الجهاز الهضمي

علم التشريح

رقم المحاضرة : 4

الكُتّاب: أبو هشام وأبو زياد

المدقق: أبو يحيى

الدكتور: محمد المحتسب

Posterior abdominal wall

Red: professor's explanation

Underlined: what the professor has mentioned from the slides

Purple: important lines

Blue: additional details

Parts the doctor explains on images will be highlighted

Posterior abdominal wall

We will see the posterior abdominal wall from abdomen (Anterior) by these pictures

Structures of post. Abdominal wall:

- 5 lumbar vertebra & their intervertebral disc
- 12th ribs
- Upper part of bony pelvis

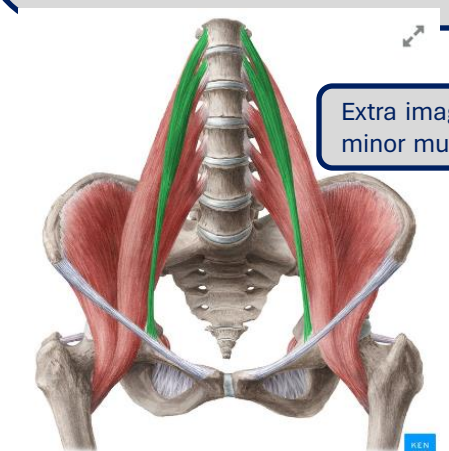
(Especially the iliac crest)

- Muscles
  - psoas major
  - psoas minor
  - Quadratus lumborum
- Aponeurosis of transversus abdominis muscles

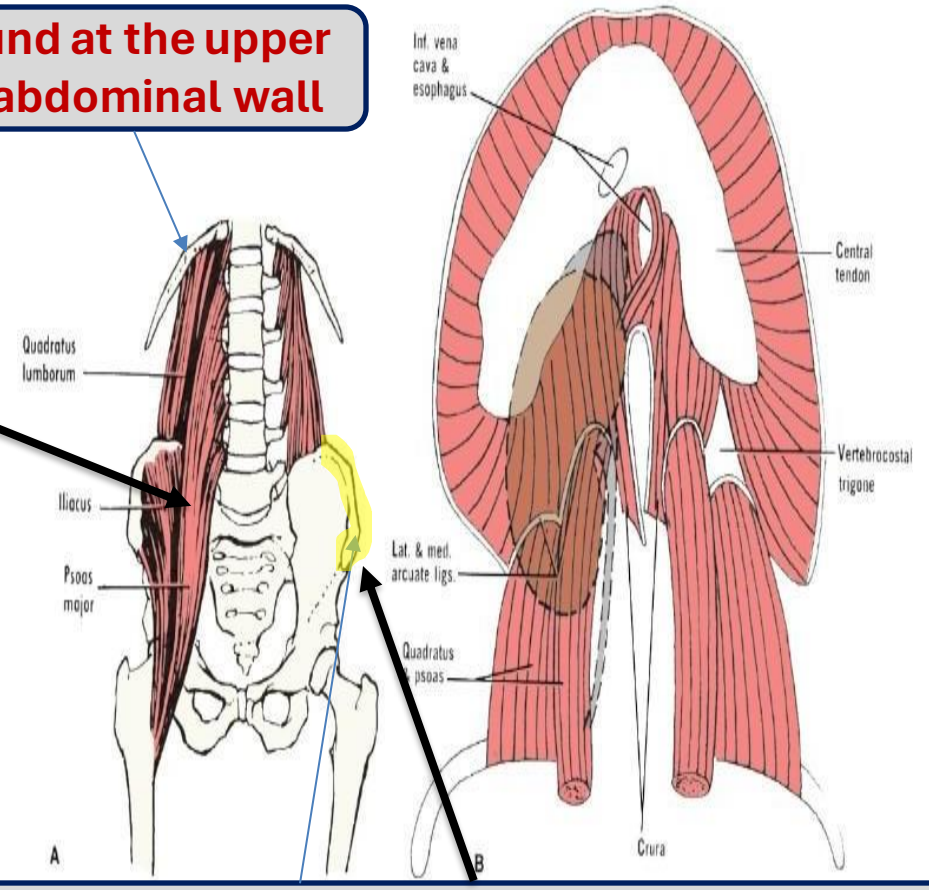
  iliacus muscle lie in the iliac fossa

The last rib is found at the upper part of posterior abdominal wall

This is psoas major muscle, sometimes there is a small muscle anterior to it called psoas minor (not always present), but if it is exist, it used for reconstructive surgery



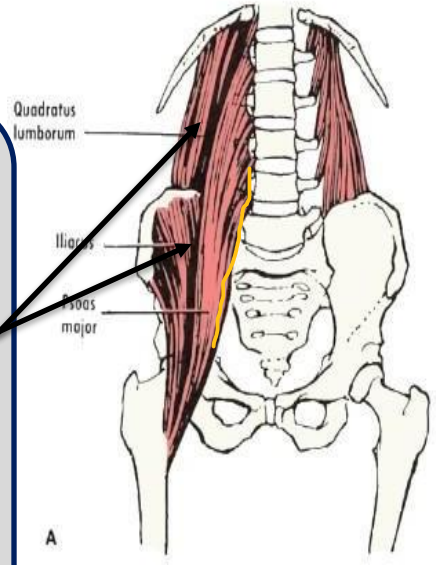
Extra image illustrate psoas minor muscle



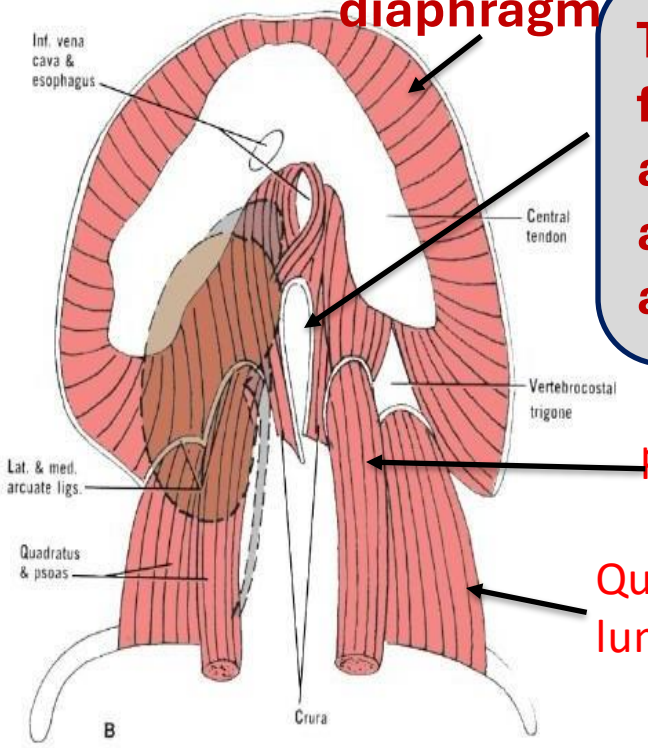
This is the hip bone and its crest (iliac crest, highlighted), we can sense this crest, it separates the abdomen from the pelvis

Posterior abdominal wall

Iliacus and quadratus lumborum, also exist in the posterior abdominal wall



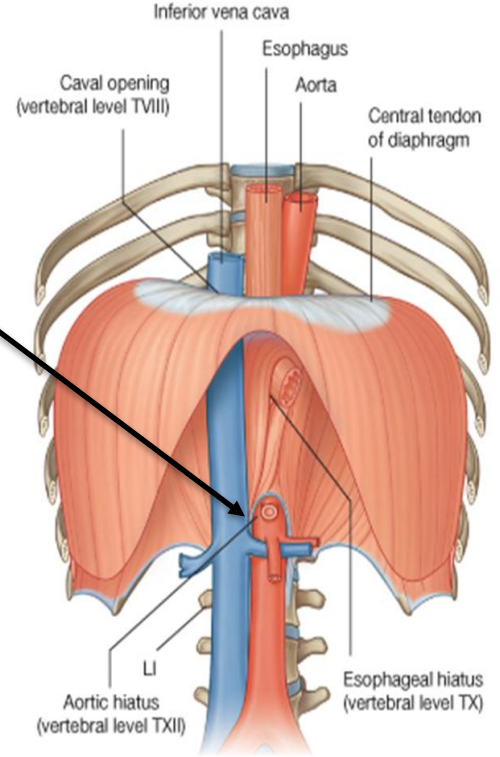
diaphragm



This opening for the abdominal aorta appear at the midline

psoas

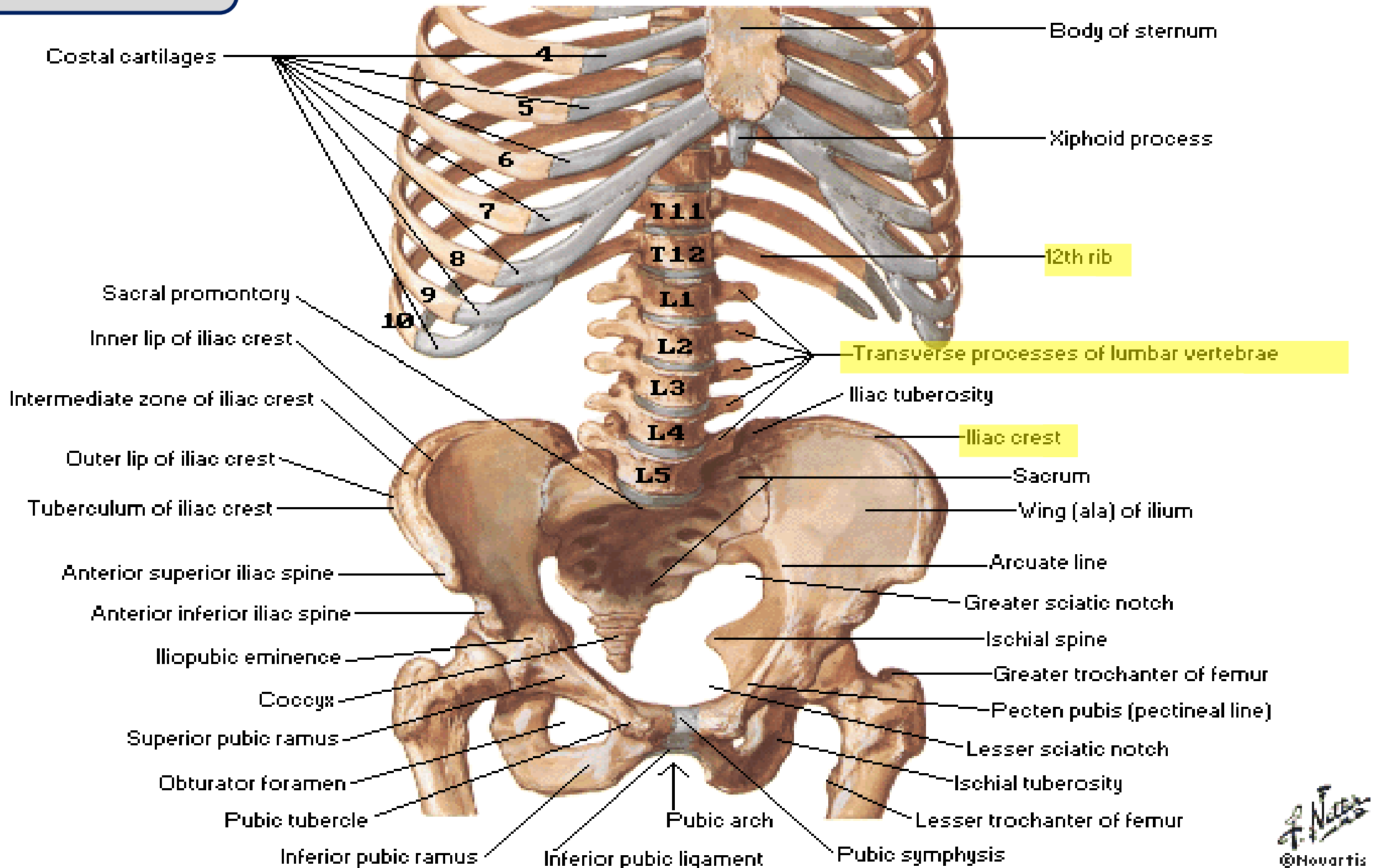
Quadratus lumborum



Extra image

Bony Framework of Abdomen

Doctor mentioned highlighted ones



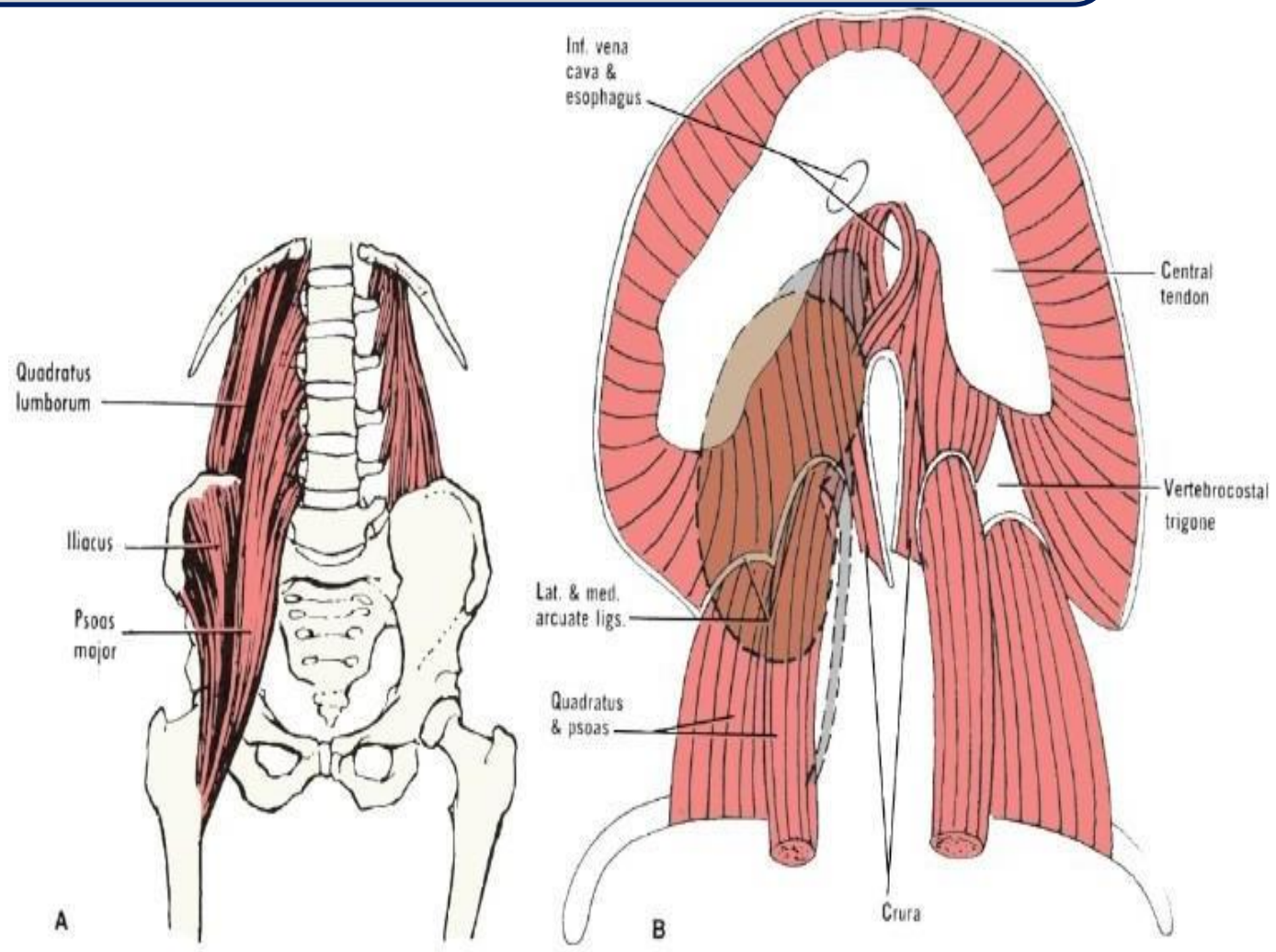
Muscles of post.abdominal wall

The muscle in the posterior abdominal wall are important especially psoas major, because some diseases occur at it (abscess, descending downward reaching the pelvic) , so it has important facia called "psoas facia"

Psoas major

- Origin: body & transverse process of lumbar vertebra & intervertebral disc
- Ins :Lesser trochanter of femur **(with iliacus muscle)**
- N.S: nerve plexus (T12,L1,L2.L3) **(spinal nerves)**
- Action: flexion of hip & thigh

Tow side bending --> Forward
One side bending --> Laterally



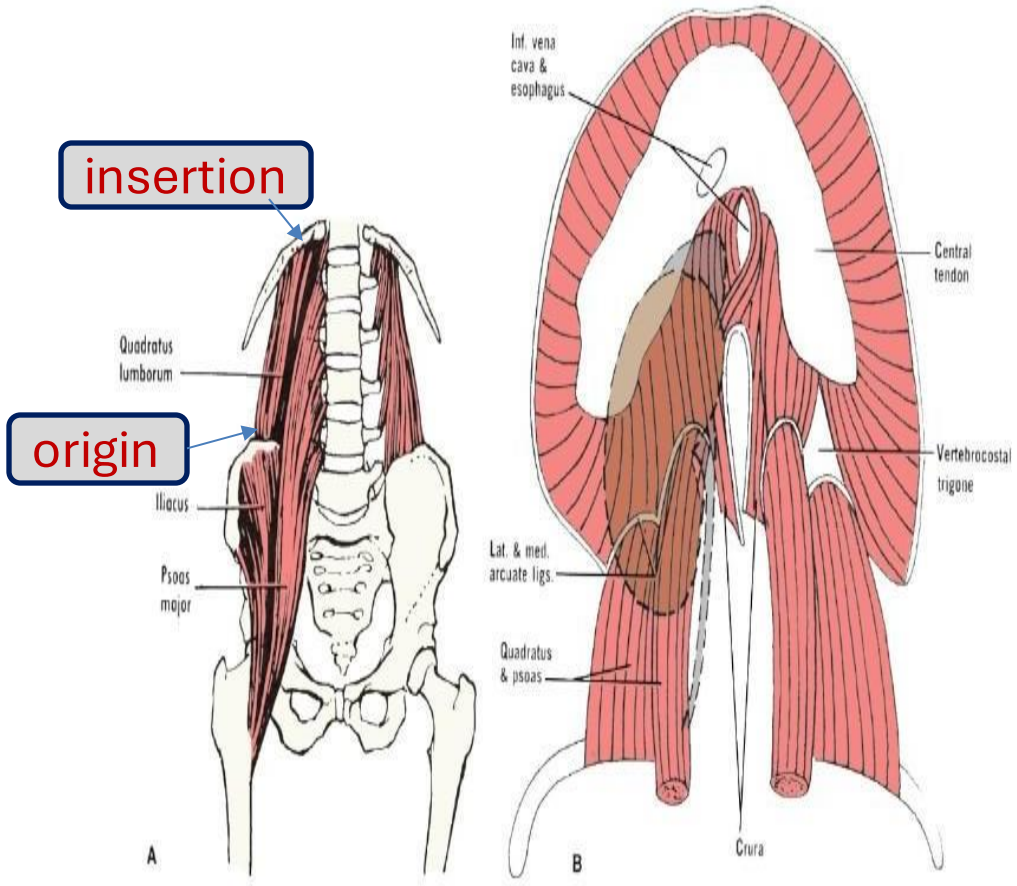
Muscles of post.abdominal wall

Quadratus lumborum

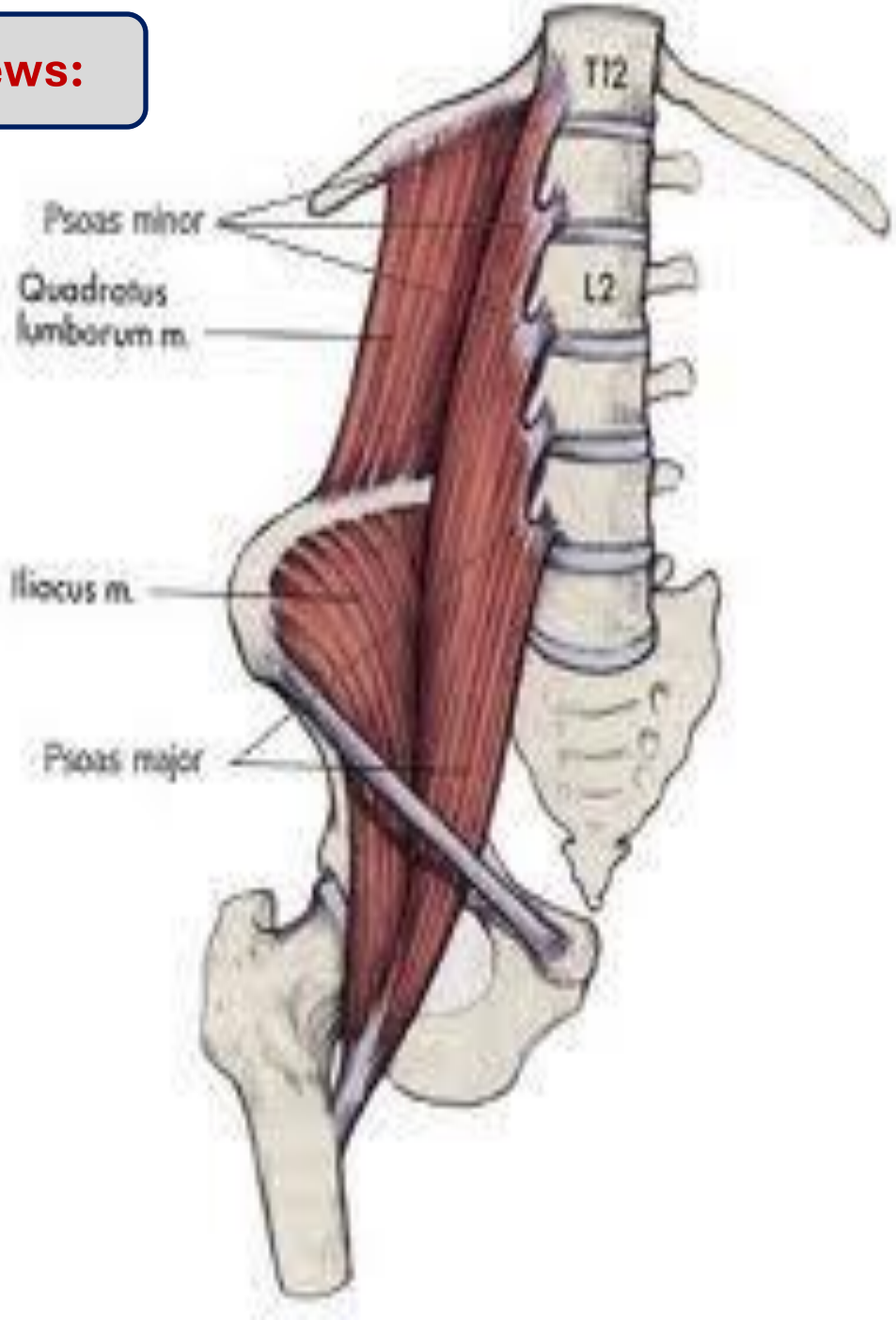
- **Origin: Iliolumbar lig.& iliac crest**
- **Ins: 12th rib**
- **N.S: nerve plexus(T12,L1,L2.L3**
- **Action: fix or depresses 12th rib during respiration (important function) & lateral flexion of the trunk and help in contraction of other muscles**

