أهلا وسهلا

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة – الأردن

دكتوراة من جامعة كولونيا المانيا

اليوتيوب د. يوسف حسين

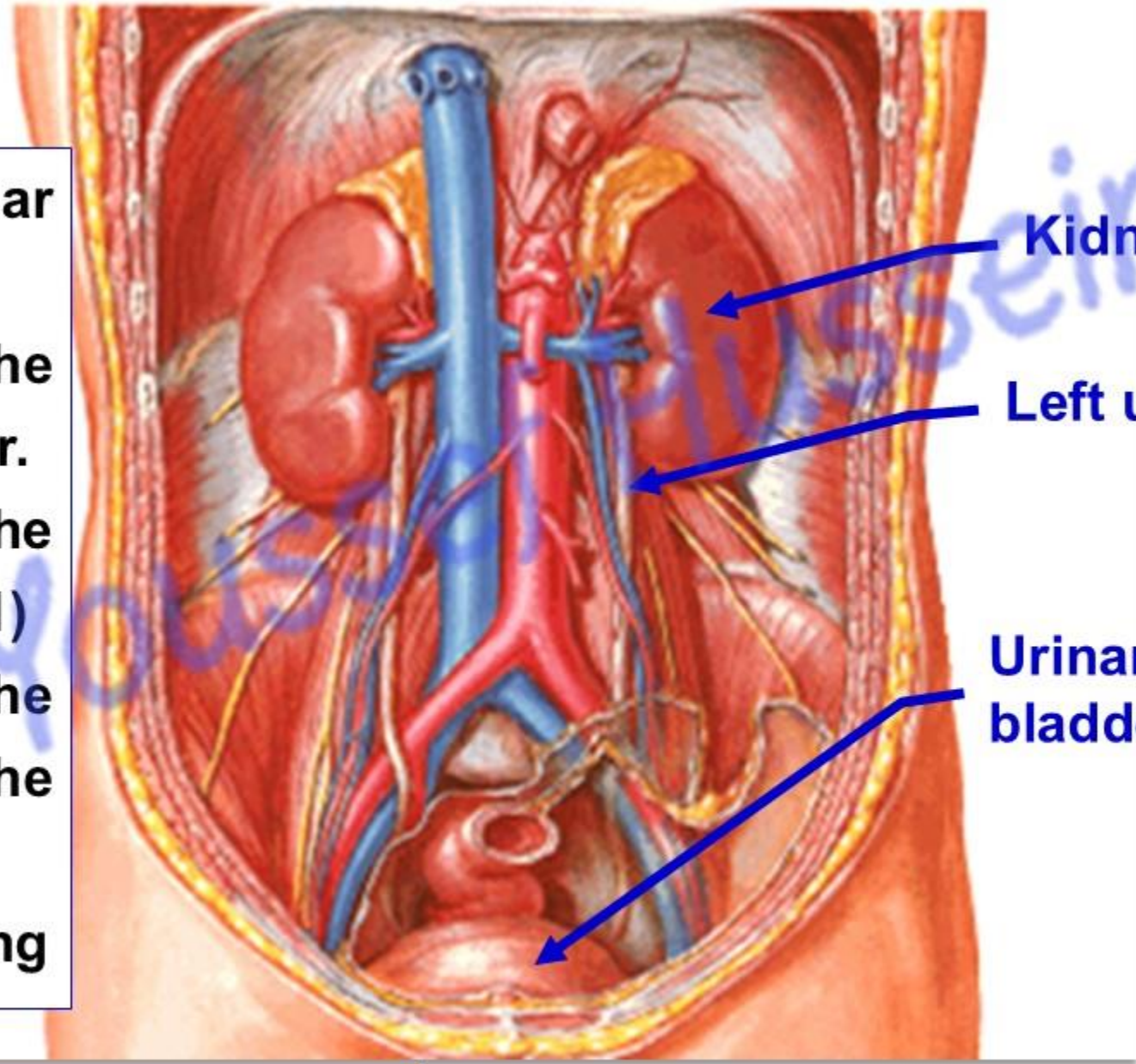
Anatomy of Ureter

- The ureters are 2 muscular tubes.
- They convey urine from the kidneys to the urinary bladder.

• ** **Begin**, from hilum of the kidney at transpyloric plane (L 1)

• ** **Termination**, opening into the posterosuperior angle of the urinary bladder.

• ** **Length**; It is about 25 cm long



Prof. Dr. Youssef Hussein Anatomy - YouTube

Abdominal part

Anterior relations

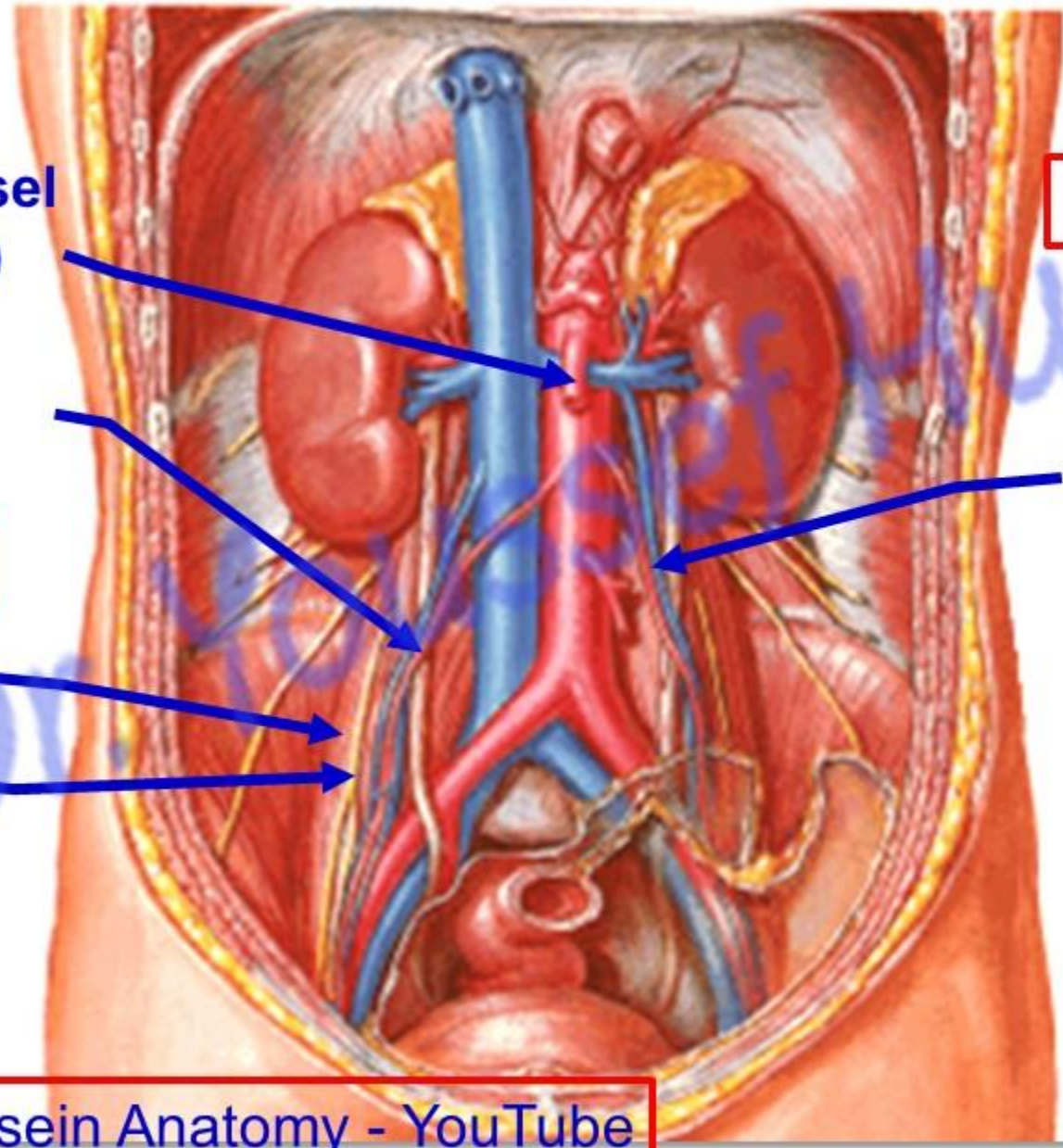
Superior mesenteric vessel in root of mesentery (cut)

