

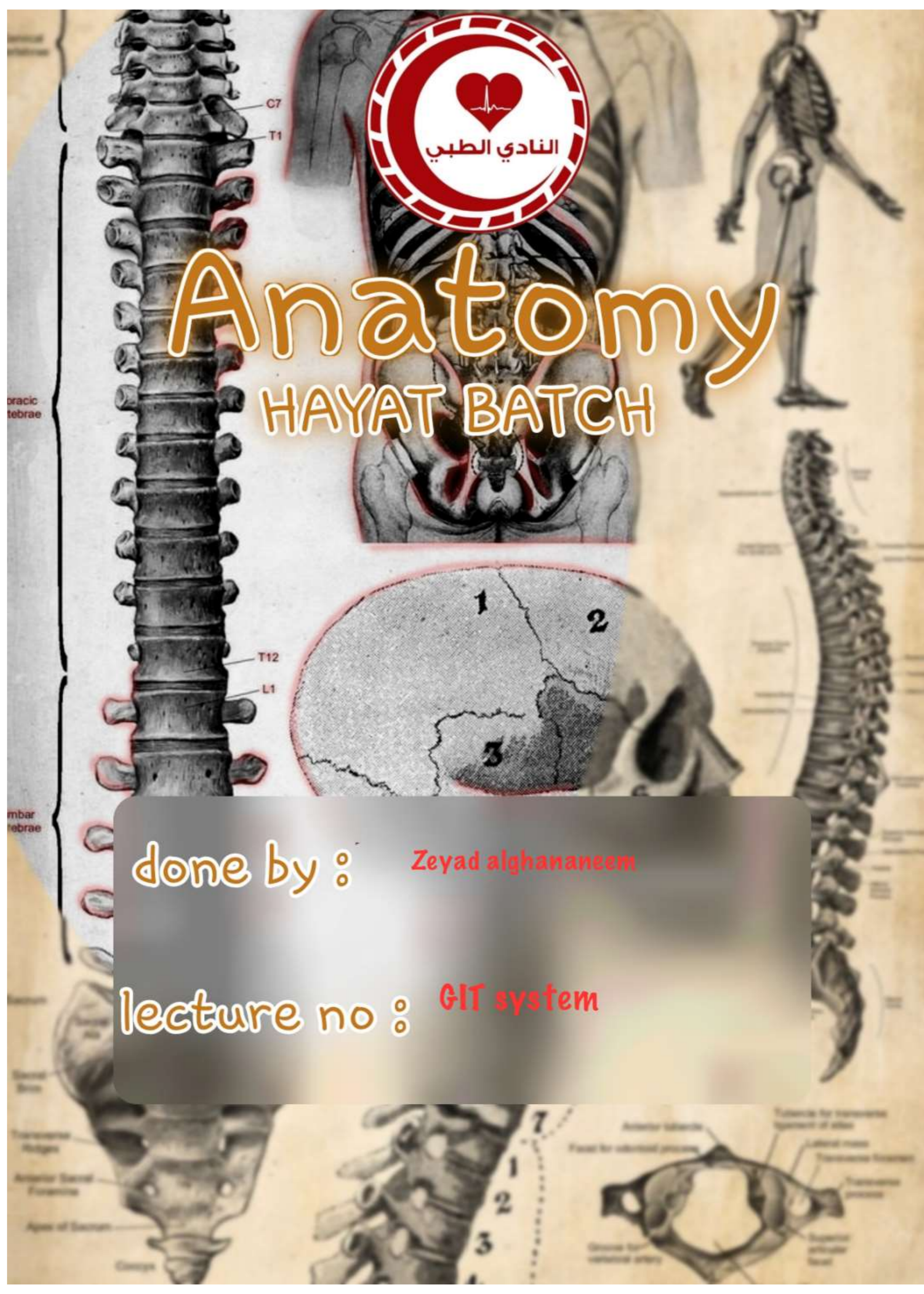


Anatomy

HAYAT BATCH

done by : Zeyad alghananeem

lecture no : GIT system



**Every day is a new beginning.
Do your best and don't give up**





General Anatomy

Lecture 18 + 19: Gastrointestinal System

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The Digestive System

- It includes the following:

Digestive system parts:-

A. The gastrointestinal tract or alimentary canal:

فتحة الشرج
↗

- This is a continuous tube that extends from mouth to anus.
- It includes mouth, pharynx, esophagus, stomach, small intestine & large intestine.

B. Accessory Glands:

liver, pancreas & salivary glands.

Opens into the mouth and secretes saliva into oral cavity.

★ Salivary Gland

Oral Cavity

★ Liver

Gall Bladder

Large Intestine

Anal

Pharynx

Oesophagus

Stomach

Pancreas ★

Small Intestine

Rectum

Extend from the base of skull to 6th cervical vertebrae.

Mainly present in the thoracic cavity.
يعني اغلبه بال Thorax

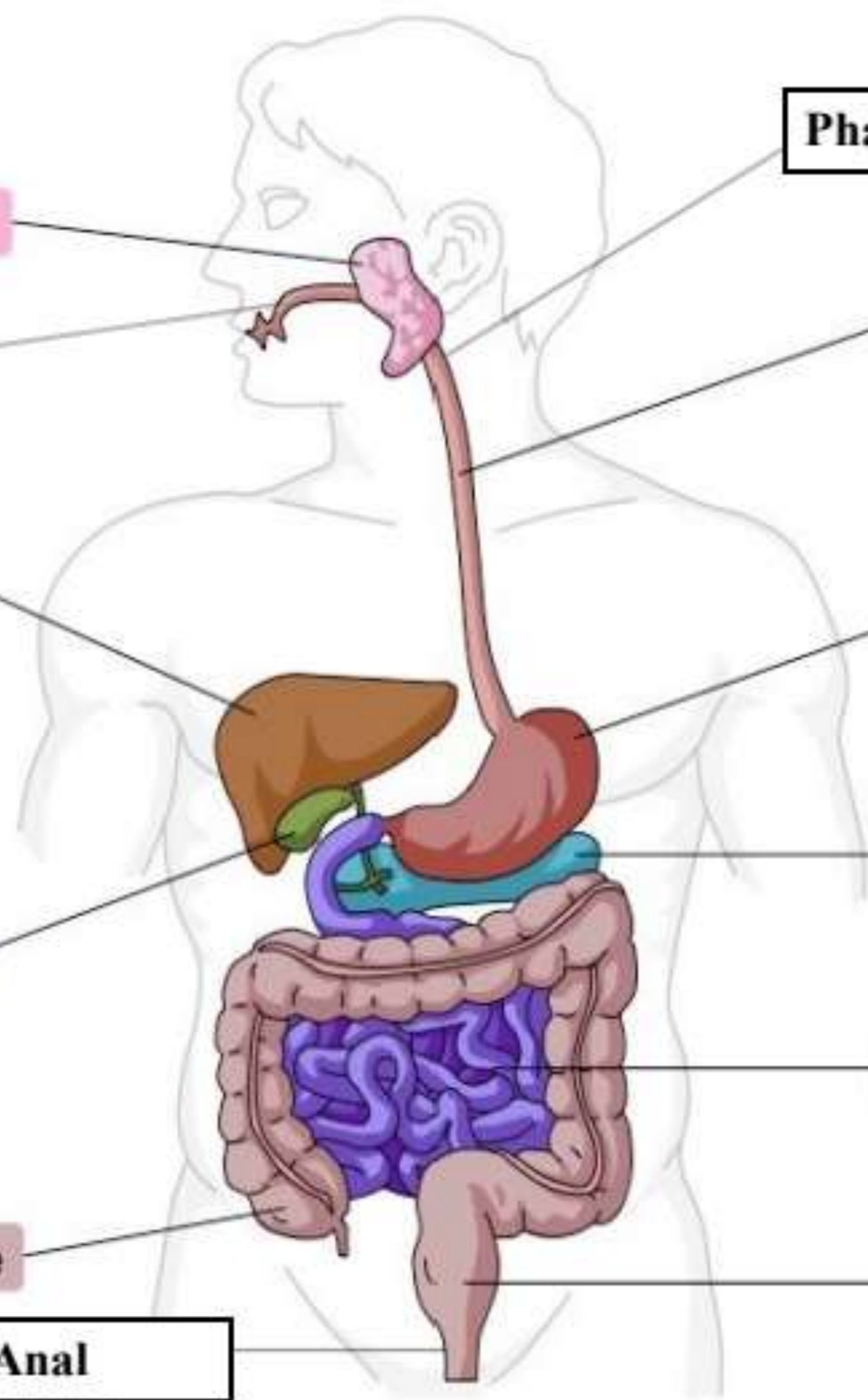
Divided into 3 parts
1) Duodenum.
2) Jejunum.
3) Ileum

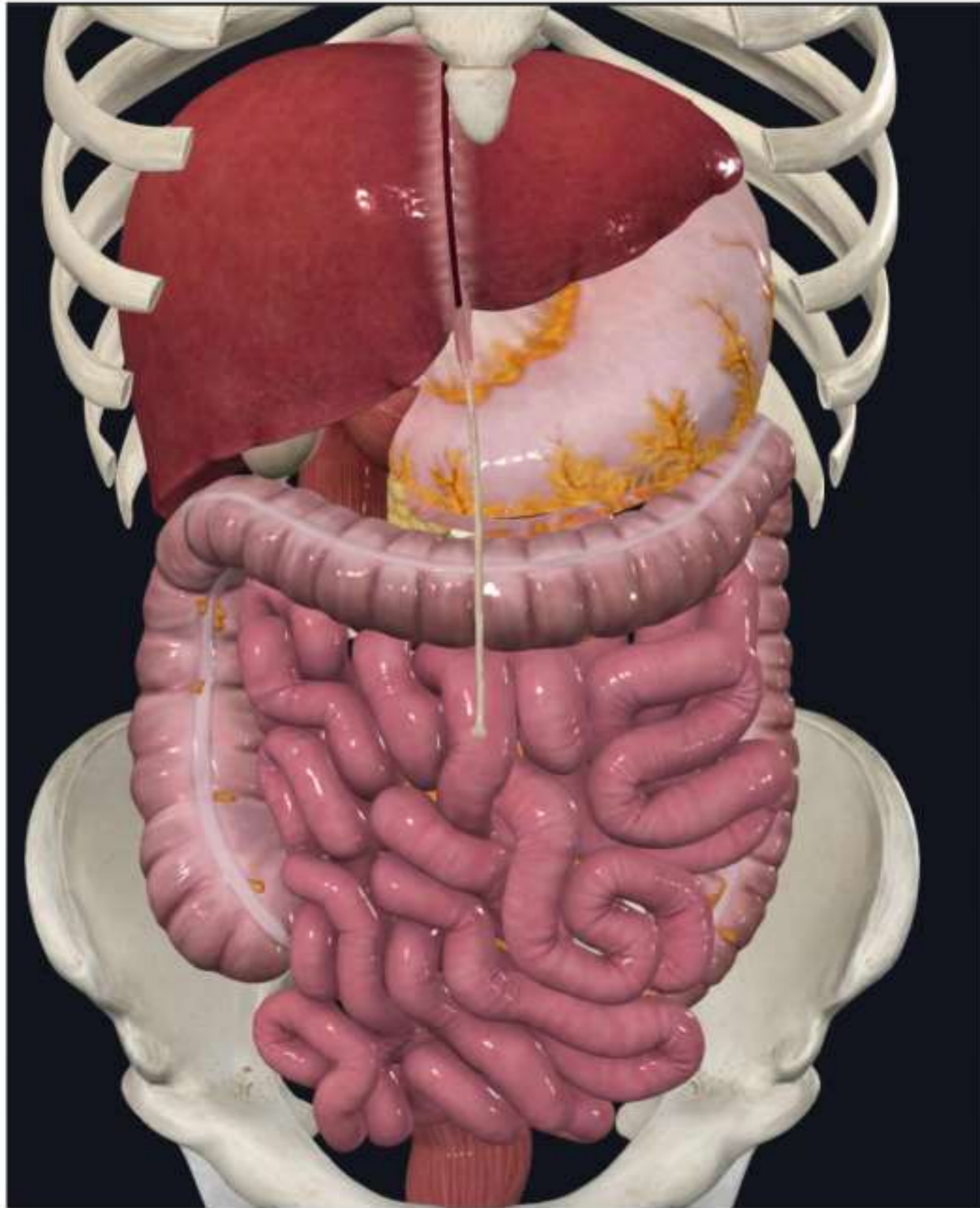
The part that stores faeces
باز

Composed of:-

- 1) Secum.
- 2) Colon.
 - Ascending colon.
 - Descending "
 - Transverse "

الرجع
قون





A. Mouth (Oral Cavity)

- Extends from lips to oropharyngeal isthmus.

* It is divided into:

يقسم حسب الأسنان إلى:

A. The Vestibule: جزء خارج الأسنان

- This is the space bounded externally by the lips and cheeks and internally by the gums and teeth.
- It communicates posteriorly behind the teeth with the mouth cavity proper. → شرحها بسلايد تحت

B. The Mouth Cavity Proper: جزء داخل الأسنان

- * Extends from teeth to oropharyngeal isthmus through which it communicates with the oral part of the pharynx.

→ This area internal to teeth, contain lung.

- It communicates posteriorly behind the teeth with the mouth cavity proper.



لو صدیت أصبعی من هون من عند آخر سن و "Behin last standing molar"
دهو أوصل إلى (Oral) Mouth cavity proper

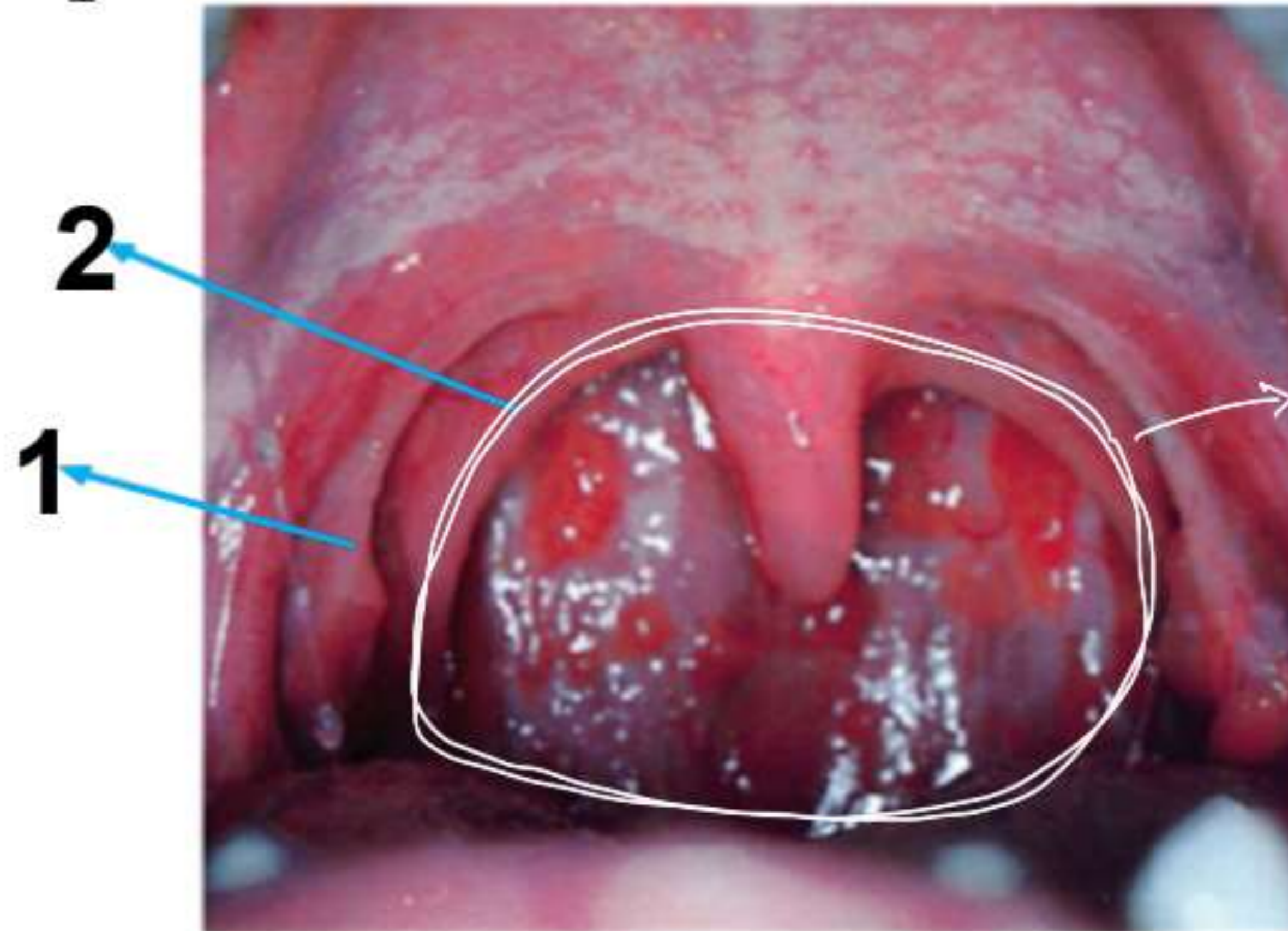
This area external to teeth, between cheeks and teeth.

The Oral Vestibule



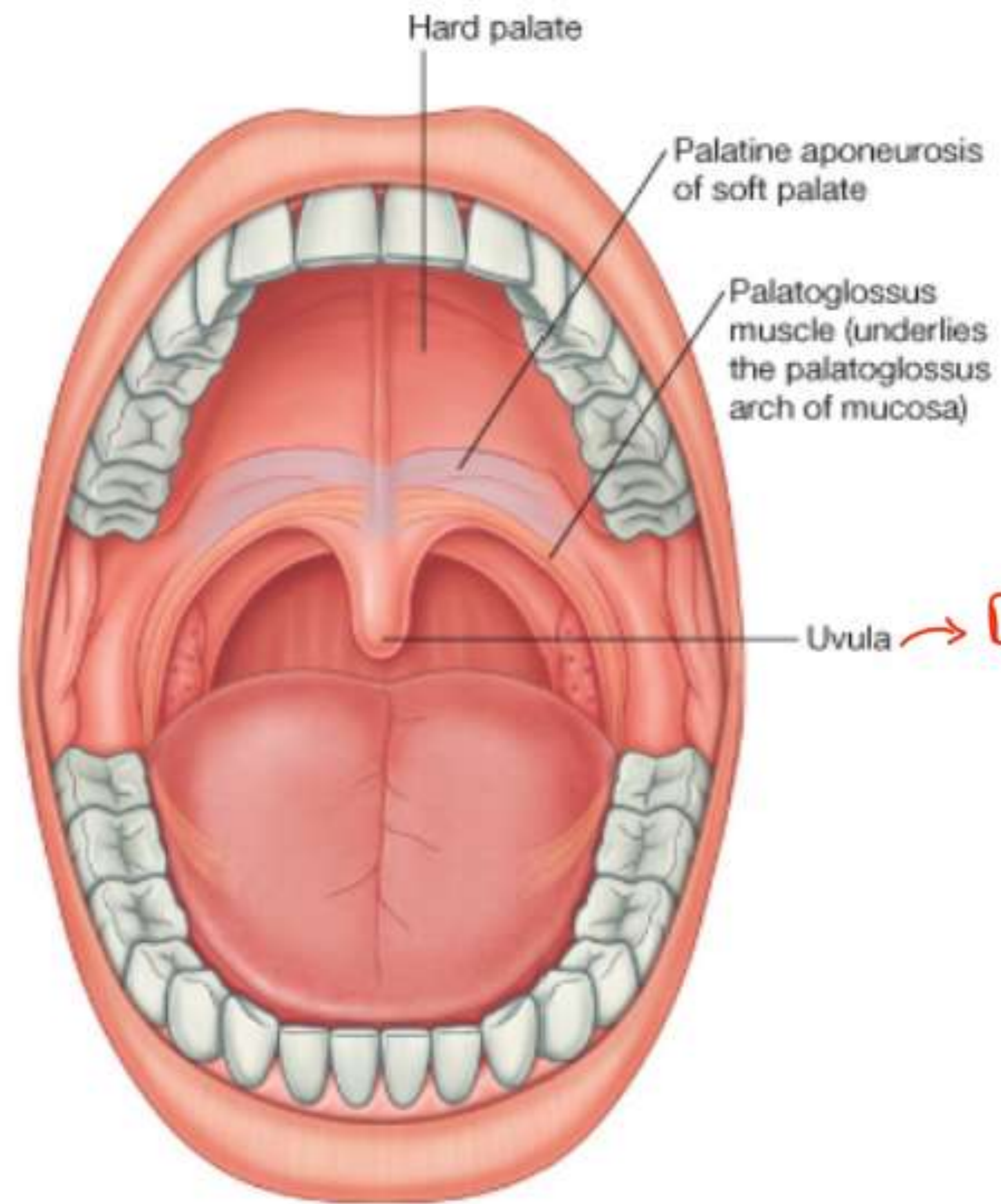
- 1: Palatoglossal Arch (Fold)
- 2: Palatopharyngeal Arch (Fold)

هو الحد ما بين :-
Oral cavity (1)
Pharynx (2)



This is the pharyngeal isthmus

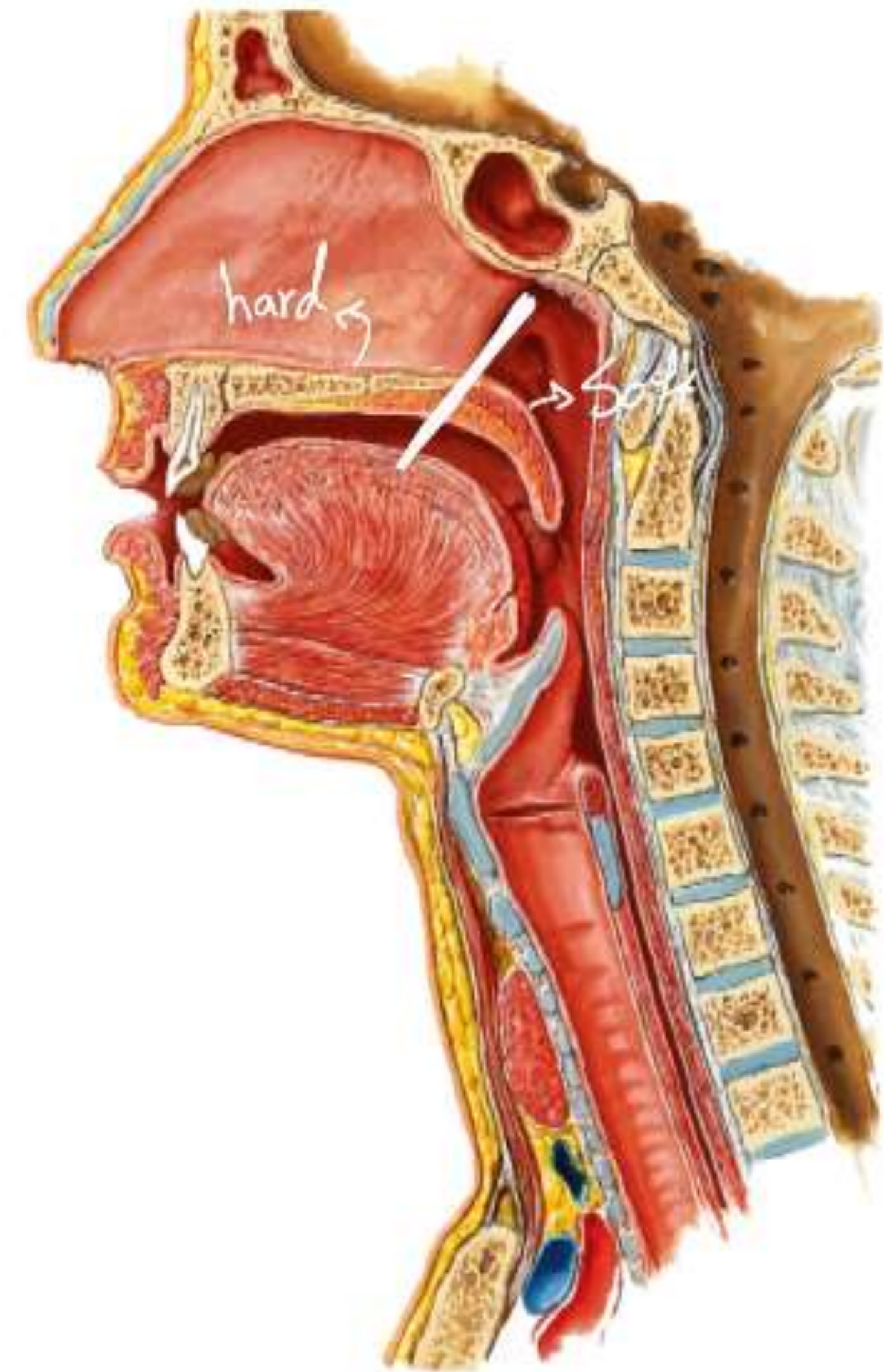
هو ما بين :-
Mouth (1)
Pharynx (2)