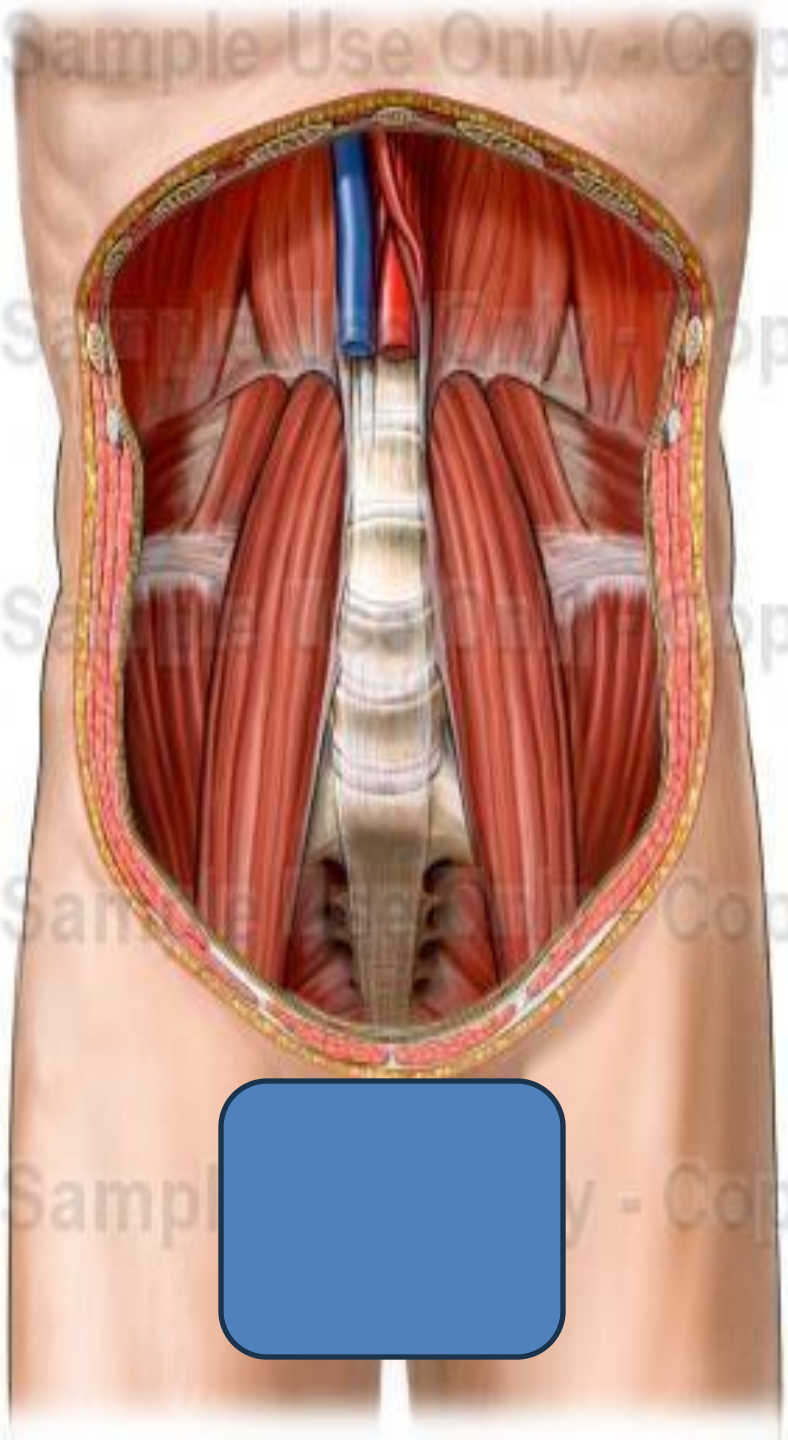
Iliacus muscle

- **Origin: iliac fossa**
- **Ins: Lesser trochanter of femur**
- **N.S: femoral nerve**
- **Action: Lateral flexion of hip & thigh for lying position**



Another views:

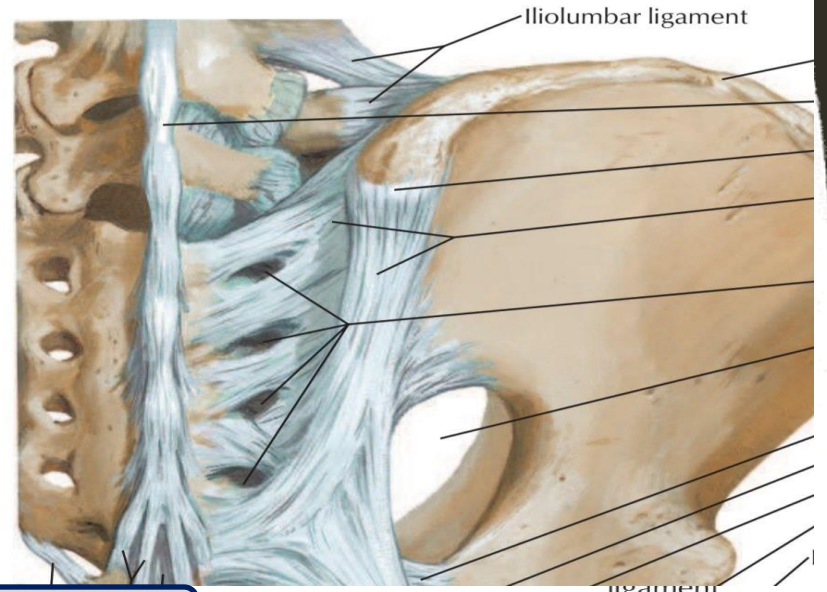




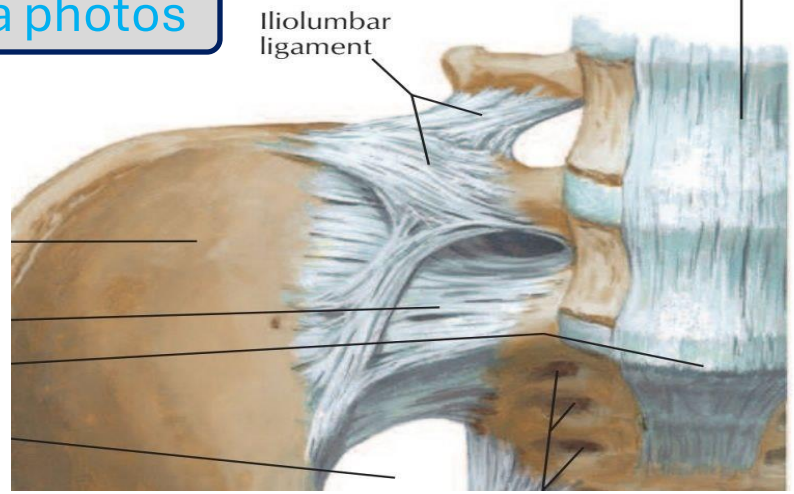
Iliolumbar ligament

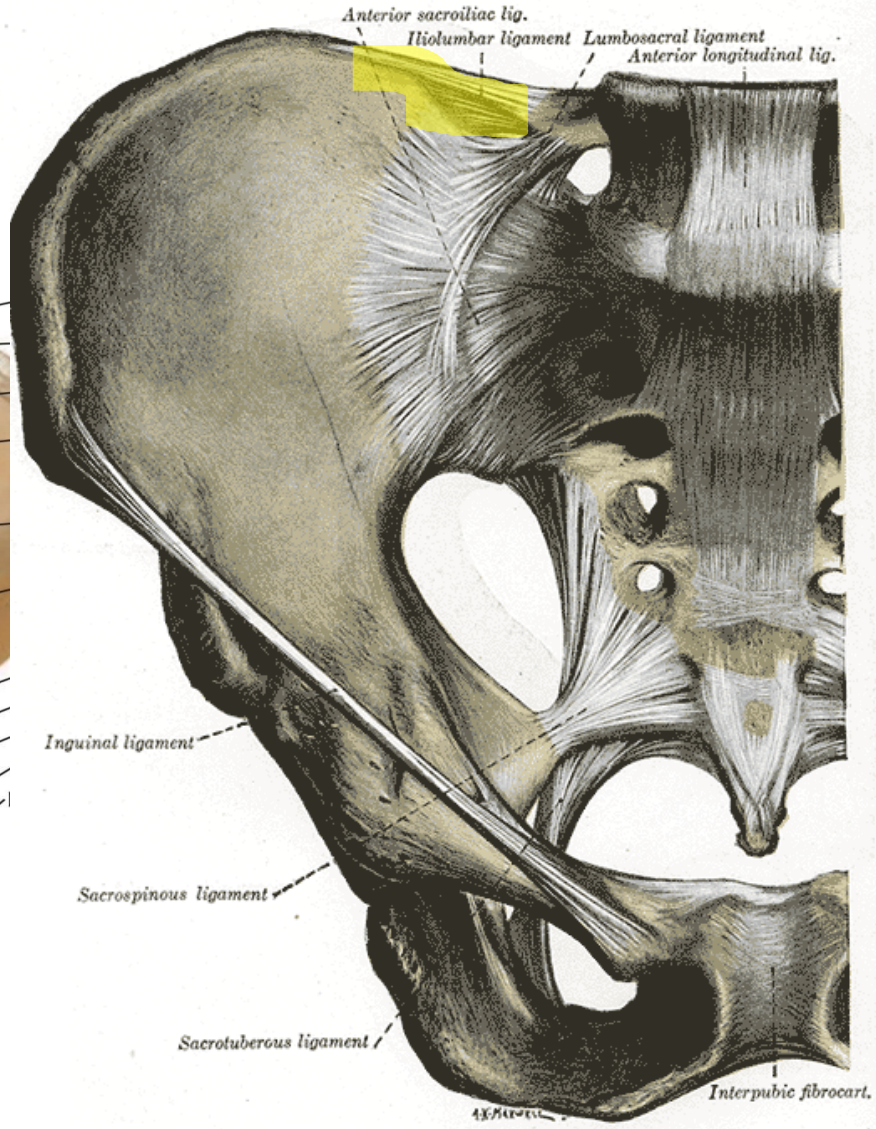
- **Remember that it is give origin for Quadratus lumborum**
- **It is strong ligament**

The **Iliolumbar ligament** is a strong ligament passing from the tip of the transverse process of the fifth lumbar vertebra to the posterior part 1/3 of the inner lip of the iliac crest



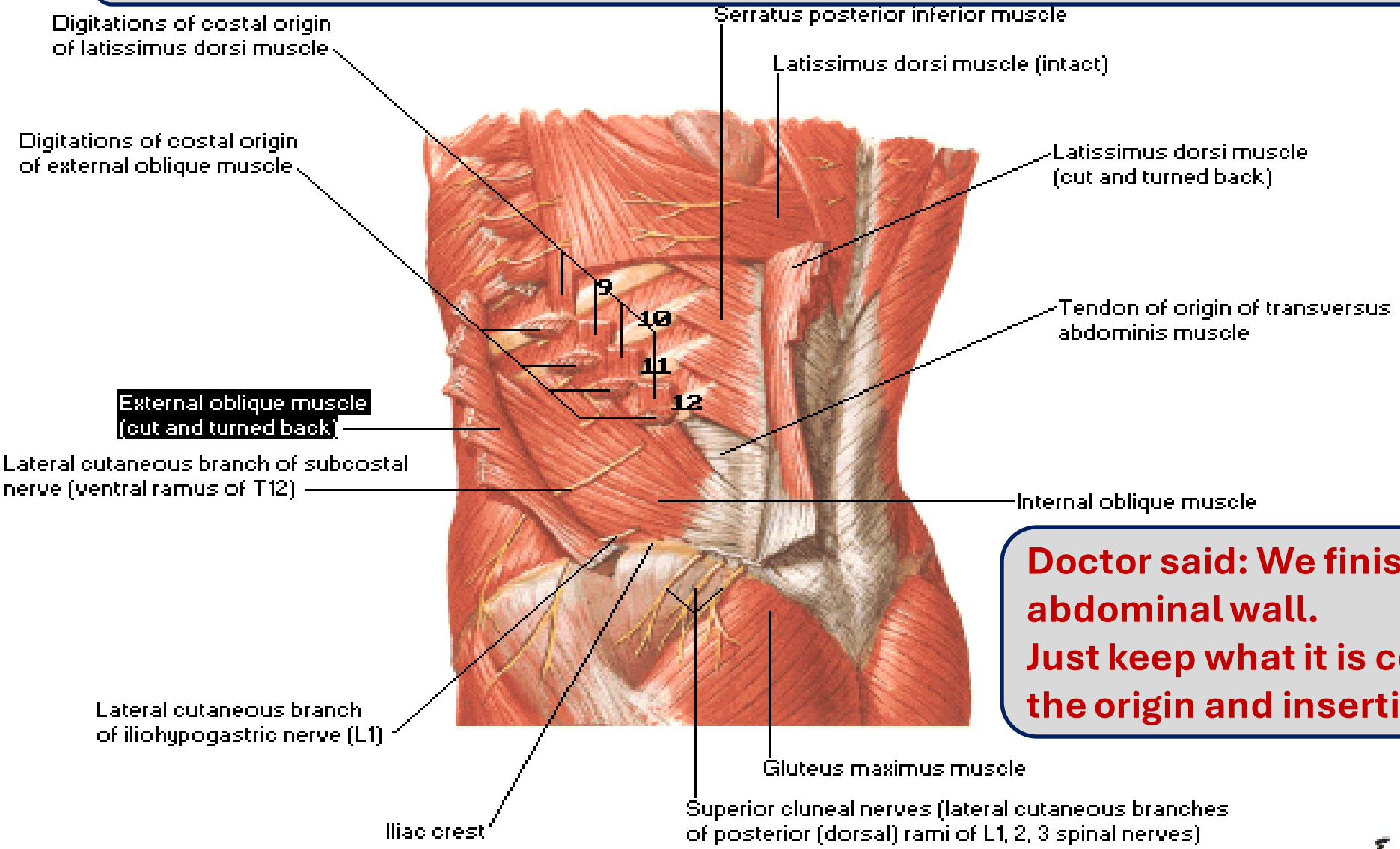
Extra photos





Posterolateral Abdominal Wall [Continued]

This photo here show you the posterolateral wall that contain muscles especially oblique muscles and transversus abdominis

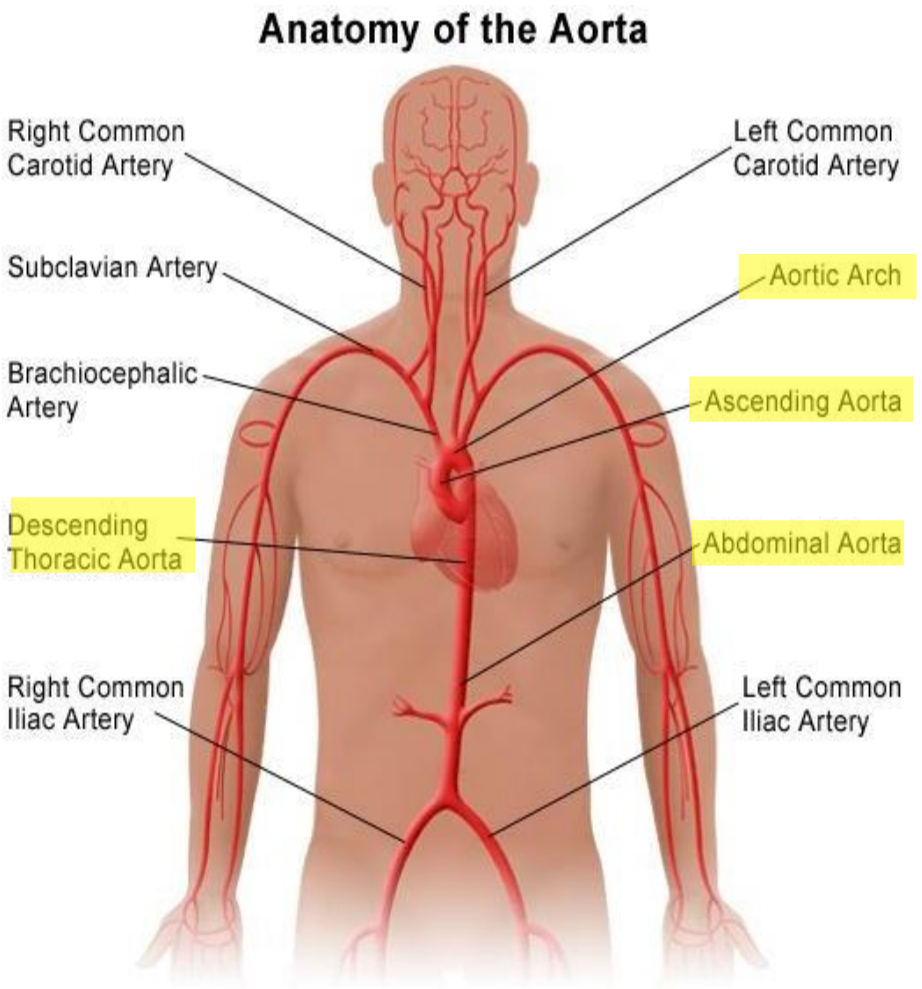


Doctor said: We finished the posterior abdominal wall.
Just keep what it is composed of, and the origin and insertion of the muscles

Arteries on the Posterior Abdominal Wall

This like a revision of the arteries of the abdominal viscera, All of them from the abdominal aorta

In the picture below: starts from the heart, ascending aorta, aortic arch, thoracic aorta, abdominal aorta and then end as common iliac arteries

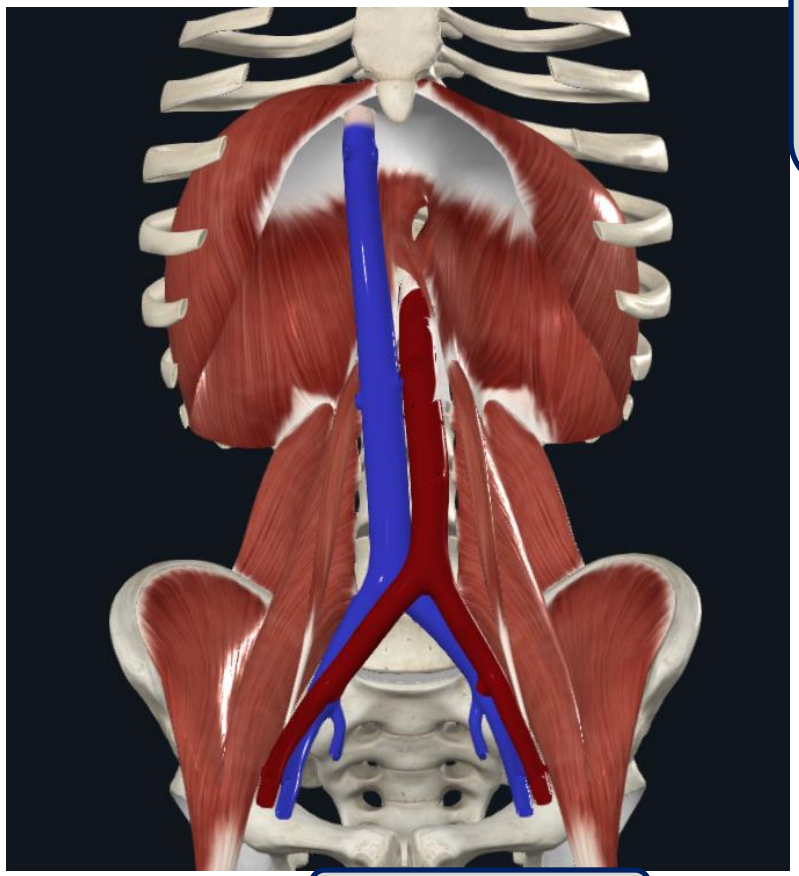


Aorta

Location and Description

- The aorta enters the abdomen (as abdominal aorta) through the aortic opening of the diaphragm in front of the 12th thoracic vertebra at the midline.
- It descends behind the peritoneum on the anterior surface of the bodies of the lumbar vertebra.
- End: At the level of the fourth lumbar vertebra (at the left side) , it divides into two common iliac arteries

Arteries on the Posterior Abdominal Wall



Extra image

Aorta and inferior vena cava are retroperitoneal organs

Vena cava starts at the fifth lumber vertebra on the right side

Intraperitoneal organ

Retroperitoneal organ

Extra image

Arteries on the Posterior Abdominal Wall

Aorta

.Relation of the aorta

Ant:

- **Pancreas**
- **3rd part of doudenum**
- **Coils of small intestine**
- **Crossed by Lt.renal vein**

On its right side :

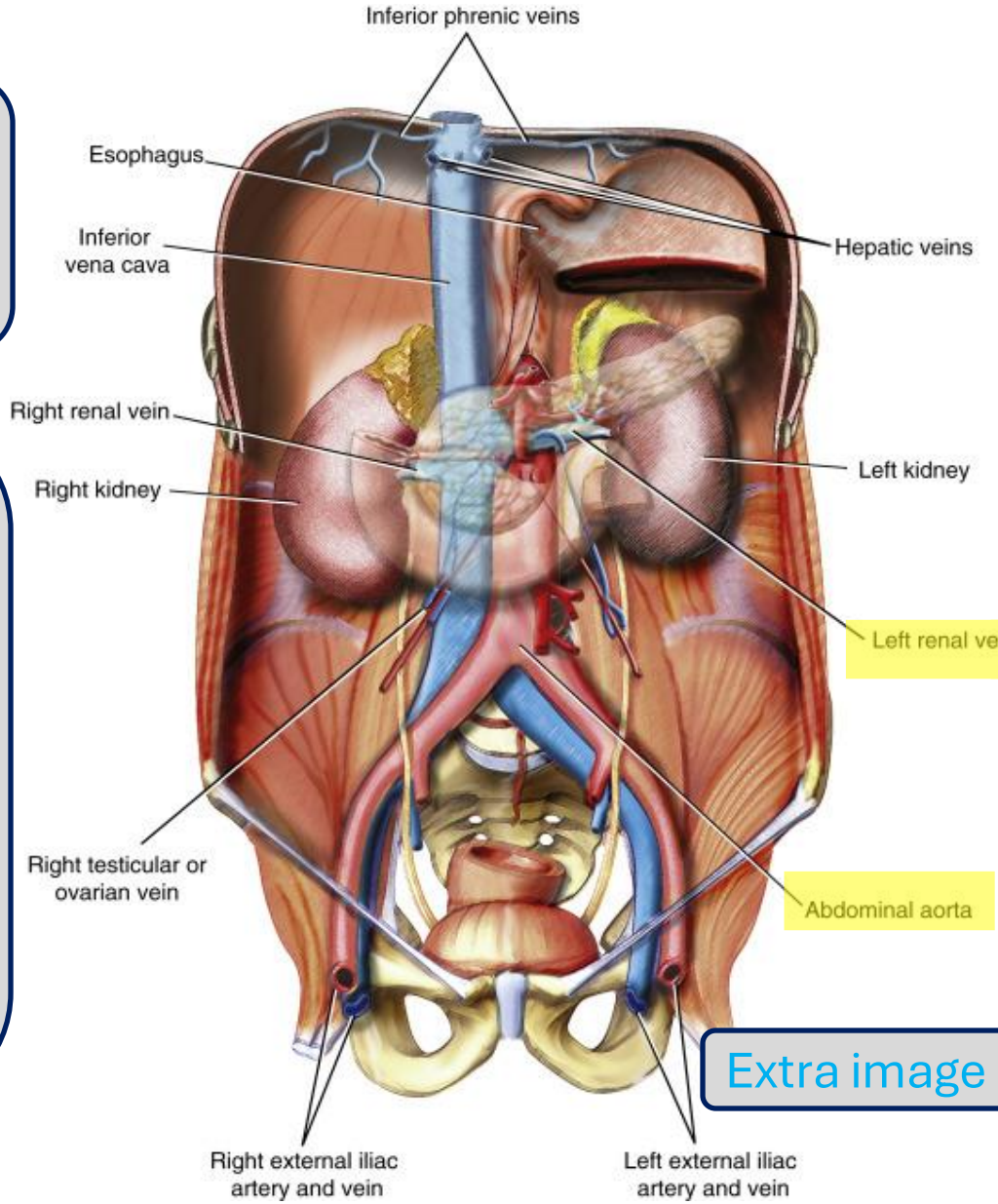
- **The inferior vena cava**
- **The cisterna chyli**
- **The beginning of the azygos vein at the same opening**

On its left side

- **The left sympathetic trunk.(Abdominal sympathetic chain)**

Why the left renal vein cross the abdominal aorta? Because it will reach the vena cava on the right.

