OSTA

TOPIC:- OSTA OF LUMBAR & RETROPERITONEAL SPACE

TOPGRAPHY & OPERATIVE SURGERY OF LUMBAR & RETROPERITONEUM

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2. LAYERED TOPOGRAPHY, PROJECTION VESSELS AND NERVES
3. CUTS IN PHLEGMON

TOPOGRAPHY OF LUMBAR REGION

1. BORDERS:-

- SUPERIOR-12TH Rib
- Inferior- iliac crest

Lateral –lesgaft's line (vertical line passing through the 11th rib from mid axillary line)

- According to the erector spinae muscle, the lumbar region is divided into the medial and lateral departments.

2. LAYERS:-

- The skin is thick
- Subcutaneous tissue:-

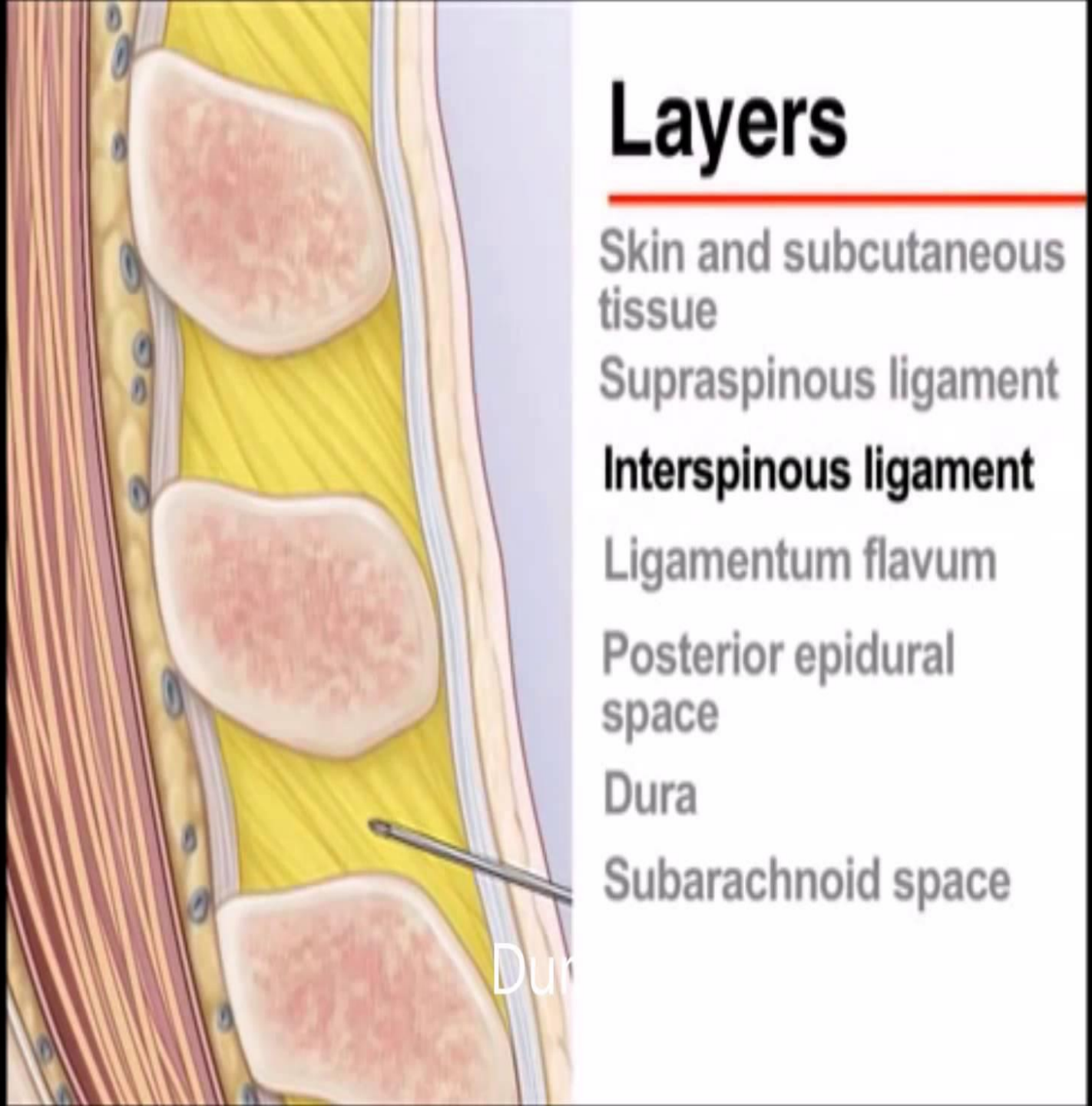
- It contains the superficial fascia which divides the fatty tissue into 2-3 layers
- The fat tissue continued in the gluteal region is called massa adiposa lumboglutealis.

- Properfascia:-

- It forms a sheath for the erector spinae muscle and is called the fascia thoracolumbalis.\
- It is divided into superficial and deep layers
- Deep layer is fixed to spinous process

- Muscles:-

- They are divided into the superficial and deep groups
- Superficial:- latissmus dorsi
- Deep muscles are divided into thr medial and lateral groups according to the margin of erector spinae muscle.


