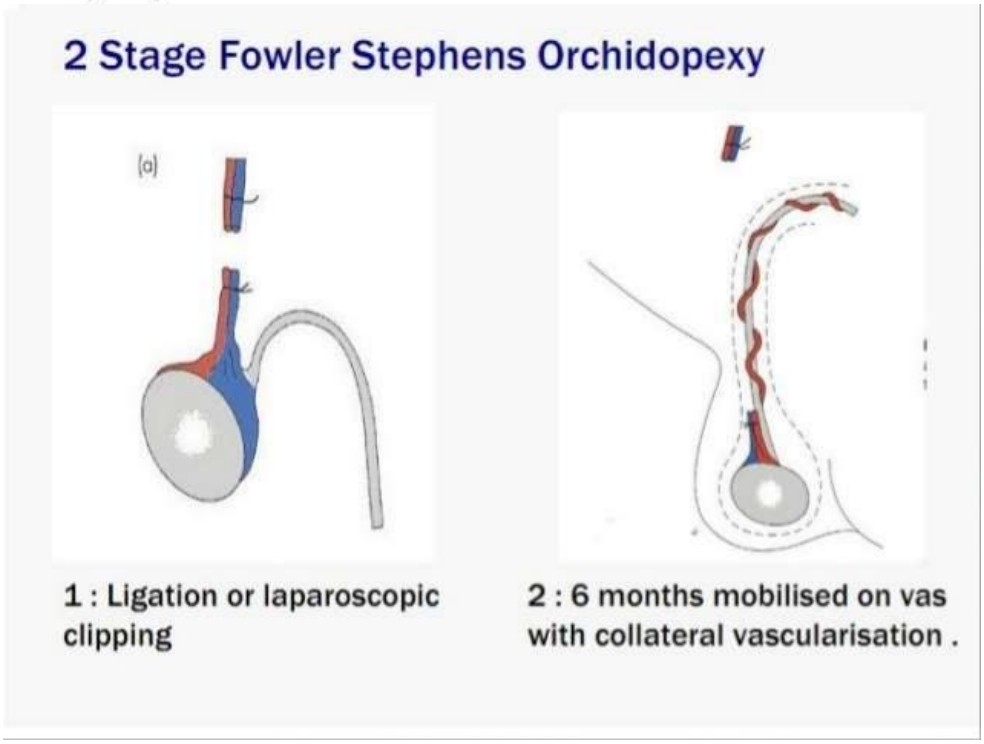
- **Method :** Human chorionic gonadotropine 1500 unit/m^2 surface area of the body , IM , twice weekly for 4 weeks , after which it is never repeated, otherwise precocious puberty occurs .

Principle of of microvascular technique









Principle of Flower Stevens operation

Hydrocele

- **Definition :** Collection of clear serous fluid in a part of processus vaginalis .
- **Classification , aetiology & pathology :**

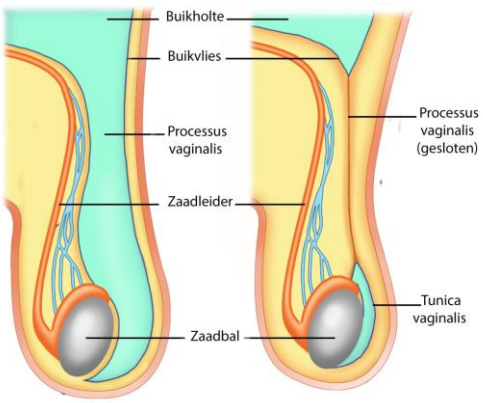
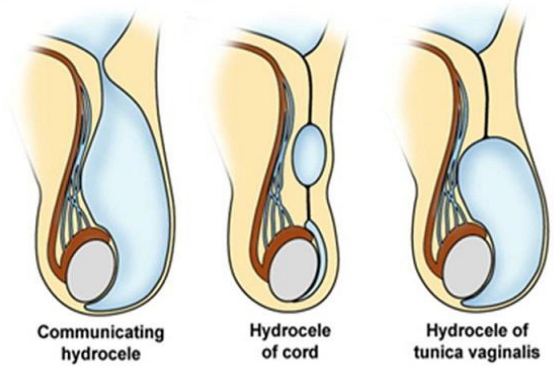


Fig. 6



I) Hydrocele of tunica vaginalis :

A) Vaginal hydrocele :

- **2 types** may occur in normally developed tunica vaginalis **.**

1- Primary vaginal hydrocele :

- The commonest type of hydrocele & commonest scrotal swelling.
- **It is idiopathic** collection of fluid in the tunica vaginalis which may be due to one of the followings :
  - ♣ Chronic irritation of tunica vaginalis .
  - ♣ Decrease fluid absorption by tunica vaginalis .
  - ♣ Chronic congestion of tunica vaginalis .

2- Secondary vaginal hydrocele :

- It is due disease in the testis , epididymis or spermatic cord .

B) Congenital hydrocele :

- It is due to congenital persistent patency of whole length of the processus vaginalis which is connected to the peritoneal cavity by a small opening allowing passage of fluid only but not intestine .

C) Infantile type :

- It is due to congenital persistent patency of whole length of the processus vaginalis but its connection with peritoneal cavity is obliterated .

II) Hydrocele of spermatic cord :

A) Encysted hydrocele of the cord :

- It is due to congenital persistent patency of the central part of processus vaginalis with obliteration of its both proximal and distal part .

B) Hydrocele of canal of Nuck :

- It is similar to the previous type but occurs in females in relation to the round ligament of the uterus in the canal of Nuck (corresponding to processus vaginalis).
- It appears as swelling in the inguinal region or labia majora .

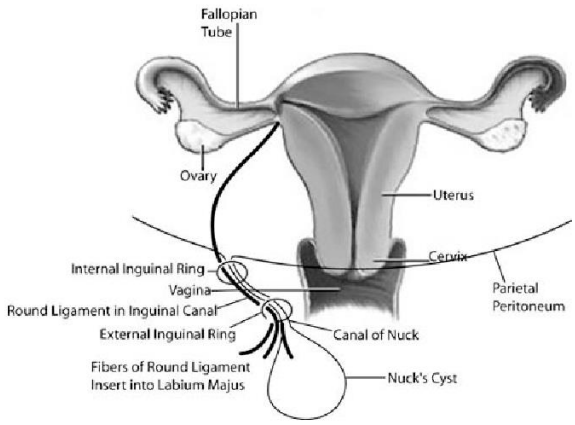


Fig. 3 Schematic diagram illustrates the canal of Nuck and Nuck's

C) Hydrocele of hernial sac :

- It is due to obliteration of neck of a small hernia sac by adhesions or omentum → the sac gradually distended with fluid

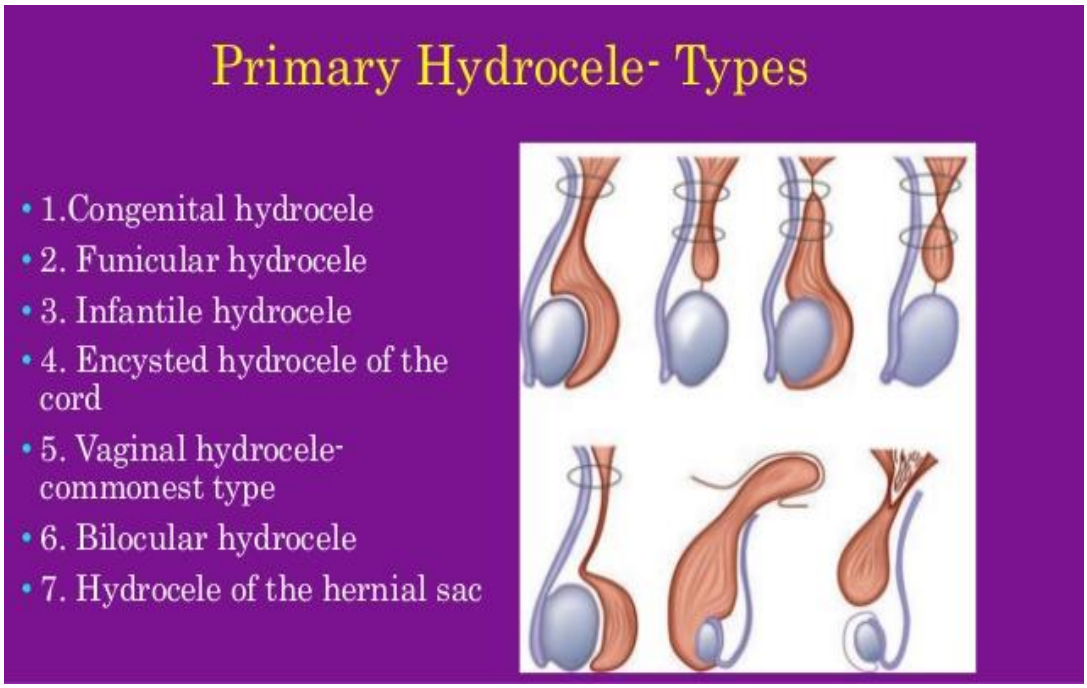
III) Rare types of hydrocele :