Uvula → *Downward, posterior projection.*

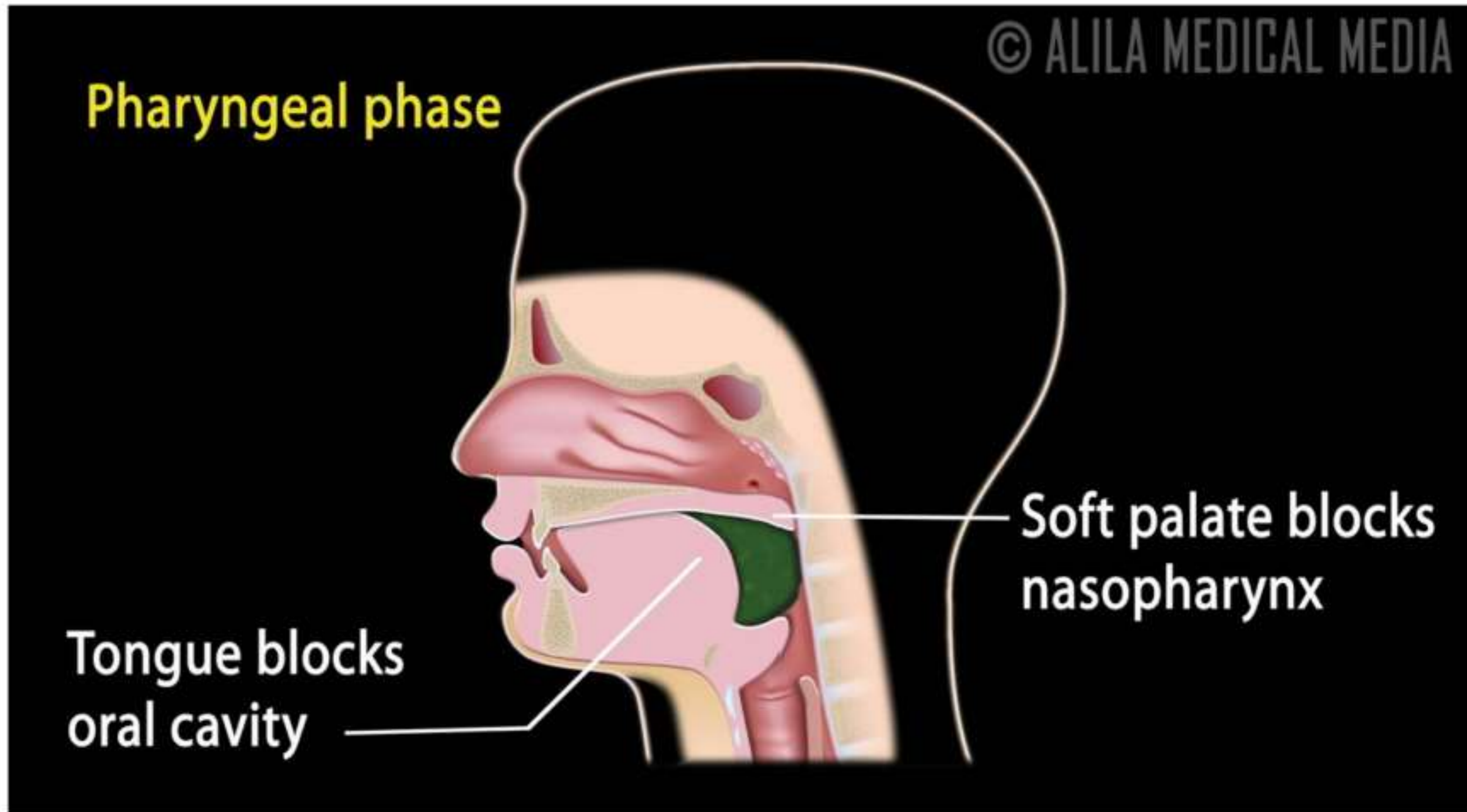
A. The Roof:

- Is formed anteriorly by the hard palate & posteriorly by the soft palate.
 $\frac{2}{3}$
 Muscular $\leftarrow \frac{1}{3}$
- The soft palate is a mobile fold attached to the posterior border of the hard palate.
- Its free posterior border presents in the midline a conical projection called the uvula.
- * During swallowing, the soft palate is drawn upwards to close off the nasal part of pharynx and preventing swallowed food and liquid from entering nasal cavity.



Soft palate closes nasal part of pharynx during swallowing.

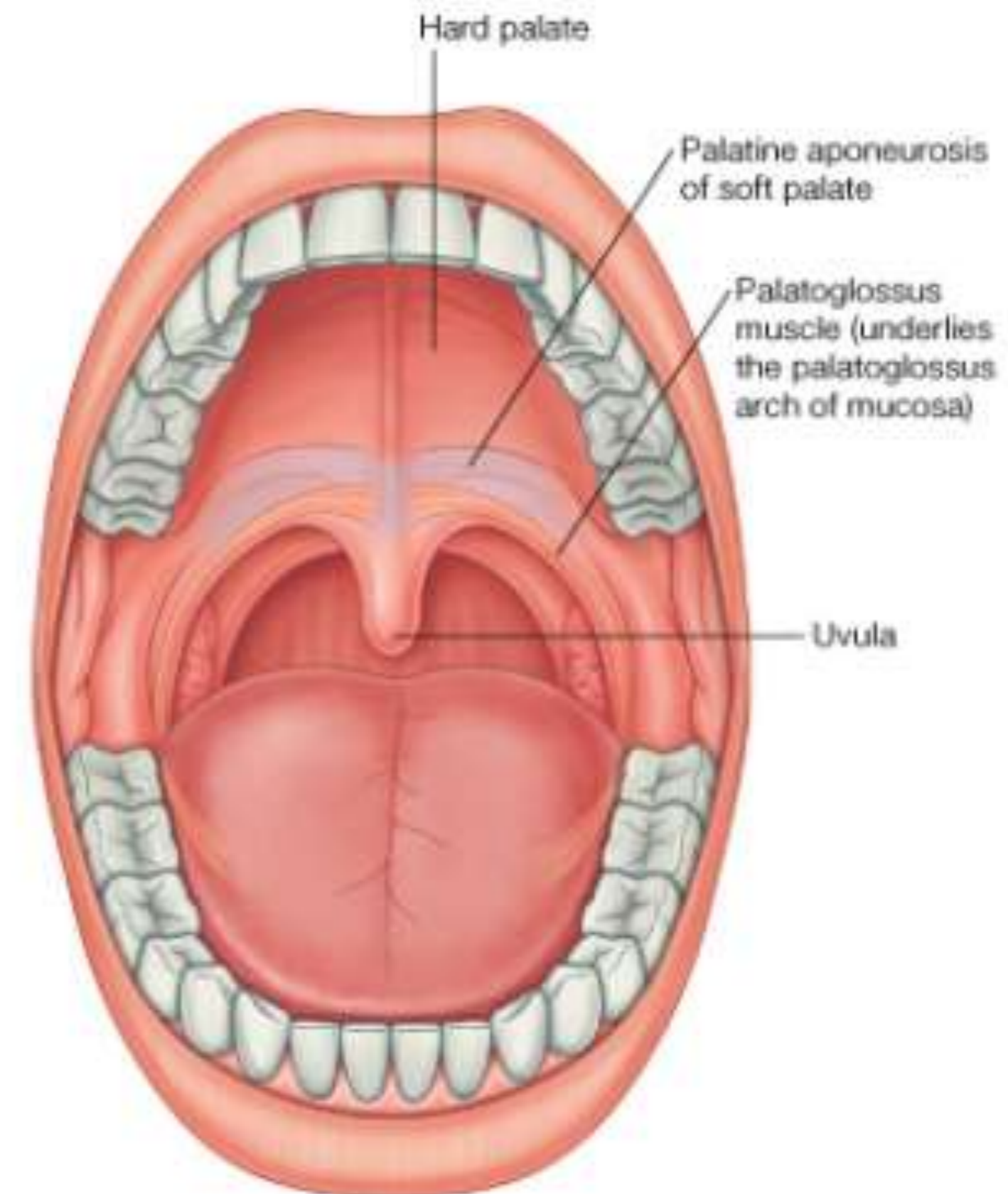
ليمنع ارتداد الطعام إلى الأنف.



B. The Floor:

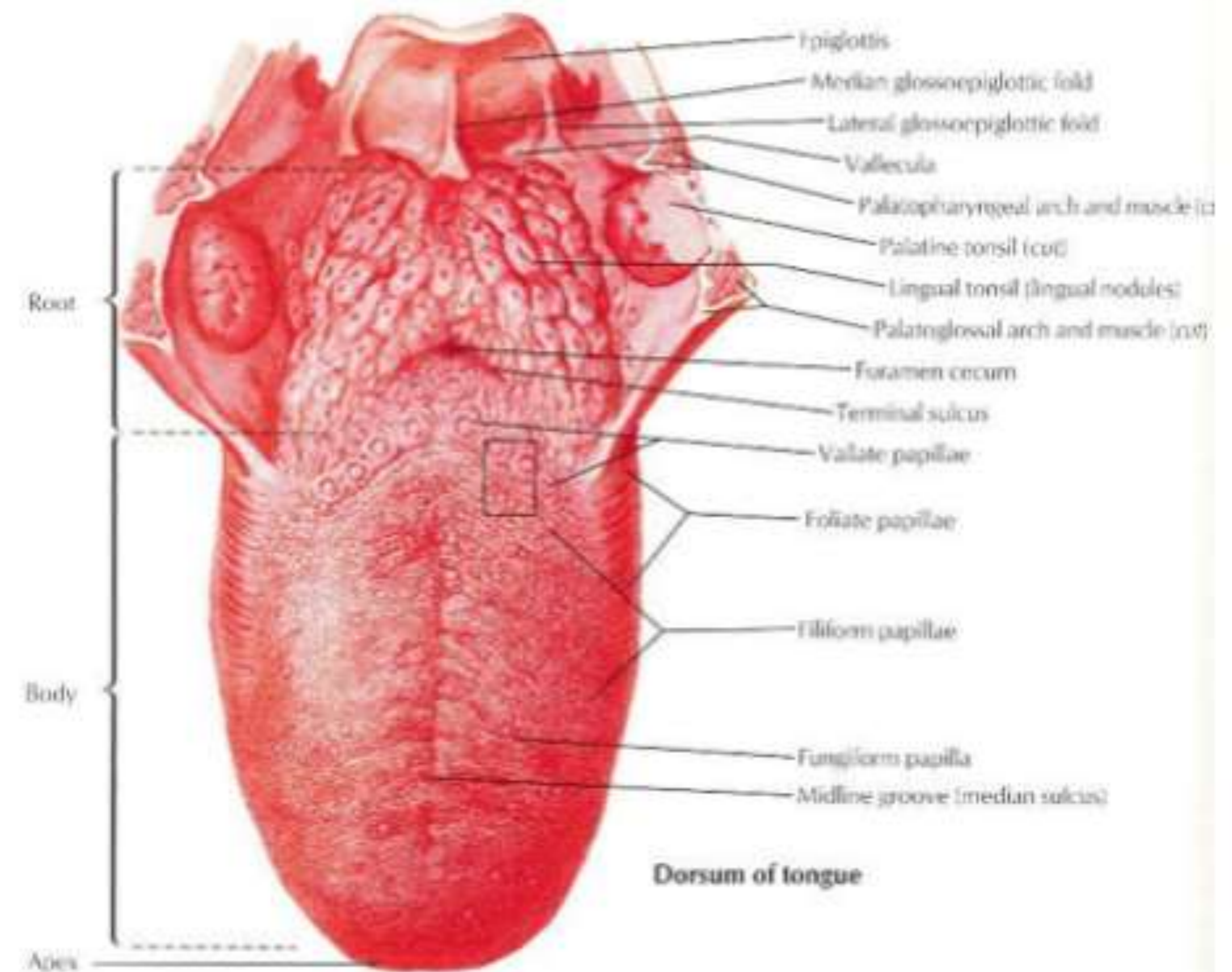
* Is formed largely by the anterior two third of the tongue and by the reflection of the mucous membrane from sides of tongue to gum.

→ The remain $\frac{1}{3}$ in pharynx located.



Tongue

- It is a muscular structure covered with mucous membrane.
- Its dorsal surface is divided by a V-shaped sulcus, the sulcus terminalis, into an anterior two-third (oral part), and a posterior one-third (pharyngeal part).
- The apex of the sulcus projects backward and is marked by a small pit termed the foramen cecum.



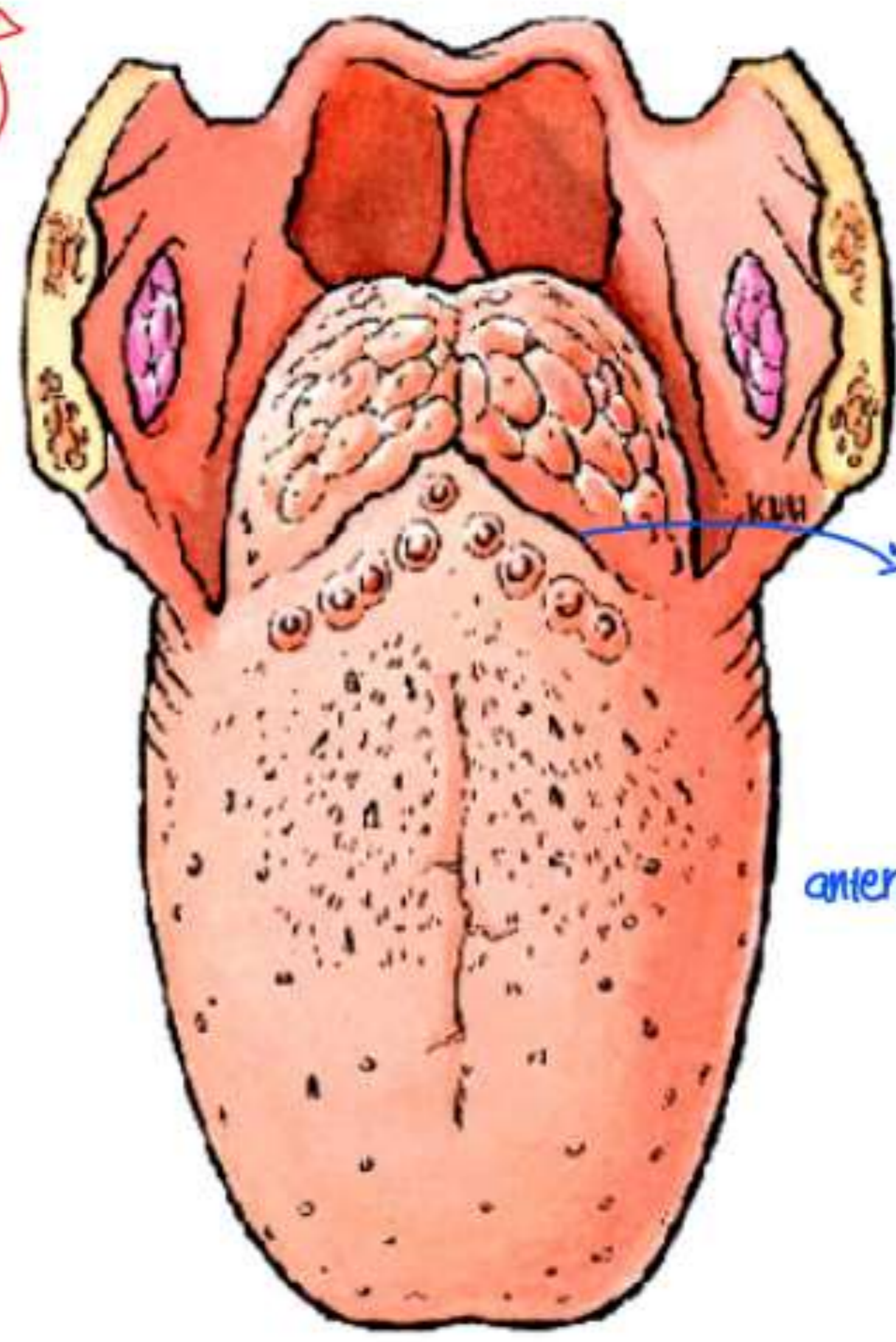
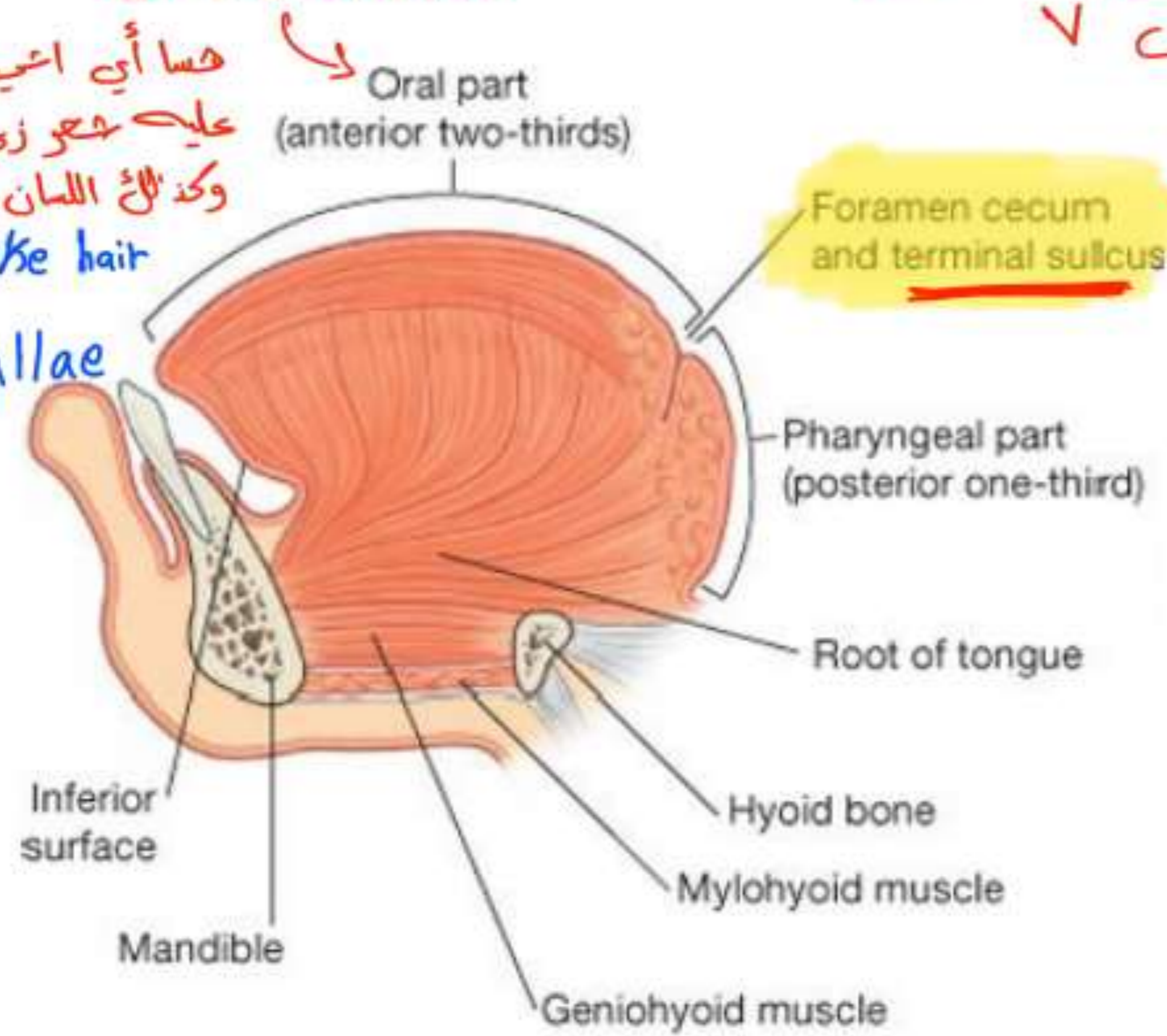
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Dorsal surface

حافض هو الخط الذي شبه حرف V

فما أي اشبه Dorsal يكون عليه شعري زي ظهر القدم واليد وكذلك اللسان عليه

Projections like hair Called papillae



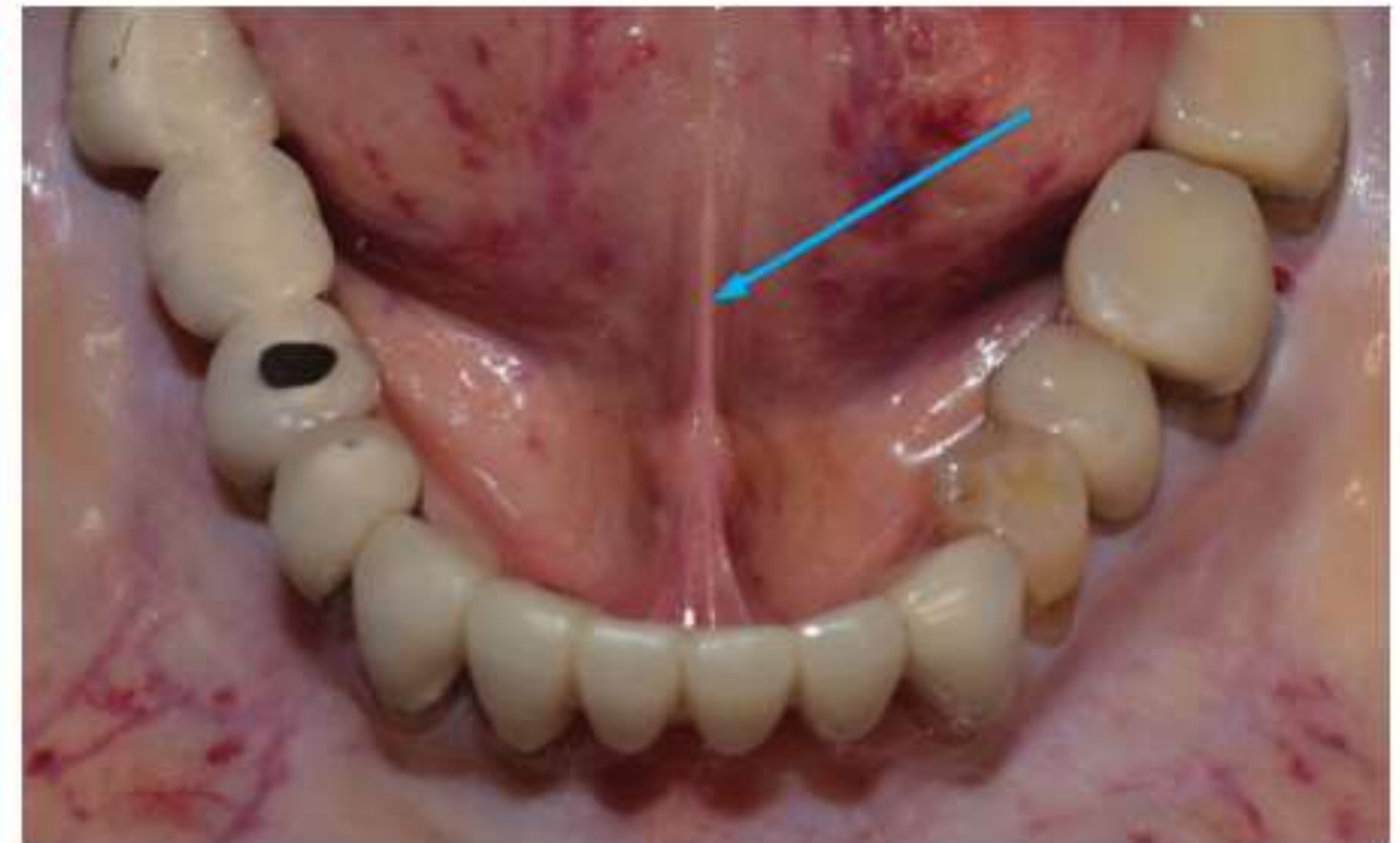
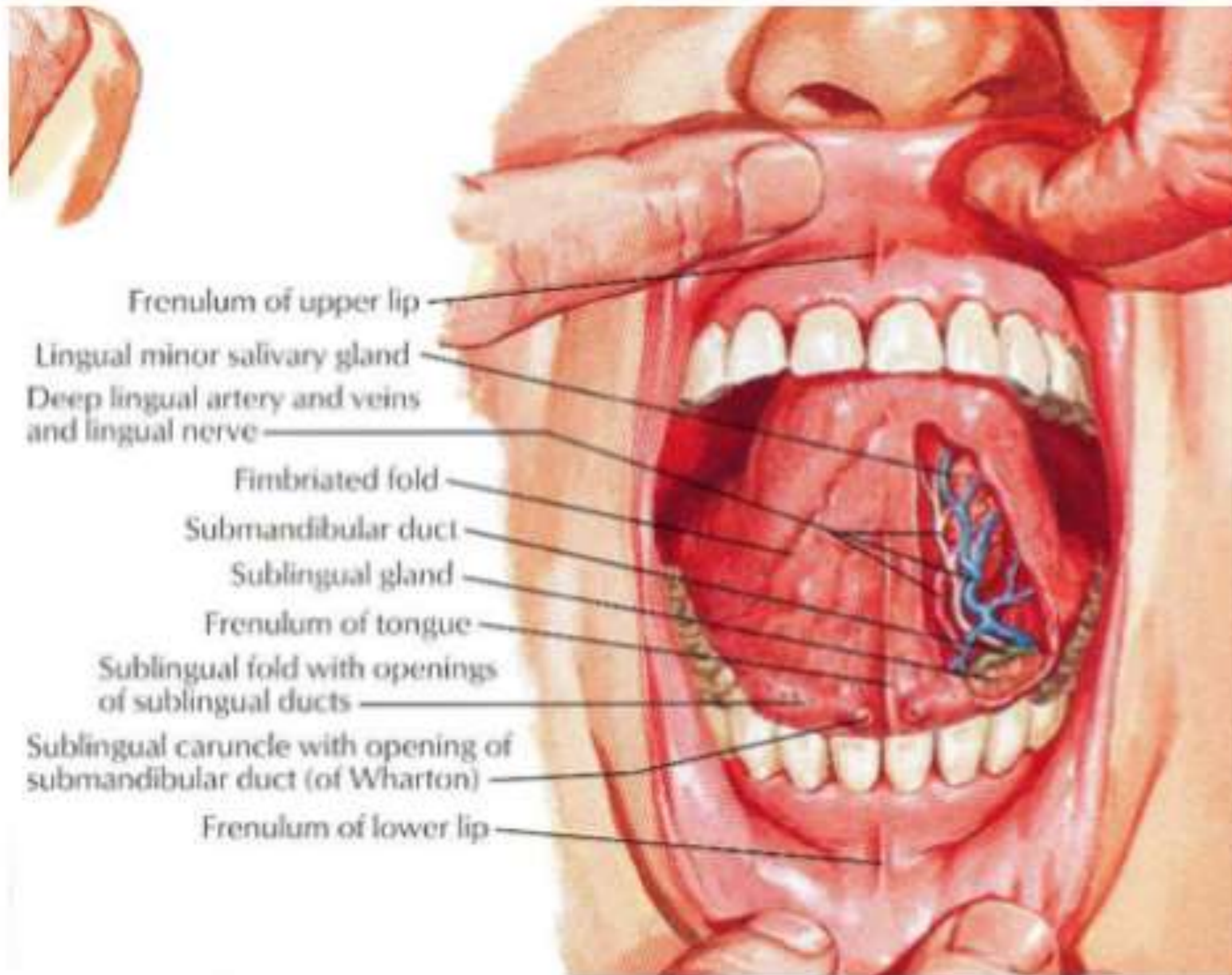
Sulcus terminalis

حافض الخط الذي شبه حرف V يفصل ما بين anterior, posterior tongue

- The mucous membrane covering dorsal surface of posterior one-third of tongue is smooth and has no papillae, but appears nodular due to underlying lymph nodules, the lingual tonsil.
- The mucous membrane covering the inferior surface of tongue is smooth and is reflected from tongue to floor of the mouth .

