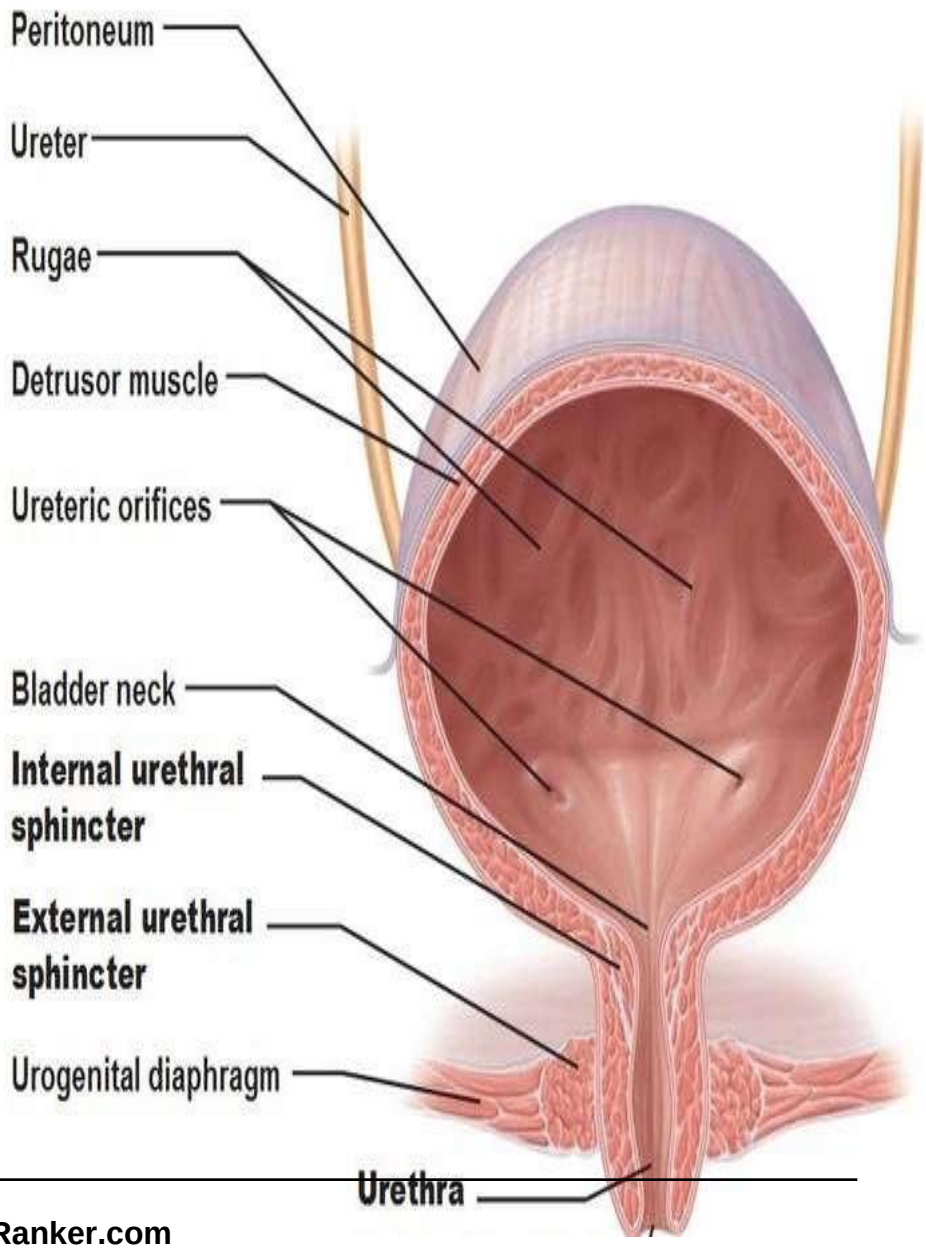
INTRODUCTION

•IT IS A HOLLOW MUSCULO-MEMBRANOUS SAC WHICH ACTS AS A RESORVOIR FOR THE URINE.

• IT IS THE MOST ANTERIOR ELEMENT OF THE PELVIC VISCERA.

•IT IS A SUBPERITONEAL ORGAN AND HAS PARIETAL PERITONEUM ONLY ON ITS SUPERIOR SURFACE.

•URINE ENTERS THE BLADDER VIA URETERS AND EXITS VIA THE URETHRA.



ANATOMICAL LOCATION

▸When "Empty" , the adult urinary bladder is located in the "Lesser pelvis" lying partially superior to and partially postetior to the pubic Bones.

▸ As the bladder fills it enters the "Greater Pelvis".

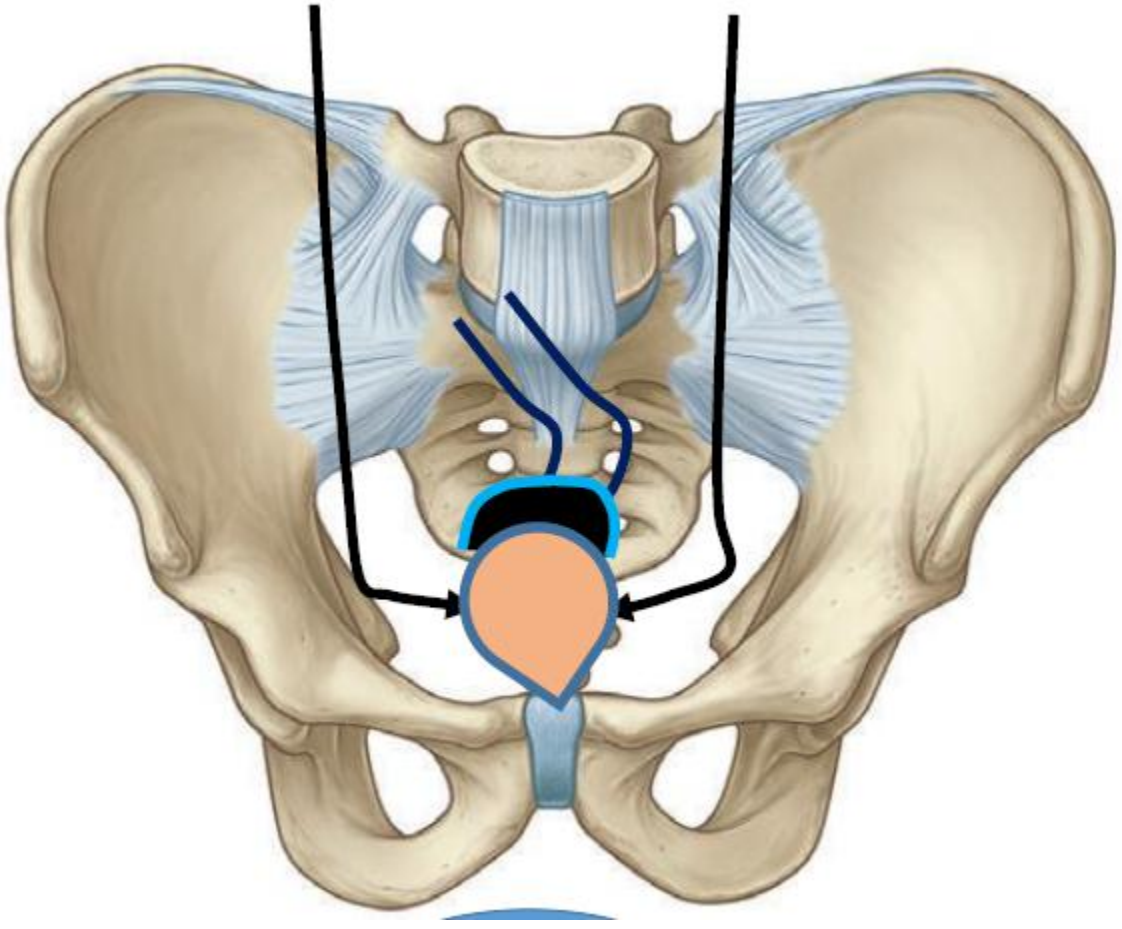
▸ In some individuals, a full bladder may ascend to the level of the "Umbilicus".

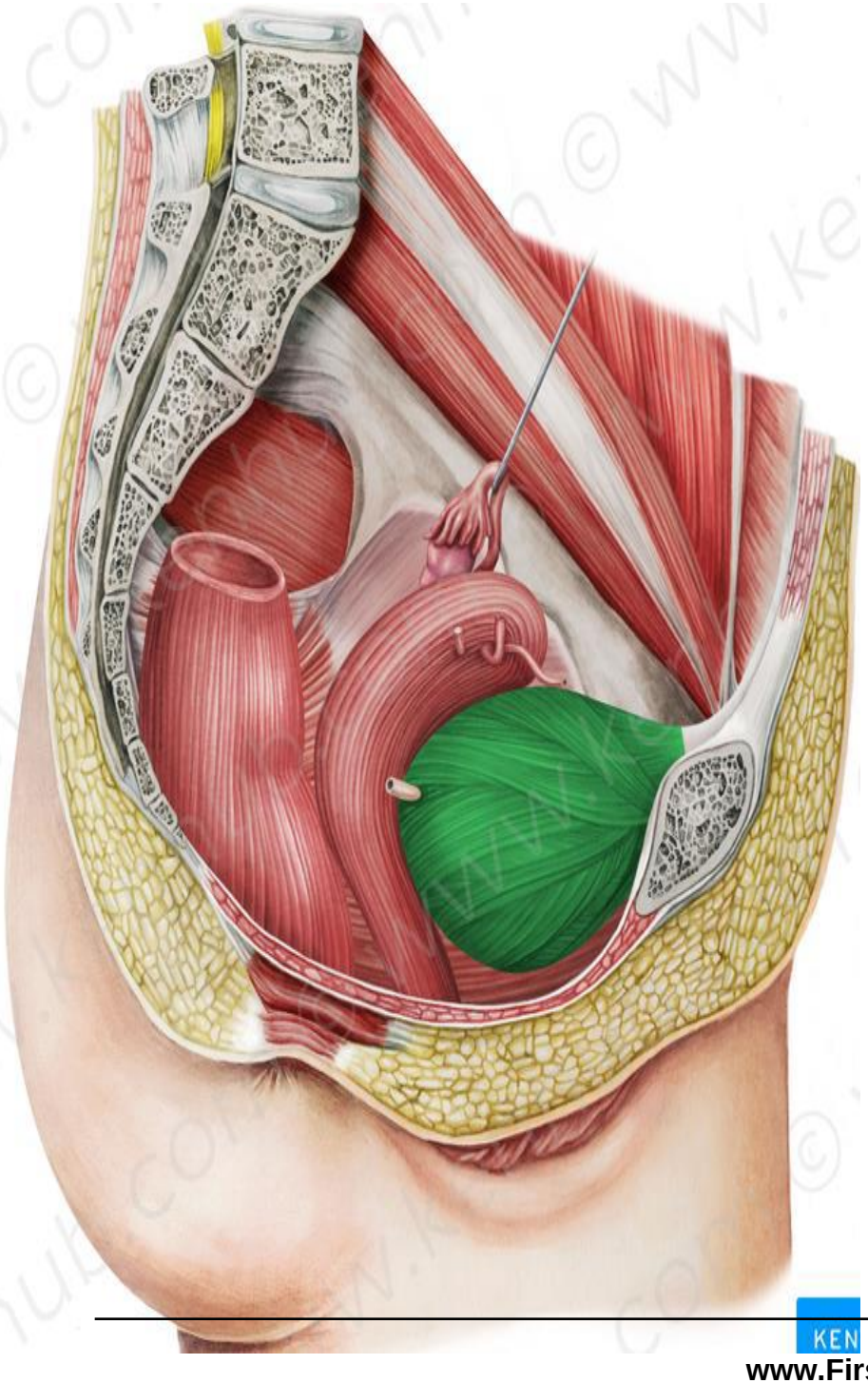
▸ In infants and young children,the urinary bladder is in the abdomen even when empty.

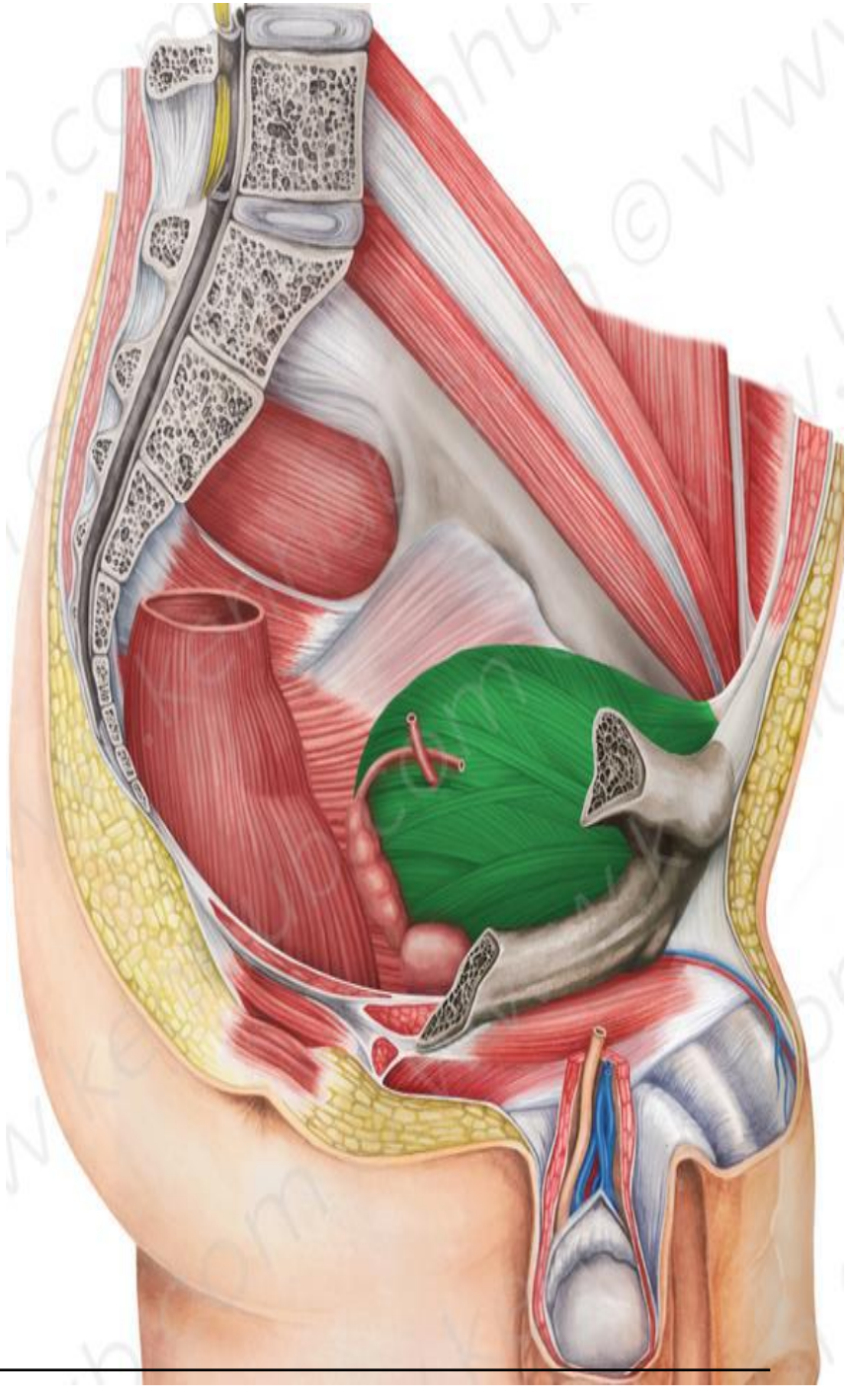
- An **empty bladder is somewhat tetrahedral and oval when full.**

