

Male genital system part 1

○ Male External Genital Organs

- 1. Scrotum
- 2. Testis
- 3. Epididymis
- 4. Spermatic cord
- 5. Penis

□ The scrotum

- The scrotum is a cutaneous pouch

○ Contents :

- Testis
- epididymis
- lower part of the spermatic cord (of both sides).

○ Layers of scrotum

▪ Skin :-

- The skin of the scrotum is pigmented, rugose and is marked by a longitudinal median raphe.

▪ Superficial fascia of the scrotum:-

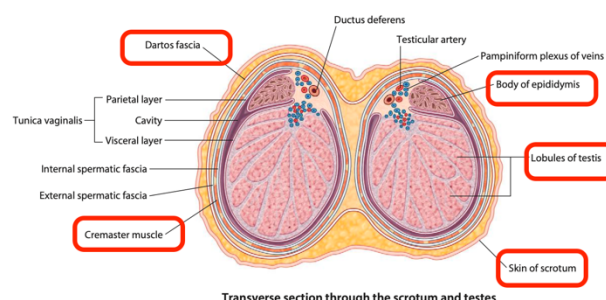
- The **fatty layer** is absent (to assist heat loss) and is replaced by the subcutaneous involuntary muscle fibers called dartos muscle .
 - The muscle aids heat regulation of testis and scrotum.
- The **deep membranous** layer of the scrotum is called Colles' fascia.
 - It is continuous superiorly with Scarpa's fascia of the anterior abdominal wall

○ Dartos muscle

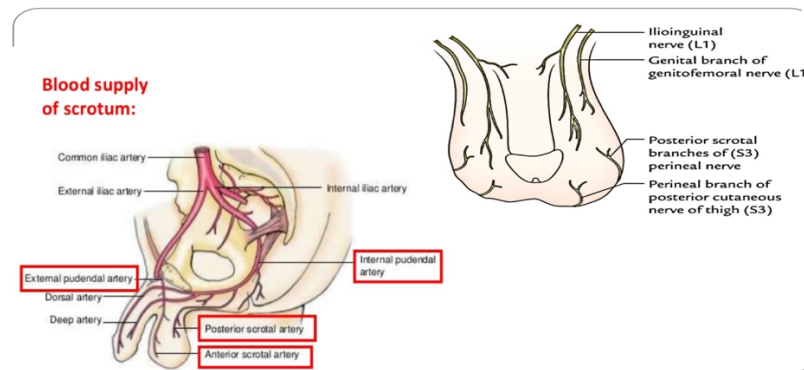
- Smooth muscle of the fat-free subcutaneous tissue of the scrotum (dartos fascia), which inserts into the skin, assisting testicular elevation as it produces contraction of the skin of the scrotum.
- It is supplied by **sympathetic nerve** fibres reaching it through the genital branch of the genitofemoral nerve

○ Cremaster muscle

- Is formed by the lowermost fascicles of the internal oblique muscle arising from the inguinal ligament



- **Blood supply :-**
 - Cremastic branch of the **inferior epigastric artery**
 - Superficial and deep external pudendal branches of **femoral artery**
 - Scrotal branches of **internal pudendal artery.**
- **Nerve supply :-**
 - Anterior 1/3: Ilioinguinal nerve (L1 dermatome) + genital branch of genitofemoral N.
 - Posterior 2/3: Scrotal branches of pudendal nerve and posterior cutaneous nerve of the thigh (S3 dermatome).
- **Lymphatic drainage :-**
 - Superficial inguinal lymph nodes.



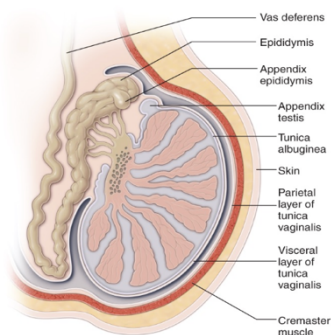
□ Testis

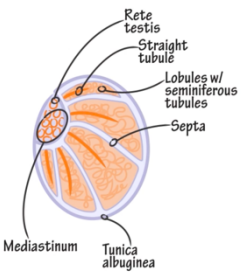
- Testis is the male primary sex organ, suspended in the scrotum by the spermatic cord.
- The testis develops at the upper part of posterior abdominal wall, then descends into scrotum
- **Testis has 2 poles**, (the upper and lower), **2 borders**, (anterior and posterior), and **2 surfaces**, (medial and lateral).
- The epididymis (which is a long coiled duct) forms a cap at the upper pole of the testis, descending down lateral to the posterior border towards its lower pole.