Layers
Skin and subcutaneous tissue
Supraspinous ligament
Interspinous ligament
Ligamentum flavum
Posterior epidural space
Dura
Subarachnoid space

3. WEAK PLACES:-

- Petit's lumbar triangle:-

i. Borders

- Medial:- margin of latissmus dorsi muscle
- Lateral:- nmargin of external oblique muscle
- Inferior:- iliac crest
- Floor:- internal oblique muscle

ii. Clinical importance:-

- Herniation
- This place contains fat, where abscess and phlegmones tend to occur.

4. ARTERIAL SUPPLY
   - Lumbar arteries (branches of abdominal aorta)
5. VENOUS DRAINAGE:-
   - Lumbar veins, then drained into the inferior vena cava
6. NERVE SUPPLY:-
   - Subcostal nerve
   - Posterior branches of the spinal nerve

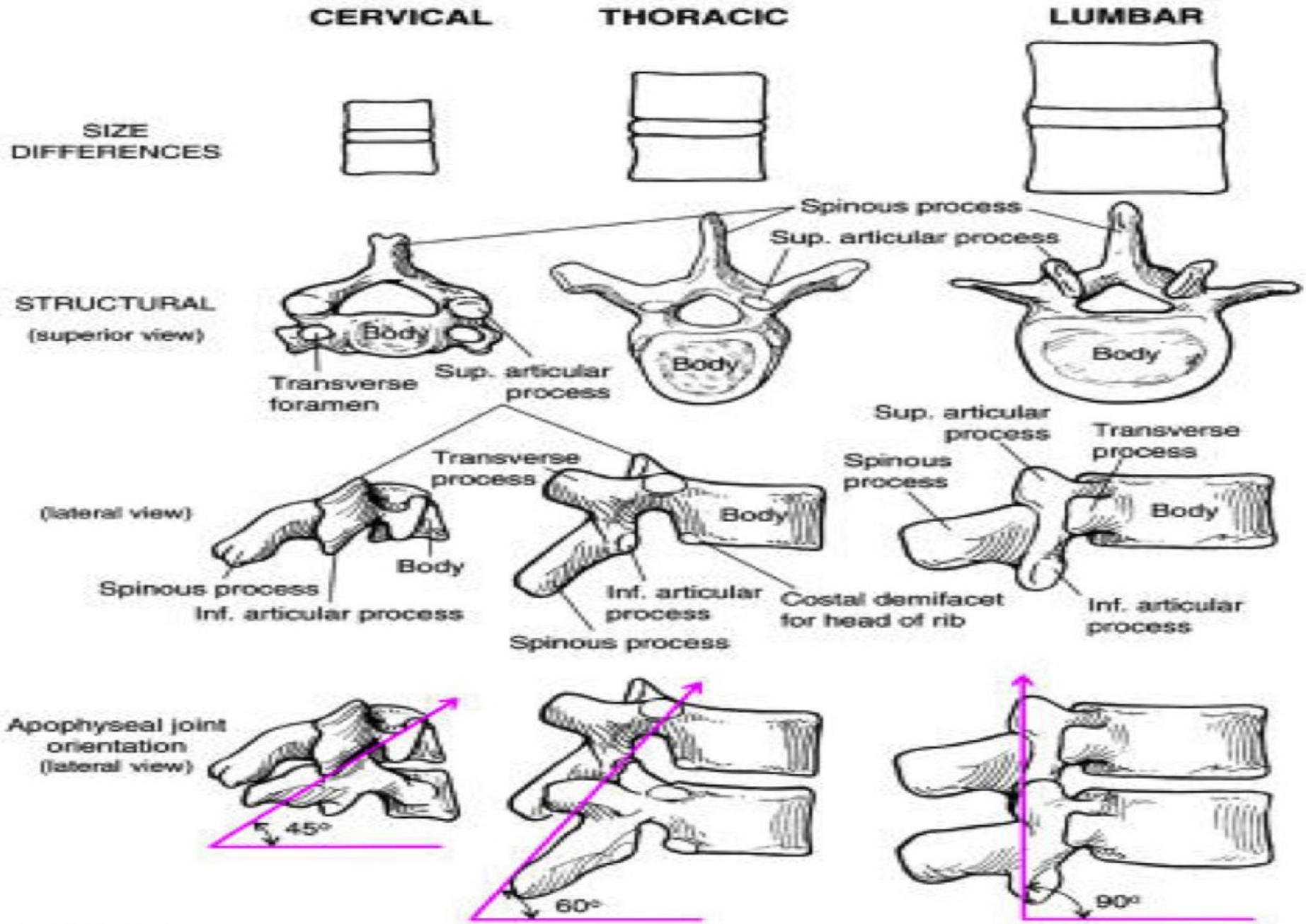


FIGURE 7-11 The cervical, thoracic, and lumbar vertebrae differ from each other. From the cervical to the lumbar region the bodies of the vertebrae become larger, and the transverse processes, spinous processes, and apophyseal joints all change their orientation.