Doctor said that the relation of the aorta is very important because in all surgeries taking place in the abdomen, the surgeon should recognise the relations and stay away from aorta, any injury in it cause bleeding, same as inferior vena cava



Extra image

- **Branches of abd. Aorta**
- **Single branches**:

- 3 front & I back

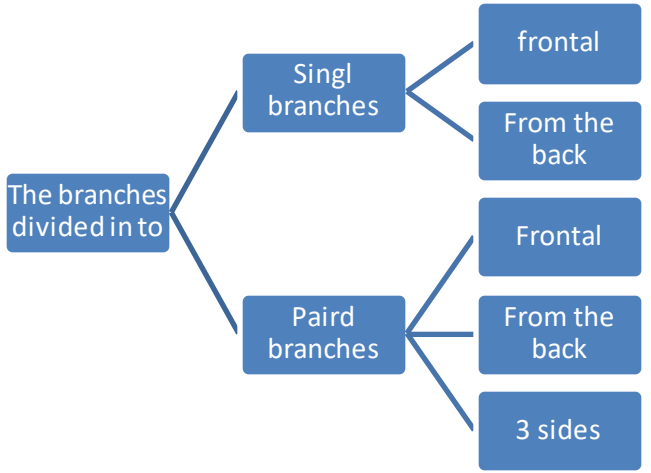
Front:

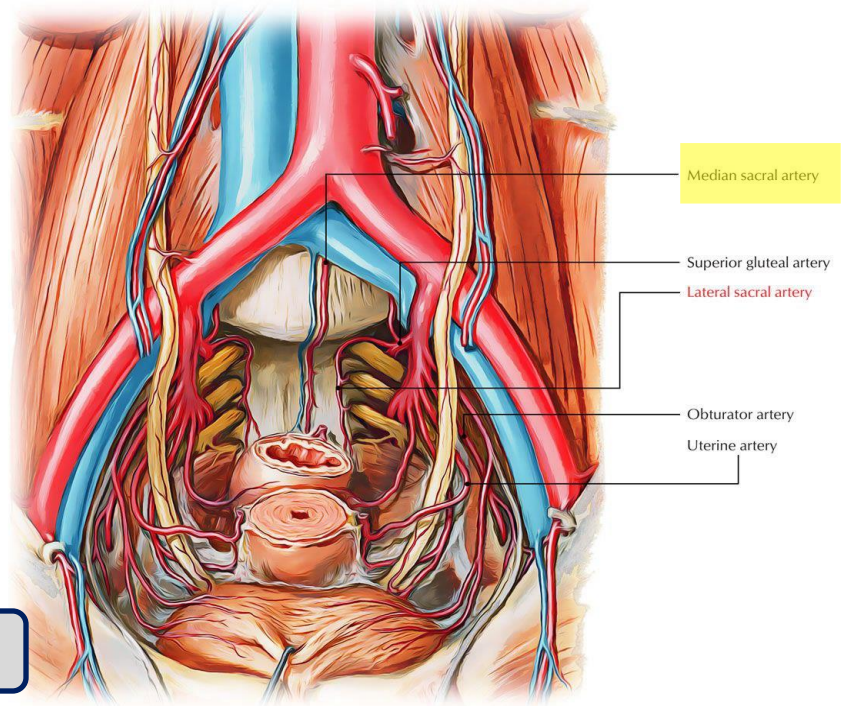
- The celiac artery (**foregut**)
- Superior mesenteric artery **(Midgut)**

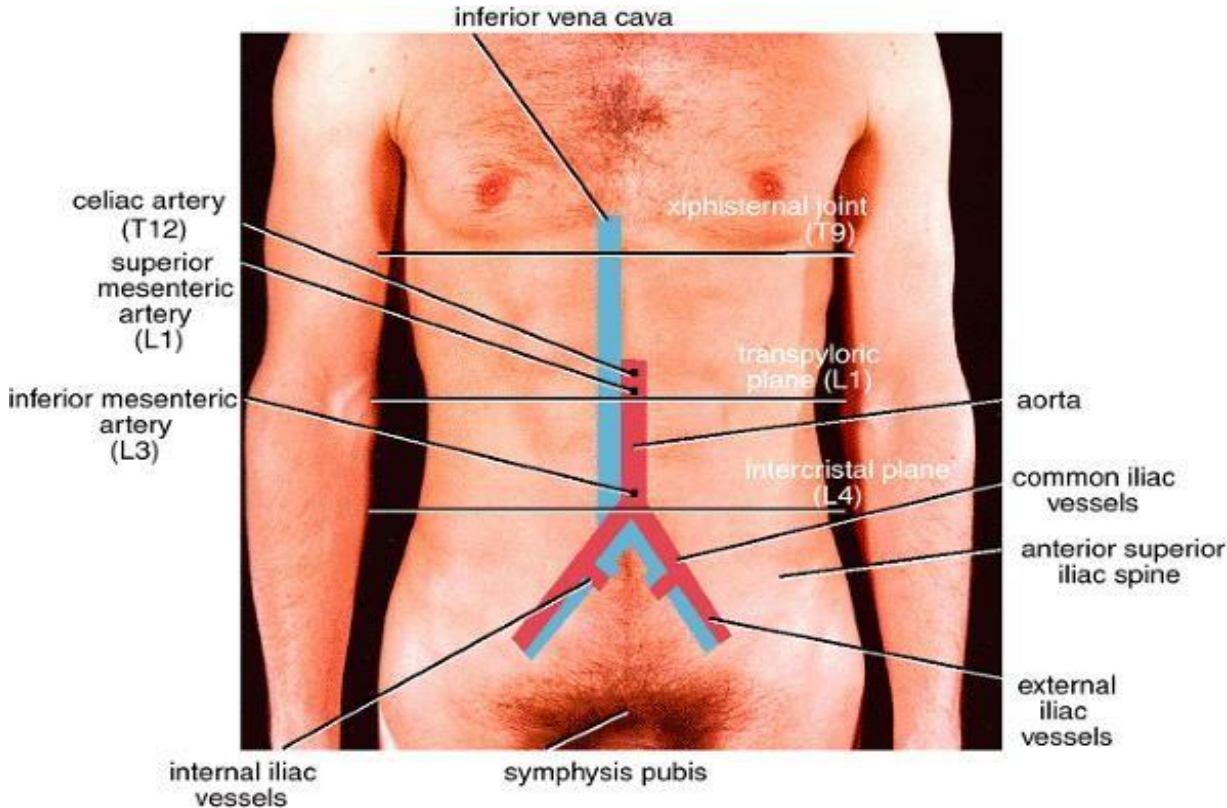
- Inferior mesenteric artery for **(Hindgut)**

Back:

- Mediar
- sacral artery







Extra image

This is the paired branches (right and left), and they either anterior or posterior or from lateral

Abdominal Aorta……cont

Pair branches: 1 front, 4 back & 3 side of aorta:

1- 1front (From the anterior surface of the aorta) **→testicular (in male) or ovarian (in female) artery at level L2**

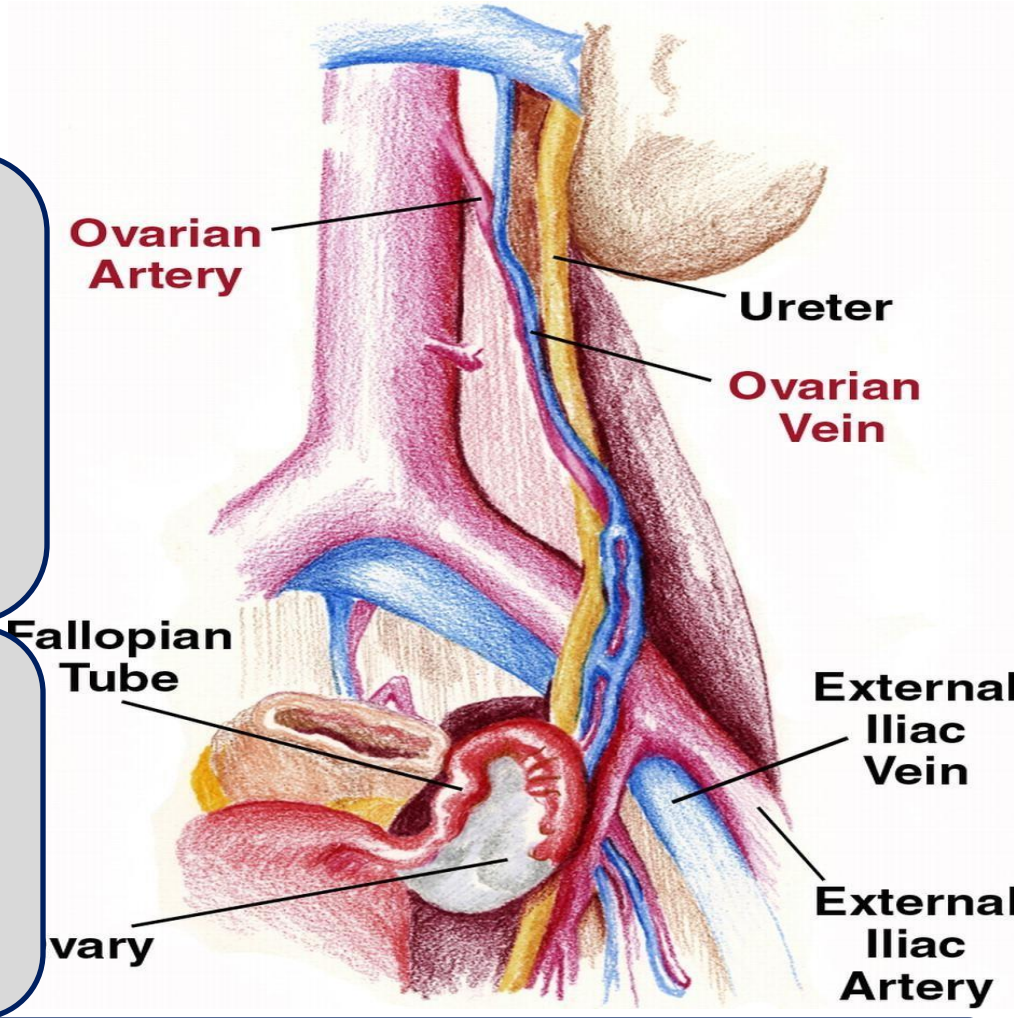
They appear at one side here but actually they exist in both side

2- 4 back → lumbar arteies

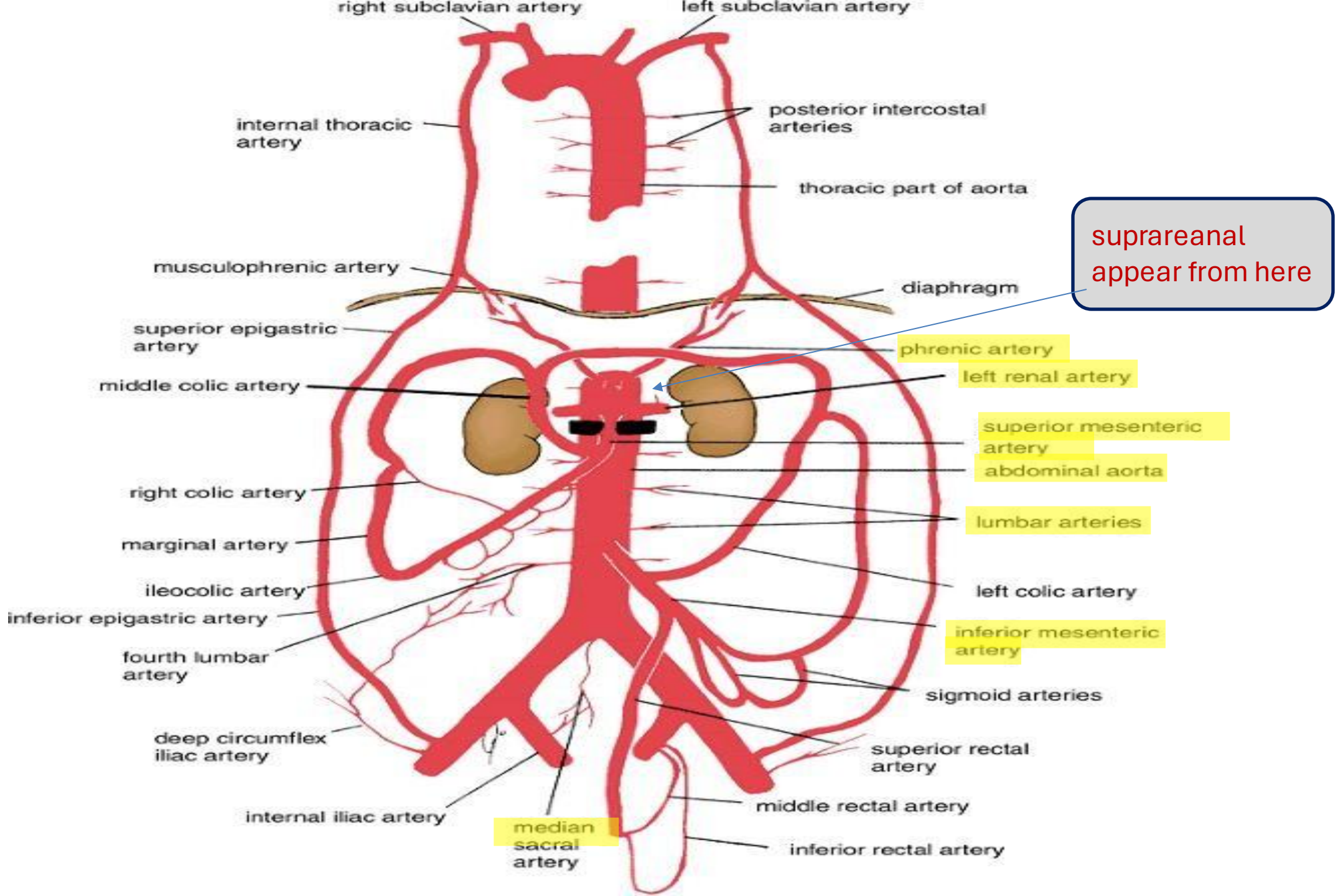
3- 3 side of aorta →Inferior phrenic . A (below the diaphragm and it goes to the diaphragm)
Middle suprarenal . a
Renal . a

As the aorta descend downward it gives branches from the back, and they appear in the both sides usually they are 4, they called lumber because they locate anterior to the lumbar vertebrae

There is suprarenal gland (will be discussed in endocrine), it has 3 arteries : superior, middle & inferior. The middle comes from the aorta



Right renal longer than left because the aorta near from left kidney, so it gives left renal by shorter artery unlike right kidney which need longer artery


right subclavian artery
left subclavian artery
internal thoracic artery
posterior intercostal arteries
thoracic part of aorta
musculophrenic artery
diaphragm
superior epigastric artery
phrenic artery
middle colic artery
left renal artery
superior mesenteric artery
abdominal aorta
right colic artery
lumbar arteries
marginal artery
ileocolic artery
left colic artery
inferior epigastric artery
inferior mesenteric artery
fourth lumbar artery
sigmoid arteries
deep circumflex iliac artery
superior rectal artery
internal iliac artery
median sacral artery
middle rectal artery
inferior rectal artery
suprareanal appear from here

Abdominal aorta…cont

Note: study this picture carefully in the coming slides

Or celiac trunk like doctor always say, because it is very short ,about 1 cm

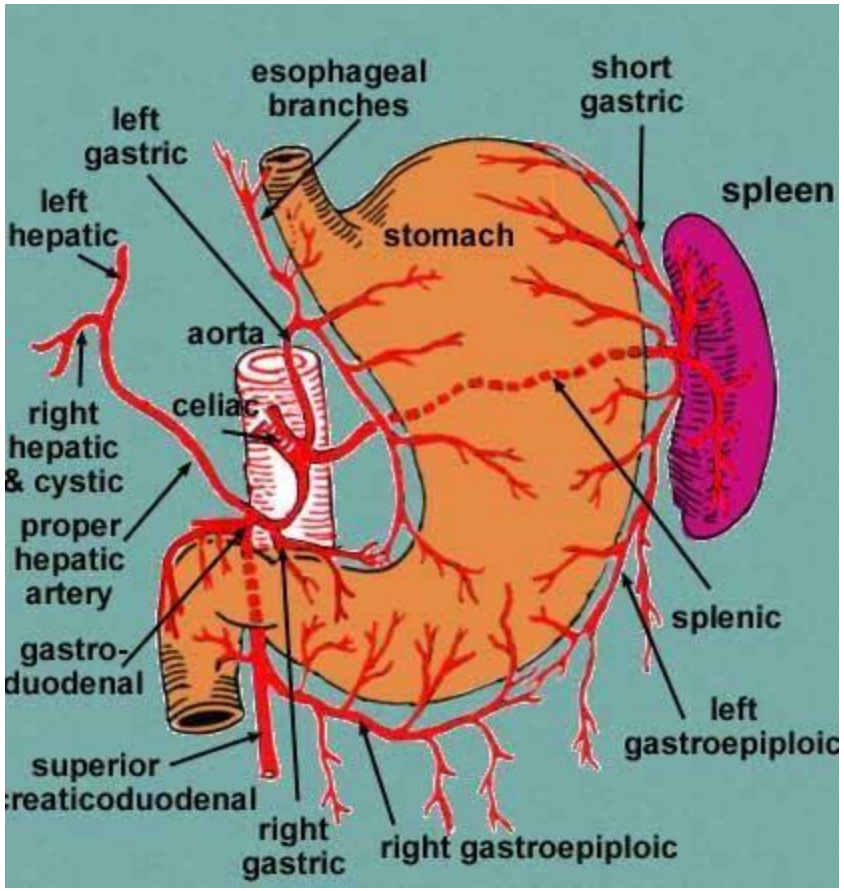
-Celiac artery at level L1

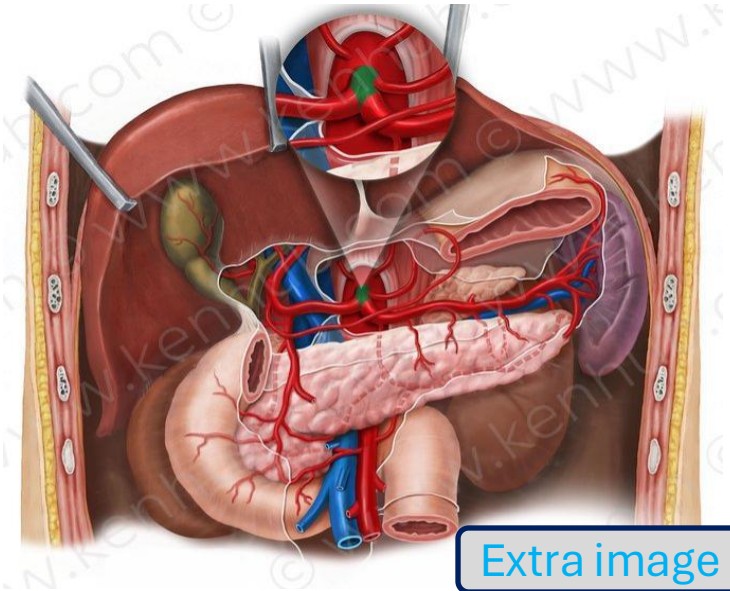
-The celiac artery or trunk is very short and arises from the commencement of the abdominal aorta at the level of the 12th thoracic vertebra. It is surrounded by the celiac plexus and lies behind the lesser sac of peritoneum

Note that doctor focused on: in some sources they say that celiac trunk at the upper border of the L1, and others say at the lower border of the T12 (they are the same)

-it has three terminal branches:

