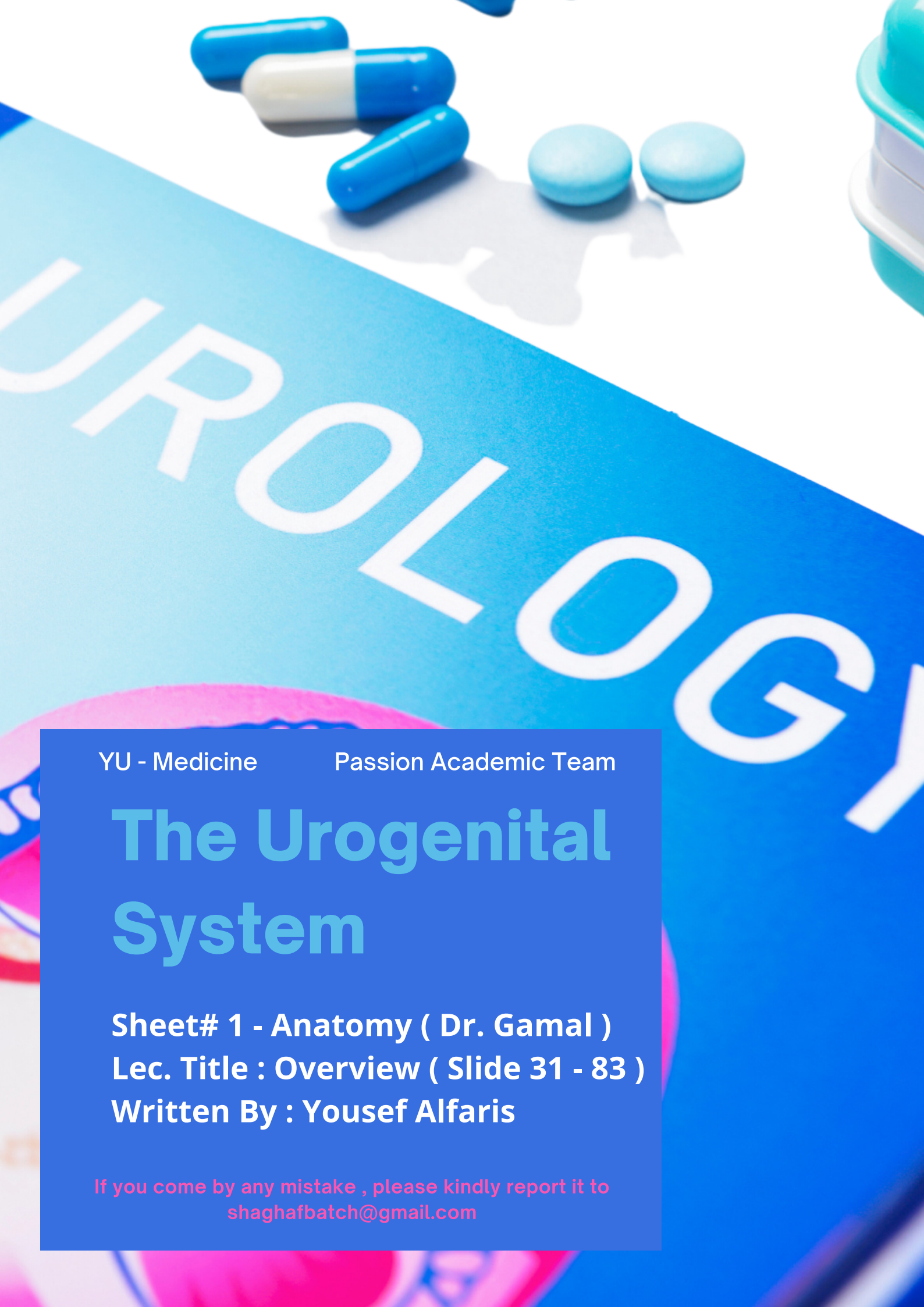


YU - Medicine Passion Academic Team

The Urogenital System

Sheet# 1 - Anatomy (Dr. Gamal)
Lec. Title : Overview (Slide 31 - 83)
Written By : Yousef Alfaris

If you come by any mistake , please kindly report it to shaghafbatch@gmail.com

Internal features of Kidney:

- on sagittal section we see it in outer called cortex and inner called medulla.
- hilum ⇒ concave border where blood vessels and nerves and ureter enters.
- sinus ⇒ cavity within the hilum, contains blood vessels and urine collecting chambers and fat.

structure of Kidney interiorly:

- in the medulla we see:

* medullary pyramids
* renal columns
* calyces ⇒ cup-shaped that funnel the urine to the renal pelvis. it consist of:

- minor ⇒ 8-20 num ⇒ collect together to form
- major ⇒ 2-3 num ⇒ collect together to form renal pelvis and surrounded by renal sinus blood vessels كتوي على hilum التعريف للوجود بال urine chambers and fat.
- renal pelvis become narrow into a small tube that is ureter and ends with the urinary bladder

Renal lobe:

بداية احنا قسمنا الكلية لفصوص عشان نسهل الجراحات نقطة ثانية مهمة وهي أنه الكلية بتشتغل بالتبادل ونقر الواحد بيشتغل بكفاءة وحدة بس بيرا لما تتضرر عشان تقوى تشتغل.