RETROPERITONEAL SPACE

- The retroperitoneal space (retroperitoneum) is the anatomical space (sometimes a potential space) in the abdominal cavity behind (*retro*) the peritoneum. It has no specific delineating anatomical structures. Organs are retroperitoneal if they have peritoneum on their anterior side only. Structures that are not suspended by mesentery in the abdominal cavity and that lie between the parietal peritoneum and abdominal wall are classified as retroperitoneal.
- The retroperitoneum can be further subdivided into the following:-
- Perirenal space
- Anterior pararenal space
- Posterior pararenal space

RETROPERITONEAL STRUCTURES

- Structures that lie behind the peritoneum are termed "retroperitoneal". Organs that were once suspended within the abdominal cavity by mesentery but migrated posterior to the peritoneum during the course of embryogenesis to become retroperitoneal are considered to be secondarily retroperitoneal organs.
- Primarily retroperitoneal, meaning the structures were retroperitoneal during the entirety of development:
  - urinary
    - adrenal glands
    - kidneys
    - ureter
  - circulatory
    - aorta
    - inferior vena cava
- Secondarily retroperitoneal, meaning the structures initially were suspended in mesentery and later migrated behind the peritoneum during development
  - the duodenum, except for the proximal first segment, which is intraperitoneal
  - ascending and descending portions of the colon (but not the transverse colon, sigmoid or the cecum)

FASCIA AND FATTY LAYERS OF RETROPERITONEAL SPACE

A. Renal fascia:-

- Divided into the prerenal and retrorenal fascia
- Between these 2 fasciae, paranephron or adipose capsule of the kidney is located
- Inferior to kidney, paranephron continues intp the paraureteron. This is fatty layer surrounding the ureter.