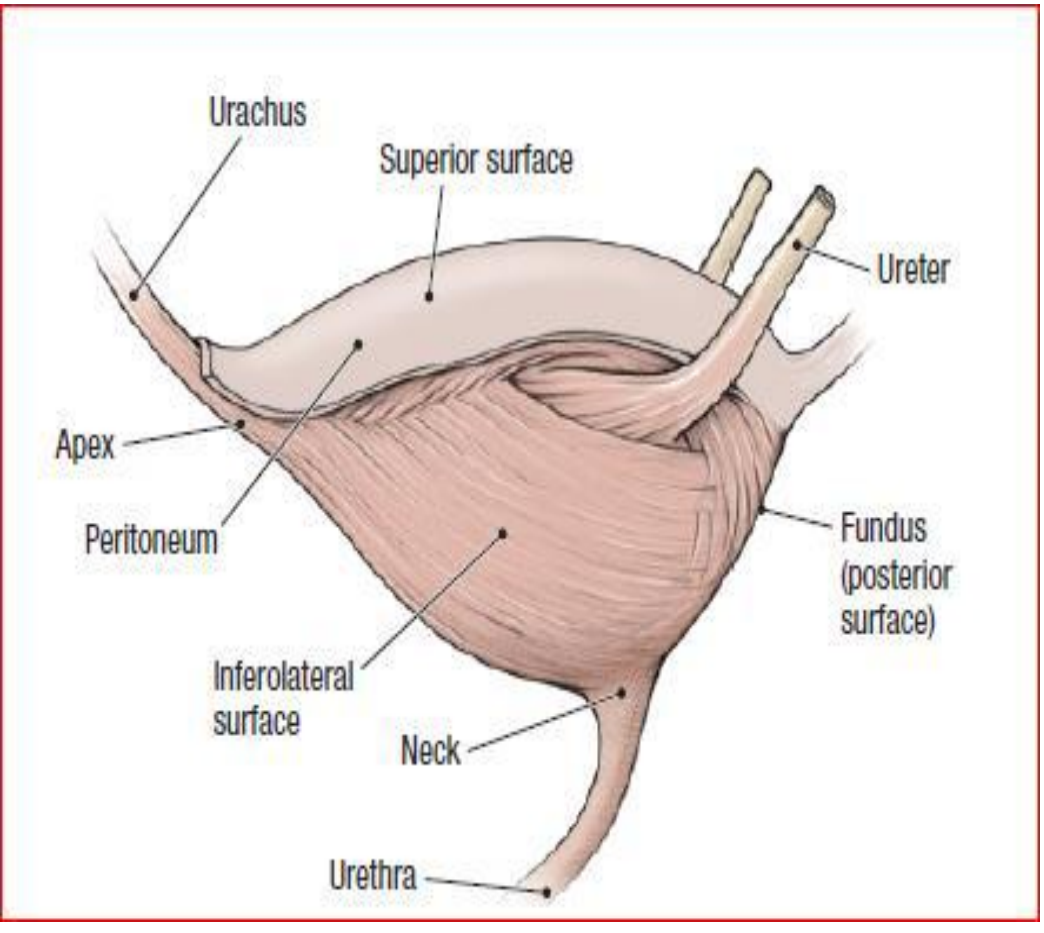
- Has **a base (fundus), neck, apex, a *superior and two inferolateral surfaces.***

- Mean capacity is 220 ml.
- 150-250 ml collection lead to desire to micturition.
- Volume >500 ml caused pain due to its distension.









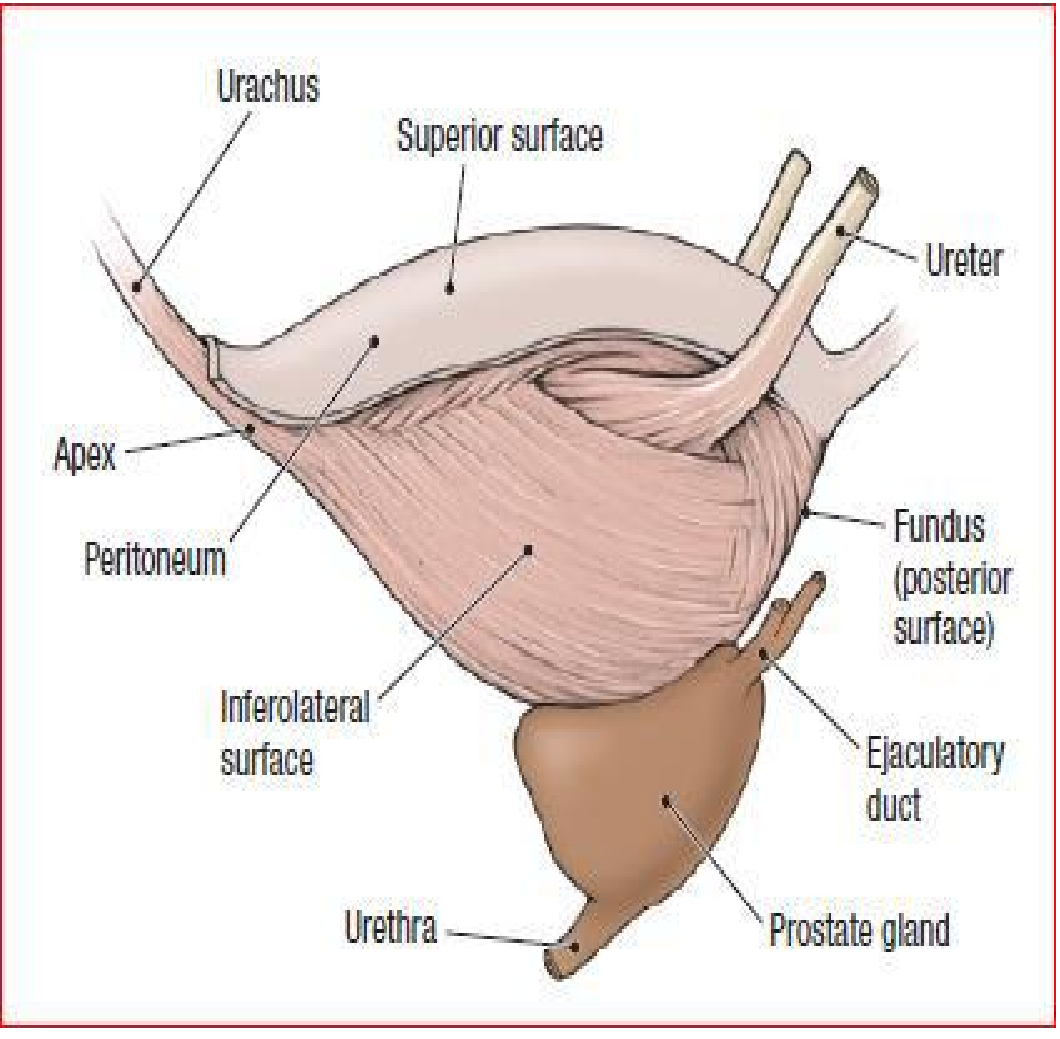
Superior surface-peritoneal
Base: upper part peritoneal
Other : non peritoneal

Surfaces:

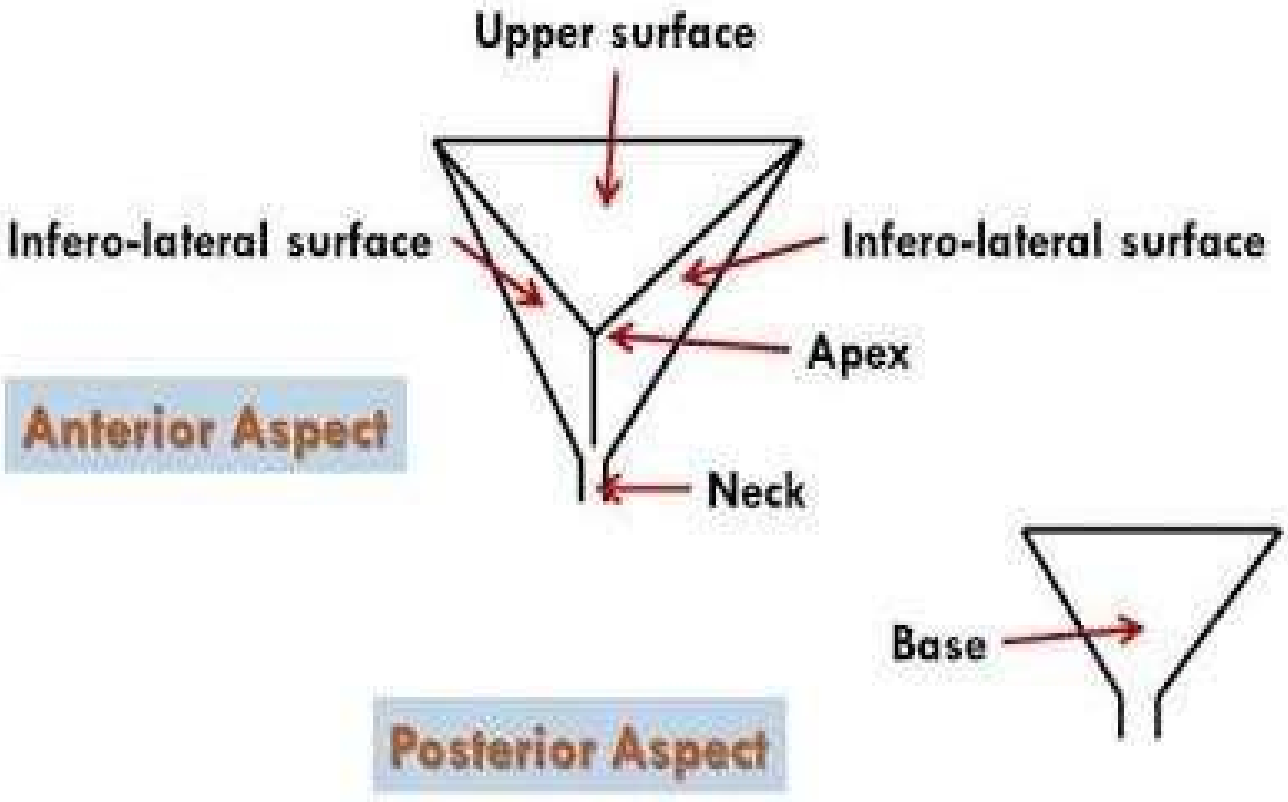
- Superior surface
- Posterior surface (Base)
- Inferolateralsurfaces