- one renal pyramid
- overlying area of renal cortex
- adjacent tissue of renal columns

nephrons:

- The structural and functional units of the kidney
- responsible of urine formation
- consist of:

glomerulus renal tubule

Glomerulus:

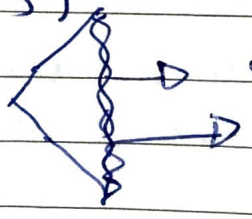
specialized capillary bed, attached to arterioles on both side ⟹ maintain high pressure.

- large afferent
- narrow efferent

its site within glomerular capsule (first part or renal tube)

Renal tubule:

- glomerular capsule (Bowman's)
- proximal convoluted tubule
- loop of henle
- distal convoluted tubule



اجزاء نيفرون

*nephron divide into: 85% lie in the cortex which called cortical nephron while 15% lie in border between cortex and medulla which called juxta medullary.

- juxta medullary ⟹ regulation of blood pressure.

Blood flow through the Kidney:

- Blood enter to the kidney through ⟹ renal artery
- Blood exit from the kidney through ⟹ renal vein

cont. →

-renal artery arise from abdominal aorta opposite L2 enter hilum between vein anteriorly and ureter posterior

Blood flow - artery to vein:

renal artery → segmental artery → lobar artery → interlobar artery → arcuate artery → interlobular artery → afferent artery → nephron → interlobular vein → arcuate vein → interlobar vein → renal vein

* nerve supply to the kidney ⟹ sympathetic fibers from T10, L1 and parasympathetic fibers from vagus.

ureters and urinary bladder:

ureter ⟹ small tube that carry urine from the kidneys to the urinary bladder and the enter the bladder the posterior wall.

urinary bladder ⟹ hollow muscular organ that lie in pelvic cavity that storage of the urine.

in male it lies anterior to rectum

in female it lies anterior to vagina

The ureters:

-pair of muscular tubes - 25 cm in lenght and 3-5 mm in diameter.

-extend from renal pelvis to bladder from site of origin to pelvic brim (abdominal part) and from site of pelvic brim to bladder (pelvic part)

-peristaltic contraction force urine from it to bladder

-retroperitoneal (خلف الصفاق) in position.

cont.

- the upper part of it lies in the abdomen and the lower part lies in the pelvis.
- constricted in 3 places:
1- pelvi-ureteric junction
2- brim of lesser pelvis
3- its passage through the bladder wall.

والثالث اماكن هاي بصير منها قطر الحالب وتتاخر على قديه
هيكا ~~[illegible]~~ صورة تكونت في الكلية.

The ureter relations:

Anterior:
- duodenum
- right colic vessels
- right testicular or ovarian vessels
- terminal part of ileum
- iliocolic vessels

posterior:
- right psoas muscle
- bifurcation of the right common iliac artery

The ureter supply:

اي مكان قريب منها بغذيها من اي شريان
- renal artery
- gonadal artery
- internal iliac artery
- abdominal aorta
- common iliac artery
- inferior vesical artery

* nerve supply to the ureters ⟹ autonomic nervous s.

Urinary bladder :

collapsible muscular sac
- stores and expels urine
- Full bladder => spherical and expands into the abdominal cavity (to umbilicus)
- empty bladder => entirely within the pelvis
- main capacity of bladder is 220 ml.
500 ml become painful and 600 spontaneous evacuation occurs.

urinary bladder location :

- pelvic floor
posterior to public symphysis
anterior to rectum in male and vagina and uterus in femal

Shape of urinary bladder :

- empty is 4 sided pyramid and has 4 angles :
apex - neck and 2 lateral angles.
- 4 surfaces :
base (posterior) - superior - 2 inferolateral surfaces.

*when distended it is ovoid in shape

in male : we found prostate gland lies inferior to the bladder and surround the urethra.

structure of urinary bladder :

- outer ⟹ loose connective tissue
- middle ⟹ smooth muscle and elastic fibers
- inner ⟹ lined with transitional epithelium

Interior structure of urinary bladder :

- The mucous membrane is straw colored (ذهبي) and is thrown into folds.
- when bladder is distended, these folds disappear. فايدة هاي الانثناءات انها بتسمح للبلانة بالتمدد
- the posterior wall show a smooth triangular area called trigone ⟹ no mucous folds in it لانه هاي المثلث مكان غوه غير مكان غو البلانة يعني كل واحد فيهم إله origin مختلف

Blood supply of urinary bladder :

- internal iliac :
* superior vesical branch ⟹ both sexes
* inferior vesical artery ⟹ male
* inferior vaginal artery ⟹ female

* nerve supply of urinary bladder :
- sympathetic ⟹ hypogastric nerve (T12-L2) relax the detrusor muscle, promoting urine retention
- parasympathetic ⟹ pelvic nerve (S2-S4) contraction of detrusor muscle, stimulating micturition
- somatic ⟹ pudendal nerve (S2-4) providing voluntary control over micturition