* At midline, the mucous membrane gives rise to a fold called the frenulum of the tongue, which connects the inferior surface of tongue to floor of mouth.

Lingual Frenum (Frenulum)



Salivary Glands

- These glands release the saliva into the mouth cavity.

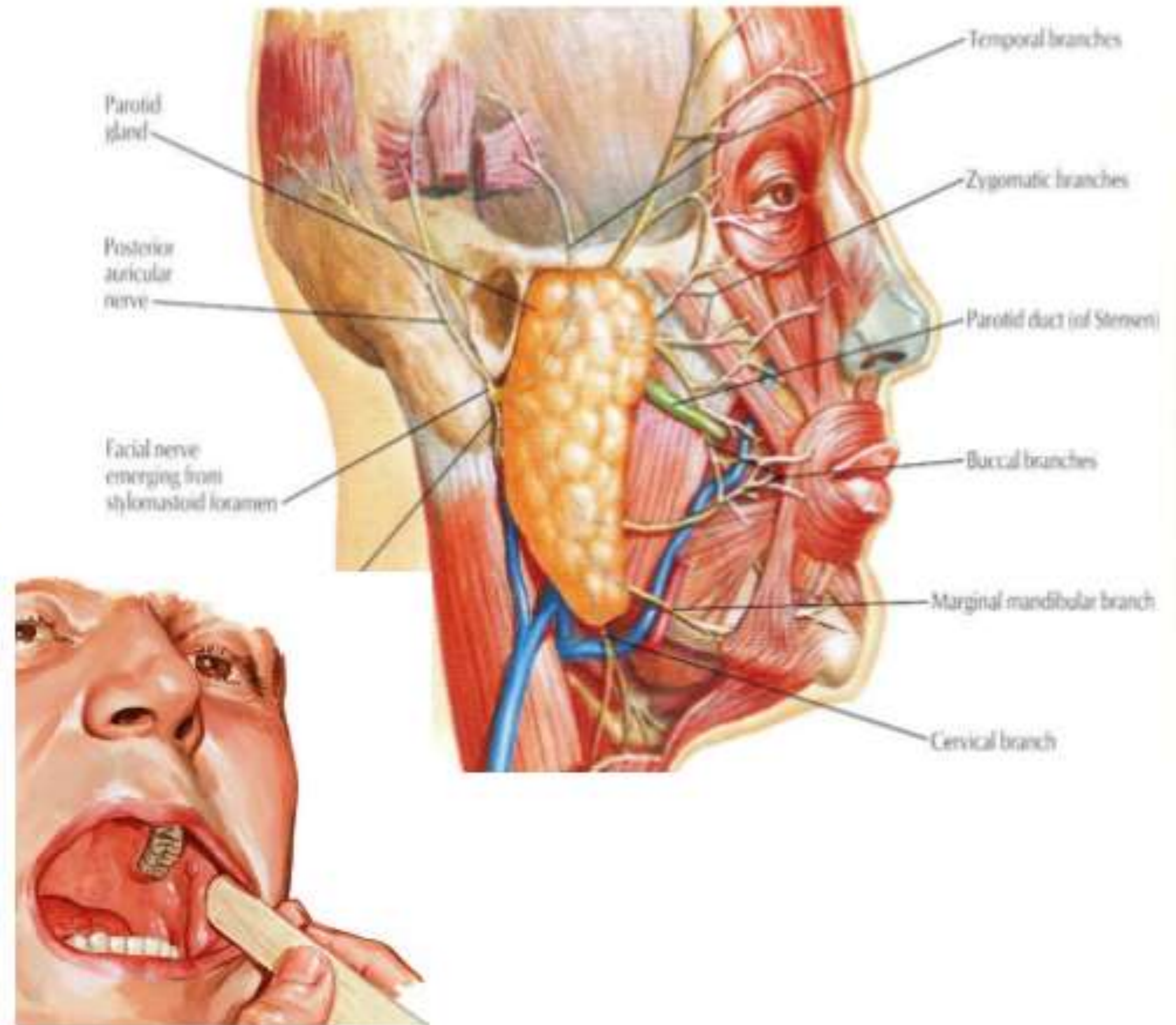
Has single duct

A. Parotid Gland:

- This is the largest of the salivary glands, situated below and in front of external auditory meatus and lies in a deep hollow behind ramus of mandible.

* The parotid duct runs forward and opens into vestibule of mouth opposite the upper 2nd molar

tooth



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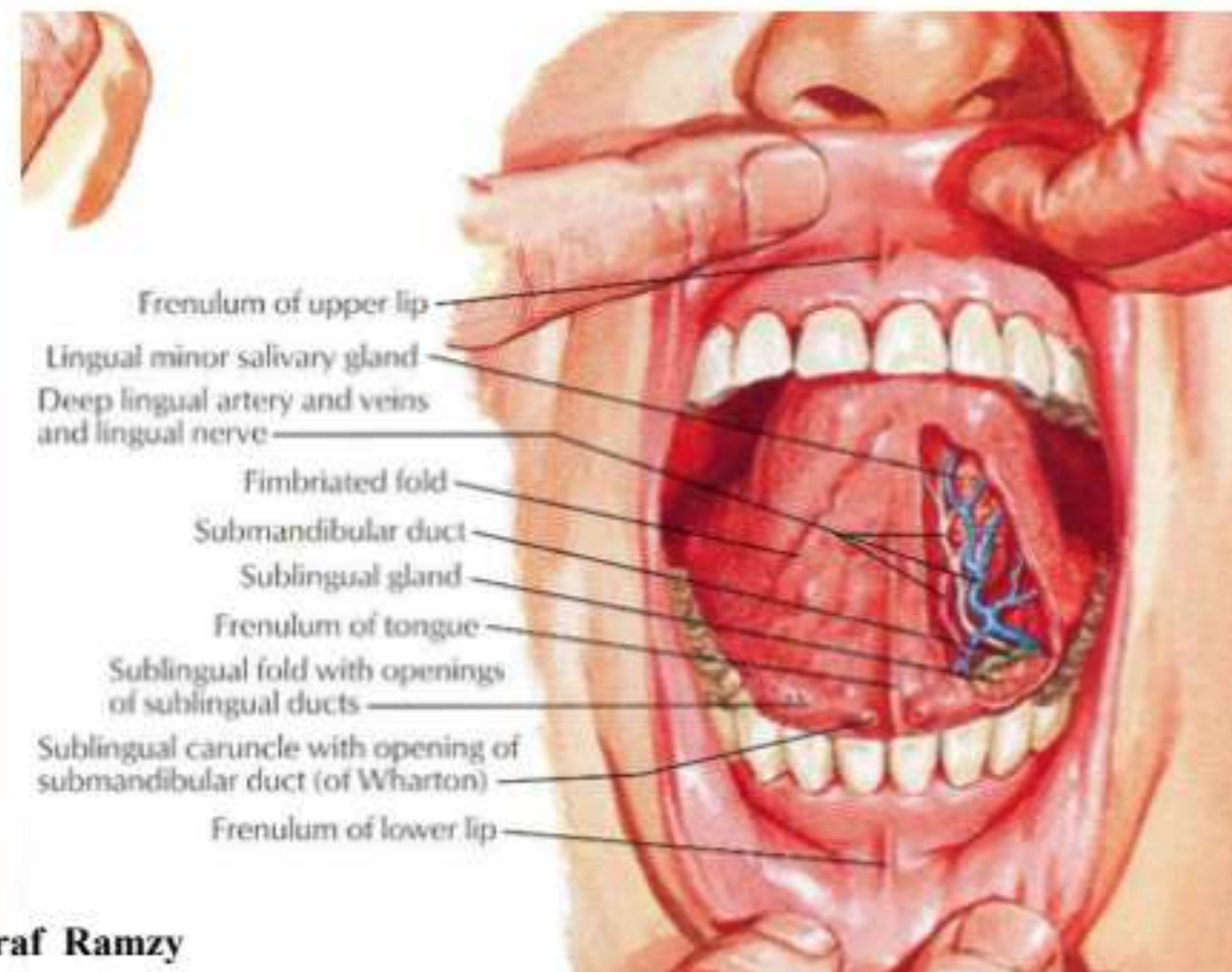
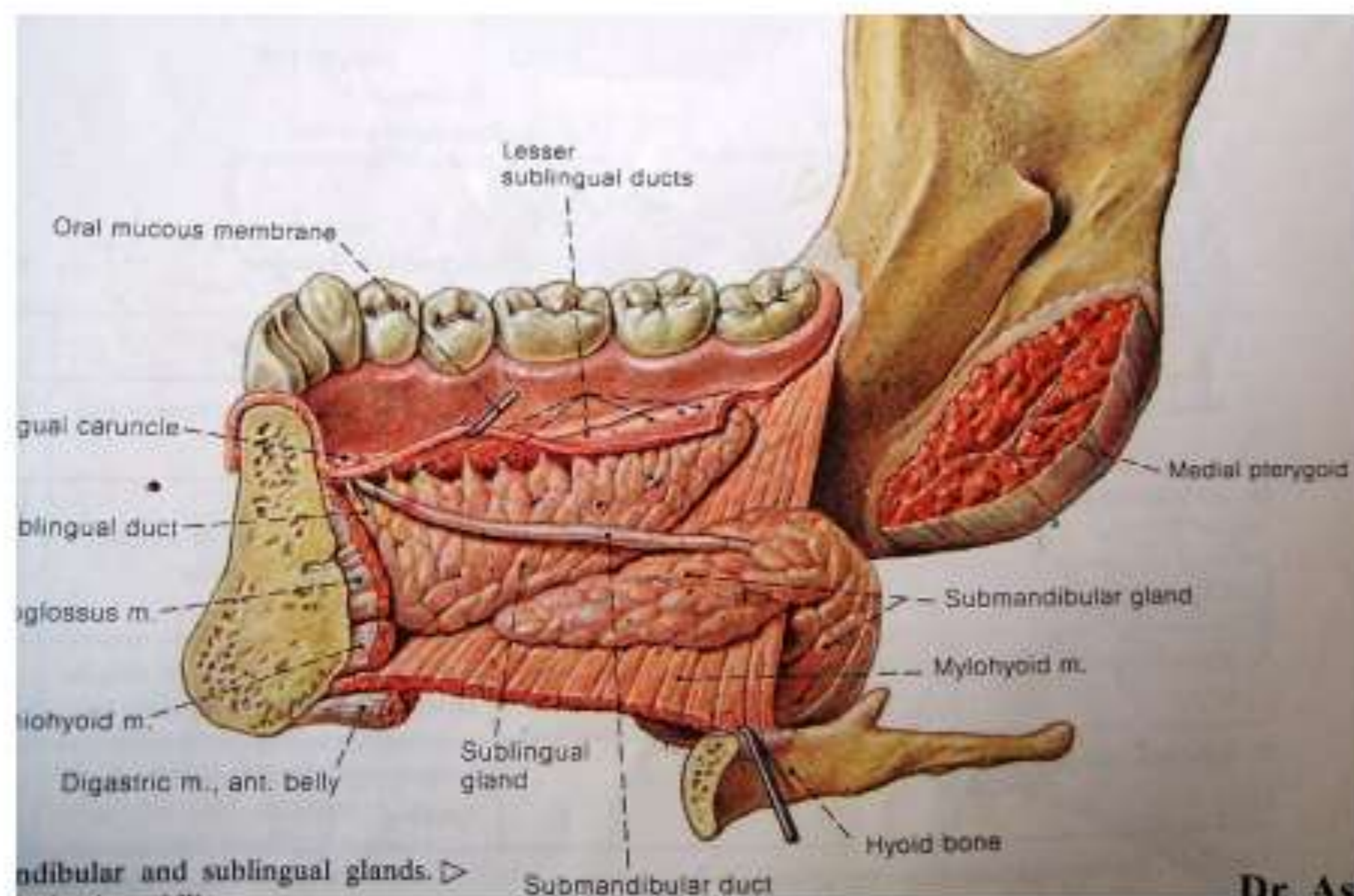
Parotid: Space between Ramus of mandible and external auditory meatus region.

B. Submandibular Gland:

Has single duct.

* **Lies** beneath the base of tongue in the posterior part of the floor of mouth. *Located in submandibular fossa.*

* The submandibular duct opens into the floor of the mouth on a small papilla situated at the side of frenulum of tongue.

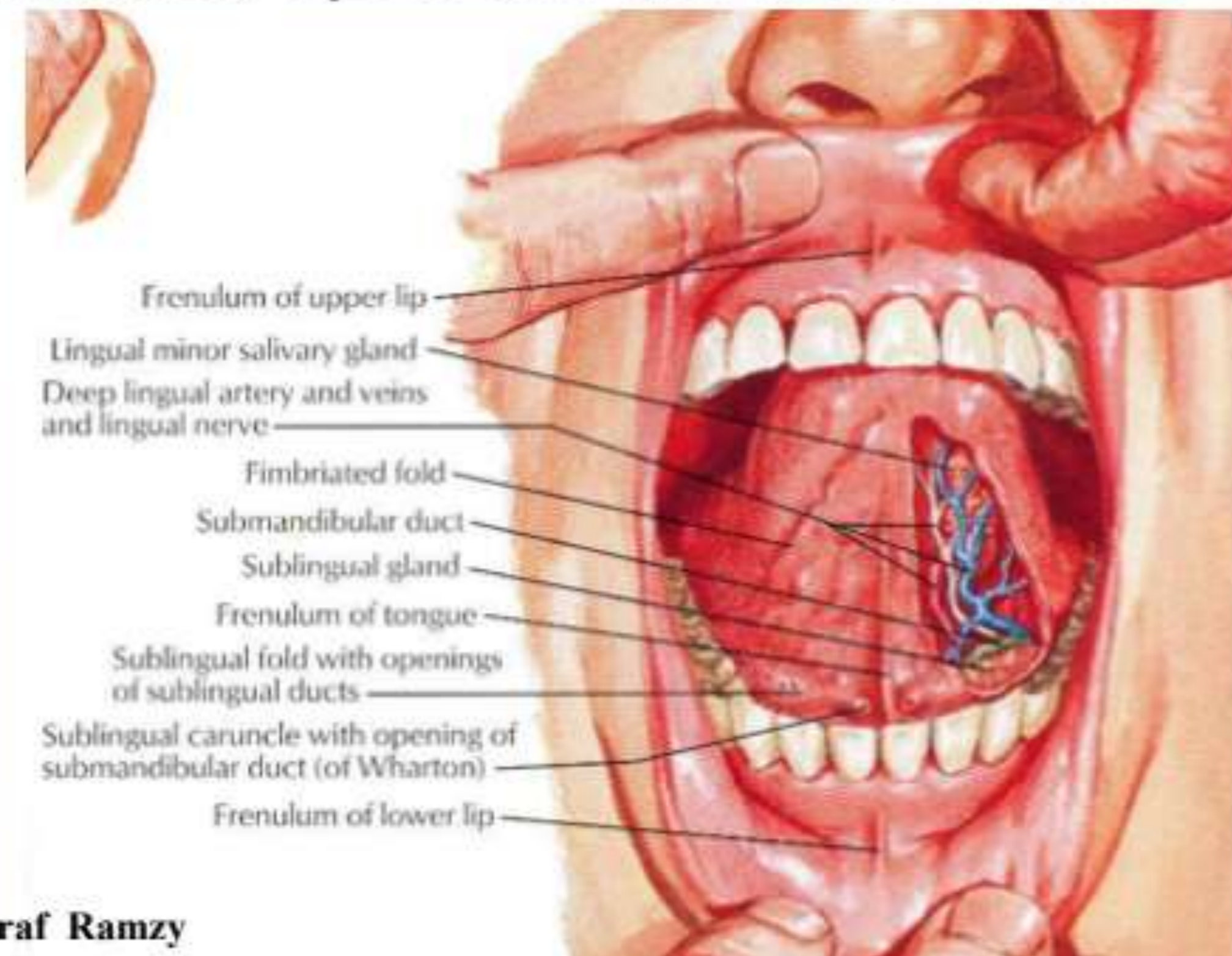
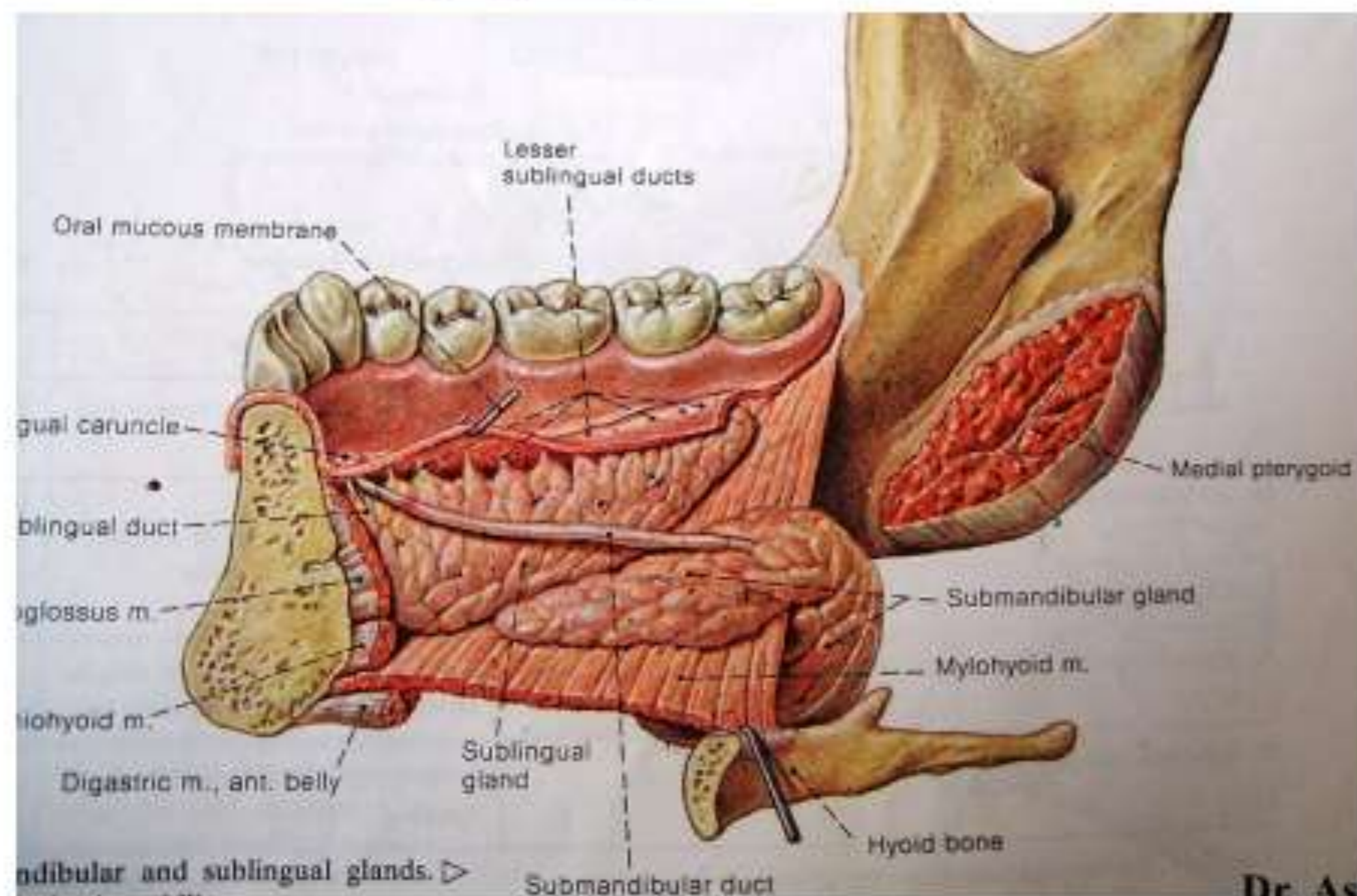


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C. Sublingual Gland:

Has multiple ducts

- * Is the smallest of the three main salivary glands.
- * Lies beneath the mucous membrane of the floor of the mouth, close to the midline.
- * The sublingual ducts are 8 – 20 in number, open into the floor of the mouth cavity proper.