1- The left gastric
2- Splenic Artery
3- Hepatic arteries





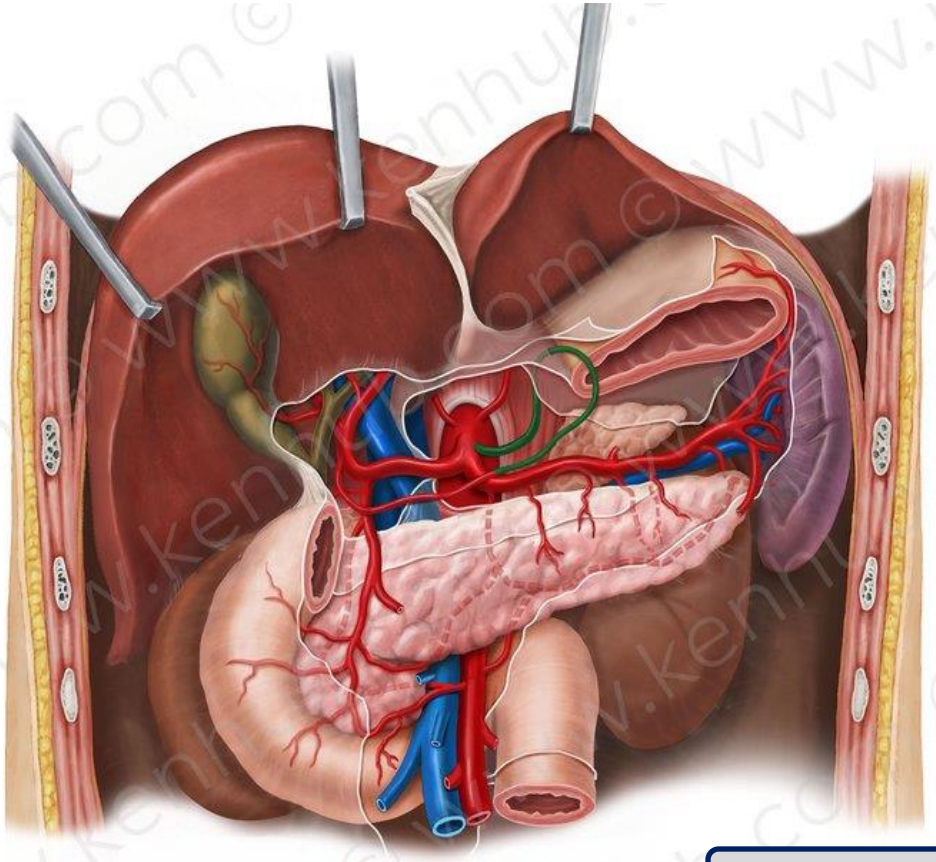
Extra image for celiac trunk

Abdominal aorta…branches of celiac artery

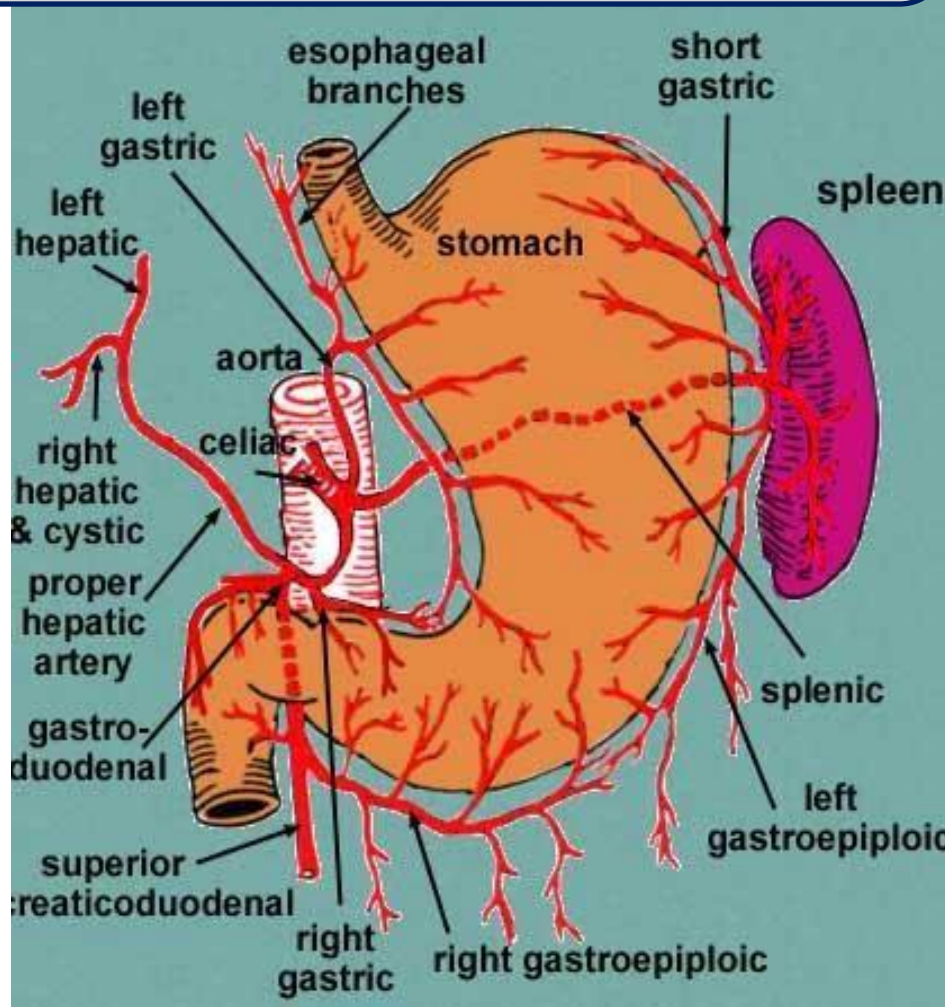
1- The left gastric

The small left gastric artery runs to the cardiac end of the stomach, gives off a few esophageal branches, then turns to the right along the lesser curvature of the stomach. It anastomosis with the right gastric artery

It goes to the lower third of the esophagus, then to the lesser curvature give the stomach and then meet with right gastric and anastomosis with it. So there are left and right gastric and they are content of the lesser omentum.



Extra image for left gastric



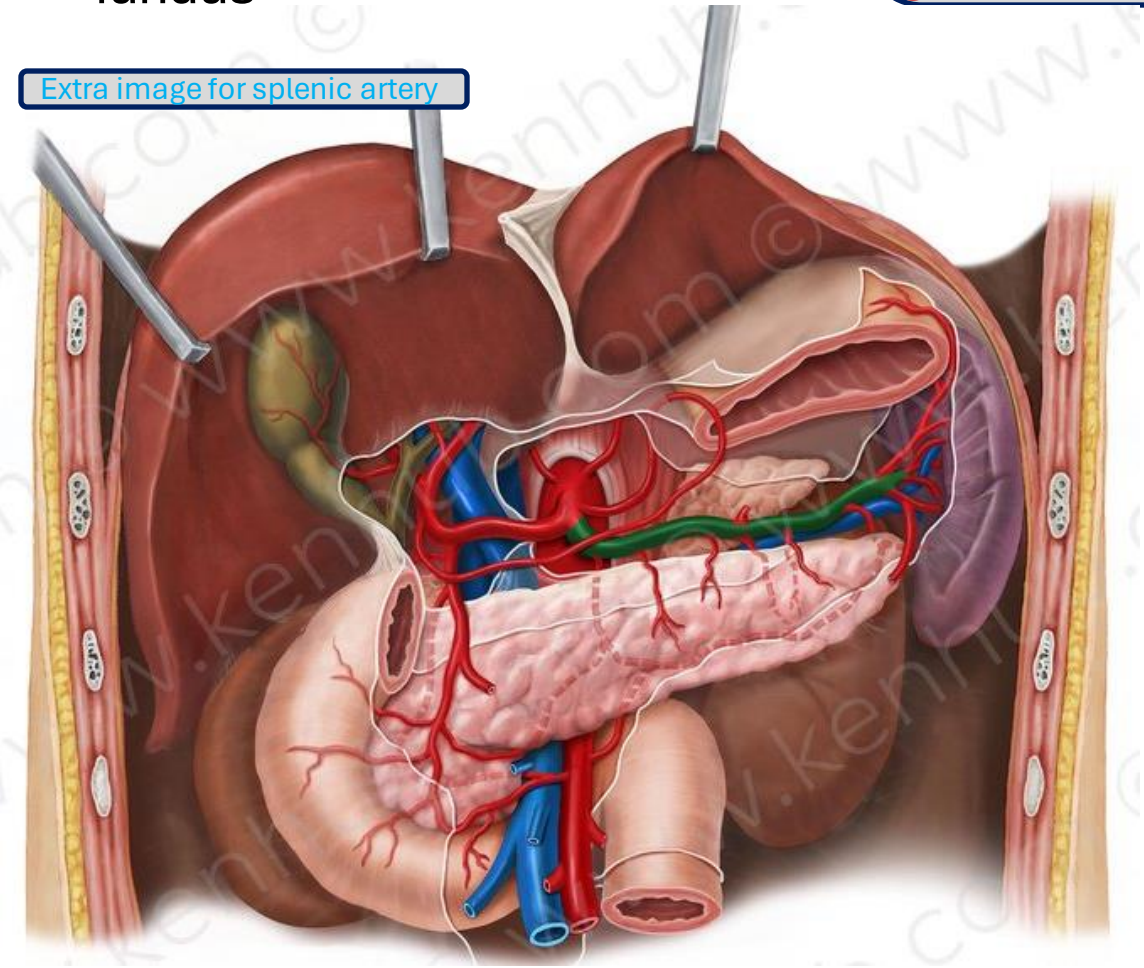
Abdominal aorta…branches of celiac artery

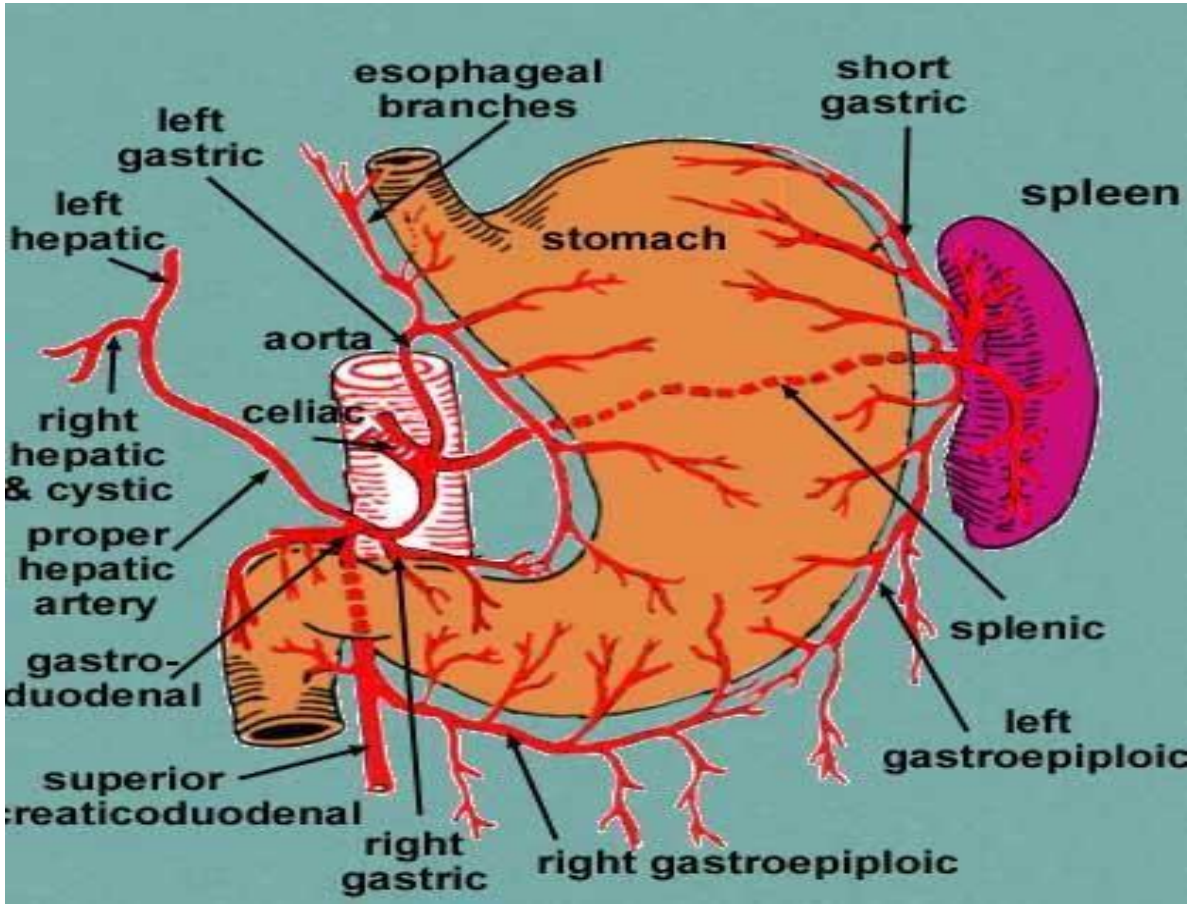
2- Splenic Artery

- Pancreatic branches
- The left gastroepiploic artery
- The short gastric arteries → fundus

Splenic is a Tortuous artery that passes on the upper border of the pancreas until it reaches the hilum of the spleen. The most important branches that it gives are pancreatic branches (anterior and posterior), and then gives short gastric that go to the fundus of the stomach via ligament called "gastrosplenic". And gives left gastroepiploic in the greater omentum.

Extra image for splenic artery





The doctor said read the branches (:

Abdominal aorta…branches of celiac artery

3-Hepatic arteries:

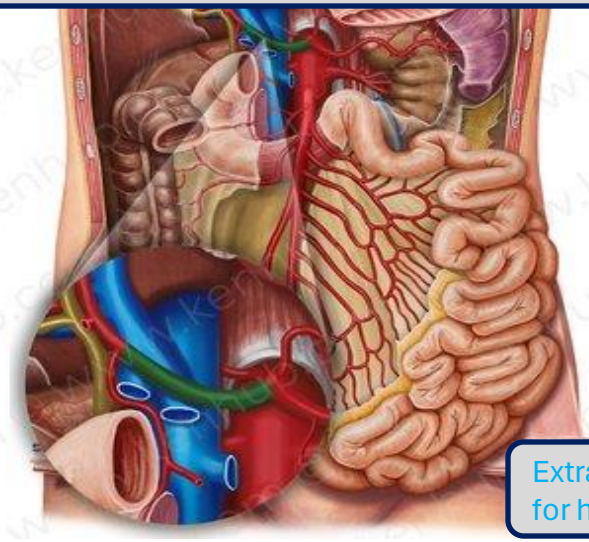
The right gastric artery arises from the hepatic artery at the upper border of the pylorus and runs to the left in the lesser omentum along the lesser curvature of the stomach. It anastomosis with the left gastric artery .

It gives the right gastric at the lesser curvature, and gastroduodenal, and then continue to the porta hepatis giving left and right hepatic arteries. The right hepatic artery gives rise to the cystic artery, which supplies blood to the gallbladder

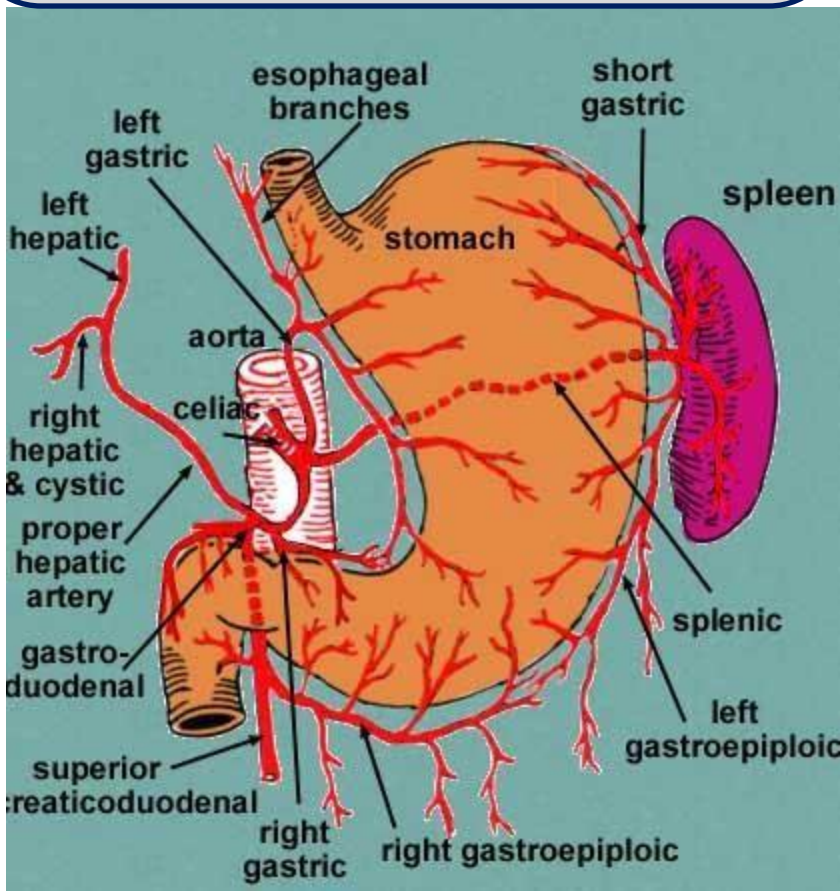
-The gastroduodenal artery:

It divides into the **right gastroepiploic artery** that runs along the greater curvature of the stomach between the layers of the greater omentum and the **superior pancreaticoduodenal artery** that descends between the second part of the duodenum and the head of the pancreas .

It gives right gastroepiploic and superior pancreaticoduodenal artery



Extra image for hepatic



-**The right and left hepatic arteries** enter the porta hepatis. The right hepatic artery usually gives off **the cystic artery**, which runs to the neck of the gallbladder

Abdominal aorta……cont

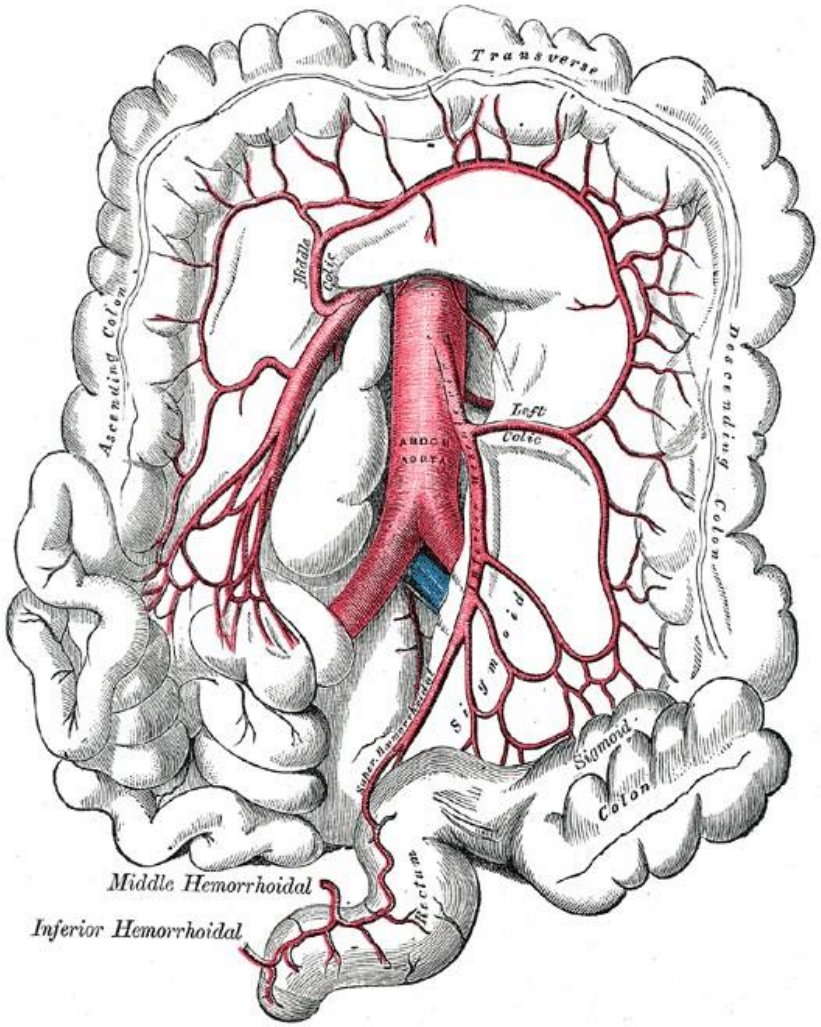
- **<u>Superior mesenteric Artery at level L 2</u> (upper border of L2 or lower border of L1) gives:**

1- <u>The inferior pancreaticoduodenal artery</u>: it goes to the lower half of the duodenum and pancreas (remember that the superior comes from the gastroduodenal of hepatic –from celiac-)

2- <u>The middle colic artery</u> runs forward in the transverse mesocolon to supply the transverse colon and divides into right and left branches. **It goes to transvers colon and gives branches to supply part of ascending colon**

3- <u>The right colic artery</u> is often a branch of the ileocolic artery. <u>It passes to the right to supply the ascending colon</u> and divides into ascending and descending branches.

<u>4- The ileocolic artery</u> (At the end of mesenteric, to the ileum and ascending colon) passes downward and to the right. It gives rise to a superior branch that anastomoses with the right colic artery and an inferior branch that anastomoses with the end of the superior mesenteric artery. The inferior branch gives rise to the **<u>anterior and posterior Cecal arteries; the appendicular artery</u>** is a branch of the posterior Cecal artery .

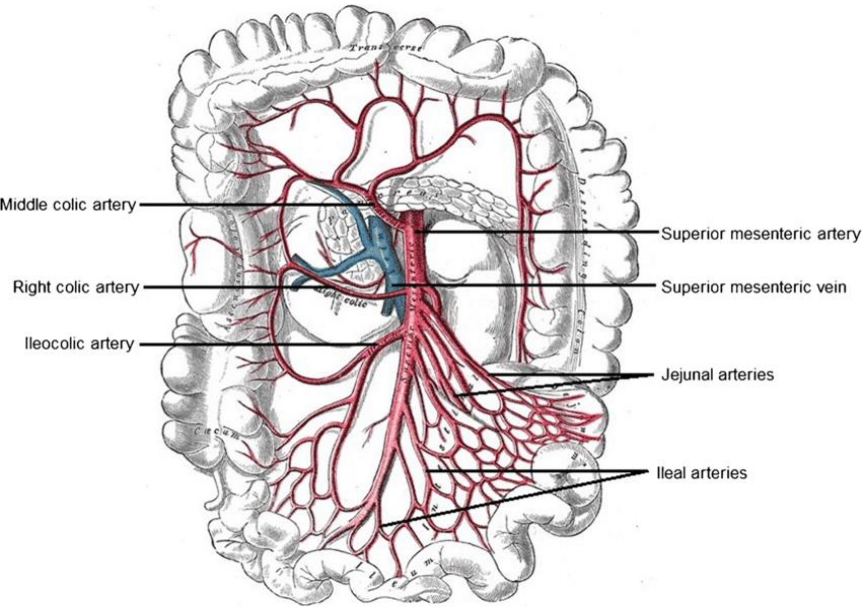


Abdominal aorta……cont

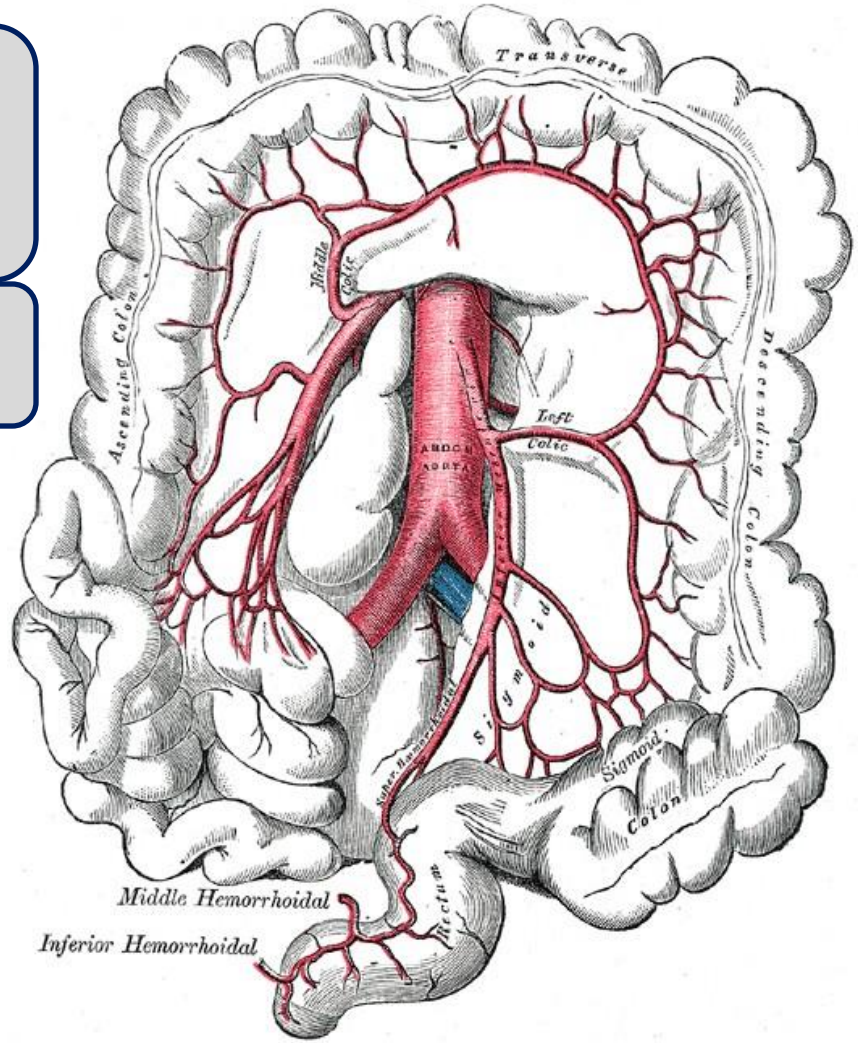
5- The jejunal and ileal branches are 12 to 15 in number and arise from the left side of the superior mesenteric artery . Each artery divides into two vessels, which unite with adjacent branches to form a series of arcades. Branches from the arcades divide and unite to form a second, third, and fourth series of arcades. Fewer arcades supply the jejunum than supply the ileum. From the terminal arcades, small straight vessels supply the intestine