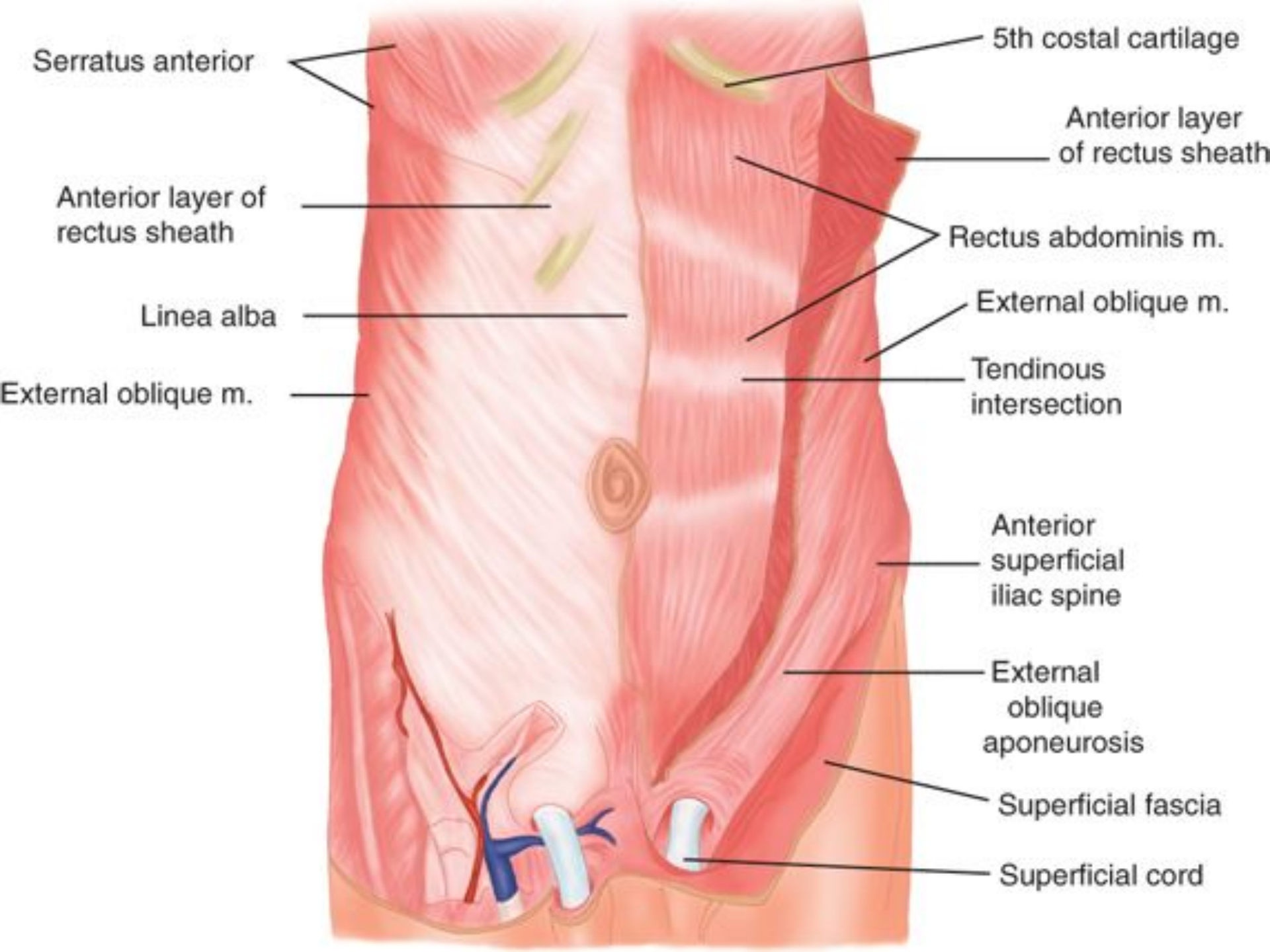
B. RETROPRITONEAL FATTY SPACE:-

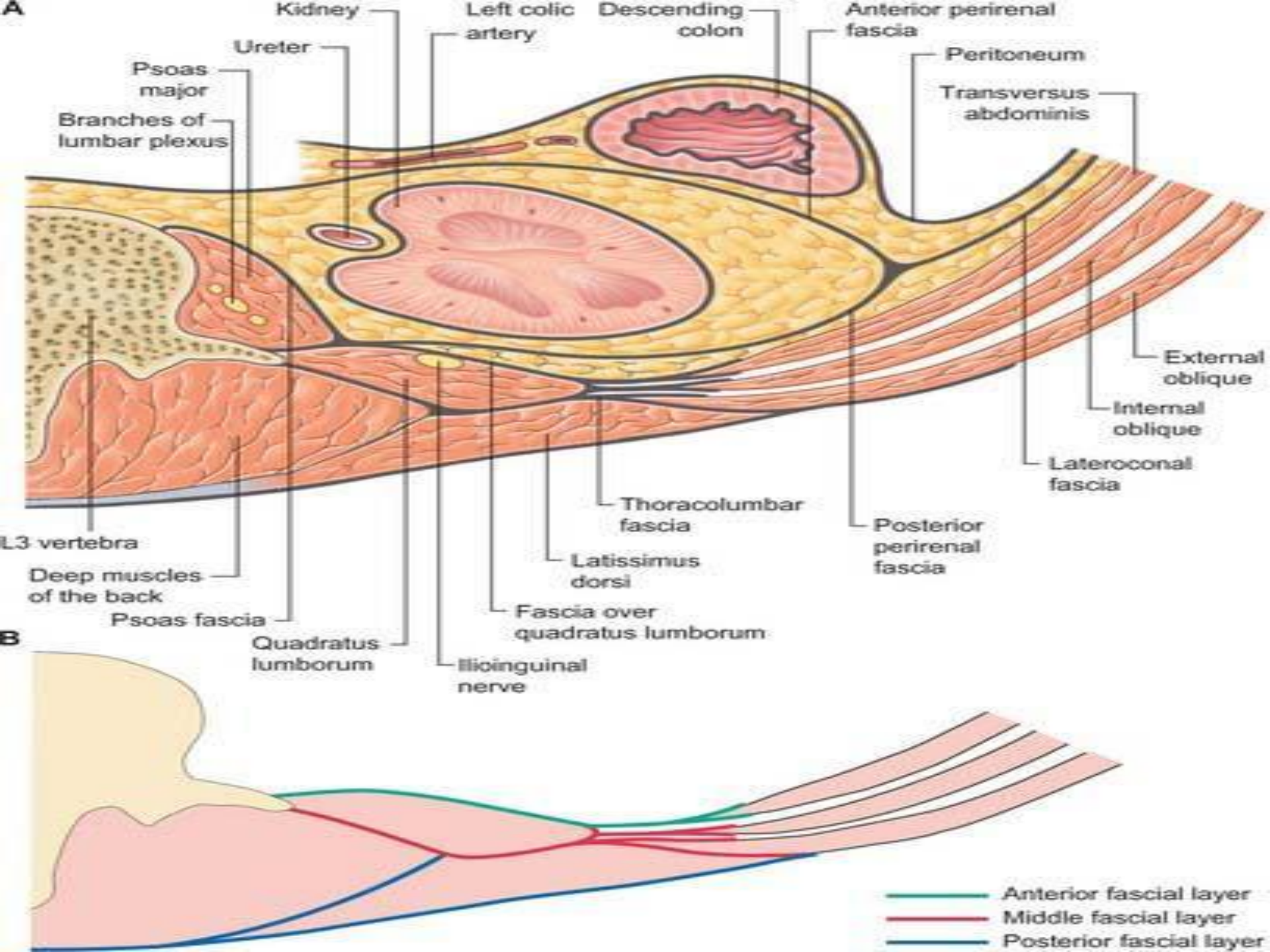
 Borders:-

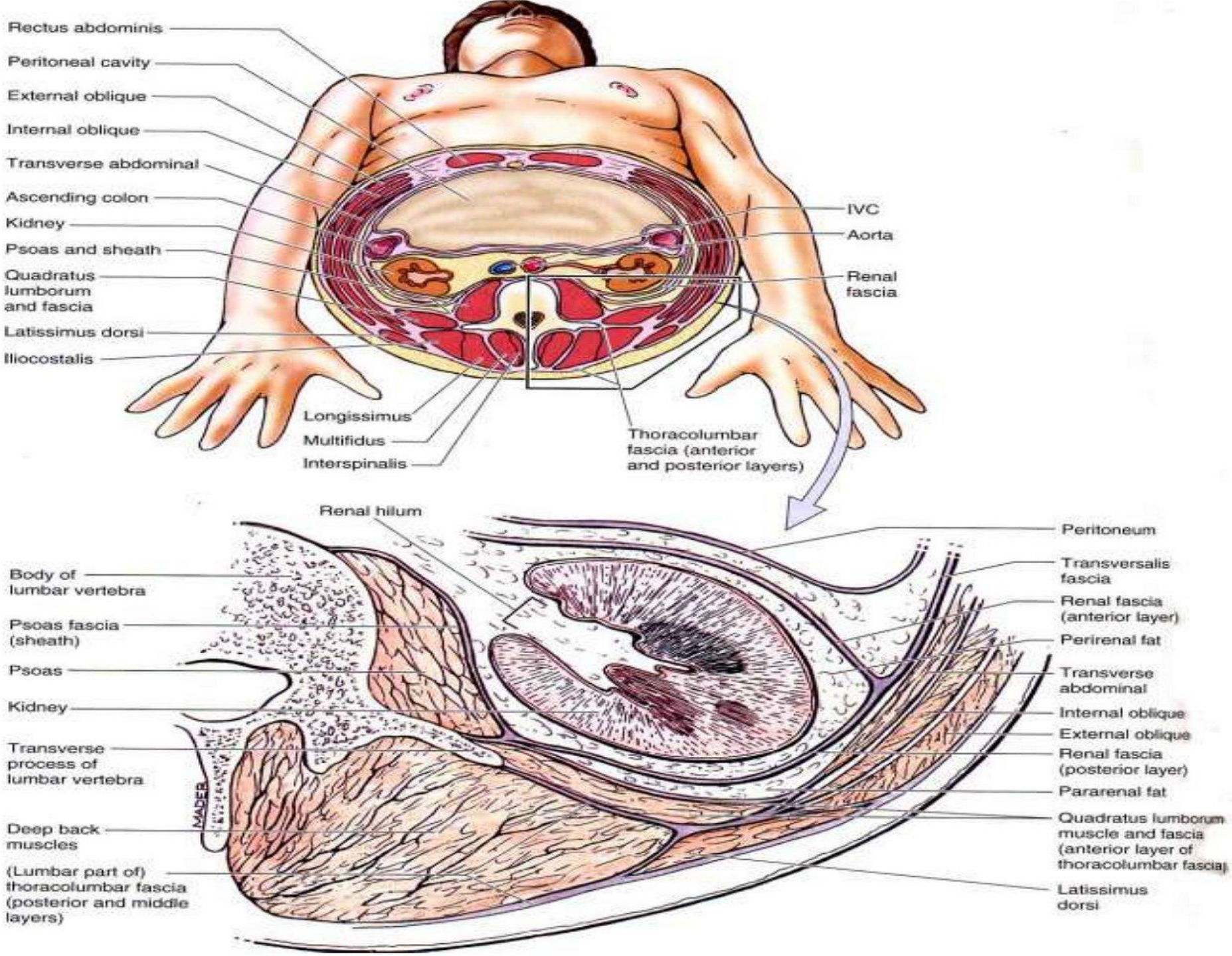
Anterior and posterior

C. PARANEPHRON:-

- BORDERS:-
- Anterior-prerenal fascia
- Posterior- retrorenal fascia
- Interior-paraureteron


Serratus anterior
Anterior layer of rectus sheath
Linea alba
External oblique m.
5th costal cartilage
Anterior layer of rectus sheath
Rectus abdominis m.
External oblique m.
Tendinous intersection
Anterior superficial iliac spine
External oblique aponeurosis
Superficial fascia
Superficial cord


A
Kidney
Left colic artery
Descending colon
Anterior perirenal fascia
Ureter
Peritoneum
Psoas major
Transversus abdominis
Branches of lumbar plexus
External oblique
Internal oblique
Lateroconal fascia
Thoracolumbar fascia
Posterior perirenal fascia
L3 vertebra
Latissimus dorsi
Deep muscles of the back
Fascia over quadratus lumborum
Psoas fascia
Quadratus lumborum
Ilioinguinal nerve
B
Anterior fascial layer
Middle fascial layer
Posterior fascial layer


Rectus abdominis
Peritoneal cavity
External oblique
Internal oblique
Transverse abdominal
Ascending colon
Kidney
Psoas and sheath
Quadratus lumborum and fascia
Latissimus dorsi
Iliocostalis
Longissimus
Multifidus
Interspinalis
IVC
Aorta
Renal fascia
Thoracolumbar fascia (anterior and posterior layers)
Renal hilum
Body of lumbar vertebra
Psoas fascia (sheath)
Psoas
Kidney
Transverse process of lumbar vertebra
Deep back muscles
(Lumbar part of) thoracolumbar fascia (posterior and middle layers)
MADER
Peritoneum
Transversalis fascia
Renal fascia (anterior layer)
Perirenal fat
Transverse abdominal
Internal oblique
External oblique
Renal fascia (posterior layer)
Pararenal fat
Quadratus lumborum muscle and fascia (anterior layer of thoracolumbar fascia)
Latissimus dorsi