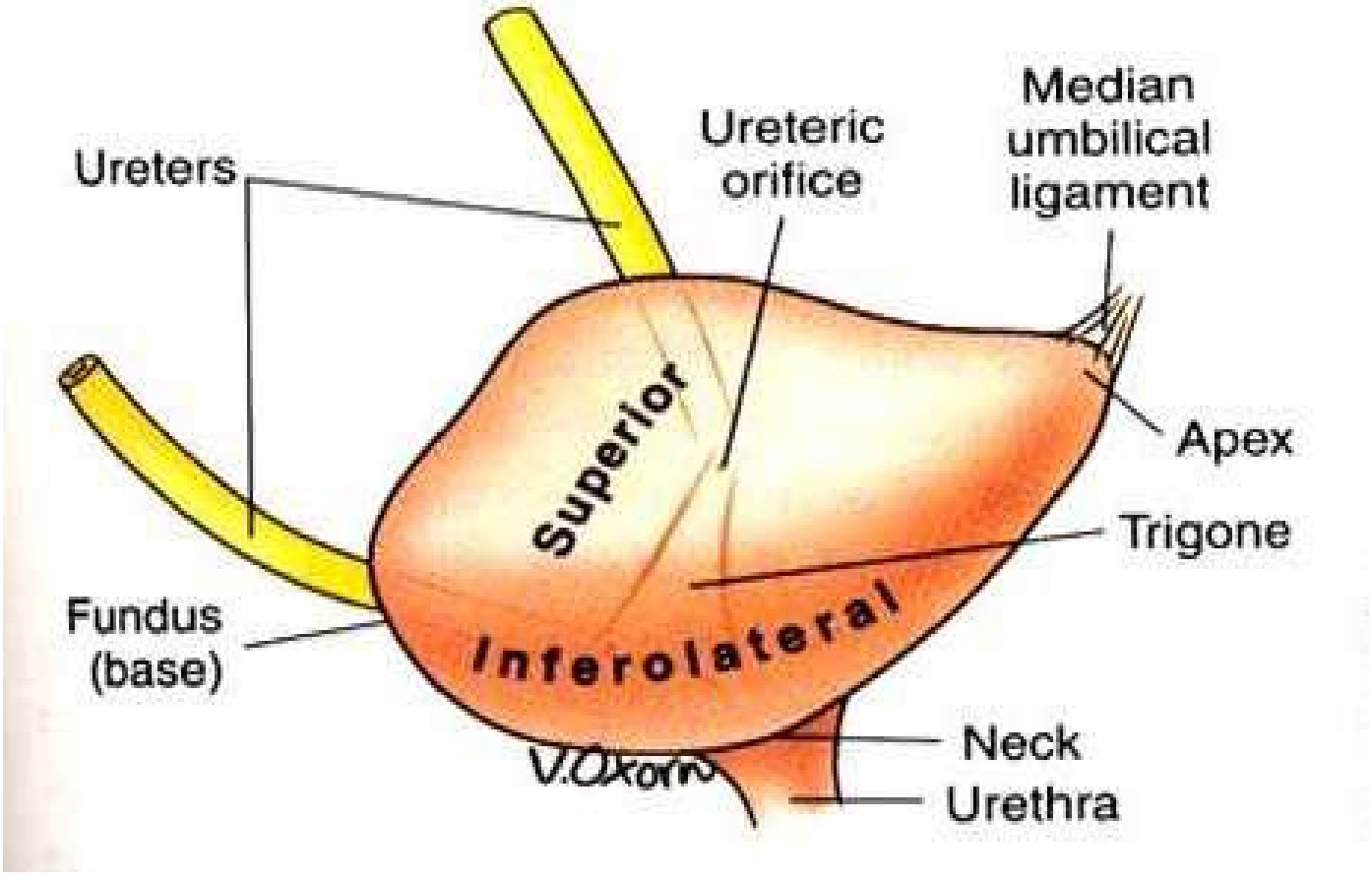
Apex-directed anteriorly

Neck-directed inferiorly

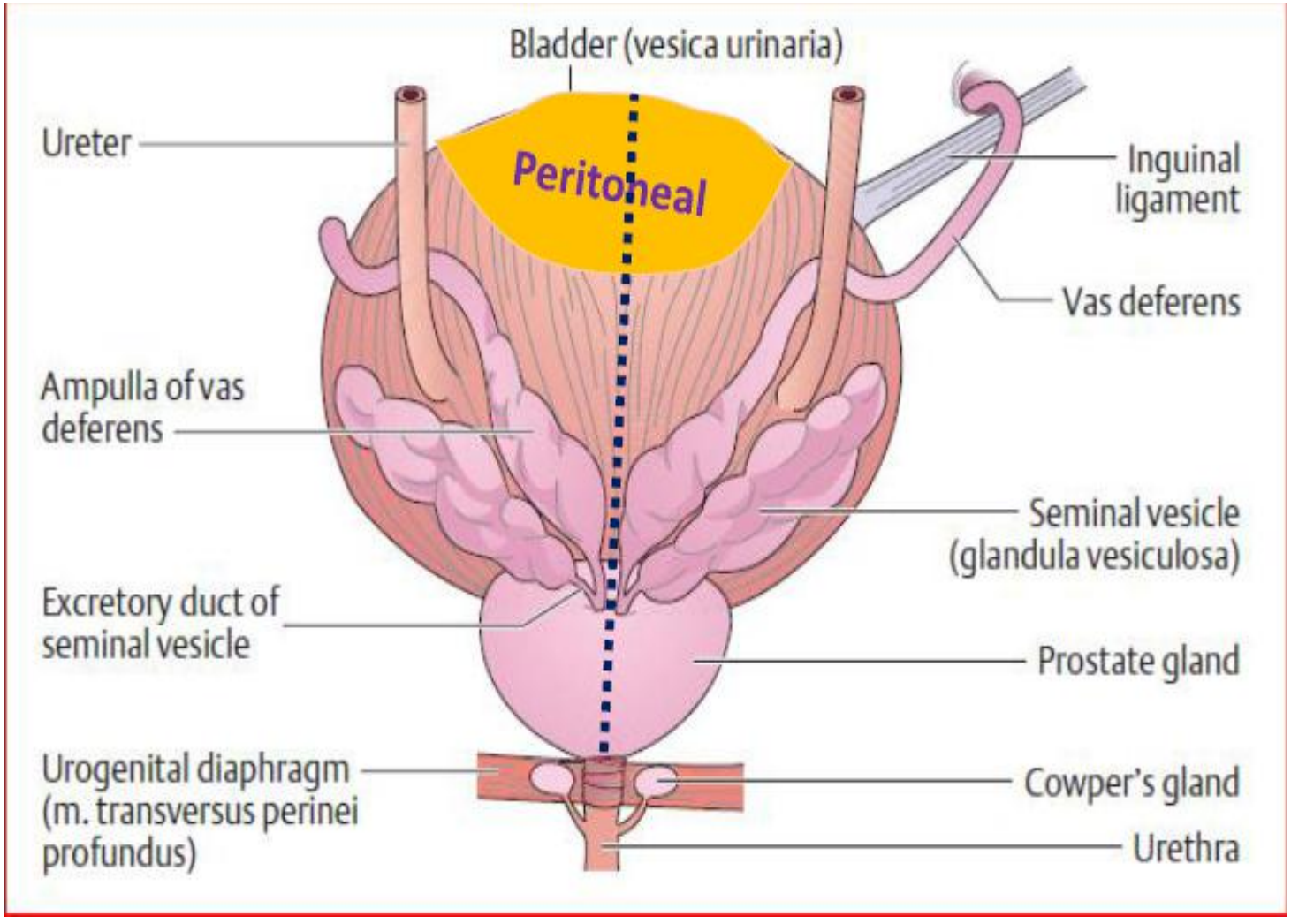


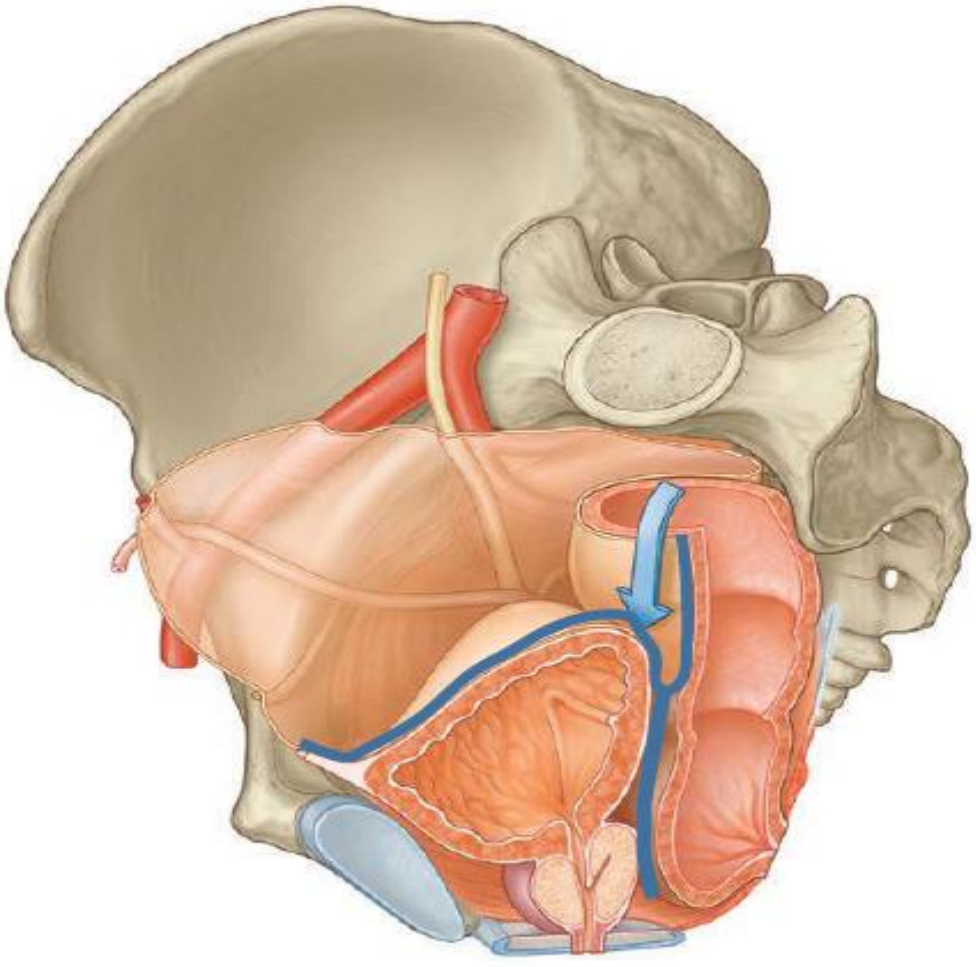
Neck is encircled by prostate in <u>MALES</u>





BASE OF BLADDER(Male)

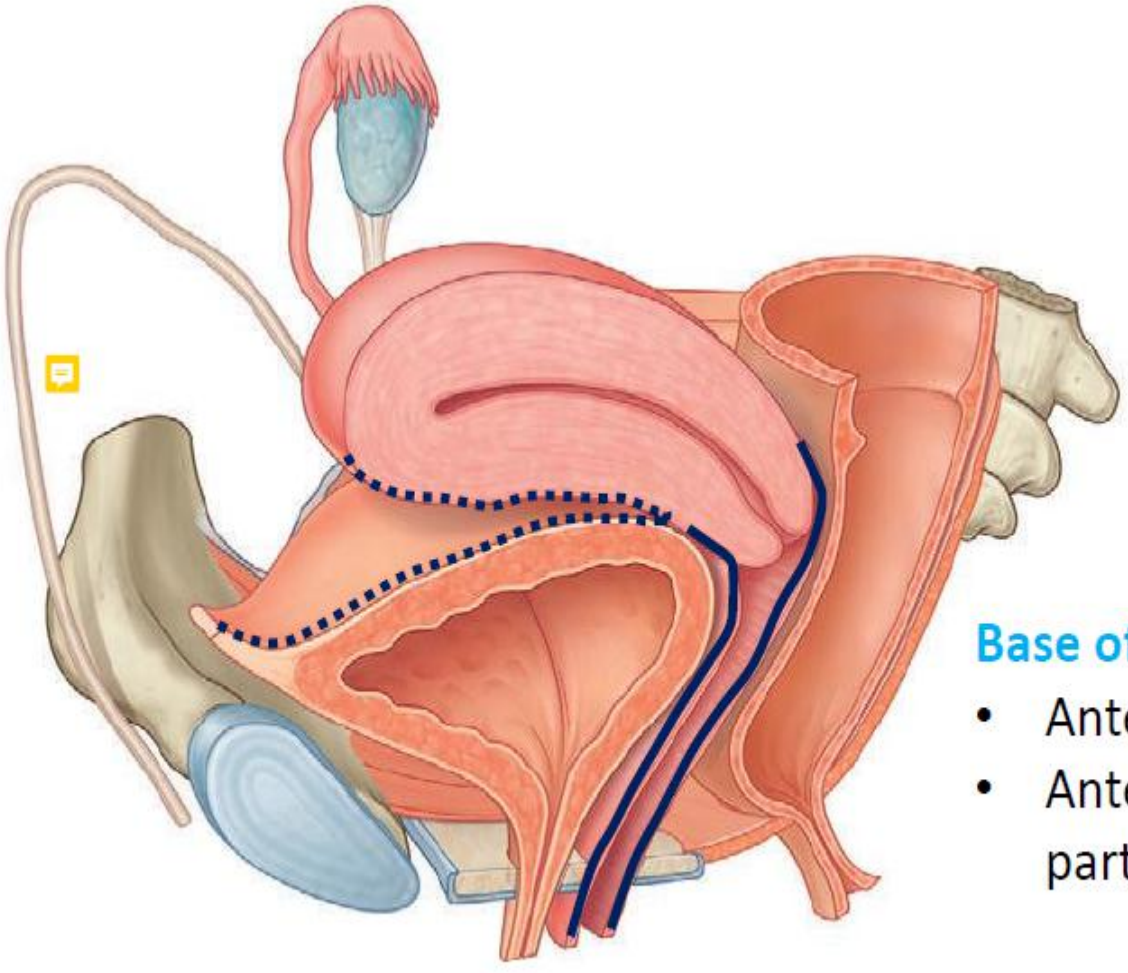




Base of urinary bladder of male

- Rectovesicle pouch
- Seminal vesicle
- Ampulla of vas deference
- Rectovesicle fascia

(Denonvillier’s fascia)



Base of urinary bladder of female

- Anterior vaginal wall
- Anterior wall of supravaginal part of cervix

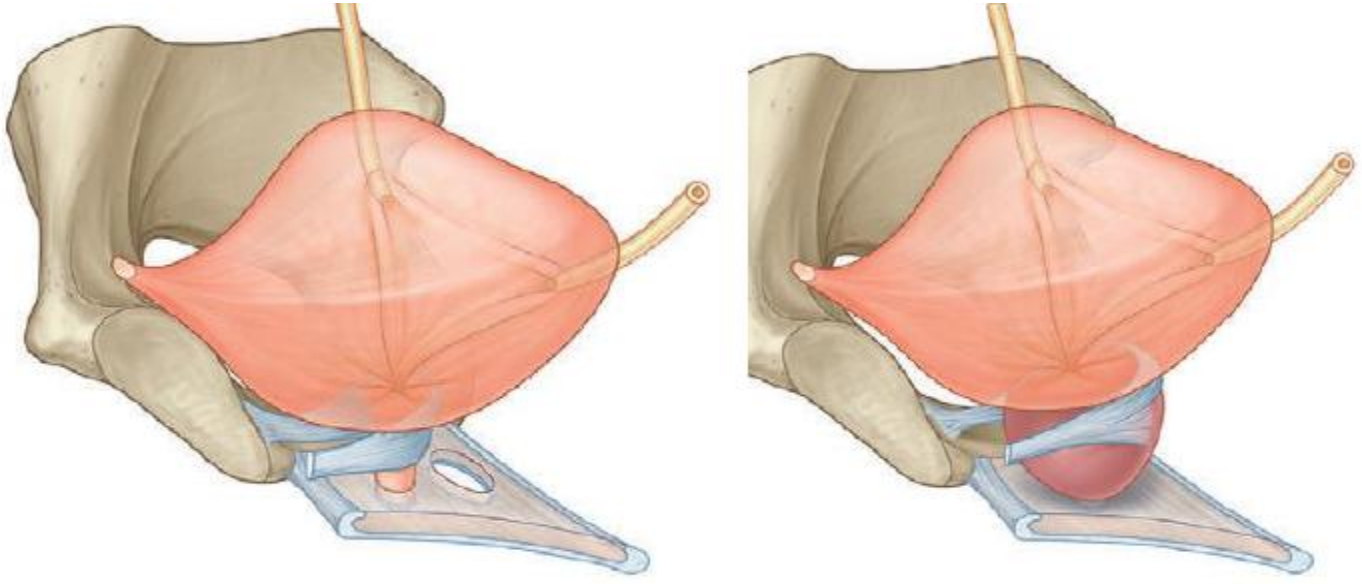
NECK OF BLADDER

- The neck of the bladder surrounds the origin of the urethra.

- The neck is the most inferior and also the most 'fixed' part of the bladder. In male it is surrounded by prostate gland.

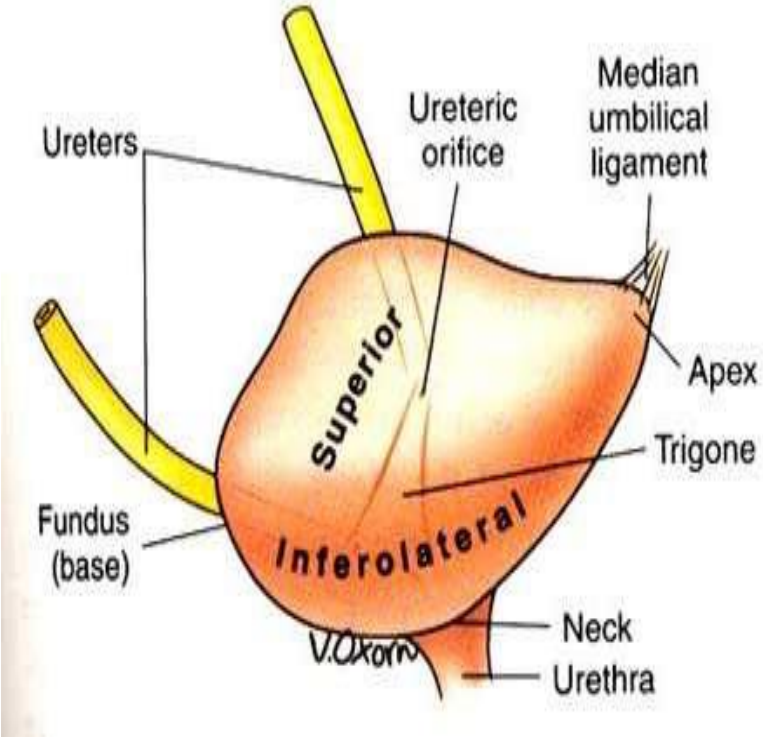
- It is anchored into position by a pair of tough **fibromuscular bands**

