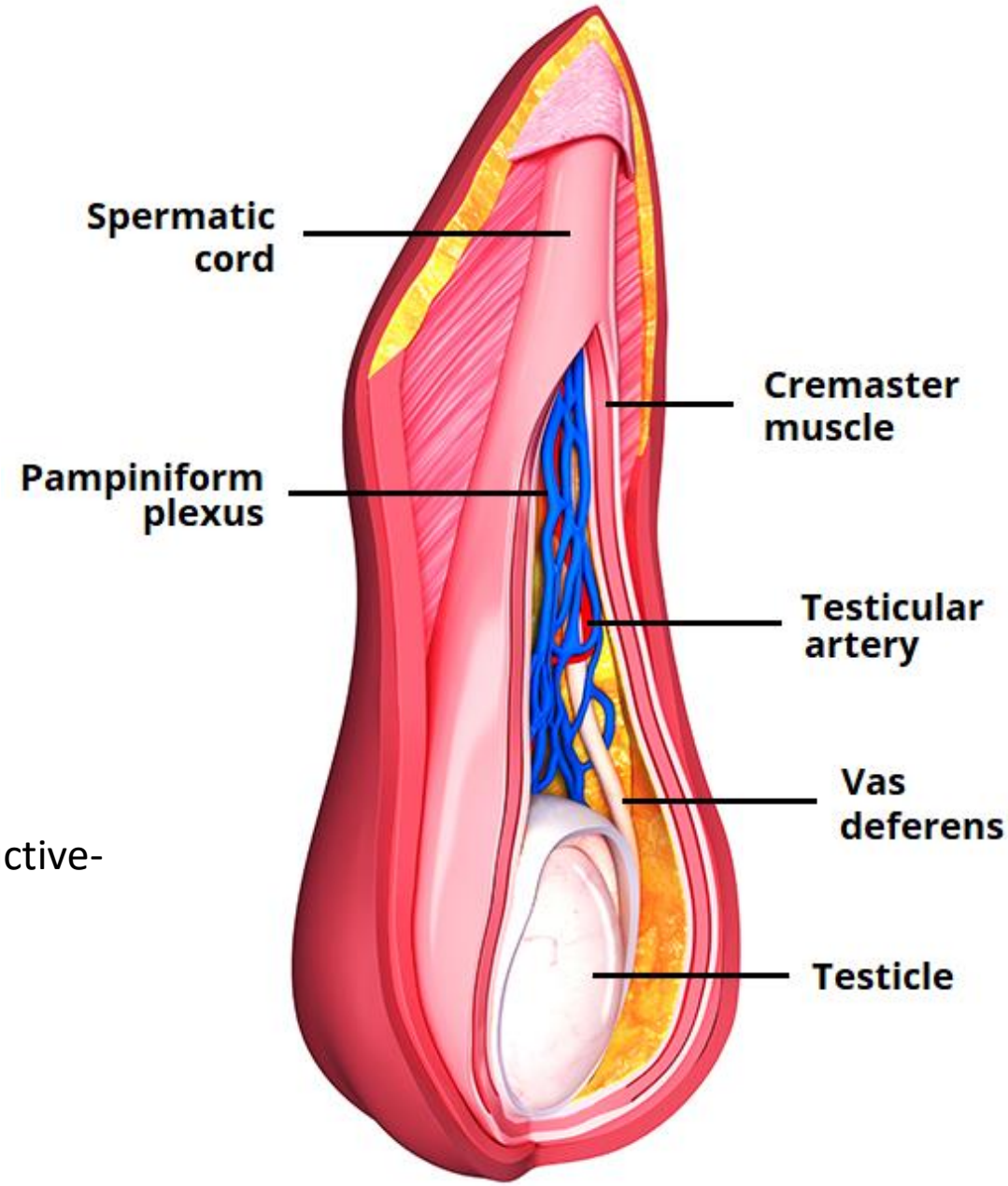
Spermatic cord

- dr. Talib

Jawad

Lecture 3 anatomy

Spermatic cord

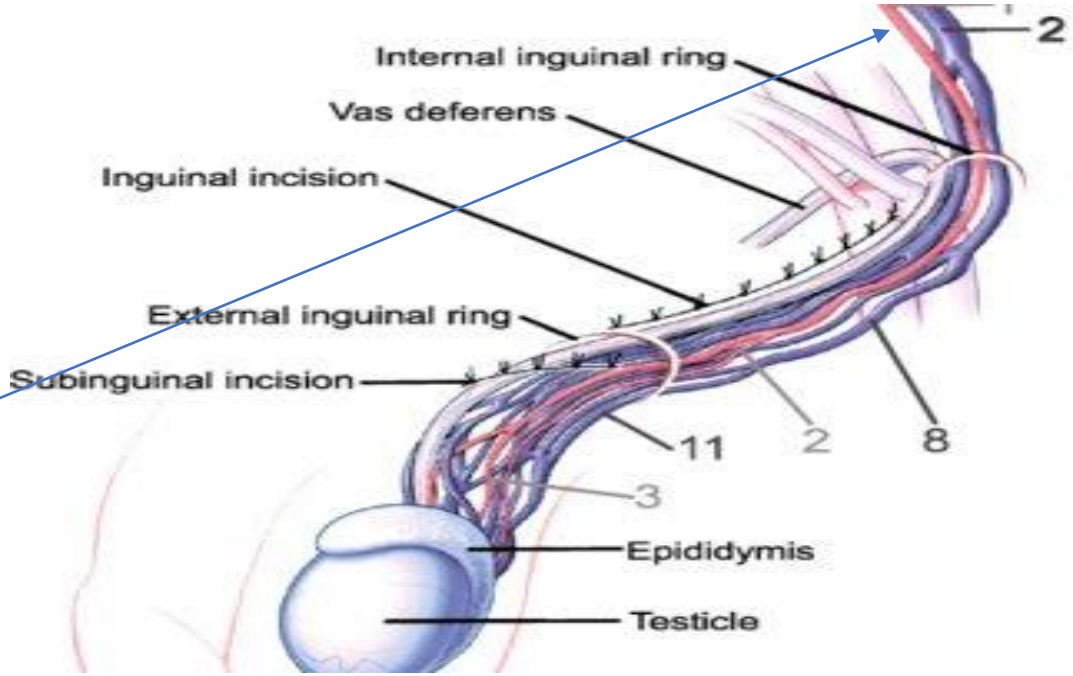


https://teachmeanatomy.info/pelvis/the-male-reproductive-system/spermatic-cord/

spermatic cord

- The **spermatic cord** refers to a collection of vessels, nerves and ducts that run to and from the testes. They are surrounded by fascia, forming a cord-like structure.

- **Contents**
- The spermatic cord conveys several important structures that run to and from the testis.
- **Blood vessels:**
    1. 1- Testicular artery – branch of the aorta that arises just inferiorly to the renal arteries.
    2. Cremasteric artery and vein – supplies the cremasteric fascia and muscle.



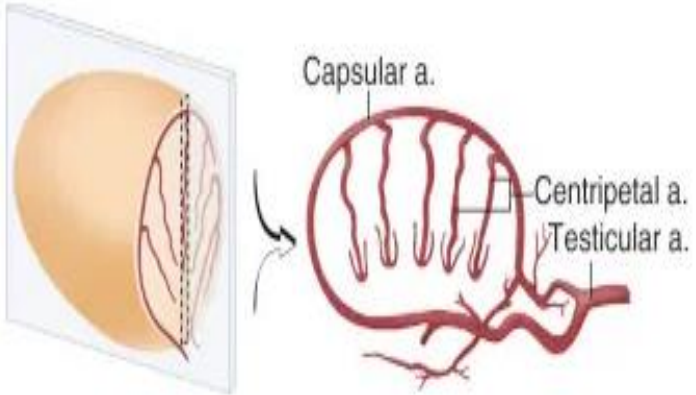
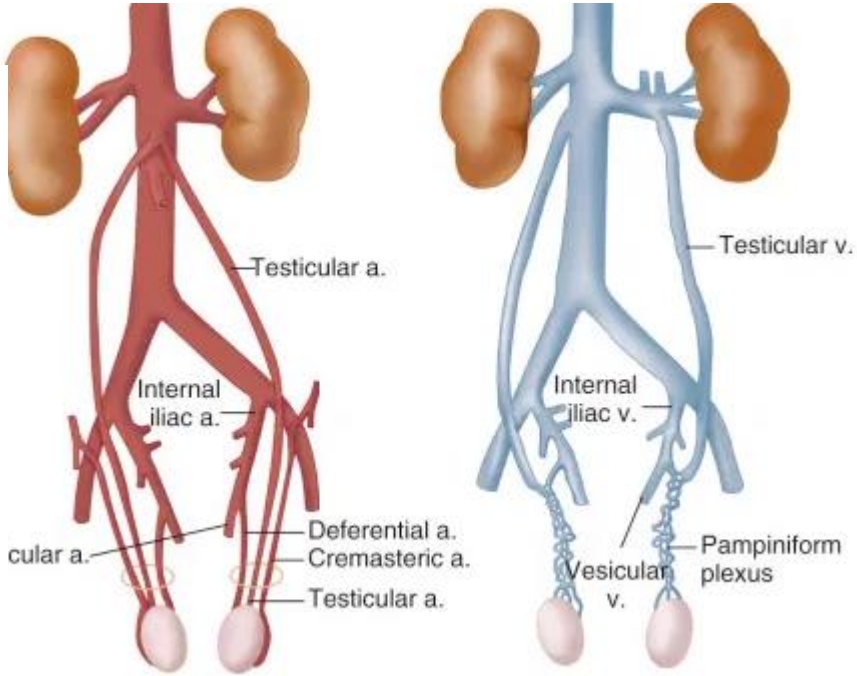
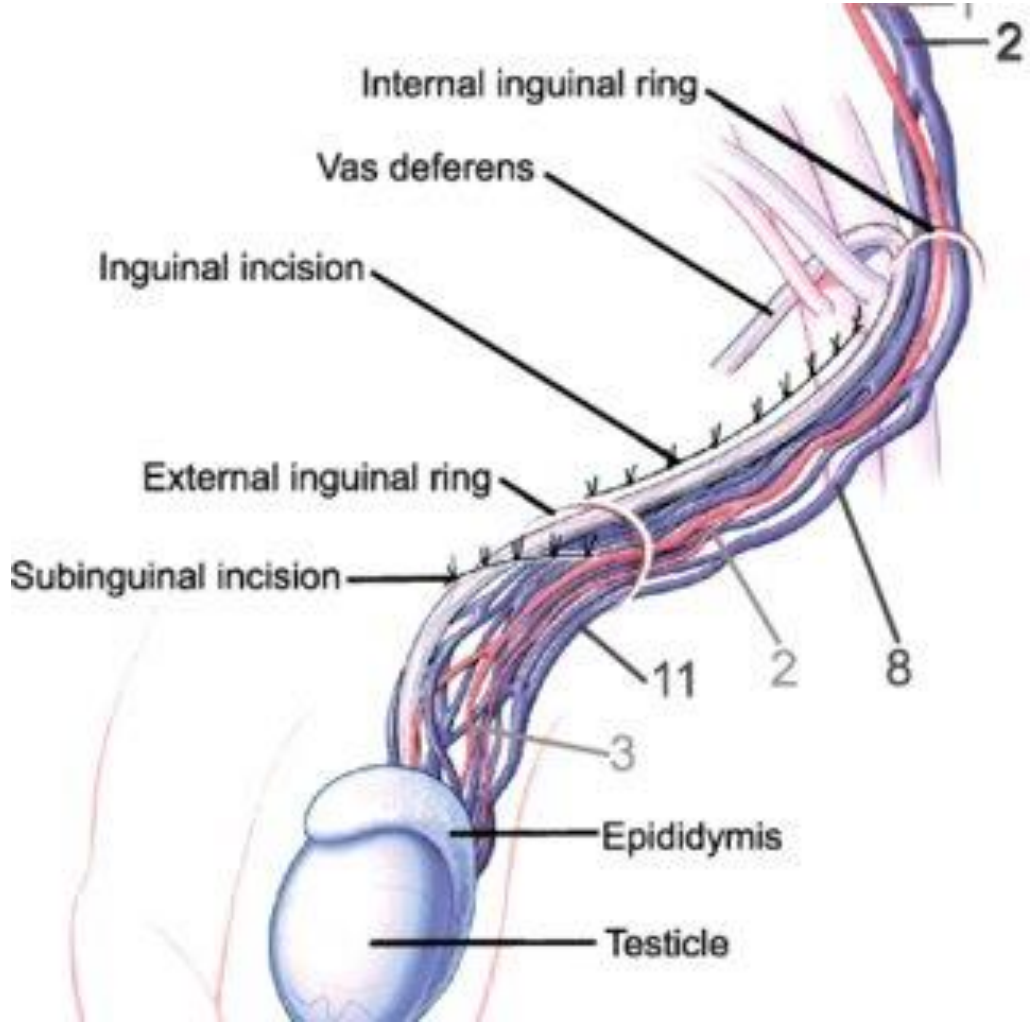