A) Hydrocele en bisac : (Bilocular hydrocele)

- 2 intercommunicating sacs , one above and one below the neck of the scrotum

B) Post-herniorrhaphy hydrocele :

- It is due to damage of lymphatics draining the tunica vaginalis .



Hydrocele en bisac

Infantile hydrocele

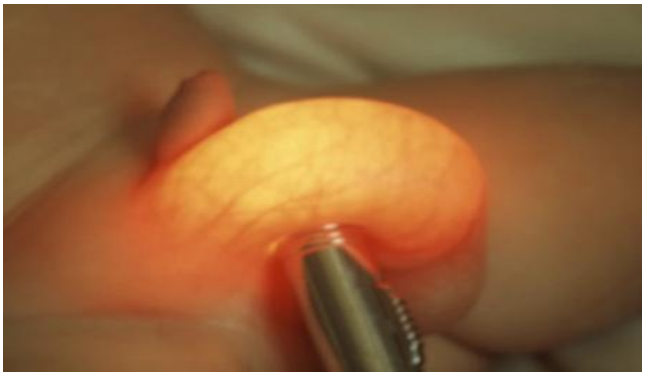
- In any type of hydrocele , the **tunica vaginalis** is gradually thickened , fibrosed and rarely calcified .
- **Characters of fluid inside hydrocele :** It resemble transudate , ambar yellow , thin , watery ,specific gravity is 1020 , rich in albumin , inorganic salts & fibrinogen .

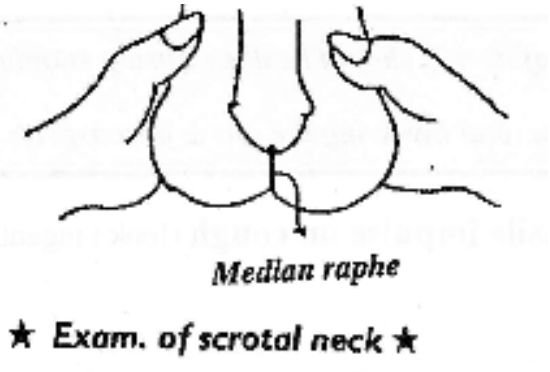
* **Complications :** Infrequent

1- **Infection :** Usually after aspiration leading to pyocele .
2- **Haemorrhage** after trauma leading to haematocele .
3- **Rupture** due to trauma .
4- Testicular **atrophy** .
5- Huge hydrocele interfere with the **daily activity** .
6- Huge scrotum leads to in drawing of penis which interfere with **micturation & intercourse** .
7- Recurrence is inevitable after aspiration.

***Clinical picture :**

* **In general , hydrocele** usually unilateral but may be bilateral , painless , not tender , slowly growing , well defined , smooth , oval , cystic , dull on percussion , not compressible , no impulse on cough and translucent (localise the site of the testis and exclude pyocele , haematocele & chylocele).



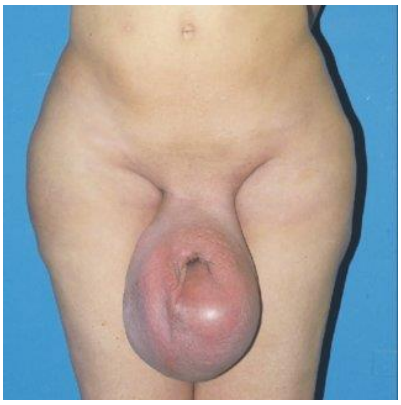


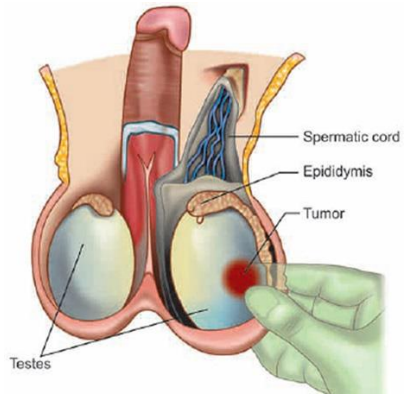
★ Exam. of scrotal neck ★

I) Hydrocele of tunica vaginalis :

A) Vaginal hydrocele : Pure scrotal swelling

1-Primary	2-Secondary
♣ The commonest hydrocele & the commonest scrotal swelling	♣ Rare .
♣ Normal intra-scrotal structures .	♣ A disease can be detected in testis , epididymis or spermatic cord .
♣ Tense cystic , may reach large size , detected by bipolar fluctuation .	♣ Lax small detected by pinching test .





B)Congenital hydrocele	C) Infantile hydrocele
♣ **Inguino-scrotal swelling** appear in infants or young age .	
♣ There is ascitis or T.B peritonitis .	♣ No source of fluid in the peritoneum .
♣ Decrease in size after night sleep .	♣ Doesn't decrease in size .
♣ Rarely compressible & impulse on cough .	♣ Incompressible & no impulse on cough .

Encysted hydrocele of cord

II) Hydrocele of spermatic cord :

Encysted hydrocele of cord	Hydrocele of hernial sac
♣ In children or young age	♣ Adult with history of small hernia .
♣ Swelling in the neck of the scrotum	♣ Swelling is inguinal .
♣ Mobile from side to side more than from above downwards .	
♣ Pull the testis down →restrict side to side movement .	♣ No effect .
♣ No impulse on cough .	♣ Impulse on cough above the swelling

Hydrocele of hernial sac

* **D.D of primary vaginal hydrocele :**

  1- Haematocele : Acute onset after trauma , tender & opaque .

  2- Chylocele : History and manifestations of filariasis , opaque .

  3- Pyocele : Toxaemia , pain , tenderness , redness , hotness & opaque .

* **Investigations :**
  - **Scrotal ultrasound** to exclude any disease in testis , epididymis or spermatic cord .

* **Treatment :** ***Only surgical***

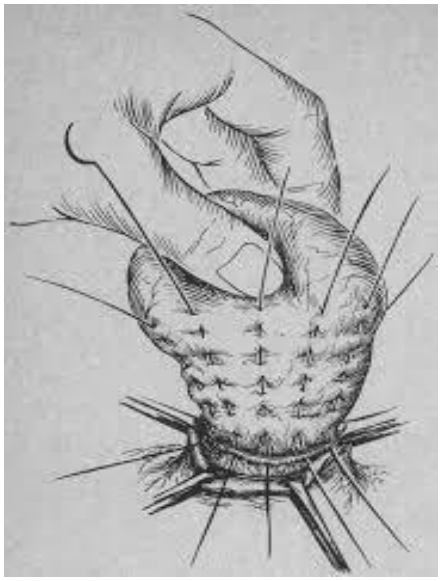
I) Primary vaginal hydrocele :

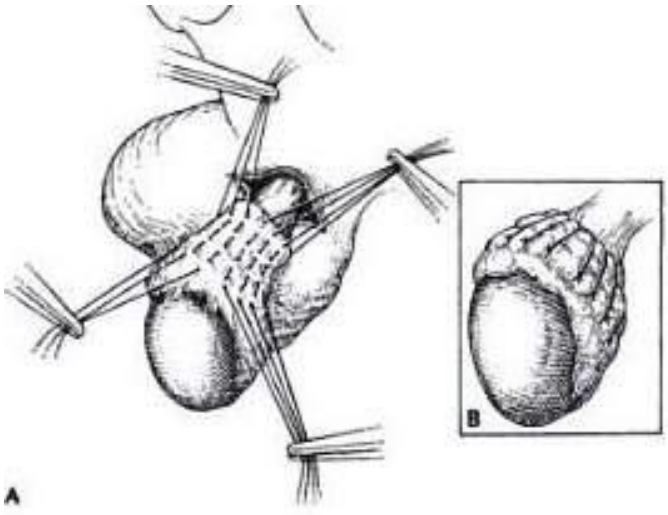
1- Lord's operation:

- **Indication :** It is the **most popular** operation for hydrocele with thin tunica vaginalis .
- **Method :**

♣ A small incision through all layers of the scrotum including the parietal layer of the tunica vaginalis (without tissue dissection) .

