AL- Rasheed university college

Pharmacy department

First year

Human anatomy

The male reproductive system

الدكتور طارق جواد الربيعي

جراح اختصاصي

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مدير م القصر الابيض الاهلي

The Male Reproductive System

- Composed of :

1- testes

2- genital duct :

a – Epididymis

b – vas deferens

c – urethra

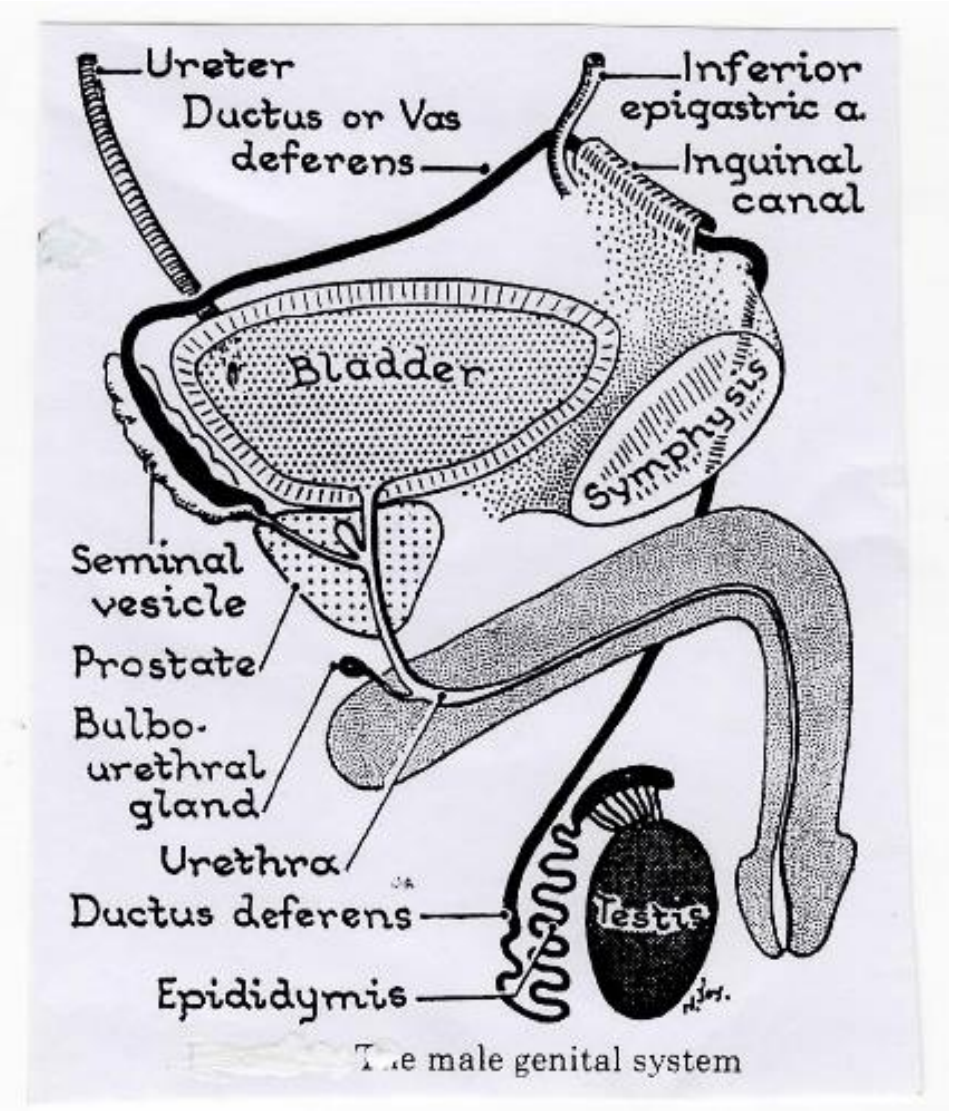
3- accessory glands.

a- seminal vesicles

b- prostate

c- bulbourethral glands

4- external genitals.



The male genital system

The Reproductive System (1)

-Embryology(1)

- The male and female organs of reproduction are fundamentally the same .
- in both sexes there is a pair of parallel duct on each side of the body:
    1. Mesonephric (wolfing) duct.
    2. Paramesonephric(mullerian)duct.

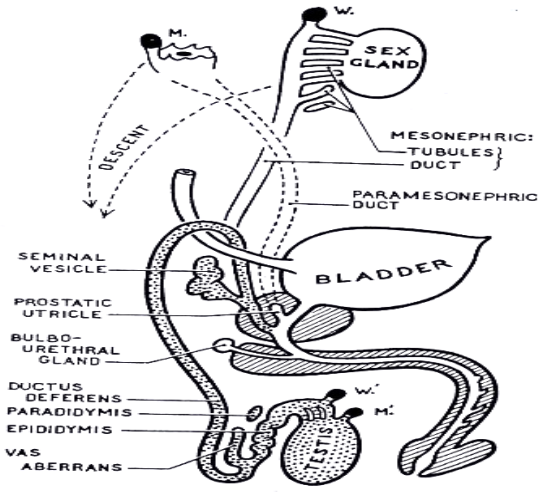


Diagram of the male genital system (side view)