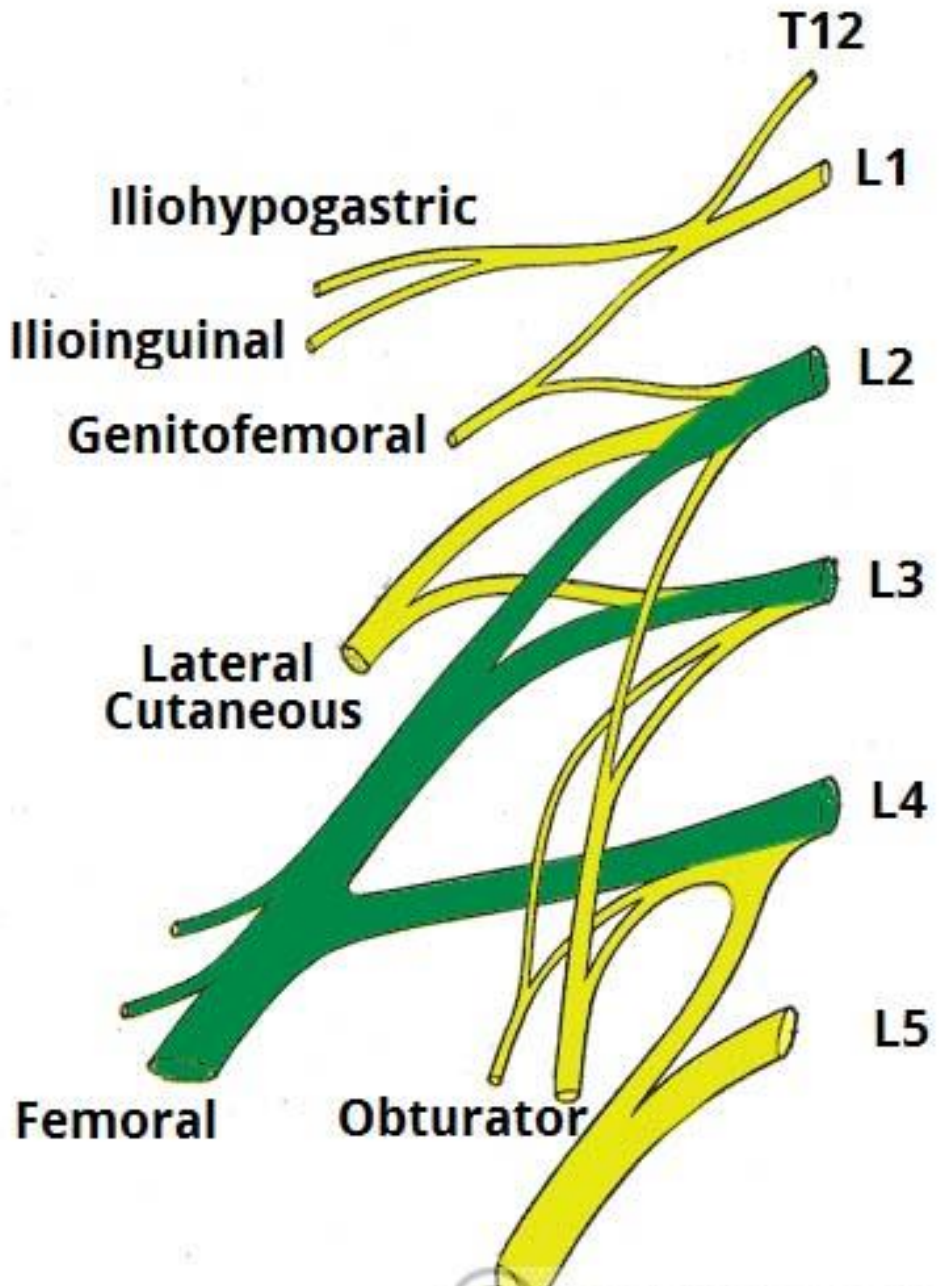
FIG. 30.4

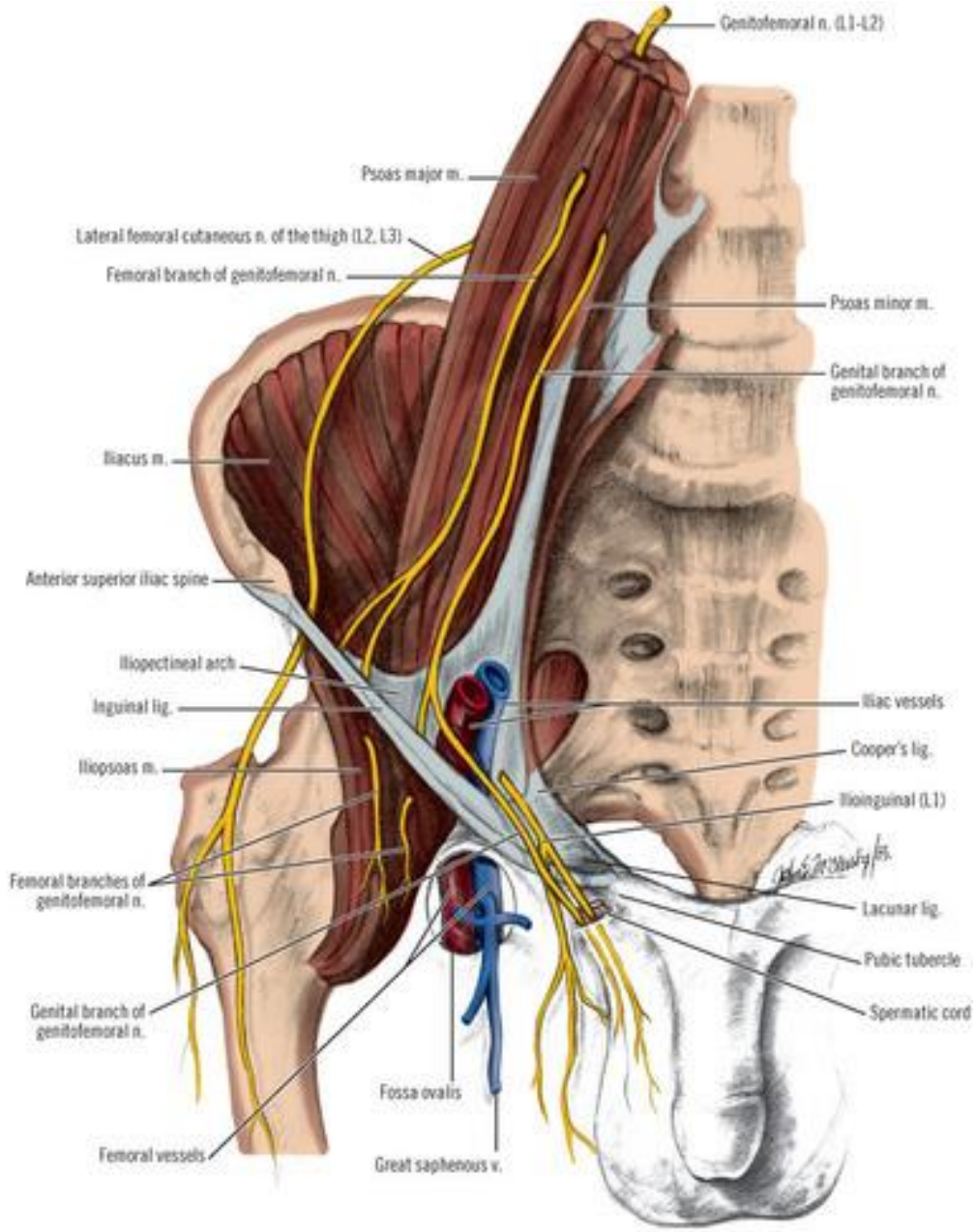


3. 2- Artery to the vas deferens – branch of the inferior vesicle artery, which arises from the internal iliac.
4. 3- Pampiniform plexus of testicular veins – drains venous blood from the testes into the testicular vein.



5. **Nerves:** Genital branch of the genitofemoral nerve – supplies the cremaster muscle.
6. Autonomic nerves