- ***pubovesical ligaments in female***
- ***puboprostatic ligaments in male.***



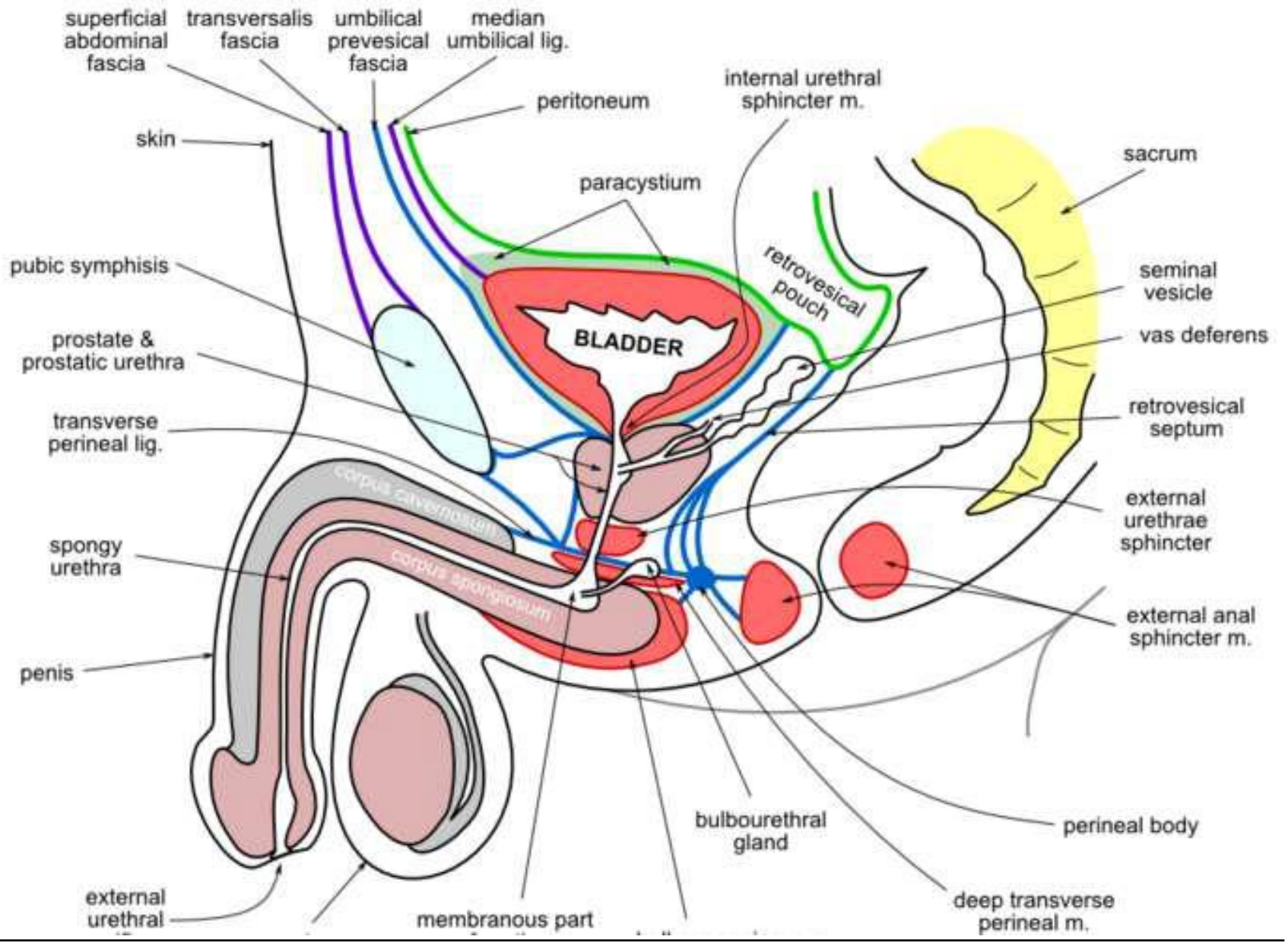
SUPERIOR SURFACE OF BLADDER

Is triangular in shape,bounded on each side by the *lateral borders extending from ureteric orifices* posterolaterally to the apex anteriorly &posteriorly by the *posterior border which joins the ureteric orifices.*

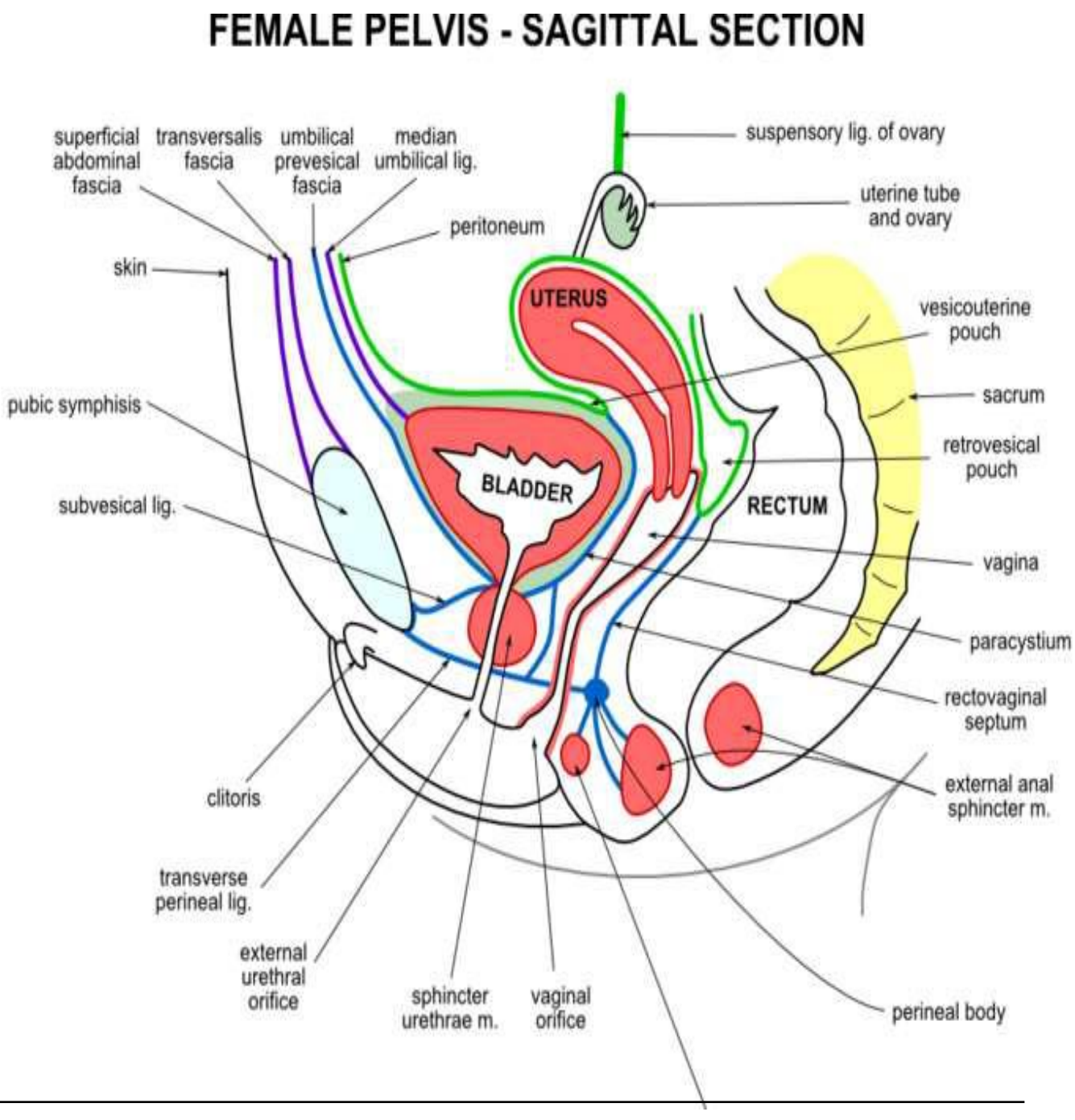


***In the male**, it is completely covered by the peritoneum* which separates it from: **coils of the ileum, and/or sigmoid colon.**Along its lateral borders, the peritoneum is reflected on ~~to the pelvic walls.~~

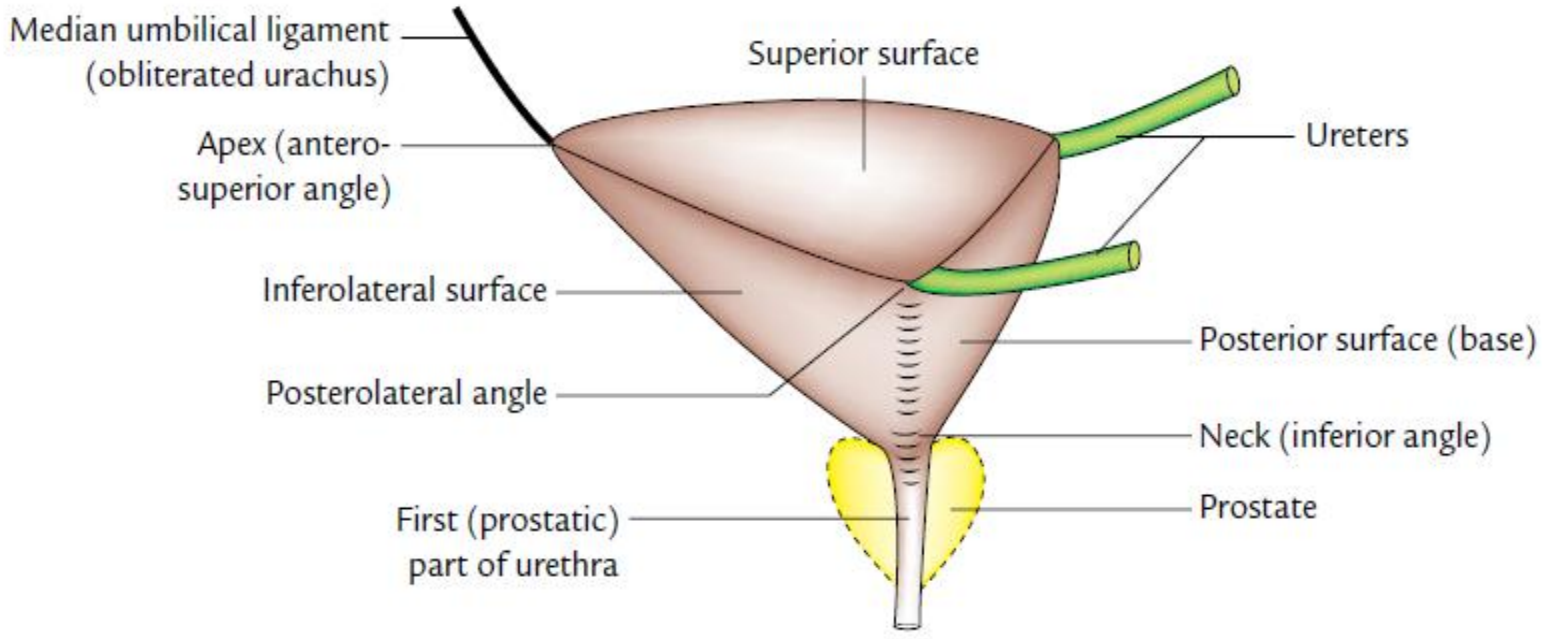
MALE PELVIS - SAGITTAL SECTION



In the female, *it is covered by the peritoneum except for a* small area near the posterior border, which is related to the supravaginal part of the uterine cervix. Here the peritoneum is reflected on to the uterine isthmus forming **vesicouterine pouch.**



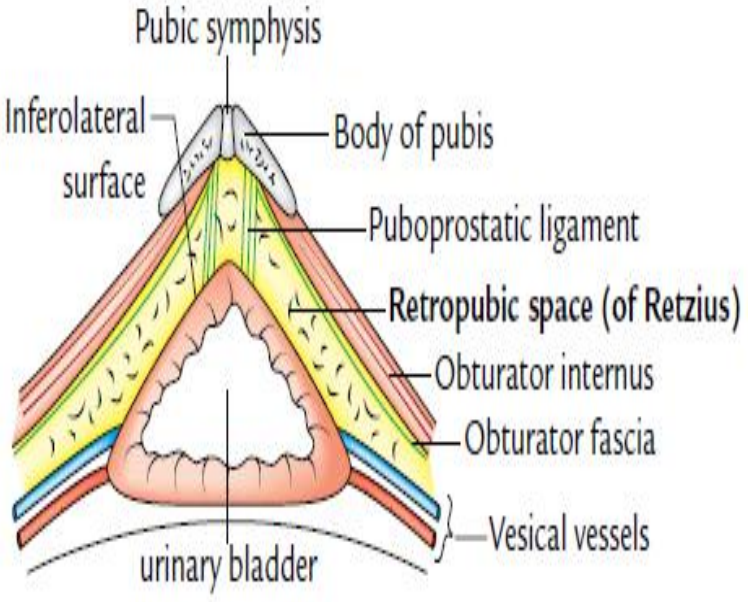
INFEROLATERAL SURFACE OF BLADDER

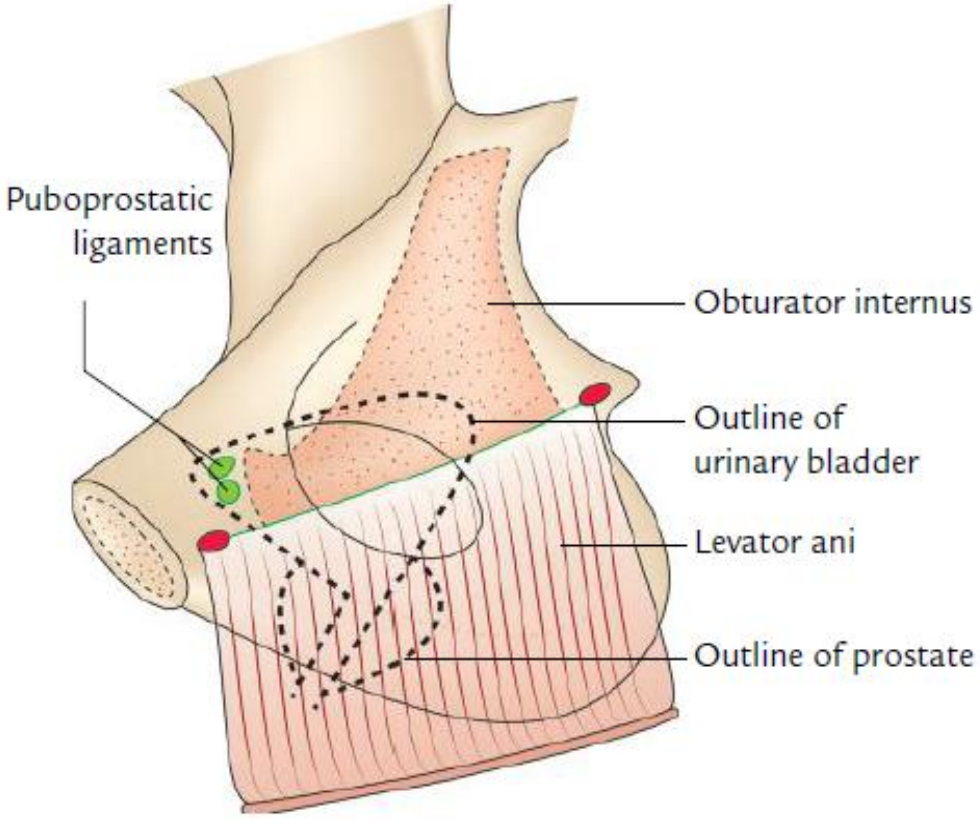


These surfaces are separated from each other,
anteriorly
by the ***anterior border,*** *and from the* ***superior surface*** *by the* ***lateral borders.***

The inferolateral surfaces are devoid of peritoneum

INFEROLATERAL SURFACE OF BLADDER





Medial view of lower part of lateral pelvic wall

RETROPUBIC SPACE(of RETZIUS)