♣ The testis is allowed to prolapsed through the incision & the tunica is then plicated by sutures around the lower part of spermatic cord .





2- Eversion of tunica :

- **Indication:** For hydrocele with thin vaginalis .
- **Method :**
  - The hydrocele is opened , evacuated & its edges are sutured behind the epididymis .

3- Subtotal excision of the tunica : (hydrocelectomy)

- **Indications:** For large thick wall hydrocele . haematocele or pyocele .
- **Method**: After evacuation of the fluid , the tunica is cut close to the epididymis .

❖ **Aspiration** is a palliative measure if surgery can't be done:

- **Complications :**
  - ♣ Recurrence is inevitable .
  - ♣ Haemorrhage → haematocele .
  - ♣ Infection → pyocele .
  - ♣ Puncture of testis .

II) Congenital & infantile hydrocele :

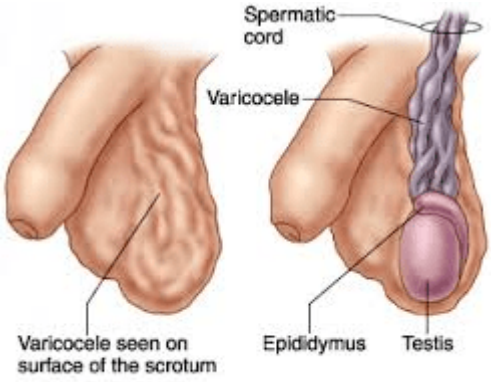
- Surgical treatment is delayed to the **end of first year** of life as spontaneous normal closure of the proximal part of the processus vaginalis usually occur .

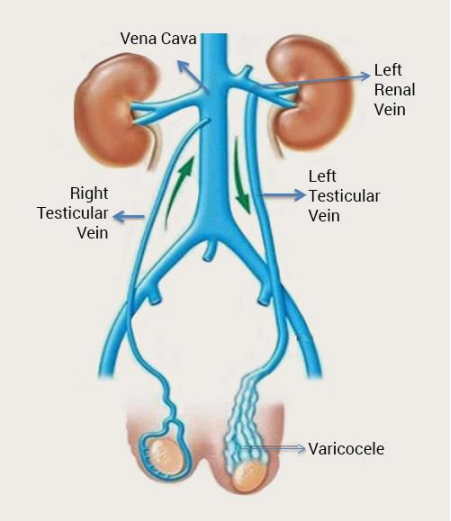
- **Divide** the hydrocele into 2 parts :
  - ♣ **Upper part** :Transfixation excision at internal ring .
  - ♣ **Lower part** : eversion .

III) **Encysted hydrocele of the cord** : Excision .

Varicocele

* **Definition :** dilatation , elongation and tortuosity of pampiniform plexus of veins .





* **Aetiology & classifications :**

I) **Primary or idiopathic varicocele :** (The commonest)

1- Familial congenital **weakness of the mesenchyme** → weakness of venous wall (associated with varicose veins of lower limb , piles ,hernia & flat foot) .

2- **Increase venous pressure** e.g. unsatisfied sexual desire .

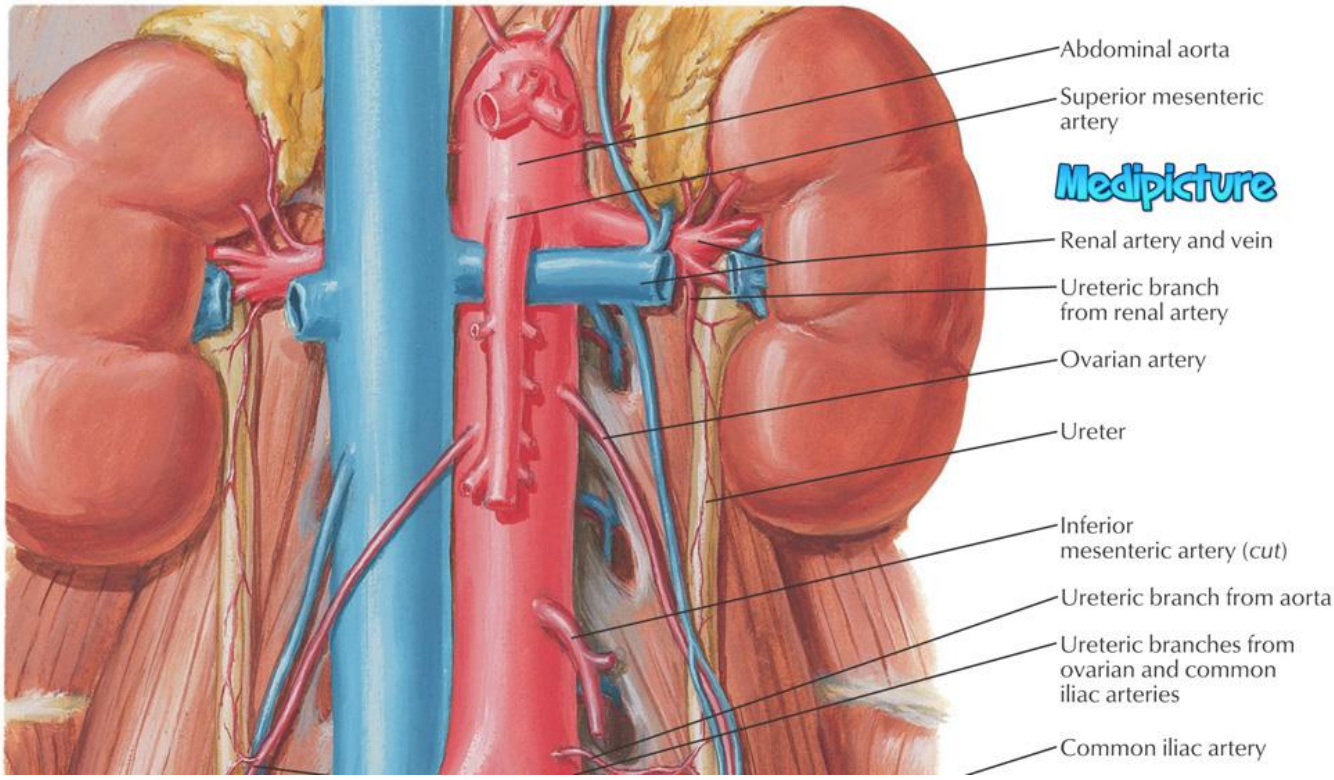
II) **Secondary varicocele :** due to obstruction of blood flow in the testicular vein by renal cell carcinoma or retroperitonel sarcoma .

* **Incidence :**

- It is the commonest cause of **oligospermia.**
- It is present in **40% of sterile males .**
- Primary varicocele usually starts in **adolescent** .

- Primary varicocele occurs in 80% of cases on the **left side** because:

1) The left testicular vein is **longer** than the right one.
2) The left testicular vein enters the left renal vein at **right angle**.
3) The left testicular vein opens into the left renal vein opposite the opening of the **left suprarenal vein** that carries adrenaline hormone (which causes vasoconstriction of the left testicular vein).
4) The left testicular vein is compressed by the heavy **pelvic colon** as it ascends deep to it.
5) Left renal vein is **compressed by** superior mesenteric **arteries**.