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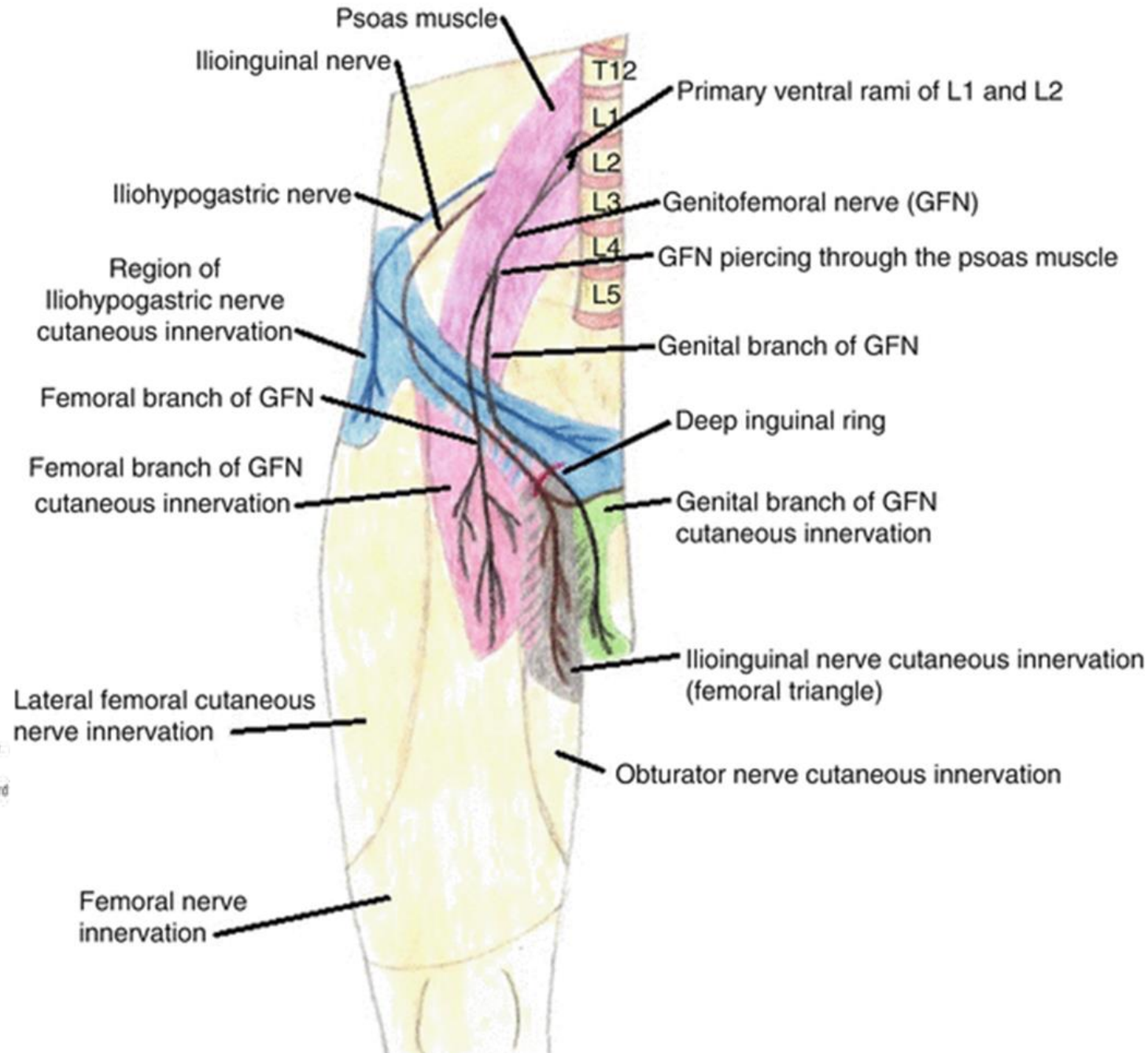
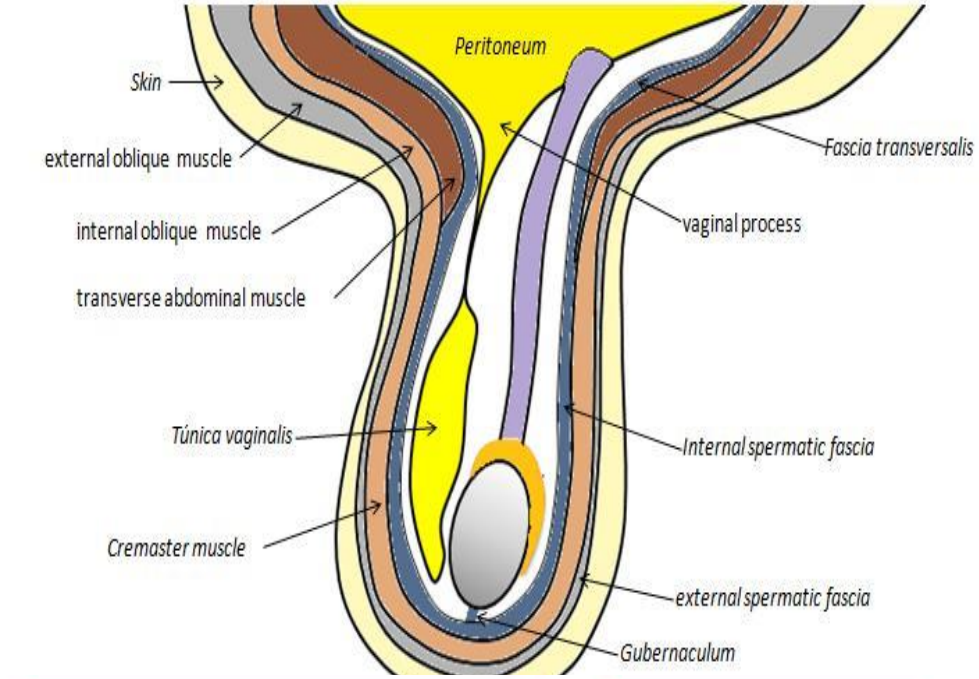
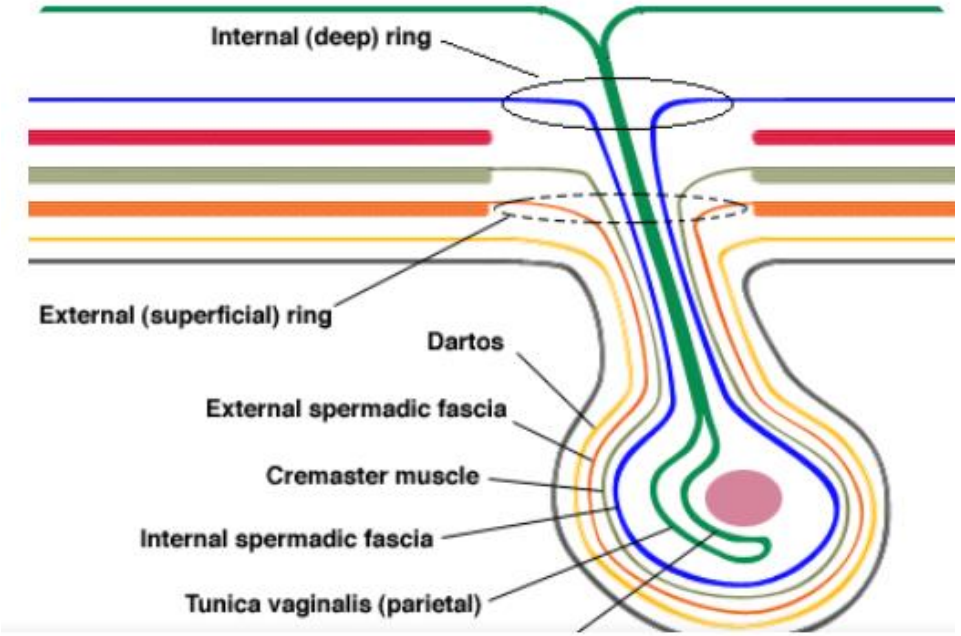
Anatomy and dermatomes of pelvic and lower extremity nerves



Other structures:

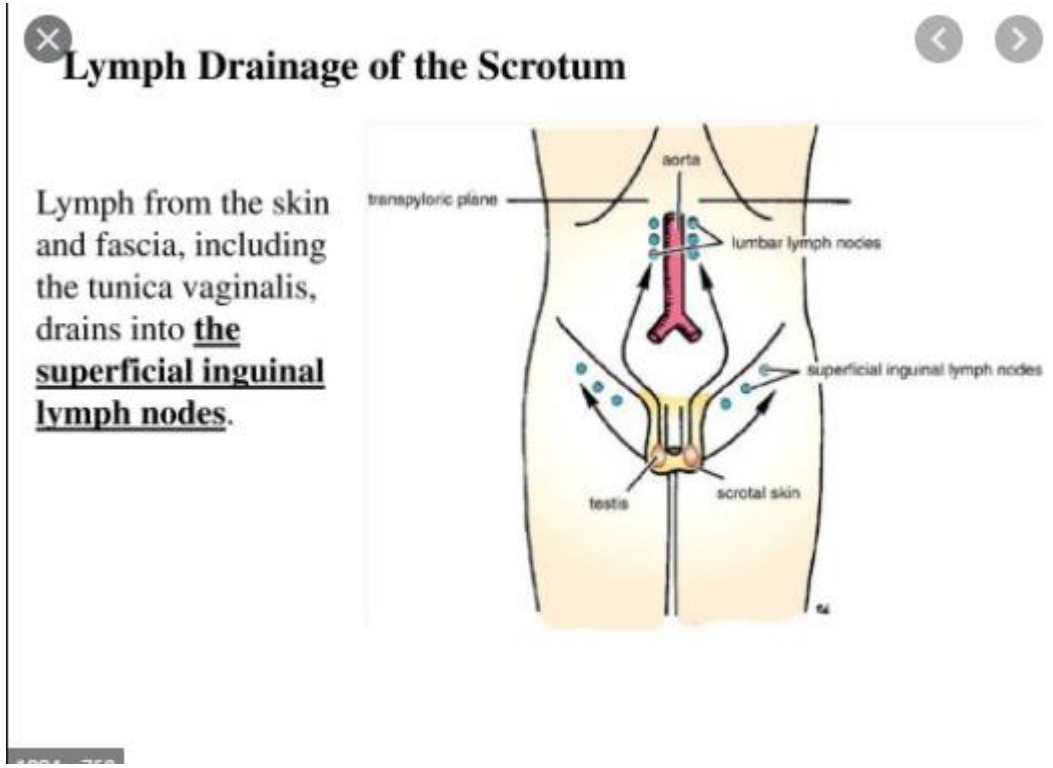
A. Vas deferens – the duct that transports sperm from the epididymis to the ampulla (a dilated terminal part of the duct), ready for ejaculation.
B. Processes vaginalis – projection of peritoneum that forms the pathway of descent for the testes during embryonic development. In the adult, it is fused shut.
C. Lymph vessels – these drain into the para-aortic nodes, located in the lumbar region.