Right gonadal vessel

Posterior relations

Psoas major M

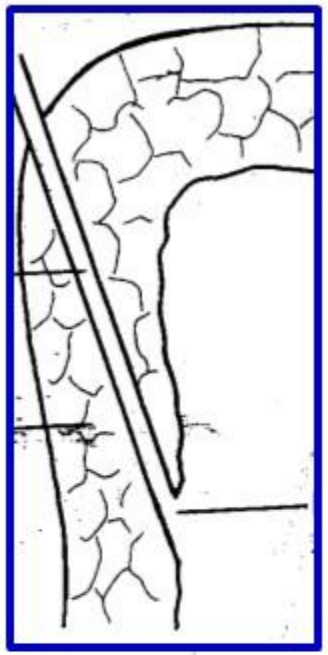
Genitofemoral N

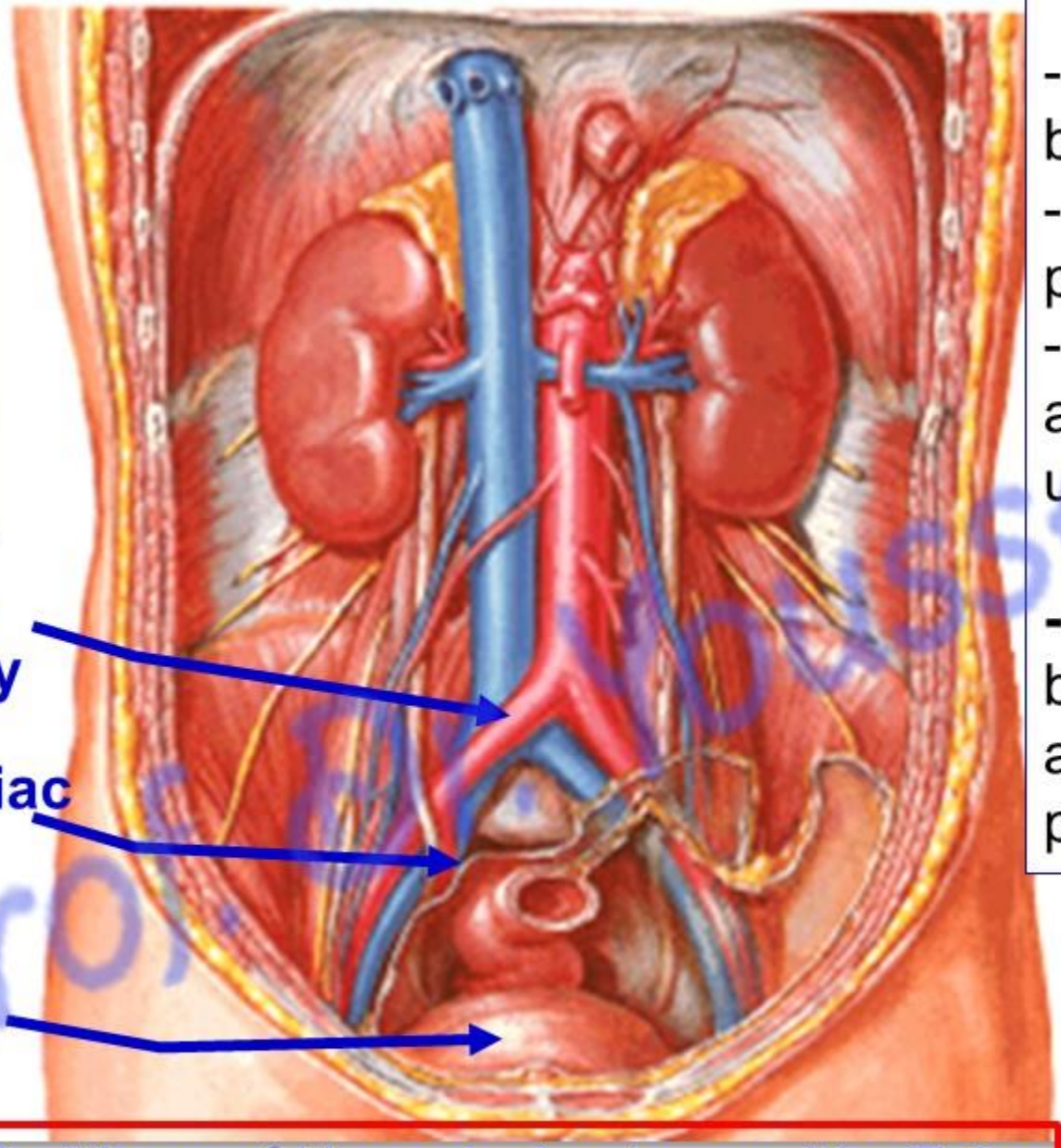


Anterior relations

Left gonadal vessel

Sigmoid colon



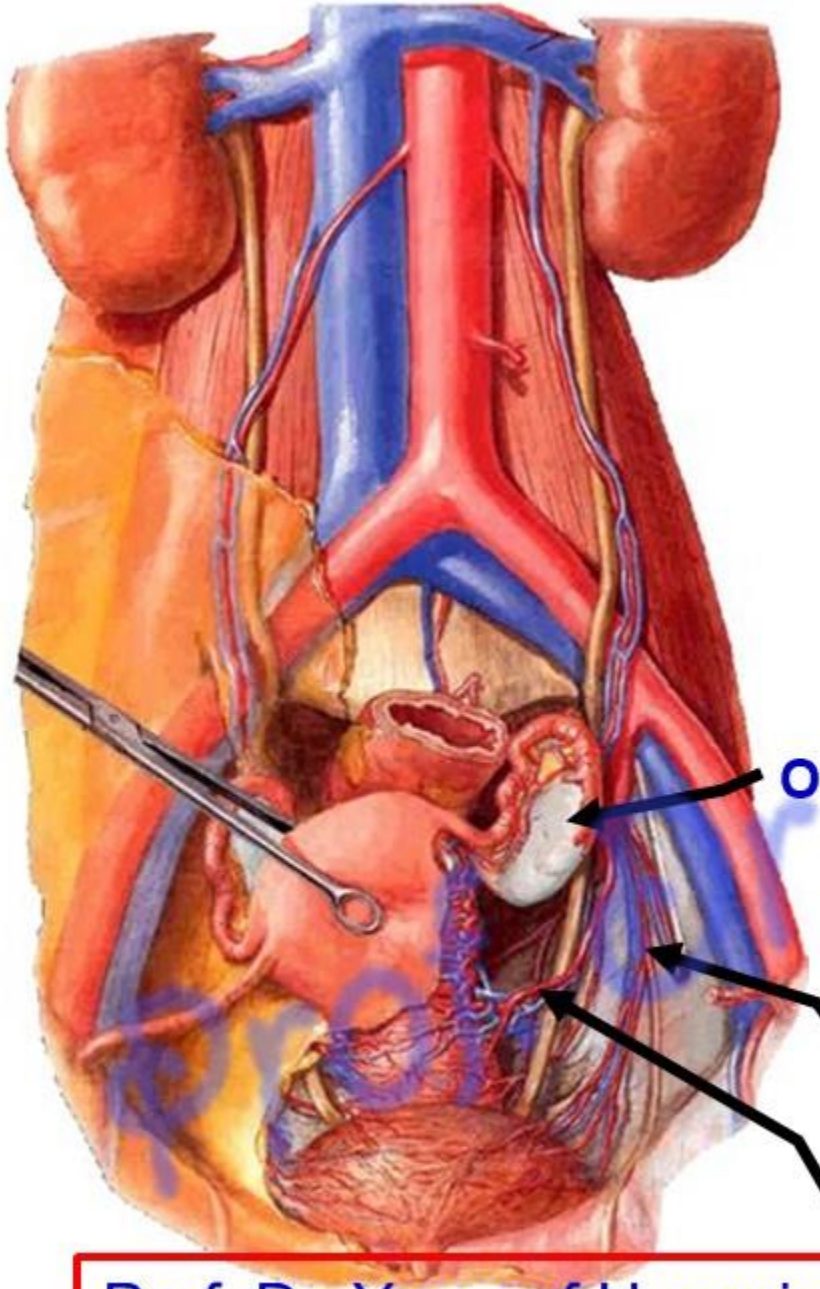


• Pelvic Part of the Ureter

- It **enters** pelvis by crossing bifurcation of common iliac artery.
- It **descends** on lateral wall of the pelvis along the internal iliac artery.
- Opposite **ischial spine**, it curves anteromedially to the angle of the urinary bladder.

