



Renal Block



LECTURE (1)

ANATOMY OF THE KIDNEY

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Reviewed by: Reem Al Rakaf

تنويه : هذا العمل لا يعتبر مصدر رئيسي للمذاكرة وإنما هو للمراجعة فقط

If there is any mistake please feel free to contact us:

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Common - Black

Male Notes - BLUE

Female Notes - GREEN

Explanation and additional notes - ORANGE

Very Important note - Red





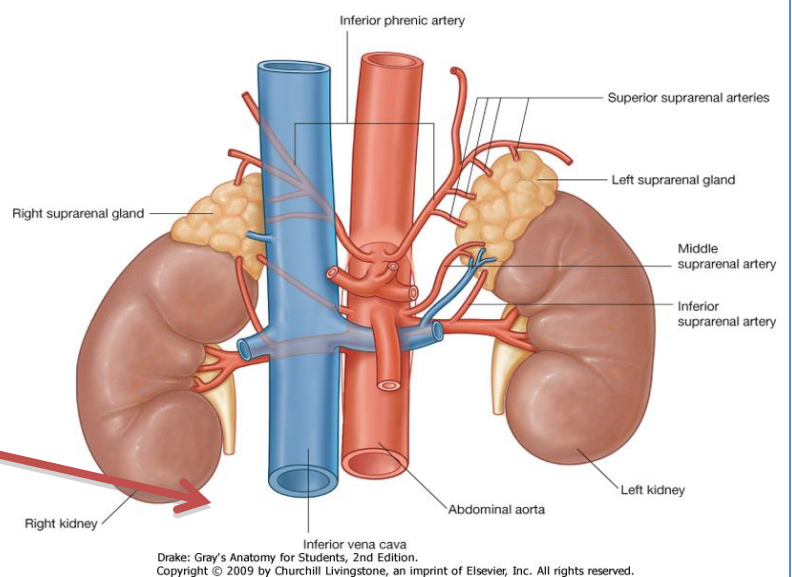
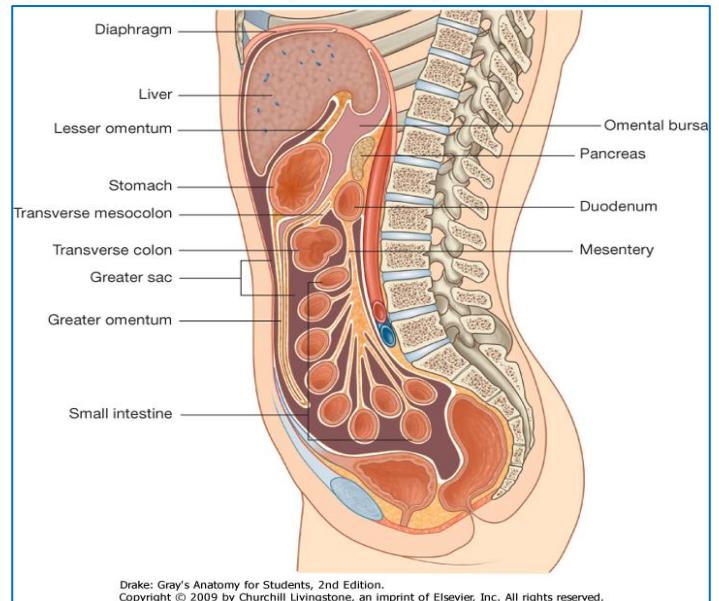
OBJECTIVES:

- **Anatomical features of the kidneys:
position, extent, relations, hilum,
peritoneal coverings.**
- **Internal structure of the kidneys:
Cortex, medulla and renal sinus.**
- **The vascular segments of the kidneys.**
- **The blood supply and lymphatics of the
kidneys.**