⁎ Pathology :

- Reflux of blood into the pampiniform plexus → increase venous pressure in these veins → dilatation , elongation & tortuosity of these veins → increase of intra-scrotal temperature → relaxation of dartos & cremasteric muscles → the veins becomes unsupported → more dilatation of veins .

- **Grades of varicocele :**

  - **Subclinical varicocele :** detected only by ultrasound .
  - **Grade I :** Palpable only during valsulva maneuver .
  - **Grade II :** Palpable without valsulva during standing position.
  - **Grade III:** Visible through scrotal skin .

✳ **Complications :**

1- **Hypofertility** especially in bilateral cases due to oligospermia and low vitality of the sperms as a result of high scrotal temperature which inhibit spermatogenesis .

2- **Testicular atrophy .**

3- Secondary hydrocele .

4- Psychological troubles .

5- Thrombophlebitis.

❖ **N.B :**

♣ Dartos and cremasteric muscles acts as a **thermostate** for optimum spermatogenesis at 33.5^0 C.

♣ Complications 1-4 are common for most intra-scrotal diseases .

✳ **Clinical picture :**

I) Primary varicocele :

A) Symptoms :

1- Usually symptomless and discovered inccidentally.

2- Dragging or dull aching pain in the testis increased by prolonged standing & hot weather.

3- Picture of complications as infertility.

B) Examination :

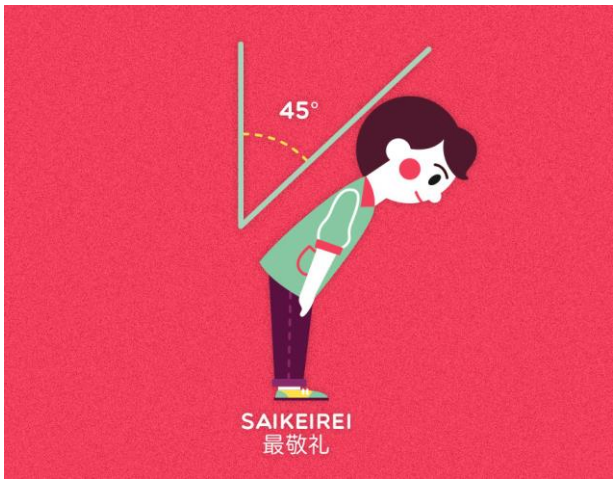
1- **Abdominal :** To exclude causes of secondary varicocele .

2- Local :

- ♣ The affected side of the scrotum is redundant with fullness above the testis .
- ♣ The skin of the scrotum may show dilated veins .
- ♣ The spermatic cord is thickened by dilated tortuous compressible tubules (like a bag of worms) with impulse & thrill on cough .
- ♣ If the patient is asked to bow , tension within the veins becomes less .
- ♣ Elevation of the scrotum while the patient lying down → varicocele disappear .
- ♣ The affect testis is atrophic , smaller and softer .
- ♣ There is a small secondary hydrocele .

II) Secondary varicocele : It is suspected if :

- ♣ Right side varicocele .
- ♣ Patient above 40 years .
- ♣ Develops rapidly .
- ♣ Does not empty on lying down & elevation of the scrotum
- ♣ Bowing has no effect on the tension within the veins .



* **Investigations :**

1- **Duplex ultrasound** show reversal of blood flow in testicular vein

2- Semen analysis .

3- **Abdominal ultrasound** to exclude causes of secondary varicocele .

* **Treatment :**

I) Conservative treatment :

- **Indications :** For early uncomplicated cases .
- **Method :** Avoid predisposing factors , regulate sexual life , frequent cold bathes .

II) Surgical treatment :

- **Indications :** For large , painful or complicated varicocele .
- **Methods :** Prevention of venous reflux by occlusion of veins of the testis by one of the following levels :

1- Retroperitoneal approach :

- Ligation and division of testicular veins in the retroperitoneal space as it emerges from the internal inguinal ring .This can be done by one of the followings :

a- Laparoscopic surgery (***commonly used*** nowadays).

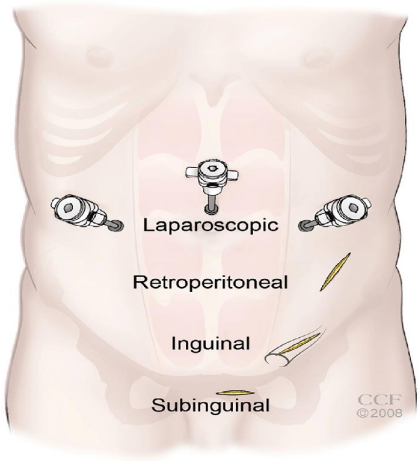
b- Open surgery (Palomo's operation) : Through incision above and lateral to the internal inguinal ring .

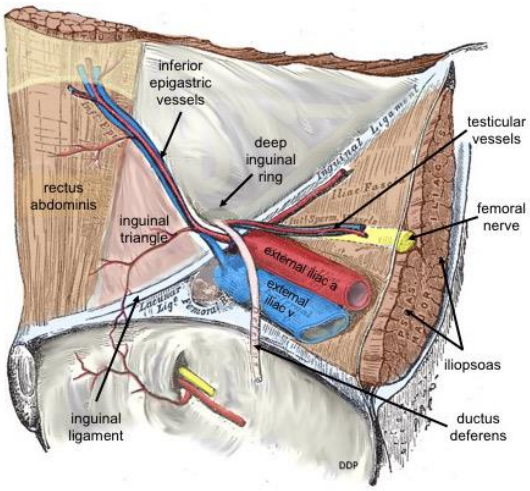
2- Inguinal approach :

- Through an inguinal incision ligation & division of pampiniform plexus in the inguinal canal .
- **Recently** , it is performed by **microsurgery** .

3- Scrotal (subinguinal) approach :

- Through an incision in the neck of scrotum ligation & division of pampiniform plexus.

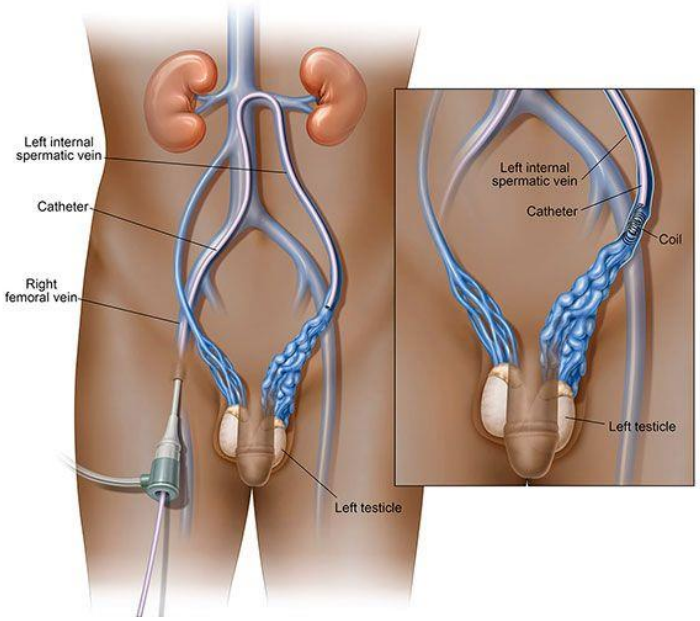




Retroperitoneal approach

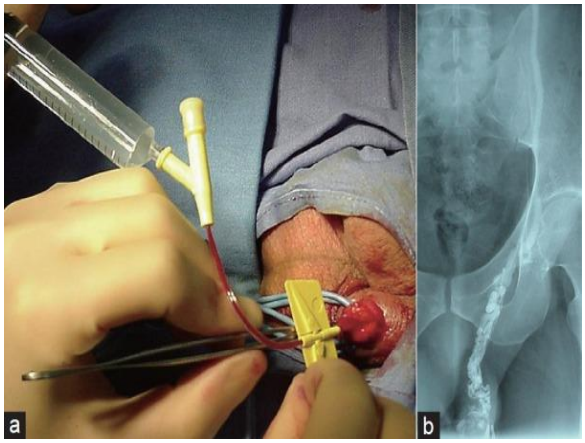
III) Percutaneous embolization : (interventional radiology)

- This is considered nowadays as the **best line of treatment** for varicocele to avoid post-operative complications , minimal invasive , under local anaesthesia and same day discharge .
- Insert a detachable ballon , metal coils or sclerosant fluid through trans-femoral or trans-jugular access .