- **Coverings (tunics) of the testis :** From outside inwards

▪ 1. Tunica vaginalis:

- It is the lower part of the processus vaginalis of the peritoneum.
- It is invaginated by the testis from behind
- It has parietal and visceral layers with a cavity in between .
- The tunica vaginalis covers the whole testis except its posterior border.
- **Sinus of epididymis** is that part of the cavity of tunica vaginalis which extends between lateral side of testis and the epididymis .





2. Tunica albuginea:

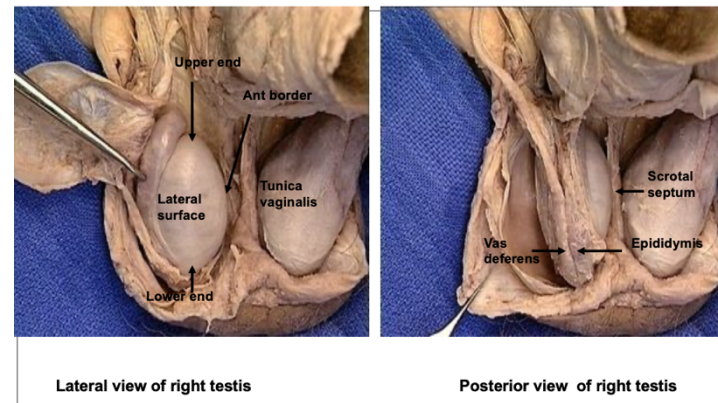
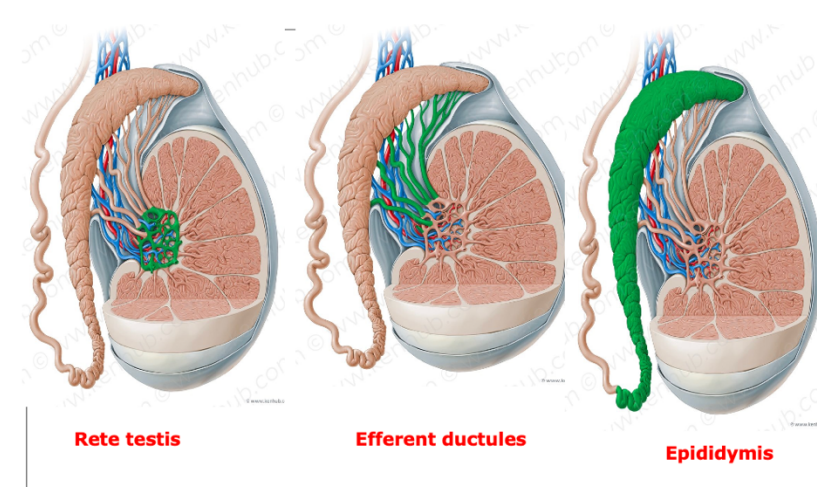
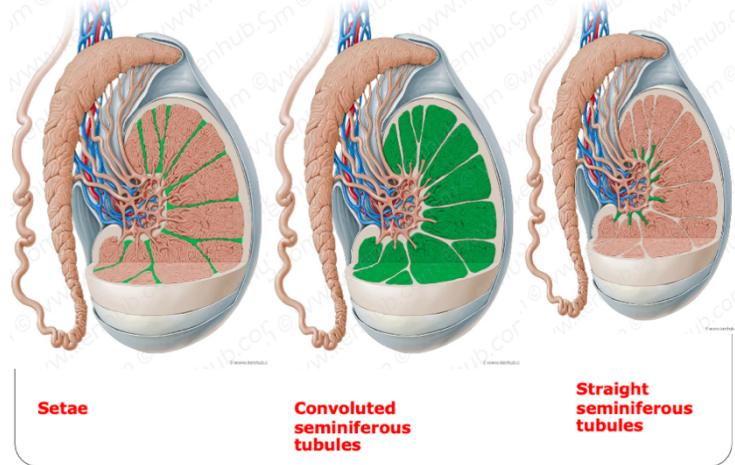
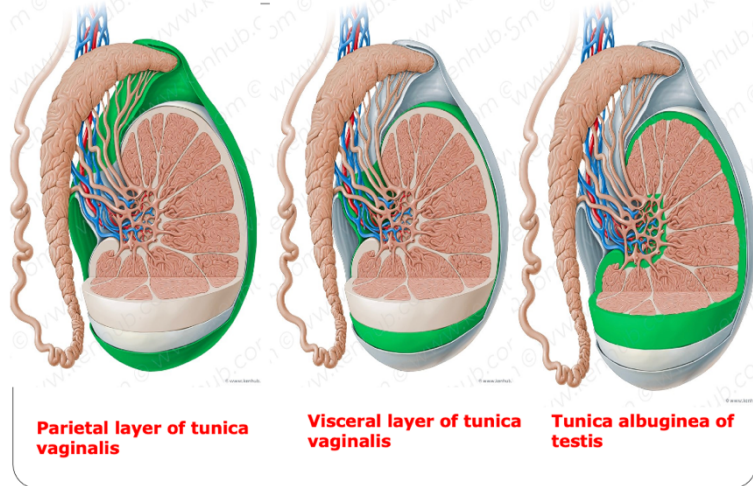
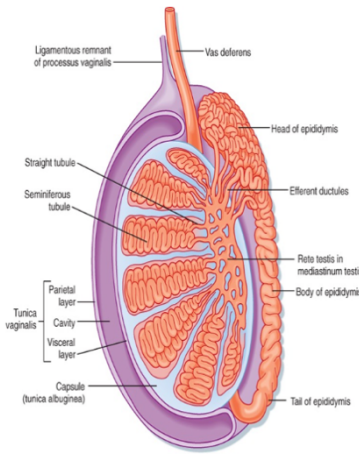
It is the tough white fibrous coat which covers the testis all around.

