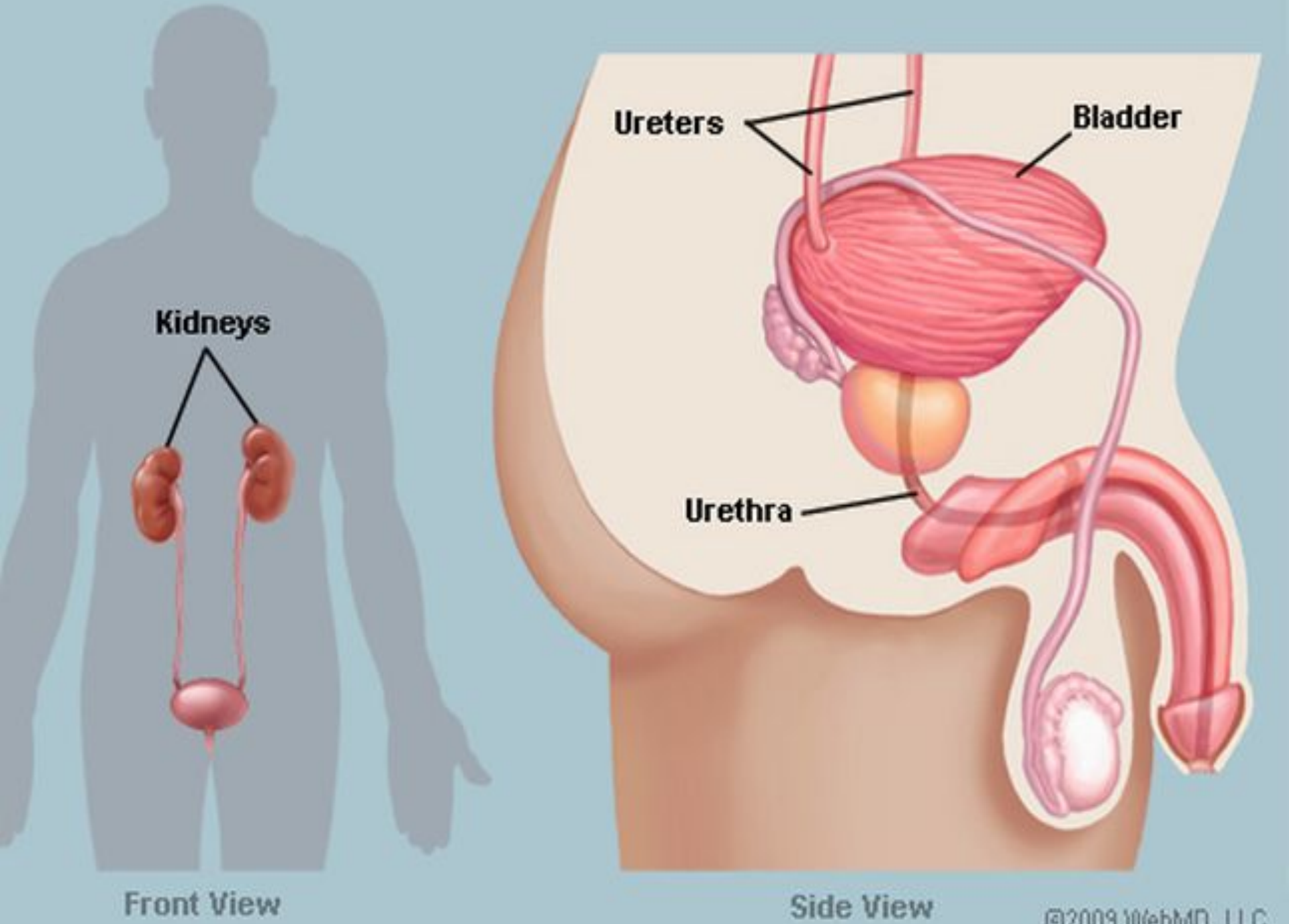
Kidneys
Front View
Ureters
Bladder
Urethra
Side View