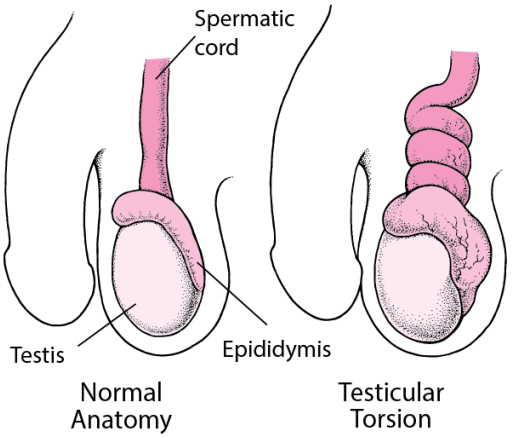


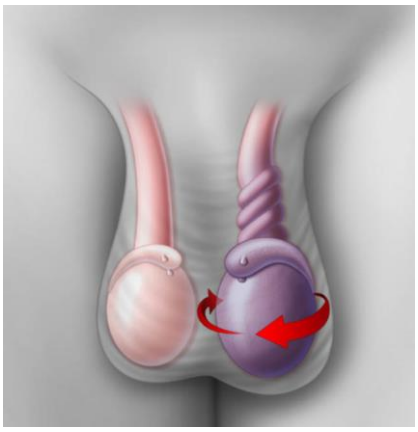
IV) Antegrade scrotal sclerotherapy :

- Through a small vertical incision in the neck of the scrotum, a fine cannula is inserted into the dilated veins and injection ethoxysclerol .



Torsion of the spermatic cord





* **Definition :** Twist of the spermatic cord leading to torsion of the testis around the axis of the spermatic cord .
* **Incidence :** Rare surgical emergency , never affects normal testis which is fixed in place .
* **Aetiology :**

I) Predisposing factors :

1- Undescended & ectopic testis .

2- High investment of the tunica vaginalis : The tunica vaginalis surround the whole testis & epididymis (bell-clapper deformity).

3- Spirally arranged cremasteric muscle .

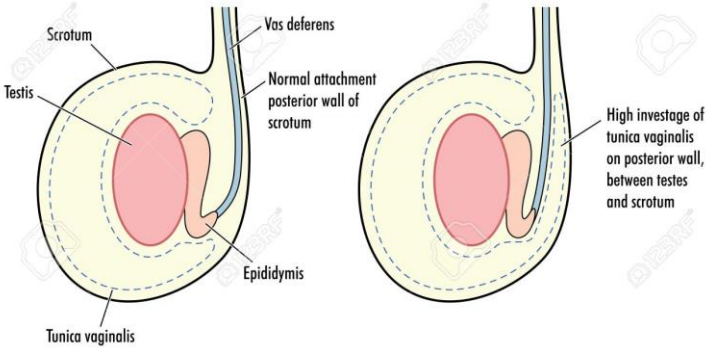
4- Mesorchium

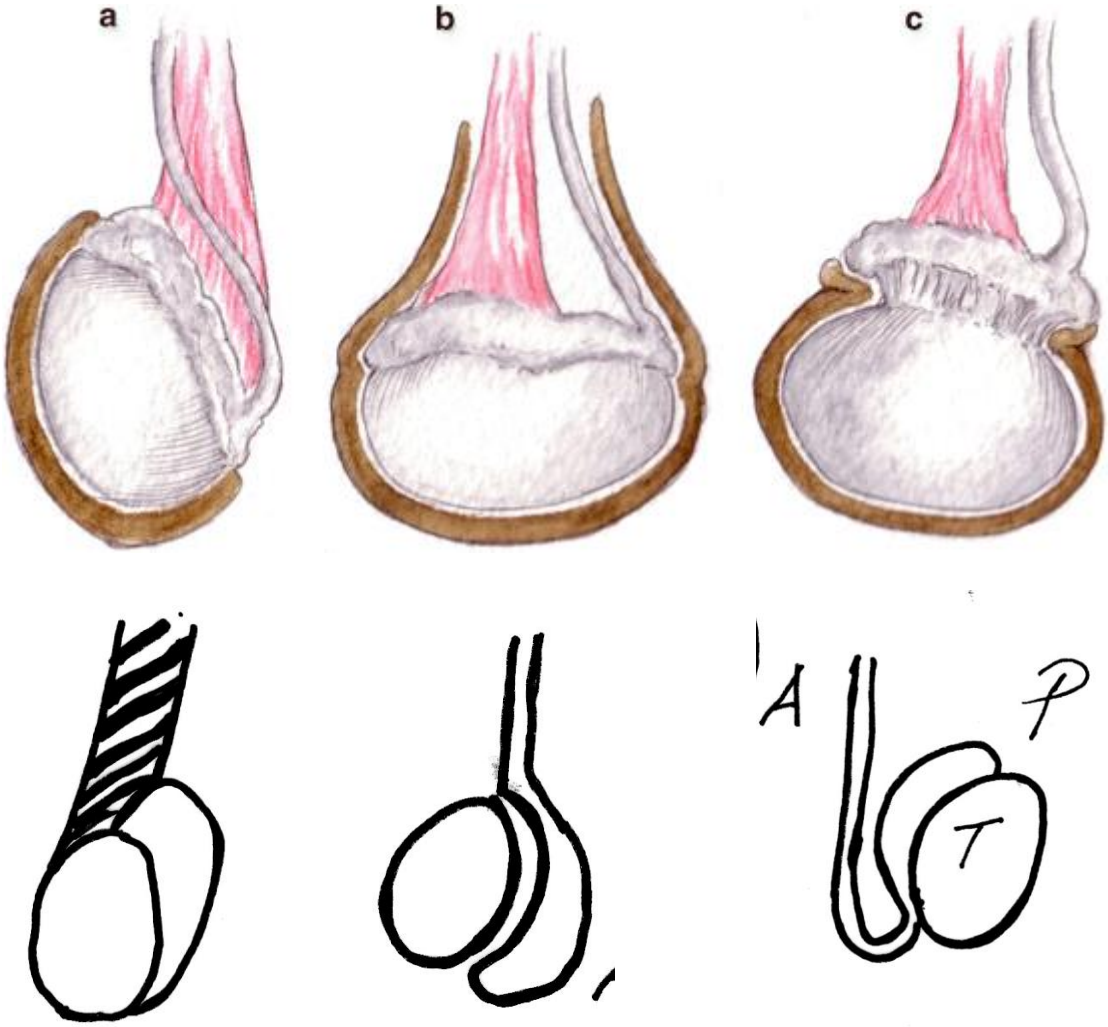
5- Horizontal anteversion : testis & epididymis lying horizontal .

6- Anterior anteversion : The epididymis lies anterior to the testis .

7- Complete polar anteversion: The testis turns upside down .

II)Exciting factors : Minor trauma e.g. crossing the legs.





* **Pathology :**
  - The testis rotates towards the scrotal septum.
  - The spermatic cord show 1-2 twists .
  - Obstruction of the blood vessels occur → testis is congested & oedematous and finally gangrene occurs within 6-8 hours .
  - **Types :**

    1- Intra-vaginal torsion: Inside capacious tunica vaginalis .

    2- Extra-vaginal torsion : The tunica vaginalis is normal .

* **Complications :**

  1- **Gangrene** of the testis .

  2- **Infertility :** due to excitation of an immune reaction to the antigenic sperms .

* **Clinical picture :**

1- Sudden severe **pain**:

- **Early :** Felt in the lower abdomen , groin & loin .
- **Late :** Felt in the testis .

