

Ureter, Bladder & Urethra

Renal block-Anatomy-Lecture 3





Objectives

Color guide :

Only in boys slides in **Green**

Only in girls slides in **Purple**

important in **Red**

Notes in **Grey**

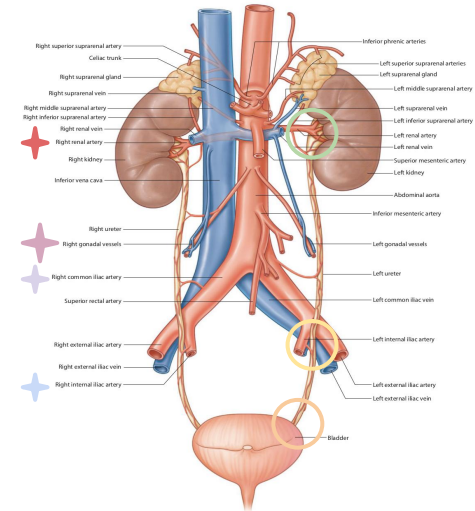
At the end of the lecture, students should be able to:

- Describe the course of ureter & identify the site of ureteric constrictions.
- Describe the important relations & identify certain areas (trigone, uvula vesicae) in the base of urinary bladder.
- List the blood supply, lymphatic drainage & nerve supply of urinary bladder.
- Differentiate between male & female urethra regarding length, structure, course & function.

1sr. The Ureter

- **Definition:** it is a muscular tube transporting urine from kidney to urinary bladder.
- **Beginning:** It begins as a continuation of renal pelvis (or pelvis of ureter).
- **Length:** 25 – 30 cm

Course In Abdomen	Course In Pelvic & termination
<ul style="list-style-type: none"> ● It descends <u>anterior</u> to <i>psaos major muscle</i> (opposite the tips of lumbar transverse processes). ● It crosses <u>anterior</u> to the end (bifurcation) of <i>common iliac artery</i> to enter the pelvis. 	<ul style="list-style-type: none"> ● It runs <u>downward & backward</u> to the level of <i>ischial spine</i>. It curves forward to <u>open in upper lateral angles</u> of the base of urinary bladder. (dr's note: superior lateral base of urinary bladder) ● It runs <u>obliquely</u> for $\frac{3}{4}$ inch in wall of bladder before opening (valve-like part).



● Arterial supply:

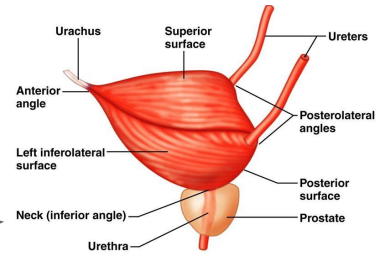
1. **Renal artery**
2. **Gonadal artery**
3. **Common iliac artery**
4. **Internal iliac artery**

● Sites of Constrictions (Obstruction-stone Impaction): *

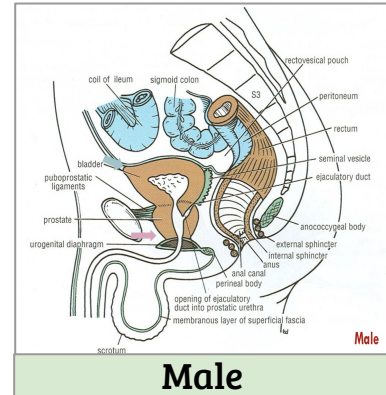
1. At **ureteropelvic junction**
2. At **pelvic inlet** (site of crossing of common iliac artery)
3. At **site of entrance to bladder**

2nd. Urinary Bladder

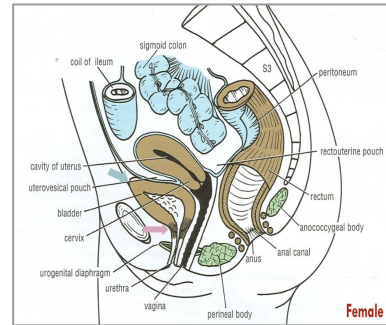
- **Site:** It is pelvic organ. (Urinary bladder is a pelvic organ in adults)
- **Shape:** It has the shape of **3-sided pyramid** placed on one of its angle (**NECK**).
- **It has:**