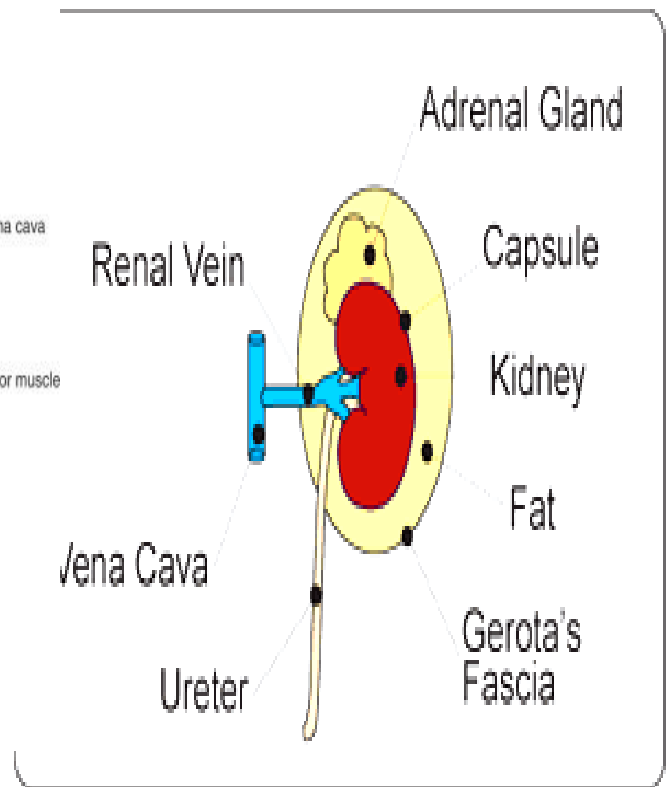
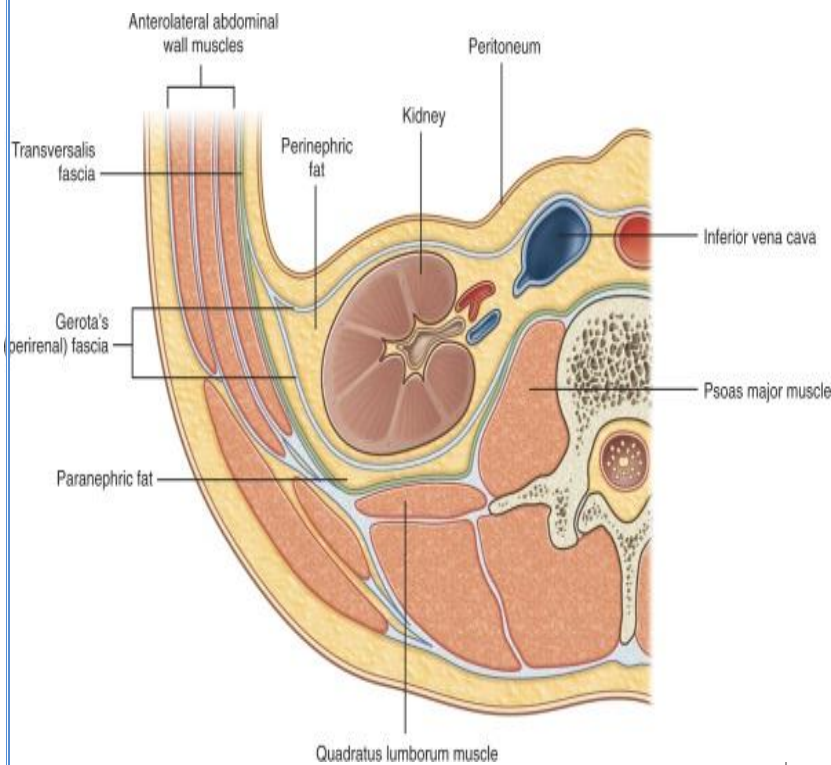
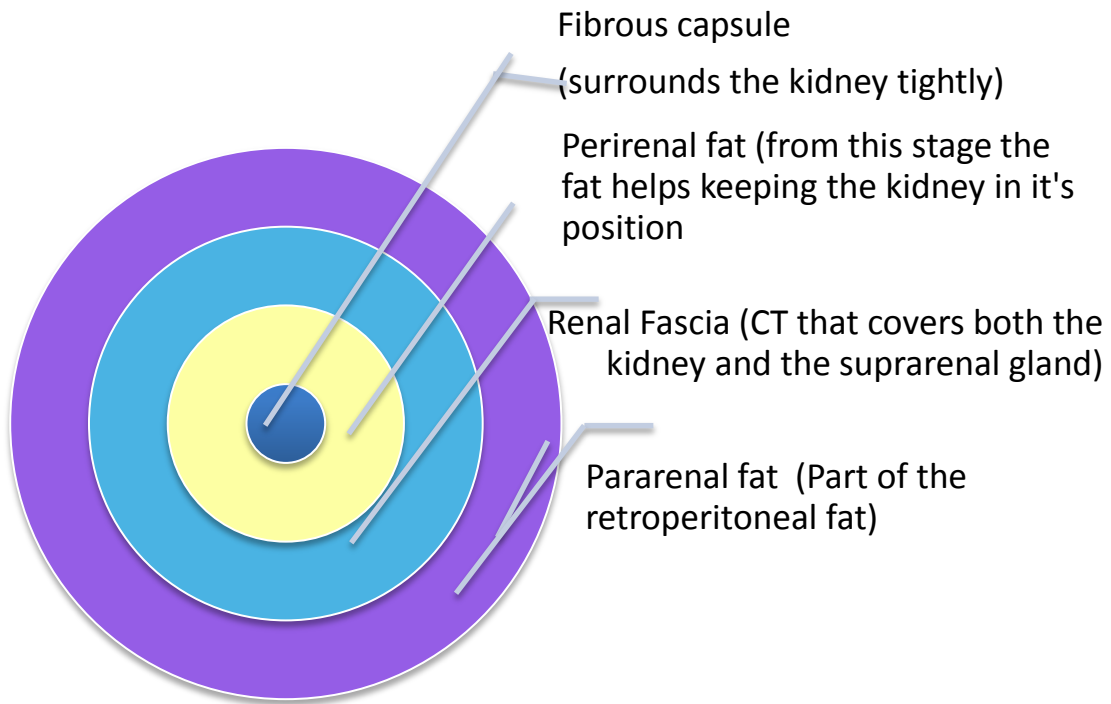
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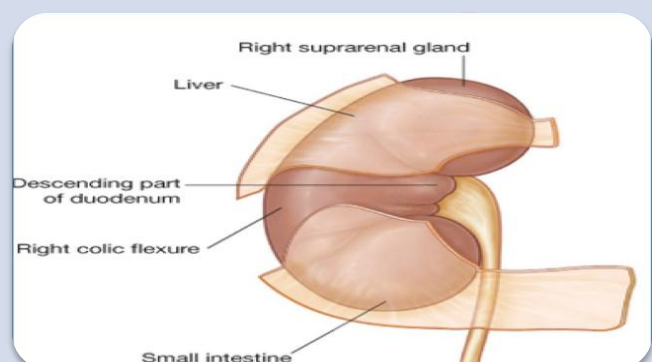
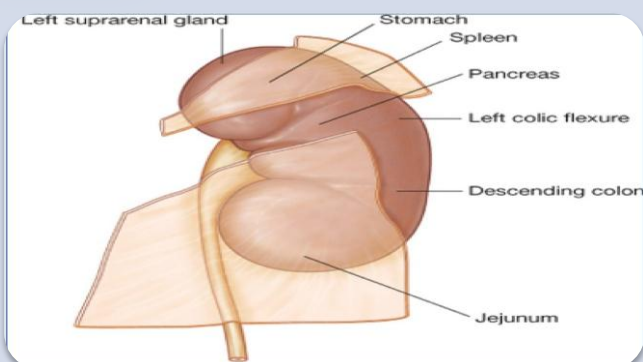
- The peritoneum is found in the abdominal cavity, it consists of two layers: parietal (Outer layer) and visceral (Inner layer).
- The space between the two layers is filled with serous fluid to facilitate the movement of the stomach and small intestine.
- Kidneys are **retroperitoneal** it literally means behind the Peritoneal. (not fully covered by peritoneum). It lies lateral to the vertebral column (spine) and largely under cover of the costal margin.
- It extends from approximately **T12 to L3**.
- The right kidney lies slightly lower than the left.
- During inspiration when the diaphragm contracts, the kidneys move down about 1 inch (2.5 cm).
- The kidneys are **bean shaped** and **reddish brown** in color with the dimensions (12 (High) x 6 (Width) x 3cm (Thickness)).
- Although they are similar in size and shape, **the left kidney is longer and more slender than the right and nearer to the midline**.
- Each kidney consists of: convex upper and lower and lateral border and the medial border is convex in the upper and lower ends and concave in the middle where we can find the hilum of the kidney.
- The hilum which is covered by perirenal fat that continues to form a cavity called **Renal sinus** where it transmits, the following structures from **anterior to posterior**:
 1. Renal vein.
 2. Renal artery.
 3. Ureter (VAU.)
 4. Lymph vessels. (The lymph always follows the artery)
 5. Sympathetic fibers