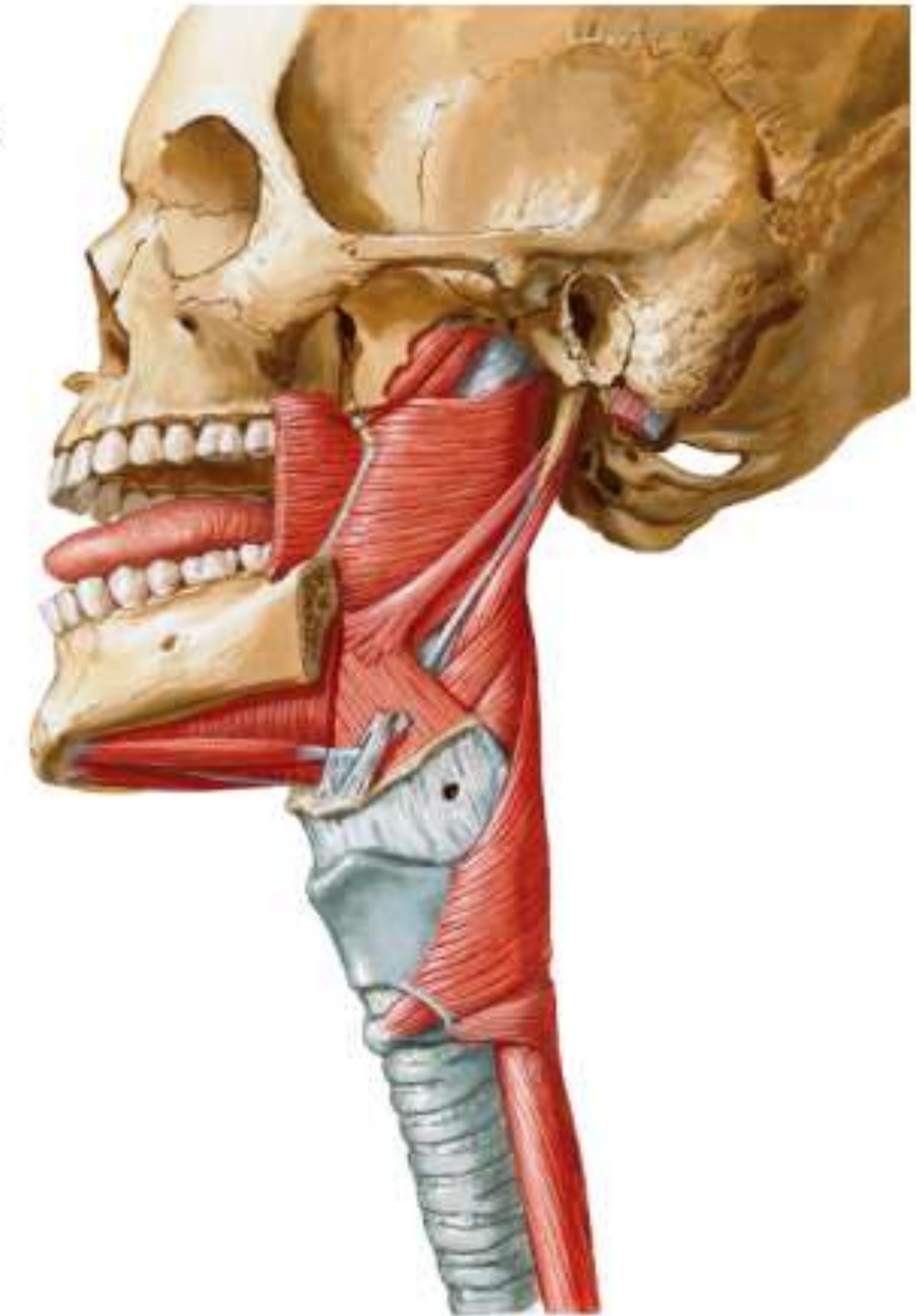


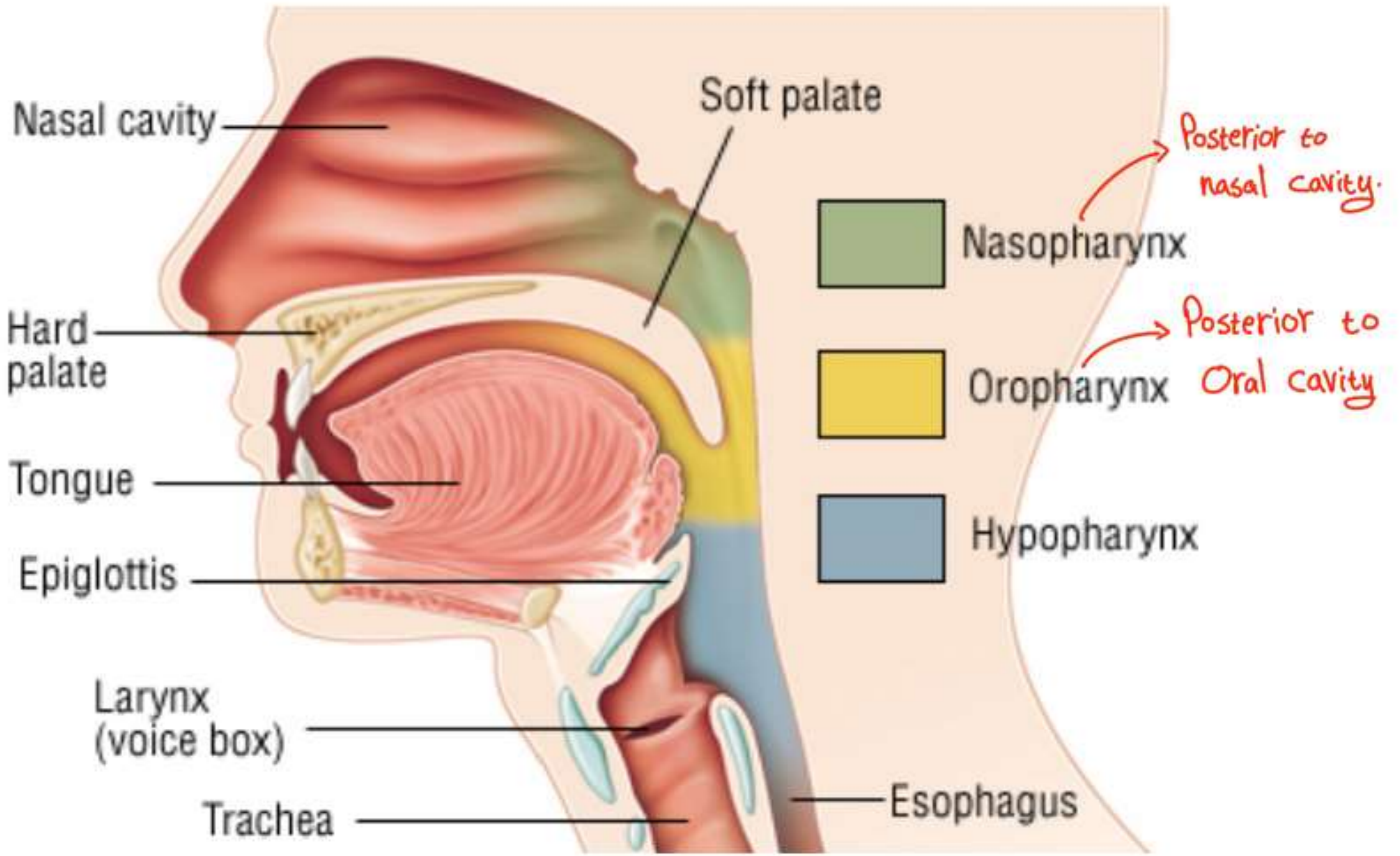
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A fibromuscular organ

B. Pharynx

- The wall of the pharynx has ³ three circular muscles (superior, middle and inferior constrictors) and ³ three longitudinal muscles (stylopharyngeus, palatopharyngeus, and salpingopharyngeus muscles).
- All these muscles are supplied by the pharyngeal plexus of nerves except the stylopharyngeus, which is supplied by the glossopharyngeal nerve (9th cranial nerve).
- The successive contraction of the constrictor muscles propels the bolus of food down into the esophagus. ^{→ Push.}
- * ^{رفع} The longitudinal muscles elevate the pharynx and larynx during swallowing.





C. The Gut

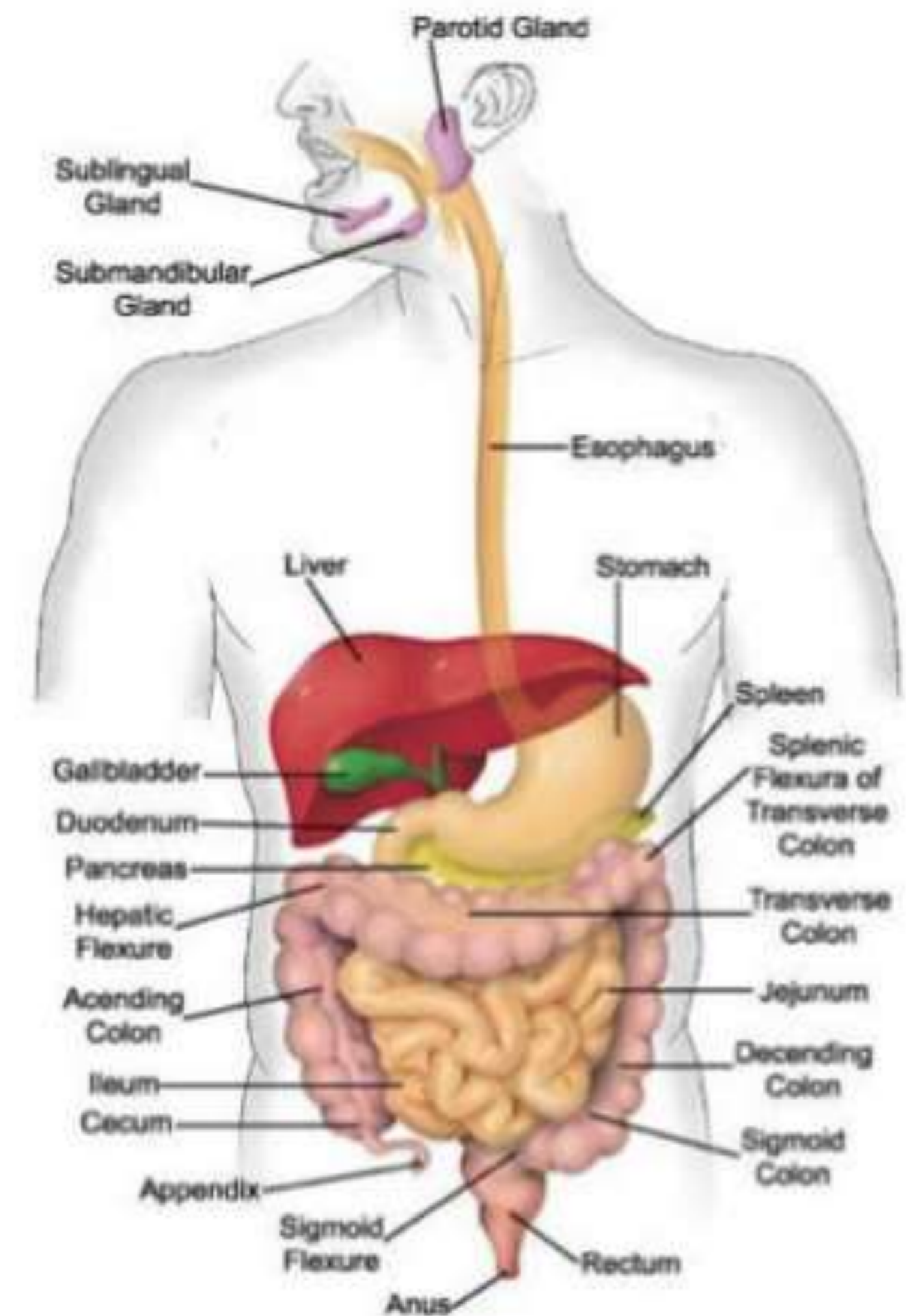
- The alimentary tract is divided into:

1. Foregut: it includes oesophagus, stomach, first part of duodenum and upper part of second part of duodenum.

- The foregut is supplied by the celiac trunk.

2. Midgut: it includes the rest of duodenum, jejunum, ileum, ascending colon and the right 2/3 of transverse colon.

- * The midgut is supplied by the superior mesenteric artery.

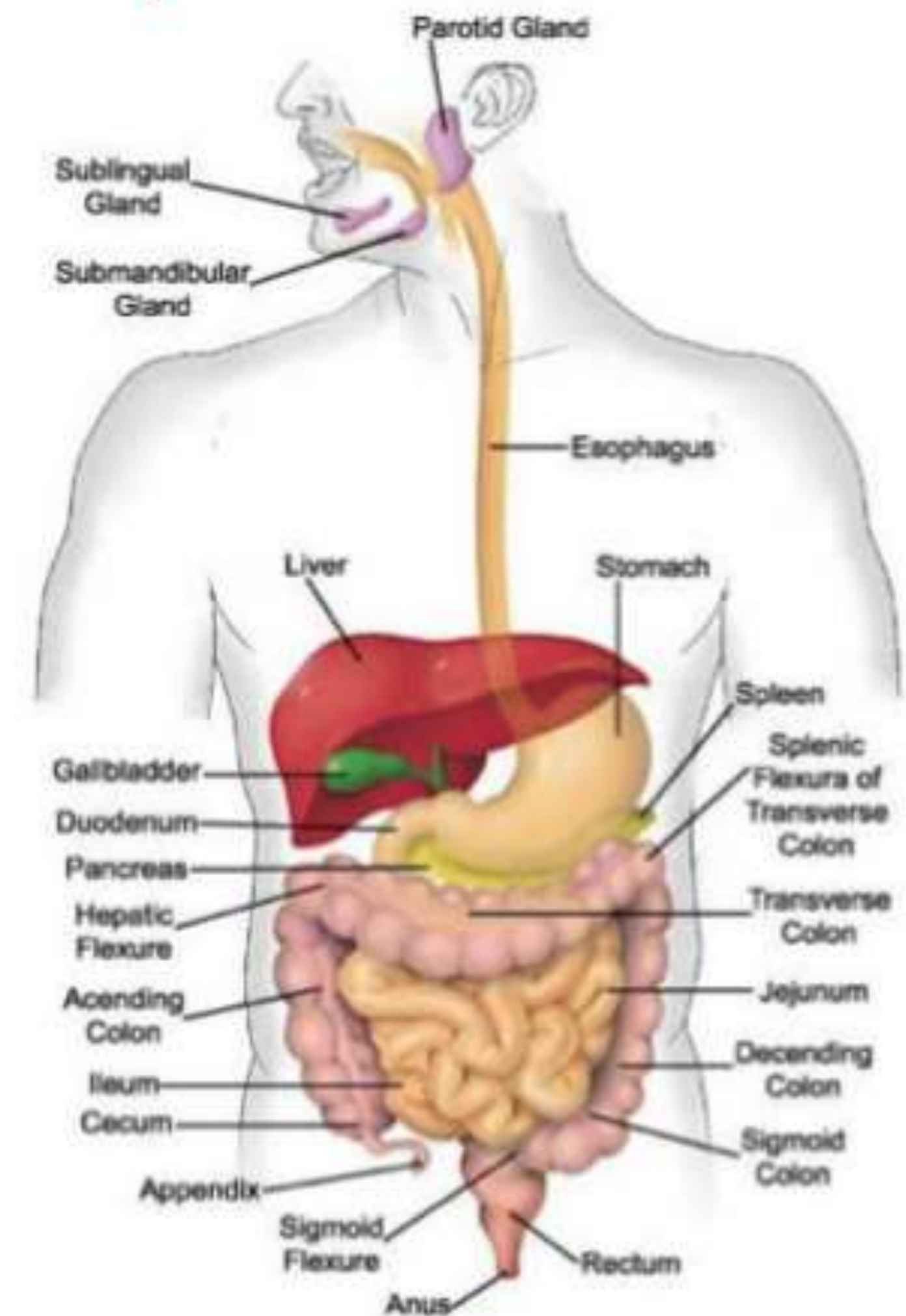


C. The Gut (Contd)

3. Hindgut: it includes the left 1/3 of transverse colon, descending colon, sigmoid colon, rectum and anal canal.

- The hindgut is supplied by the inferior mesenteric artery.

* The venous blood of the gut is drained by the portal vein.



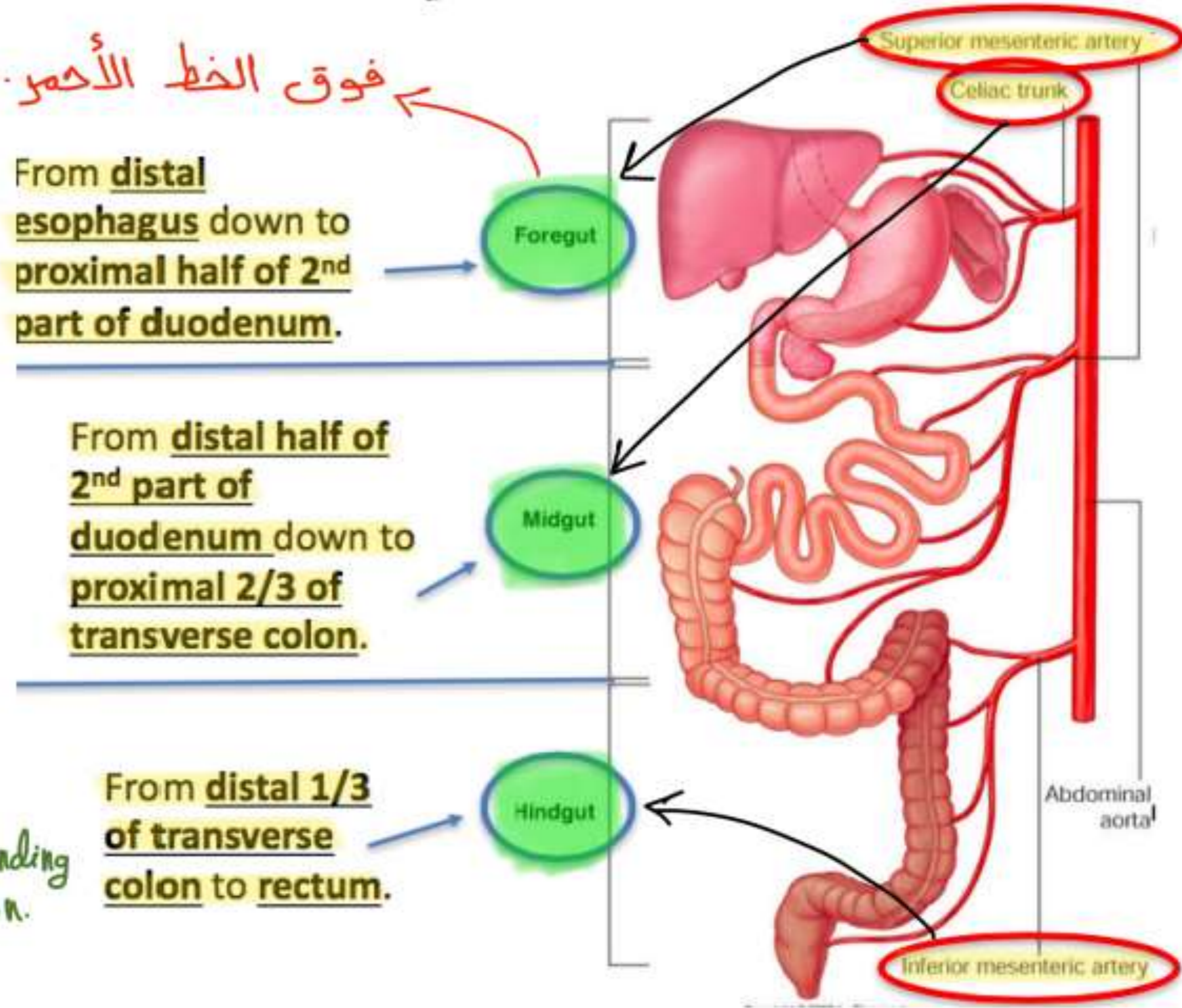
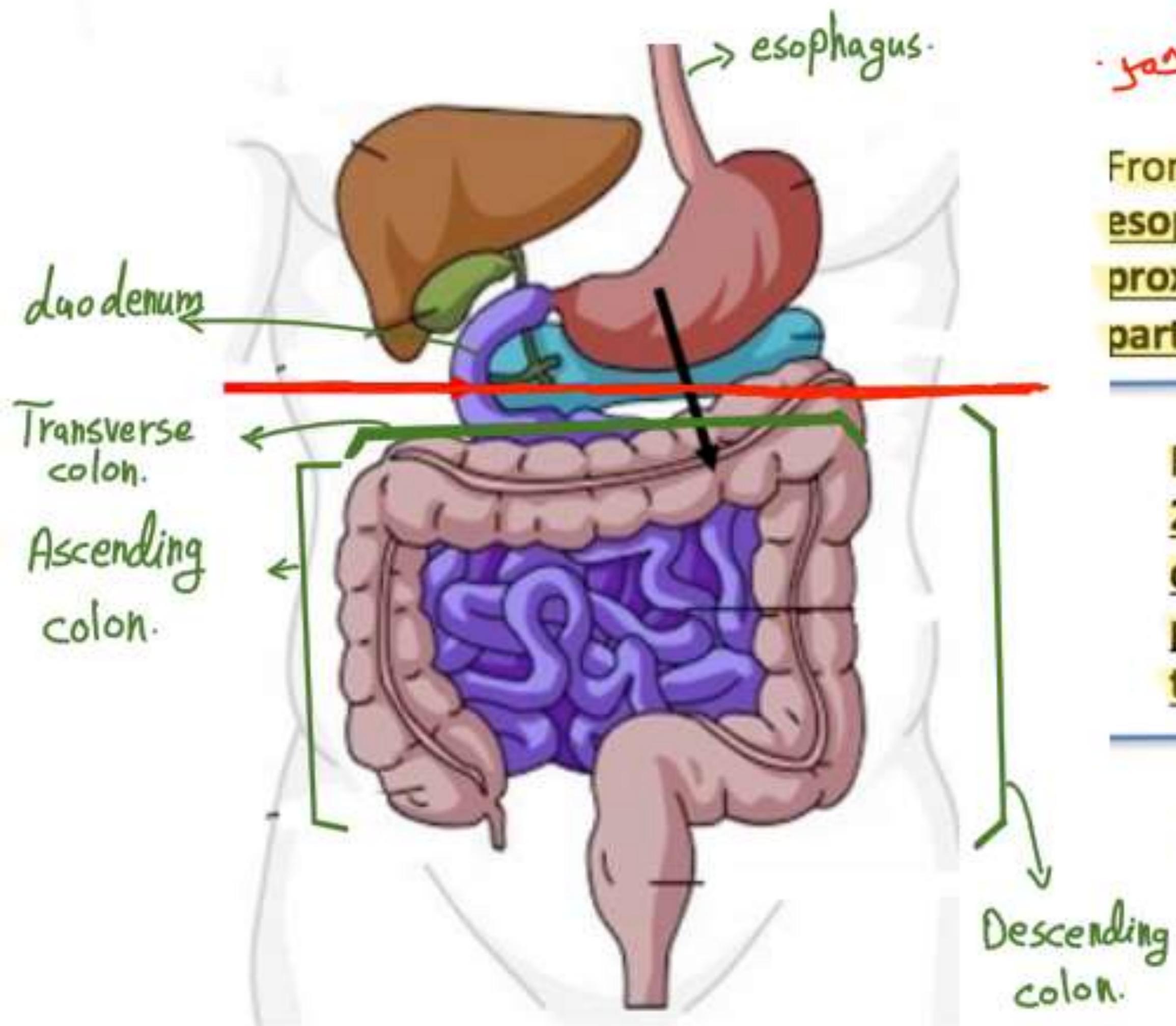
* حفظ كل منطقة ومن الشريان التي يعطيها دم.

فوق الخط الأحمر.

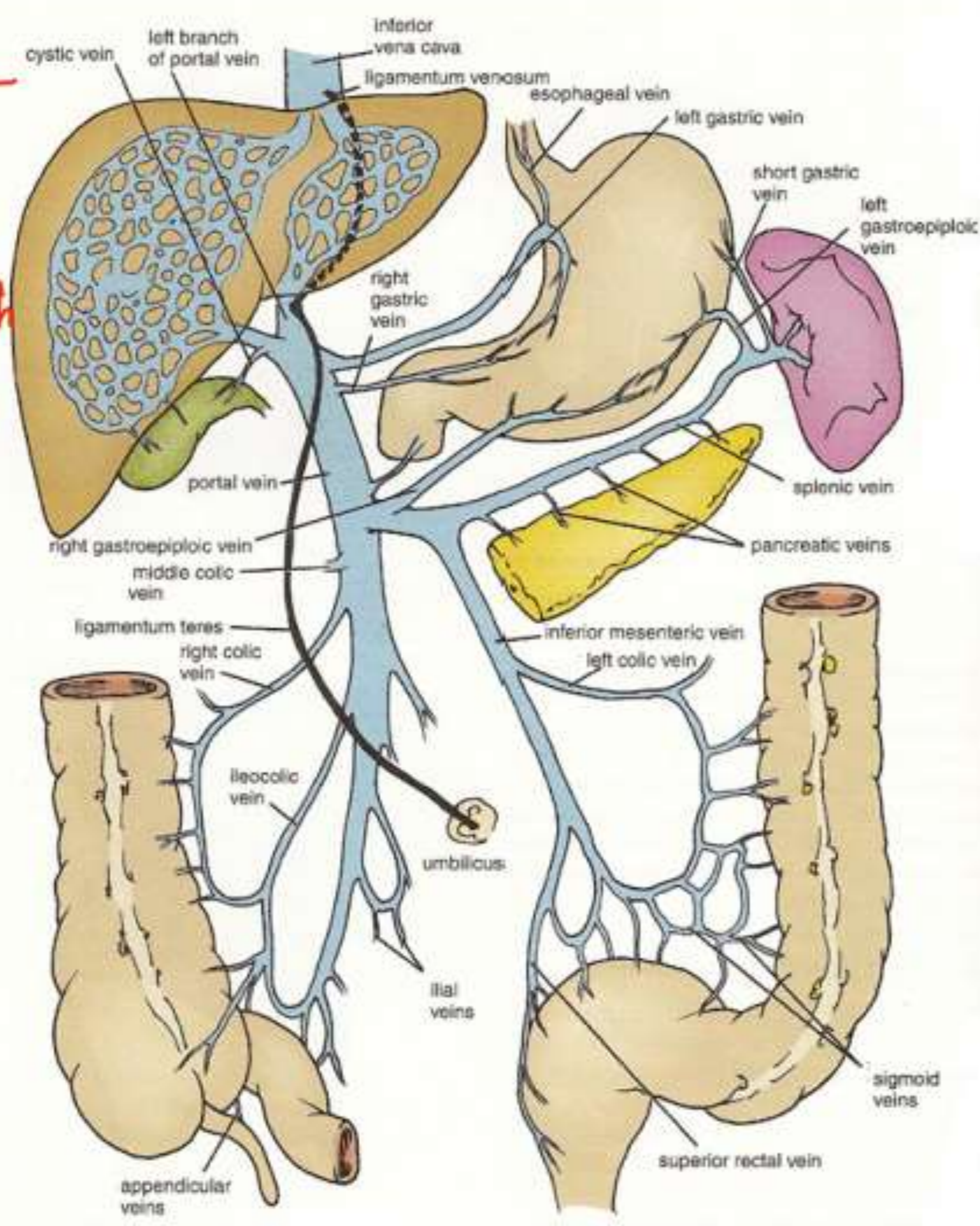
From distal esophagus down to proximal half of 2nd part of duodenum.

From distal half of 2nd part of duodenum down to proximal 2/3 of transverse colon.

From distal 1/3 of transverse colon to rectum.



Venous blood from GIT before returning to systemic circulation, must pass through the liver.