VESSELS OF RETROPERITONIUM

- ARTERIES
- Abdominal Aorta
- The abdominal aorta is the principal artery of the abdomen, pelvis and lower limb.
- Course
- The abdominal aorta is the continuation of the descending thoracic aorta. It begins at the level of T_{12}, slightly to the left of midline, posterior to the diaphragm and anterior to the T_{12} vertebral body. It passes inferiorly, remaining anterior to the lumbar vertebrae, before dividing into the paired common iliac arteries.
- Relations
- The relations of the abdominal aorta are:
- Left, with the left kidney
- Right, with the azygos vein (superiorly), inferior vena cava and right coeliac plexus
- Posteriorly, with the vertebral bodies of T_{12} to L_4.
- Anteriorly, with the right lobe of the liver, stomach, pancreas and small bowel. The left renal vein passes anterior to the aorta
- Branches
- The principal branches of the abdominal aorta are:
- The coeliac trunk or axis, a short vessel that contributes to supply of the liver, stomach, pancreas and spleen
- The superior mesenteric artery which supplies the small bowel, proximal large bowel, and the proximal pancreas
- The paired renal arteries which supply the kidneys. The right renal artery passes **posterior** to the inferior vena cava
- The paired gonadal arteries, the course of which varies between men and women.
- The inferior mesenteric artery which supplies the descending and sigmoid colon, and the rectum.
- Smaller branches include lumbar arteries which supply the vertebrae and spinal canal, and inferior phrenic branches which supply the diaphragm.
- Coeliac Axis / Trunk
- The coeliac axis is a 2 cm stub that arises from the anterior aspect of the abdominal aorta, at about T_{12}. It rapidly divides into numerous branches.

- Common Hepatic Artery and Branches
- The common hepatic artery is the larger branch of the coeliac axis, and passes laterally to the porta hepatis within the lesser omentum. It gives off the gastroduodenal artery as it passes superior to the pylorus, followed by the right gastric artery which passes back along the lesser omentum to supply the lesser curvature of the stomach. It continues as the hepatic artery into the porta hepatis, giving off the cystic artery before dividing into right and left hepatic arteries.
- Splenic Artery and Branches
- The splenic artery passes to the left in the retroperitoneum. It gives off numerous branches to the pancreas, which lies inferiorly. It also gives off the left gastroepiploic artery and short gastric arteries to the lateral greater curvature of the stomach.
- Left Gastric Artery
- The smallest branch of the coeliac axis, the left gastric passes to the gastro-oesophageal junction, where it gives of an oesophageal branch. It then passes along the lesser curvature of the stomach to anastamose with the right gastric
- Superior Mesenteric Artery
- The superior mesenteric is the second anterior artery to arise from the abdominal aorta, about 1 cm below the coeliac axis and posterior to the pancreas. It passes inferiorly, laterally and slightly anteriorly, in front of the uncinate process of the pancreas. The left renal vein passes between this artery and the aorta, as does the third part of the duodenum. The superior mesenteric gives off numerous branches to the small bowel and proximal large bowel

- VEINS:-
- Inferior Vena Cava
- The inferior vena cava is the major vessel for the return of blood to the heart from the abdomen and pelvis. Many abdominal viscera drain via the portal system to the liver; but hepatic veins still empty into the inferior vena cava just prior to its entry into the right atrium. The IVC is typically considered in four parts:
- The long abdominal section which runs from L_5 to L_1
- The intrahepatic part that lies within the substance of the liver
- The short suprahepatic segment between the liver and the diaphragm
- The short thoracic part that empties into the right atrium
- Portal Vein
- The portal venous system drains blood from the spleen, pancreas and gastrointestinal tract to the liver, separate to the systemic venous return. It is not covered in this section

TOPOGRAPHY OF KIDNEYS

- MORPHOLOGY:
- kidney has two histologically parts

i. Cortex &

ii. Medulla

- It has 2 poles which are distinguished, namely superior and inferior poles
- It has 2 margins which are distinguished, namely medial and lateral margins.
- FUNCTIONS:-
- Filtartion
- Reabsorption
- Excretion
- Production of erythropoietin for erythropoiesis

- SYNTOPY:-

RIGHT KIDNEY:-

i. SUPERIOR:- rt. Adrenal gland and liver
ii. Inferior:- loops of small intestine and right colon
ii. Anterior:-transverse mesocolonnear hilus
iv. Posterior:- psoas major muscle, quadratus lumborum muscle
v. Medial:- descending part of duodenum

LEFT KIDNEY

i. SUPERIOR:- left adrenal gland, stomach and spleen
ii. Inferior:- loops of sma;ll intestine
ii. Ant.:- transverse mesocolon, pancreas, left colic flexure and loops of small intestine
iv. Posterior:- psoas major muscle, quadratus lumborum muscle, transverse abdominis muscle
v. Lateral:- spleen and descending colon.

- ARTERIAL SUPPLY:-

Renal artery

- Renal vein, then drained into inf. Vena cava
- Lymphatics:- para aortic and coeliac lymph nodes
- Nerve supply:-