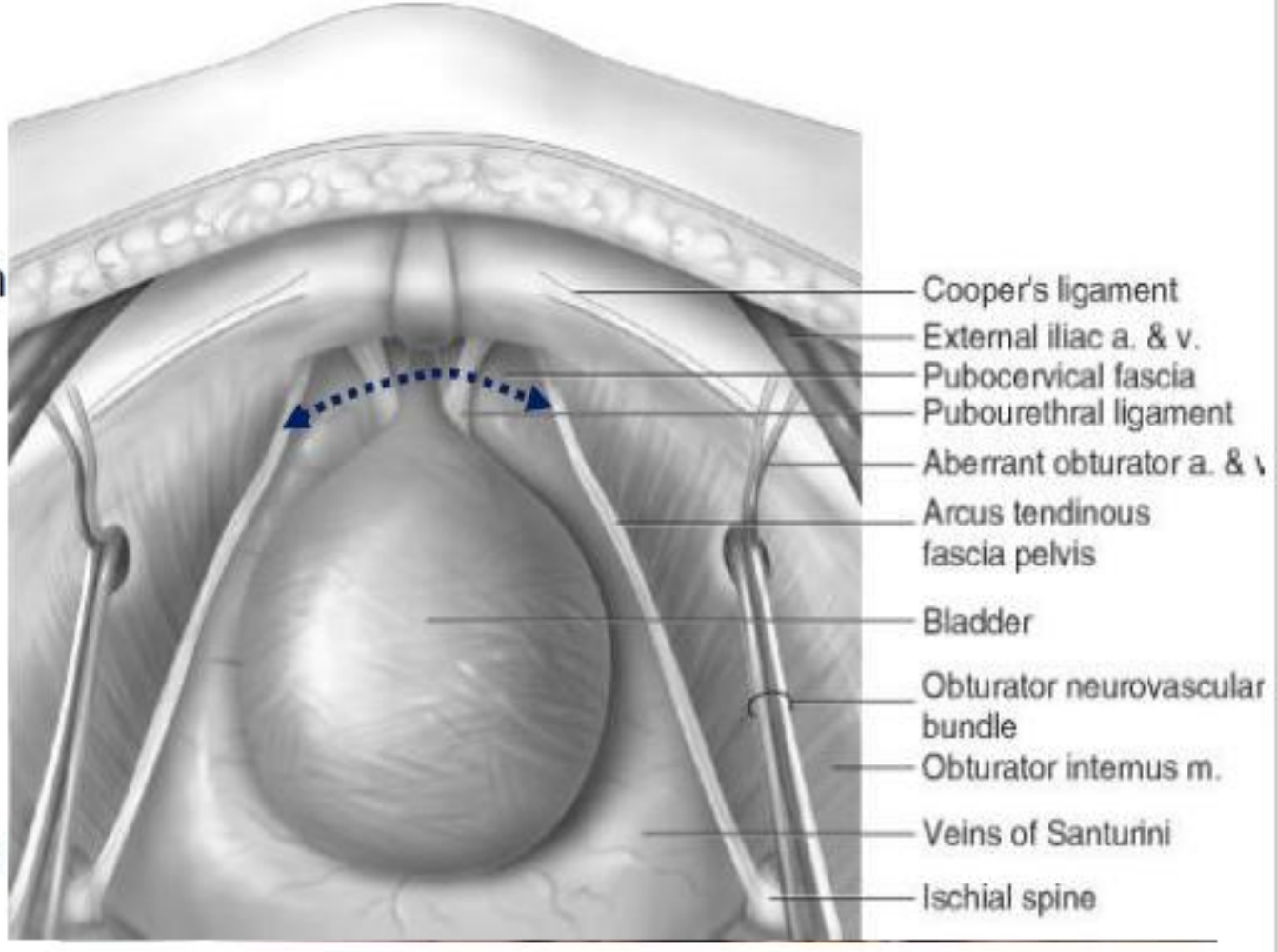
Space of Retzius

Potential space between urinary bladder and pubic symphysis.

Content:

Retro-pubic fat

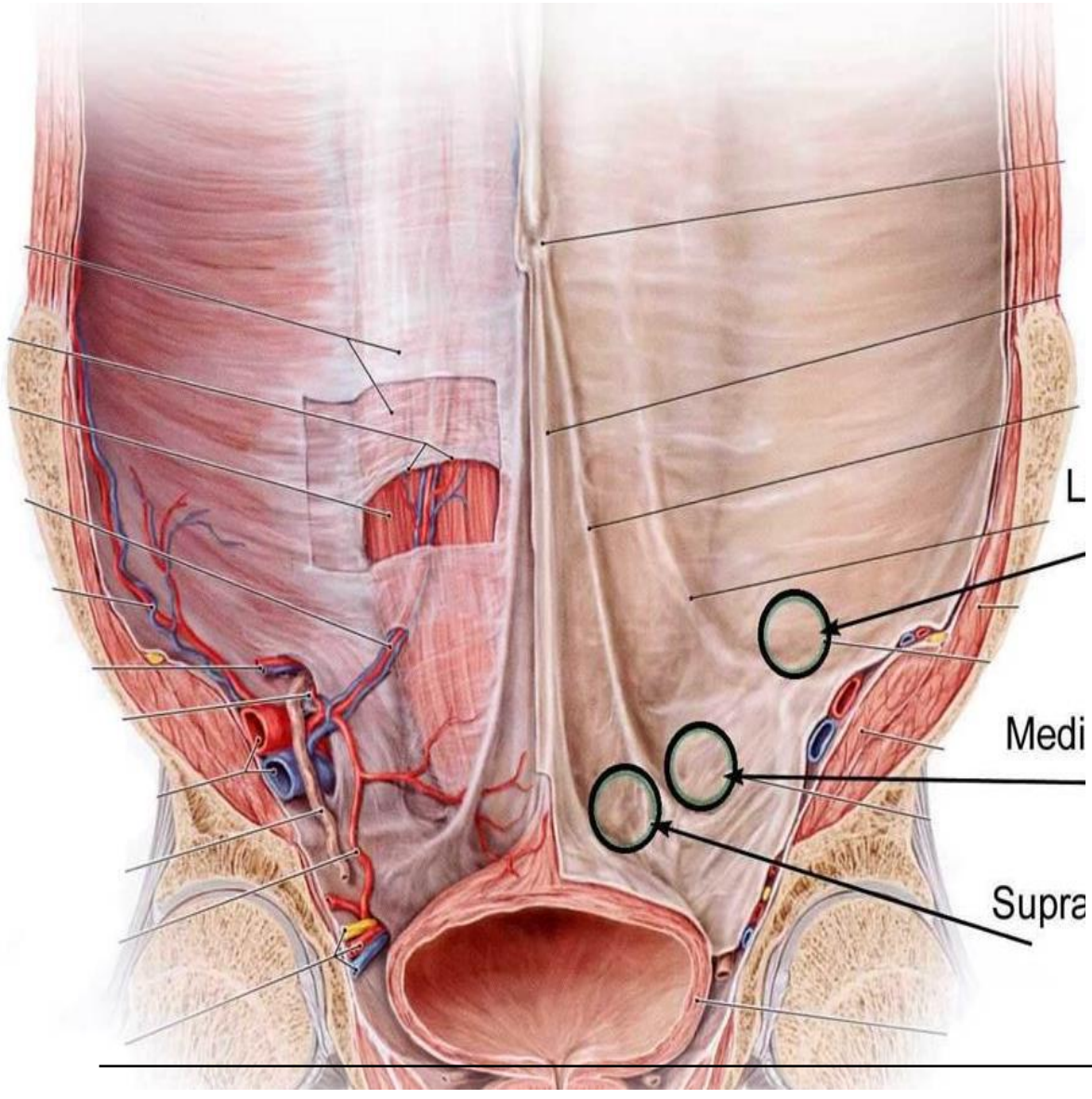
Veicle plexus of vein



RELATIONS OF THE BLADDER

Parts	Relations
Base	• Rectovesical pouch in the male • Vesico uterine pouch in the female • Vasa deferentia and seminal vesicles (separated from the rectum by fascia of Denonvilliers)
Superior surface	• Peritoneal cavity containing loops of ileum • Coils of ileum • Sigmoid colon • Uterine cervix (in female)
Anterior surface (inferolateral surfaces)	• Retropubic space • Puboprostatic ligaments • Obturator internus and levator ani muscles
Apex	Median umbilical ligament
Neck	• Prostate gland (in male) • Urogenital diaphragm (in female)

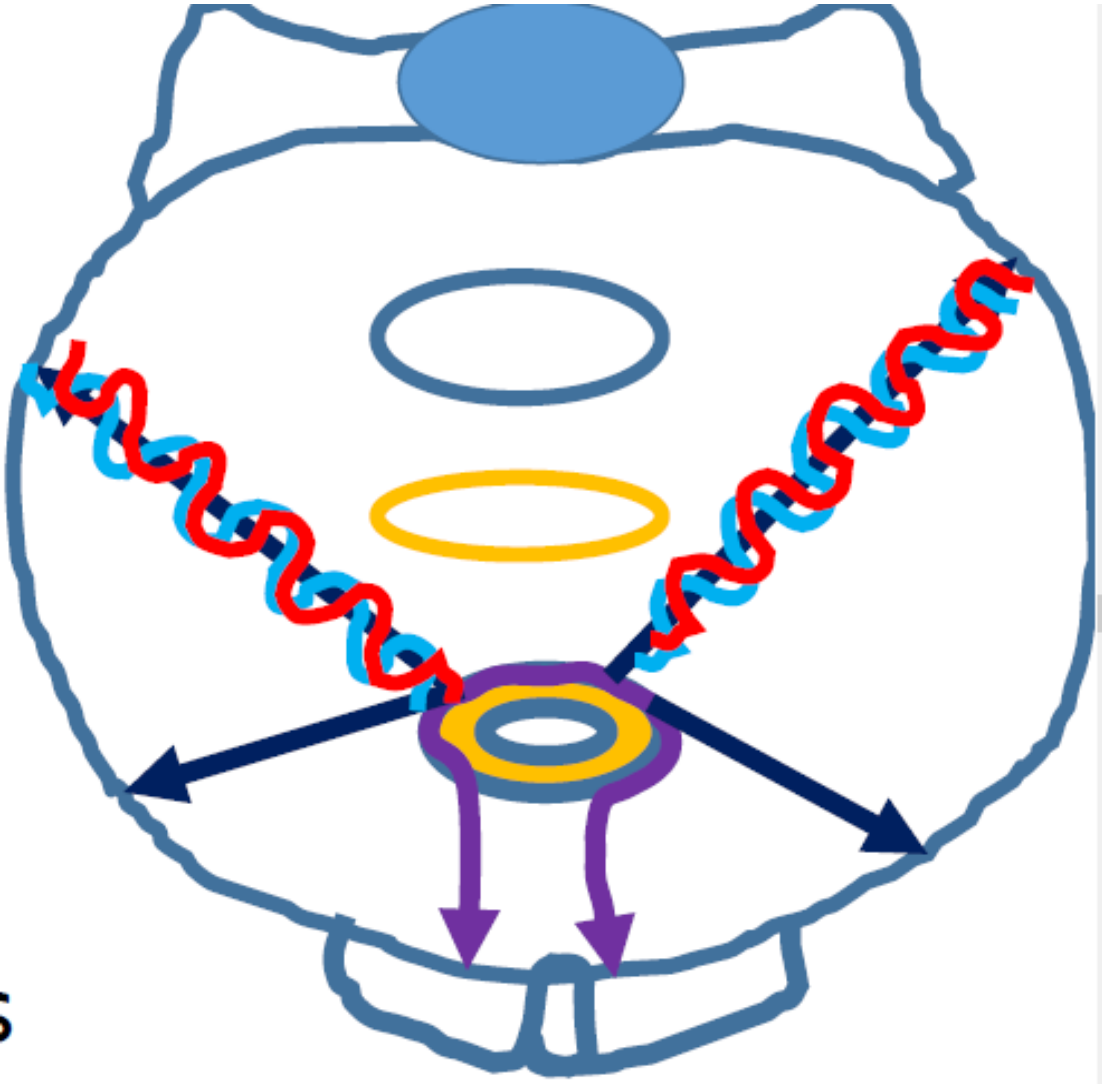
SUPPORTS OF THE BLADDER



False ligaments

1. Median umbilical fold
2. Medial umbilical fold
3. Lateral false ligaments
4. Posterior false ligaments

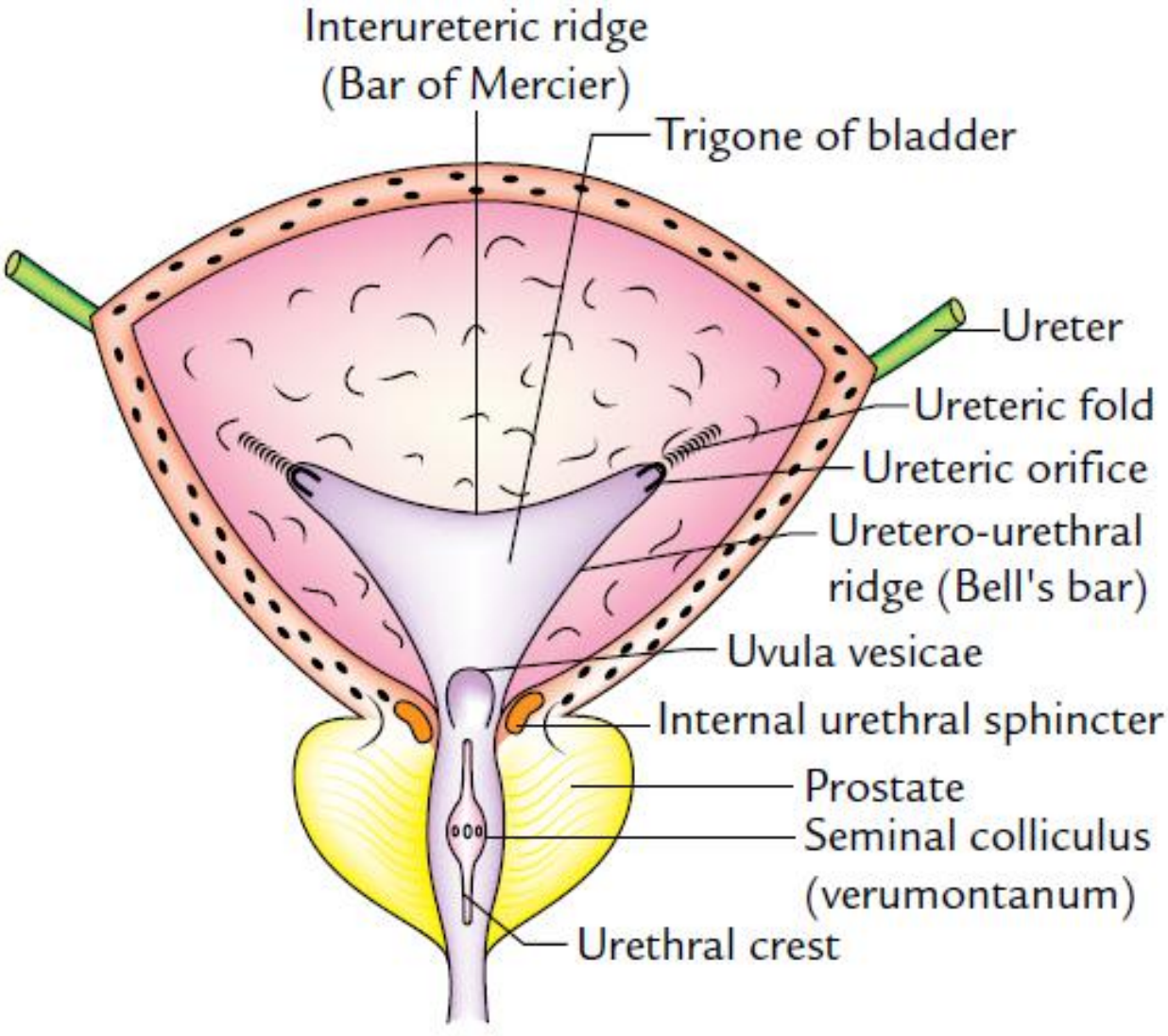
SUPPORTS(contd..)