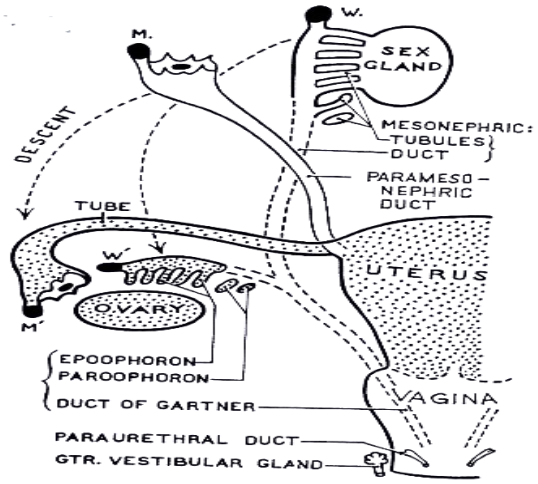


Diagram of the female genital system (front view)

In the upper halves of both figures the parts are shown in their early or indifferent state. Most of the paramesonephric (Mullerian) structures disappear in the male, and of the mesonephric (Wolffian) in the female. (M = Wolffian appendage.)

The Reproductive System (2)

- Embryology (2)
- In the male

- The mesonephric ducts are utilized as genital duct
- And the paramesonephric ducts disappear or remain vestigial

- In the female

-the paramesonephric duct are utilized as genital duct.

-and the mesonephric ducts disappear or remain vestigial

The Reproductive System (3)

- **Embryology .(3)**
- As a result : each sex has :

1- symmetrical pair of reproductive (sexual) glands which produce germ cell ,spermatozoa in male and ova in the female.

2- two different pairs of passages through which , the germ cell ultimately find their way to the exterior of the body.(one being well , developed in each sex , and vestigial in the opposite sex.

3- Accessory glands.

4- external genitals.

The Reproductive system(4)

- Embryology

Developmental Homologs of the Male and Female Genital Systems

Origin	Male	Female
Developing gonad	Testis	Ovary
Mesonephric duct	Duct of the epididymis, vas deferens, seminal vesicle, ejaculatory duct, trigone of the bladder, and part of the prostatic urethra	Ducts of the epoophoron, paroophoron, trigone of the bladder, and part of the urethra
Paramesonephric duct	Prostatic utricle, appendix of the testis	Uterine tubes, uterus
Urogenital sinus	Lower part of the prostatic urethra, membranous urethra, most of the penile urethra, prostate glands, and bulbourethral glands	Vagina and lower part of the urethra, paraurethral glands
Glans of the phallus	Glans of the penis	Glans of the clitoris
Genital (urethral) folds	Floor of the penile urethra	Labia minora
Genital swellings	Scrotum	Labia majora
Gubernaculum	Gubernaculum testis	Round ligament of the ovary, round ligament of the uterus