Peritoneum

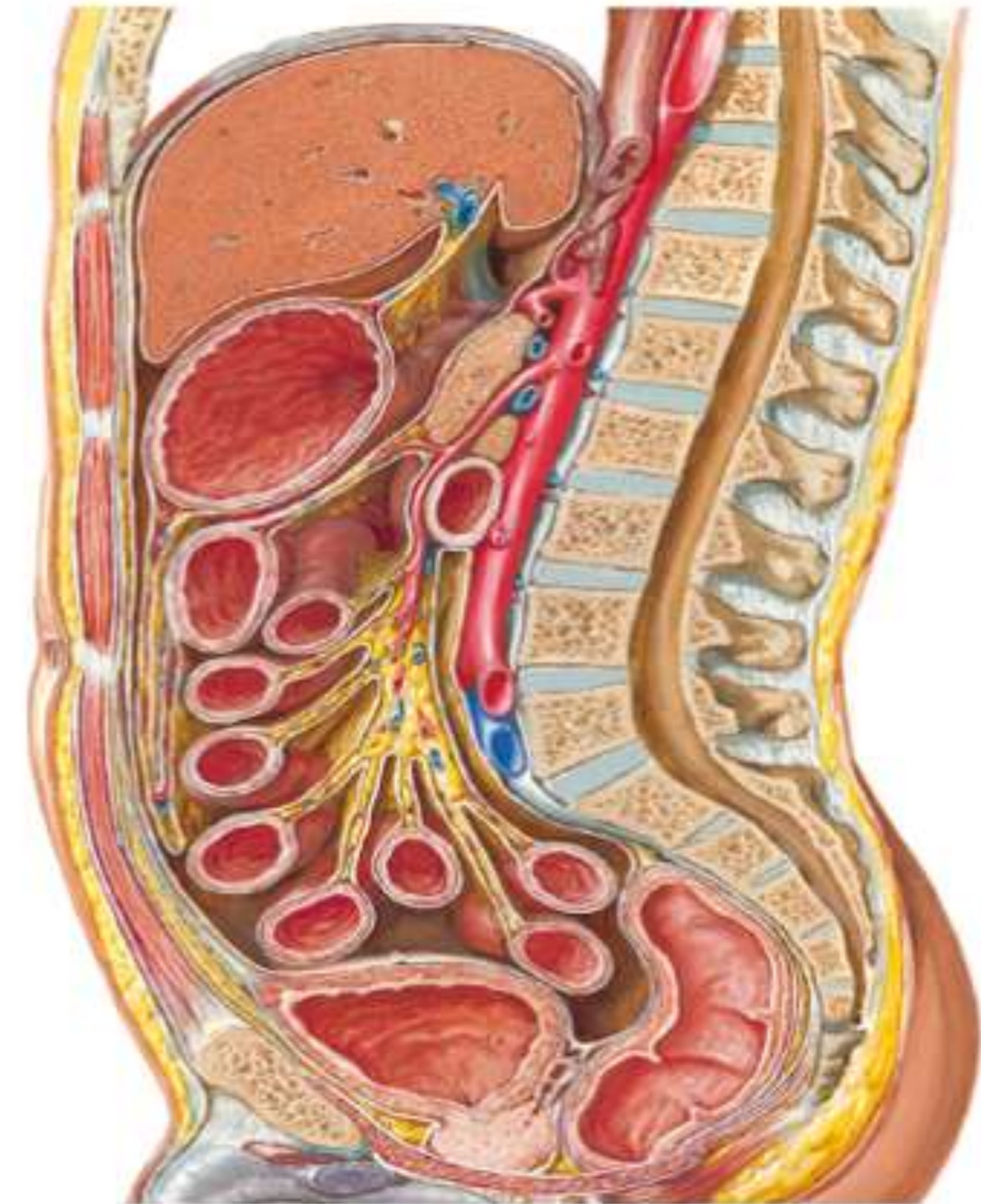
* It is a **serous sac** which lines the abdominal wall and covers the abdominal and pelvic organs

* **It is formed of 2 layers; parietal and visceral layers:**

1. **The parietal layer** → lines the abdominal wall.

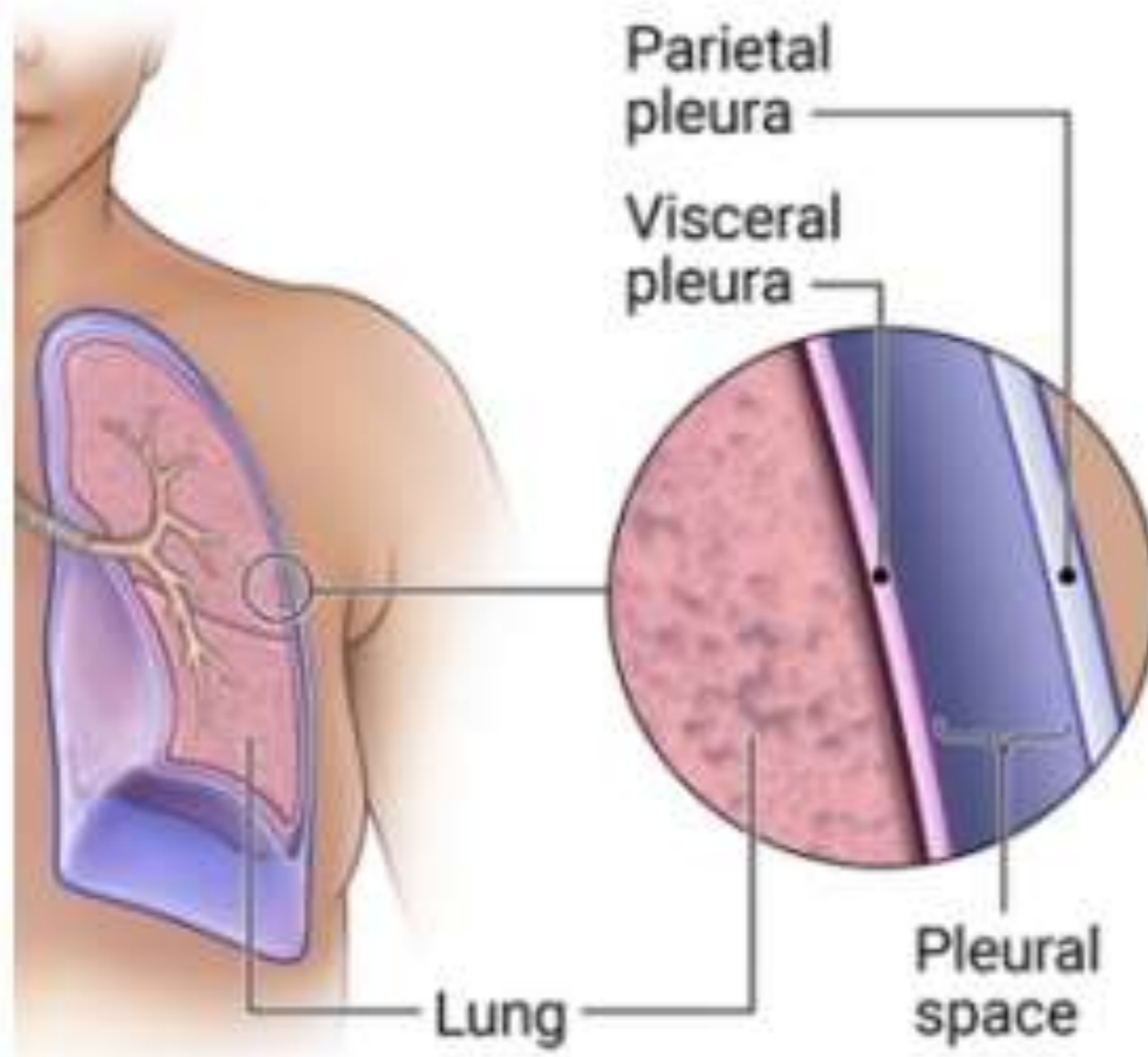
2. **The visceral layer** → covers the abdominal organs.

* **Between the 2 layers**, there is a potential space called the **peritoneal cavity** which contains a little amount of **peritoneal fluid**.



✱ Ascites: Accumulation of fluid inside the peritoneal cavity.

Serous Membranes



Pleura

↓
Surrounds the lungs.

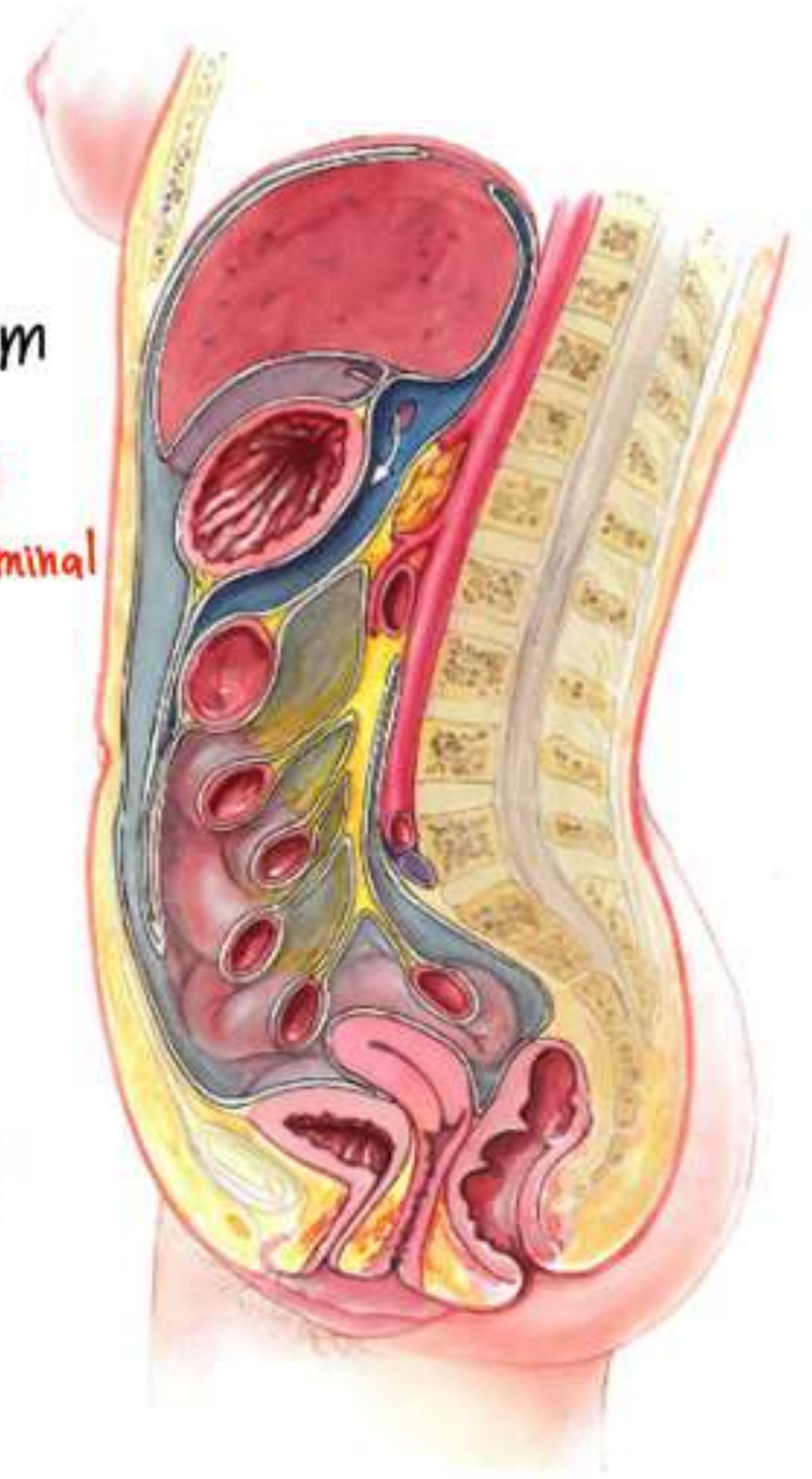
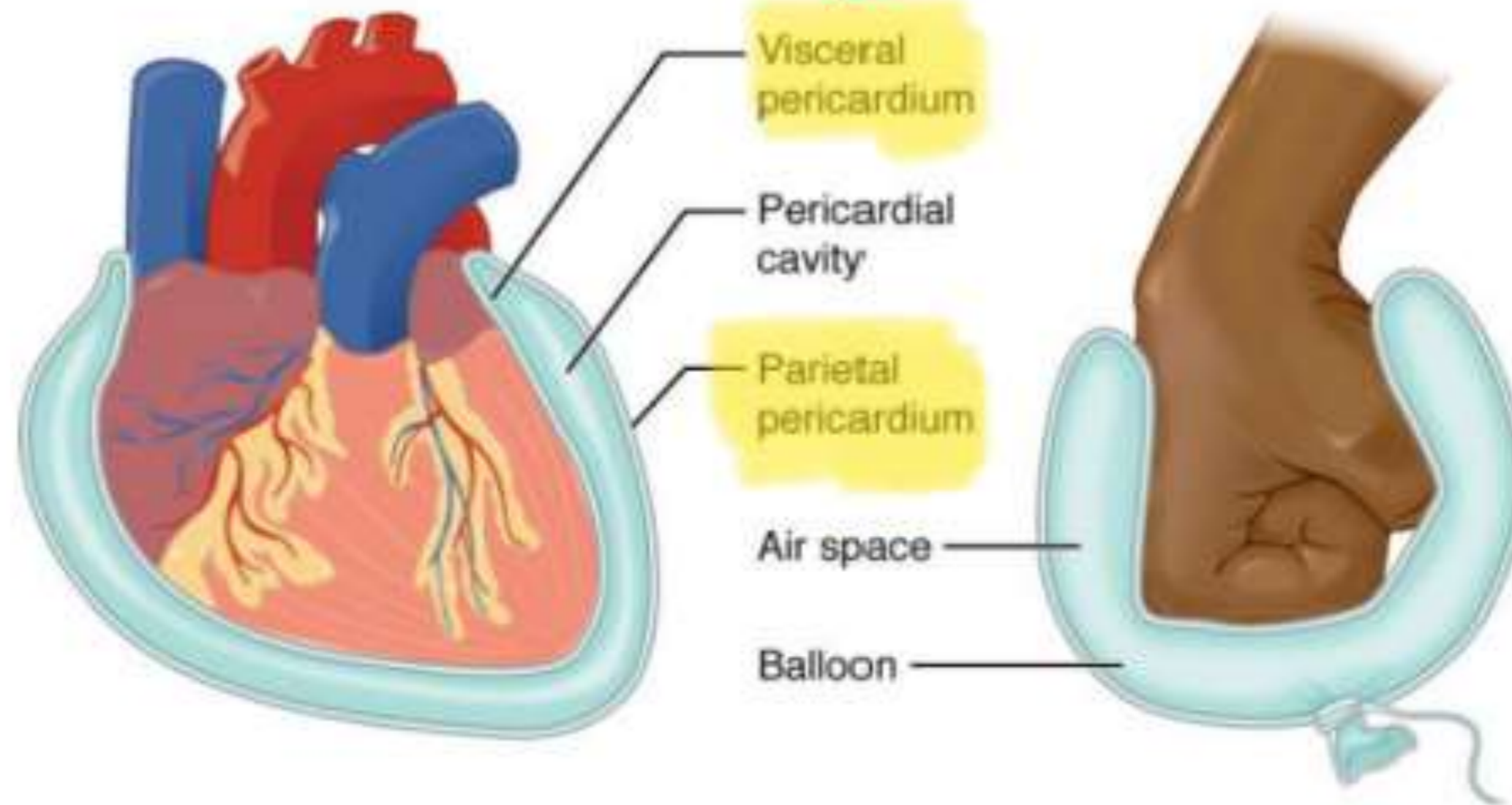
Pericardium

↓
Surrounds the heart.

Peritoneum

↓
Surrounds the abdominal cavity.

الملاصقة للعضو
→



Oesophagus

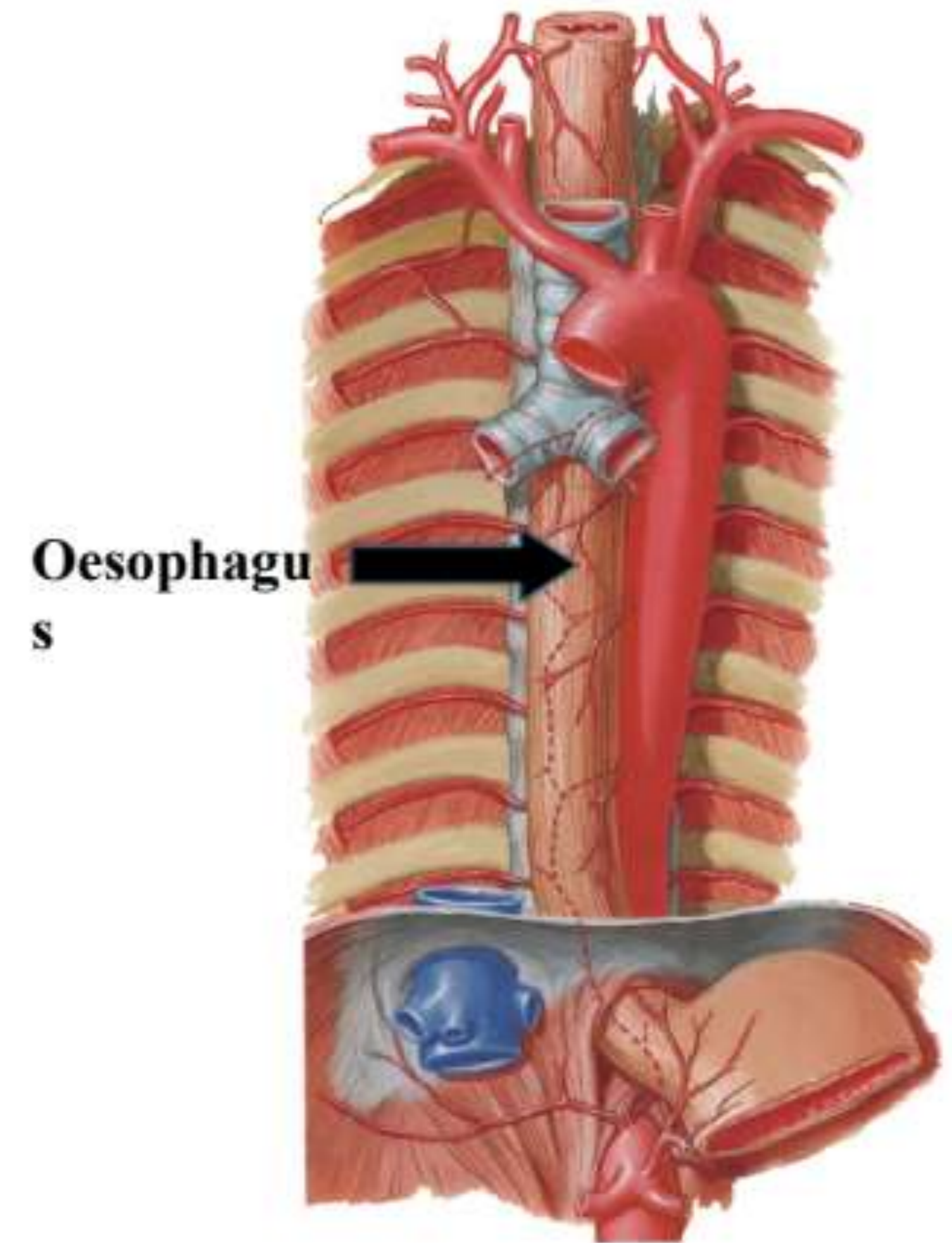
- It is a **muscular tube** (continuation of pharynx) which extends from the level of 6th cervical vertebra (lower border of cricoid cartilage) to the cardiac end of stomach.

* **Parts:**

1. A **short** cervical part.
2. A **long** thoracic part.
3. A **short** abdominal part which opens in the stomach. Piercing the diaphragm.

يُنقِبُ

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Stomach

- It lies in the upper part of abdomen mainly to the left.

*** It has:**

- ** 2 ends:** 1. cardiac end.
2. pyloric end.

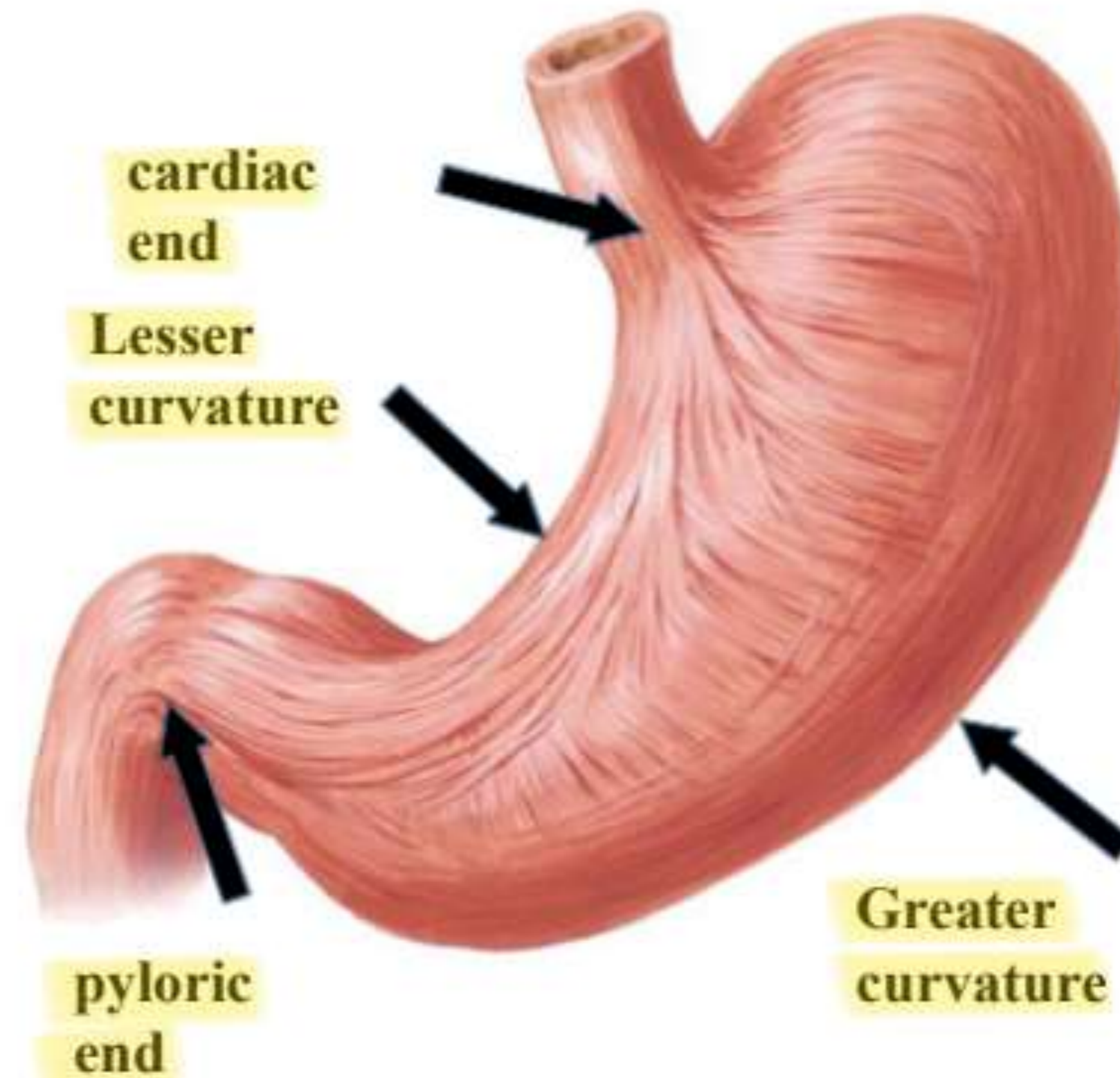
Connect oesophagus to stomach

Connect stomach to duodenum

**** 2 borders:**

1. Lesser curvature → to the right.
2. Greater curvature → to the left.

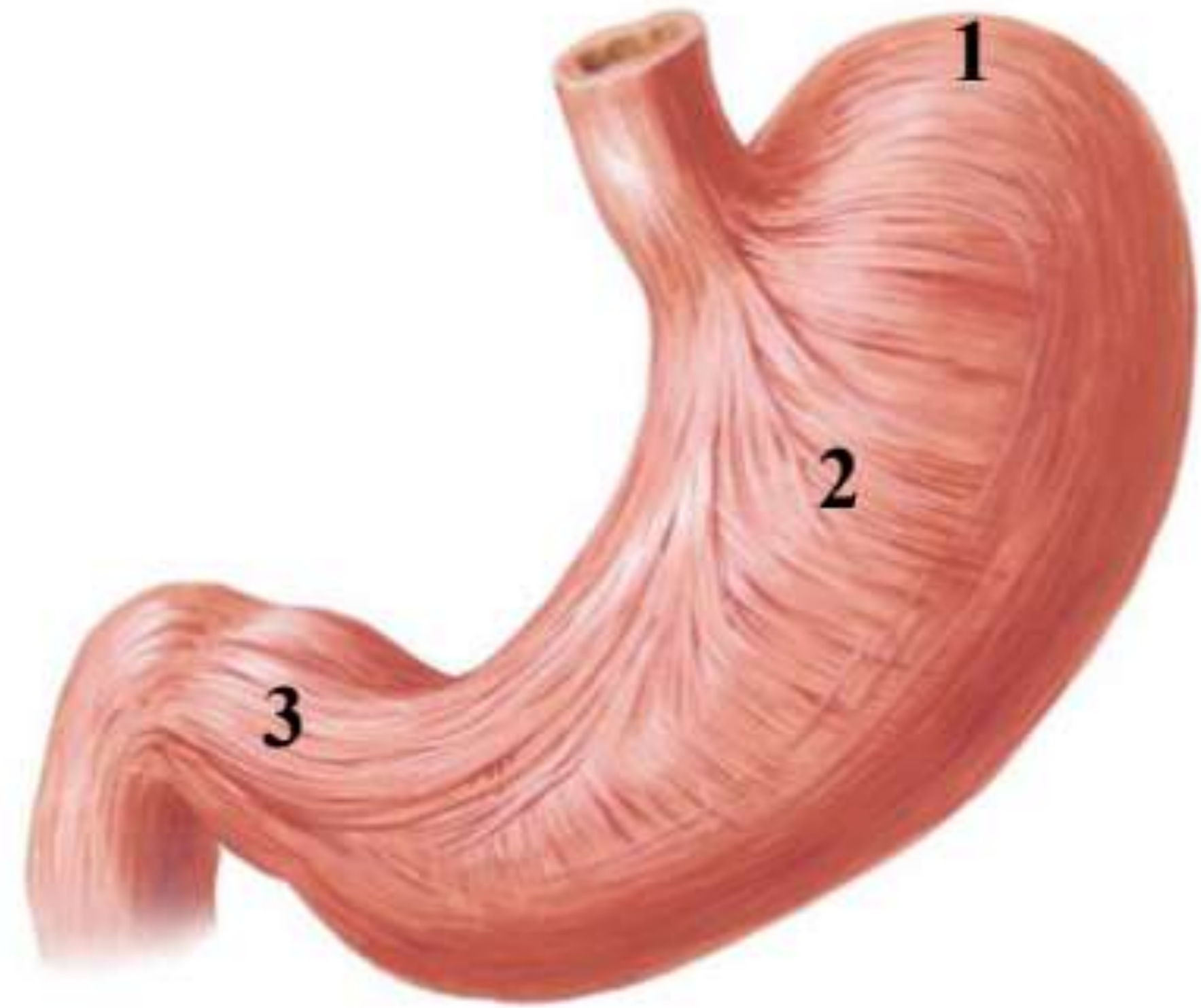
**** 2 surfaces:**



Stomach (Contd)