3. Tunica vasculosa:

It is formed of vascularized connective tissue, deep to the tunica albuginea and extends between the lobules of the testis

Structure of the testis

- The postero-superior part of tunica albuginea is thickened to form the **mediastinum testis**.
- Numerous septa pass from the mediastinum to the inner surface of the rest of tunica albuginea dividing the testis into 200-300 lobules.
- Each lobule contains 2-3 seminiferous tubules with **interstitial cells of Leydig** in between the tubules.
- Near the mediastinum testis, the seminiferous tubules join together to form 20-30 **straight tubules**, which enter the mediastinum anastomosing with each other to form a network of tubules called "**rete testis**"
- The rete testis gives rise to 12-20 **efferent ductules** which emerge from the upper pole of the testis to form head of epididymis.

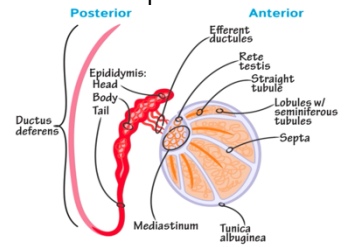


□ The epididymis

- It is the highly coiled comma shaped tube which is attached to the postero-lateral aspect of the testis. It may act as a reservoir for sperms.



- **Length:**
 - In the comma shaped coiled form it is about 1.5 inches long.
 - When it is uncoiled, it measures about 6 meters in length.



- It has 3 parts

- **Head:**

- forms a cap at upper pole of the testis, to which is connected by efferent ductules. These ductules form head of the epididymis

- **Body:**

- is the intermediate part and is made up of the single coiled tube

- **Tail:**

- is the lower end of the tube and it continues as vas deferens which ascends medial to the epididymis.

- **Arterial blood supply of the testis and epididymis**

- By testicular artery, a branch of abdominal aorta at L2 vertebra.
- It descends on the posterior abdominal wall to reach the deep inguinal ring where it runs in the spermatic cord in the inguinal canal.
- It supplies epididymis and enters the testis
- It anastomoses with cremasteric artery and artery of the vas .

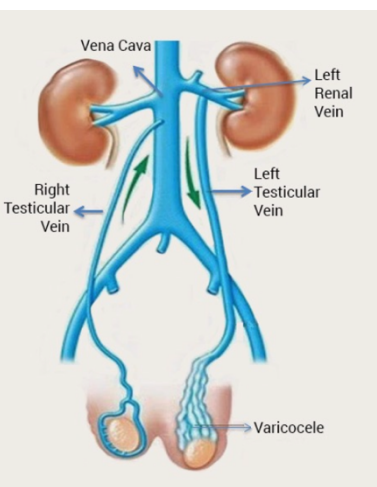
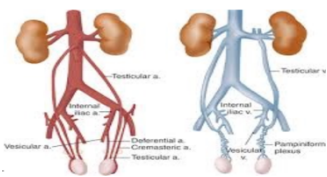
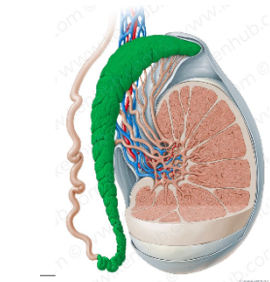
- **Venous drainage**

- Venous blood from testis and epididymis drain into the pampiniform plexus.
- It surrounds and accompanies the testicular artery up to the superficial inguinal ring.
- In the inguinal canal, it gives rise to a single testicular vein.
- The **right** vein ends in the inferior vena cava and the **left** one ends in left renal vein.