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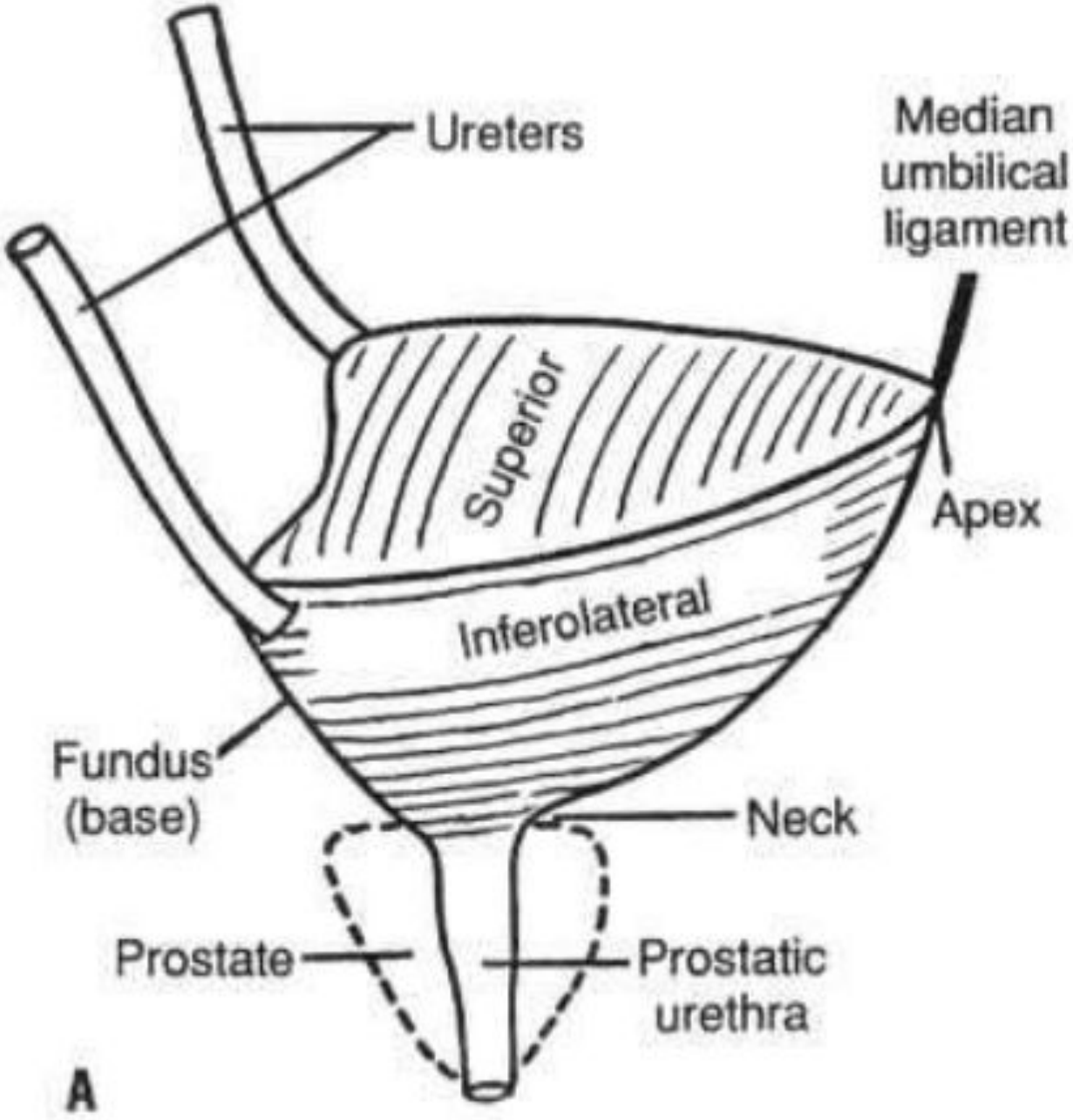
SURGICAL ANATOMY OF THE BLADDER