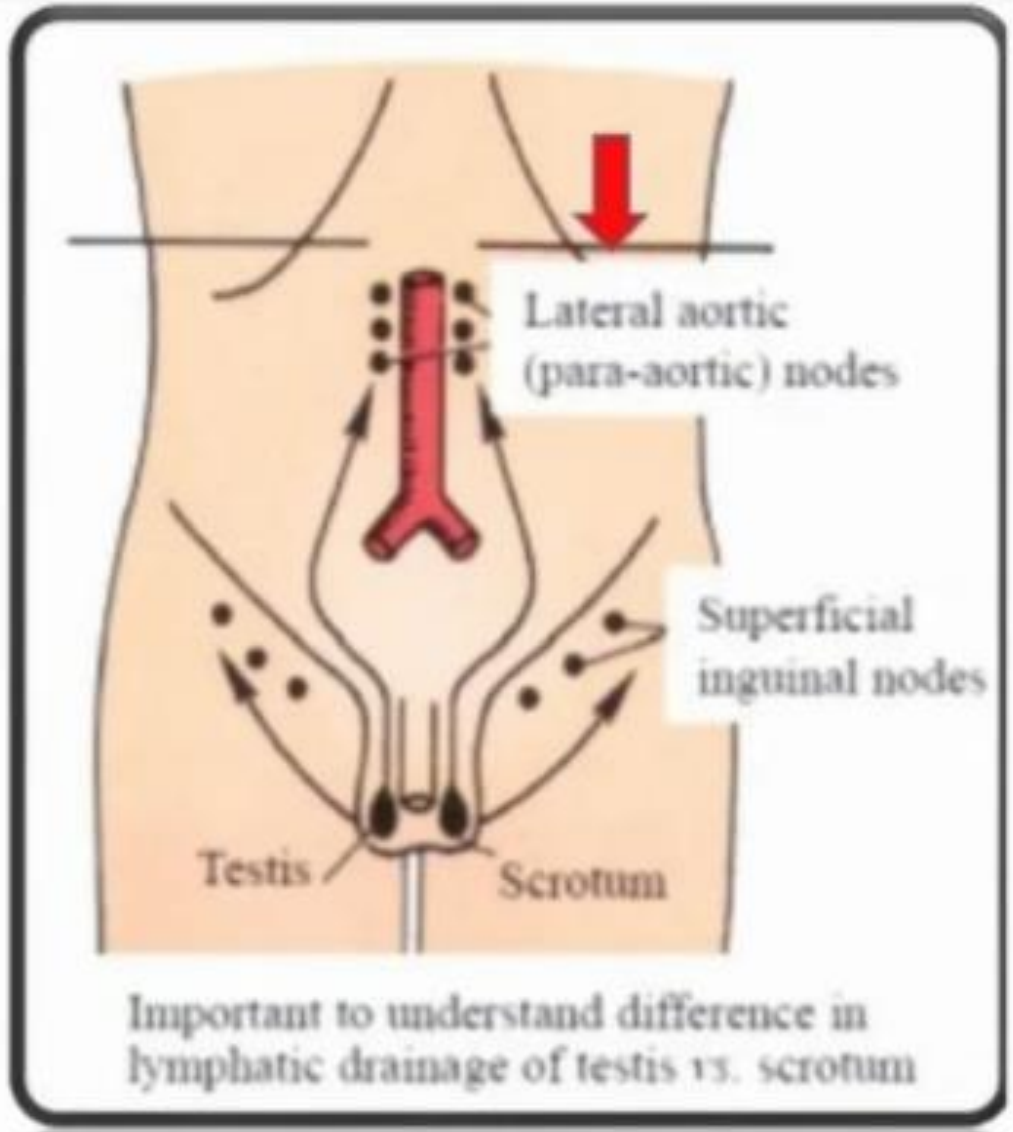
Lymph vessels

- Since the **testes** are originally retroperitoneal organs, the **lymphatic drainage** is to the lumbar and para-aortic nodes, along the lumbar vertebrae.
- This is in contrast to the **scrotum**, which **drains** into the nearby superficial inguinal nodes.



Lymphatics:

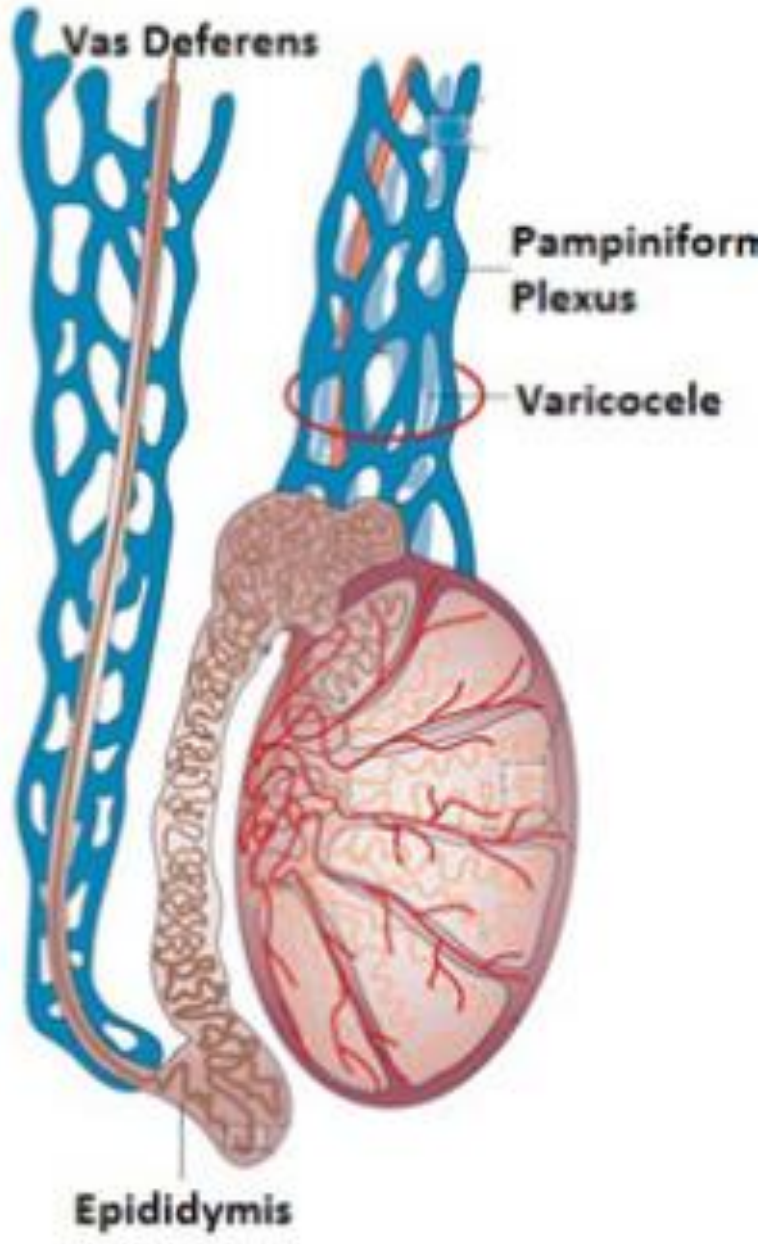
The lymphatics ascend along the testicular vessels and drain into the **preaortic and para aortic** groups of lymph nodes.



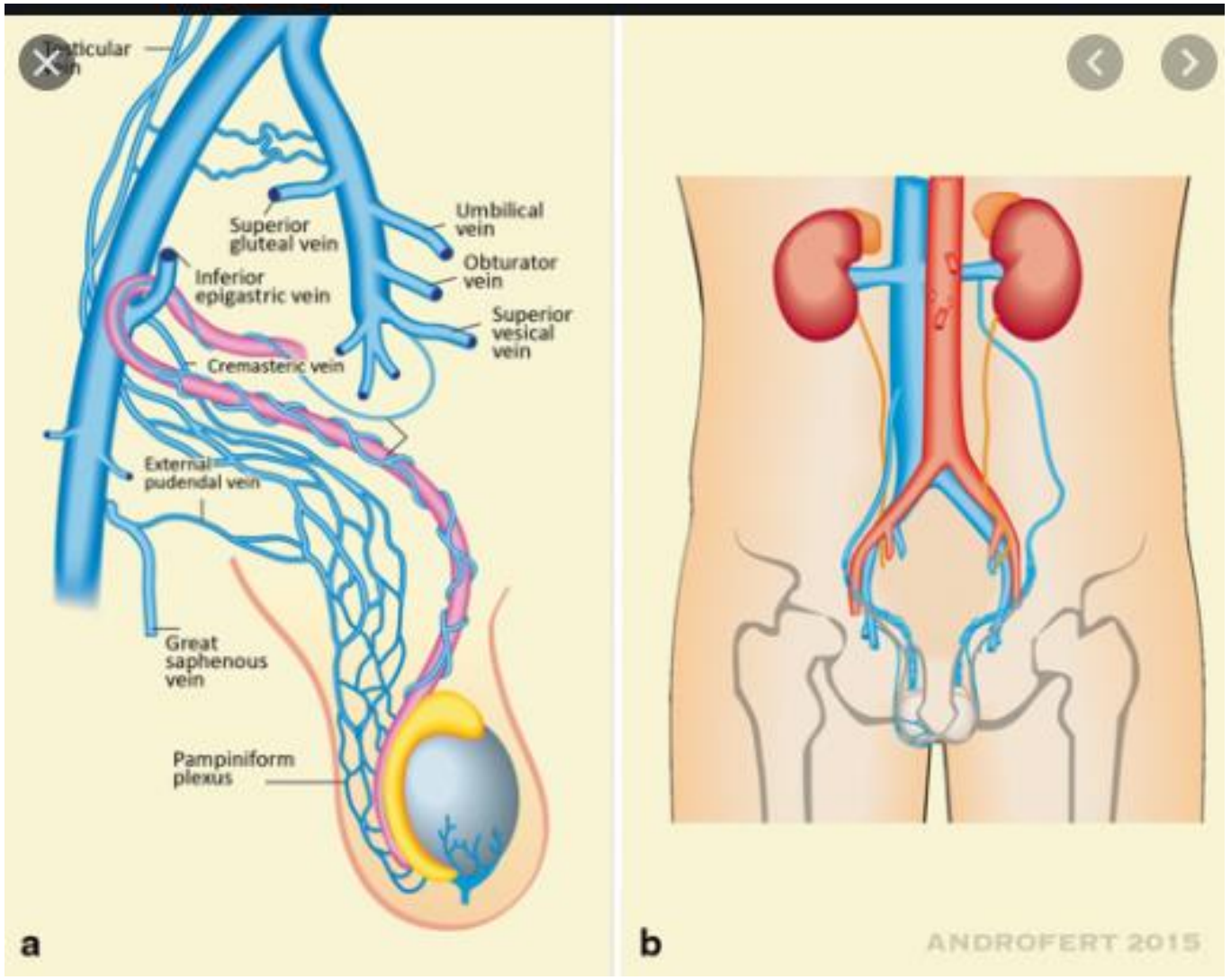
Important to understand difference in lymphatic drainage of testis vs. scrotum

Pampiniform Plexus

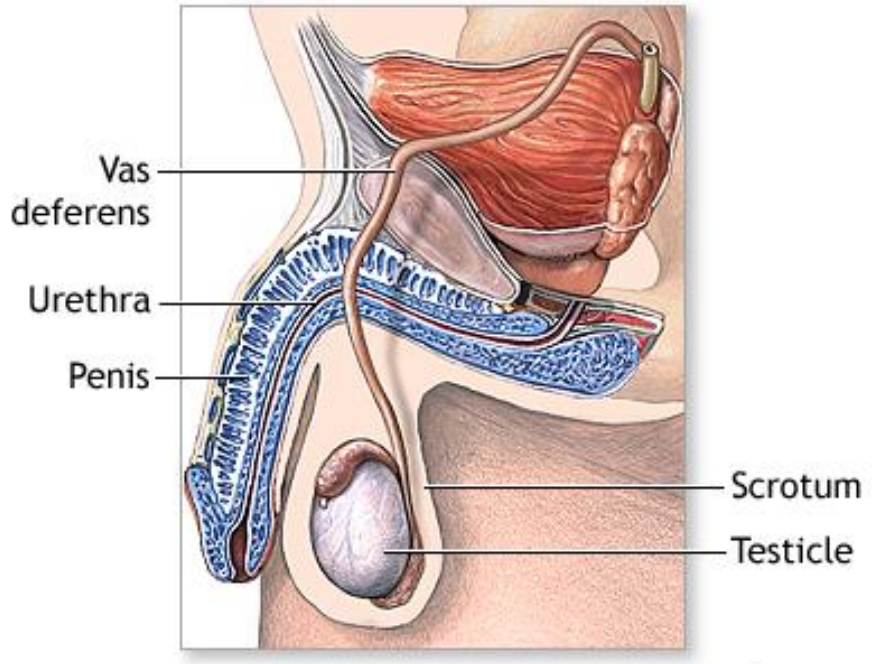
- The pampiniform plexus is a **network** of veins responsible for the venous drainage of the testes. It has a unique configuration, wrapping itself around the **testicular artery**
- The testes function best at a temperature just below that of the body. The pampiniform plexus acts as a **heat exchanger**, cooling the arterial blood before it reaches the testes. As it travels through the inguinal canal, the pampiniform plexus condenses into a single testicular vein.