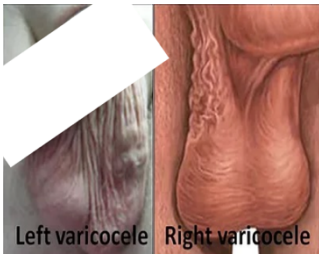
- **Varicocele**

- A varicocele is a condition in which the veins of the pampiniform plexus are elongated and dilated.
- It is a common disorder in adolescents and young adults
- It is more common occurring on **the left side because** :

- 1-The right testicular vein joins the low-pressure inferior vena cava (by acute angle)
 - The left vein joins the left renal vein, in which the venous pressure is higher (by right angle)
- 2- The Left side drained by left renal vein which receive left suprarenal vein contains adrenaline and noradrenaline which causing vasoconstriction of Left testicular vein



Screen Draghmeh



- 3- The left renal vein is compressed between aorta and superior mesenteric artery
- 4- Left testicular vein may be compressed by heavy left colon
- 5- The left testis is lower than right one with elongated left testicular vein

- **Lymphatic drainage :**
 - Into lateral aortic lymph nodes.
- **Nerve supply of the testis**

Superior spermatic nerves :

- Composed of fibers from the **renal and intermesenteric plexus** follow the **testicular artery** to the testis.
- This association between the intestinal (intermesenteric) and testicular nerves may explain the **"kick in the stomach"** feeling accompanying testicular injury.

Middle spermatic nerves

- arise from the **superior hypogastric plexus**, pass to the mid-ureter and travel alongside the vas deferens to join the **spermatic cord**.
- The ureteral proximity may explain pain radiation to the scrotum of an obstructing ureteral stone.

Inferior spermatic nerves :

- Originate from **inferior hypogastric plexus**, and join the middle spermatic nerves at the prostate-vesical junction.
- Some afferent and efferent fibers decussate to the contralateral pelvic plexus

- **Thermoregulation of the testis**
 - The process of spermatogenesis needs a temperature 2-3°C below the body temperature. This is achieved through the following 3 mechanisms;

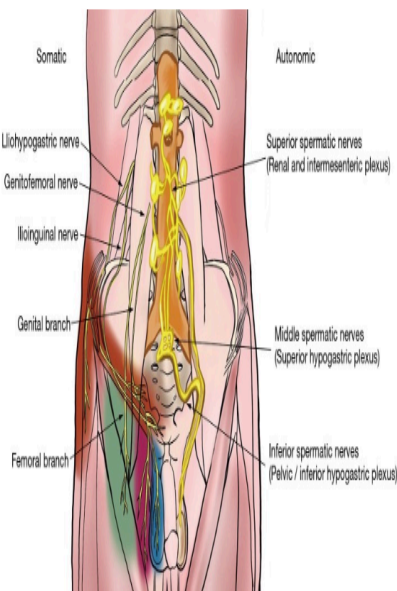
□ **1. Cutaneous mechanism;**

- The scrotal skin is very vascular and rich in sweat glands.
- Fat is absent in its subcutaneous tissue, all aid heat loss.

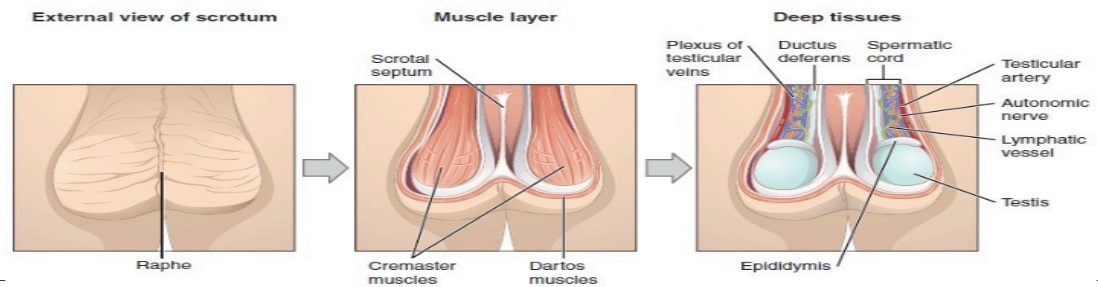
□ **2. Muscular mechanism:**

- Includes 2 muscles, dartos and cremastic.
- In cold cremastic muscle elevates the testis near the body, so preventing heat loss.
- In warm weather, the opposite effects are obtained.