True Ligaments

- Puboprastatic or Pubovesicle ligament
- Lateral ligament
- Posterior ligament
- Median umbilical ligament

INTERIOR OF BLADDER



coronal section.

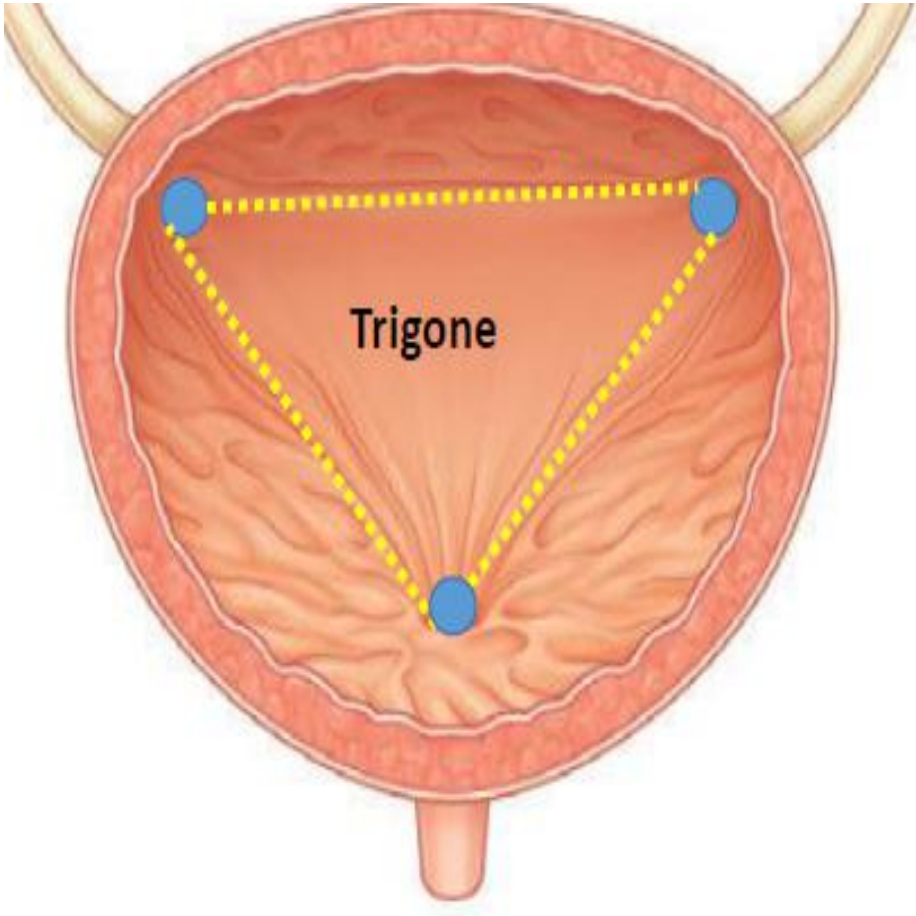
TRIGONE OF URINARY BLADDER

- It is smooth triangular part of urinary bladder.

- Mucosal lining of trigone is smooth and firmly attached to the underlying wall of the bladder.

- Formed by Right and left ureteral orifices.

- Once the trigone of urinary bladder is stretched to a certain degree, siganl is sent to the brain that bladder needs to be emptied.

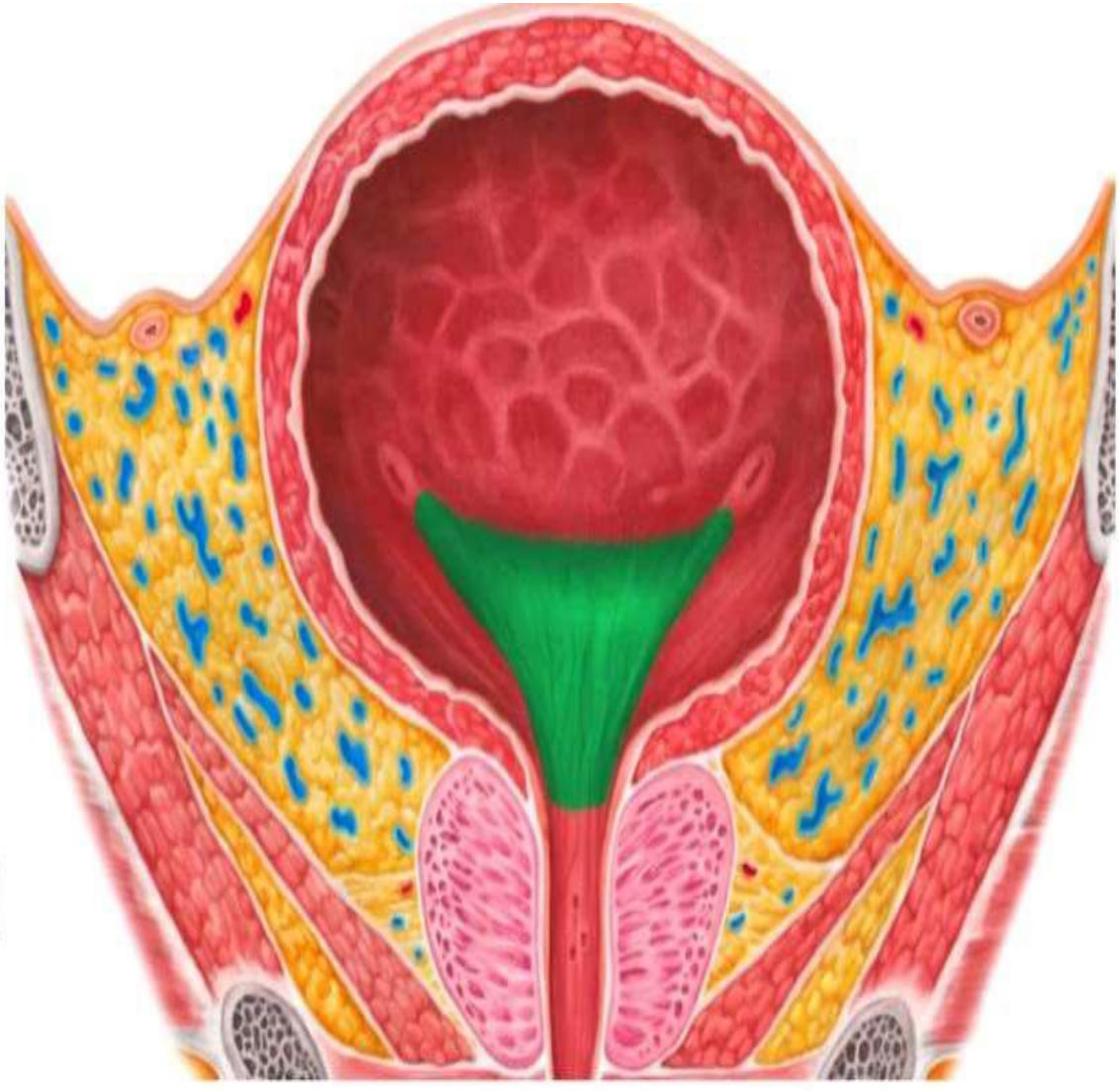


Trigone of urinary bladder

LATIN
Trigonum vesicae urinariae

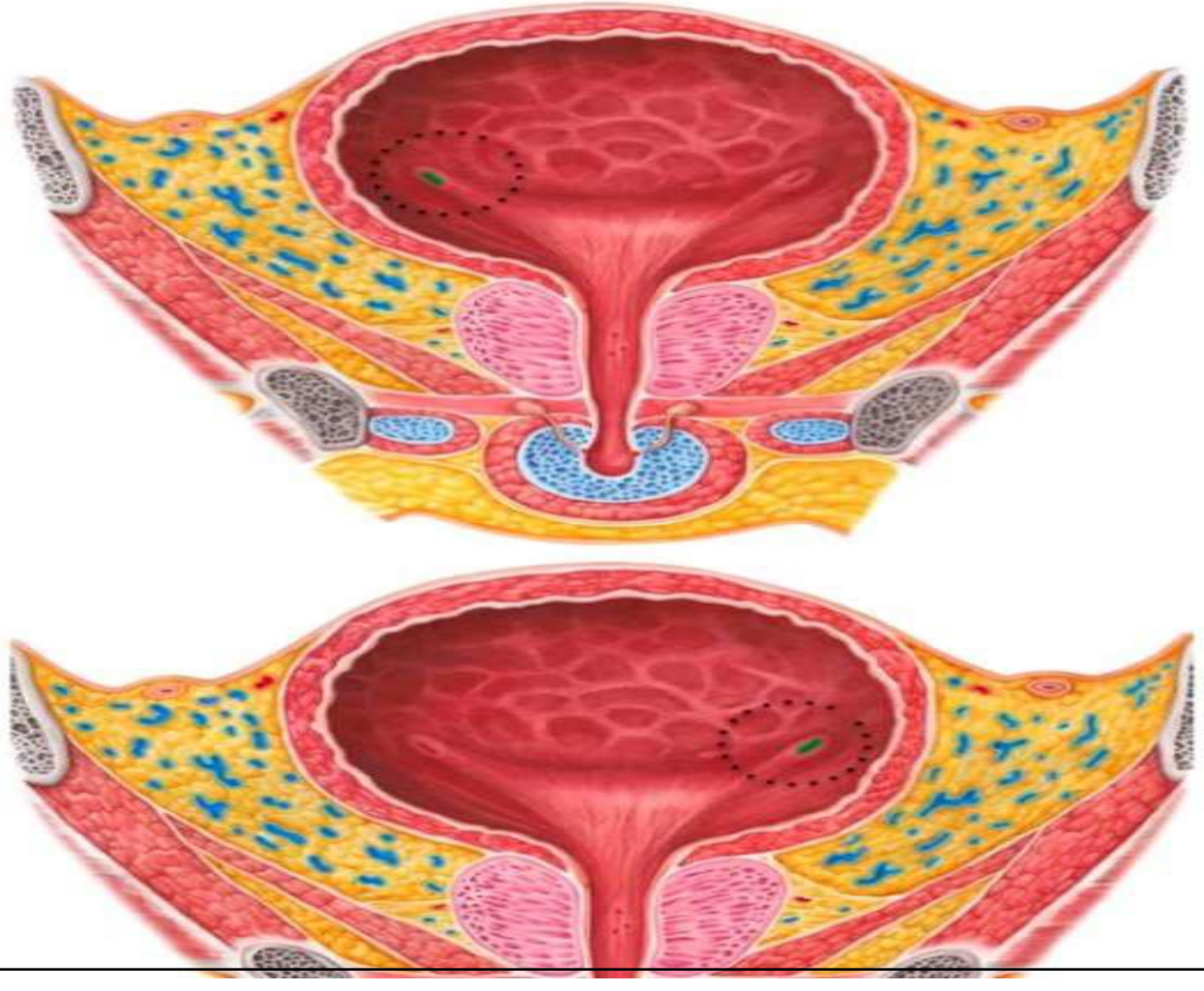
Triangular

Formed by the left and right ureteral orifices.



URETERAL ORIFICES

▸ These are Slit like openings through which ureters enter the bladder on the posterolateral angles of the trigone of urinary bladder.



MERCIER'S BAR

- It is a mucous membane present between the two ureteral orifices.