* It is formed of three parts:

1. **Fundus.** *Superior, dome like.*
2. **Body.**
3. **Pyloric part.**



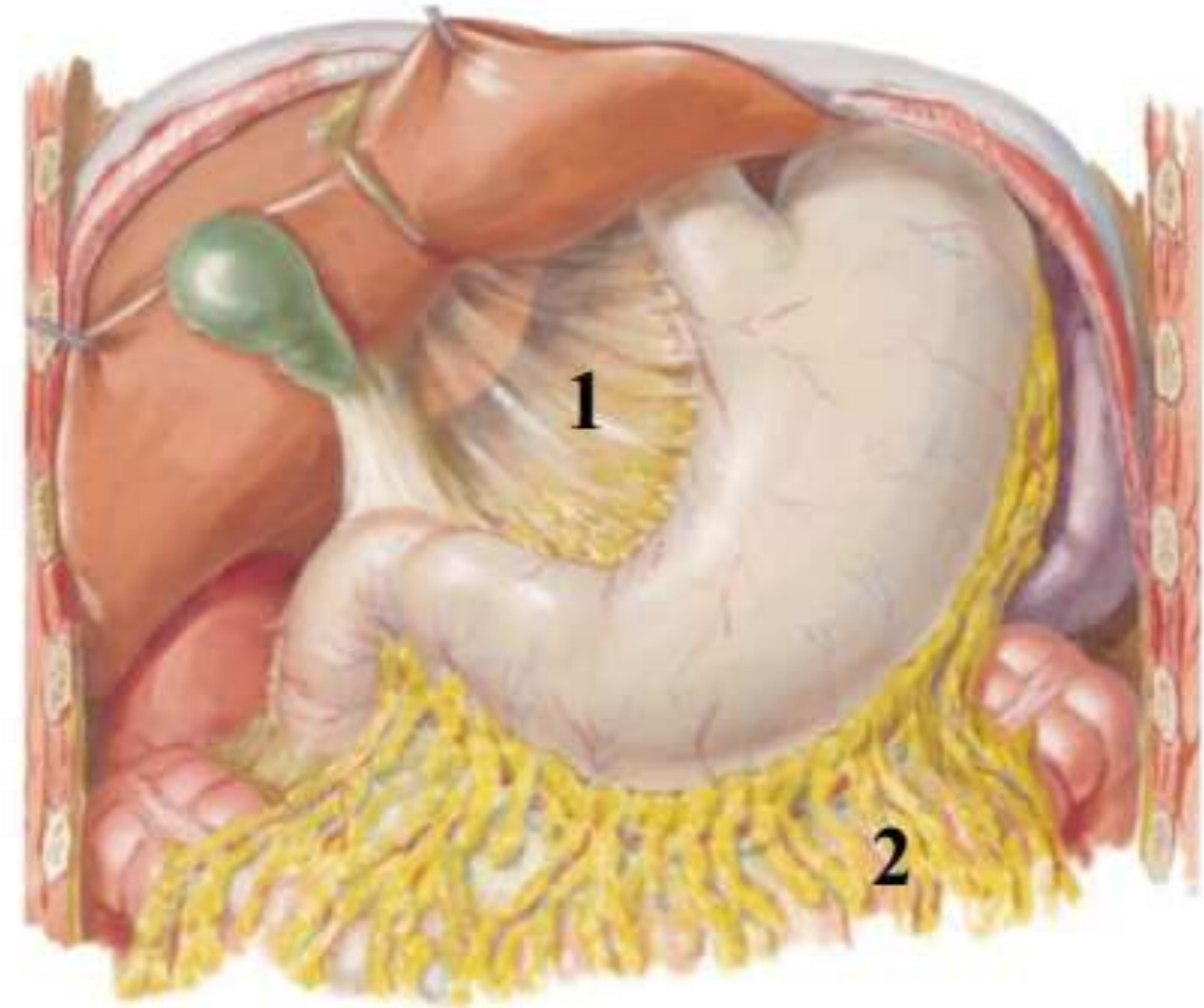
Stomach (Contd)

* Peritoneal folds of stomach:

Double layer.

← **Lesser omentum:** It extends from the liver to the lesser curvature.

2. Greater omentum: It is attached to the greater curvature and lies in the front of the intestine.



Small Intestine

** It is formed of duodenum, jejunum and ileum.

I. Duodenum: First 25 cm.

* It is C-shaped and formed of 4 parts.

* **Openings in the second part of duodenum:**

1. **The main pancreatic duct** joins the common bile duct to open together.

2. **Accessory pancreatic duct.**

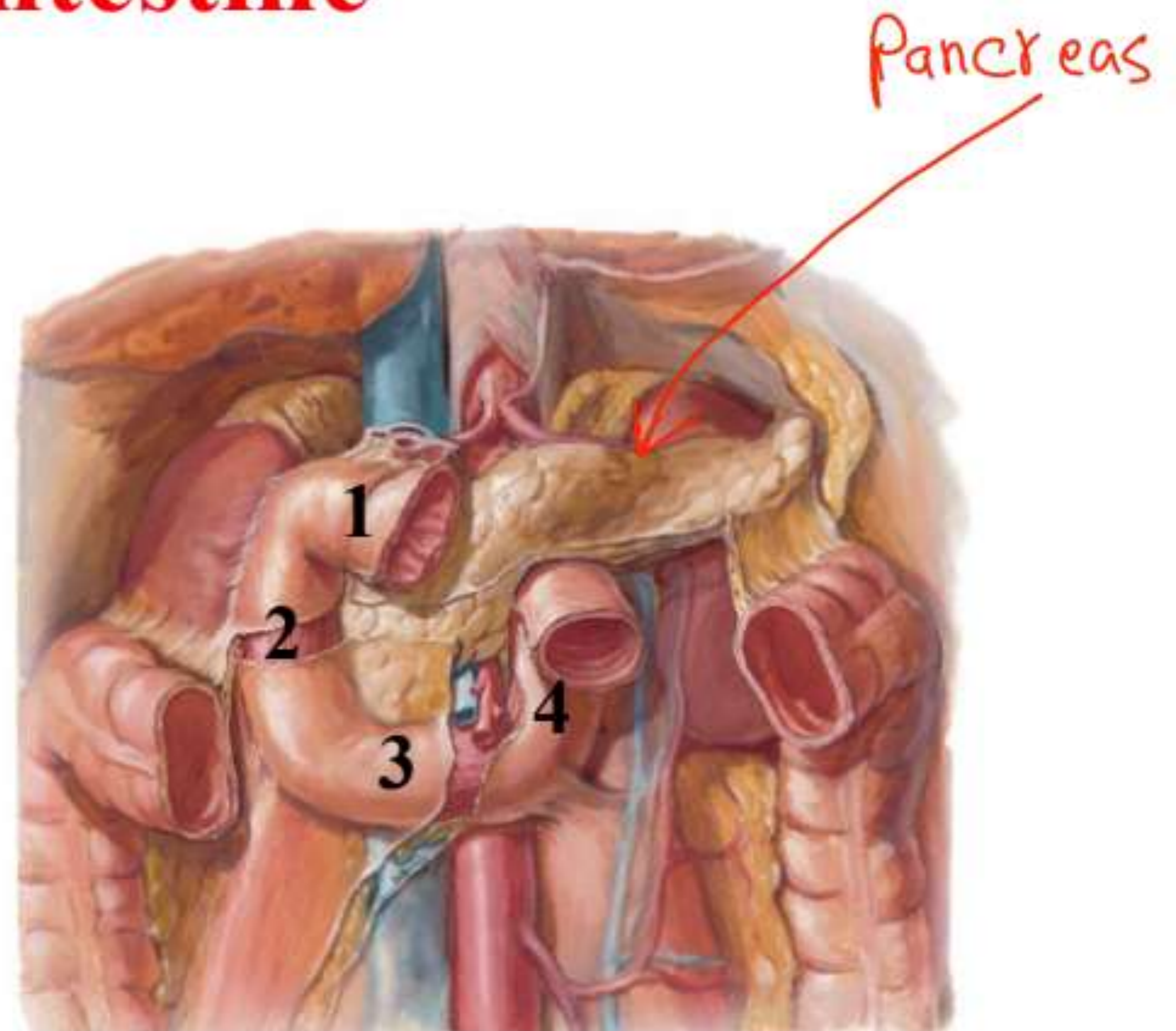
* **Parts of duodenum:**

1) Superior, 1st part.

2) Descending, 2nd part.

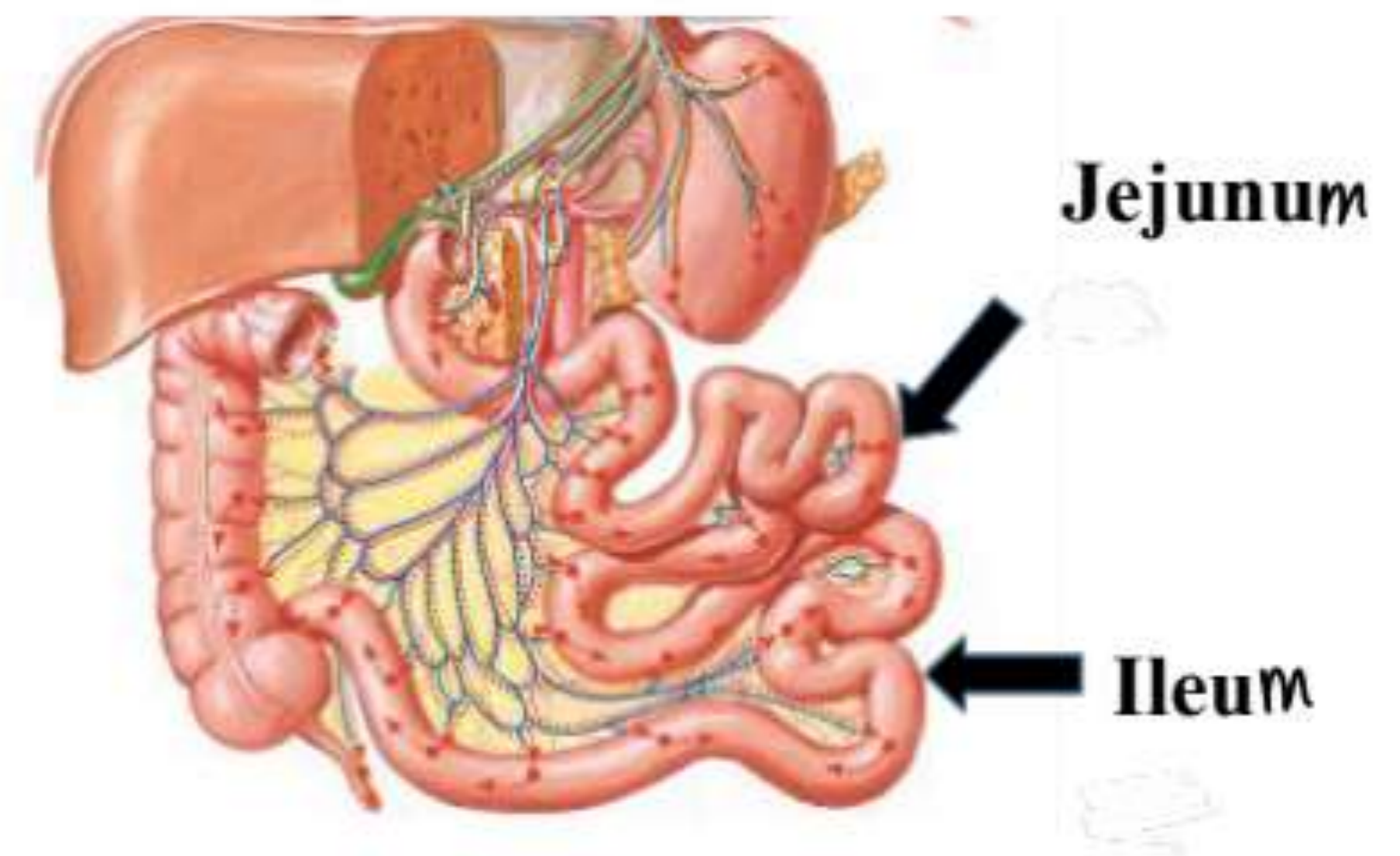
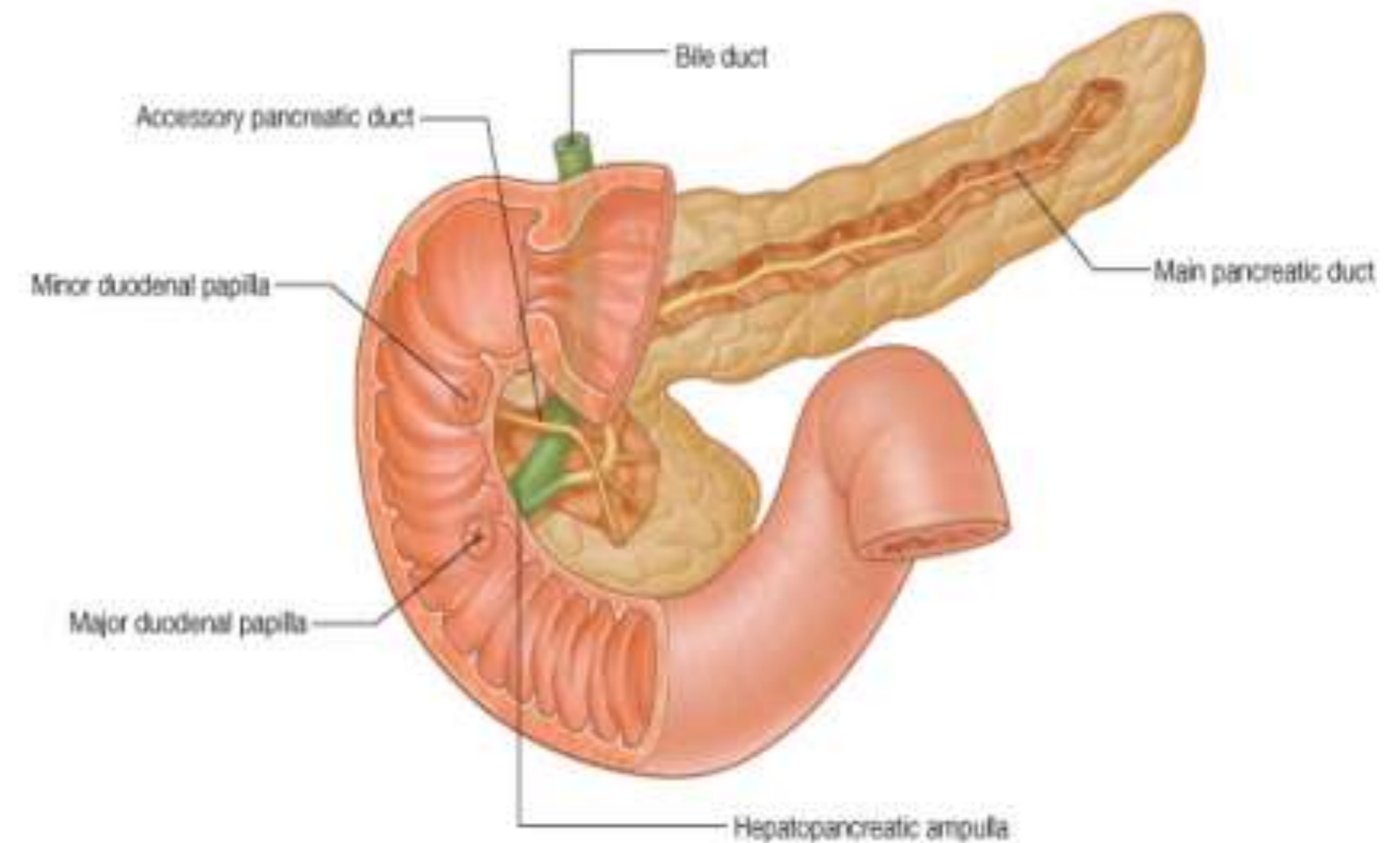
3) Horizontal, 3rd part.

4) Ascending, 4th part.

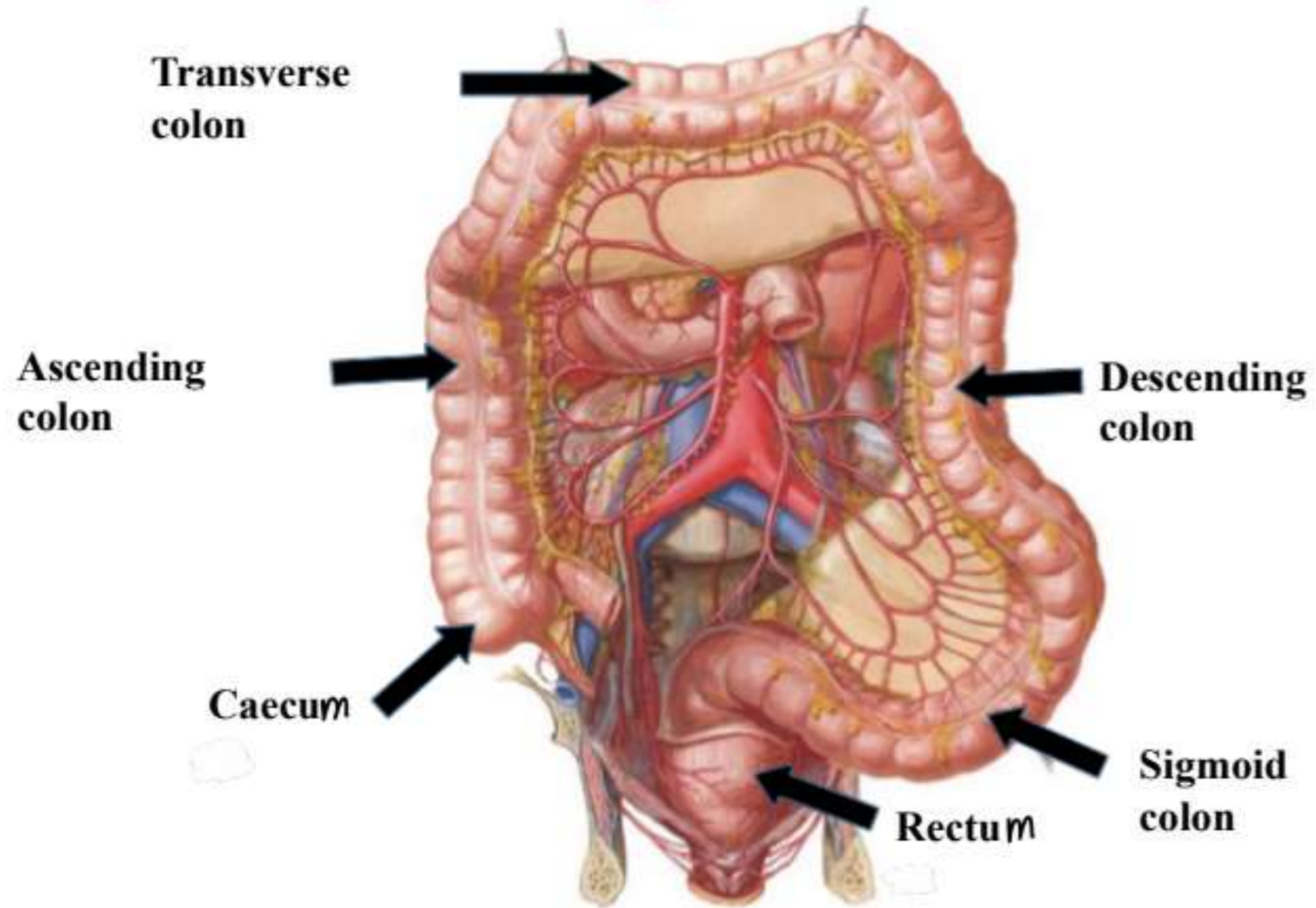


II. Free Parts of Small Intestine:

- These are the **jejunum and ileum**.
- **The jejunum** constitutes the proximal 2/5 and the ileum constitutes the distal 3/5.
- **The ileum** opens in the Caecum.
- They are **freely mobile** as they are completely covered by peritoneum and suspended by a peritoneal fold called **mesentery**.



Large Intestine



Large Intestine

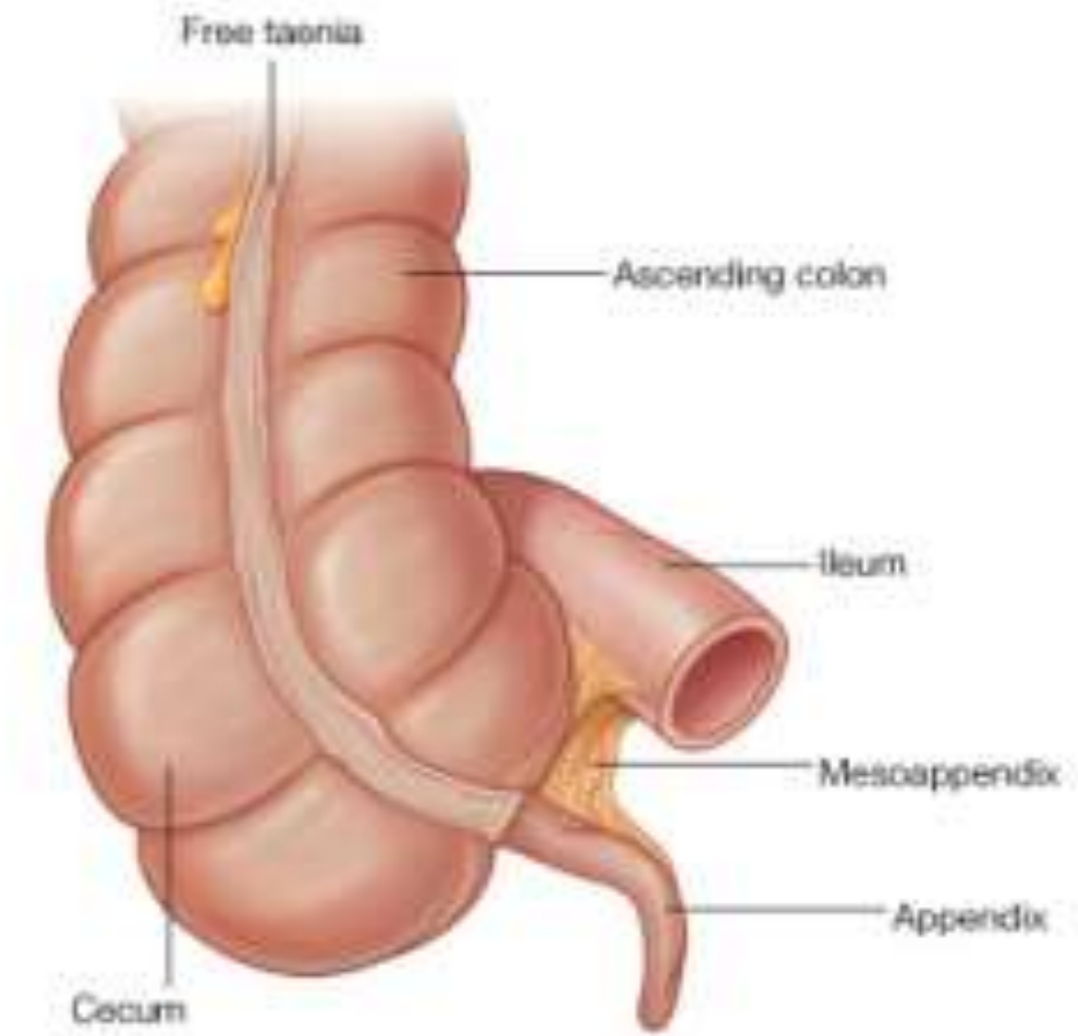
1. Caecum:

Link between ileum and ascending colon.