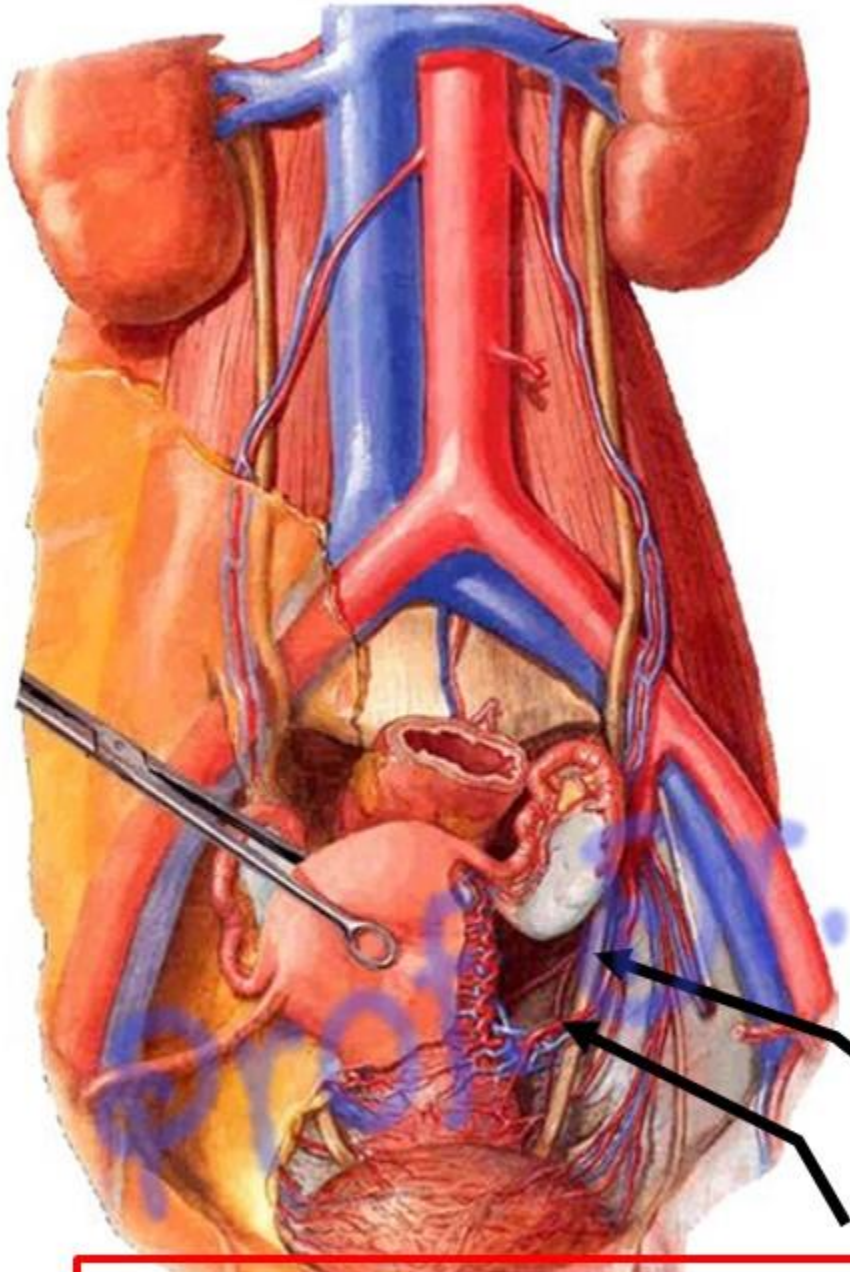
• Intramural part

- It runs oblique through urinary bladder wall **for 2 cm** before opening act as a **valve like mechanism** to prevent regurgitation of urine.



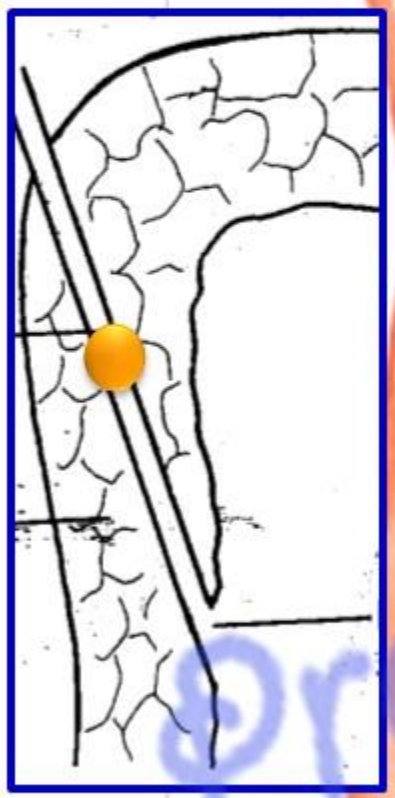
- ** **Relations of the pelvic part**

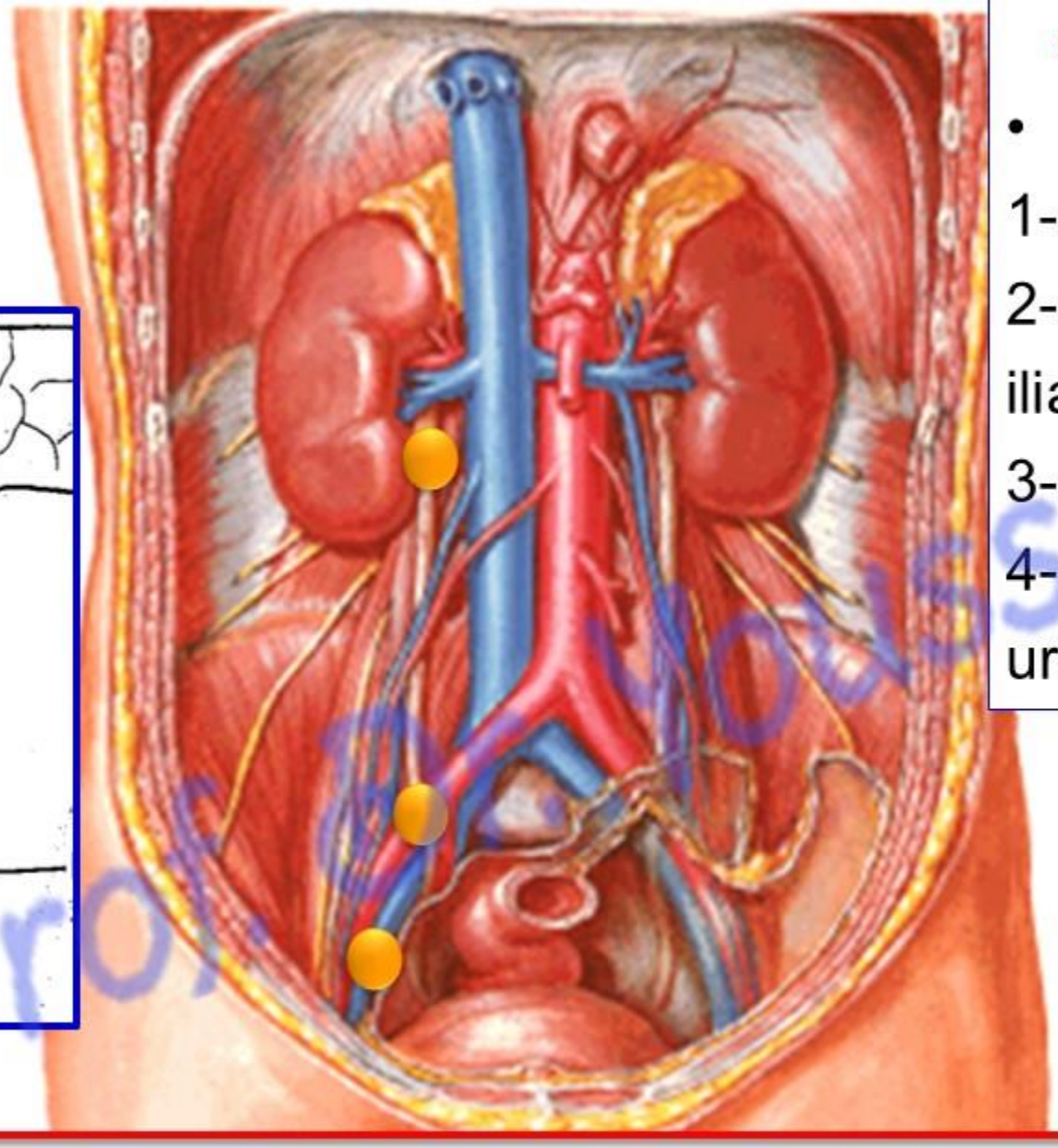
- It crosses obturator nerve and vessel.
- **A- In the male,** It is crossed by vas deferens.
- **B- in female,**
- It forms posterior boundary of the **ovarian fossa.**
- Then runs **on lateral aspect of the cervix and upper part of the vagina** to reach the bladder.
- Here, it is crossed by uterine artery (**water under bridge**).



- **Clinical notes**

- **Injury of the ureter** in the female may occur during a hysterectomy or surgical repair of uterine prolapse
- **Because it runs under the uterine artery,** the ureter is accidentally clamped, ligated, or divided during a hysterectomy when the uterine artery is being ligated to control uterine bleeding.





- **Normal constrictions of ureter**
- Where stones may be impacted

1- Pelviureteric junction.

2- Crossing the bifurcation of common iliac artery at the pelvic brim.

3- At ischial spine (curvature of ureter).