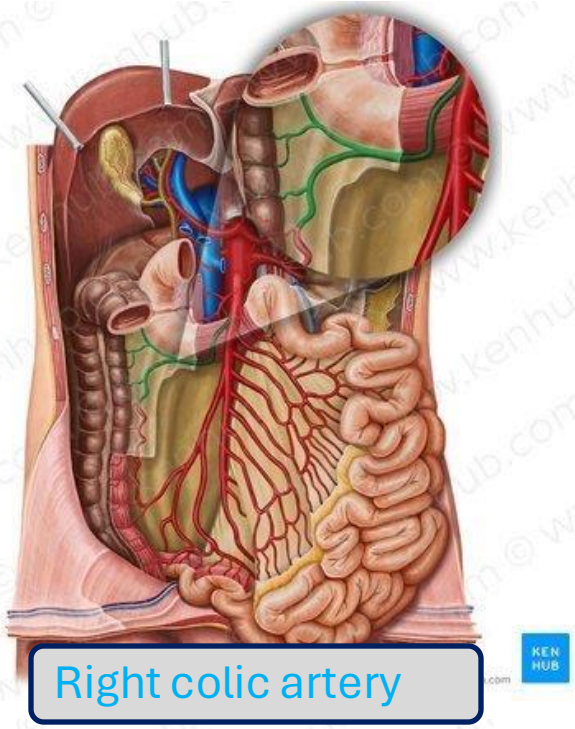
It goes to transvers colon and gives branches to supply part of ascending colon

The branches anastomoses with each other

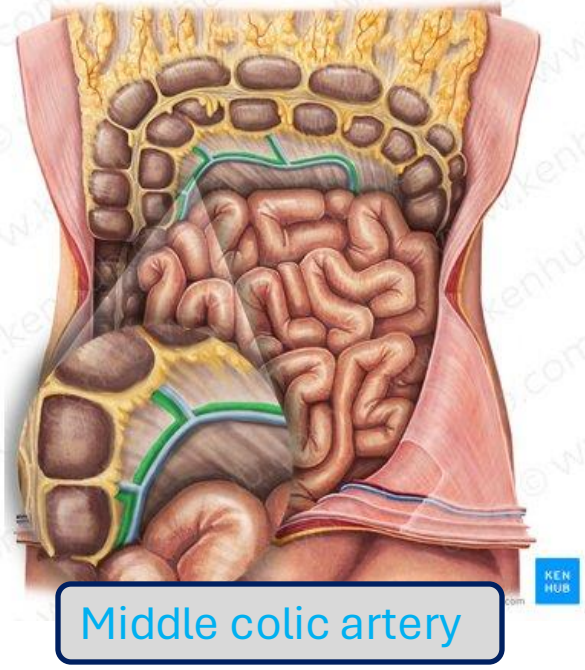


Note: the venous drainage always located lateral to the artery or on the right side!!

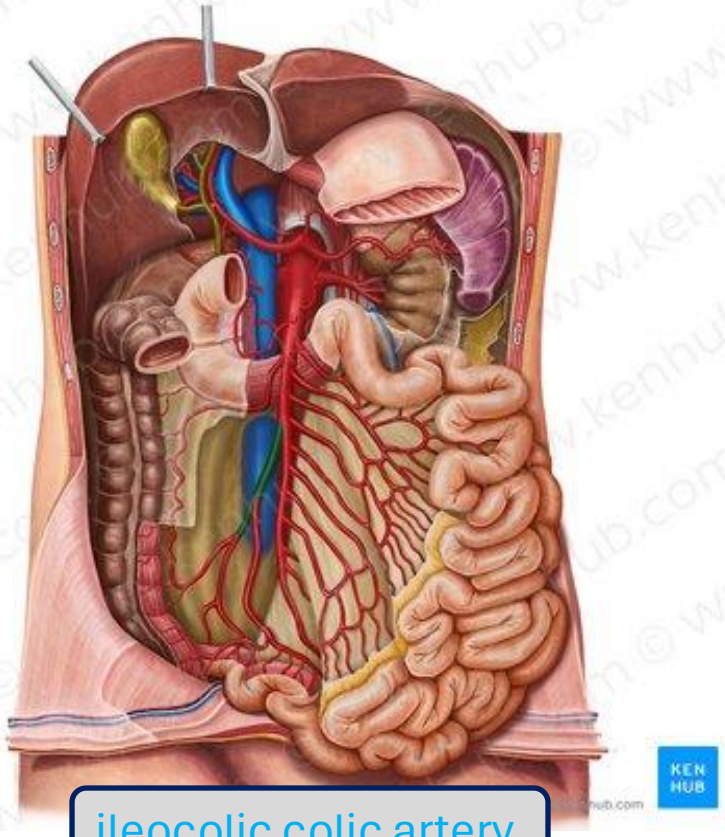




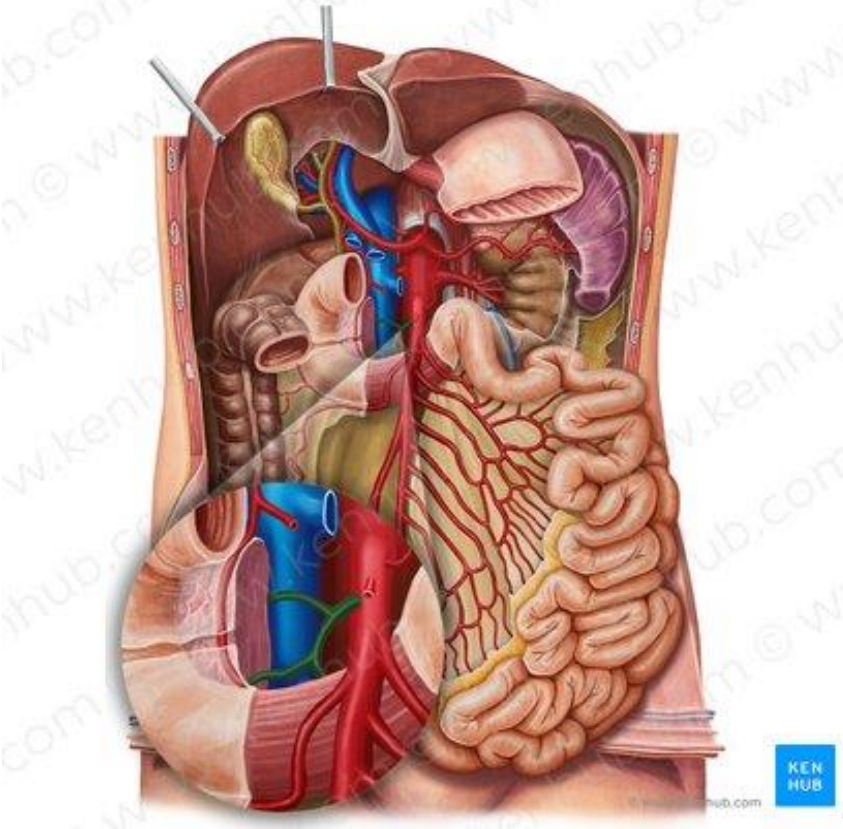
Right colic artery



Middle colic artery

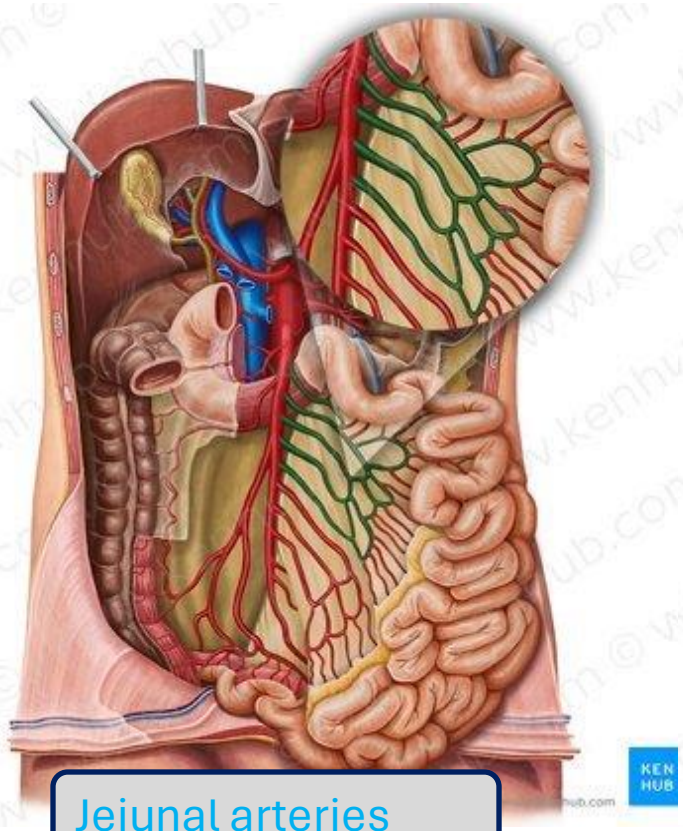


ileocolic colic artery

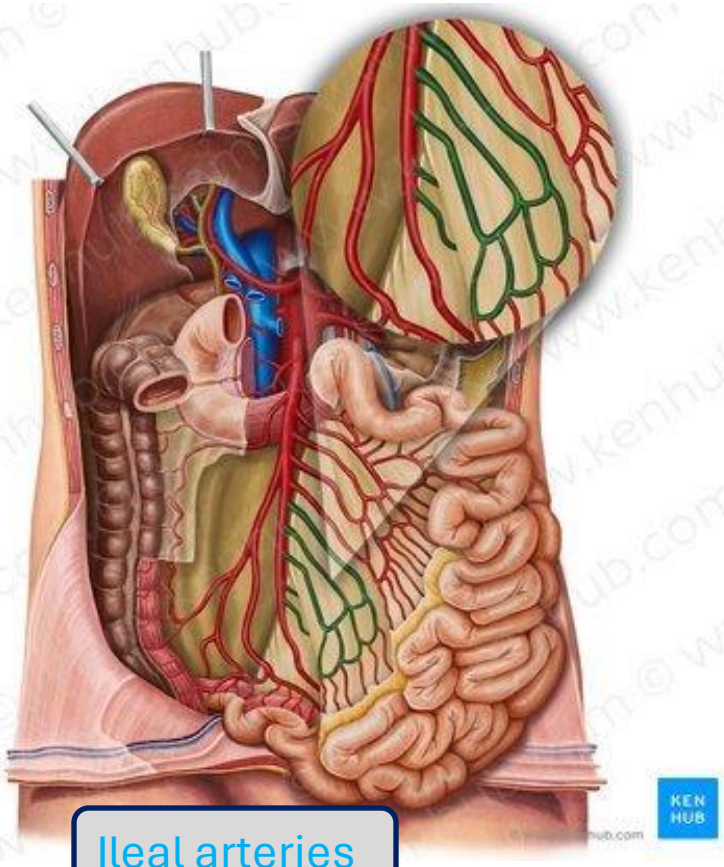


Inferior pancreaticoduodenal artery

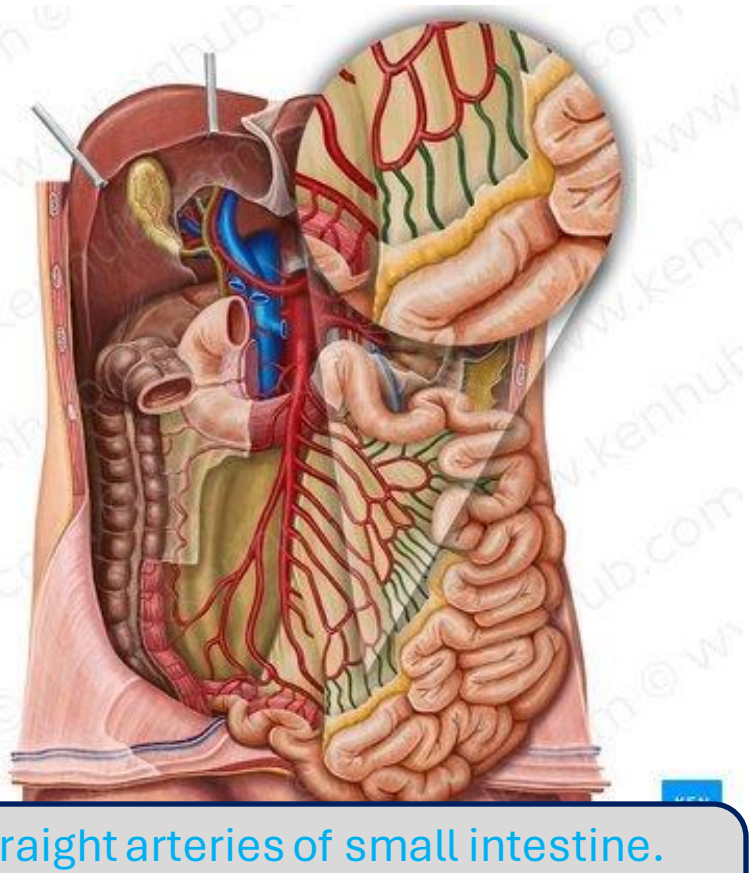
Note: the photo in this slide and the next one are extra image for more clarification



Jejunal arteries



Ileal arteries



Straight arteries of small intestine.
*doctor didn't mention them, but they are exist in the slides

Abdominal aorta….cont

- **Inferior Mesenteric Artery at level L3**

Gives left colic to the lateral third of transverse colon, descending colon and sigmoid artery to sigmoid.

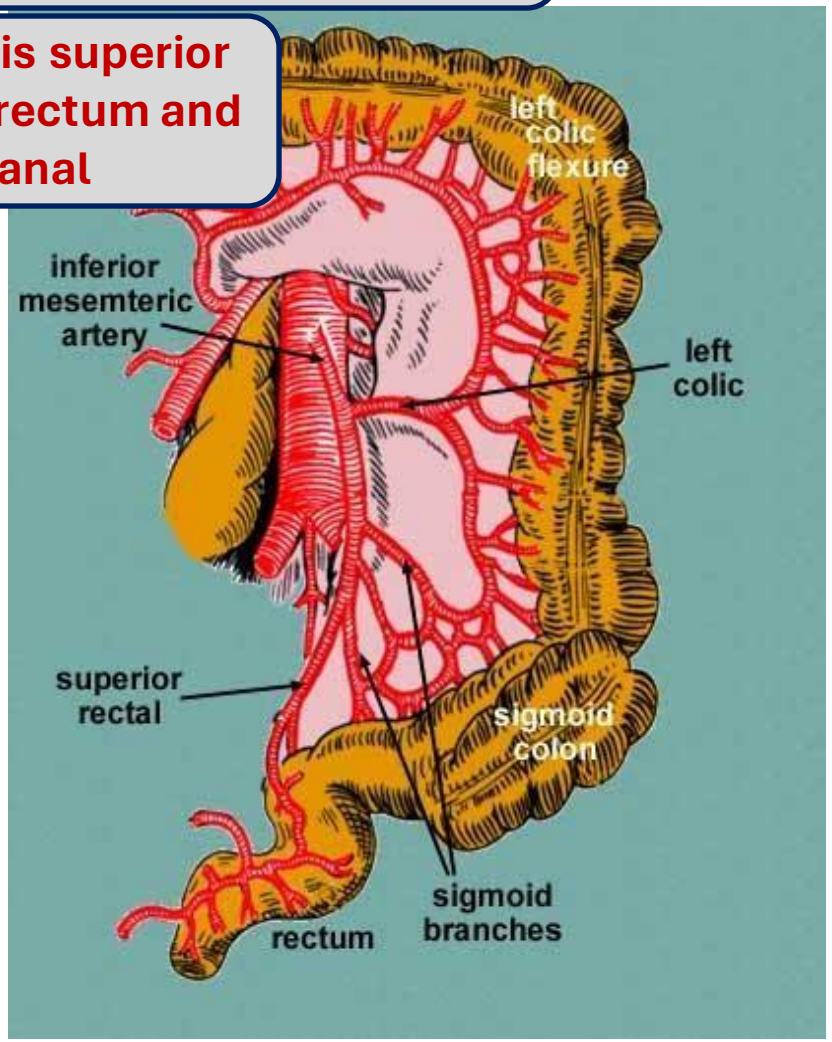
A continuation of it is superior rectal artery to the rectum and upper half of anal canal

Branches:

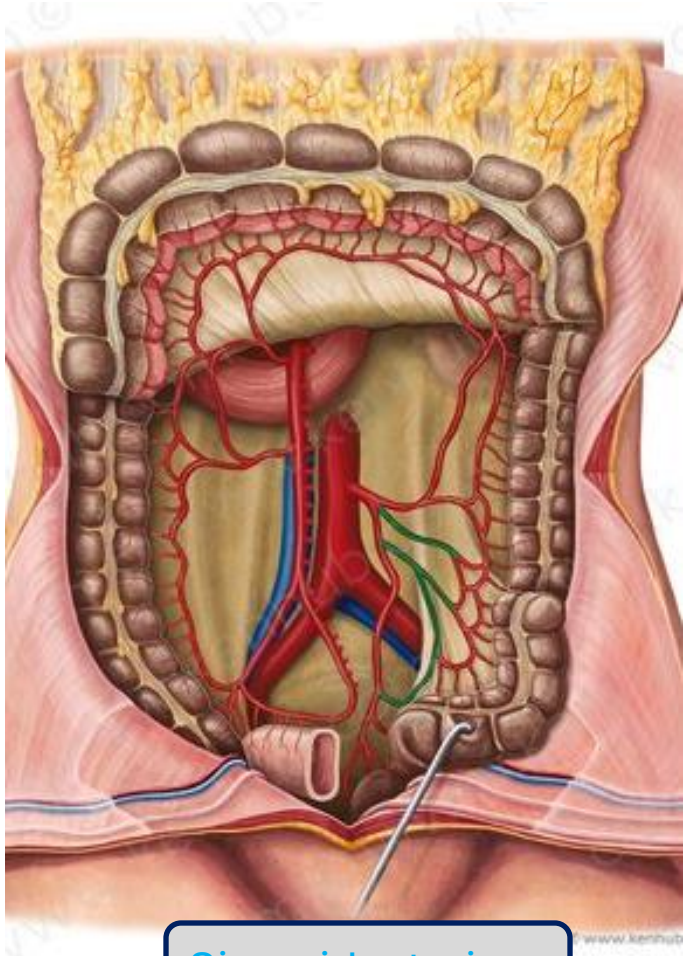
• **The left colic artery** runs upward and to the left and supplies the distal third of the transverse colon, the left colic flexure, and the upper part of the descending colon. It divides into ascending and descending branches.

• **The sigmoid arteries** are two or three in number and supply the descending and sigmoid colon.

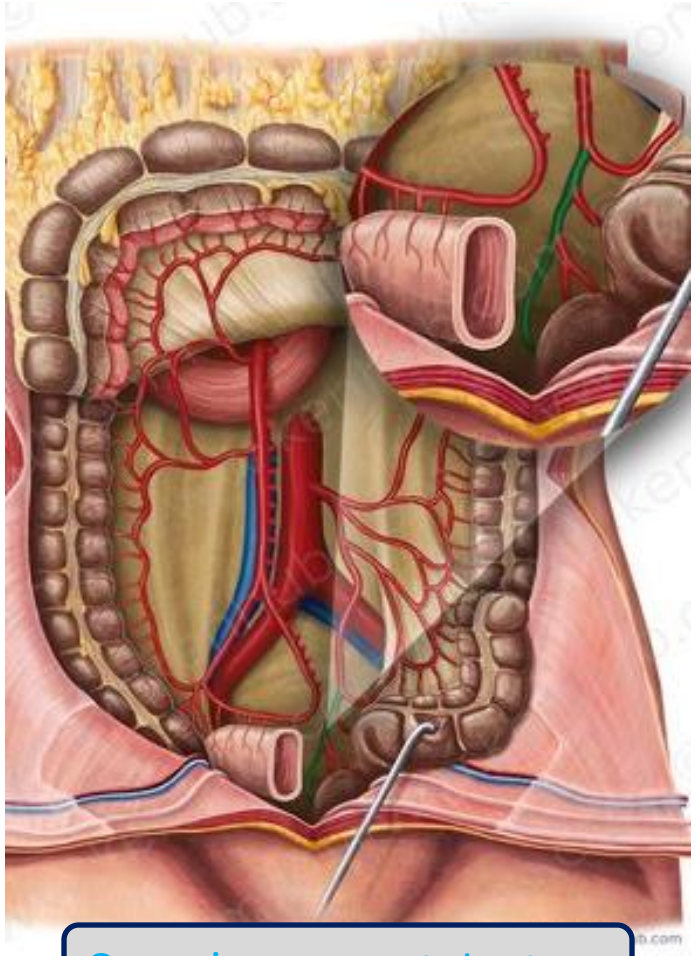
• **The superior rectal artery** is a continuation of the inferior mesenteric artery as it crosses the left common iliac artery. It descends into the pelvis behind the rectum. The artery supplies the rectum and upper half of the anal canal and anastomoses with the middle rectal and inferior rectal arteries



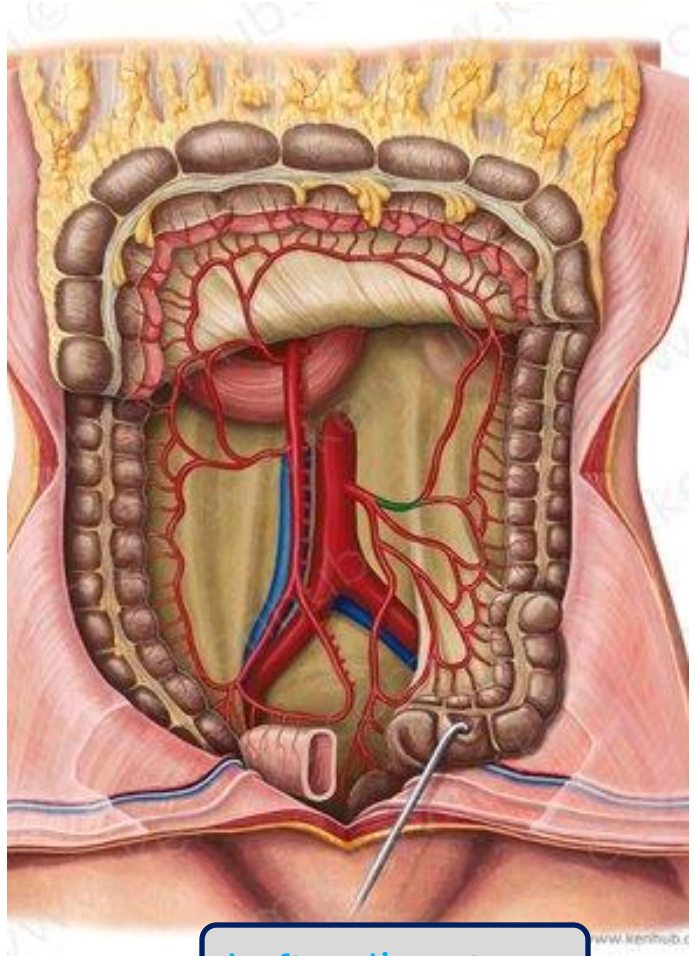
Note: the photo in this slide are extra image for more clarification