- the bladder is located anteriorly in the pelvic cavity, behind the pubic bones
- Bladder is a thick-walled organ having superior and inferior walls,a fundus,and an apex.
- The trigone of the bladder is a smooth-surfaced traingular area lying between the ureteral orifices at its basal angles and the internal urethral orifice at its apex.
- The bladder wall consists of:-

  - mucosa --- composed of transitional epithelium.

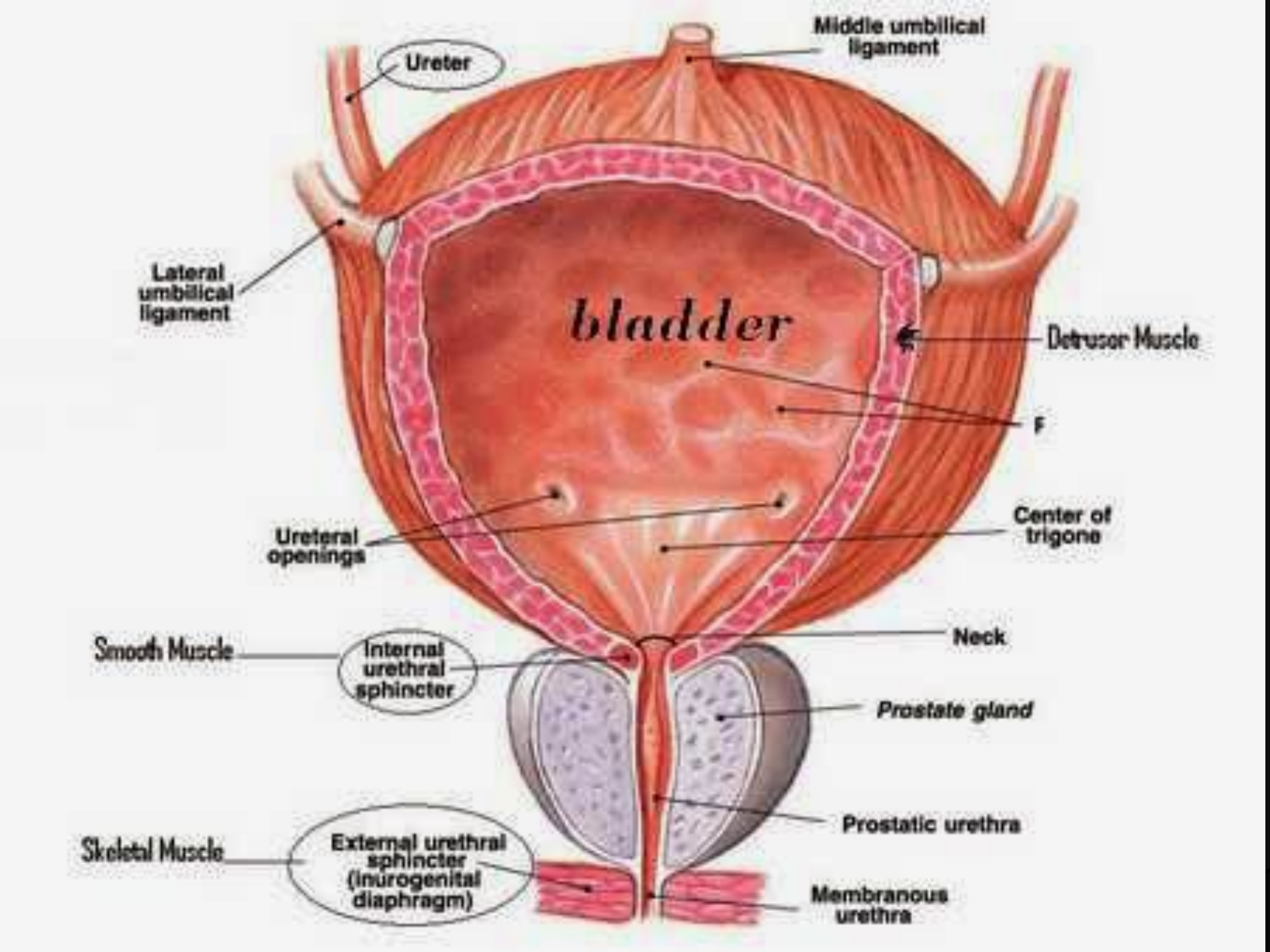
  - sub-mucosal layer--- formed largely of connective & elastic tissue