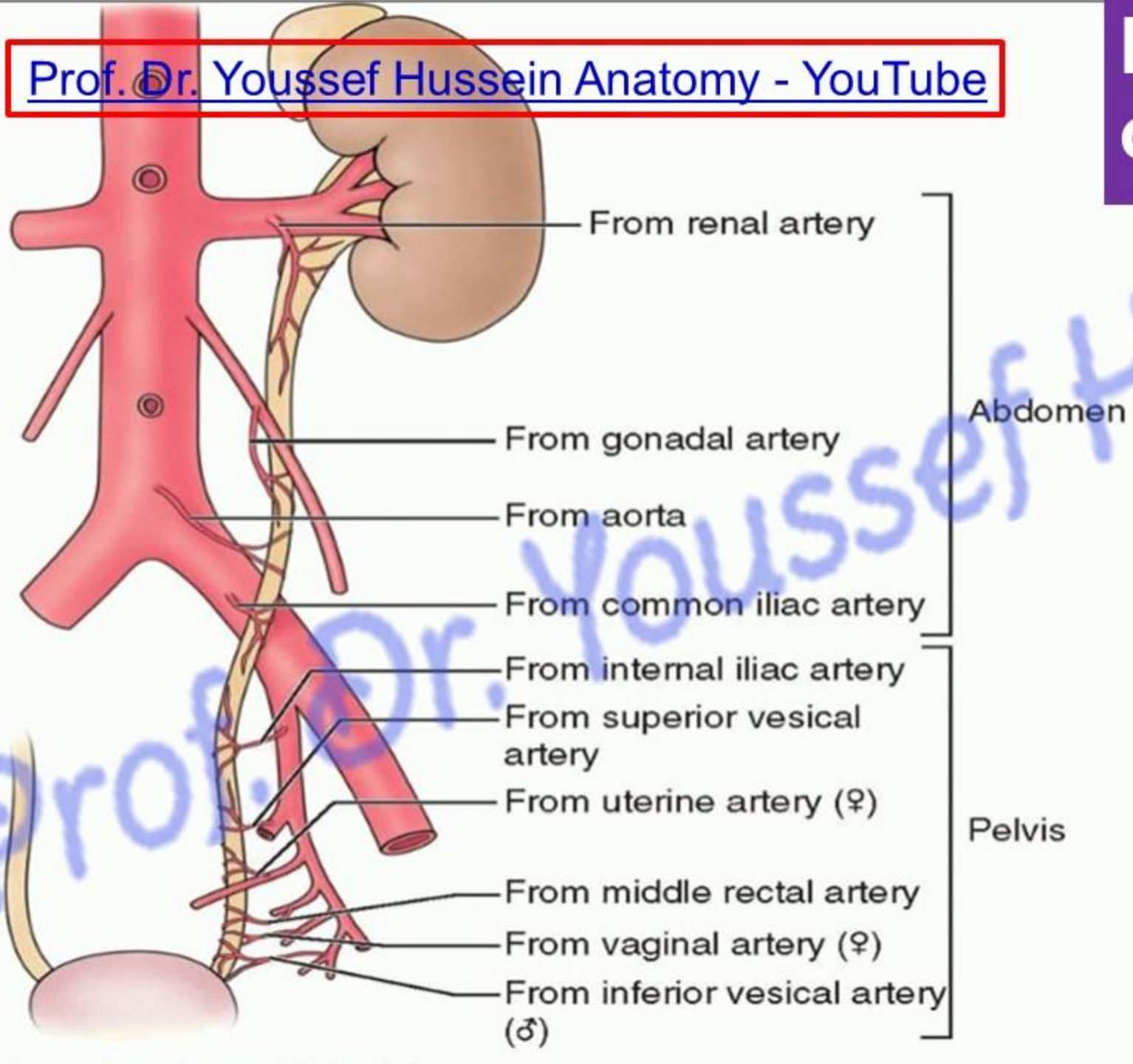
4- Intramural part (inside the wall of urinary bladder).

IVP

Intravenous pyelogram

- Ureter descends downwards and slightly medially opposite the tips of transverse processes of the lumber vertebrae.
- Then it descends in front of the sacroiliac joint.

Blood supply of the ureter



- **The ureter is identified at operation by**

a- it appears as thick muscular tube with longitudinal blood vessels.

b- It shows peristalsis and gives urine on aspiration.

- **Nerve supply**

- Sympathetic from T 11 to L 1.

- Parasympathetic S 2, 3, 4.

- **Renal pain is referred to the groin and external genitalia which are supplied by genitofemoral nerve (L1&2).**

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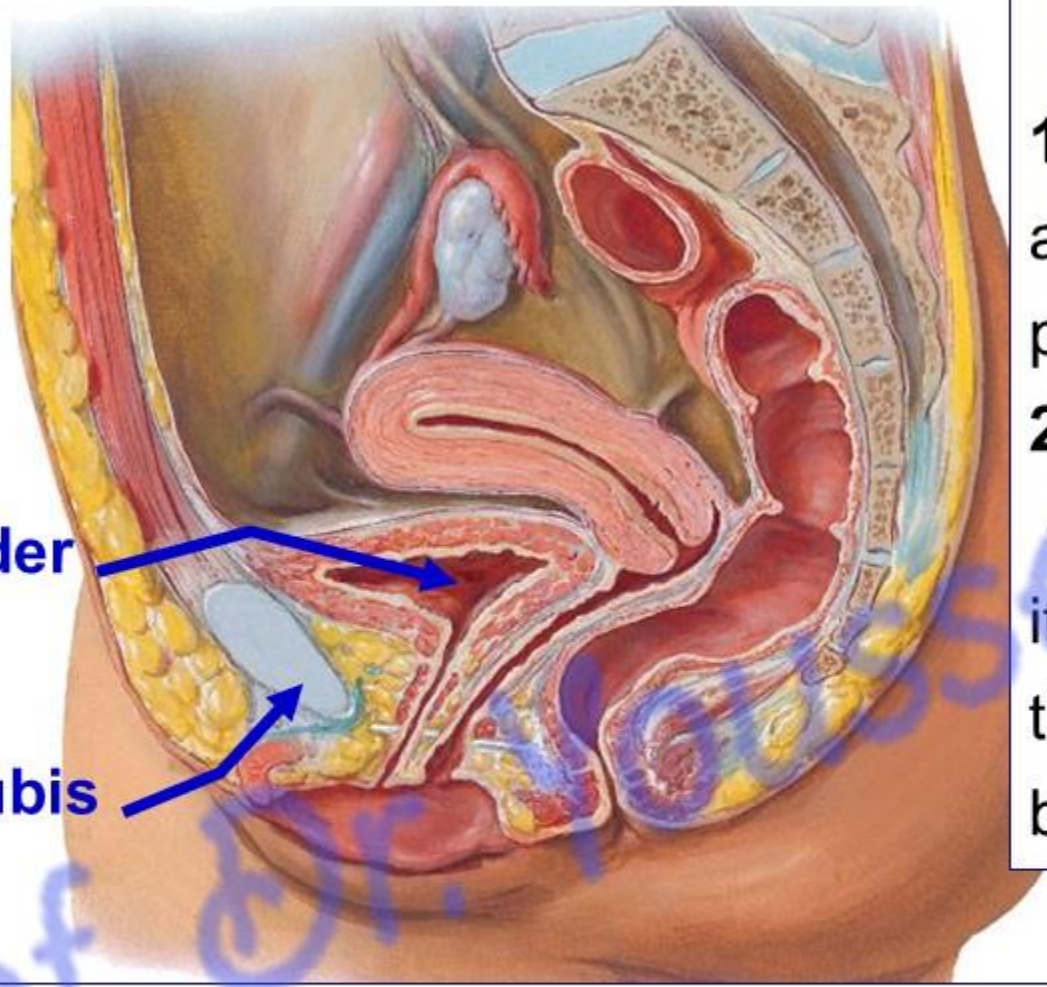
Anatomy of Urinary bladder