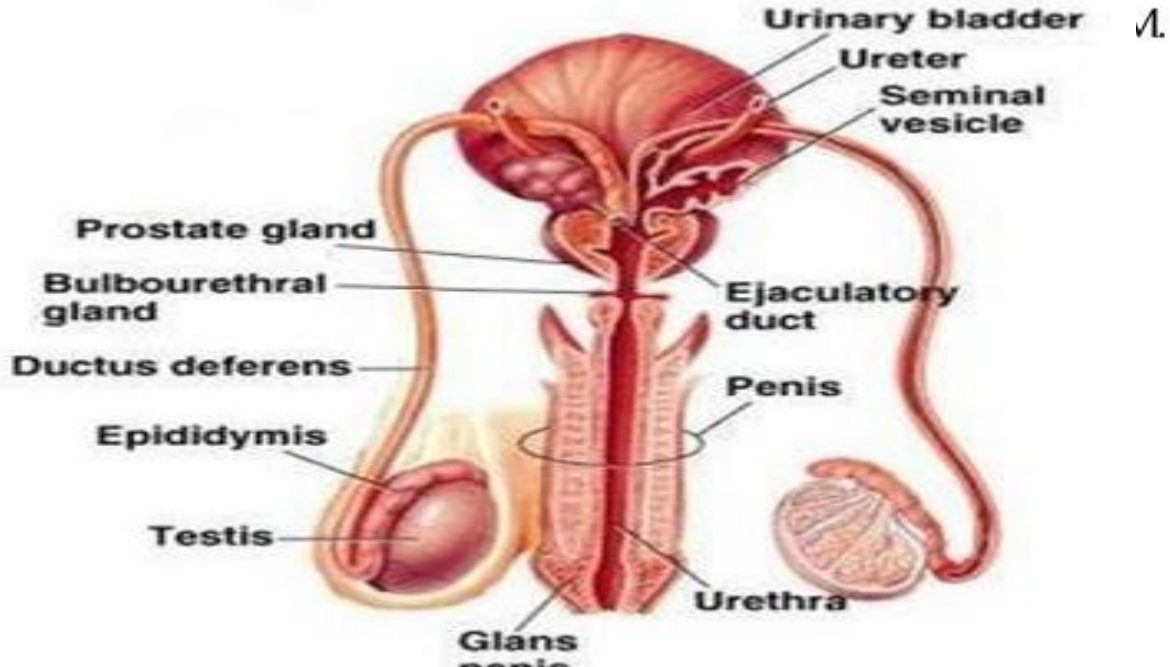


- The right testicular vein drains into the **inferior vena cava** and the left testicular vein drains into the **left renal vein**. However, there are also some anastomotic branches that allow communication with other veins, such as the cremasteric, scrotal and internal pudendal veins.



- **Vas Deferens**
- The vas deferens is a straight, thick muscular tube that conveys sperm from the **epididymis** to the ampulla and eventually, to the ejaculatory duct (formed by the convergence of the vas deferens and seminal vesicle duct). From the ejaculatory duct, sperm can pass through to the prostatic urethra





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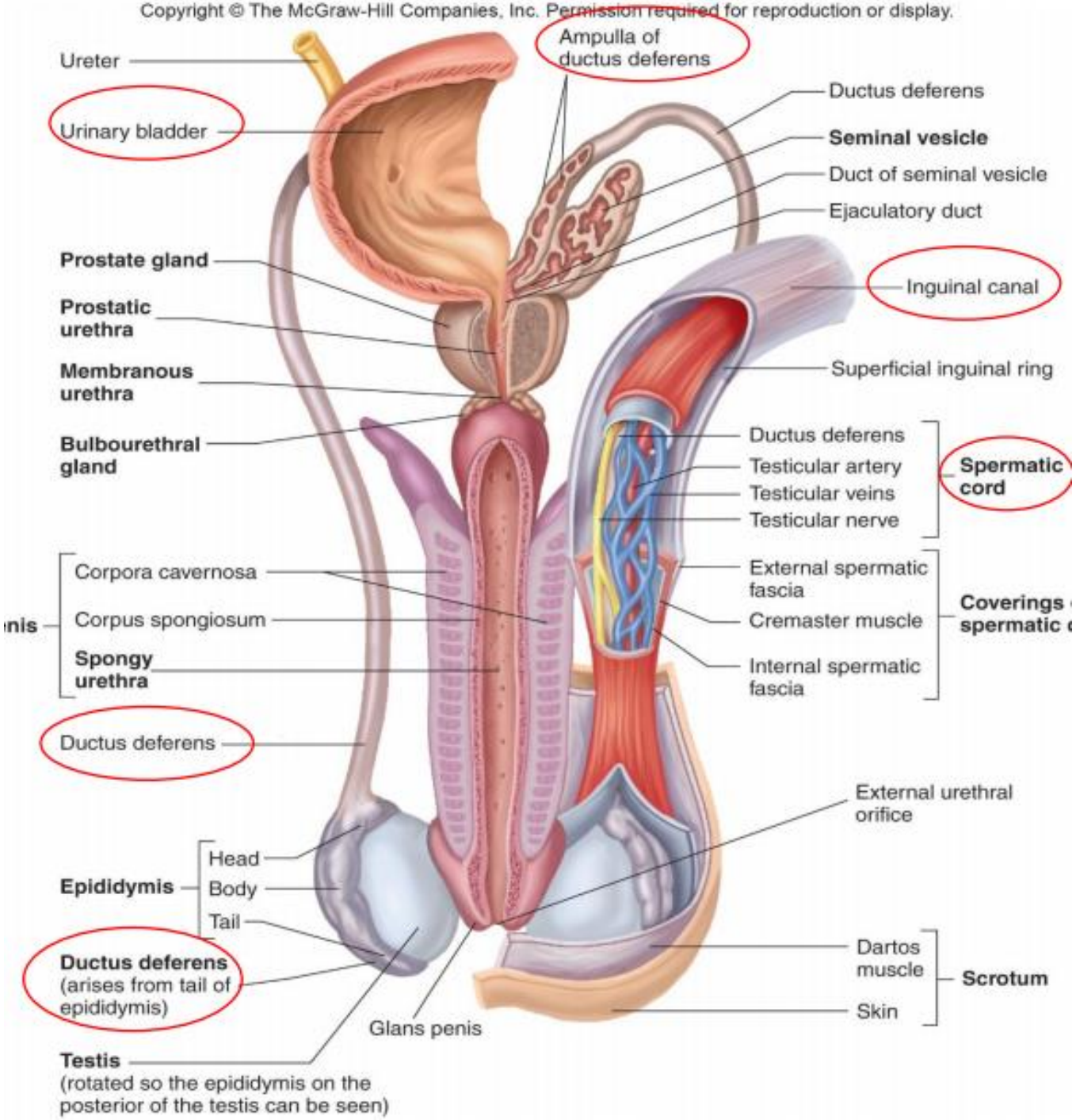
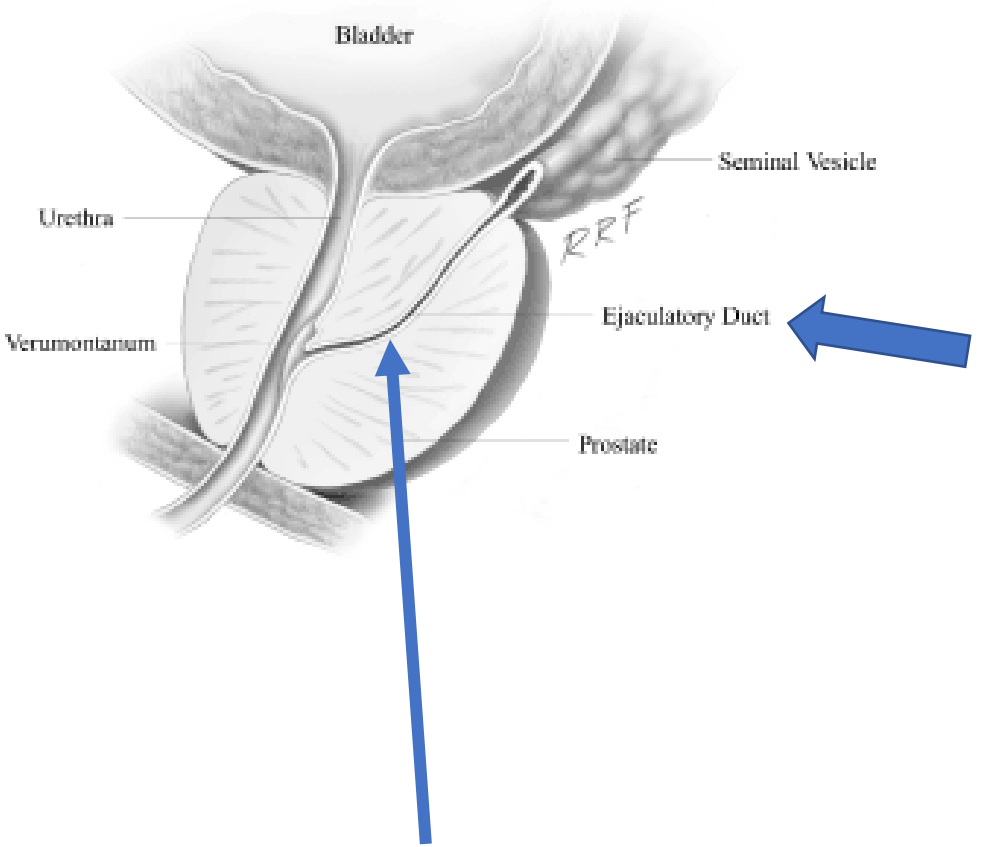


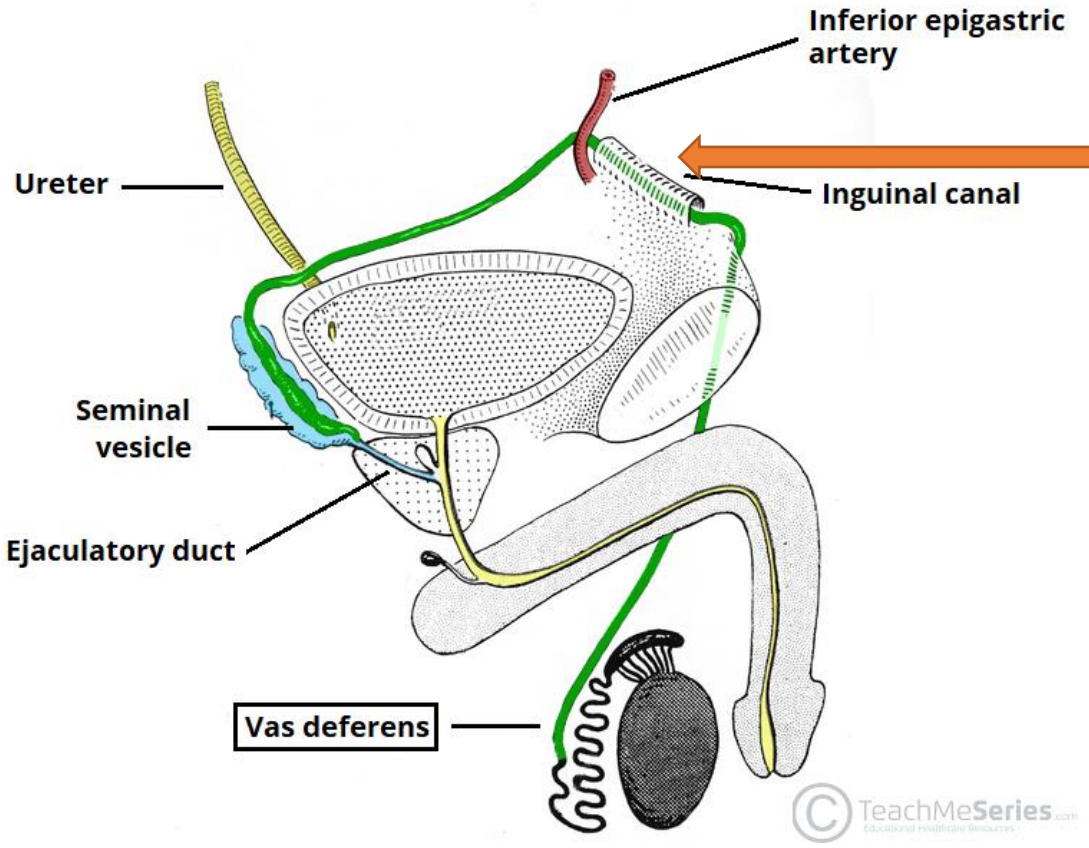


The wall of the vas deferens consists largely of **smooth muscle**, arranged in three muscle layers:

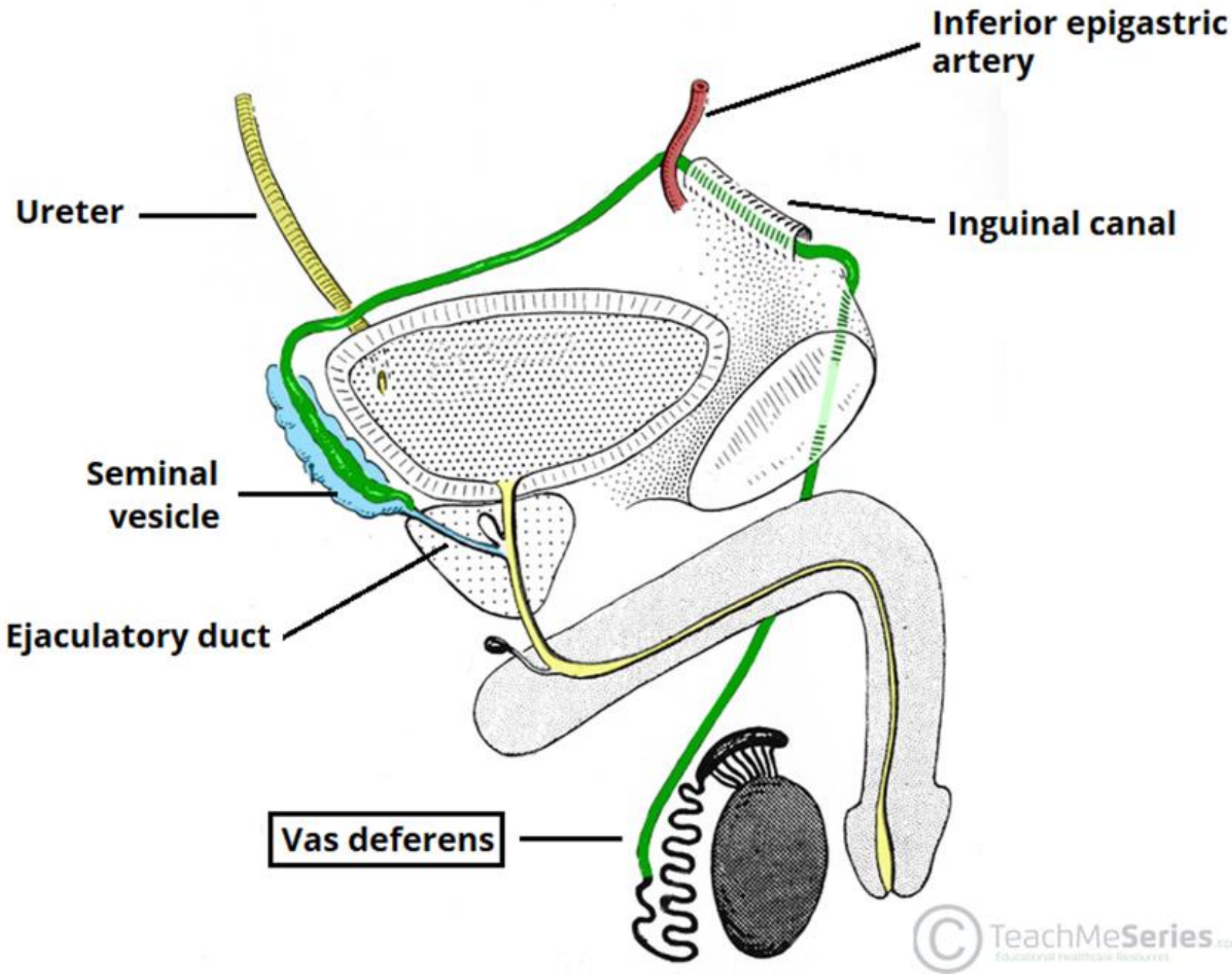
Inner Layer	Intermediate Layer	Outer Layer
•Longitudinal smooth muscle	•Circular smooth muscle	•Longitudinal smooth muscle

There is a rich autonomic innervation of these muscle fibers, which permits fast movement of sperm towards the ejaculatory duct. This movement is also facilitated by the inner mucosal layer of the vas deferens – which is lined by cells that possess microvilli. Their seaweed-like movement helps advance spermatozoa through the spermatic tube.

Anatomical course of the vasdifference



- It is continuous with the **tail of the epididymis.**
- Travels through **the inguinal canal**, as part of the spermatic cord.
- Moves down the lateral pelvic wall close to the **ischial spine.**
- Turns medially to pass between the bladder and the ureter and then travels downward on the posterior surface of the **bladder.**
- The inferior narrow part of the ampulla joins the duct from the seminal vesicle to form the **ejaculatory duct.**
- By TeachMeSeries Ltd (2021)



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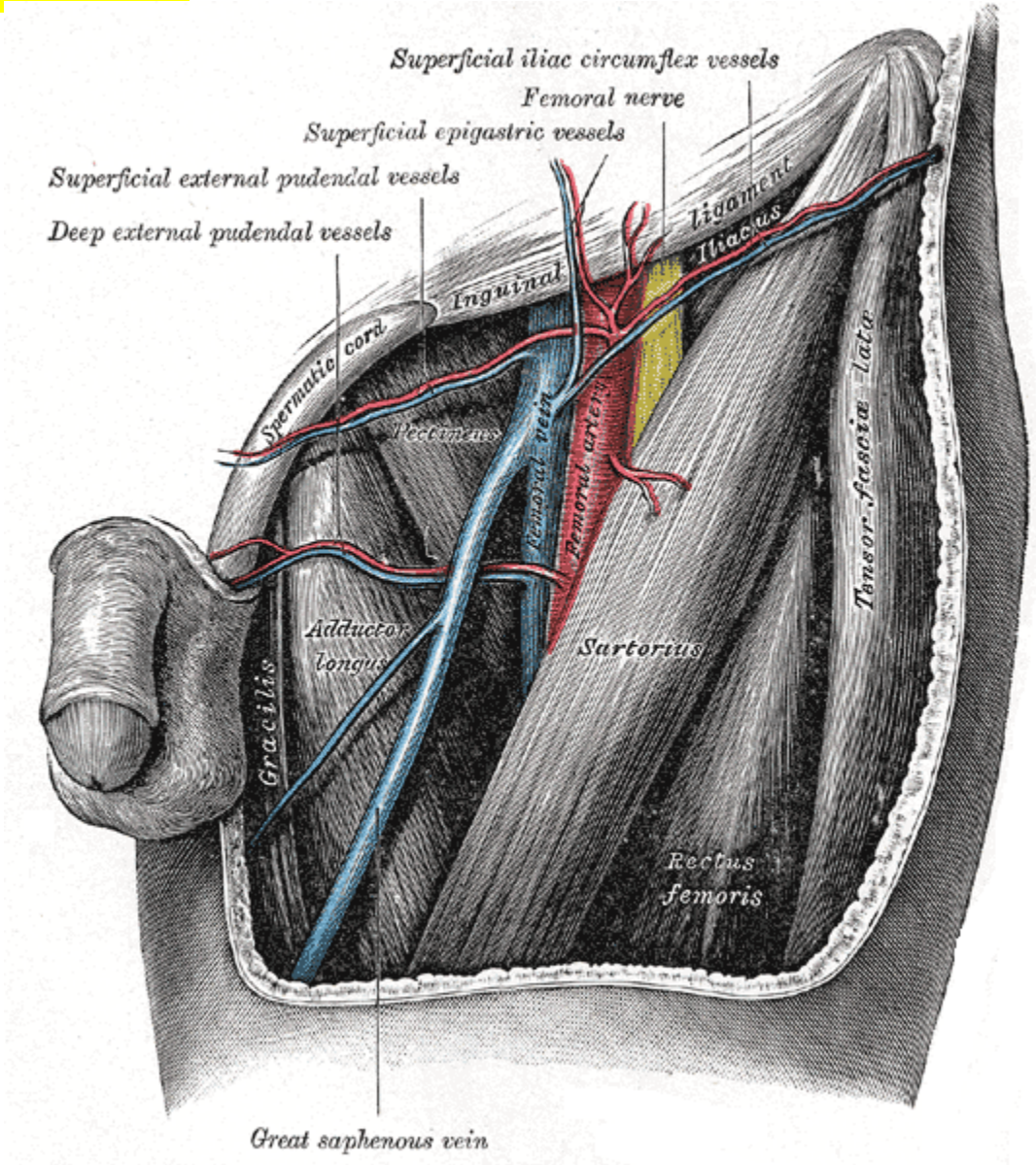
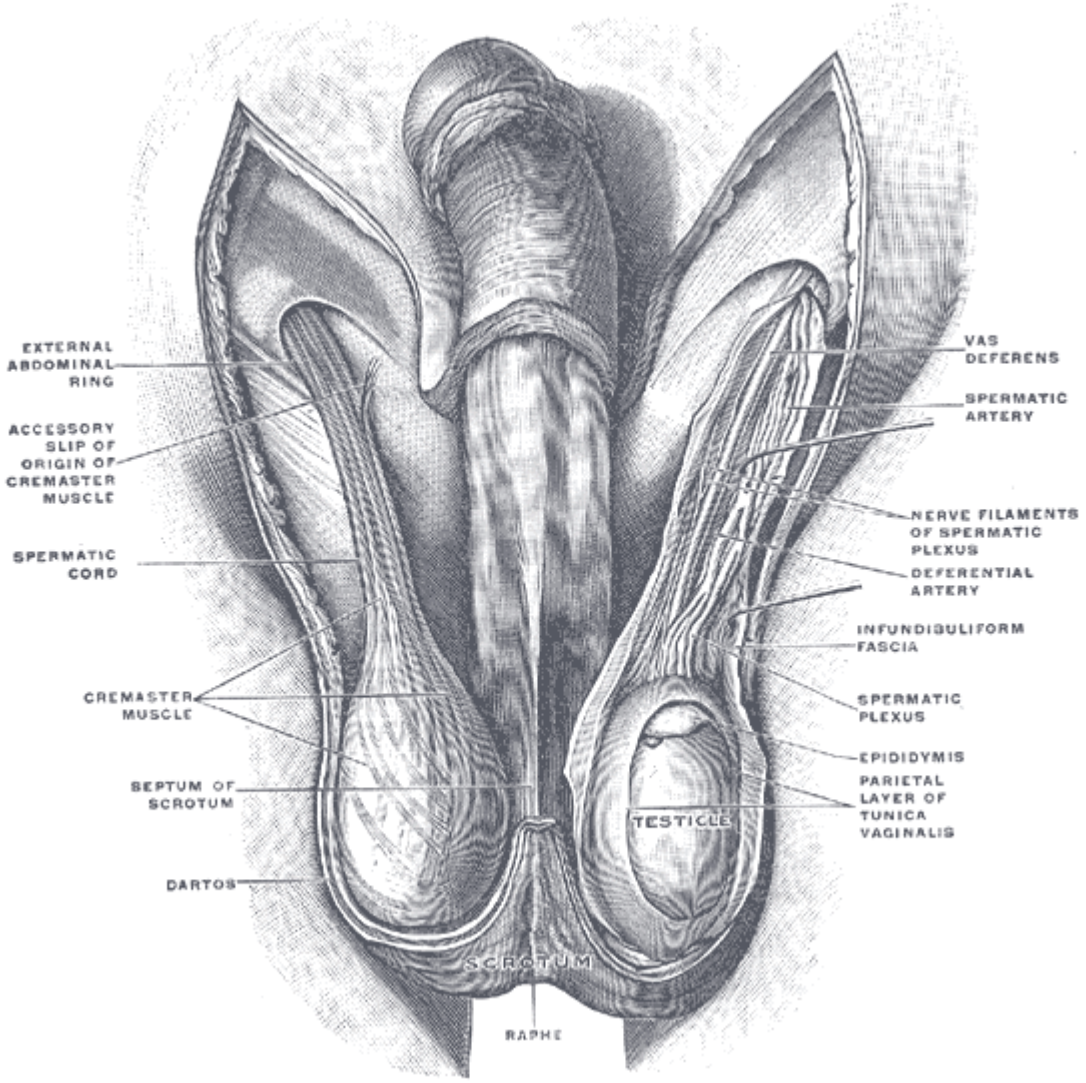
Anatomical Course of the spermatic cord