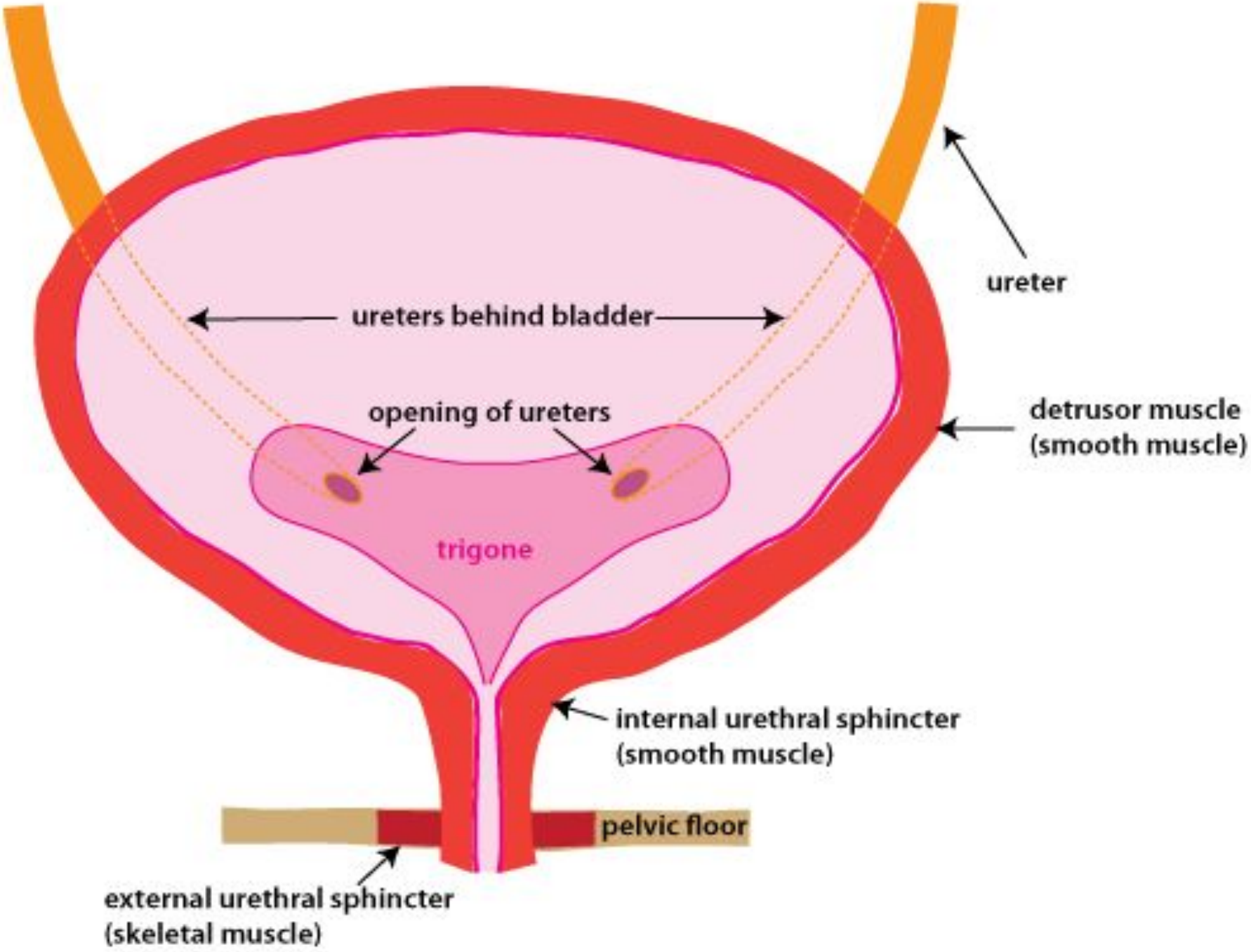
  - detrusor muscles (external to the sub mucosa) which consists of numerous bundles of smooth mucsle fibers arranged at random in a longitudinal, circular, and spiral manner


Ureters
Median umbilical ligament
Superior
Apex
Inferolateral
Fundus (base)
Neck
Prostate
Prostatic urethra
A

- Around the male bladder neck is the smooth muscle internal sphincter which fulfils a sexual function , it is innervated by alpha-adrenergic fibers and prevents retrograde ejaculation.