- It is also called **"InterUreteral Fold"**

Mercier's bar

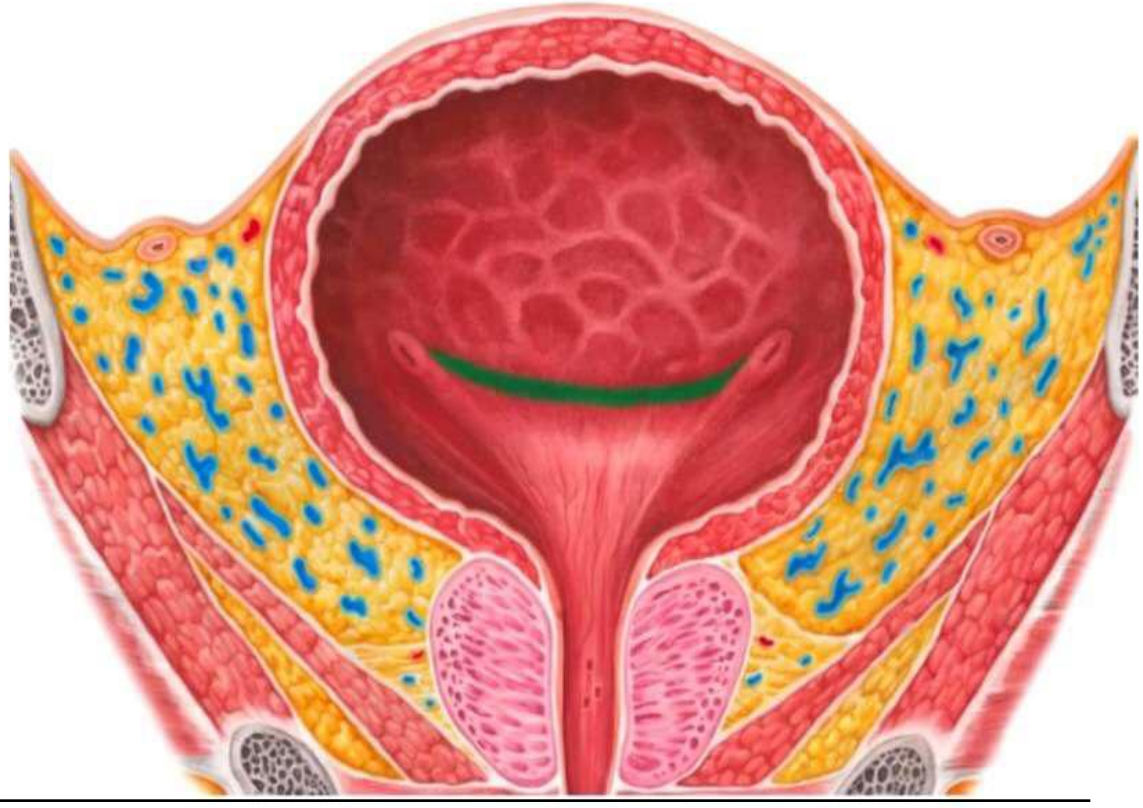
Interureteral fold

LATIN

Plica interureterica

Mucous membrane

Between the two ureteral orifices



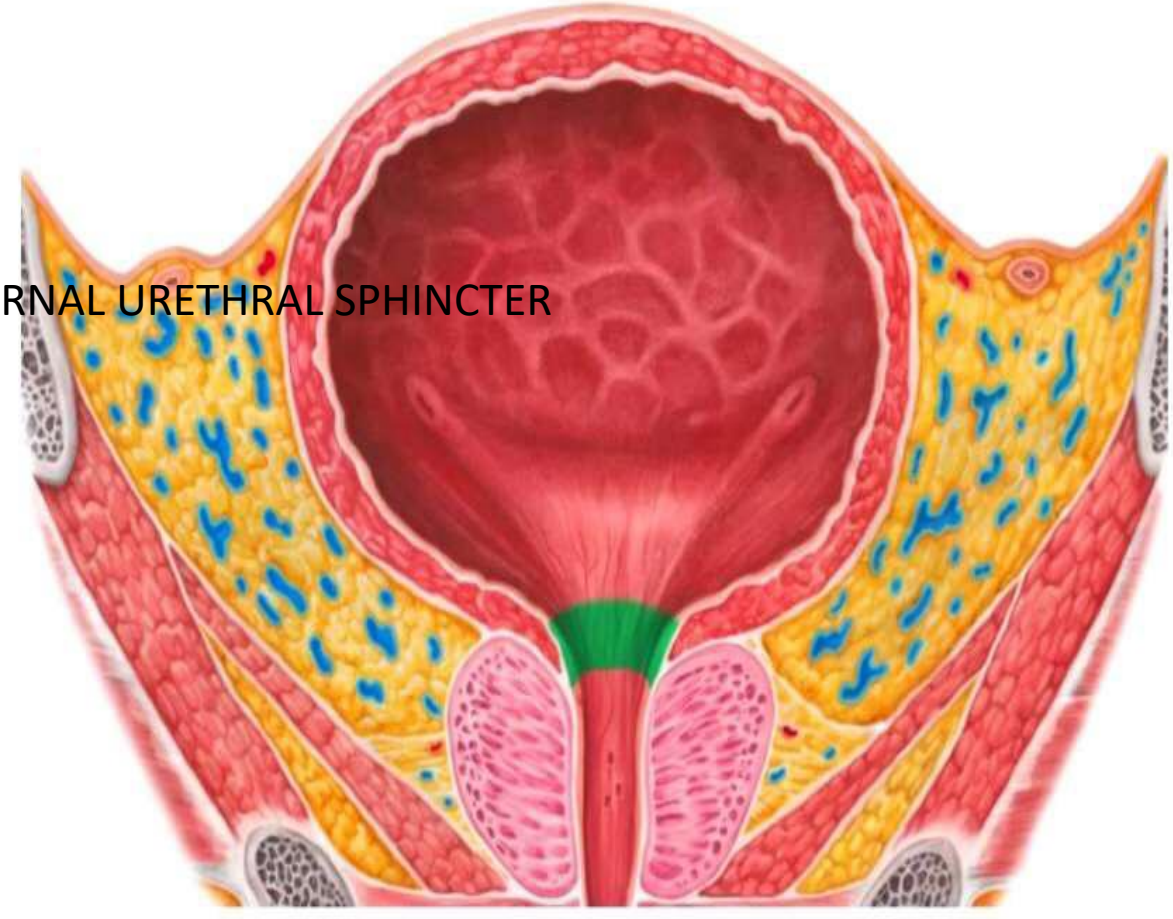
NECK OF URINARY BLADDER

- It is the lowest portion of the bladder through which the "Urethra" arises.

Neck of urinary bladder

LATIN

Cervix vesicae urinariae



INTERNAL URETHRAL SPHINCTER

- It is comprised of smooth muscle that is located at the junction of urethra and the urinary bladder.
- It is innervated by S2-S4 nerves of the pelvic plexus.
- It's function is to constrict the internal urethra ,preventing the urine leakage and also prevents the Retrograde ejaculation (Ejaculatory Reflex) of semen into the bladder.

Internal urethral sphincter

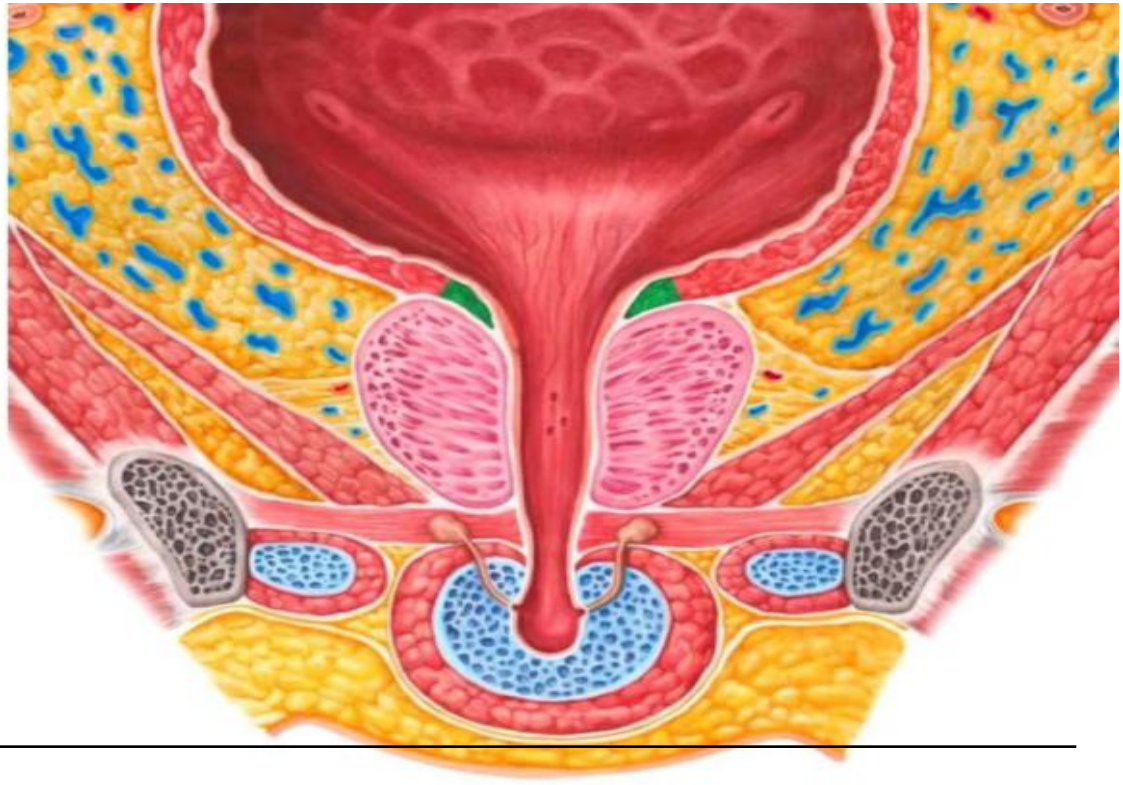
LATIN

Musculus sphincter urethrae internus

Smooth muscle

Innervation:

S2-S4 nerves



DETRUSOR MUSCLE

- It is also referred as " Muscularis Propria“.

- It is smooth muscle , found around the wall of bladder ,comprised of inner and outer longitudinal, and middle circular layer.

- This muscle is relaxing during accomulation of urine in the bladder, and contracts only during urination to void and empty the bladder.

Detrusor urinae muscle

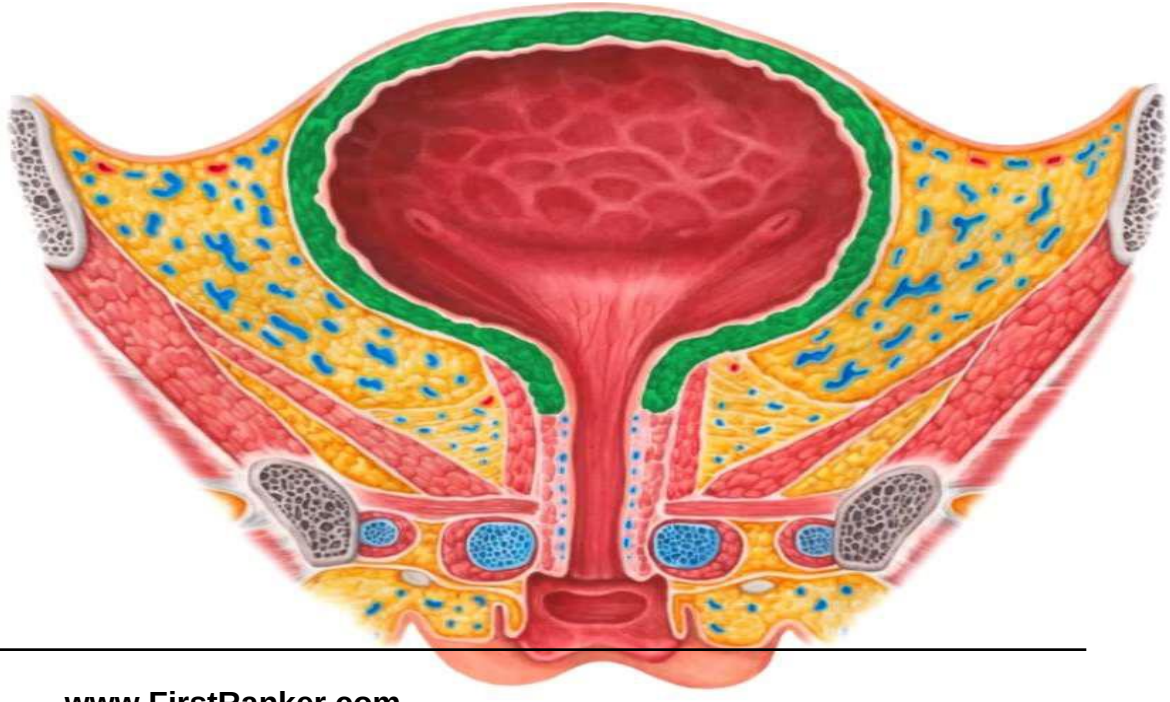
LATIN

Musculus detrusor vesicae

Muscularis propria

Inner and outer longitudinal layer

Middle circular layer

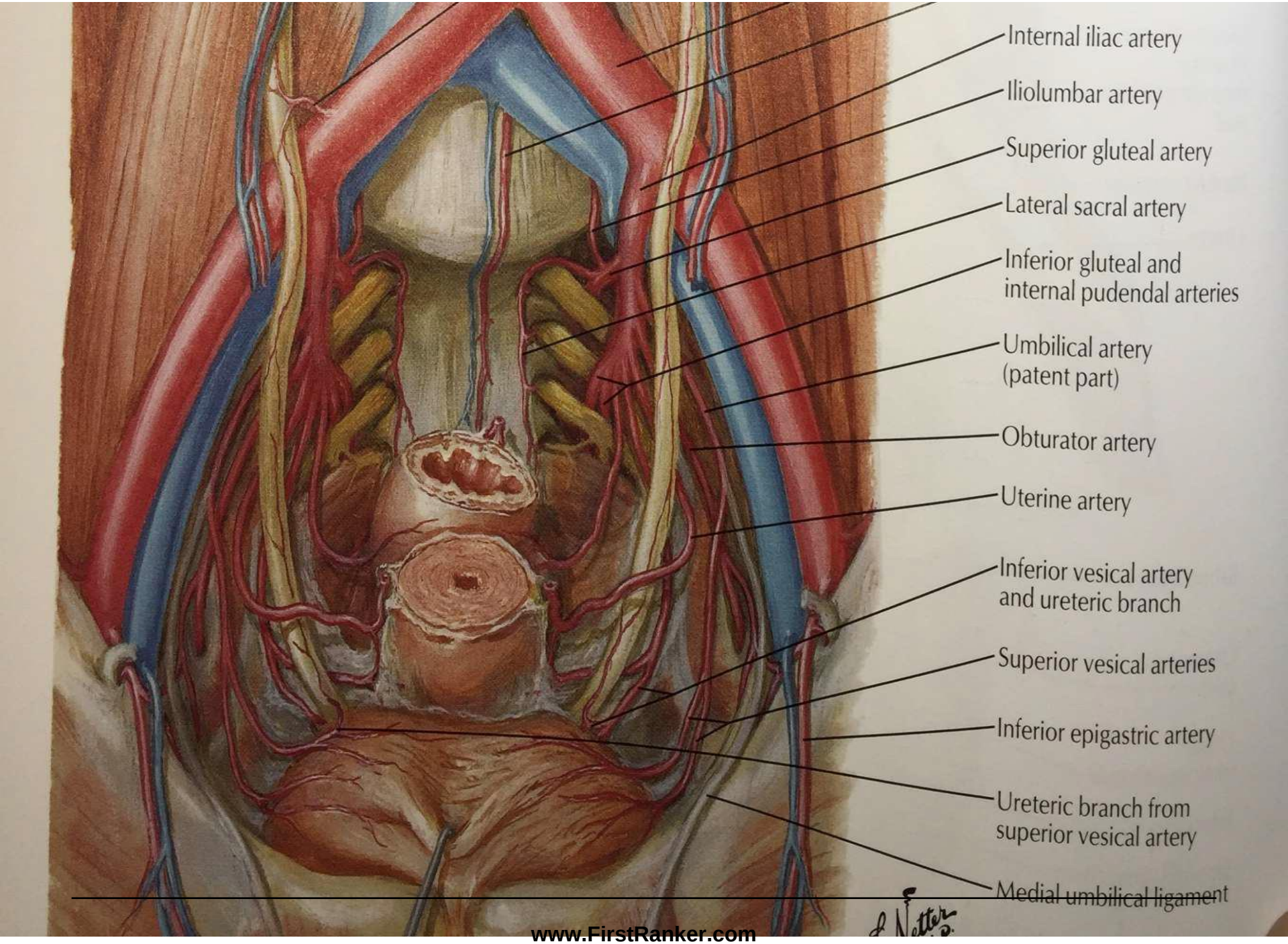


ARTERIAL SUPPLY

- Branches of internal iliac arteries.

- Superior vesical arteries supply anterosuperior parts of the bladder.

- In males, inferior vesical arteries supply the fundus and neck of the bladder.
- In females, vaginal arteries replace the inferior vesical arteries and small branches to posteroinferior parts of the bladder.
- Obturator and inferior gluteal arteries also supply small branches to the bladder.

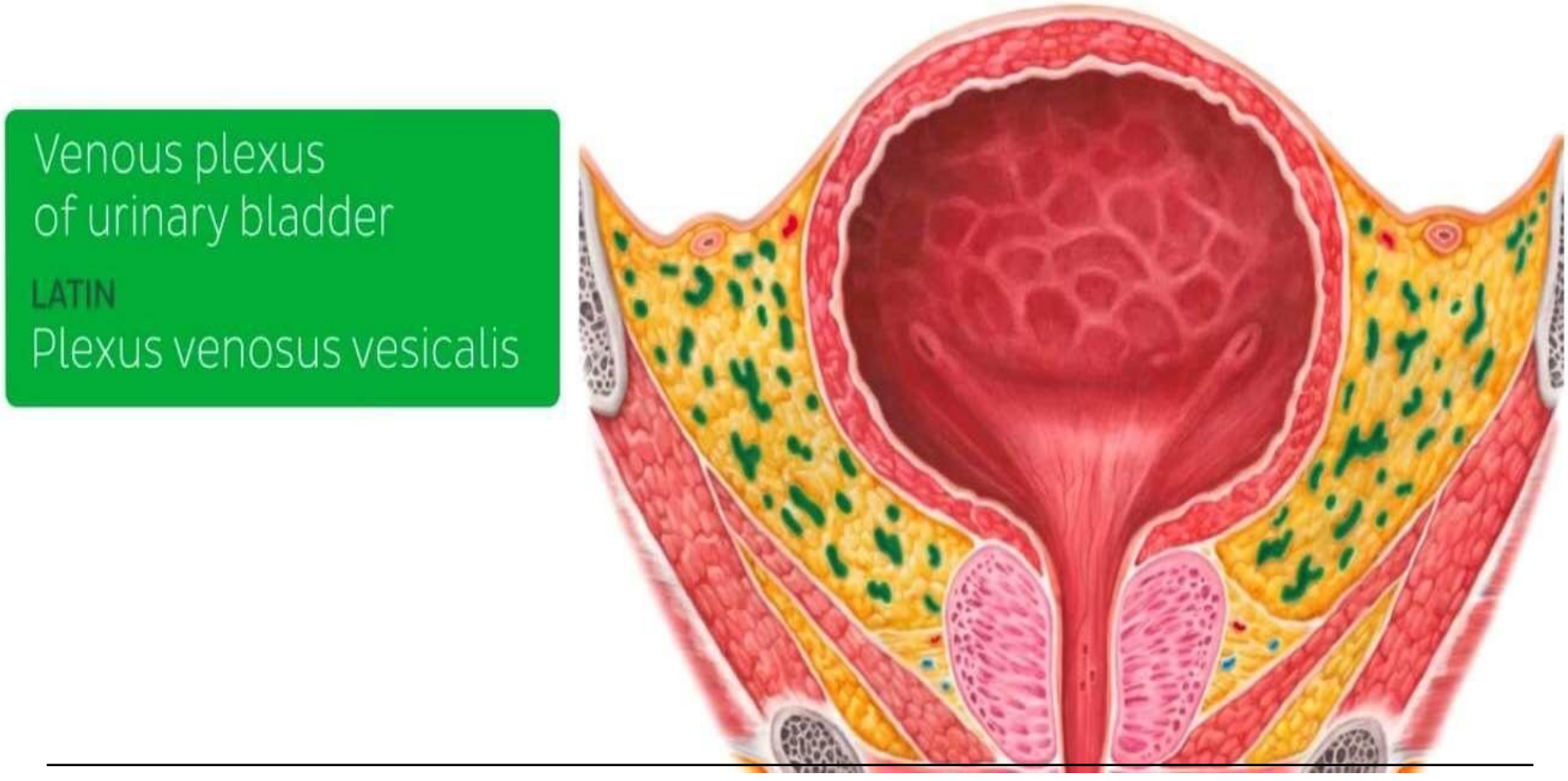


VENOUS DRAINAGE

- The veins draining from the bladder correspond to the arteries

.