□ **3. Vascular mechanism:**



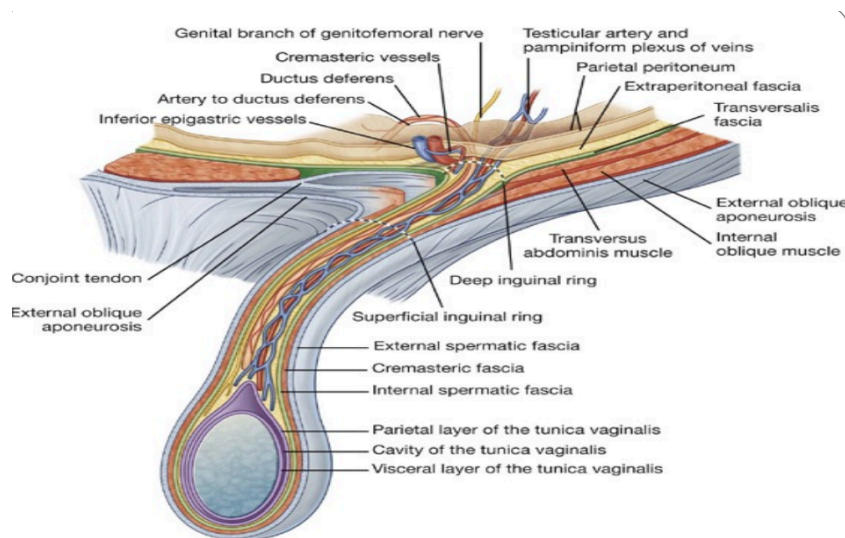
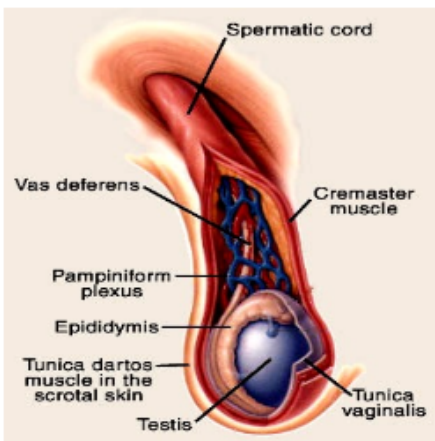
- The pampiniform plexus aids heat loss by radiation, so helps to maintain low temperature around the testis.



○ The spermatic cord

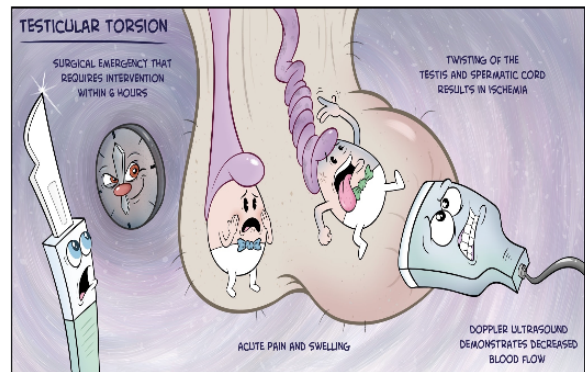
- It is a group of structures which meet at deep inguinal ring and traverse the inguinal canal down to posterior border of the testis.
- **Coverings:** The spermatic cord is invested by 3 coverings; *internal spermatic fascia, cremasteric muscle and fascia, and external spermatic fascia*.
- **Constituents of the spermatic cord (A, V, N, L)**

- 1. Testicular **A**rtery (from aorta)
- 2. Cremasteric **A**rtery (from inferior epigastric artery)
- 3. **A**rtery of the vas (from the inferior vesical artery)
- 4. **V**as deferens
- 5. Pampiniform **V**enous plexus
- 6. **V**estige of processus vaginalis.
- 7. Genital branch of genitofemoral **N**erve,
- 8. **S**ympathetic plexus around the testicular artery and artery of the vas
- 9. Lymphatics of testis and epididymis ascending to lateral aortic lymph nodes and Loose areolar tissue.



○ **Torsion of the Testis**

- Torsion of the testis is a rotation of the testis around the spermatic cord . It is often associated with an excessively large tunica vaginalis.
- The patient complains from severe pain.
- It is an emergency case , the testicular artery may be occluded, followed by necrosis of the testis



○ **Hydrocele**

- It is an accumulation of fluid within the tunica vaginalis.

○ **Haematocele**

- It is an accumulation of blood within the tunica vaginalis.