**** Position:**

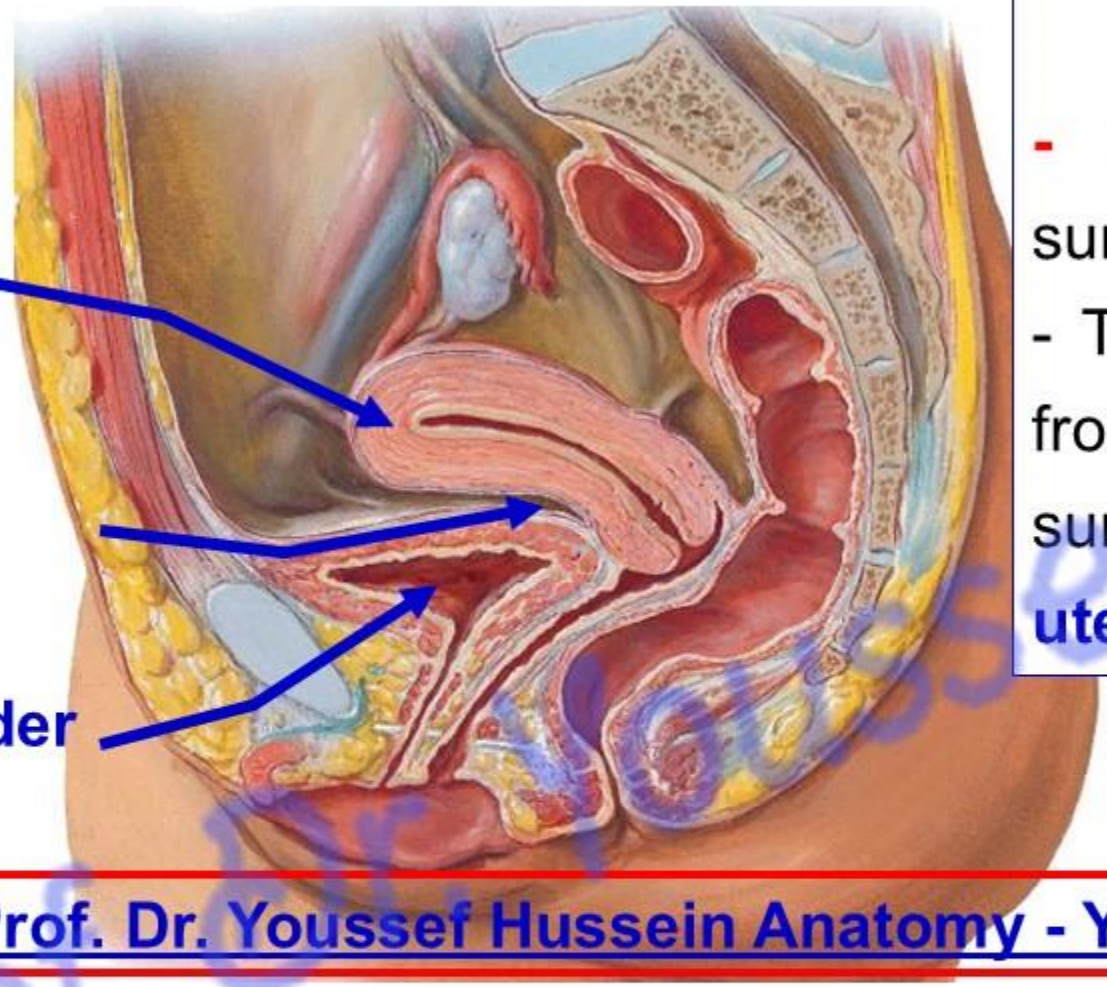
1- During childhood, it is an abdominal organ because the pelvis is narrow.

2- At puberty, lies in pelvic cavity.

- When the bladder is **distended**, it raises above the upper border of the symphysis pubis and becomes behind the anterior abdominal wall.

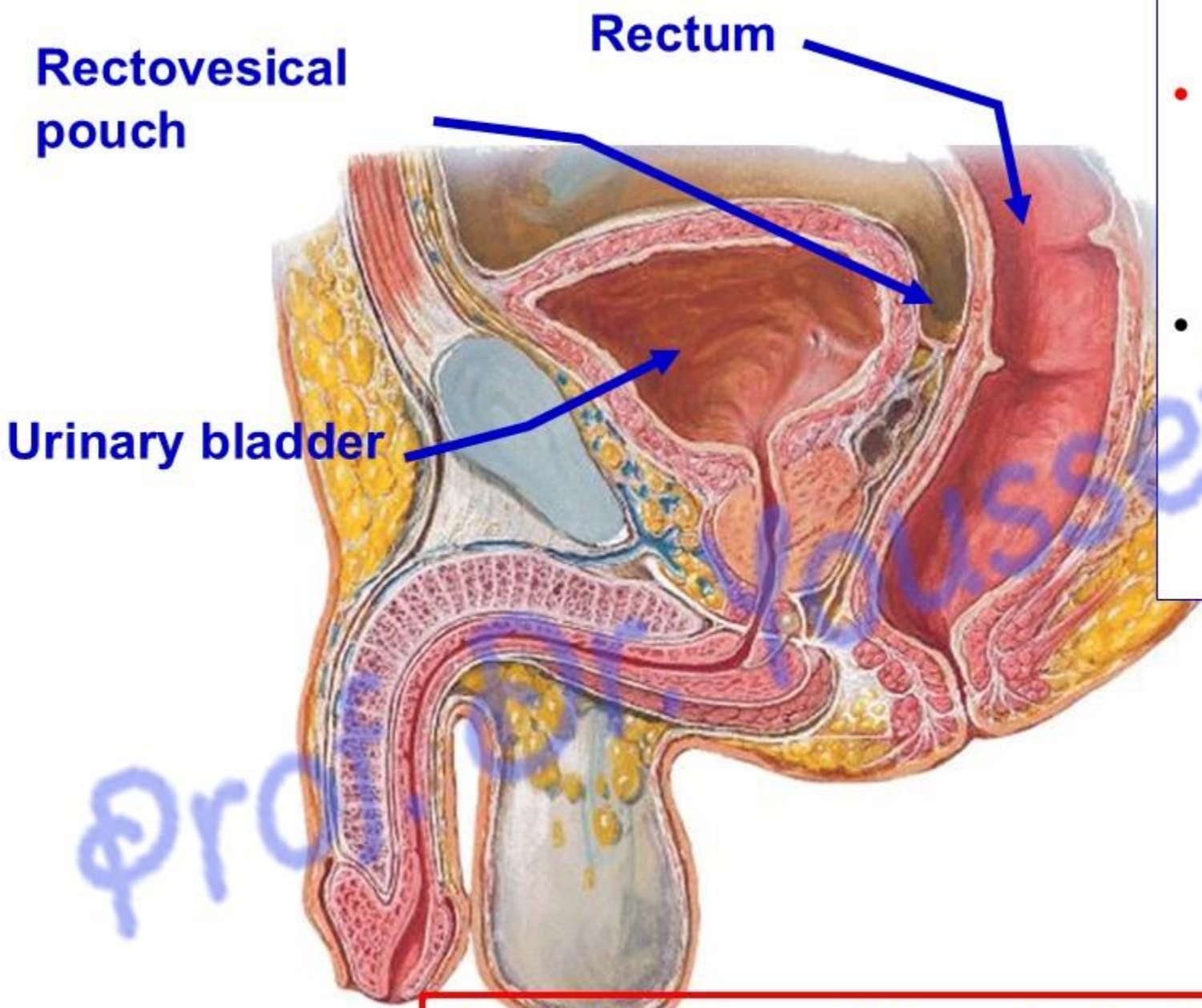
**** Function and capacity**:

- It is a muscular reservoir to the urine.
- The average capacity of the bladder is 400 - 500 cc.



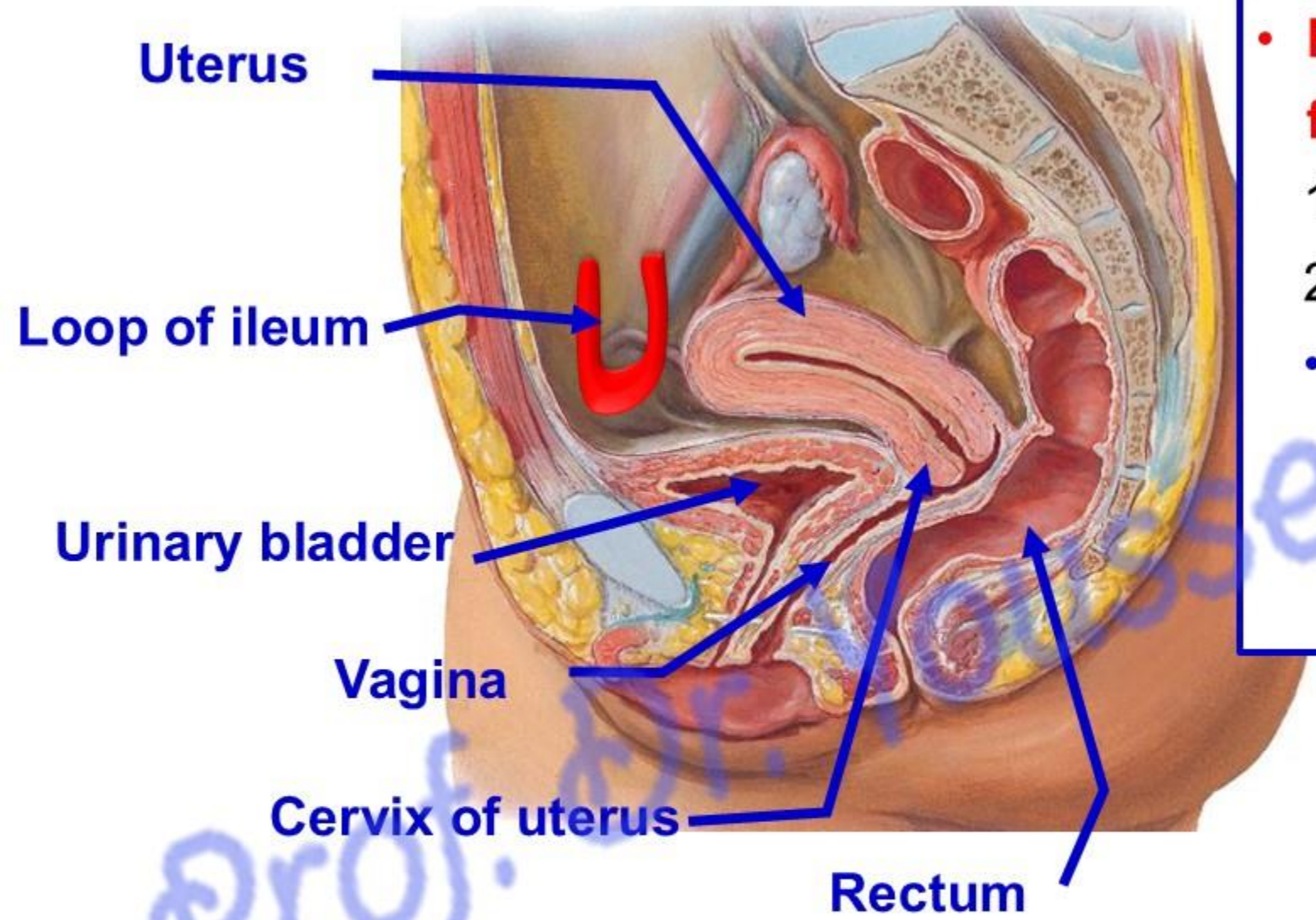
** Peritoneal covering

- **In female** only the superior surface is covered by peritoneum.
- The reflection of the peritoneum from the uterus to the superior surface of the bladder forming the **uterovesical pouch**.