Apex	Base	Superior Surface	2 Infero-lateral Surface	Neck	
<ul style="list-style-type: none"> • Directed forward (anteriorly) • Related anteriorly to upper border of symphysis pubis. • Connected to umbilicus by the median umbilical ligament (remnant of urachus). 	<ul style="list-style-type: none"> • Directed backward (posteriorly) 	<p>In male</p> <ul style="list-style-type: none"> • Related to coils of ileum & sigmoid colon 	<ul style="list-style-type: none"> • Are related to retropubic fat separating them from pubic bones <p>Retropubic fat:</p> <ul style="list-style-type: none"> • Accommodates distention of bladder. • Continuous with anterior abdominal wall. So Rupture of bladder will lead to escape of urine to anterior abdominal wall. 	<p>Is the lowest & most fixed part of urinary bladder.*</p> <ul style="list-style-type: none"> • Continues with urethra. • Related to (lies behind) lower border of symphysis pubis 	
	<p>In male</p> <ul style="list-style-type: none"> • Related to vas deferens & seminal vesicle of both sides. 	<p>In female</p> <ul style="list-style-type: none"> • Related to uterus & uterovesical pouch. 			<p>In male</p> <ul style="list-style-type: none"> • Related to upper surface of prostate gland (inferiorly, it rests on the base of prostate)
		<p>In female</p> <ul style="list-style-type: none"> • Related to vagina. 			



Male

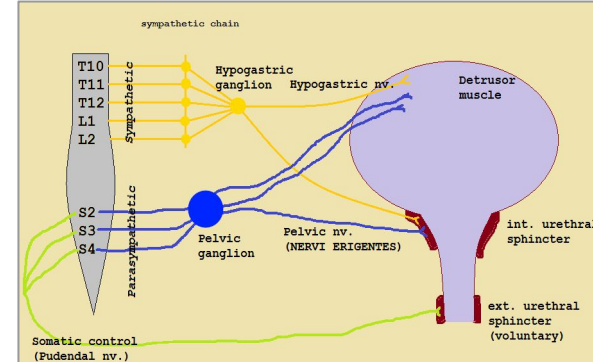
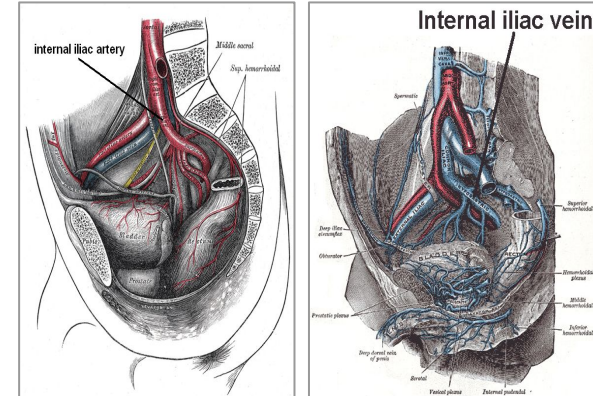


Female

Urinary Bladder (Position & Supply)

- It Is found in abdomen until age of 6 years
- Begins to enter the enlarging pelvis from age of 6 years onward
- Is found entirely in pelvis at puberty

Arteries	<p>from internal iliac artery.</p> <p>In males: 1) Superior vesical. 2) Inferior vesical.</p> <p>In females: 1) Superior vesical. 2) Vaginal.</p>
Veins	into internal iliac vein.
Lymph	into internal iliac lymph nodes.
Nerves	<p>1-Parasympathetic: through pelvic splanchnic nerves from S2, S3, S4.</p> <p>2-Sympathetic: from L1,L2 through hypogastric nerves. (it is actually from T10 to L2 ,but the lumbar supply is more than thoracic. So L1 to L2 is more accurate)</p> <p>3-Sensory: transmitting pain due to <u>overdistention</u> of bladder. (via general visceral afferent fibres from bladder to CNS).</p>



3rd. Urethra

Male

- **Length:** 20 cm.
- **Function:** both urinary and genital. (never work at the same time)
- **Divided into three parts:**

1- Prostatic Urethra

- Length: 3 cm.
- Widest & most dilatable.
- Extends from neck of bladder inside prostate gland.

2- Membranous Urethra

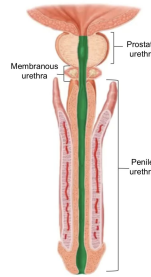
- Length: 1 cm.
- Surrounded by external urethral sphincter.

3- Penile (Spongy) Urethra

- Length: 16 cm.
- Extends inside penis & opens externally through external urethral orifice (narrowest part of whole urethra).

- **Structures openings into prostatic urethra:**

1. Ejaculatory ducts: containing sperms & secretion of seminal vesicles.
2. Ducts of prostate gland.



Female

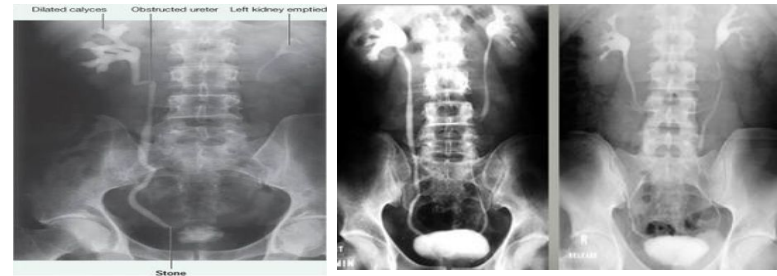
Length: 4 cm.