- The distal urethral sphincter is a mass of striated muscle which lies distal to the prostate or proximal two-thirds of the female urethra ,this sphincter is supplied by S2-S4 fibres via the pudendal nerve.


Middle umbilical ligament
Ureter
Lateral umbilical ligament
bladder
Detrusor Muscle
F
Ureteral openings
Center of trigone
Smooth Muscle
Internal urethral sphincter
Neck
Prostate gland
Prostatic urethra
Skeletal Muscle
External urethral sphincter (inurogenital diaphragm)
Membranous urethra


ureter
ureters behind bladder
opening of ureters
detrusor muscle
(smooth muscle)
trigone
internal urethral sphincter
(smooth muscle)
pelvic floor
external urethral sphincter
(skeletal muscle)

BLOOD SUPPLY:

A. Arterial : the bladder is supplied with blood by :--

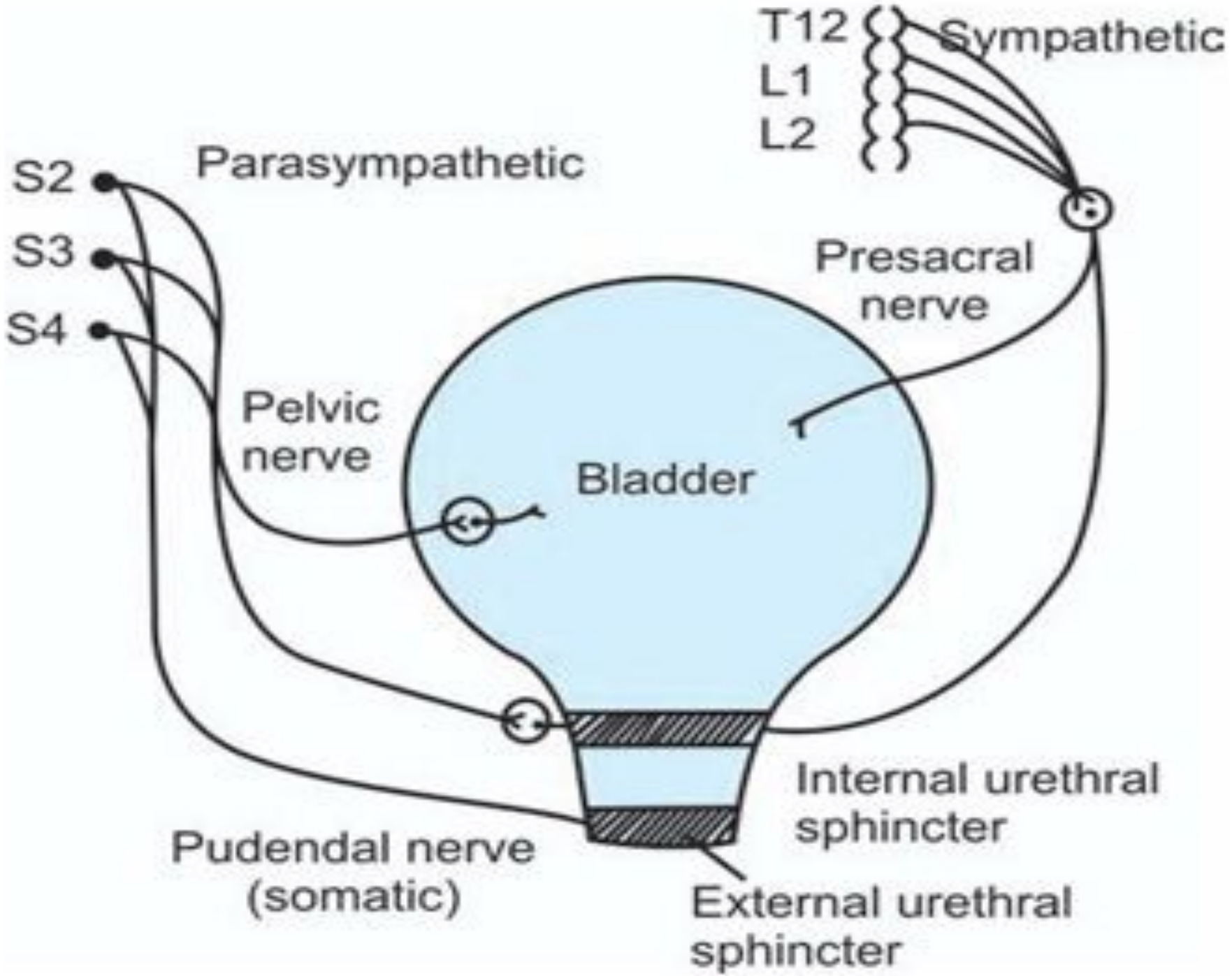
1- the superior, middle, and inferior vesical arteries---- branches of anterior trunk of internal iliac(hypogastric) artery.