Renal plexus

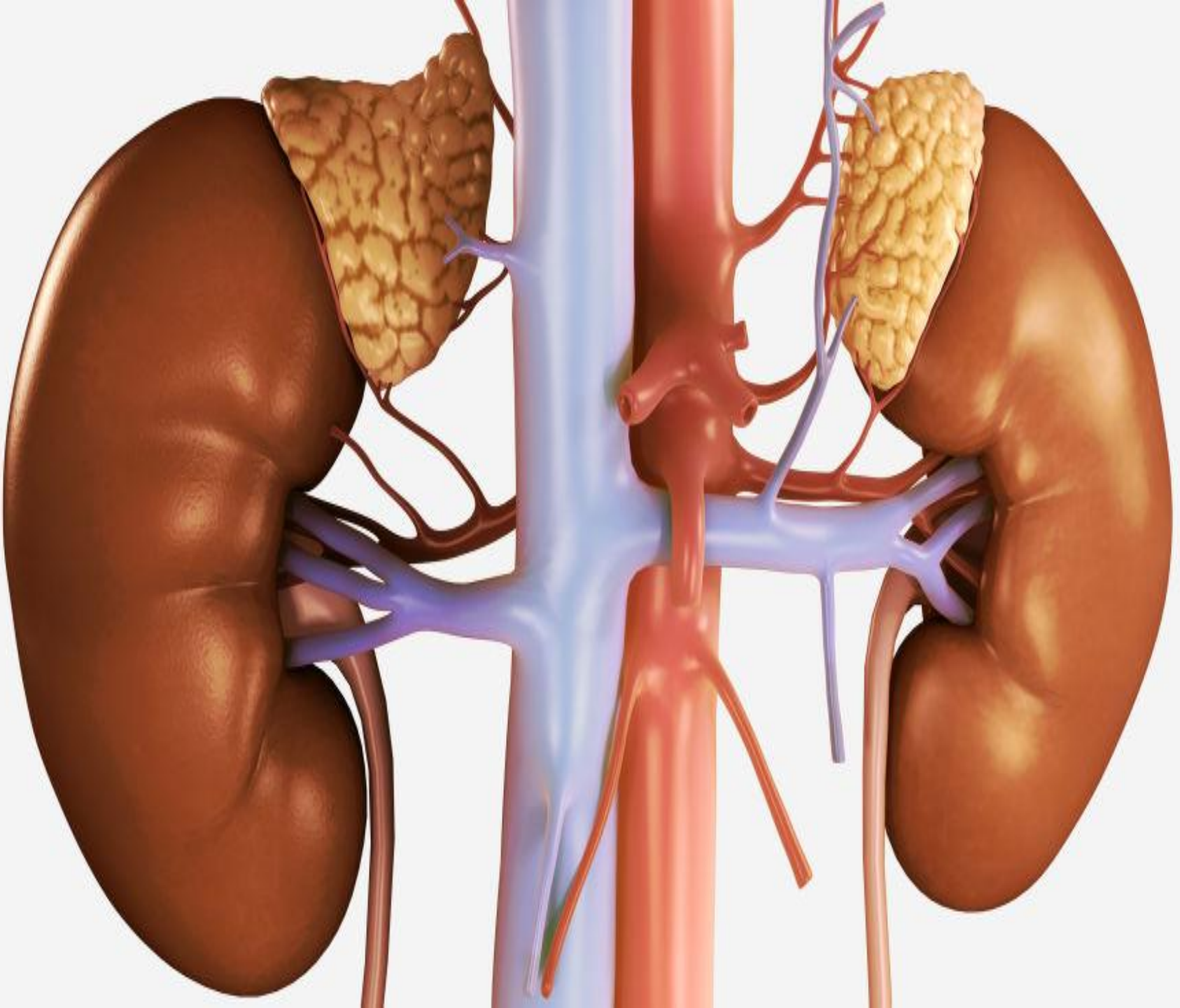
Sympathetic fibers from T10th-L1

Parasympathetic fibers:- vagus nerve

TOPOGRAPHY OF ADRENAL GLANDS

IT HAS 2 PARTS CORTEX AND MEDULLA

- FUNCTIONS:-
- Secretion of glucocorticoids, mineralocorticoids and androgens in the cortex
- Secretion of adrenaline and noradrenaline in medulla
- HOLOTOPY:- they are projected rt. And lft. Hypochondriac regions
- SKELETOPY:- 11^{th} and 12^{th} thoracic vertebra



- ARERIAL SUPPLY:-
- Superior suprarenal artery(br. Of inf. Phrenic A.)
- Middle and suprarenal artery(branches of abdominal aorta and renal artery)
- VENOUS DRAINAGE:-
- right and left suprarenal gland(drained into inf. Vena cava and left renal vein then into inf. Vena cava)
- NERVE SUPPLY:-
- Suprarenal nerve plexus