* It is a sac which receives the ileum and opens in the ascending colon.

شكل دودة.

• The vermiform appendix is attached to the caecum.



* As the appendix and the umbilicus are supplied by the same nervous segment, the pain from the appendix is referred to the umbilicus.

السرة

إنو لو صار التهاب بالـ Appendix رح احس بالألم بالسرة

Referred pain: إنو بيصير ألم بمكان يسبب مشكلاته في مكان آخر

Large Intestine

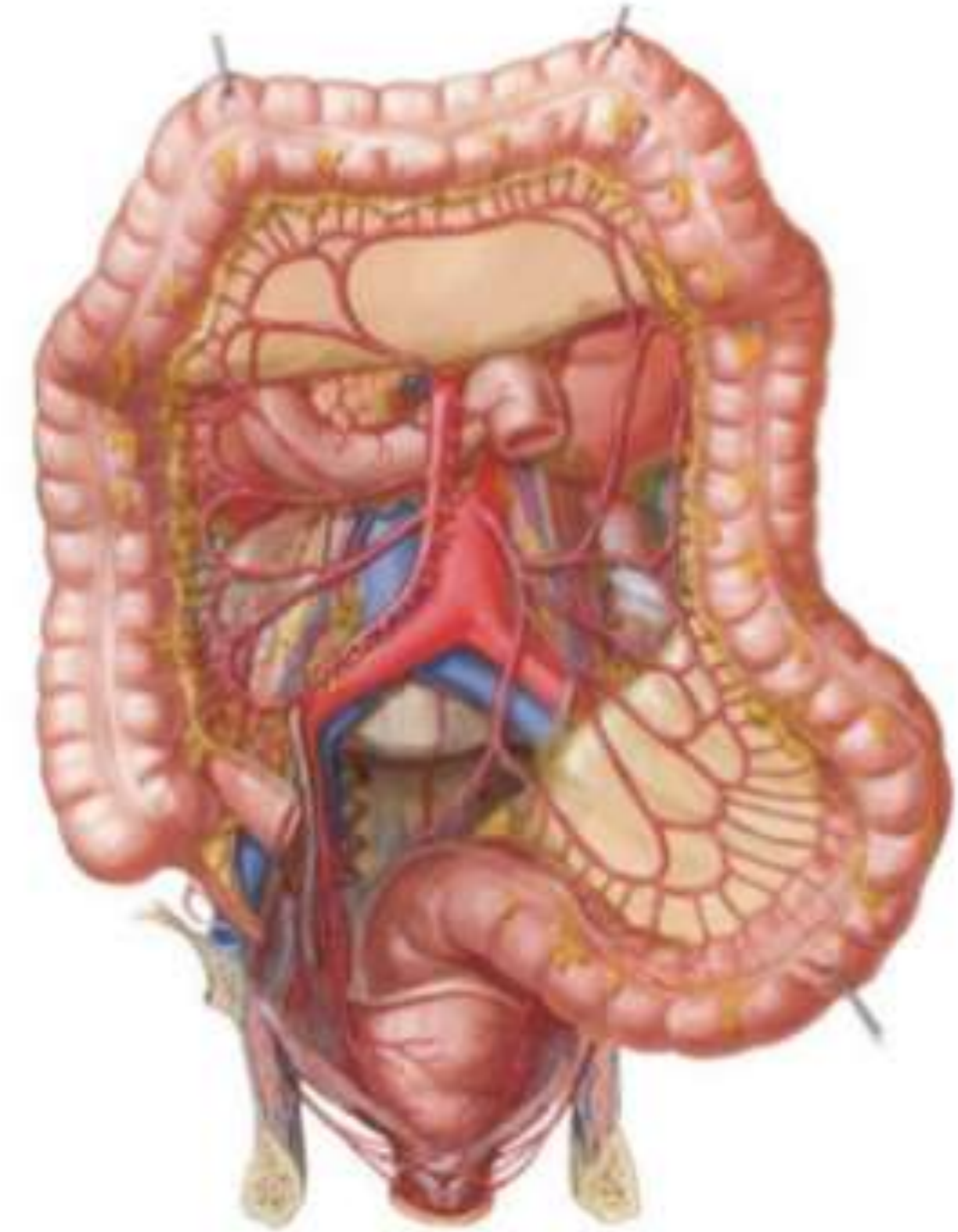
2. Ascending colon:

* It extends from the caecum to the right colic (hepatic) flexure.

3. Transverse colon:

• It extends from the hepatic flexure to the left colic (splenic) flexure.

* It is completely covered by peritoneum and suspended by a peritoneal fold called **transverse mesocolon**.



Large Intestine

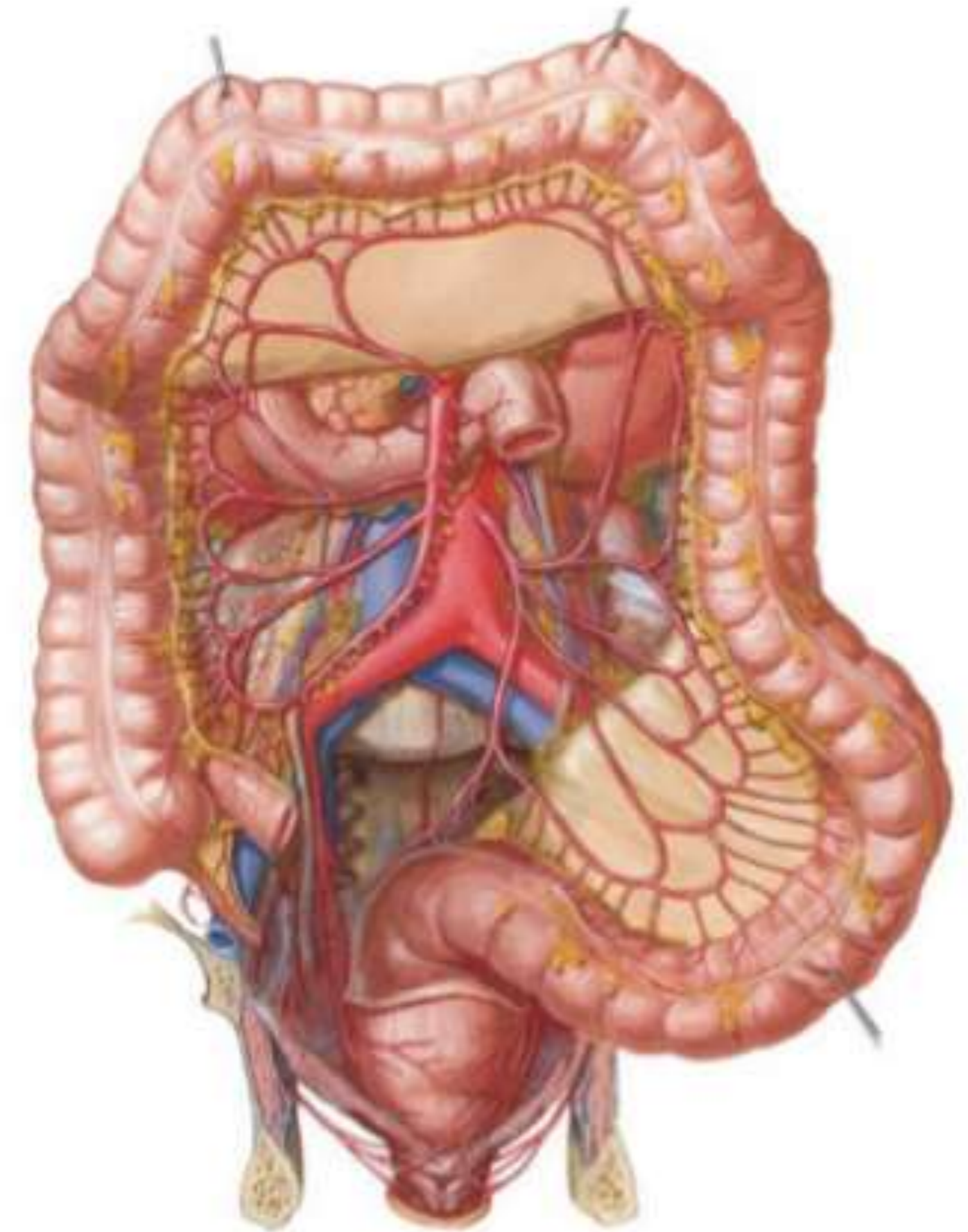
4. Descending colon:

* It extends from the splenic flexure to the sigmoid colon.

5. Sigmoid colon (Pelvic colon):

- It extends from the end of descending colon, enters the pelvis and takes an S-shape.
- It ends in front of the 3rd sacral vertebra where the rectum begins.

* It is completely covered by peritoneum and suspended by a peritoneal fold called **transverse mesocolon**.



Large Intestine

6. Rectum:

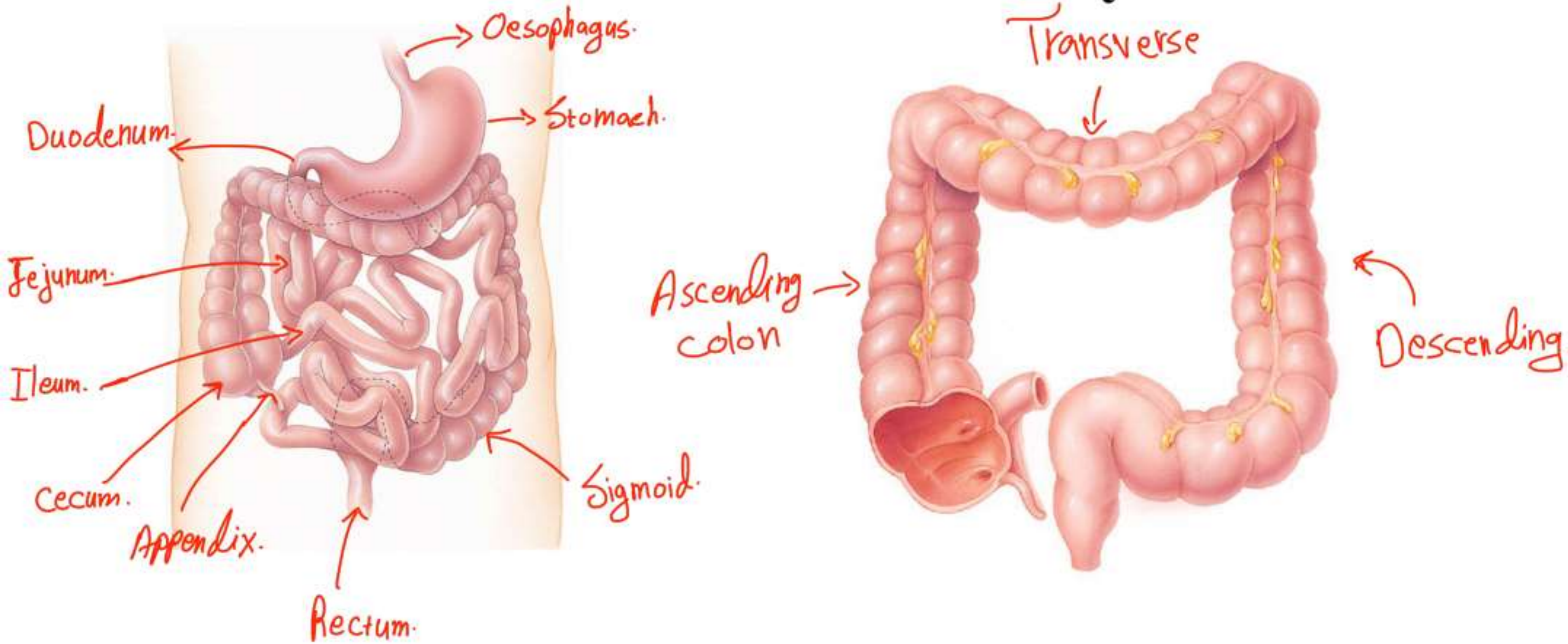
- It begins in front of the sacrum (at the level of 3rd sacral vertebra) and ends one inch in front and below the coccyx.

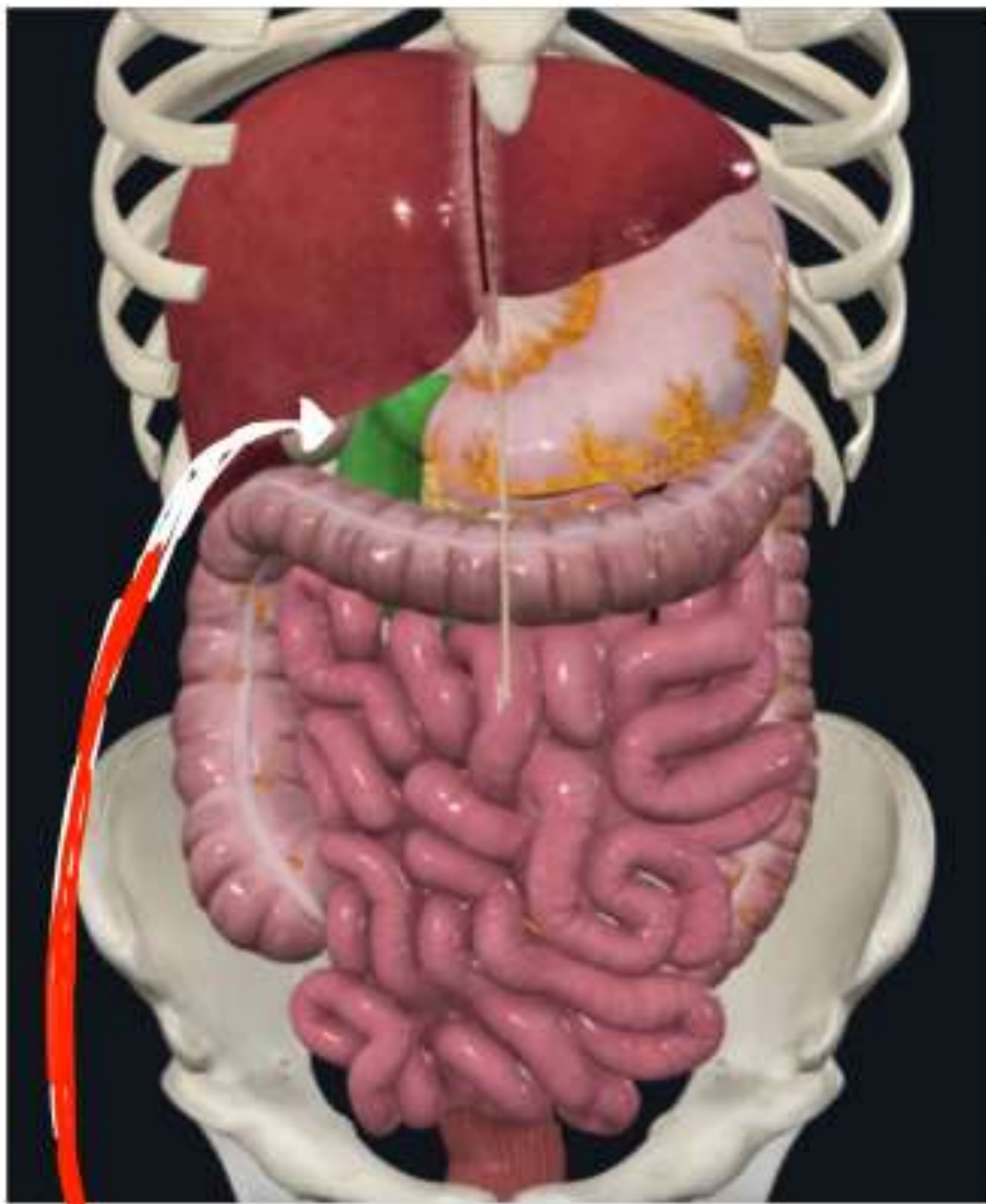
* 7. Anal canal:

- * It begins one inch in front and below coccyx and ends at the anus.
- * It is directed downward and posteriorly.



Revision : Parts of Alimentary Canal

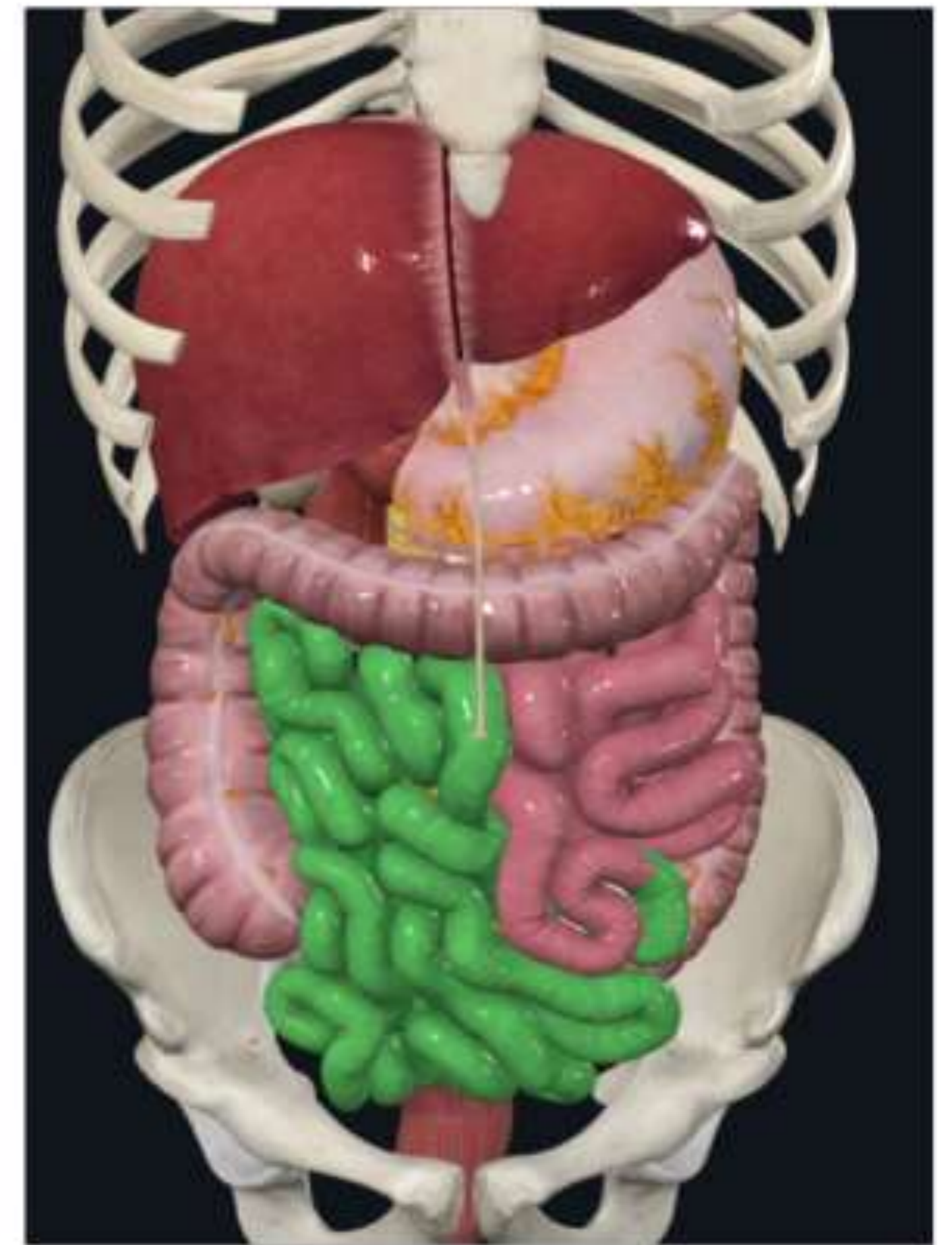




Duodenum

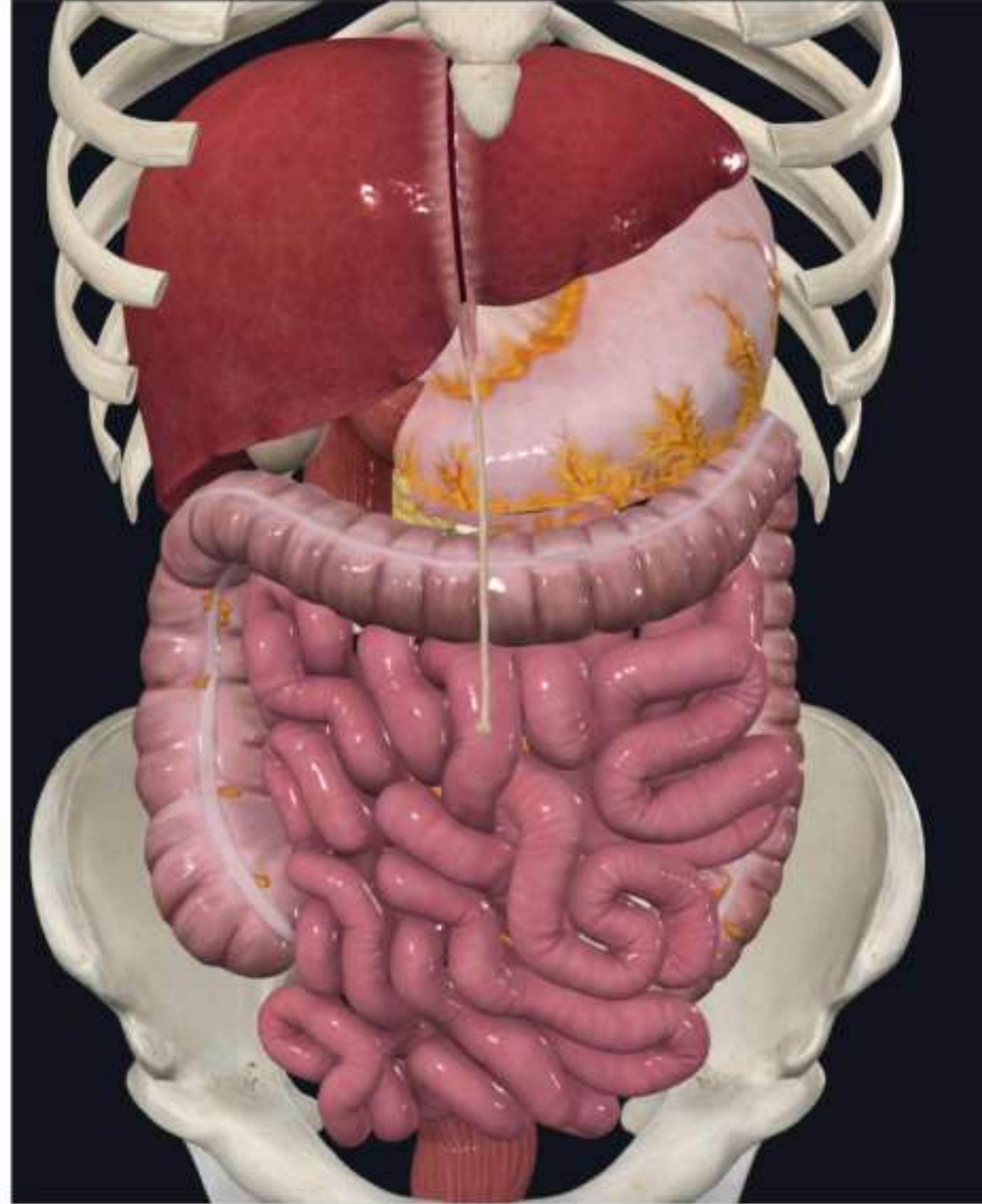


Jejunum



Ileum

كردوهام لجالكم بيلا 😊



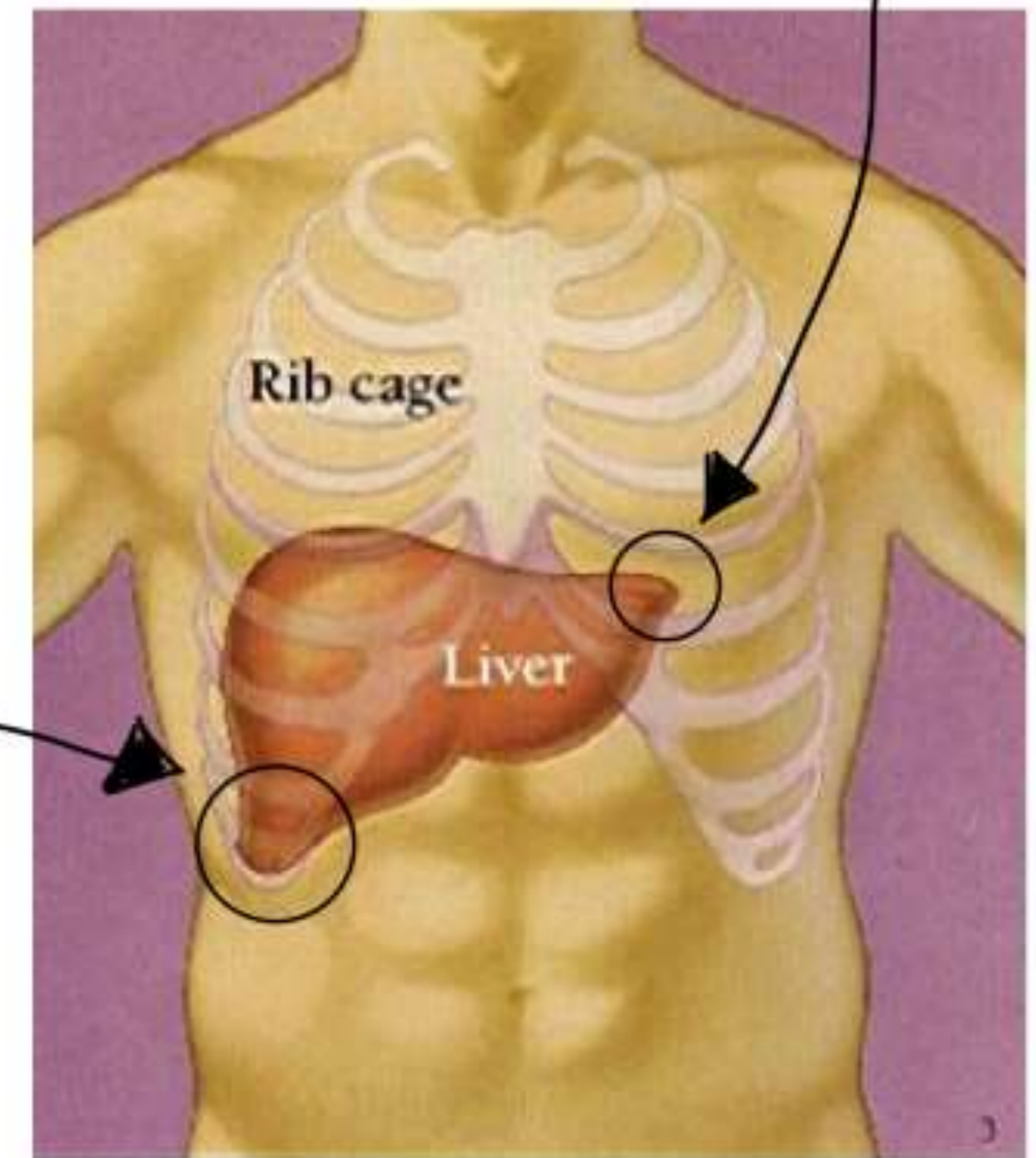
Accessory Glands of G.I.T.