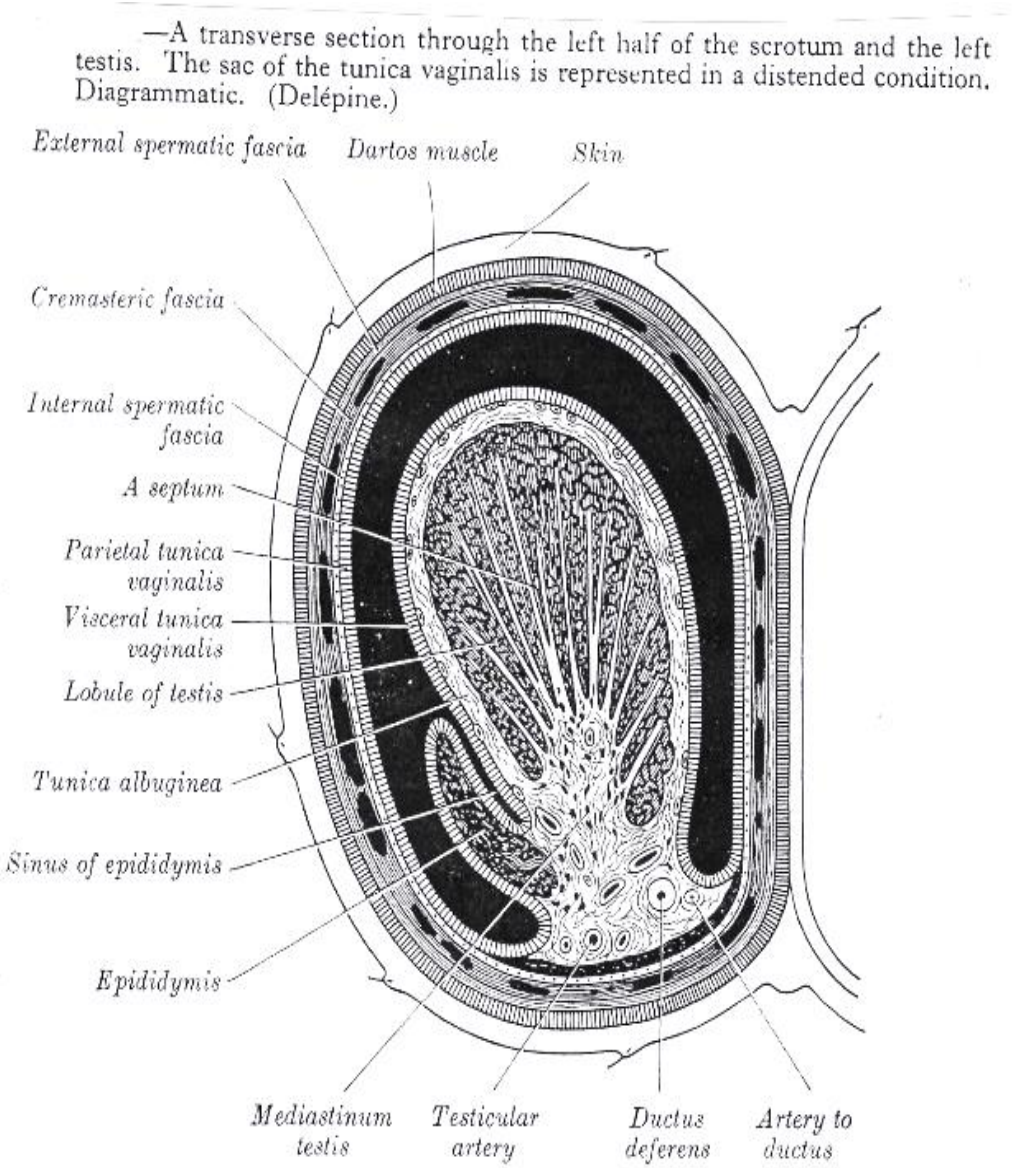
The Male Reproductive System

- **<u>Testis(1):</u>** is the male sex organ responsible for:

1. Production of spermatozoa.
2. Production of testosterone.

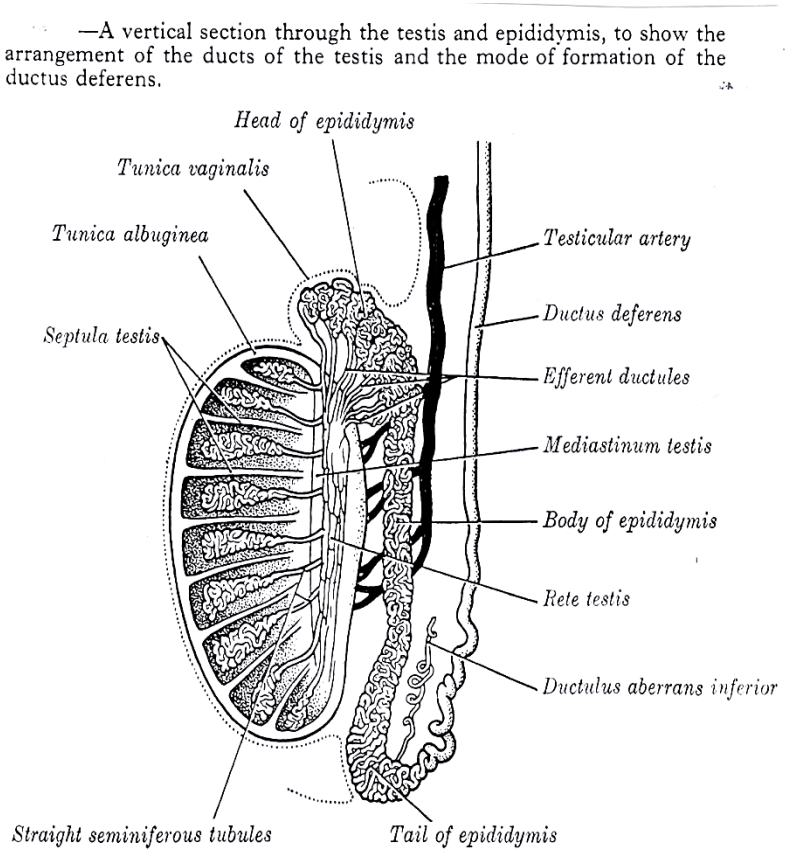
- They are paired ,ovoid , firm, mobile organs ,
- Measuring (3.75 x 2.5 x 1.9 cm)
- Lying in the scrotum
- In the left testis usually lies at the lower level .
- The testis is covered in front and at the side with

a bursa sac called (tunica vaginal) which before birth was continuous with the peritoneal cavity



The Male Reproductive System
the testes(2)

- testis is covered by white inelastic fibrous coat called (tunica albuginea)
- It sends septae to the interior of the testis , to divide it into lobules.
- Within each lobule are to three coiled delicates , thread-like (seminpherous tubules).
- The lining of each tubule produces enormous number of (spermatozoa)
- The tubule open into a network of channels in the posterior part of the testis called (rete testis)
- Small efferent ductules connect the rete testis to the upper part (head) of the epididymis.



The Male Reproductive System
the testes(3)

- Spermatogenesis:

can occur only if the temperature of testes is lower that of the abdominal cavity (34°c)

The mechanisms keeping the tempreture at (34°c) :