Covering:





Left Kidney

- **Retroperitoneal:** Suprarenal gland, Pancreas, left colic flexure, Descending Colon
- **In front of the Peritoneal:** Stomach, Spleen, Jejunum
- **Posteriorly:** Related to the 11th and 12th rib + last intercostal space

Right Kidney

- **Retroperitoneal:** Right suprarenal gland, Descending Deodenum, Right colic flexure
- **In front of the Peritoneal:** Liver, Small intestine
- **Posteriorly:** 12th rib + last intercostal space

- The table above shows the Anterior relation of the Abdominal organs to the Kidney, whereas the posterior are related to almost the same structures.
- **The Diaphragm and Costodiaphragmatic recess intervene between the thoracic wall and Kidney**
- The kidney is consist of outer cortex which represent **one third** of the thickness and inner medulla which is **two third** of the thickness.
- Extension of the cortex (**renal columns**) divide the medulla into renal pyramid, each pyramid is consists of base and apex (**Renal papilla**).
- **Minor calyx** surrounds the renal papilla.
- Several **minor calices** > **major calyx** and two or three major calices > **Renal pelvis**.
- **Left vein:** is Anterior to Aorta below the Superior Mesentric Artery
- **Right Vein:** Behind the 2nd part of Duodenum and lateral to the head of Pancreas.





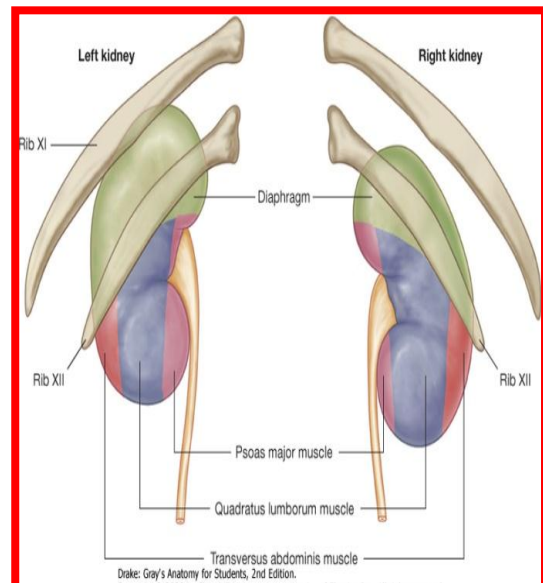
- The left renal vein is three times **longer** than the right (7.5 cm and 2.5 cm).
- **So, for this reason the left kidney is the preferred side for live donor nephrectomy.**
- The renal artery arises from the abdominal aorta at the level of the **2nd lumbar vertebra.**
- Each kidney has **5 vascular segments.**
- Each segment is supplied by one segmental artery:

1. Apical Segment. 2- Caudal Segment. 3- Anterior Superior Segment.

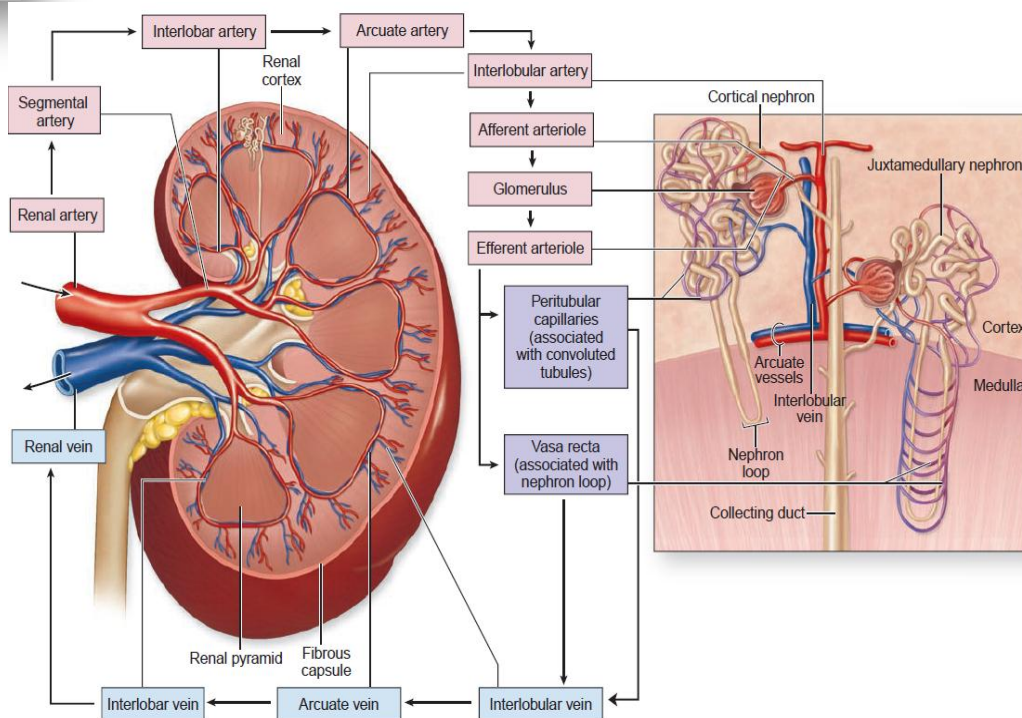
4- Anterior Inferior Segment. 5- Posterior Segment