Sigmoid arteries

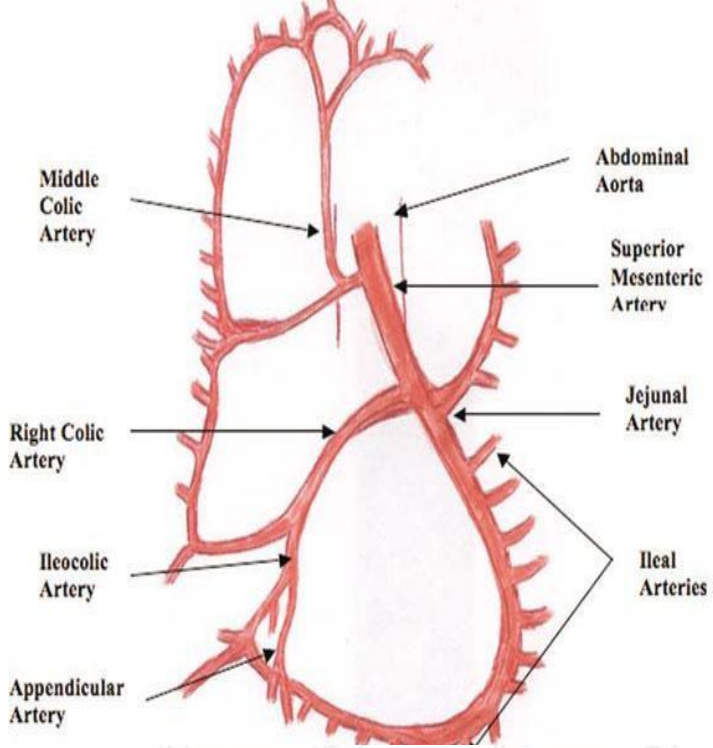


Superior anorectal artery

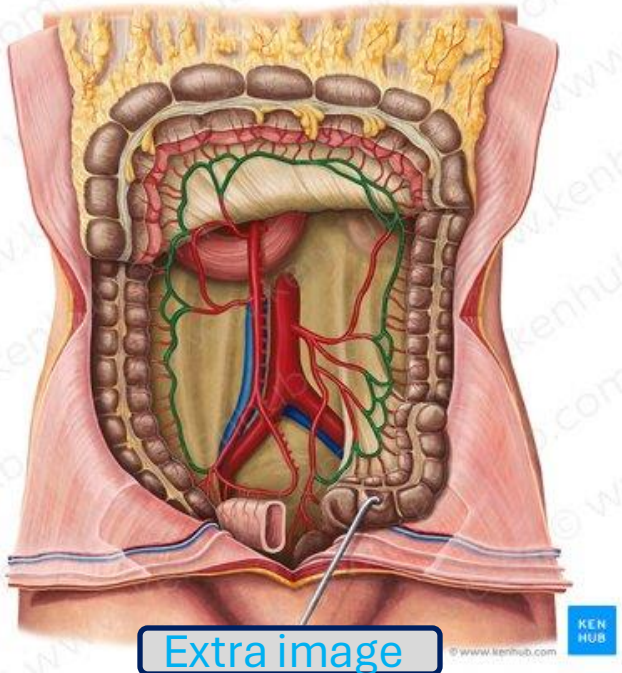


Left colic artery

- **Marginal Artery**
- The anastomosis of the colic arteries around the concave margin of the large intestine forms a single arterial trunk called the marginal artery. This begins at the ileocecal junction, where it anastomoses with the ileal branches of the superior mesenteric artery, and it ends where it anastomoses less freely with the superior rectal artery

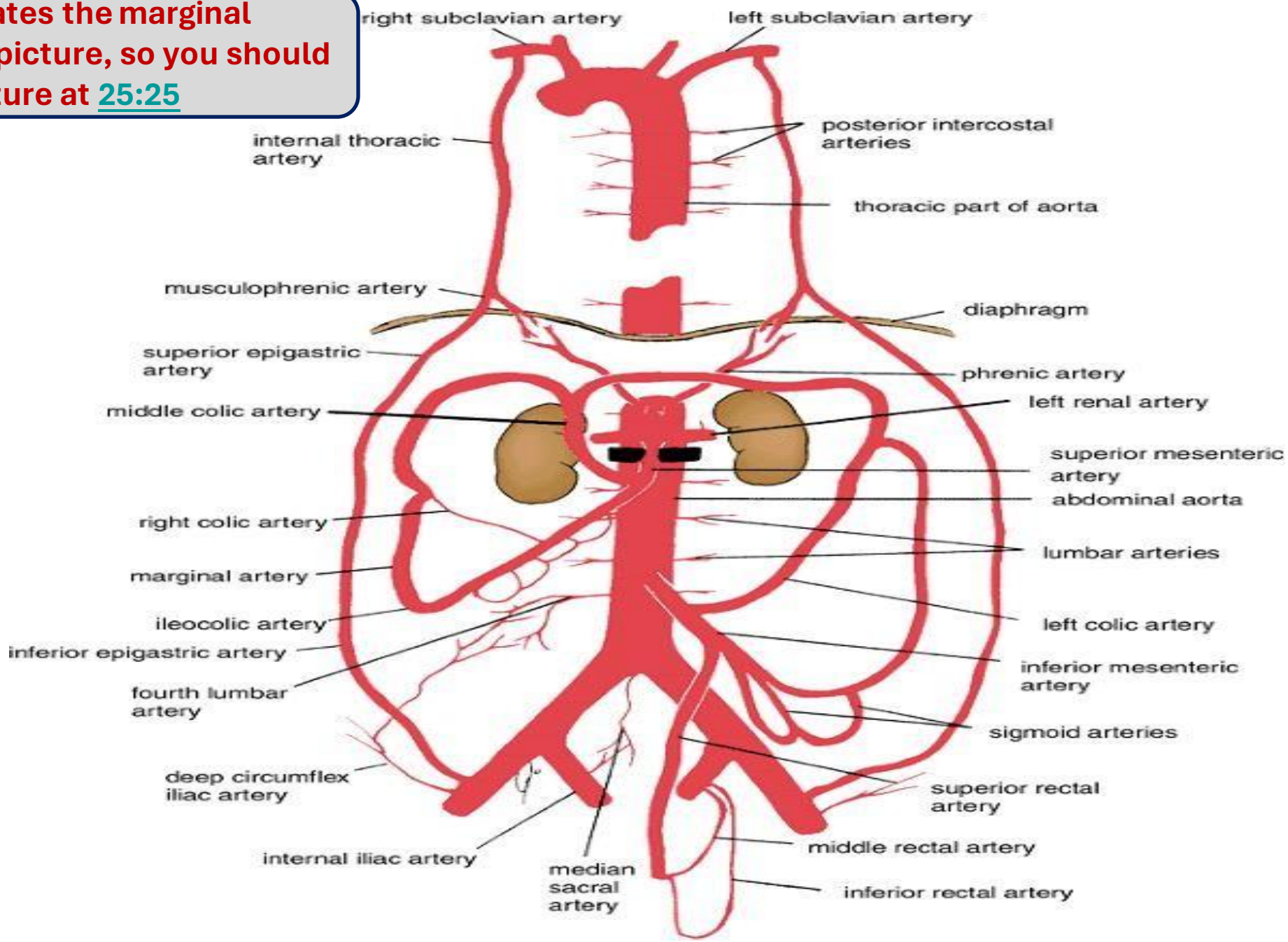


Note that for large intestine (transverse colon, ascending, descending and sigmoid), all the branches that exist at concavity of the large intestine form anastomosis, this anastomosis called marginal artery, which mean if any blockage occurs, there will be a connection between the vessels due to anastomosis



Extra image

Doctor illustrates the marginal artery on this picture, so you should watch the lecture at 25:25

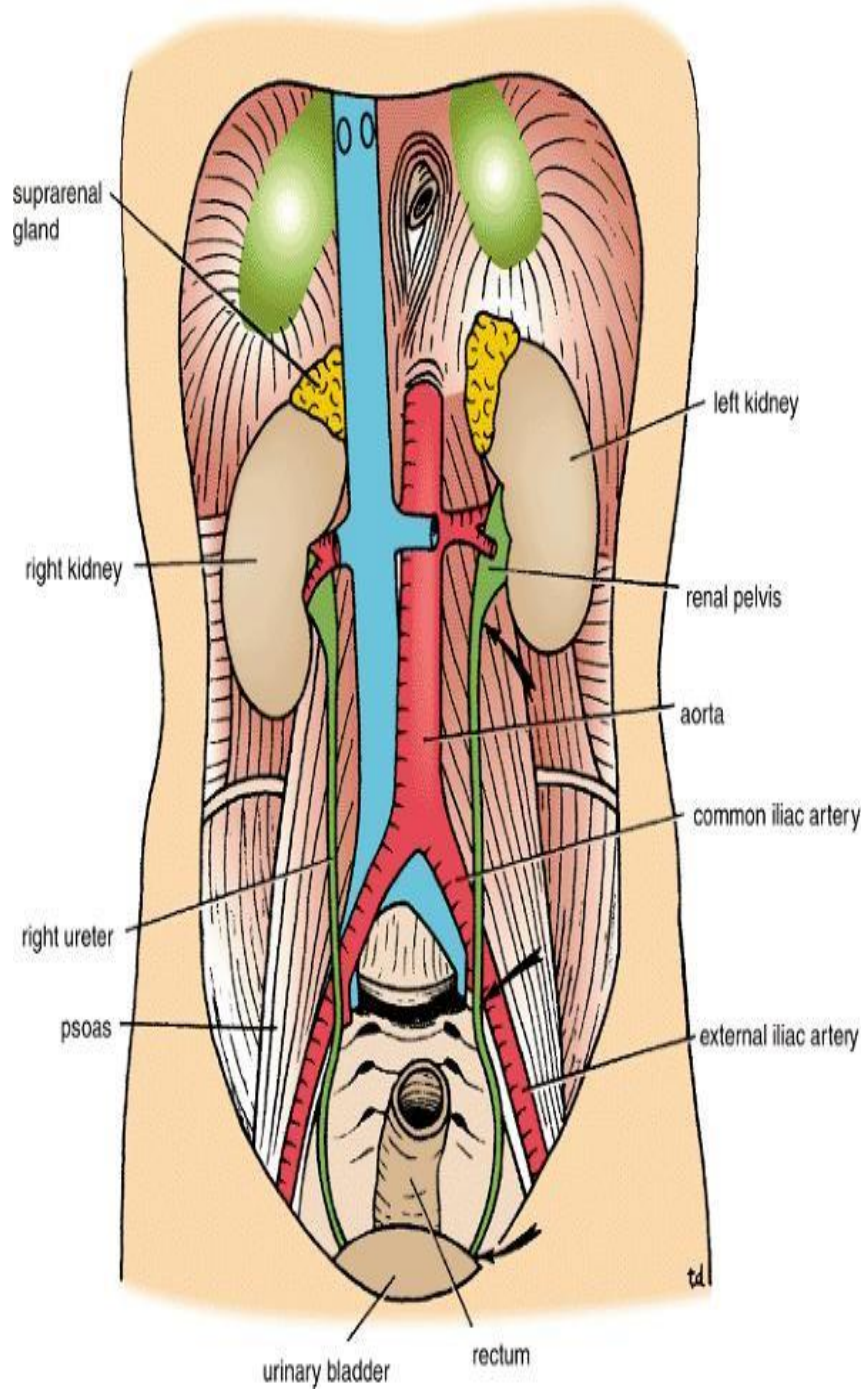


- **Common Iliac Arteries**

- The right and left common iliac arteries are the terminal branches of the abdominal aorta. They arise at the level of the fourth lumbar vertebra and run downward and laterally along
- At medial border of the psoas muscle .

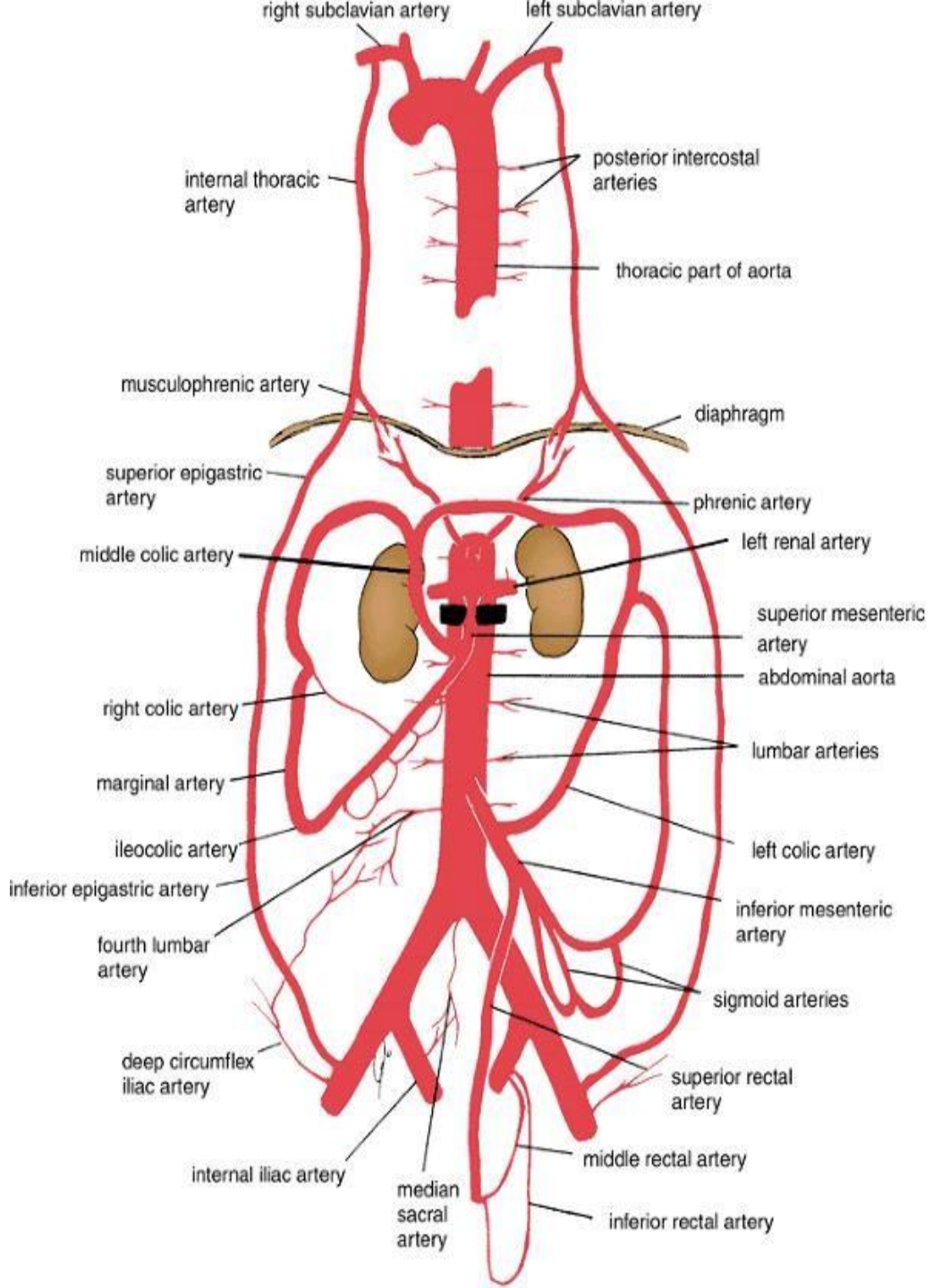
- Each artery ends in front of the sacroiliac joint by dividing into the external and internal iliac arteries **in the inlet of the pelvis.**

- At the bifurcation, the common iliac artery on each side is crossed anteriorly by the ureter .



External iliac artery : goes to lower limb, but before it goes to lower limb and giving femoral, it gives inferior epigastric artery (it is important because it differentiate between direct and indirect hernia) then inferior epigastric artery enter rectus sheath deep to muscles (rectus abdominis muscles)

- **External Iliac Artery**
- runs along the medial border of the psoas,
- following the pelvic brim .
- It gives off the inferior epigastric and deep circumflex iliac branches .
- The artery enters the thigh by passing under the inguinal ligament to become the femoral artery.



Branches of Ex. iliac artery

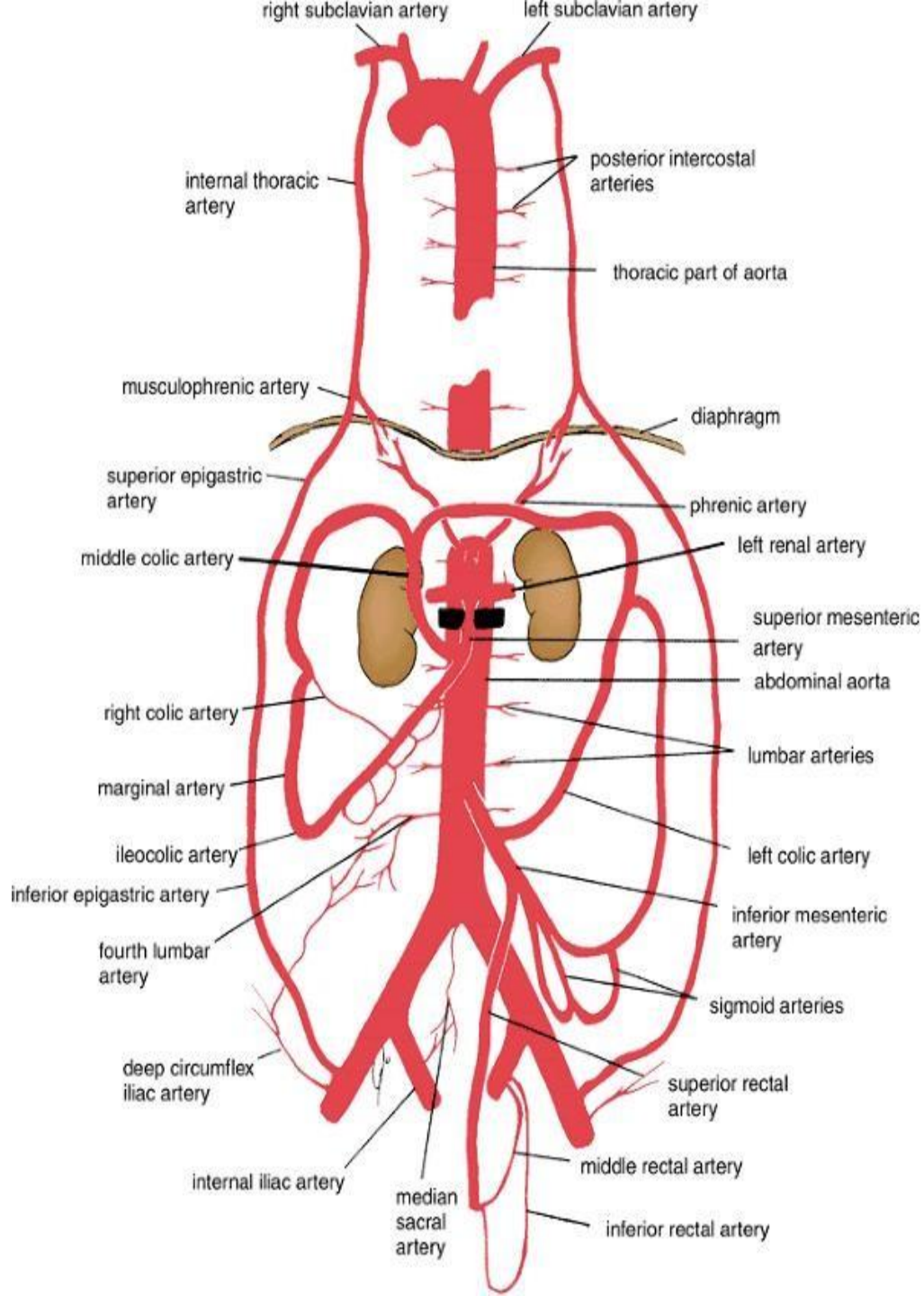
1- **The inferior epigastric**

- Artery arises just above the inguinal ligament.

- It passes upward and medially along the medial margin of the deep inguinal ring and enters the rectus sheath behind the rectus abdominis muscle.

2- The deep circumflex iliac - artery arises close to the inferior epigastric artery.

- It ascends laterally to the anterior superior iliac spine and the iliac crest, supplying the muscles of the anterior abdominal wall.

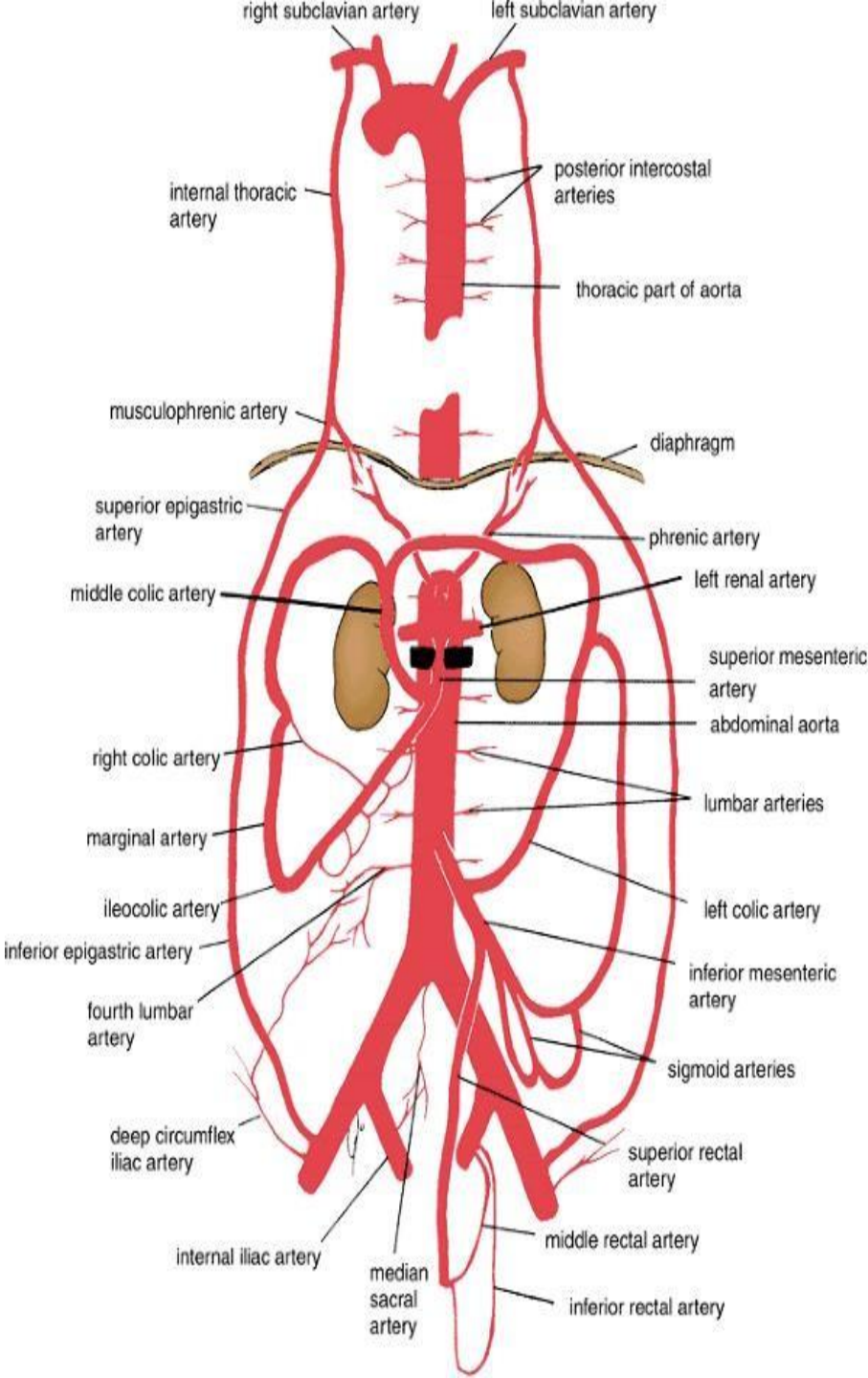


Internal Iliac Artery going to pelvic viscera

- The internal iliac artery passes down into the pelvis in front of the sacroiliac joint

•Just memorize the names, Doctor said.