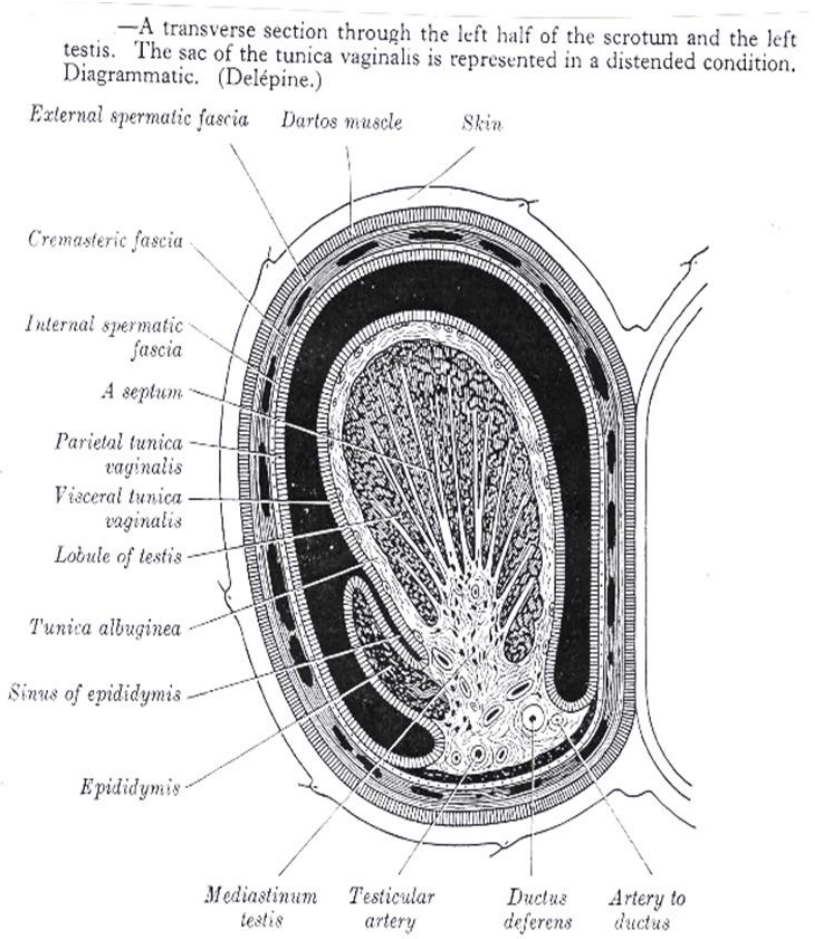
1. Counter - current heat exchange between the pampaniform venous plexus within the spermatic cord and the testicular artery.
2. changing of the surface area of the scrotal skin reflexly by contraction or relaxation of the (dartos)muscle in the scrotum and (cremasteric) muscle in the spermatic cord
3. Evaporation of sweat from scrotal skin also helps in cooling

The Male Reproductive System
The scrotum

- A paired sac that holds the testes and epididymis

<u>Layers of the scrotal wall:</u>

1. The skin.
2. Superficial fascia , in what dartos muscle (smooth muscle)replaces the fatty layer.
3. External spermstic fascia (from the external oblique muscle) of the abdominal wall.
4. Cremasteric fascia (from the internal oblique muscle) of abdominal wall.
5. Internal spermatic fascia (from the transversals fascia) of abdominal wall.
6. Tunica vaginalis (a closed sac that covers the anterior , medial , and lateral surface of each testes).



The Male Reproductive System
the epididymis

- Is a firm structure lying posterior to the testis.
- The vas deference is on its medial side.

<u>Parts of the epididymis:</u>

1. The head :is the expanding upper end.
2. The body.
3. A pointed tail.

- It is a coiled tube measuring (6 m)long embedded in connective tissue.
- The vas deference emerges from its tail.

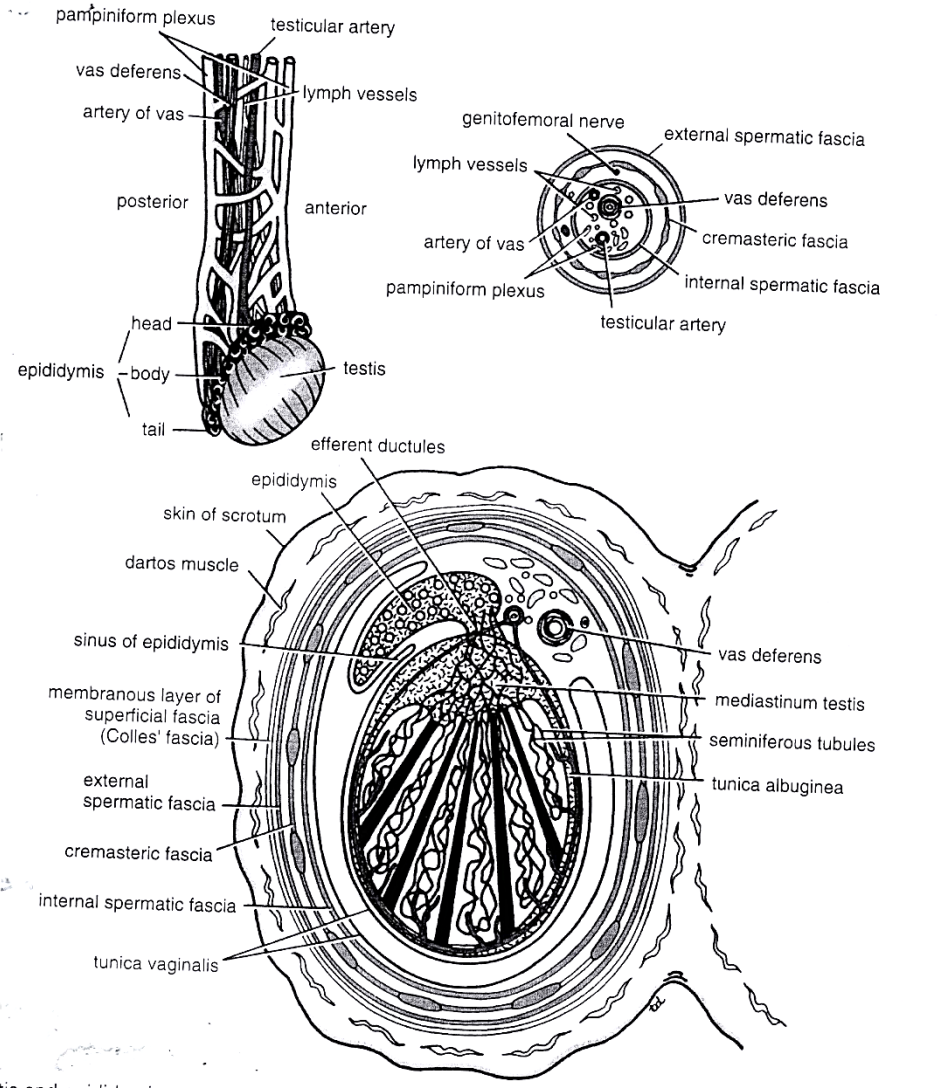
<u>Functions of epididymis:</u>

1.Provides storage space for spermatozoa.