Function: Has **only** urinary function. Extends from neck of urinary bladder to open externally through the external urethral orifice which lies **anterior to the vaginal opening**.



Intravenous Urogram (IVU, IVP)

- A urogram (Post micturition): demonstrates a bladder stone. Or any obstruction in the urinary system.



Summary

Ureter

-Beginning: as continuation of renal pelvis

-Course: descends anterior to: psoas major & ends at (bifurcation) of common iliac artery.

-Termination: opens at upper lateral angle of base of urinary bladder

Sites of constriction: at ureteropelvic junction, at pelvic inlet, at site of entrance of bladder.

-Arterial supply: renal, gonadal, common & internal iliac arteries.

Urinary Bladder:

-Apex: related to symphysis pubis, continuous with median umbilical ligament.

-Base: related to vas deferens & seminal vesicle (in male) & to vagina (in female).

-Superior surface: related to coils of ileum & sigmoid colon (in male) & to uterus (in female).

-Inferolateral surfaces: related to retropubic fat

-Neck: continuous with urethra, related to upper surface of prostate gland (in male).

-Trigone: lies in the base of bladder, bounded by ureteric orifices & internal urethral orifice, its mucous membrane is elastic.

-Uvula vesicae: dilatation behind internal urethral orifice, produced by the median lobe of the prostate gland.

-Supply: internal iliac (artery, vein, lymph nodes).

-Nerves: parasympathetic (S2,3,4), sympathetic (L1,2).

-A slight projection into the cavity of the bladder just behind the urethral opening, marking the location of the middle lobe of the prostate gland.

Male Urethra

-Function: both urinary & genital

-Length: 20 cm, divided into prostatic (3 cm), membranous (1 cm) & penile (16 cm)

-Course: Extends from neck of bladder to open externally through external urethral orifice (narrowest part of whole urethra)

Female Urethra

-Function: urinary only.

-Length: 4 cm.

-Course: Extends from neck of bladder to external urethral orifice (anterior to vaginal opening).

MCQs

Question 1: A patient developed post-renal failure as a result of obstruction in the left ureter, which of the following places is the least likely place for this obstruction?

- A. At ureteropelvic junction
- B. At pelvic inlet
- C. At site of entrance to bladder
- D. At gonadal artery crossing

Question 2: Which of the following is true about the course of the ureter in the pelvis?

- A. It descends anterior to psoas major muscle
- B. It runs opposite the tips of lumbar transverse processes
- C. It runs downward & backward to the level of ischial spine
- D. It crosses the bifurcation of common iliac artery

Question 3: Which of the following is only found in males?

- A. Retropubic fat.
- B. Uvula vesicae
- C. Trigone
- D. Neck

Question 4: Apex of urinary bladder is related to:

- A. Lower border of symphysis pubis
- B. Upper border of symphysis pubis
- C. upper surface of prostate gland
- D. to vas deferens & seminal vesicle of both sides

Question 5: If there is rupture in the urinary bladder the urine will go to:

- A. anterior of the abdominal wall.
- B. posterior of the abdominal wall.
- C. the neck.
- D. the liver.

Question 6: Which of them is sympathetic supply of urinary bladder?

- A. Through pelvic splanchnic nerves from S2, S3, & S4.
- B. Via general visceral afferent fibers from CNS to bladder.
- C. Via general visceral afferent fibers from bladder to CNS.
- D. L1 & L2 through hypogastric nerves.

Question 7: the uvula vesicae located, and found in.....:

- A. behind internal urethral orifice, in female.
- B. behind internal urethral orifice, in male.
- C. Lateral to internal urethral orifice, in female.
- D. Lateral to internal urethral orifice, in male.

Team members

Boys team:

- Faisal Alqifari
- Salman Alagla
- Ziyad Al-jofan
- Ali Aldawood
- Khalid Nagshabandi
- Omar Alammari
- Sameh nuser

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- Taif Alotaibi
- Noura Al Turki
- Amirah Al-Zahrani
- Alhanouf Al-haluli
- Sara Al-Abdulkarem
- Renad Al Haqbani
- ★ Nouf Al Humaidhi
- ★ Jude Al Khalifah
- Nouf Al Hussaini
- Rahaf Al Shabri
- Danah Al Halees
- Rema Al Mutawa
- Amirah Al Dakhilallah
- Maha Al Nahdi
- Ghaida Al Braithen
- ★ Razan Al zohaifi

Team leaders

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- Ateen Almutairi



THANKS!

Contact us:



Editing file