** Peritoneal covering

- **In male** the peritoneum covers the superior surface and upper part of the base.
- The reflection of the peritoneum from the rectum to the upper part of the base forming **rectovesical pouch**.



- **Relations of Superior surface In female:**

1) Anterior surface of uterus

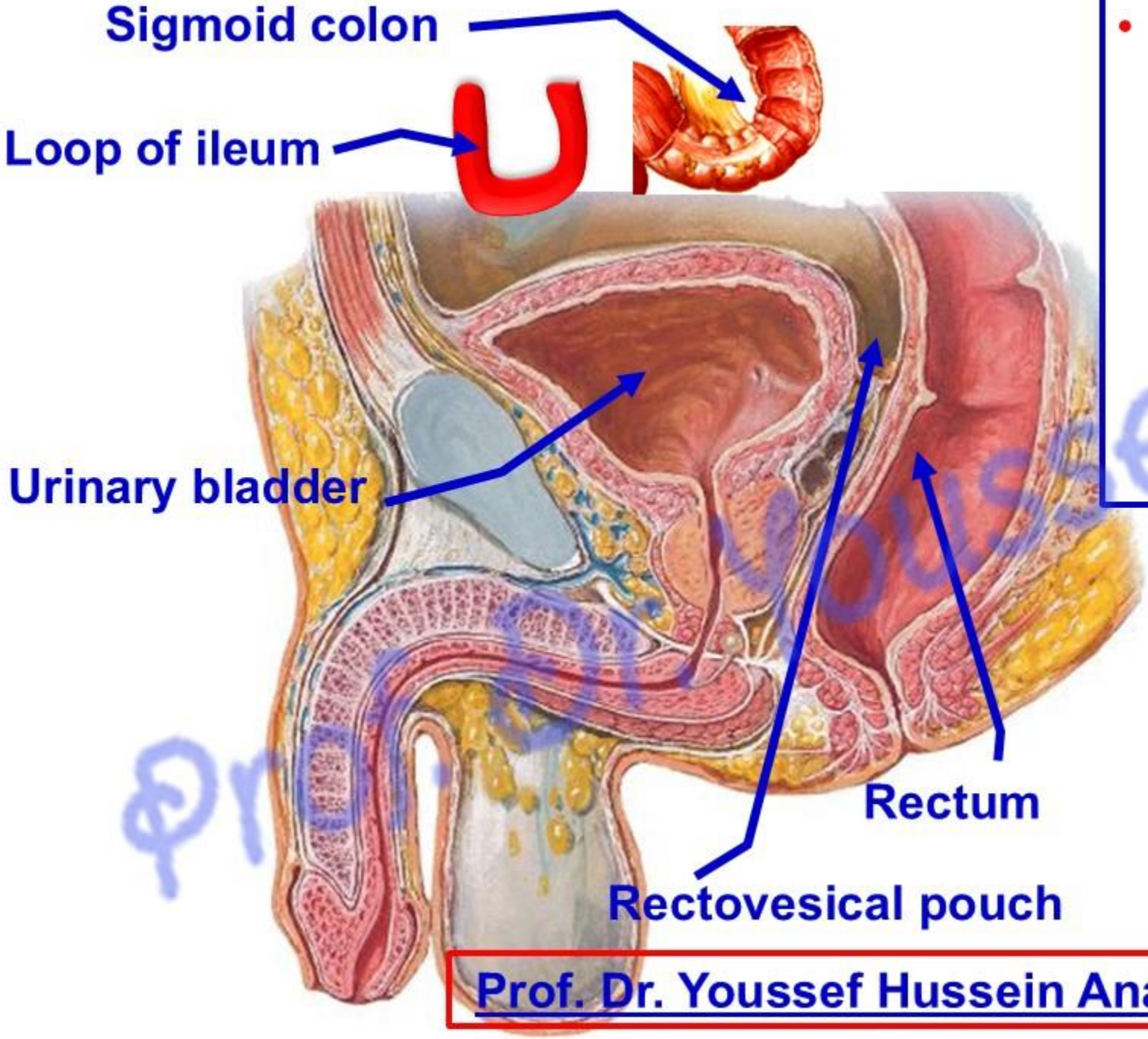
2) Loop of ileum

- **Posterior relations**

1) Cervix of the uterus.

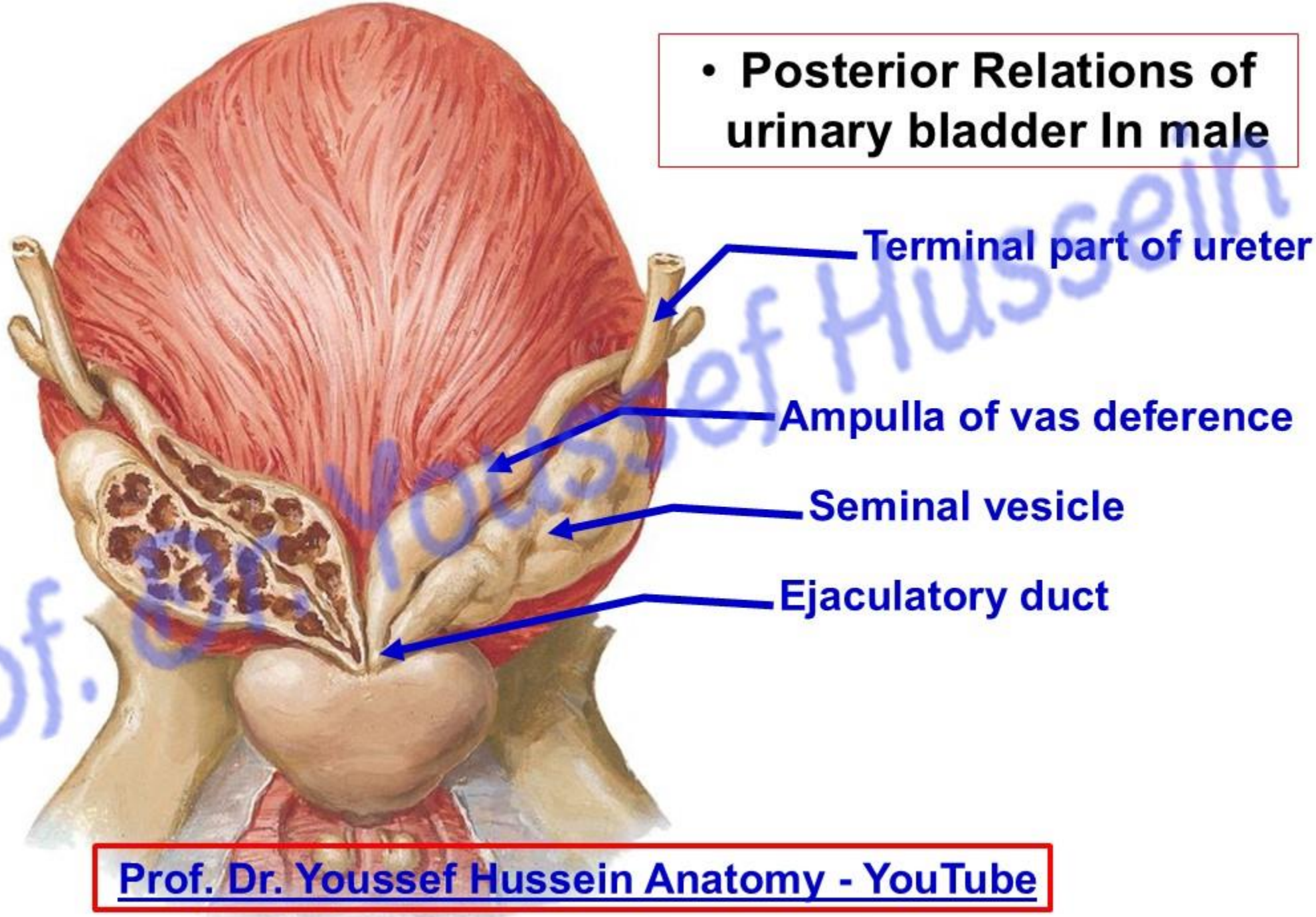
2) Anterior wall of the vagina.