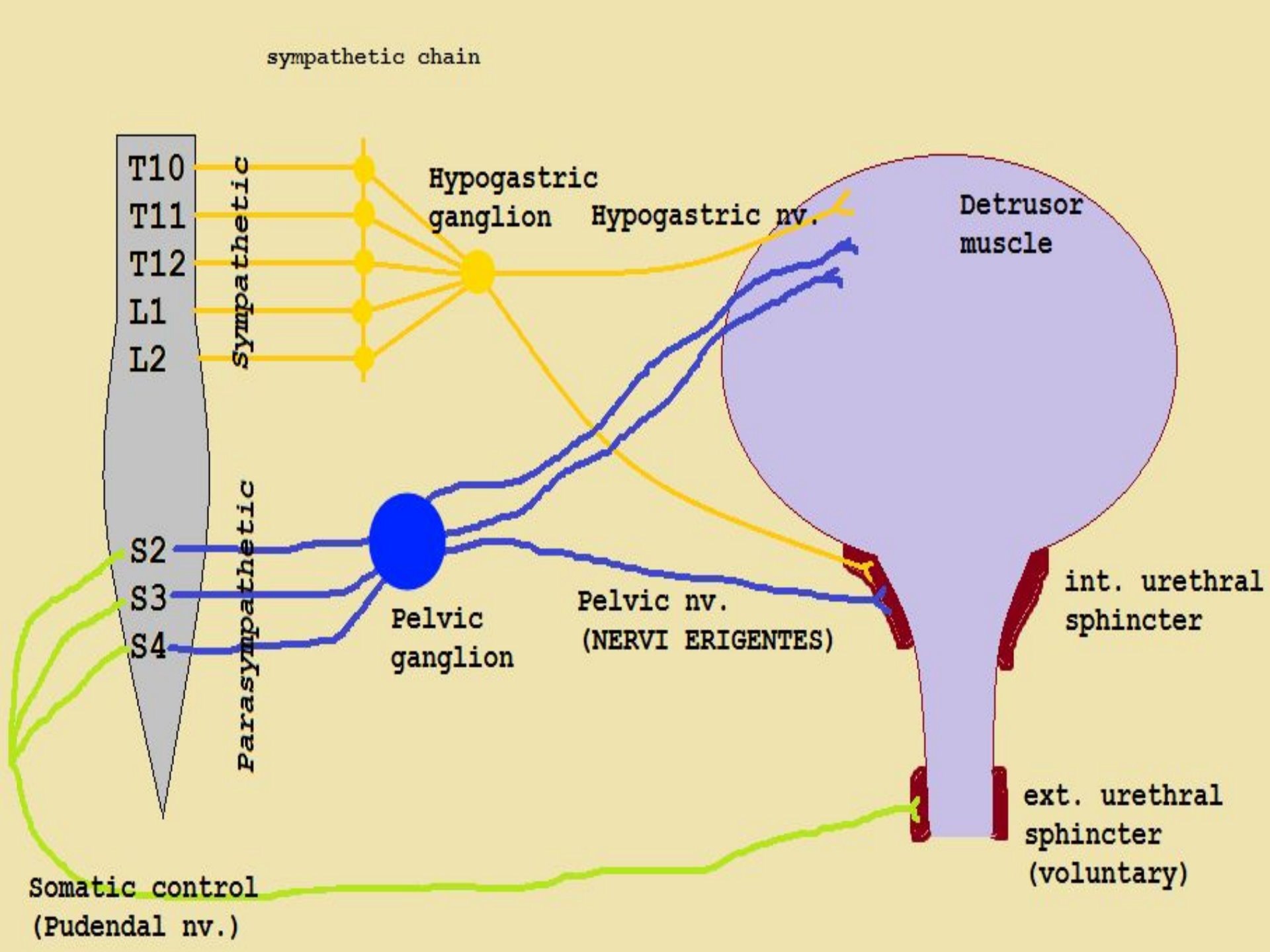
2- the smaller branches from obturator & inferior gluteal arteries.