VISHNEVSKY'S PERIRENAL BLOCKADE

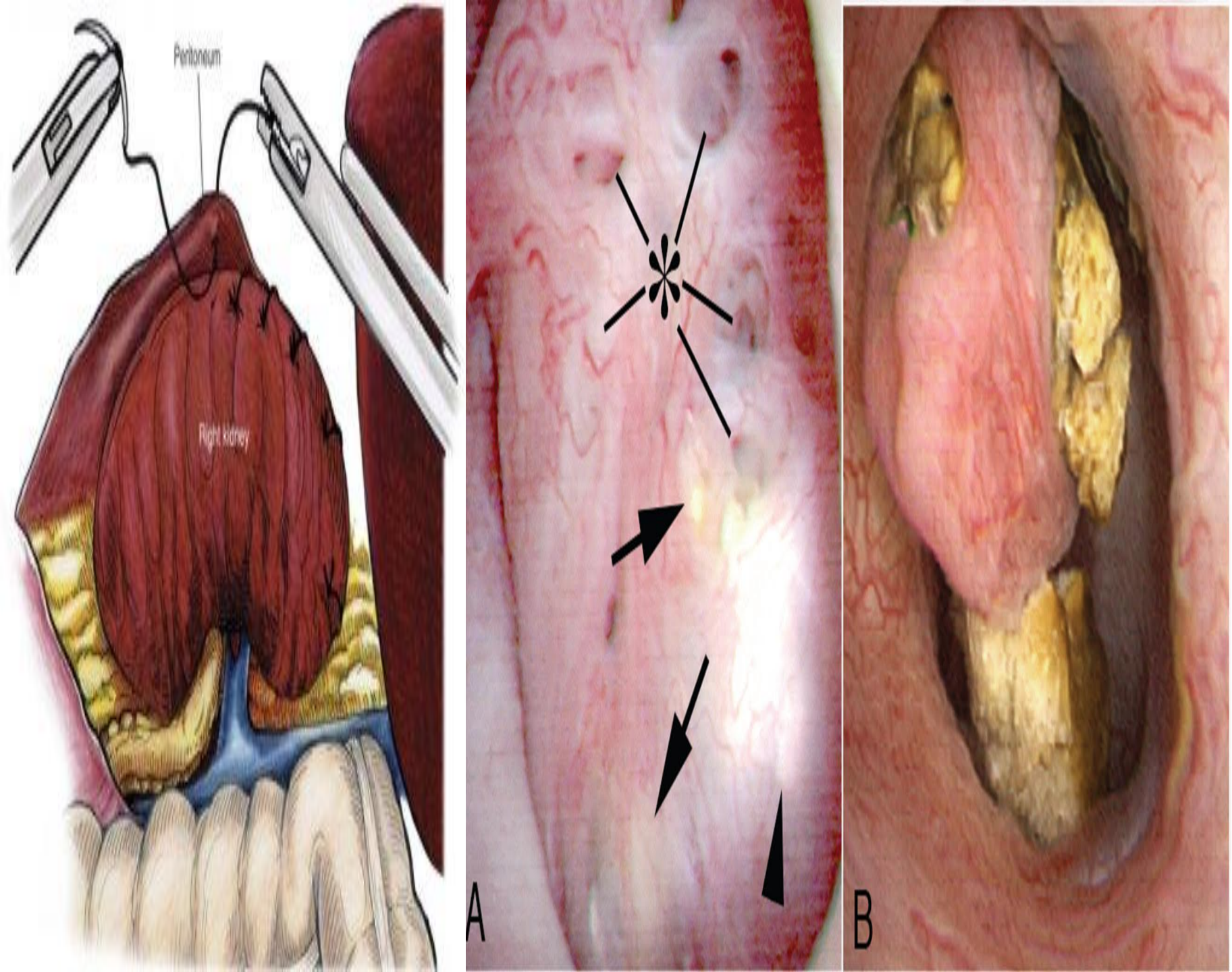
- Position of the patient on one side with the roller under a waist. In the field of a corner between the XII edge and the muscle straightening a backbone enter a needle (fig. 2), to-ruyu advance deep into in situation, strictly normal to the surface skin. Having passed through a layer of muscles and a back leaf of a renal fascia, the end of a needle gets to space between front and back leaves of a renal fascia what intake of solution of novocaine and lack of a reversed current of liquid from a needle at removal of the syringe testifies free to (without essential pressure). After that enter 60 — 120 ml of 0,25% of solution of novocaine. At emergence of blood in a needle the last is slightly extended. Faultlessly carried out lumbar N. shall answer the rule: from a needle — at all liquids and at all blood. Sick after lumbar N. shall observe a bed rest within 1 — 2 days

- INDICATIONS:-
- it has to be regarded only as one of to lay down. the factors applied in a complex with others.
- The main indications to use. inflammatory processes, disturbance of a tone of muscles of bodies, the pathology which is followed by pain are (injuries, wounds, an obliterating endarteritis, hepatic and renal colic, etc.). By Vishnevsky, under the influence of inflammatory process in a stage of serous treatment of fabrics can be suspended, in a stage of abscessing — is quicker delimited and allowed, in an infiltrative stage, and also at subacute , forms positive trophic shifts are observed, destructive processes quite often break and replaced by recovery. At disturbance of a tone of bodies (a gut, a uterus) . promotes permission of spasms, on the one hand, and to increase of a tone at an atony — with another.

NEPHROPEXY

- **Nephroptosis** (also called floating kidney or renal ptosis) is an abnormal condition in which the kidney drops down into the pelvis when the patient stands up. It is more common in women than in men.
- Operation is carried out in nephroptosis
- INDICATIONS:-
- SIGNIFICANT DISPLACEMENT OF KIDNEY
- Haemorrhage
- Pyelonephritis
- Renal hypertension
- **PROCEDURE:-**
- THE pelvis and ureter are examined to exclude any organic obstruction to the urinary outflow.
- The kidney is stiched against the quadratus lumborum muscle
- The kidney is then placed to the lateral part of the muscle with 3 stiches
- A sheet of polyvinyl alcohol sponge is placed between the kidney and muscle to promote adhesion.

- **Potential complications of nephropexy include the following :**
- Urinary tract infection.
- Uncorrected ptotic kidney.
- Retroperitoneal hematoma.
- Bowel injury or puncture during trocar placement.
- Conversion to open nephropexy.
- Muscle paresthesia.
- Genitofemoral nerve injury or entrapment


Peritoneum
Right kidney
A
B