2.Allows for maturation of spermatozoa.

3. Absorption of fluids (main function).

4.Nutrition for maturation of spermatozoa.



Testis and epididymis, spermatic cord, and scrotum. Also shown are the testis and epididymis cut across in horizontal section.

The Male Reproductive System
testes and epididymis

Arterial blood supply

Testicular artery , a branch of abdominal aorta.

Venous drainage :

To pampaniform venous plexus which is then reduced to a single vein:

1.Right testicular vein: drains into the inferior vena cava.

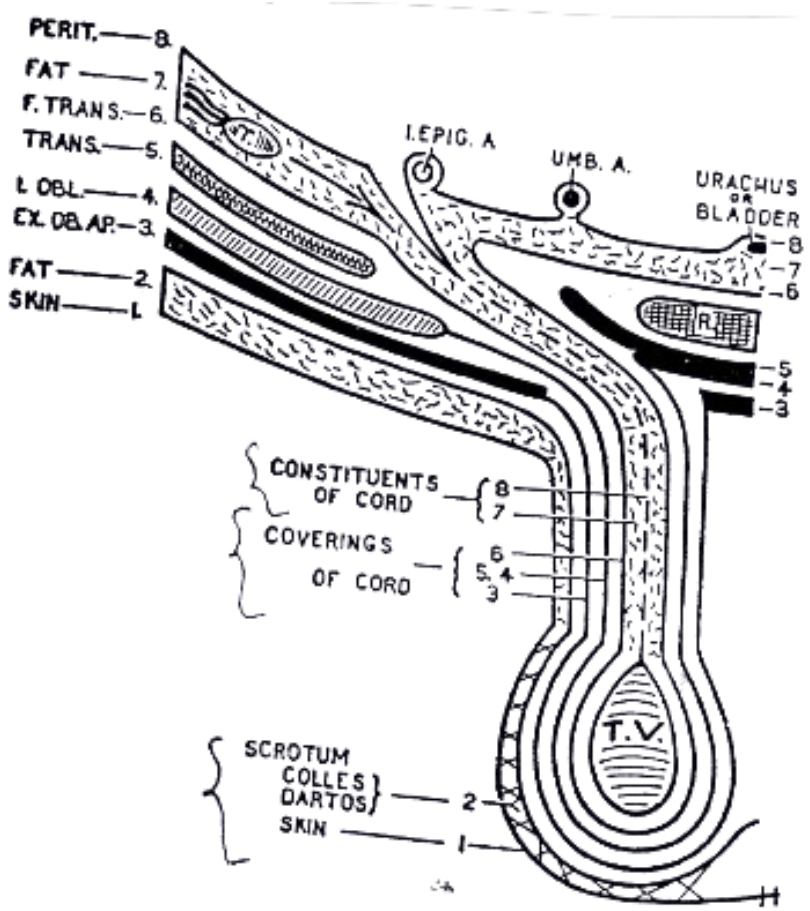
2.Left testicular vein: drains into the left renal vein.

Lymphatic drainage:

Lymphatic vessels ascend in the spermatic cord → end in lumber para- aortic lymph nodes at the level of first lumbar vertebra

The Male Reproductive System
the spermatic cord

- Is a collection of structures that pass through the inguinal canal to and from the testis.
- Begins at the deep inguinal ring , and ends at the testis.



Structures of the spermatic cord:

1.Vas deferens.

2.Testicular artery.

3.Testicular vein (and pampanform venous plexus).

4.Testcular lymphatic vessels

5.Autonomic nerves.

6.Remains of processes vaginalis.

7.Genital branch of the genitofemoral nerve (which supplies the cremasteric muscle)

Covering of the spermatic cord:

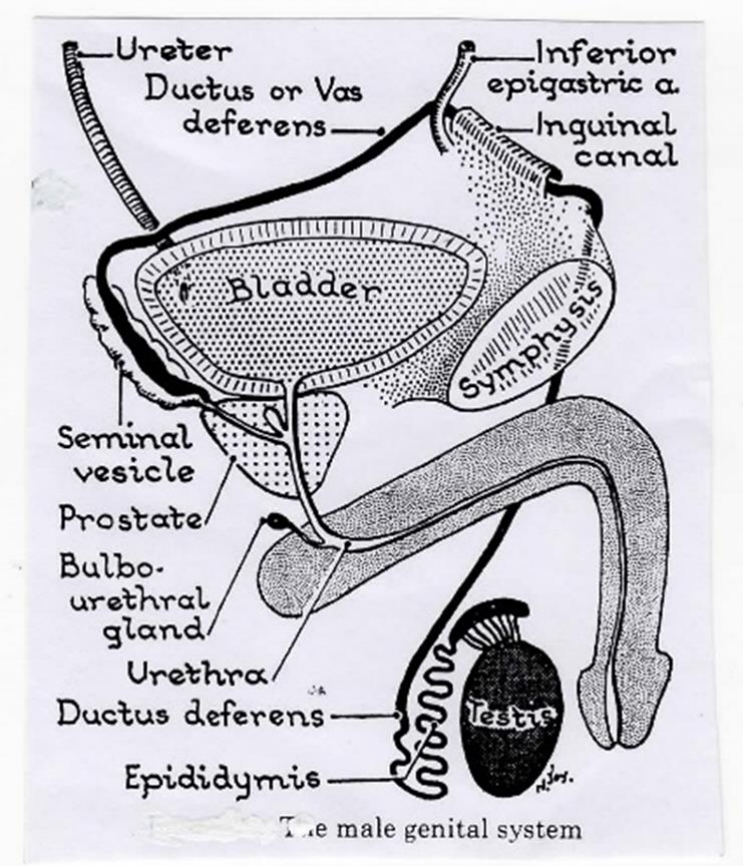
1.External spermatic fascia.