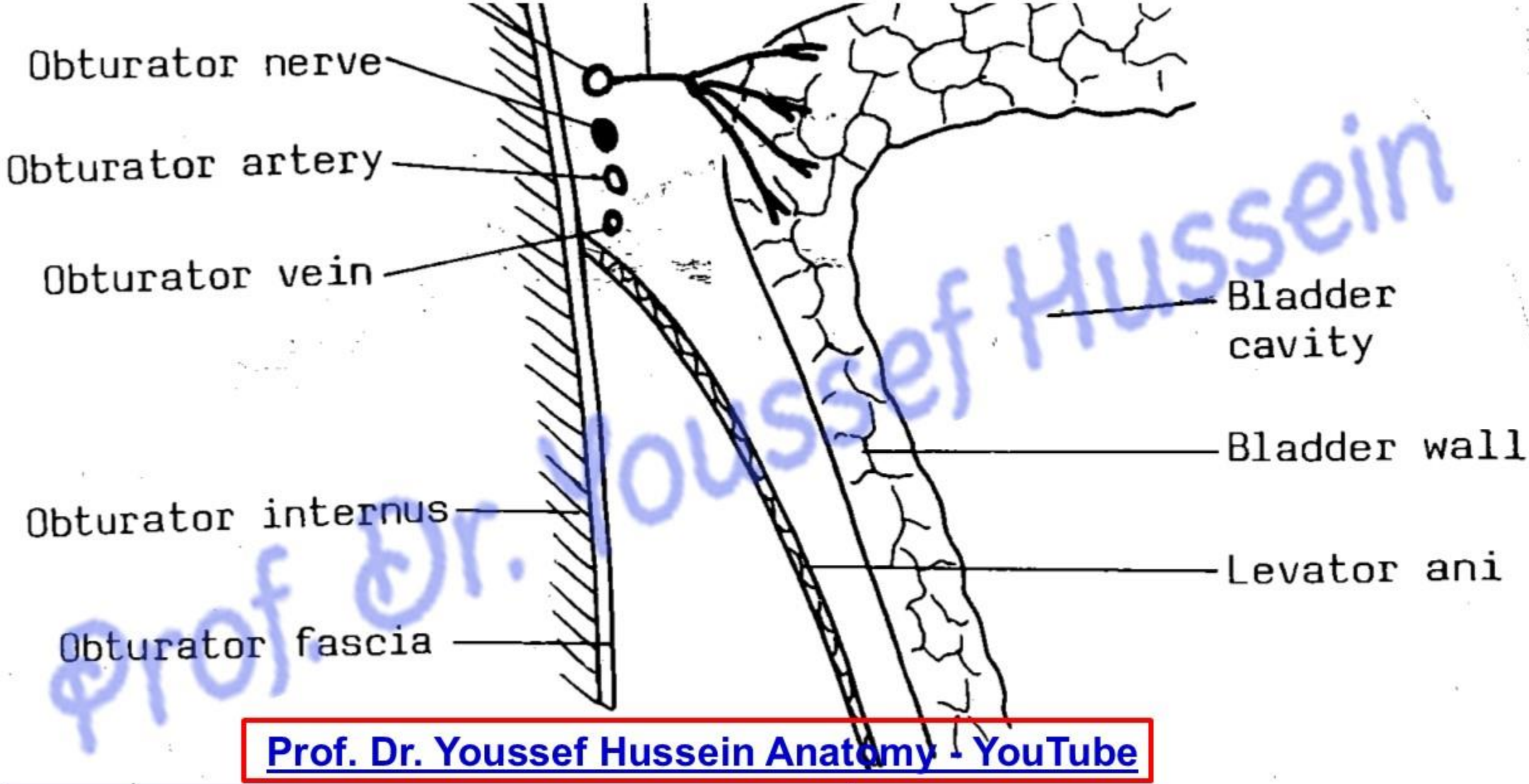
3) Rectum



- **Relations of Superior surface In male:**
  1) Sigmoid colon
  2) Loop of ileum
- **Posterior relations**
  1) Rectum
  2) Rectovesical pouch

- **Posterior Relations of urinary bladder In male**





- **Inferolateral surfaces in both sex**

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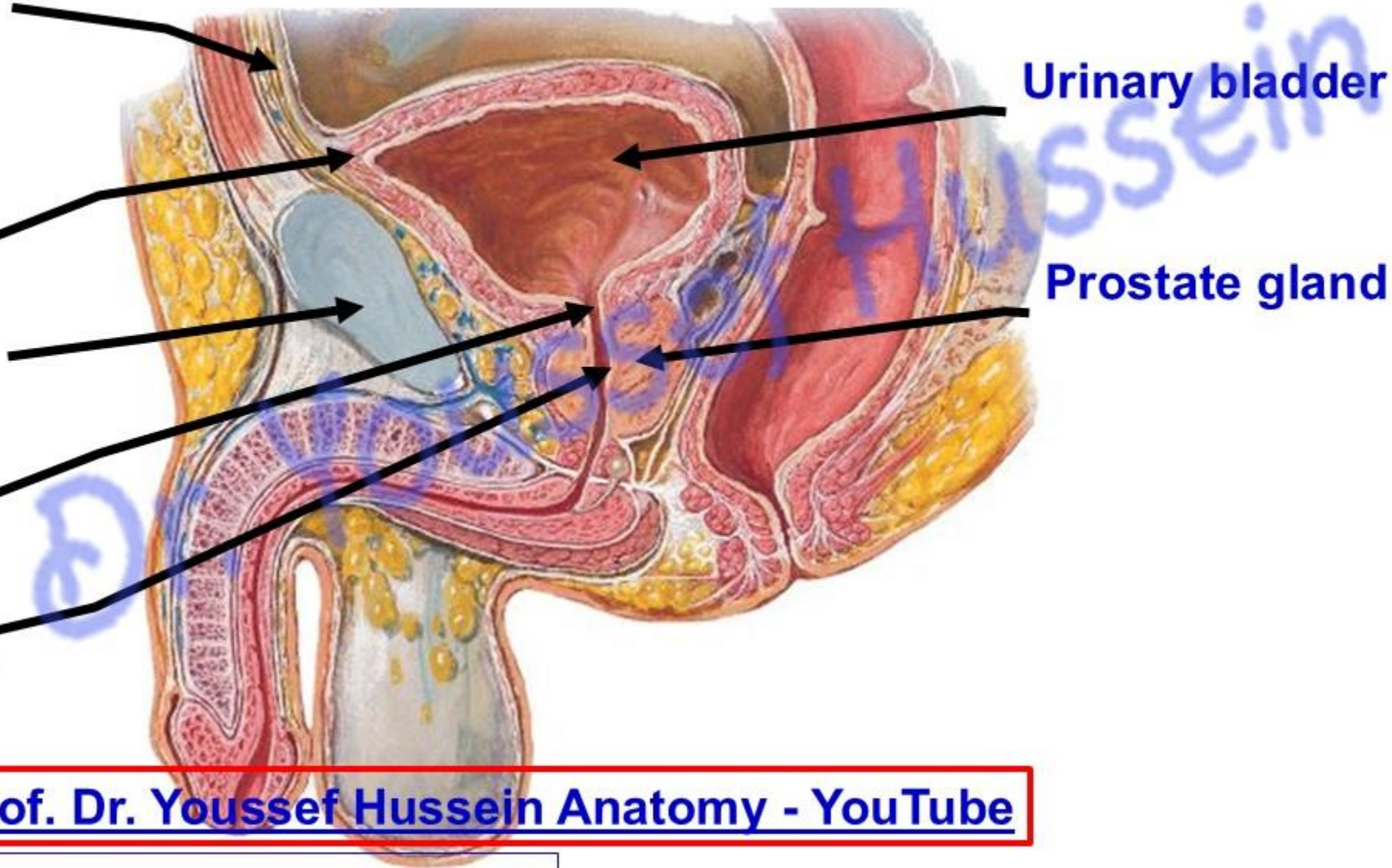