- The anatomical course of the spermatic cord is relatively short, beginning in the **inferior abdomen** and ending in the **scrotum**.
- The spermatic cord is formed at the opening of the **inguinal canal**, known as the deep inguinal ring. This opening is located laterally to the inferior epigastric vessels.



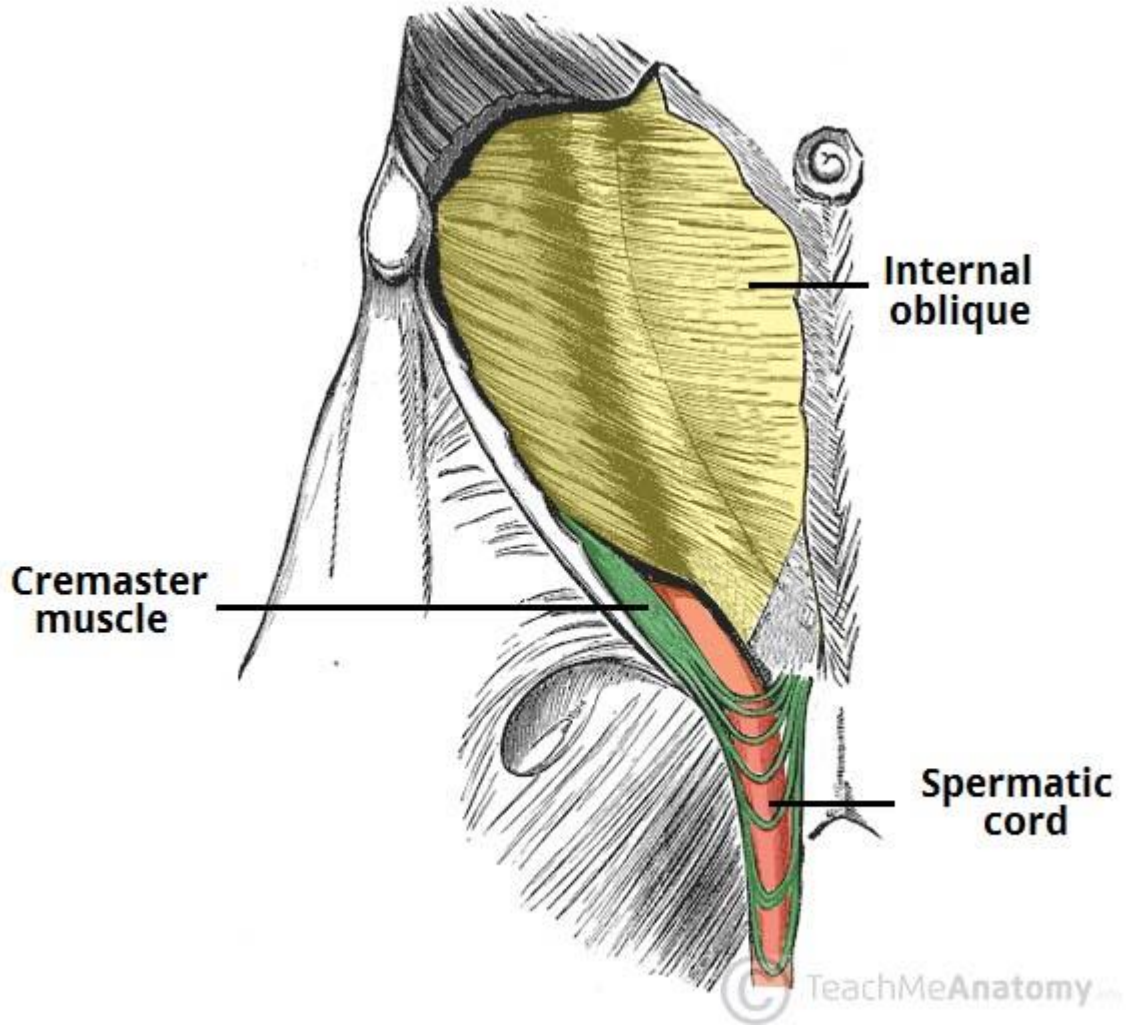
- The cord passes through the inguinal canal, entering the scrotum via the **superficial inguinal ring**. It continues into the scrotum, ending at the posterior border of the testes. Here, its contents disperse to supply the various structures of the testes and scrotum.



Fascial Coverings

- The contents of the spermatic cord are mainly bound together by three fascial layers. They are all derived from anterior abdominal wall:
- **External spermatic fascia** – derived from deep subcutaneous fascia (fascia innominata).
- **Cremaster muscle and fascia** – derived from the internal oblique muscle and its fascial coverings.
- **Internal spermatic fascia** – derived from the transversalis fascia.

- The three fascial layers themselves are covered by a layer of superficial fascia, which lies directly below the scrotal skin.
- The **cremaster muscle** forms the middle layer of the spermatic cord fascia. It is a discontinuous layer of striated muscle that is orientated longitudinally.



Cremasteric Reflex

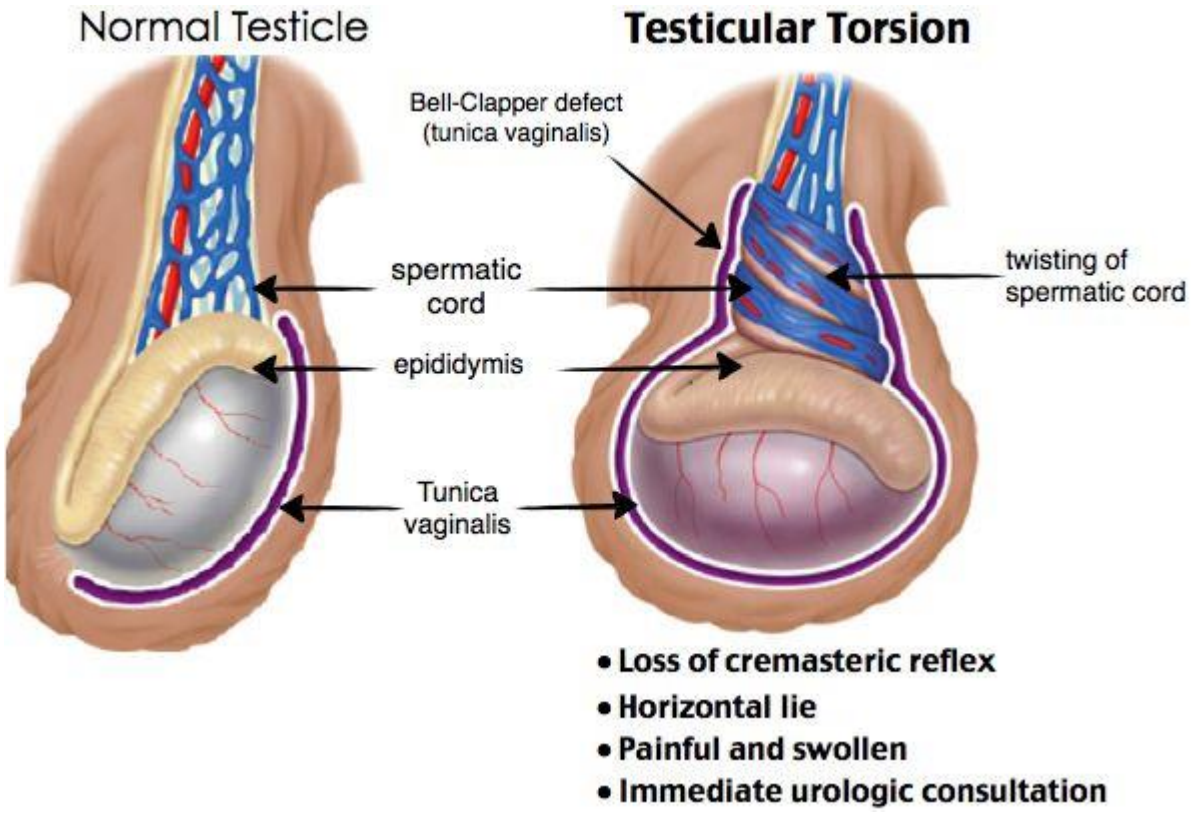
- **The cremasteric reflex can be stimulated by stroking the superior and medial part of the thigh. This produces an immediate contraction of the cremaster muscle, elevating the testis on the side that has been stimulated.**
- **This spinal reflex consists of two parts:**

1. **Afferent (sensory) limb – ilioinguinal nerve (innervates the skin of the superomedial thigh). Fibres from this nerve enter the spinal cord at L1.**
2. **Efferent (motor) limb – genital branch of the genitofemoral nerve (innervates the cremaster muscle).**

Testicular Torsion

- **Testicular torsion** is a surgical emergency, where the spermatic cord twists upon itself. This can lead to strangulation of the testicular artery, resulting in **necrosis** of the testis.
- A common cause of testicular torsion is spasm of the **cremasteric muscle fibres** which then force the testicle to spin around its own cord. Certain anatomic conditions (e.g. a loose testicle in a large peritoneal sac – tunica vaginalis) may facilitate this movement.

- Diagnosis can be confirmed via **ultrasound** and colour doppler scanning. The main clinical feature of testicular torsion is severe, sudden pain in the affected testis which usually lies higher (due to the torsion of the cord) in the scrotum.
- Testicular torsion is an absolute surgical emergency. A few hours delay can lead to **testicular necrosis**.