2.Cremasteric fascia.

3.Internal spermatic fascia.

The Male Reproductive System
the vas (ductus) deferens

- Is a thick – wall tube about (45 cm) long.
- Conveys mature sperms form the epididymis to the ejaculatory duct , and urethra.
- Arises from the lower end (or tail) of the epididymis
- Pass through the inguinal canal → emerges from the deep inguinal ring.
- Passes downward and backward on the lateral wall of the pelvis.
- Crosses the ureter in the region of the ischial spine.
- It runs medially and downward on the posterior surface of the bladder.
- The terminal part is dilated to form the (ampulla of the vas deferens)
- The interior end of the ampulla narrows down and join the duct of the seminal vesicle to form the (ejaculatory duct).

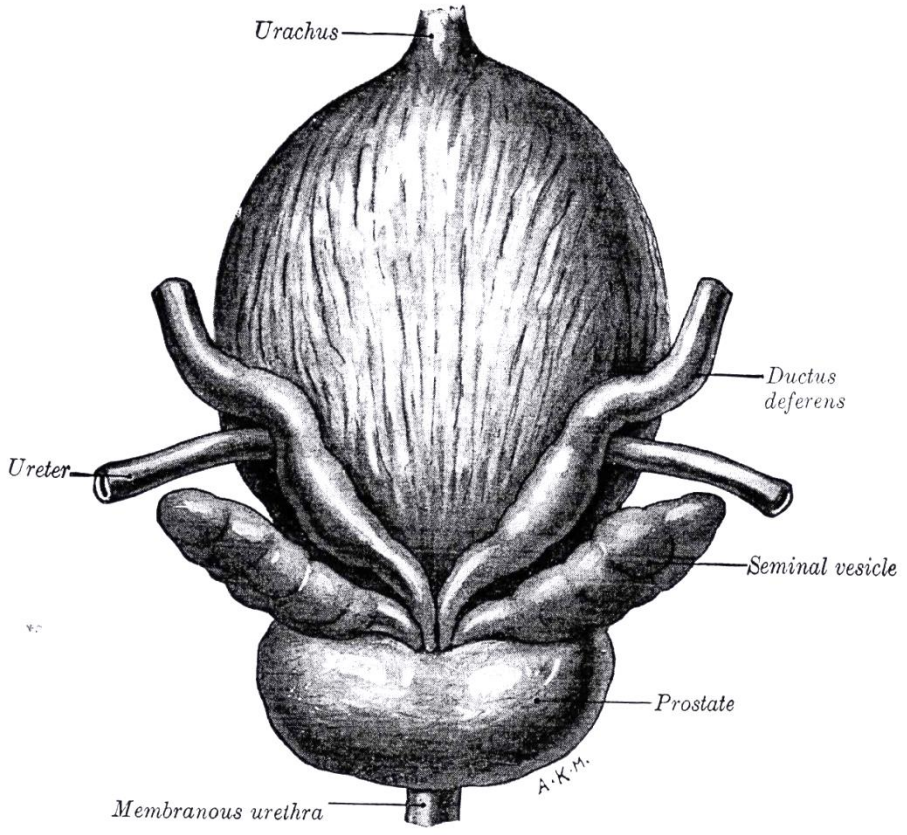


The male genital system

The Male Reproductive System
the seminal vesicles

- Tow lobulated organs.
- About (5 cm) long.
- Consists of coiled tubules embedded in connective tissue.
- Lying on the posterior wall of the bladder.
- The terminal parts of both of vas deference lie on the medial side of each vesicle.
- Posteriorly they are related to the rectum.

FIG. 1242.—The bladder, seminal vesicles, etc. Viewed from above and behind.