2- **Vomiting** : once or twice only, not persistent .

3- Neurogenic **shock**.

4- Examination :

a) Torsion of **undescended** testis : Tense , tender inguinal swelling with empty scrotum .

b) Torsion of **normal descended** testis :

- Acute , tense , irreducible , tender **swelling** felt at the external inguinal ring (reflex spasm of cremasteric muscle).
- **Spermatic cord** : Twisted & thickened .
- **Tunica vaginalis :** Lax 2ry. hydrohaematocele .
- **Skin** of scrotum :Red & oedematous .

* **D.D :**

Torsion of testis	Acute epididymo-orchitis
▪Shock is present .	▪ No shock .
▪Low temperature .	▪ High temperature .
▪Elevation of scrotum doesn't relieve pain .	▪ Elevation of scrotum relieve pain .

Torsion of testis	Strangulated inguinal hernia
▪ Vomiting occurs once or twice .	▪ Vomiting is persistent .
▪ No absolute constipation .	▪ Absolute constipation .
▪ Swelling involves testis .	▪ Swelling separate from testis .

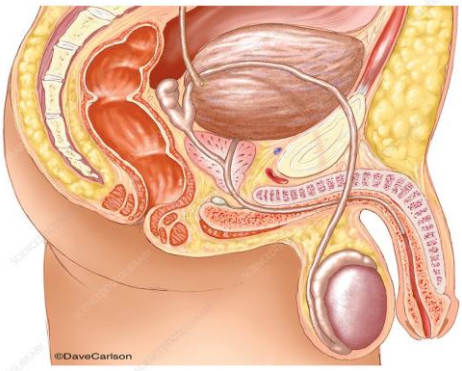
⁎**Investigations :** Duplex ultrasound show obstruction of blood vessels .

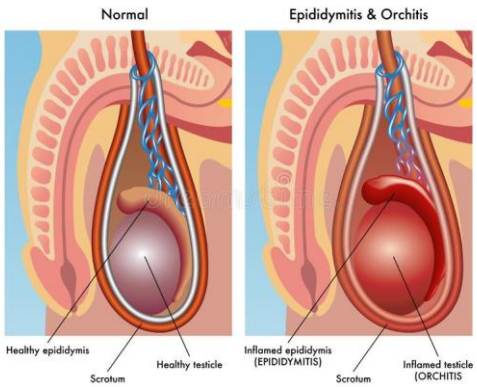
⁎**Treatment :**

- **Antishock measures .**
- Once the diagnosis is suspected , **urgent exploration , by scrotal incision** :
  - Torsion is **undone** .
  - If the testis is **viable** i.e normal in colour : **fix both** testes in the bottom of the scrotum to avoid recurrence .
  - If the testis is **gangrenous** : **Orchidectomy** for the affected testis and **fixation** of the other testis .

Acute Epididymo-Orchitis

⁎ **Definition:** Acute inflammation of epididymis & testis.





⁎ **Aetiology :**

I) Predisposing factors & route of infection :

A- Retrograde spread along the lumen of the vas due to lower UT infection→ infection start in the tail of epididymis .

B- Haematogenous spread is rare due to mumps , small pox or other fevers → infection start in the head of epididymis .

II) Organism : Gonococci is the commonest followed by E.coli , B.proteus , staph., strept. or viral .

* **Pathology :**
  - Inflammation usually starts in the epididymis and spread to the testis .
  - Early, there are congestion and oedema followed by suppuration and pus formation.

* **Complications :**

  1- Testicular destruction, fibrosis & atrophy**.**

  2- Infertility in bilateral cases .

* **Clinical picture :**

  1- History of the **cause** e.g. burning micturation , urethral dischgarge ….etc

  2- **Pain and swelling** in the testis with manifestions of **toxaemia** .

  3- **Testis and epididymis** are swollen & tender .

  4- Small secondary **hydrocele** .

  5- Scrotal **skin** : Hot and red .

* **Investigations :** Culture & sensitivity for urine & urethral discharge before intake of any antibiotics .

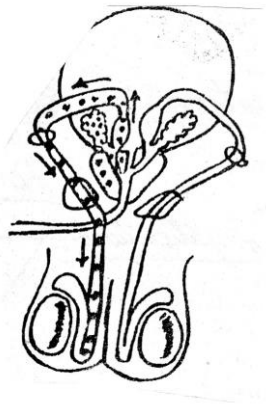
* **Treatment :**

  I) Early :
  - Proper **antibiotic** : Usually quinolones group (e.g. ciprofloxacin) for 2-3 weeks .
  - Rest in bed , analgesics & elevation of scrotum by scrotal suspendor
  - Cold applications on the scrotum .

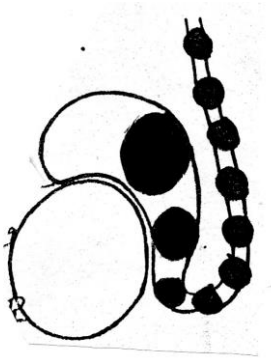
  II) Advanced cases with suppuration : incision & drainage .

* **The following clinical picture is common for most scrotal diseases :**
    1- **Features of the cause**
    2- **Pain :** dragging , heaviness or dull aching .
    3- **Swelling :** Describe as usual.
    4- **Constitutional manifestations.**
    5- **General exam.:** Abdominal & PR exam.
    6- **Local exam. :** Comment on the followings
        - **Skin**
        - **Testis**
        - **Epididymis**
        - **Tunica vaginalis** (secondary hydrocele)
        - **Spermatic cord .**

T.B Epididymitis



- **Aetiology :**
  - **I) Predisposing factors :** Primary T.B focus .
  - **II) Organism:** Mycobacterium T.B , usually human type .
  - **III) Route of infections :** (as acute epididymo-orchitis)
- **Pathology :** Usually there is retrograde s.m lymphatic spread along the vas → s.m tubercles .Caseation & cold abscess → sinus on the posterior aspect of scrotum.
- **Clinical picture :**
  - **I) General :**
    - **T.B toxaemia & chest manifestations .**
    - **Abdominal examination**: may show renal T.B.
    - **PR :** may show T.B of prostate & seminal vesicles (hard & nodular).
  - **II) Local :**
    - **Skin :**May show sinus on the posterior aspect of scrotum .
    - **Testis:** Usually remains normal (has good blood supply)
    - **Epididymis:** show multiple hard nodules
    - **Tunica vaginalis** (secondary hydrocele)
    - **Vas deference is beaded** (submucous tubercles)



- **Investigations : (as any T.B. in general)**
- **Treatment :**
  - **I) Mainly conservative** treatment by anti-T.B drugs .
  - **II) Surgical treatment :**
    - **Indication: if there is failure of conservative treatment.**
    - **Method :**
      - **Epididymo-vasectomy :**Excision of epididymis & vas up to internal inguinal ring .
      - **Orchidectomy** only if the testis is affected

Bilharziasis of Cord & Epididymis

- **Indience :** May occur with severe urinary bilharziasis .
- **Aetiology :**

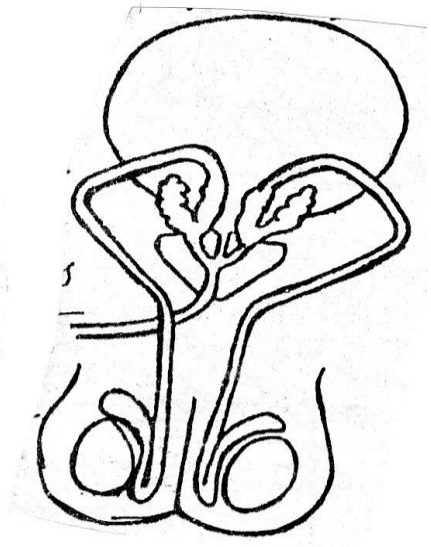
  I) Predisposing factors: Severe urinary or intestinal Bilharziasis .