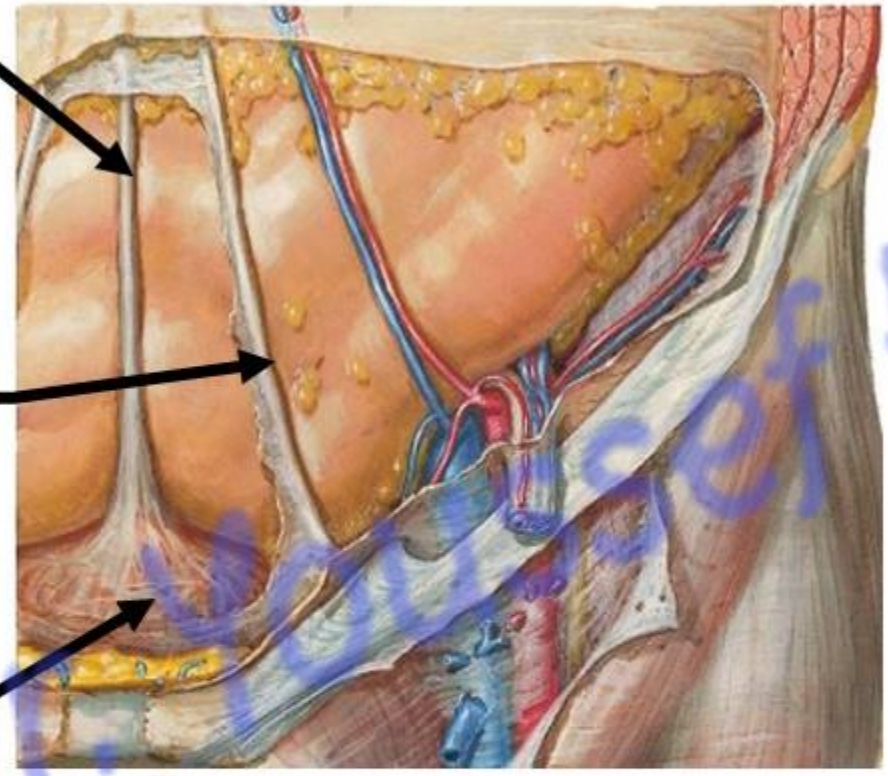
- **Neck In female,** rested on pelvic fascia.

• Ligaments of urinary bladder

Median umbilical ligament (obliterated urachus) if patent urine discharge from umbilicus

Two medial umbilical ligaments obliterated umbilical arteries if patent blood discharge from umbilicus

Urinary bladder



- **Two lateral ligaments from the neck to the pelvic fascia**

Puboprostatic ligament: between body of pubis and prostate in **male**)

Pubovesical ligament: between body of pubis and neck of the bladder in **female**).

* Arterial supply of urinary bladder:

1- Superior vesical arteries from internal iliac artery.

2- Inferior vesical artery (**male**) or **vaginal** artery (**female**) from internal iliac artery.

*** Venous drainage:** venous plexus; drain into the internal iliac vein.

** Lymphatic drainage:

1- Mostly into the external iliac lymph nodes.

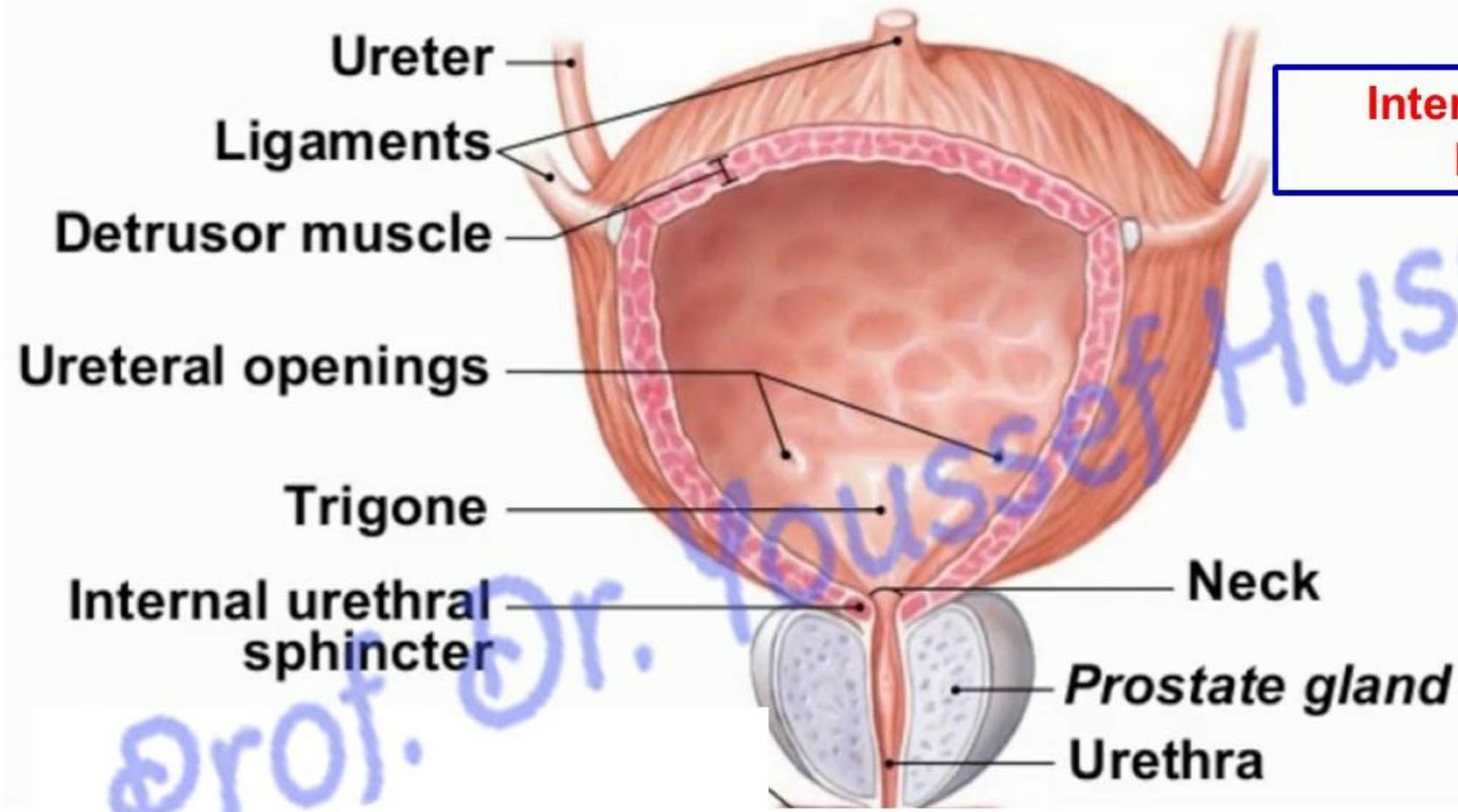
2- Partly Into the internal iliac, and common iliac lymph nodes.

** Nerve supply:

a- Sympathetic from T11, 12 and L 1, 2 segments of the spinal cord.

b- Parasympathetic from S 2, 3, 4.

Internal Urinary bladder



• Internal (mucosa) of urinary bladder

- It is lined by transitional epithelium (endoderm) and shows folds except the trigone.

• Trigone

- This is a triangular area on the **posterior** wall of the bladder wall.
- It is **mesoderm.**
- The mucosa of trigone is **sensitive, smooth, vascular, and elastic**.
  - It is bound by 3 lines connecting 2 ureteric openings and internal urethral opening.
  - **Internal urethral meatus** is situated at the apex of the trigone.

• In male,

- **Uvula of urinary bladder** is a slight elevation behind the internal urethral meatus.
- It is produced by the median lobe of the prostate

• Micturition (Urination)

- Is initiated by stimulating **stretch receptors in the detrusor muscle** in the bladder wall by increasing volume of urine.
- Can be assisted by contraction of the abdominal muscles, which increases the intraabdominal and pelvic pressures.
- **Involves the following processes:**

1. Sympathetic [GVE] induce relaxation of the bladder wall and constrict the internal urethral sphincter, **inhibiting emptying**.

2. Impulses **(GVA)** arise from stretch receptors in the bladder wall and enter the spinal cord (S2–S4) then to the micturition center in the **brain**.

3. Parasympathetic (GVE) to the bladder musculature induce contraction of the detrusor muscle and relaxation of the internal urethral sphincter, **enhancing the micturition**.

4. General somatic efferent (GSE) fibers in the pudendal nerve cause voluntary relaxation of the external urethral sphincter, and the bladder begins to void.

5. At the end of micturition, external urethral sphincter contracts, and bulbospongiosus muscles expel the last few drops of urine from the urethra.

Clinical Notes

- **Reflex Bladder – Spinal Cord Transection Above T12**
- The afferent signals from the bladder wall are unable to reach the brain, and the patient will have **no awareness** of bladder filling.
- Thus, the bladder automatically empties as it fills

- **Flaccid Bladder – Spinal Cord Transection Below T12**
- The parasympathetic outflow to bladder is damaged. Paralysis of detrusor muscle.
- The spinal reflex does not function.
- The bladder will become abnormally distended until **overflow incontinence** occurs.

Urine Retention

- **Causes**: the most common cause is prostate enlargement (BPH) In males, a stone or large blood clot.
- **Acute retention** is a medical emergency, The patient needs urinary catheter.
- **Chronic retention** leads to accumulation of residual urine in the bladder. It is often complicated by infections and formation of bladder stones

https://www.youtube.com/channel/UCVSNqbibj9UWYaJdd_cn0PQ

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