The Male Reproductive System

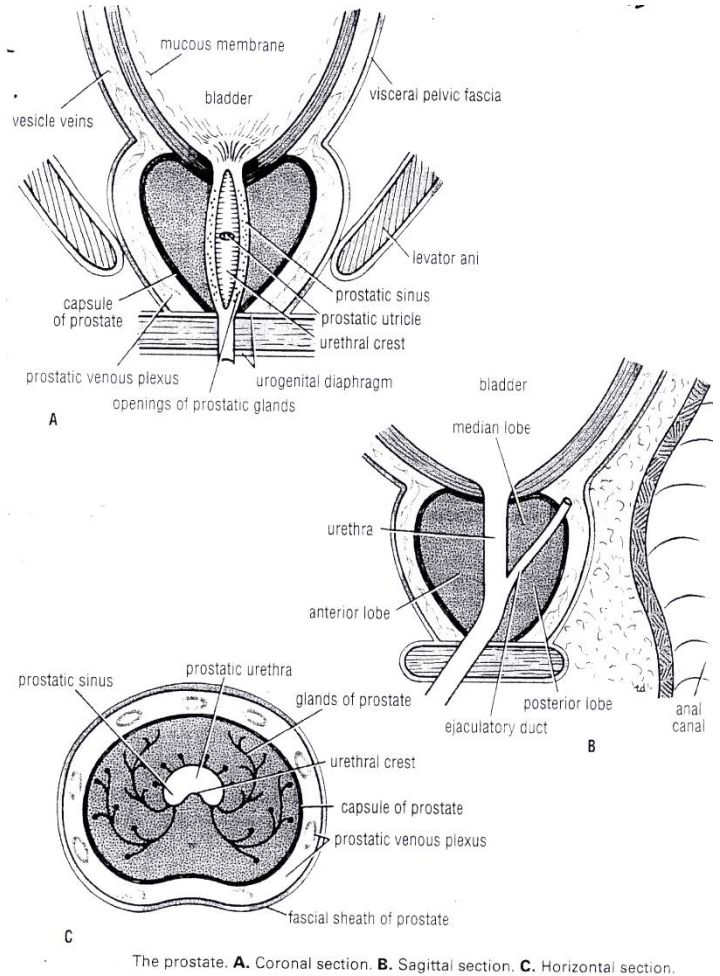
the ejaculatory ducts

- The two ejaculatory duct are each (2.5cm) long.
- Are formed by union of vas deference and the duct of seminal vesicle.
- They pierce the posterior surface of the prostate.
- And open into the prostatic urethra ,close to the margins of the prostatic utricle
- To drain the seminal fluid into the prostatic urethra.

The Male Reproductive System
the prostate (1)

- Is a fibromuscular glandular organ.
- It is about (3 cm) long.
- Lies between the neck of the bladder above and the urogenital diaphragm below.
- It is surrounded by a fibrous capsule.
- It is surrounding the prostatic urethra.
- The prostate is some what conical, Base above , apex below.
- The two ejaculatory ducts pierce the upper part of the posterior surface.

They open in the prostatic urethra.



The prostate. **A.** Coronal section. **B.** Sagittal section. **C.** Horizontal section.

The Male Reproductive System

the prostate (2)

- Relation of the prostate
- Superiorly :the neck of the bladder.
- the urethra enter the center of the base of the prostate.
- Inferiorly :the apex lies on the upper surface of the urogenital diaphragm.
- The urethra leaves prostate just above the apex on the anterior surface.
- Anteriorly: symphysis pubis.
- The prostate is connected to the posterior aspect of the pubis by pub prostatic ligament.
- Posteriorly: anterior surface of the rectum.
- Separated from it by the rectovesical septum.
- Laterally on both side: the prostate is embraced by anterior fiber of the levator ani muscle.

The Male Reproductive System

the prostate (3)

- **Structure**
- Numerous glands embedded in a mixture of muscle and connective tissue.
- Their ducts open into the prostatic urethra.

Lobes of the prostate (5 lobes)

1.Anterior lobe: in front of urethra devoid of glands.

2.Median (middle) lobe: is a wedge between the urethra and ejaculatory ducts.

- Rich in glands.

3.Posterior lobe: behind the urethra ,below the ejaculatory ducts.

-contain glands.

4 , 5: right and left lateral lobes: on either sides of the urethra.

-contains many glands.

The Male Reproductive System

the prostate (4)

- Functions of the prostate:
- Produce thin milky fluid, that is added to the seminal fluid at the time of ejaculation.
- The smooth muscles surrounding the glands squeeze the secretion into the prostatic urethra.
- The prostatic secretion is alkaline and helps neutralize the acidity of the vagina .

The Male Reproductive System

the prostate (5)

- Arterial blood supply:

1.Branches from the interior vesical artery.

2.Branches from middle rectal artery.

- Venous drainage:

Prostatic venous plexus which lies outside the capsule of the prostate , drain into the internal iliac vein.

Lymphatic drainage:

Internal iliac lymph nodes.

Nerve supply

From inferior hypogastric plexus.

Sympathetic nerves, stimulate smooth muscle during ejaculation.

The Male Reproductive System

the prostatic urethra

- About (3 cm) .
- Begins at the neck of the bladder.
- Passes through the prostate from the apex.
- Then becomes continues with the membranous urethra.
- This part is (urogenital):shared between urinary and genital tract).
- It is the widest and most dilatable part of the entire urethra.