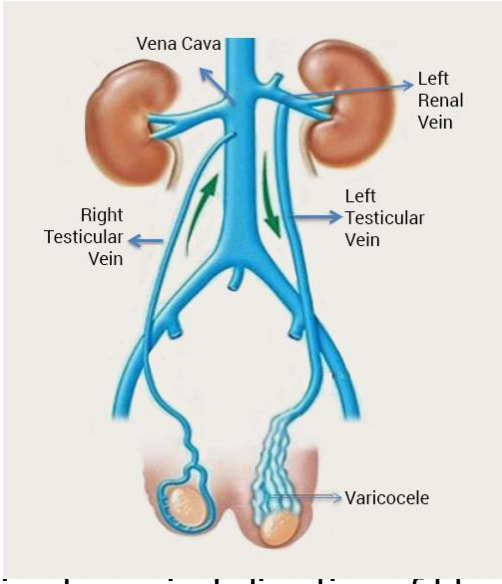
  II) Organism : Schistosoma haematobium or mansoni warms .

  III) Route of infection :

  1- Haematobium warms in the vesico-prostatic plexus pass in the veins around the vas to reach the pampiniform plexus .

  2- Mansoni warms in the inferior mesenteric vein pass to testicular vein & pampiniform plexus though retroperitoneal anastomosis .



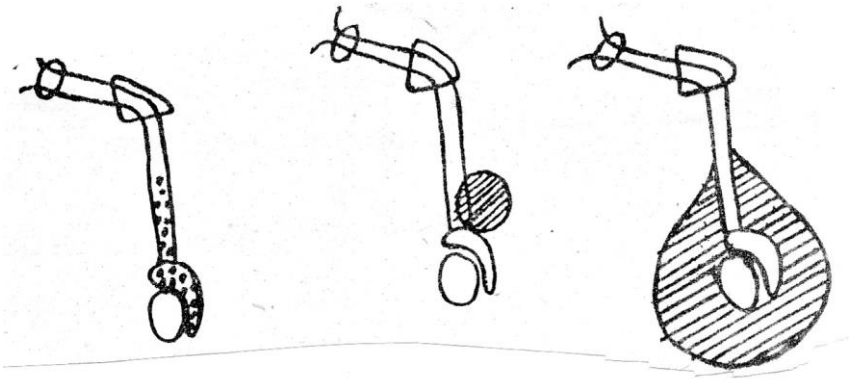


- **Pathology :**
  - Warms in the pampiniform plexus migrate against direction of blood flow until impact in small veins where they lay ova which penetrate the wall of veins → peri-venous Bilharzial granuloma .
  - **Types :**

    1- Granular type : There are multiple greyish firm small granules `.

    2- Nodular type : The commonest type , one or more greyish mass .

    3- Massive type : Rare , all intra-scrotal structures are included in a large pyriform Bilharzial granuloma .



* **Clinical picture :**

  I)General :

  - **Abdominal :** Hepatosplenomegally & ascitis .
  - **PR:** may show Bilharziasis of prostate & seminal vesicles .

  II) Local :

  - **Pain** (As general)
  - Pure scrotal **swelling** : slowly growing , firm ,in the lower part of spermatic cord & head of epididymis .
  - Tunica vaginalis show secondary **hydrocele** .

* **Investigations :** Urine & stool analysis show Bilharzial ova .
* **Treatment :**

  I) Anti-Bilharzial drugs is the main line of treatment for all cases .

  II)Surgical treatment :

  - **Indications** : Severe pain or suspicious for malignancy.
  - **Method** : Excision of the mass with preservation of vas , testis & epididymis .

Filariasis of Cord & Epididymis

- **Aetiology :** Wuchereria Bancrofti worms obstruct the lymphatics .
- **Pathology & clinical picture :**

❖ **3 Filarial lesions affect the spermatic cord & epididymis :**

I) Chronic filarial funiculo-epididymitis :

- Other manifestations of filariasis e.g. in lower limb
- 2 types :

1- **Diffuse type :** The commonest type , the cord is thickened and matted (chronic oedema & fibrosis).

2- **Nodular type** : Rare , one or more nodule attached to the vas and the cord is thickened and matted .

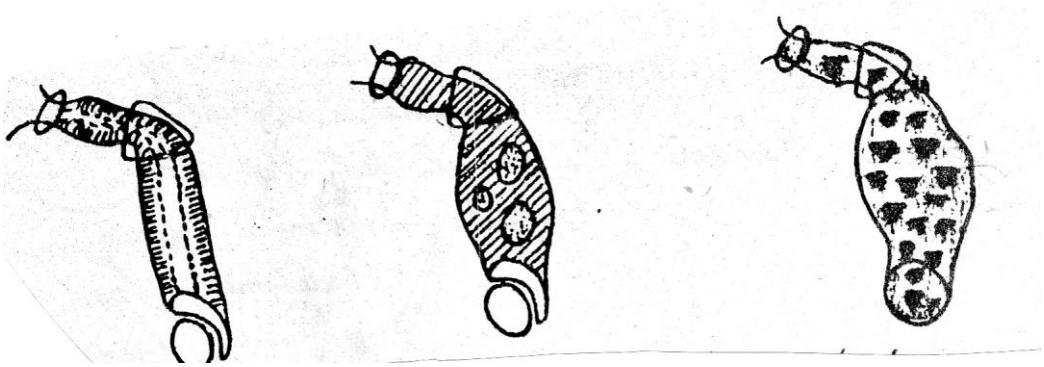
II) Acute filarial funiculo-epididymitis :

- **Stasis of lymph** → streptococcal lymphangitis , phlebitis & thrombophlebitis .
- **There are 3 pathological types :**

1- **Acute catarrhal :** Slight congestion & oedema due to mild infection .

2- **Acute suppurative :** The cord show multiple abscesses .

3- **Acute gangrenous :** Severe infection → massive thrombosis of blood vessels → gangrene of testis , cord and overlying skin .



Catarrhal Suppurative Gangrenous

- **Clinical picture :**

1-A patient from filarial discret with rapid onset of painful tender inguino-scrotal swelling .

2-High fever & toxaemia .

3-Cord : Thickened , matted & tender up to internal ring .

4-The inguino-scrotal skin is red , warm & oedematous .

5-Tunica vaginalis :show secondary hydrocele .

III) Lymphocele :Dilated lymphatics in the spermatic cord → soft swelling in the cord simulating varicocele but the swelling does not empty on lying down .

* **Investigations :** (see lymphoedema)
* **Treatment :**

A) Conservative : Anti-filarial drugs are the main line of treatment .

B) Surgical :

I) Chronic filarial funiculo-epididymitis :

- Excision of nodule only .

II) Acute filarial funiculo-epididymitis :

- If suppuration occurs → drainage .
- If gangrene occurs → orchidectomy .

Testicular Neoplasms

* **Incidence :**
  - 99% of testicular neoplasms are **malignant** .
  - Testicular malignancy represent **1-2%** malignant tumours in males .
  - Usually occurs between **20-50 years** .
* **Predisposing factors :**
  - **Undescended** testis especially intra-abdominal type . Malignancy is 15 time more common than in normal testis . It is genetically determined and occur even after successful surgery to descend the testis into the scrotum .
  - **Family or personal** history of testicular malignancy .
  - Maternal administration of **oestrogen**.
  - **HIV & AIDS .**

* **Pathology :**

I) Types :

- **Seminoma 40%**
- **Teratoma 30%**
- **Combined seminoma & teratoma 15%**
- **Interstitial tumours :**

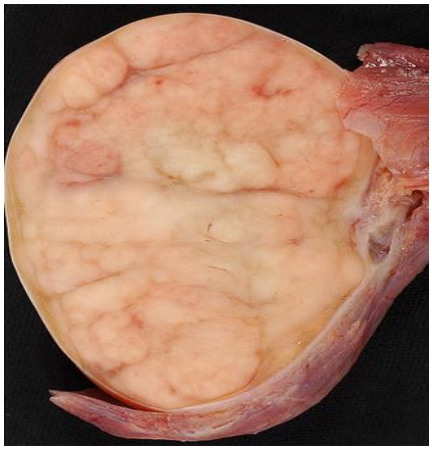
1- **Leydig cell tumour** :Usually occur before puberty , secreting excess androgens → precocious puberty & extreme muscular development (infant Hercules)