- **Psoas major. (Medial)**
- **Quadratus lumborum.**
- **Transversus abdominis.(Lateral)**
- **Supplied by: Subcostal (T12), iliohypogastric & ilioinguinal nerves.**

Difference between	
Renal Angle	Vertebrocostal angle
Between last rib and lateral border of erector spinae muscle	Between last rib and lateral border of the vertebrae " Occupied by the lower pleural sac"



- The nerve supply is the renal sympathetic plexus. The afferent fibers that travel through the renal plexus enter the spinal cord in the 10th, 11th, and 12th thoracic nerves.



Quiz:

- 1- Kidneys extend from approximately and the left kidney lies than the right.
A- T12 to L3. Lower.
B- T11 to L4. Upper.
C- T12 to L3. Upper.
- 2- The dimensions of kidneys are and the left kidney than the right.
A- (12x6x3cm). Longer.
B- (12x6x3cm). Shorter.
C- (16x8x4cm). Longer.
- 3- The renal sinus contains the upper expanded part of the ureter called:
A- Renal papiila.
B- Renal pelvis.
C- Renal Ureter.
- 4- For left kidney, The rest of the upper part of anterior surface is covered by:
A- Retroperitoneal pancreas.
B- Stomach and spleen.
C- Left colic flexure.



- 5- For right kidney, Which one of the following contacts with the kidney close to hilum:
- A- 2nd part of duodenum.
 - B- 1st part of duodenum.
 - C- Small intestine.
- 6- Which one of the following related to left kidney from posterior surface:
- A- 12th rib.
 - B- 11th & 12th ribs; last intercostals space.
 - C- Right colic flexure.
- 7- Which one of the following related to left kidney from posterior surface:
- A- Small intestine.
 - B- Jejunum
 - C- Psoas major.
- 8- The is occupied by
- A- Vertebrocostal angle, kidney.
 - B- Vertebrocostal angle, lower part of the pleural sac.
 - C- Renal angle, lower part of the pleural sac.
- 9- In the renal sinus, several minor calices unite form:
- A- Major calyx.
 - B- Renal pelvis.
 - C- Renal papilla.
- 10- In kidney, Each segmental artery gives rise to number of:
- A- Interlobar arteries
 - B- Lobar arteries.
 - C- Renal artery.
- 11- The arcuate arteries give off several that ascend in the cortex and give off
- A- Interlobar arteries, afferent glomerular arterioles.
 - B- Interlobular arteries, efferent glomerular arterioles.



C- Interlobular arteries, afferent glomerular arterioles.

12- Which one of the following drain into renal vein:

- A- Arcuate veins.
- B- Interlobar veins.
- C- Interlobular veins.

13- The left renal vein Than the right, so is the preferred side for live donor nephrectomy.

- A- Shorter, left kidney.
- B- Longer, left kidney.
- C- Longer, right kidney.

14- Which one of the following drain into left renal vein:

- A- Left gonadal vein.
- B- Inferior mesenteric.
- C- Superior mesenteric.

15- Kidney supply by:

- A- Vagus nerve.
- B- Renal sympathetic plexus (T10, 11, 12).
- C- Renal sympathetic plexus (T9, 10, 11).

16- Which organs are directly related to the kidney:

- A. Liver
- B. Costodiaphragmatic recess
- C. Lower half of the muscles + Upper half of the Diaphragm

17- The left renal vein in relation to the splenic vein and Pancreas is:

- A. Anterior
- B. Posterior
- C. Media



Q	Ans
1	C
2	A
3	B
4	B
5	A
6	B
7	C
8	B
9	A
10	B
11	C
12	B
13	B
14	A
15	B
16	C
17	B

**GOOD
LUCK!**

Anatomy Team Leaders:

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