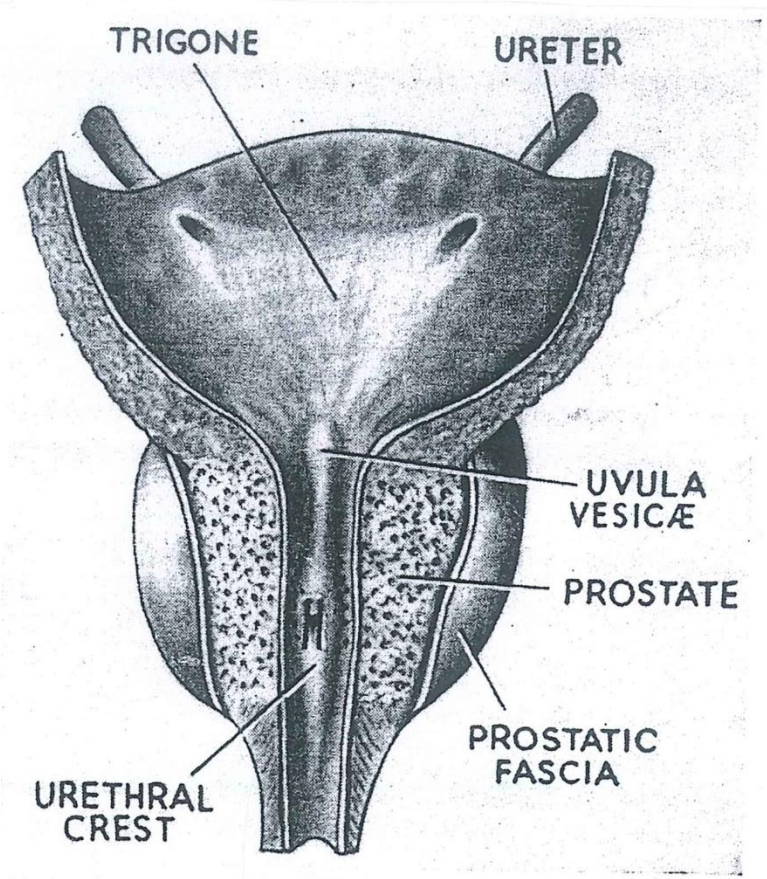
Structure on the posterior wall of the prostatic urethra:

1.Urethral crest: a longitudinal ridge.

2.Prostatic sinus: grooves on both sides of the crest , they are sites where prostatic glands open.

3.Prostatic utricle: a depression on the summit of the crest (analog of uterus and vagina in the female)

4.Openings of the two ejaculatory ducts: are on the edge of the utricle



THE PROSTATIC URETHRA OPENED FROM IN FRONT. A bristle lies in each ejaculatory duct; the utriculus masculinus lies between them. Drawn from a specimen.

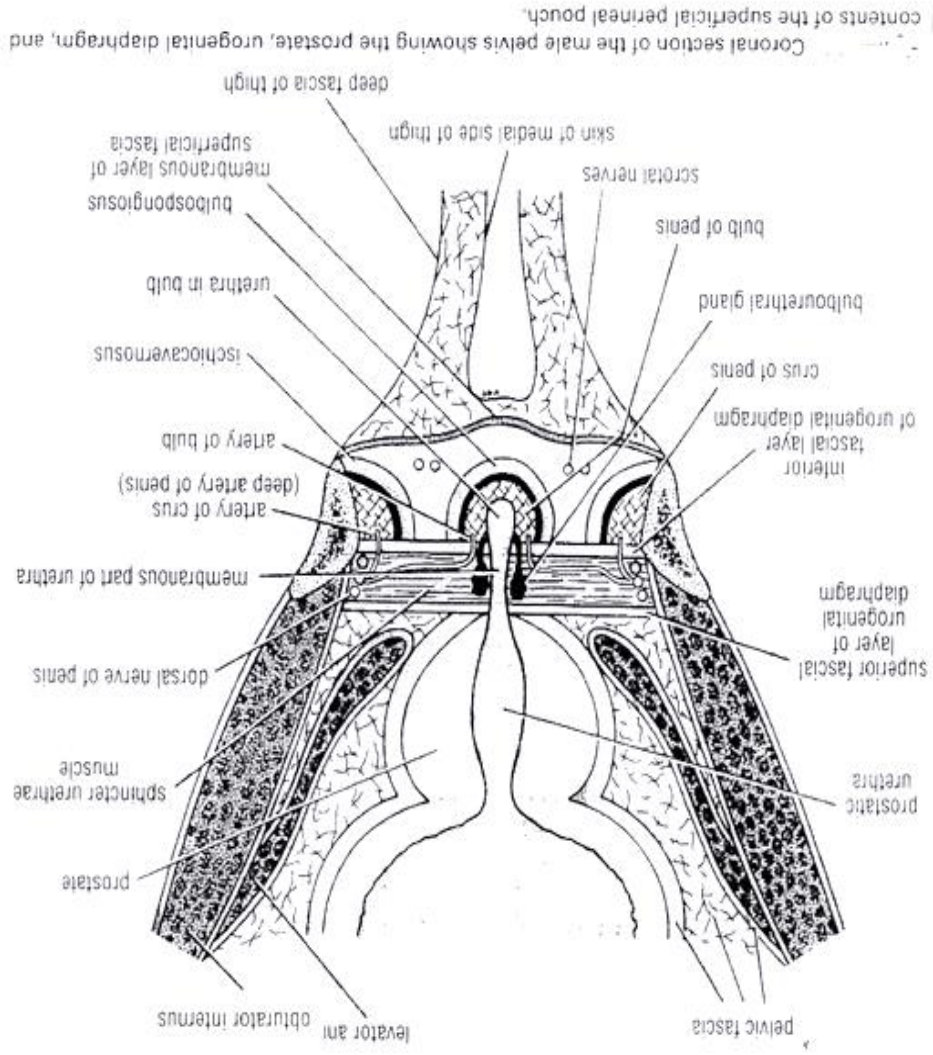
The Male Reproductive System

the bulbourethral glands.

- Two small glands.
- Lie beneath the sphincter urethra , muscle.
- Their ducts pierce the perineal membrane.

  (interior fascial layer of the urogenital diaphragm.

- enter the spongy urethra.
- The secretion poured into the urethra as a result of erotic stimulation.



- ***THANKS***