- Posterior Iliolumbar artery
- Posterior Lateral sacral arteries
- Posterior Superior gluteal artery - greater sciatic foramen
- Anterior Obturator artery (occasionally from inferior epigastric artery) - obturator canal
- Anterior Inferior gluteal artery - greater sciatic foramen
- Anterior Umbilical artery superior vesical artery (usually, but sometimes it branches directly from anterior trunk) medial umbilical ligament
- Anterior Uterine artery (females) or deferential artery (males) superior and vaginal branches uterus, vas deferens
- Anterior Vaginal artery (females, can also arise from uterine artery) - vagina
- Anterior inferior vesical artery - urinary bladder
- Anterior Middle rectal artery - rectum
- Anterior Internal pudendal artery



Veins on the Posterior Abdominal Wall

Inferior Vena Cava

- Location and Description

- **The inferior vena cava conveys most of the blood from the body below the diaphragm to the right atrium of the heart.**

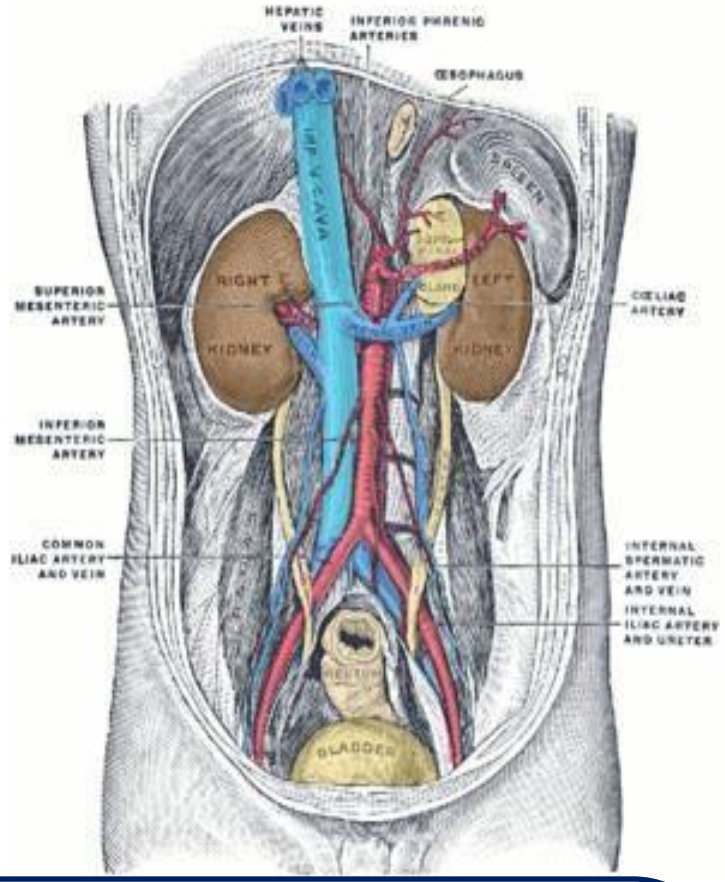
- **It is formed by the union of the common iliac veins behind the right common iliac artery at the level of the fifth lumbar vertebra .**

- **It ascends on the right side of the aorta, pierces the central tendon of the diaphragm**

- **Ascends then separated from the aorta by Rt .crus of the diaphragm**

- **Ends at the level of the eighth thoracic vertebra, and drains into (opens at) the right atrium of the heart.**

- **What is the relation between the sympathetic chain & inferior vena cava ? The right sympathetic trunk lies behind its right margin and the right ureter lies close to its right border. The entrance into the lesser sac separates the inferior vena cava from the portal vein .**



We mentioned that the abdominal sympathetic chain lies adjacent to the aorta, positioned along its left edge. However, in contrast to this, when compared to the inferior vena cava, the sympathetic chain is situated behind the right edge of the vena cava, almost as if it is concealed متخبية

In the pelvis, the common iliac veins are found deep to the common iliac arteries, contrary to the general rule where arteries tend to be deeper than veins. This arrangement is due to the relatively thin walls of veins compared to the thicker walls of arteries, which helps protect veins from compression and damage. However, despite this typical positioning, varicocele can occur during pregnancy.

Relations of I.V.C

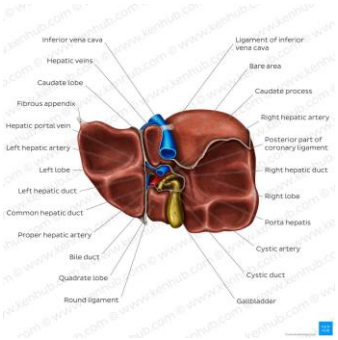
- **Anterior**

- Coils of small intestine
- 3rd part & 1st part of duodenum
- Head of pancreas & C.B.D
- Related to foramen of Winslow
- Portal vein (& Inferior level)
- **(IVC) indeed lies within a deep groove on the posterior surface of the liver.**
- **Lesser sac**

I.V.C = Inferior Vena Cava

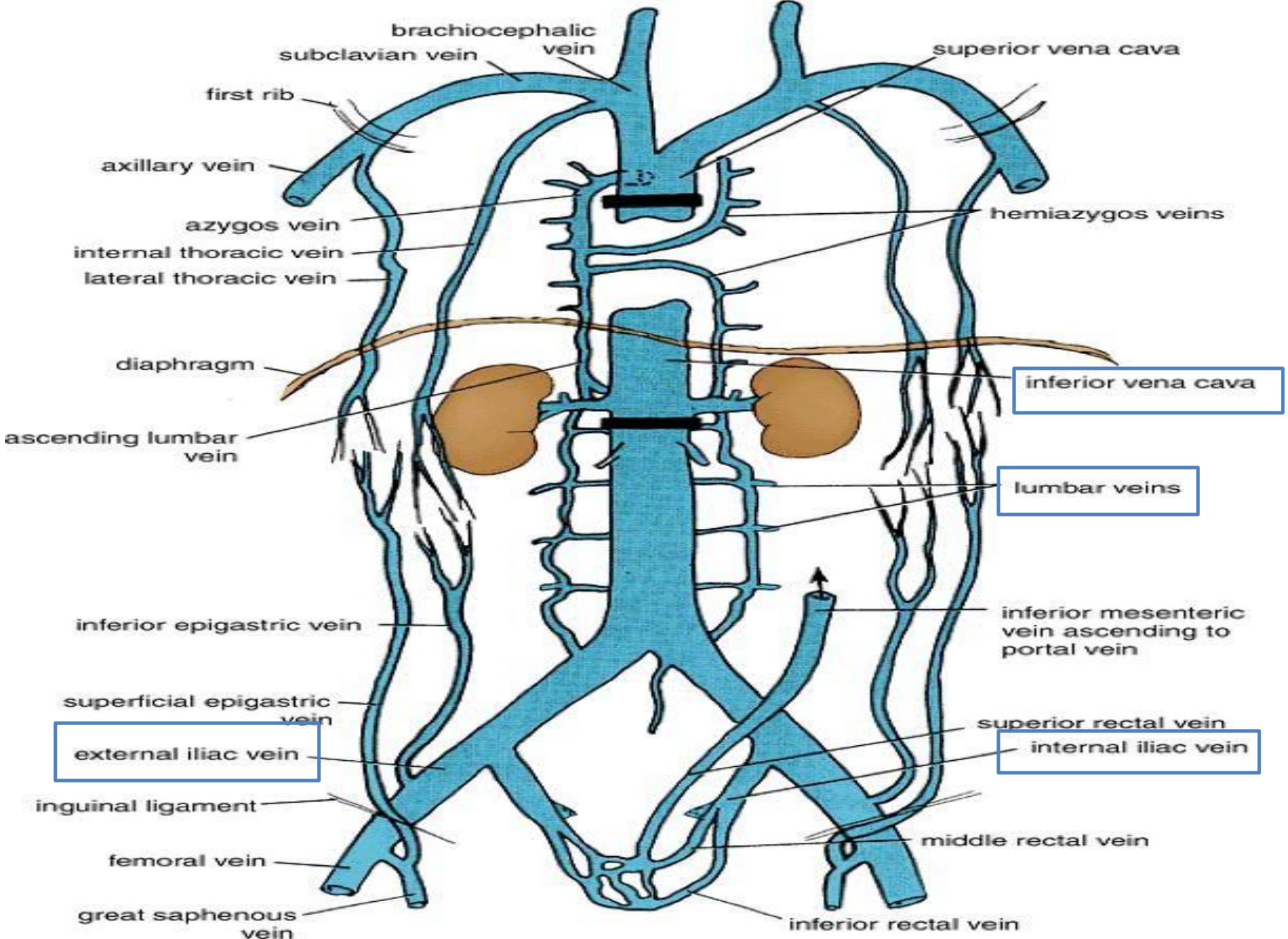
IVC is posterior to these.

Tributaries of I.V.C



The inferior vena cava has the following tributaries:

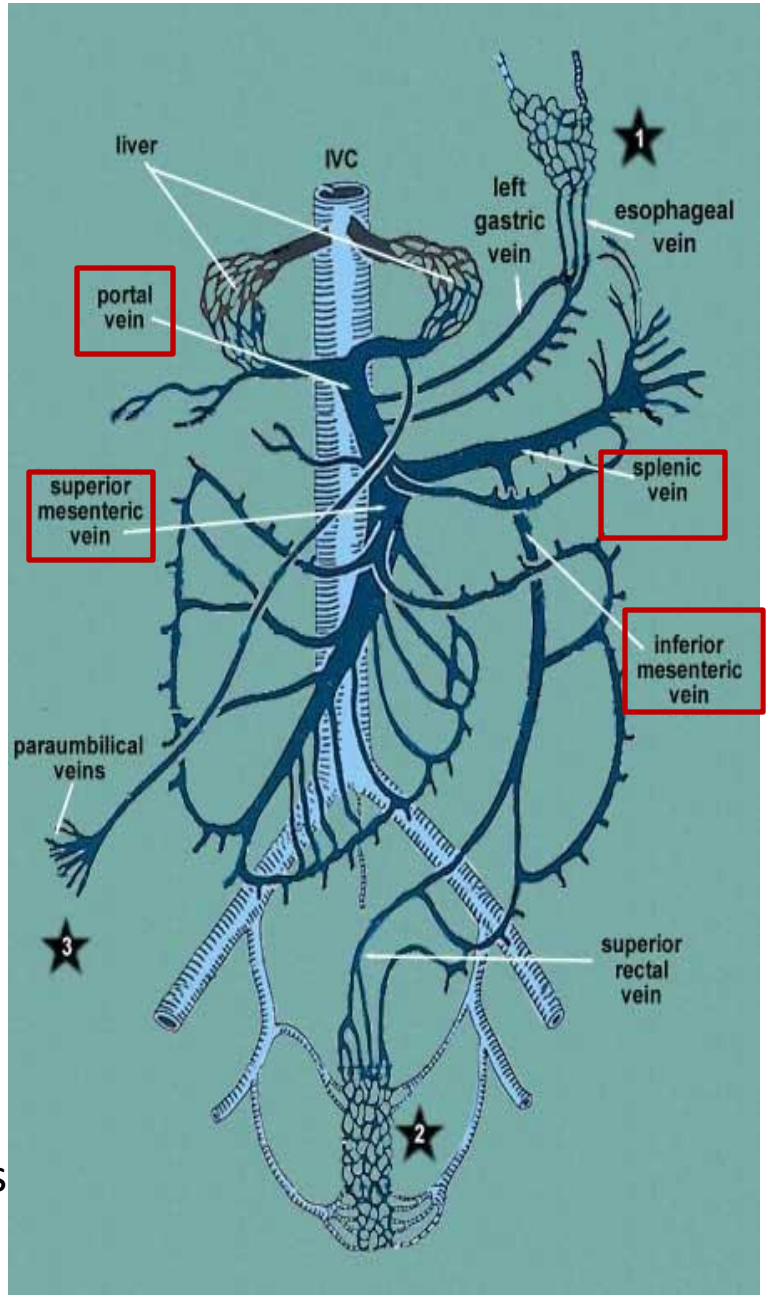
- Two anterior visceral tributaries: **the hepatic veins = venous drainage of the liver , they're usually 2 (right and left) but in العملي we'll see 3. The quadrate and caudate lobes they have a special central vein, which eventually contribute to the drainage of the hepatic veins into the IVC. so hepatic veins open into I.V.C**
- Three lateral visceral tributaries: the right suprarenal vein (the left vein drains into the left renal vein), renal veins, and right testicular or ovarian vein (the left vein drains into the left renal vein) ; **because of that the varicocele in left testis is more common than the right , also because left testis is lower than the right & the left vein has oblique course while right vein has perpendicular.**
- Five lateral abdominal wall tributaries: the inferior phrenic vein and four lumbar veins
- Three veins of origin: two common iliac veins and the median sacral vein


brachiocephalic vein
subclavian vein
superior vena cava
first rib
axillary vein
azygos vein
hemiazygos veins
internal thoracic vein
lateral thoracic vein
diaphragm
inferior vena cava
ascending lumbar vein
lumbar veins
inferior epigastric vein
inferior mesenteric vein ascending to portal vein
superficial epigastric vein
superior rectal vein
external iliac vein
internal iliac vein
inguinal ligament
middle rectal vein
femoral vein
great saphenous vein
inferior rectal vein

- **Inferior Mesenteric Vein**
- The inferior mesenteric vein is a tributary of the portal circulation. It begins halfway down the anal canal as the superior rectal vein . It passes up the posterior abdominal wall on the left side of the inferior mesenteric artery and the duodenojejunal flexure and **joins the splenic vein** behind the pancreas. It receives tributaries that correspond to the branches of the artery.

- **The splenic vein**
- It is a tributary of the portal circulation. It begins at the hilum of the spleen by the union of several veins and is then joined by the short gastric and the left gastroepiploic veins. It passes to the right within the splenicorenal ligament and runs behind the pancreas**. It joins the superior mesenteric vein behind the neck of the pancreas to form the portal vein.** It is joined by veins from the pancreas and the inferior mesenteric vein.

- **Superior Mesenteric Vein (all the midgut)**
- The superior mesenteric vein is a tributary of the **portal circulation (venous drainage to portal vein , the drainage goes to the liver at the end of this circulation) .** It begins at the ileocecal junction and runs upward on the posterior abdominal wall within the root of the mesentery of the small intestine and on the right side of the superior mesenteric artery. It passes in front of the third part of the duodenum and behind the neck of the pancreas, where it joins the splenic vein to form the portal vein. It receives tributaries that correspond to the branches of the superior mesenteric artery and also receives the inferior pancreaticoduodenal vein and the right gastroepiploic vein .



Venous drainage ;

Sure, here's a brief overview of the venous drainage of the portal circulation:

1. Lower half of the anal canal: Drains into the inferior rectal veins, which then drain into the internal iliac vein.

2. Upper half of the anal canal: Drains into the superior rectal vein, which then drains into the inferior mesenteric vein.

3.Midgut organs (including small intestine, cecum, ascending colon, and proximal two-thirds of the transverse colon): Drain into the superior mesenteric vein.

4.Superior mesenteric vein and splenic vein confluence: These veins join to form the portal vein.

5.Portal vein (a lot of foregut): Carries blood from the gastrointestinal tract, spleen, and pancreas to the liver.

6. Hepatic sinusoids: Blood from the portal vein flows through the hepatic sinusoids in the liver.

7.Hepatic veins: Blood exits the liver via the hepatic veins.

8. Inferior vena cava (IVC): Finally, the blood from the hepatic veins enters the IVC, which carries it back to the heart.

Portal Vein **Important!!!**

• The portal vein drains blood from the abdominal part of the gastrointestinal tract from the lower third of the esophagus to halfway down the anal canal; it also drains blood from the spleen, pancreas, and gallbladder.

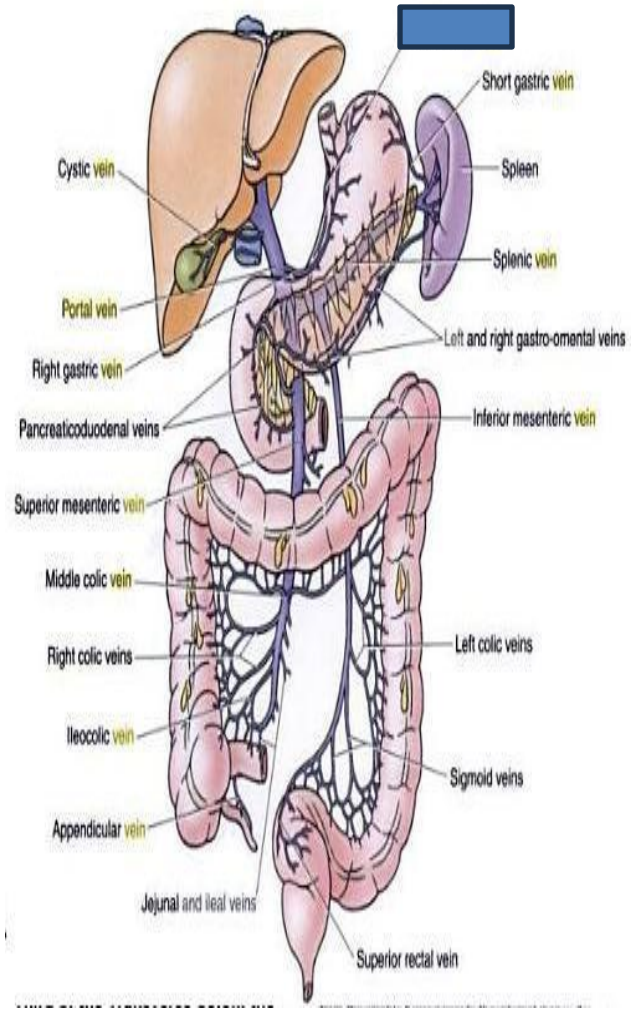
• The portal vein enters the liver and breaks up into sinusoids, from which blood passes into the hepatic veins that join the inferior vena cava.

• It is about 2 in. (5 cm) long and is formed behind the neck of the pancreas by the union of the superior mesenteric and splenic veins.

• It ascends to the right, behind the first part of the duodenum, and enters the lesser omentum .

• It then runs upward in front of the opening into the lesser sac to the porta hepatis, where it divides into right and left terminal branches (ينتهي هون)

• The portal circulation begins as a capillary plexus in the organs it drains and ends by emptying its blood into sinusoids within the liver



Tributaries of the Portal Vein

• **The tributaries of the portal vein are the splenic vein, superior mesenteric vein, Superior pancreaticoduodenal, left gastric vein, right gastric vein, and cystic veins.**

• **Splenic vein:** This vein leaves the hilum of the spleen and passes to the right in the splenicorenal ligament. It unites with the superior mesenteric vein behind the neck of the pancreas to form the portal **vein** . It receives the short gastric, left gastroepiploic, inferior mesenteric, and pancreatic veins.

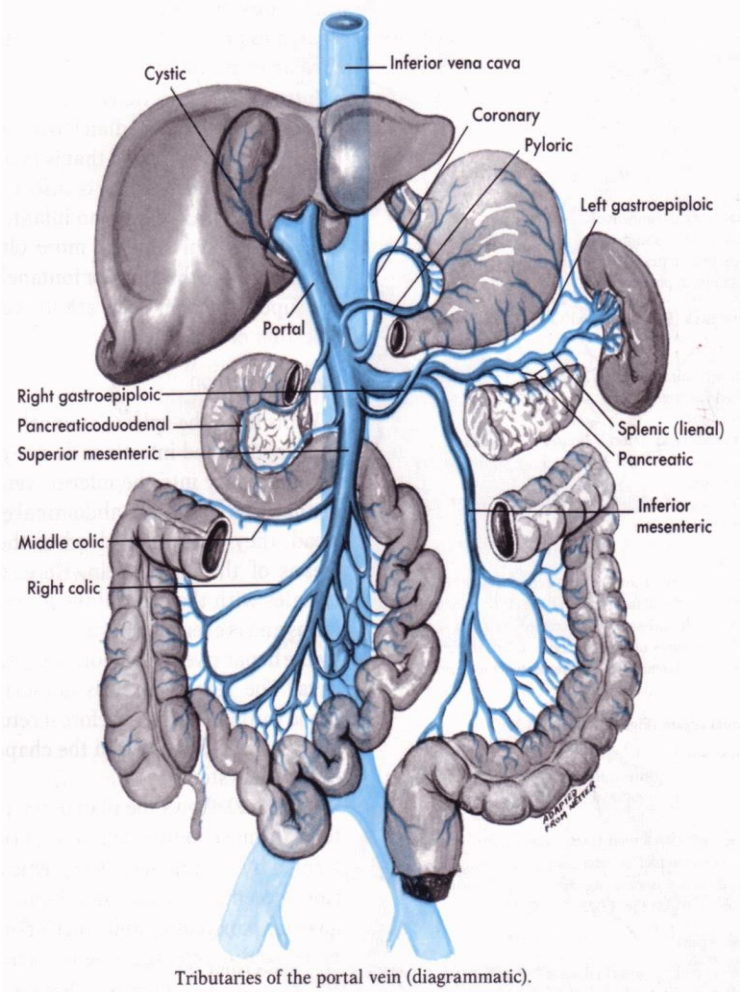
• **Inferior mesenteric vein:** This vein ascends on the posterior abdominal wall and **joins the splenic vein behind the body of the pancreas**. It receives the superior rectal veins, the sigmoid veins, and the left colic vein.