- Veins from the Vesical venous plexus drain into the internal iliac veins.



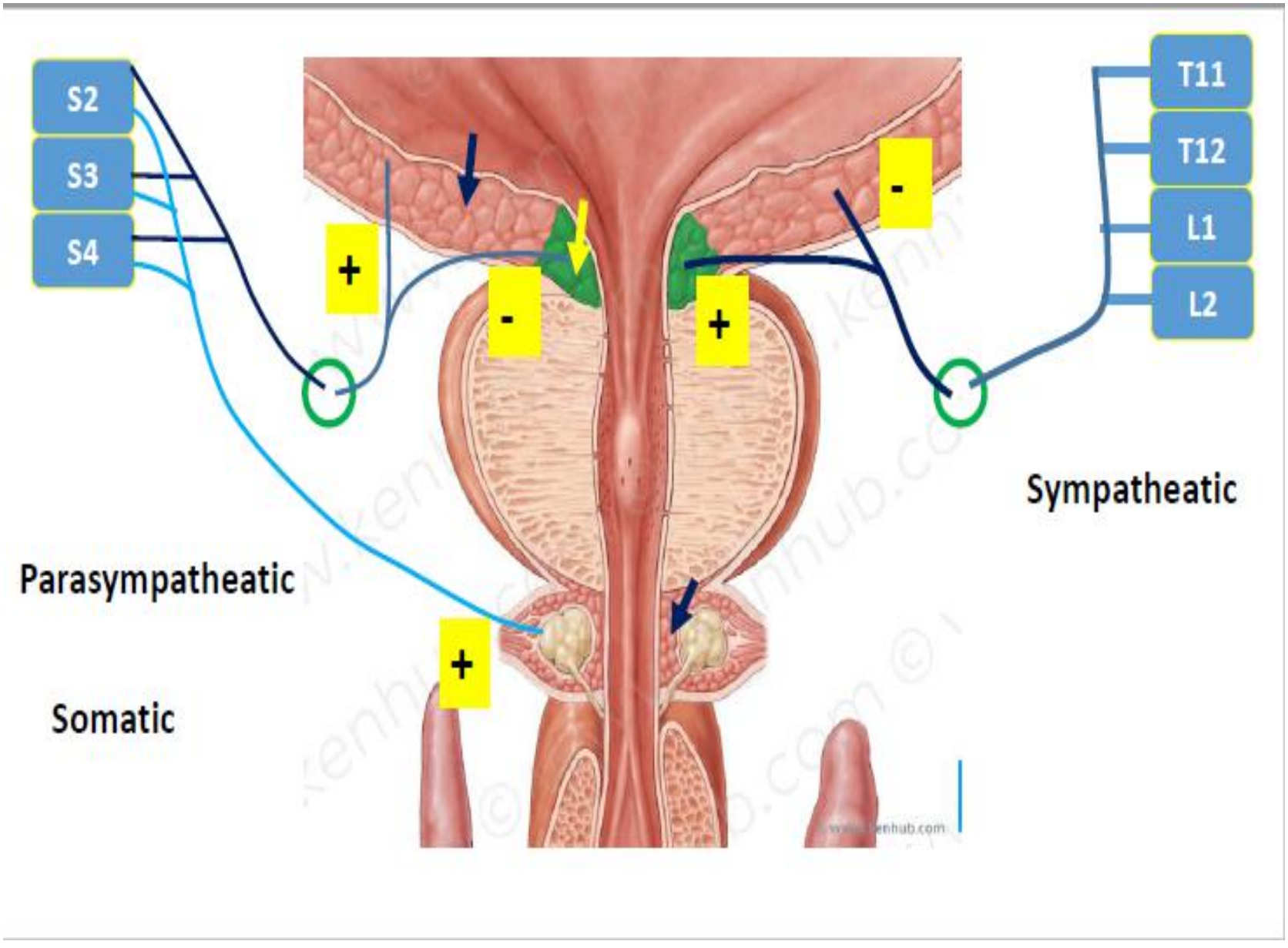
INNERVATION OF URINARY BLADDER

▸ Pelvic Nerve (Parasympathetic nerve) comes from the sacral region of spinal cord. It is not under our control. It causes contraction of the Detrusor muscle.

▸Pudendal nerve (Somatic nerve) causes contraction of External Sphincter. We are firing pudendal nerve when we are trying to hold our urine.

▸Hypogastric nerve (Sympathetic nerve) causes relaxation of Detrusor muscle and contraction of Internal sphincter.

▸ Afferent Pelvic nerve that is sensory and comes from the detrusor muscle. It is stimulated when the bladder is stretched.



LYMPHATIC DRAINAGE OF BLADDER

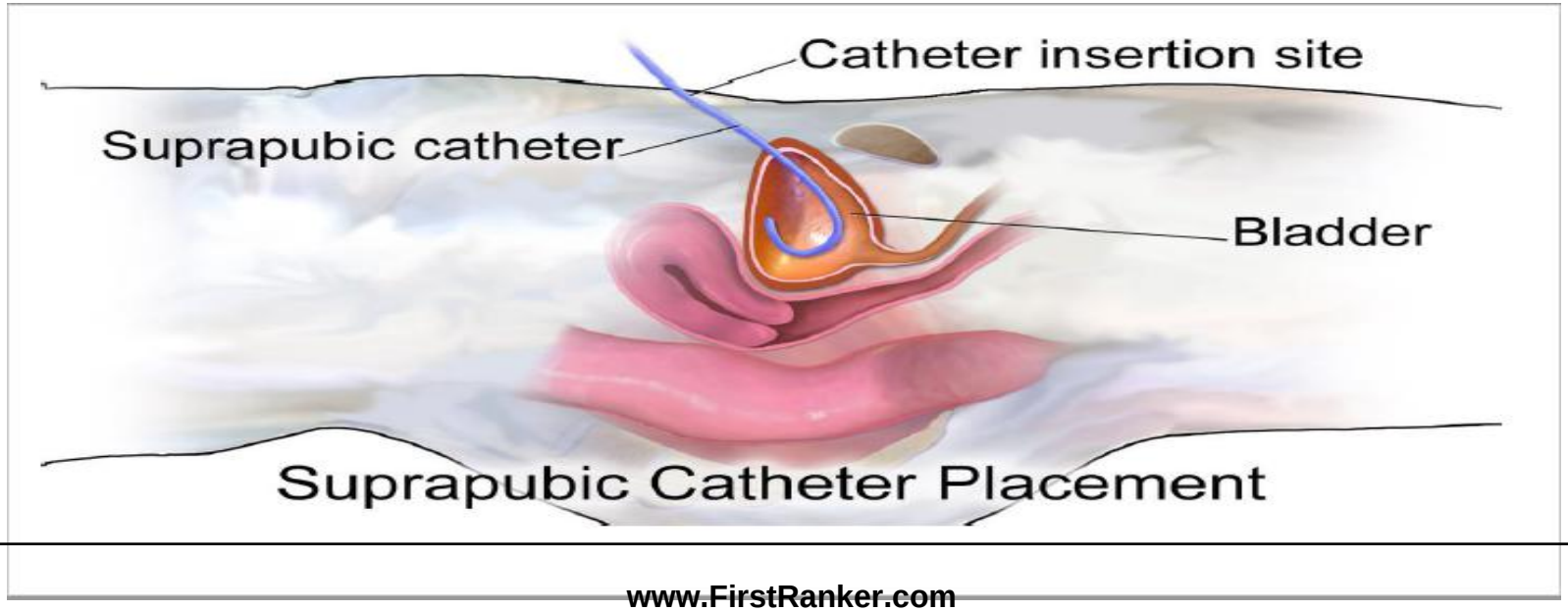
- In both sexes, lymphatic vessels leave the superior surface of the bladder and pass to the "External iliac lymph nodes".

- Those from fundus pass to the "Internal iliac lymph nodes".

- Some vessels from the neck of bladder drain into the "Sacral" to "Common iliac lymph nodes".

APPLIED ANATOMY

1. Trabeculated bladder- due to chronic obstruction to the outflow of the urine by enlarged prostate or stricture of the urethra.
2. Suprapubic cystostomy-An extraperitoneal approach of opening the cavity of the urinary bladder.



APPLIED ANATOMY

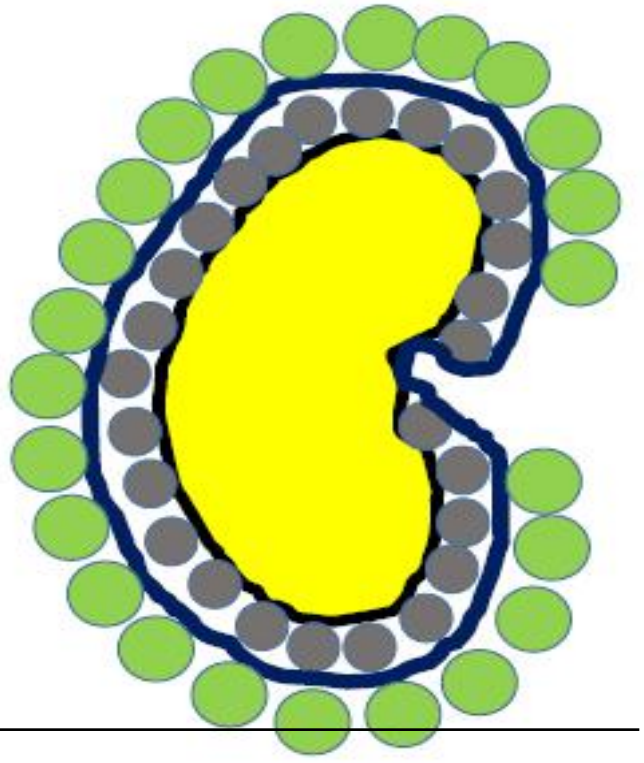
3. Neurogenic bladder

a. Automatic reflex bladder.

b. Autonomous bladder

Coverings of Kidney

- Fibrous capsule (true capsule)
- Perinephric fat
- Renal fascia(fascia of Gerota)
- Paranephric fat

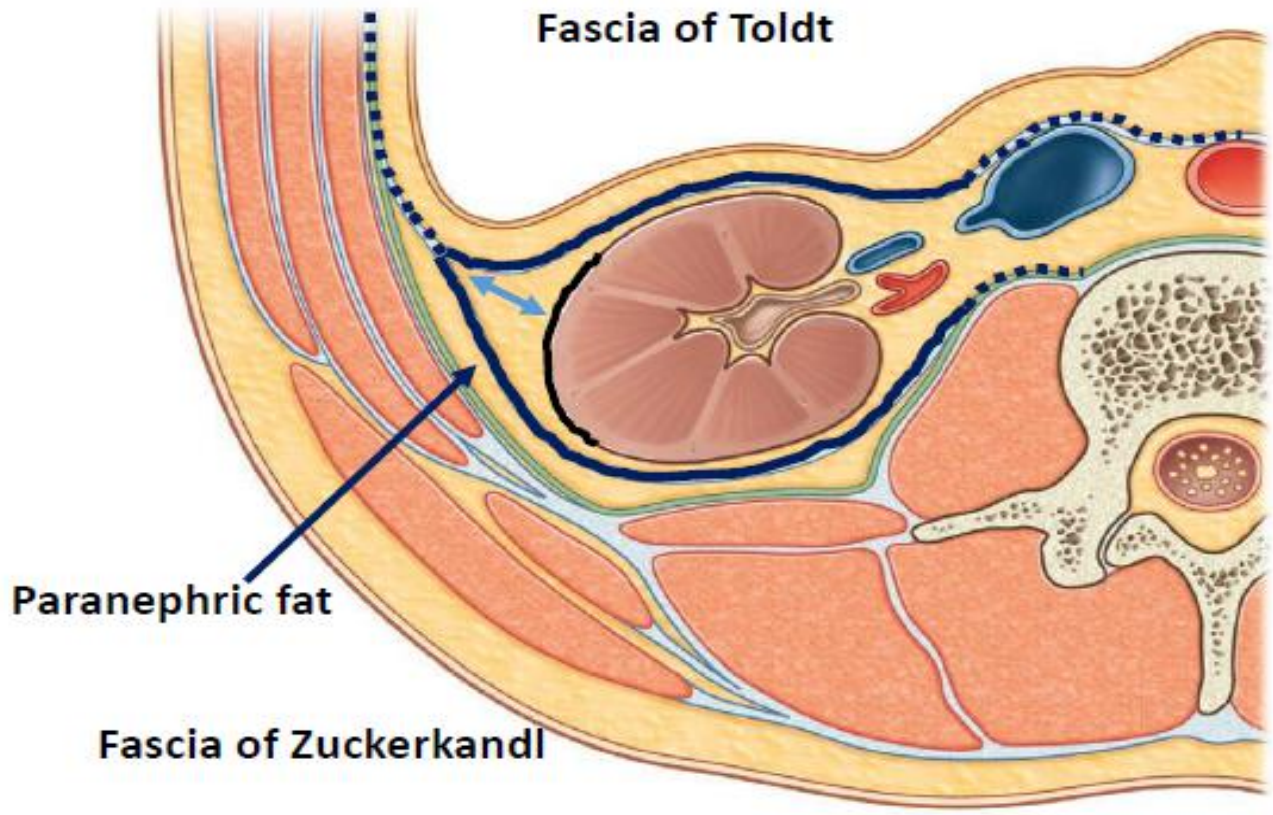


Renal Fascia or fascia of Gerota

- Consists of two layers

1. Anterior layer or **fascia of Toldt**

2. Posterior layer of **Fascia of Zuckerkandl**



- **Laterally: Both layer fused and continued with the fascia transversalis**

- **Medially: Layers do not fuse.**