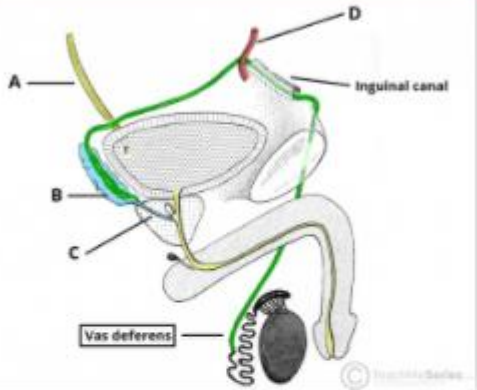
Quis

Which anatomical space does the spermatic cord travel through?

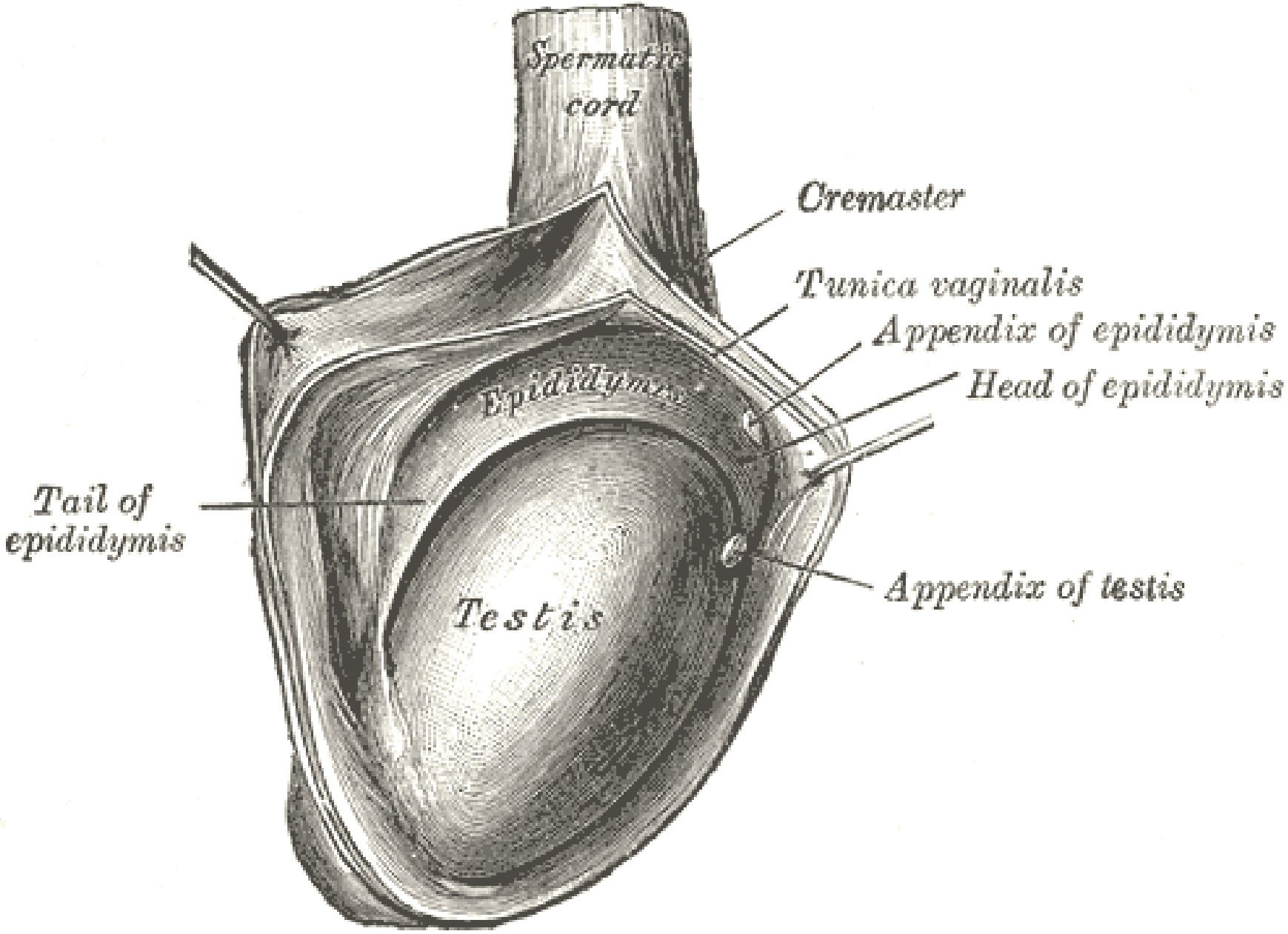
- Urogenital hiatus
- Femoral canal
- Inguinal canal
- Lesser sciatic foramen

Skip | Submit

Below is an illustration of the vas deferens. Which structure corresponds to the label 'B'?



- Bulbourethral gland
- Ejaculatory duct
- Seminal vesicle
- Prostate gland


Spermatic cord
Cremaster
Tunica vaginalis
Appendix of epididymis
Epididymis
Head of epididymis
Tail of epididymis
Testis
Appendix of testis

Scrotum And Testes

- ***The scrotum developed from two cutaneous out pouching of the anterior abdominal wall***

  (labioscrotal swelling)
- ***The scrotum consist of two layers , skin and superficial fascia***
- ***superficial fascia is devoid of fat , but it contain a thin sheet of smooth muscle called dartos muscle (wrinkle when cold)***

- ***The covering of the testis are contineous with the covering of the spermatic cord , the outermost covering of the testis , the external spermatic fascia , is contineous with this layer of spermatic cord , which is contineous with the E.O.A. at the superficial ring***
- ***Internal to this layer is the cremastric muscle with its fascia***
- ***Inside this layer is the internal spermatic fascia***
- ***Inside the internal spermatic fascia is tunica vaginalis***

Arterial Supply of The Scrotum

1.Perineal branch of internal pudendA.
2.External pudendal branches of the femoral A.
3.Cremastric A. branch of inferior epigastric A.

Venous Draiage of The Scrotum

The scrotal veins acompany the arteries . The external pudendal vein enter the great saphenous veis

Nerve Supply of the scrotum

Genital branch of genito femoral nerve

Scrotal branch of ilioinguinal nerve

Perineal branch of pudendal nerve

Perineal branchs of posterior femoral cutaneous nerve

Lymphatic Drainage of the Scrotum

Superficial inguinal lymph nodes

Testes

Main male reprodutive organ

Paired ovoid glands that are suspended in the scrotum by the spermatic cord

Surface of each testis is covered by the visceral layer of the tunica vaginalis , except epididymis & spermatic cord .internal to this layer is tunica albuginea (connective tissue coat of the testis)

The testes produce male germ cell or sperms (spermatozoa) and androgen
The sperms are formed in the somniferous tubules of the testis , which join to form a network of canal known as the rete testis
Small efferent ductule (15-20) connect the rete testis to the head of epididymis

The Epididymis

Comma shaped structure is applied to the superior & posteriolateral surfaces of the testis

Head composed of the lobules of the epididymis, which are the coiled ends of the efferent ductules of the testis(transmit the sperm from testis to EP).

Body of the epididymis consist of highly convoluted duct of the epididymis (final stage of maturation of sperm)

Tail of the epididymis is contineous with the vas deferens, which transports sperm from EP to the ejaculatory duct for expulsion in to prostatic urethra.

- The fermentative action of certain bacteria (Doderlein's bacillus) on the glycogen-rich desquamated cellular debris renders vaginal fluid acid, and this appears to have an inhibitory effect on the growth of micro-organisms;

Arteries of True Pelvis

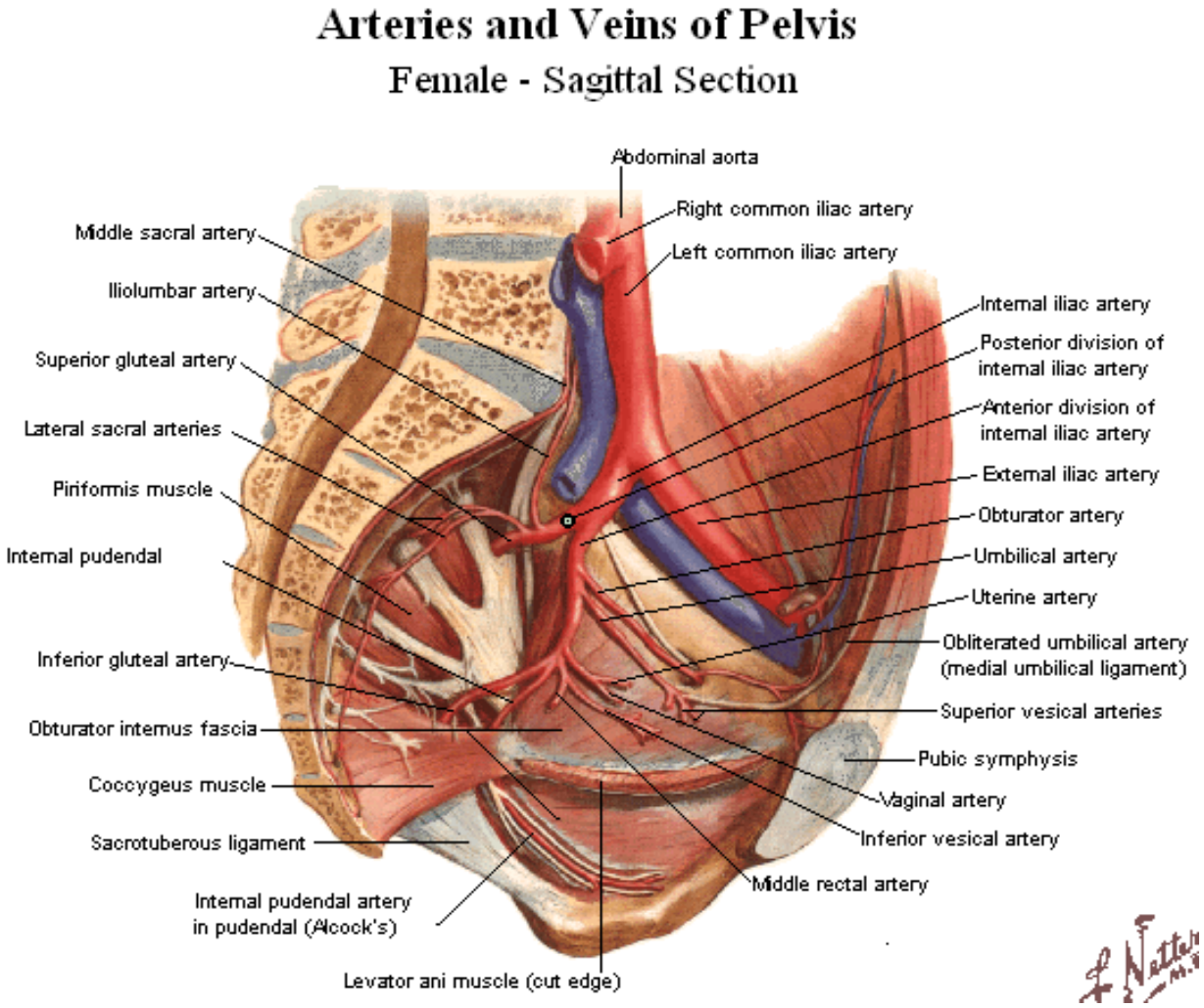
1. Intern. Iliac art

a) Ant. Division

- Umbalical a.
  Superior vesical a.
- Obturator
- Inf. Vesical
- Middle rectal
- Internal Pudendal
- Inf. Gluteal
- Uterine
- Vaginal

b) Post. Division

- Iliolumbar
- Lateral sacral
- Sup. Gluteal



Arteries and Veins of Pelvis

Female - Sagittal Section