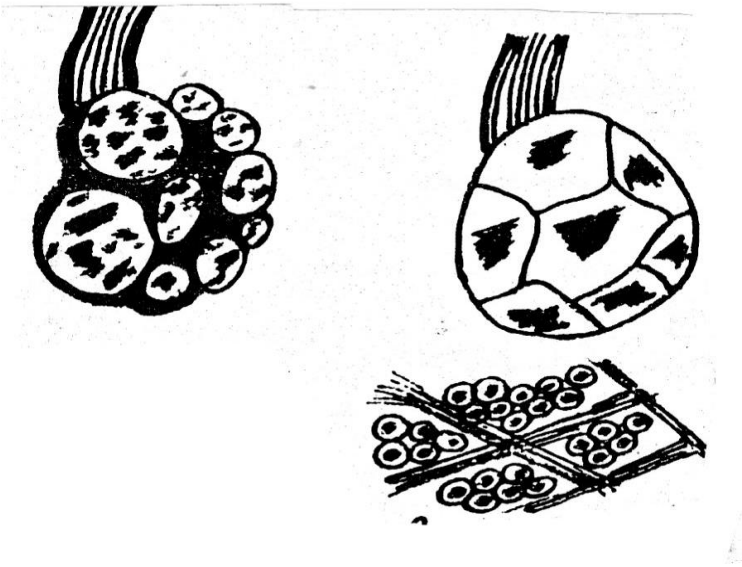
2- **Sertoli cell tumour** : Usually occur after puberty , secreting excess oestrogen → gynaecomastia , loss of libido and aspermia .

- **Other rare tumours** e.g. lymphoma .

II) Pathological features of seminoma & teratoma :

	Seminoma	Teratoma
1- Age :	▪ 30-50 years .	▪ 20-30 years
2- Origin :	▪ Epithelium of seminiferous tubules .	▪ Multipotent embryonic cells .
3- Gross picture :	▪ Smooth , firm or hard & not capsulated mass.	▪ Non-capsulated , irregular mass with variable consistency .
4-Cut section :	▪ Homogenous , **greyish yellow** tumour with fibrous septa, lobulated with less haemorrhage & necrosis .	▪ **Cystic spaces** contain gelatinous material with wide areas of haemorrhage & necrosis . ▪ **Usually dark brown** in colour .
5-Microscopiclly	▪ Masses of large oval malignant cells, with large oval nuclei and clear cytoplasm similar to **spermatocytes** , separated by fibrous tissues. ▪ The stroma is infiltrated by **lymphocytes & plasma cells** represent good host reaction & good prognosis .	▪ Look below the table .
6-Growth :	▪ Relative slow	▪ Rapid .
7- Malignancy :	▪ Usually low .	▪ Usually high
8-Spread :	▪ Mainly lymphatic .	▪ Mainly blood.
9-Radiation :	▪ Radio-sensitive .	▪ Radio-resistant
10-Prognosis :	▪ Relative good .	▪ poor





Teratoma **Seminoma**

- **Histological types of teratoma:**

1- Teratoma differentiated :

- No histological evidences of malignancy (e.g. dermoid cyst) but it can give metastases .

2- Malignant teratoma intermediate :(commonest testicular teratoma)

- It consists of malignant incompletely differentiated tissues .

3- Malignant teratoma anaplastica :

- It consists of malignant undifferentiated embryonic tissues .

4- Malignant teratoma trophoblastica :(most aggressive tumour)

- It consists of malignant syncytial cells & cytotrophoblast which secrete chorionic gonadotrophin .

III) Staging of testicular malignancy :

- **Stage I :** Tumour localized to testis .
- **Stage II :** affection of lymph nodes below the diaphragm .
- **Stage III :** affection of lymph nodes above the diaphragm .
- **Stage IV :** Distal metastases .

* **Complications :**

I) Spread :

1- **Direct spread** :to epididymis , tunica , skin and spermatic cord .

2- **Lymphatic spread** :Mainly in seminoma , to para-aortic L.Ns → cysterna chyli → thoracic duct → Virchow's glands .

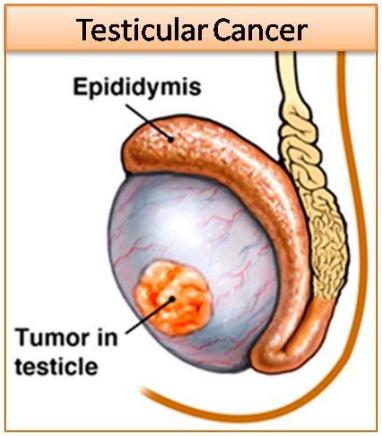
3- **Blood spread** :Mainly in teratoma to lungs , bones , brain & rarely to liver .

II) Haematocele , fungation , ulceration , anaemia , cachexia & death .

* **Clinical pictures :**

I) Typical cases :

A) Symptoms :



1- Rapidly enlarged painless scrotal swelling .

2-Sense of heaviness or dragging pain in the testis .

B)Signs :

1- **Testis :**

- Hard , irregular , not tender testicular swelling .
- There is early loss of testicular sensation .

2-**Tunica :**Secondary lax ,soft hydrocele .

3-**Epididymis :** Early normal , then flattened & finally infiltrated .

4-**Spermatic cord :** Early normal , later on thickened & infiltrated .

5-**Skin :**Fungation & ulceration occurs in late cases .

II) Metastatic cases :

- In some patients , testicular enlargement is not noticed by the patient who presents by manifestation of metastases as epigastric or supraclavicular swelling (para-aortic or Virchow's lymph nodes enlargement) , chest pain ….. etc (as usual).

III) Atypical cases :

1-Epididymo-orchitis simulating type : The patient presents by acute pain and swelling due to haemorrhage inside the tumour .

2- Slowly growing progressive testicular swelling for 2-3 years .

3-Hurricane type : Highly malignant disseminating fatal tumour .

4-Hormonal effects of interstitial cell tumous as infant Hercules or feminizing manifestations .

* **D.D :** Hydrocele , calcified haematocele , massive Bilharziasis of scrotum or syphilitic gumma .
* **Investigations :**

1- Tumour marker :

- **Beta fraction of human chorionic gonadotrophin** is high in 100% of patient with malignant teratoma trophoplastica and 10% of seminoma.
- **Alphafetoprotein** may be elevated in teratoma , never in seminoma
- **Lactic dehydrogenase .**

2- **Scrotal ultrasound :** Confirm the diagnosis and exclude other causes of scrotal swelling .

3- **Abdominal ultrasound , CT scan & MRI** to detect abdominal lymph nodes enlargement .

4- **Investigations to detect distal metastasis (as usual)**

5- **Testicular biopsy (see initial treatment)** (never incision or needle biopsy as it allows spread to skin of scrotum & superficial inguinal lymph nodes).

✳ **Treatment :**

I) Initial treatment : ***High orchidectomy***

- Through an inguinal incision, a vascular clamp is applied on the cord (to avoid blood dissemination) and the testis is derived and examined
  - ♣ If there is **frank malignant** tumour , the spermatic cord is double ligated & divided at the internal ring with excision of testis and spermatic cord .
  - ♣ If there is any **doubt** , biopsy is taken for frozen section .

II) Further management : Depends on the pathological type & staging .

A) Seminoma :

- **Stage I :** Radiotherapy to para-aortic lymph nodes .
- **Stage II :** Radiotherapy to para-aortic & supra-diaphragmatic lymph nodes.
- **Stage III :** Chemotherapy with radiotherapy .
- **Stage IV :** Chemotherapy .

B) Teratoma :

- **Stage I : 2 option**
  - ♣ Nowadays laparoscopic (rarely opened) **retroperitoneal lymphadenectomy or**
  - ♣ **Careful follow up** and if lymph nodes enlargement occur Retroperitoneal lymphadenectomy or chemotherapy .
- **Stage II ,III & IV :** Chemotherapy .

Laparoscopic retroperitoneal lymphadenectomy