- in the female the uterine & vaginal arteries also send branches to the bladder.

B. VENOUS: surrounding the bladder is a rich plexus of veins that empties into the internal iliac (hypogastic) veins.

LYMPHATICS:- the lymphatics of the bladder drain into the vesical, external iliac, internal iliac (hypogastric) & common iliac lymph nodes.


T12
L1
L2
Sympathetic
Parasympathetic
S2
S3
S4
Presacral
nerve
Pelvic
nerve
Bladder
Internal urethral
sphincter
Pudendal nerve
(somatic)
External urethral
sphincter


sympathetic chain
T10
T11
T12
L1
L2
Sympathetic
Hypogastric ganglion
Hypogastric nv.
Detrusor muscle
S2
S3
S4
Parasympathetic
Pelvic ganglion
Pelvic nv.
(NERVI ERIGENTES)
int. urethral sphincter
ext. urethral sphincter (voluntary)
Somatic control
(Pudendal nv.)

NERVE SUPPLY

- Parasympathetic input:- this innervation is derived from the anterior primary divisions of the second ,third & fourth sacral segments mainly (S2&S3).these fibers stimulate “emptying" of the bladder by stimulating detrusor mucsle contraction, elevating the trigone ,and relaxing the internal sphincter.
- Sympathetic input:-- these nerves arise in the 11th thoracic to the second lumbar segments. These nerves are stimulated during filling of the bladder and act to inhibit detrusor muscle tone; they also increase tension in the internal sphincter.
- Somatic innervation:-this passes to the distal sphincter via the pudendal nerves.
- Normal micturition is co-ordinated in the pons in the midbrain where detrusor contraction is ***timed*** with inhibition of the distal sphincter mechansim.

RUPTURE OF THE BLADDER

- It is either intraperitoneal (20%) or extra peritoneal (80%). Intraperitoneal rupture may be secondary to a blow, kick or fall on a fully distended bladder & it is more common in the male than in the female.
- more rare , it is due to surgical damage.
- Extrapritoneal rupture is usually caused by a fractured pelvis or is secondary to major trauma or surgical damage.

INTRAPERITONEAL RUPTURE

- Sudden agonising pain in the hypogastrium often accompanied by syncope.
- The shock later subsides & the abdomen starts to distend. No desire to micturate.
- Varying degrees of abdominal rigidity & abdominal distension are present on examination.

- No suprapubic dullness, but there is tenderness.
- There may be shifting dullness.
- If the urine is sterile , symptoms & signs of peritonitis are delayed.

how to confirm the diagnosis of intraperitoneal rupture

- Abdominal plain X-ray in the erect position may show fluid-level appearance in the lower abdomen.
- Intravenous urography (IVU) may confirm a leak from the bladder.
- A peritoneal “tap” may be of value if facilities for radiological examination are not available.

Treatment of intraperitoneal rupture

- The mainstay is to provide adequate drainage of the bladder.
- The standard treatment is to perform a lower midline laparotomy, the urine is removed by suction, the bladder's injury is sutured, the operation completed by placement of a suprapubic & urethral catheter

The operations in which the bladder is liable to be injured are :-

1- Inguinal or femoral herniotomy
2- Hysterectomy
3- Excision of the rectum
4- TURBT (transurethral resection of a bladder tumour)
5- TURP (transurethral resection of prostate)