• **Superior mesenteric vein:** This vein ascends in the root of the mesentery of the small intestine. It passes in front of the third part of the duodenum and **joins the splenic vein behind the neck of the pancreas** . It receives the jejunal, ileal, ileocolic, right colic, middle colic, inferior pancreaticoduodenal, and right gastroepiploic veins.

• **Left gastric vein**: This vein drains the left portion of the lesser curvature of the stomach and the distal part of the esophagus. It opens directly into the portal vein

• **Right gastric vein:** This vein drains the right portion of the lesser curvature of the stomach and drains directly into the portal vein .

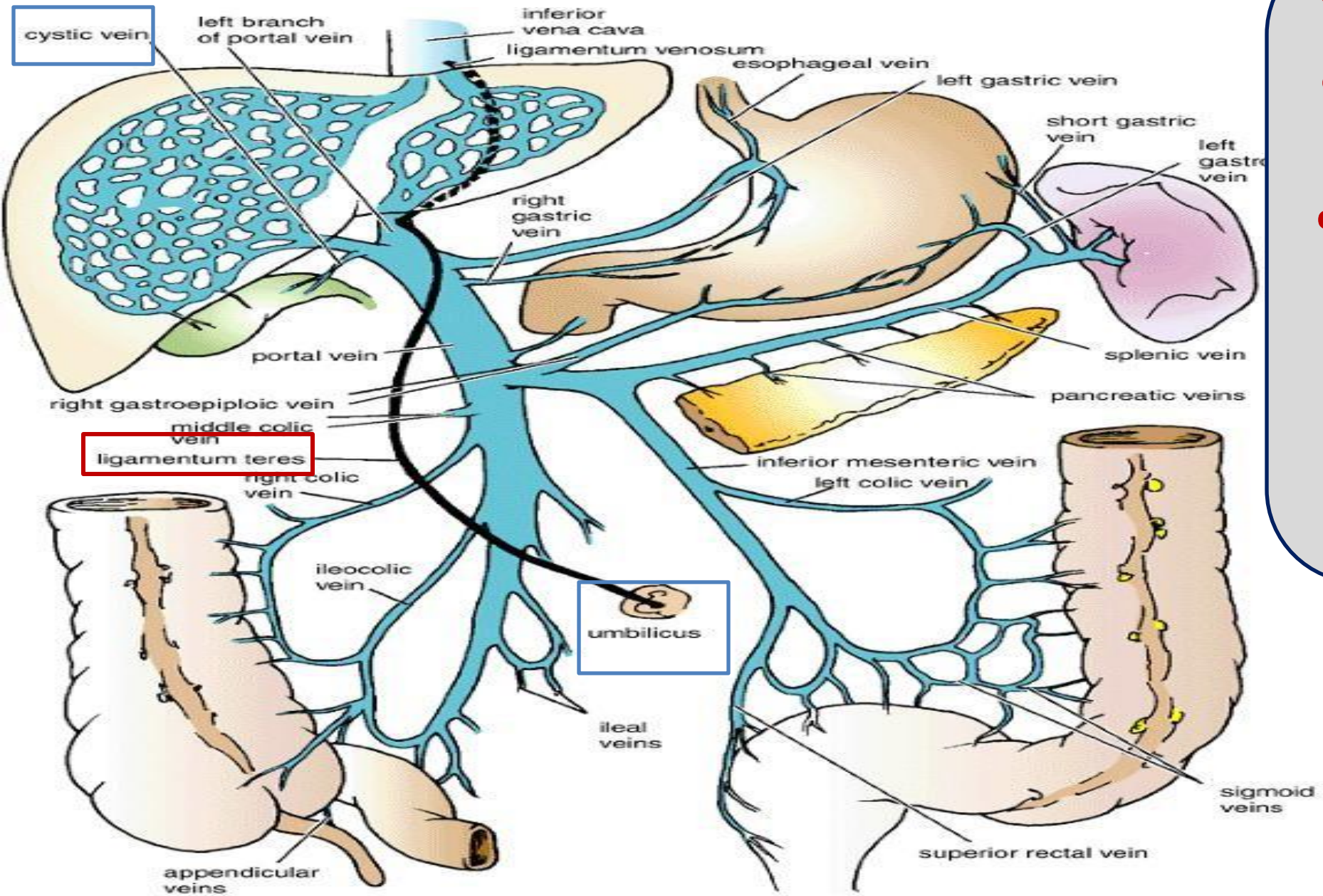
• **Cystic veins:** These veins either drain the gallbladder directly into the liver or join the portal vein



Tributaries of the portal vein (diagrammatic).

Cystic usually drains to the right portal vein (it might go to the liver directly)

Portal circulation



We had ducts that existed, but they undergo obliteration. For example, the ductus venosum between the inferior vena cava and the left branch of the portal vein,
And the umbilical vein, which undergoes obliteration and transforms into the ligamentum teres (round ligament of the liver)

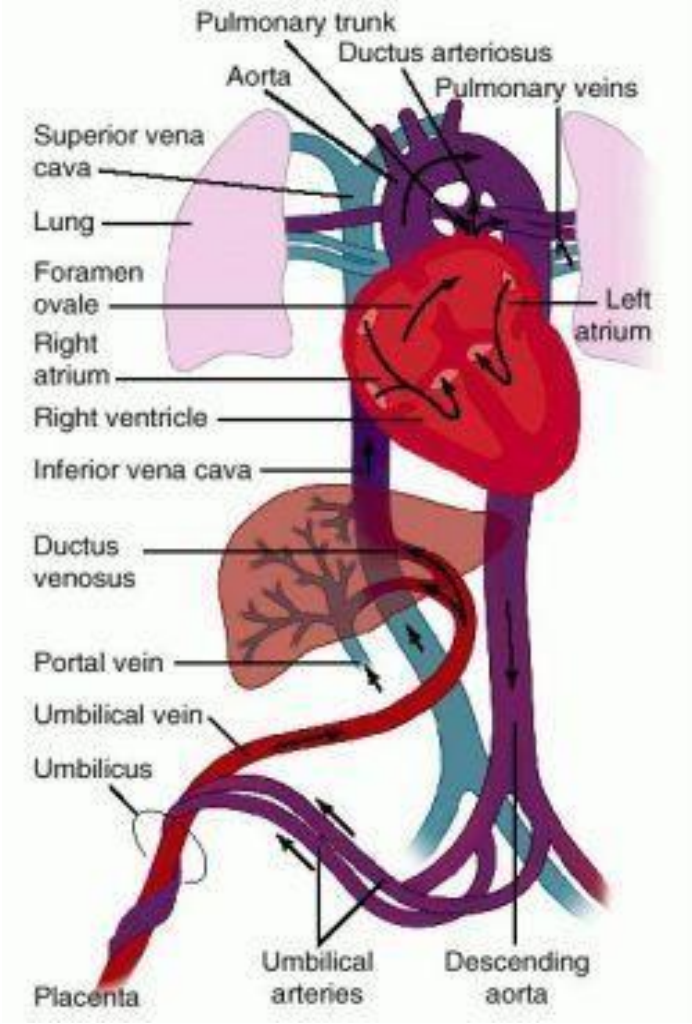
Portal systemic anastomosis

- A porta caval anastomosis (also known as portal systemic anastomosis or portal caval system) is a specific type of anastomosis that occurs between the veins of portal circulation and those of systemic circulation.

- The lower end of esophagus is one of the important sites for the portosystemic anastomosis . In portal hypertension as in the case of cirrhosis of liver the anastomosis opens and forms venous dilatation called esophageal varices.

- **Their rupture causes severe and dangerous haematesis (hematemesis).**

hematemesis= (Vomiting of blood)



في سؤال امتحان من هون غالبًا

Porto-systemic anastomosis. In cases of liver cirrhosis or fibrosis, or if there's an obstruction in the portal vein preventing blood flow to the liver, the blood will need to find an alternative route. It typically returns through three important sites: the lower third of the esophagus via the left gastric vein, the umbilicus via the paraumbilical vein, and the rectal and anal canal via the superior rectal vein. These sites form connections between the portal and systemic circulations, known as anastomoses.

Portal systemic anastomosis……cont

Causes of portal hypertension

- Liver diseases → Cirrhosis, fibrosis (bilharzial)
- Valvular diseases of the heart
- Congenital patent = ductus venosum remains patent (remain

The ductus venosus is a fetal blood vessel that shunts blood from the umbilical vein to the inferior vena cava, bypassing the liver. Normally, this duct closes shortly after birth. However, if it remains patent (open), it can lead to abnormal circulation patterns and potentially contribute to hypertension.

Portal systemic anastomosis

Region	Name of clinical condition	Portal circulation	Systemic circulation
Esophageal	Esophageal varices دوالي المريء	Esophageal branch of left gastric vein	Esophageal branches of Azygos vein
Rectal	Internal Hemorrhoids	Superior rectal vein	Middle rectal veins and inferior rectal veins
Paraumbilical	Caput medusae	Paraumbilical veins	Superficial epigastric vein
Retroperitoneal	(no clinical name)	Right colic vein, middle colic vein, left colic vein	Renal vein, suprarenal vein, paravertebral vein, and gonadal vein
Intrahepatic	Patent ductus venosus	Left branch of portal vein	Inferior vena cava

الدكتور بحكي إذا حفظتوه كل اشي بكون تمام ، لازم تعرف ايش الـ بورتال فين اللي برجّع البلود وايش السستمك اللي بصير معه أنستوموسس

Can lead to bleeding with defecation

Goes to femoral vein and external iliac vein

Esophageal varices , In the past, conditions like these often led to fatal outcomes due to bleeding with limited treatment options. However, nowadays, treatment has become easier with the use of procedures such as gastroscopy, which allows reaching esophageal varices and injecting sclerosing material. Additionally, techniques like applying ice and other methods inducing vasoconstriction are employed. Thus, these conditions are now treated effectively using endoscopic approaches.

Lymphatics on the Posterior Abdominal Wall

- **Lymph Nodes**
- The lymph nodes are closely related to the aorta and form a preaortic and a right and left lateral aortic (Para-aortic or lumbar) chain .
- **The preaortic lymph nodes (in front of aorta) as celiac , superior and inferior mesenteric lymph nodes.**

lie around the origins of the celiac, superior mesenteric, and inferior mesenteric arteries and are referred to as the celiac, superior mesenteric, and inferior mesenteric lymph nodes, respectively.

They drain the lymph from the gastrointestinal tract, extending from the lower one third of the esophagus to halfway down the anal canal, and from the spleen, pancreas, gallbladder, and greater part of the liver. **(why the greater part of liver ? Because the upper surface goes through the right thoracic duct)**

The efferent lymph vessels form the large intestinal trunk.

- **The lateral aortic (para-aortic or lumbar) lymph nodes (on the two sides of aorta, especially in lumbar region)**

drain lymph from the kidneys and suprarenals; from the testes in the male and from the ovaries, uterine tubes, and fundus of the uterus in the female; from the deep lymph vessels of the abdominal walls; and from the common iliac nodes **(from pelvic viscera and lower limb).**

The efferent lymph vessels form the right and left lumbar trunk

- **The thoracic duct** commences in the abdomen as an elongated lymph sac, the cisterna chyli. This lies just below the diaphragm in front of the first two lumbar vertebrae and on the right side of the aorta .

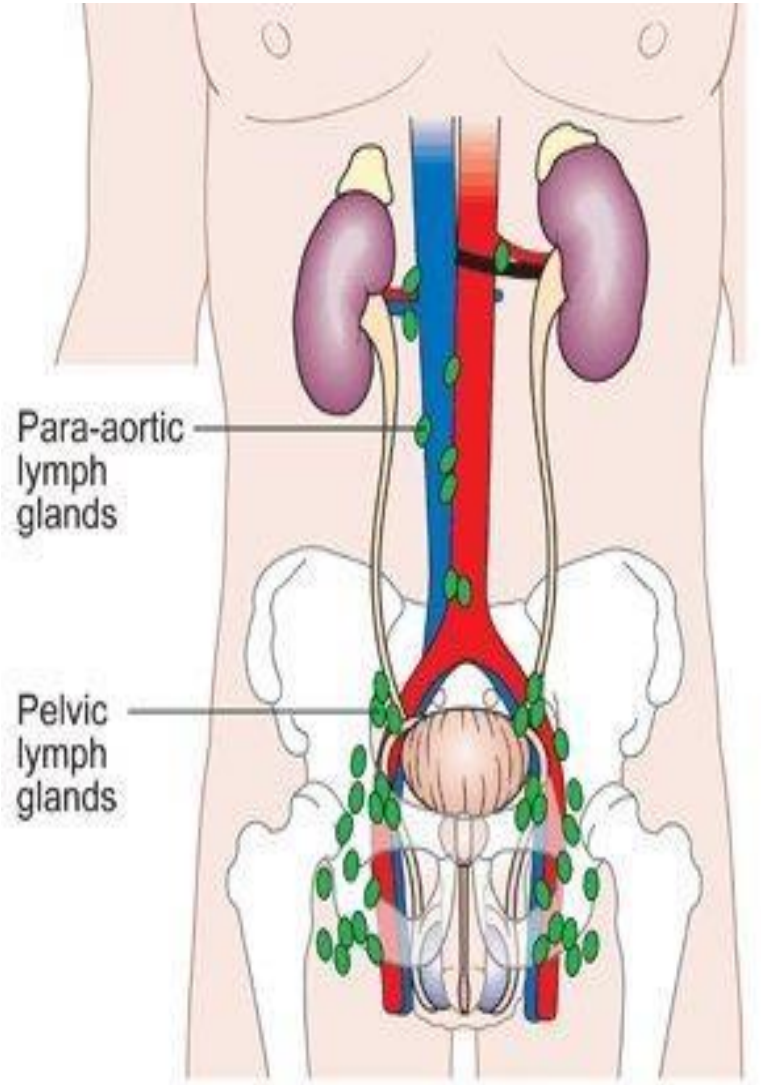


Diagram showing the pelvic and para-aortic lymph nodes

The preaortic lymph nodes ,
After gathering lymph in the celiac, superior, and inferior mesenteric lymph nodes, where do they go next? They travel to the intestinal trunk, which connects the celiac, inferior and superior mesenteric lymph nodes together. Finally, they move to the cisterna chyli.

The lateral aortic (para-aortic or lumbar) lymph nodes ,
drainage from abdominal organs (as kidneys, suprarenal , testes , ovaries , uterine tube , fundus of uterus , and the common iliac nodes (that receive lymph from the pelvic viscera and the lower limbs.))
The efferent lymph vessels form the right and left lumbar trunks then join the cisterna chyli

The cisterna chyli

• The right and left lumbar trunks under the diaphragm on the side of the aorta

• Receives lymph from

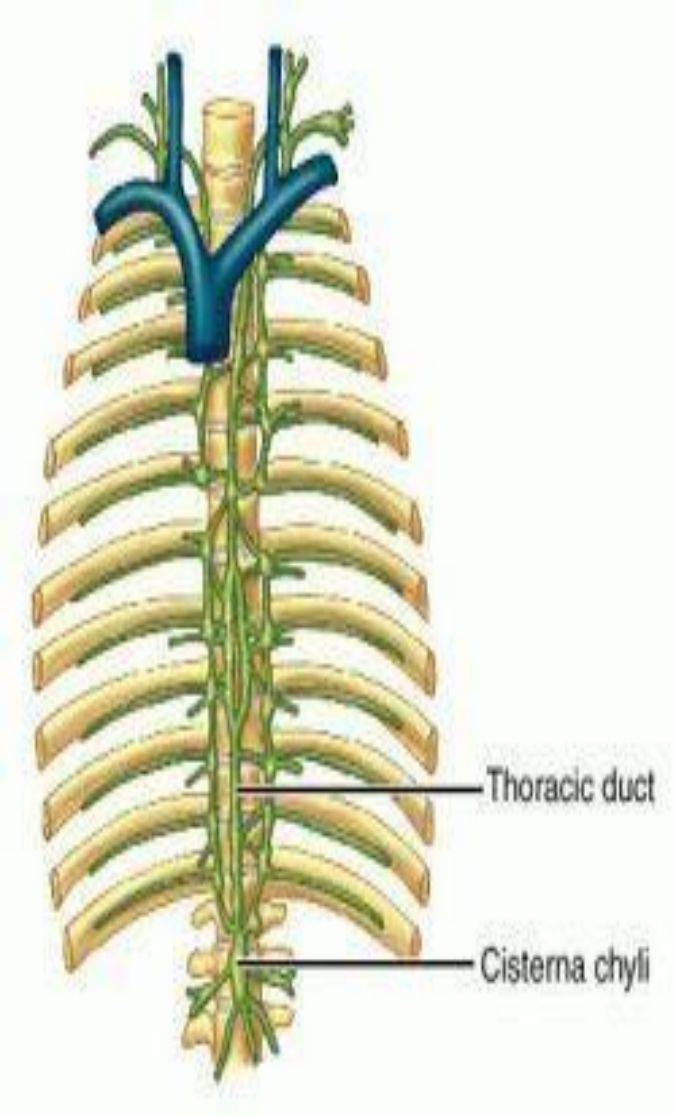
- The intestinal trunk (Joining of superior and inferior mesenteric nodes make the intestinal trunk)

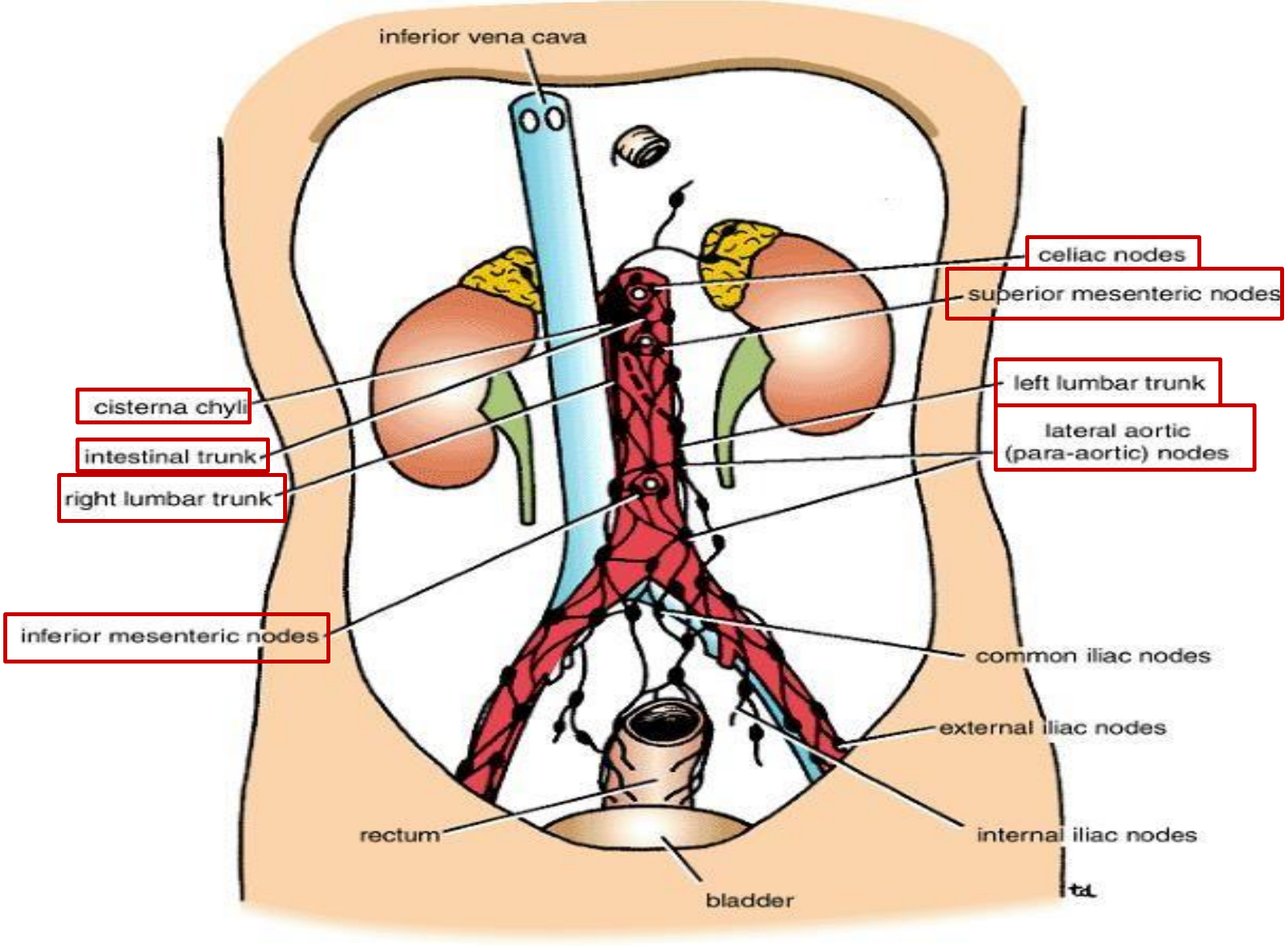
- Some small lymph vessels that descend from the lower part of the thorax.

- Rt & Lt vessels from lower thorax

It's a sac in the aortic orifice on the right side of abdominal aorta , and more to the right we'll found the beginning of Azygos vein.

The thoracic duct crosses at the root of the neck, opening into bifurcation at the convergence of the internal jugular vein with the subclavian vein, at the beginning of the brachiocephalic vein.




inferior vena cava
celiac nodes
superior mesenteric nodes
left lumbar trunk
lateral aortic
(para-aortic) nodes
cisterna chyli
intestinal trunk
right lumbar trunk
inferior mesenteric nodes
common iliac nodes
external iliac nodes
internal iliac nodes
rectum
bladder

خَطَبَ النُّعْمَانُ بنُ بَشِيرٍ، فَقالَ: لَلَّهُ أَشَدُّ فَرَحًا بتَوْبَةِ عَبْدِهِ مِن رَجُلٍ حَمَلَ زَادَهُ وَمَزَادَهُ علَى بَعِيرٍ، ثُمَّ سَارَ حتَّى كانَ بفَلَاةٍ مِنَ الأَرْضِ، فأدْرَكَتْهُ القَائِلَةُ، فَنَزَلَ، فَقالَ تَحْتَ شَجَرَةٍ، فَغَلَبَتْهُ عَيْنُهُ، وَانْسَلَّ بَعِيرُهُ، فَاسْتَيْقَظَ فَسَعَى شَرَفًا فَلَمْ يَرَ شيئًا، ثُمَّ سَعَى شَرَفًا ثَانِيًا فَلَمْ يَرَ شيئًا، ثُمَّ سَعَى شَرَفًا ثَالِثًا فَلَمْ يَرَ شيئًا، فأقْبَلَ حتَّى أَتَى مَكَانَهُ الَّذي قالَ فِيهِ، فَبَيْنَما هو قَاعِدٌ إذْ جَاءَهُ بَعِيرُهُ يَمْشِي، حتَّى وَضَعَ خِطَامَهُ في يَدِهِ، فَللَّهُ أَشَدُّ فَرَحًا بتَوْبَةِ العَبْدِ مِن هذا حِينَ وَجَدَ بَعِيرَهُ علَى حَالِهِ.

الراوي : سماك بن حرب | المحدث : مسلم | المصدر : صحيح مسلم

الصفحة أو الرقم: 2745 | خلاصة حكم المحدث : [صحيح]

السلام عليكم رابط الفيدباك اذا في مجال تعطونا رأيكم وشكرا

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V2: Slide 7 we fix the origin and insertion

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