A. Liver and Biliary System

- It is the **largest gland in the body** (1400 – 1800 gms weight).

- **Shape:** Wedge-shaped with its rounded base to the right.

- * **Surfaces:** It has **5 surfaces**; anterior, superior, posterior, right (diaphragmatic) and inferior (visceral)



Surfaces of Liver

1. Anterior Surface:

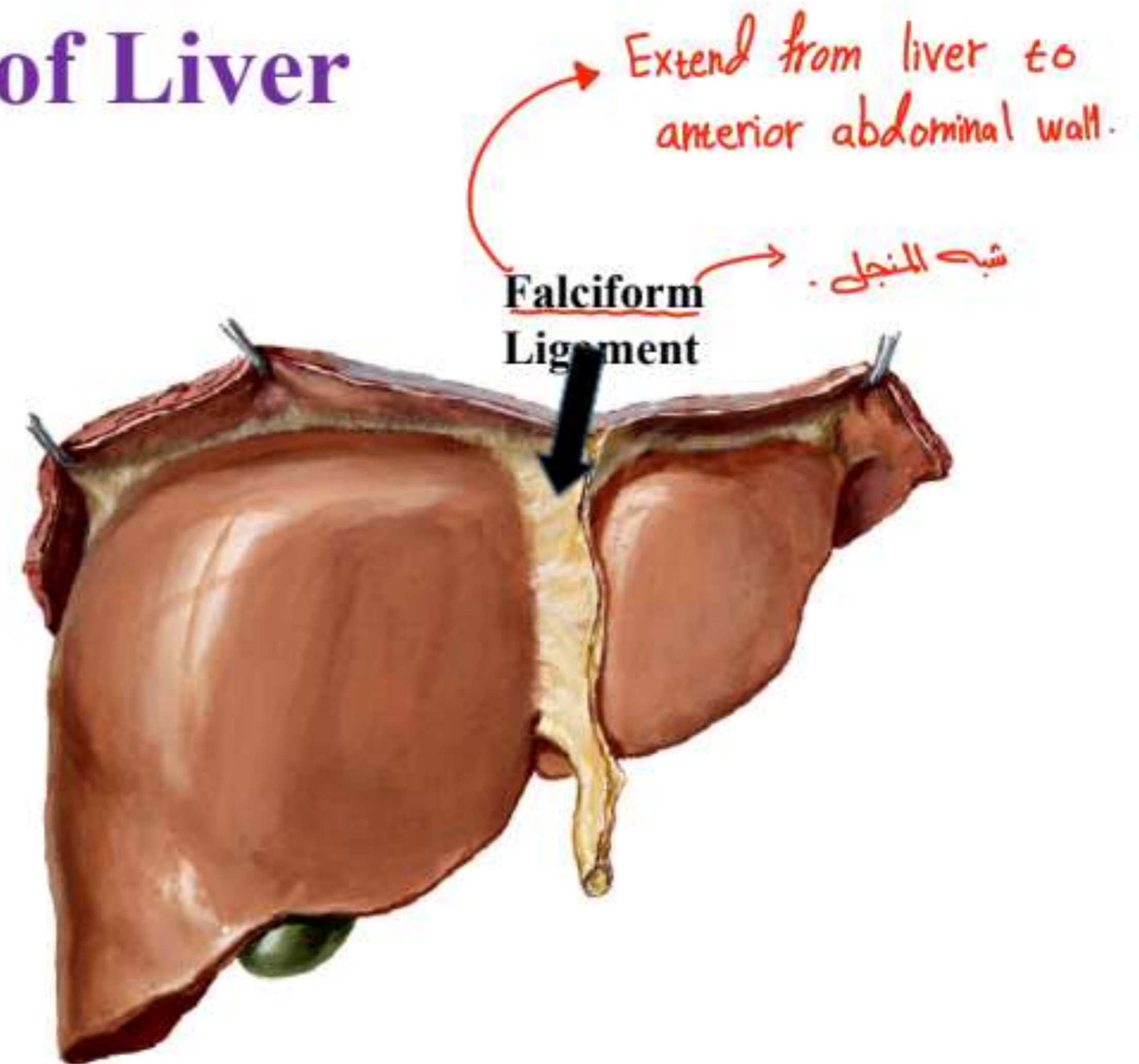
- * Gives attachment of falciform ligament.

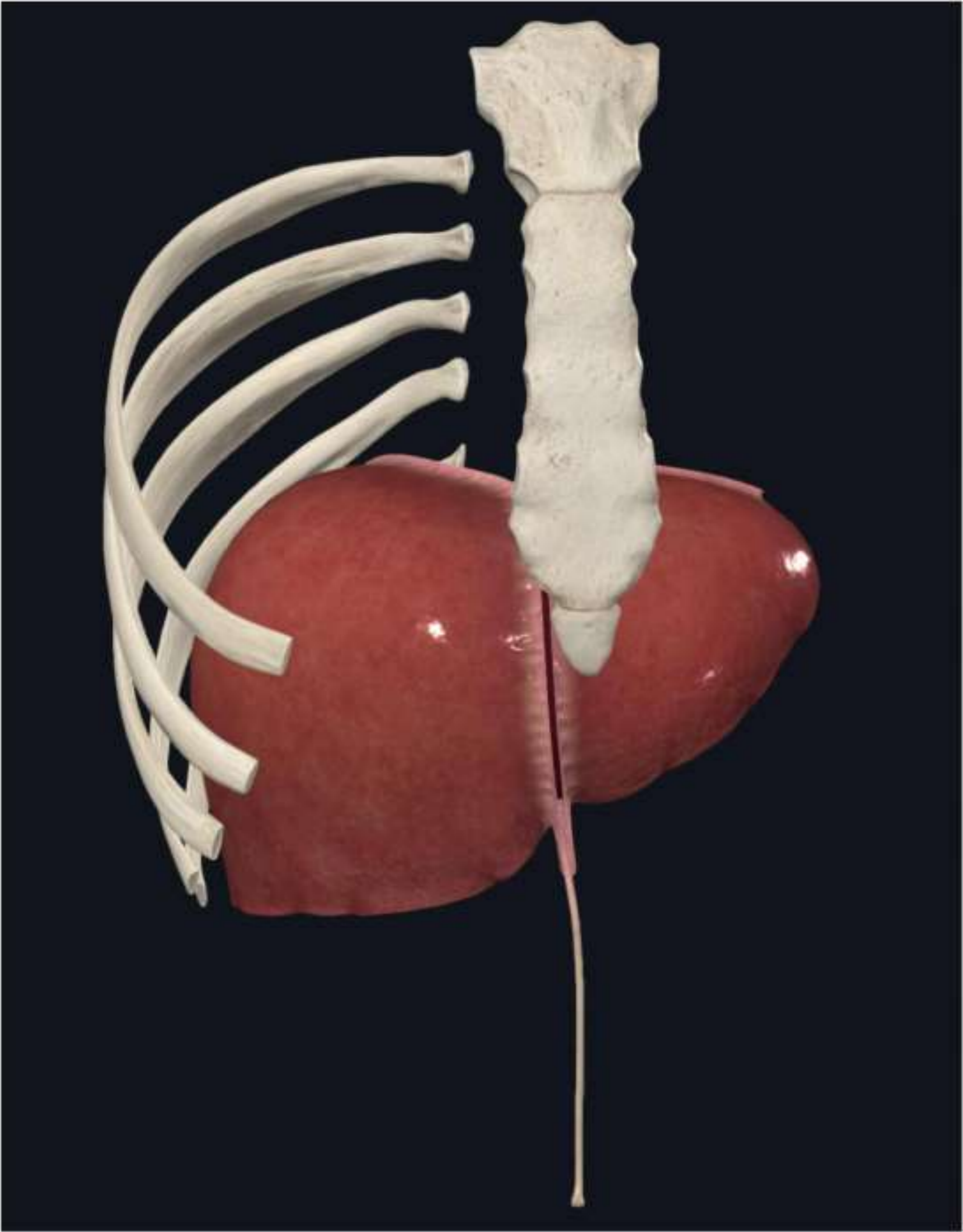
2. Superior surface:

- * Related to diaphragm.

3. Right surface (Base):

- * Related to diaphragm & ribs.





4. Posterior surface of liver:

* It shows the following:

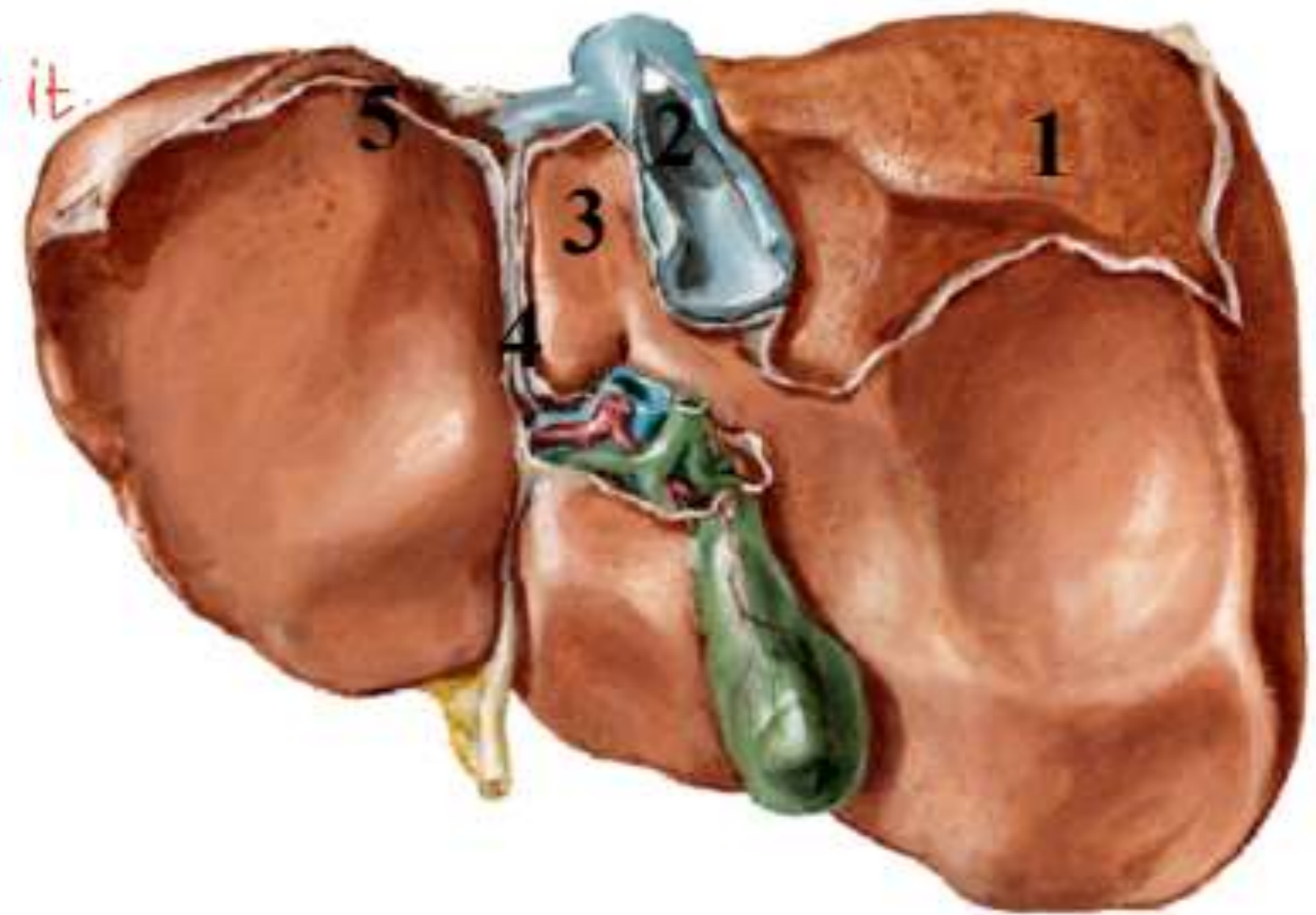
1. **Bare area.** *No visceral peritonum cover it.*

2. **I.V.C. in caval groove.**

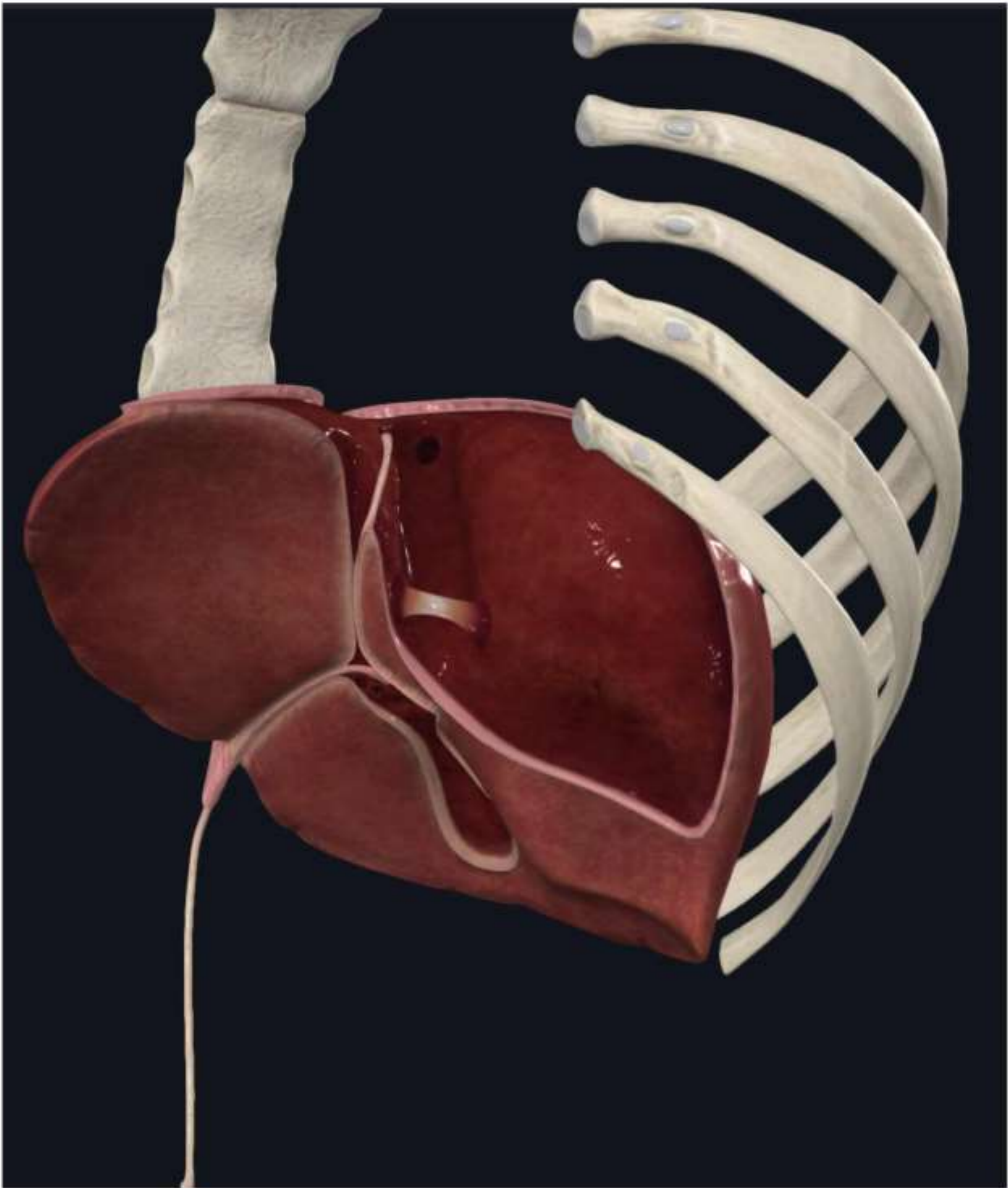
3. **Caudate lobe.**

4. **Fissure for ligamentum venosum.** *The ligament between 2 veins.*

5. **Oesophageal impression.**



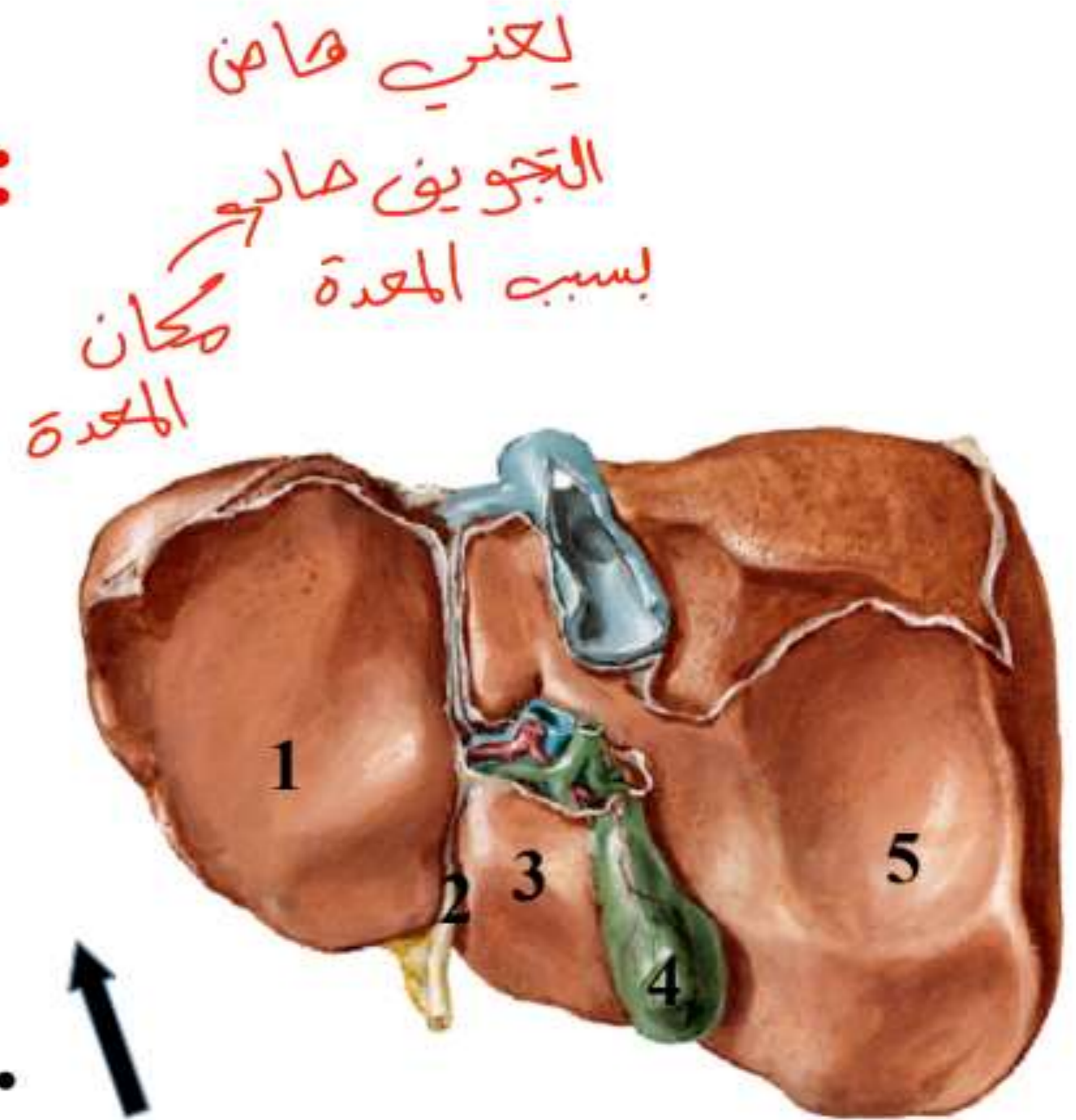
I.V.C. : Inferior vena cava.

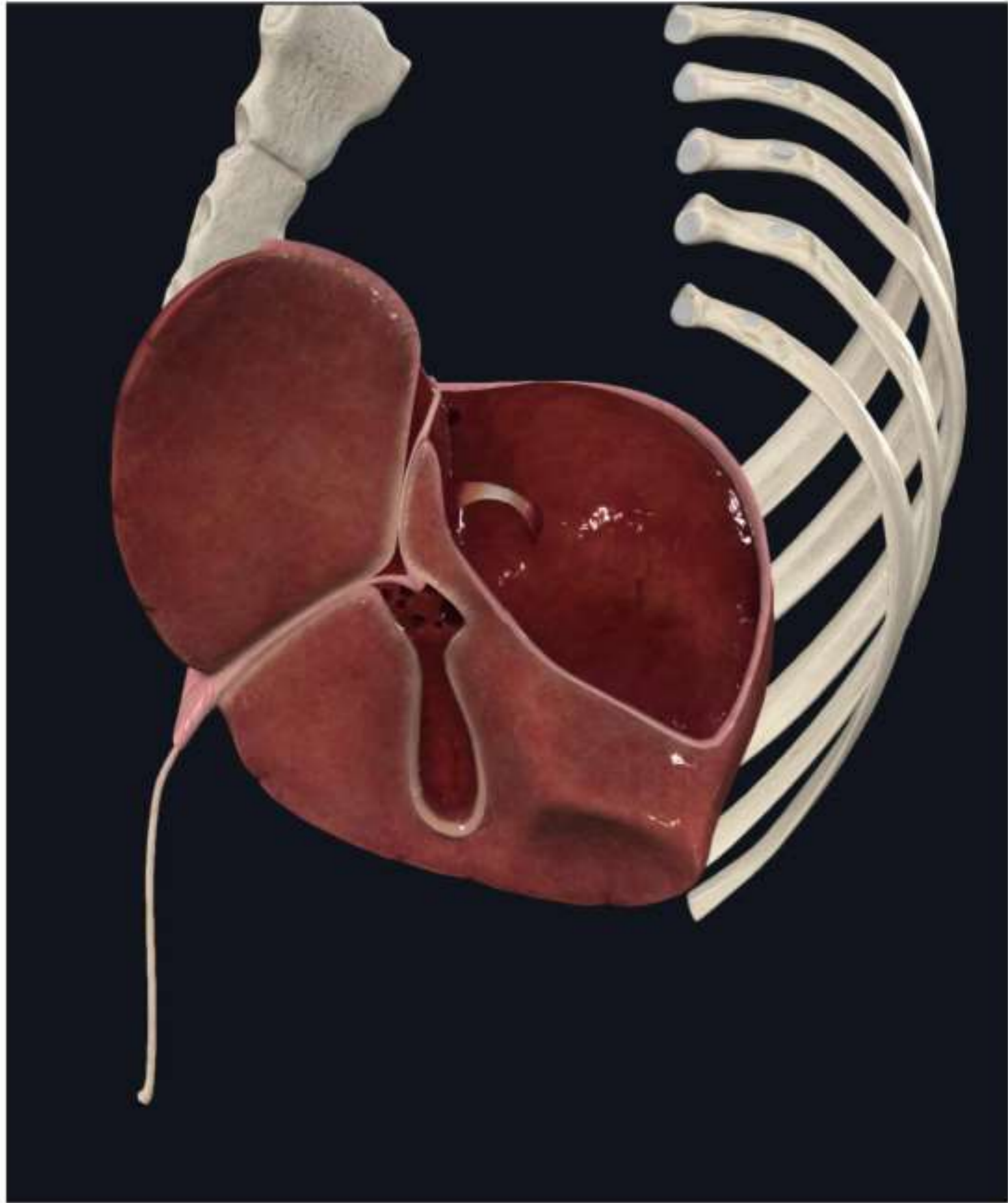


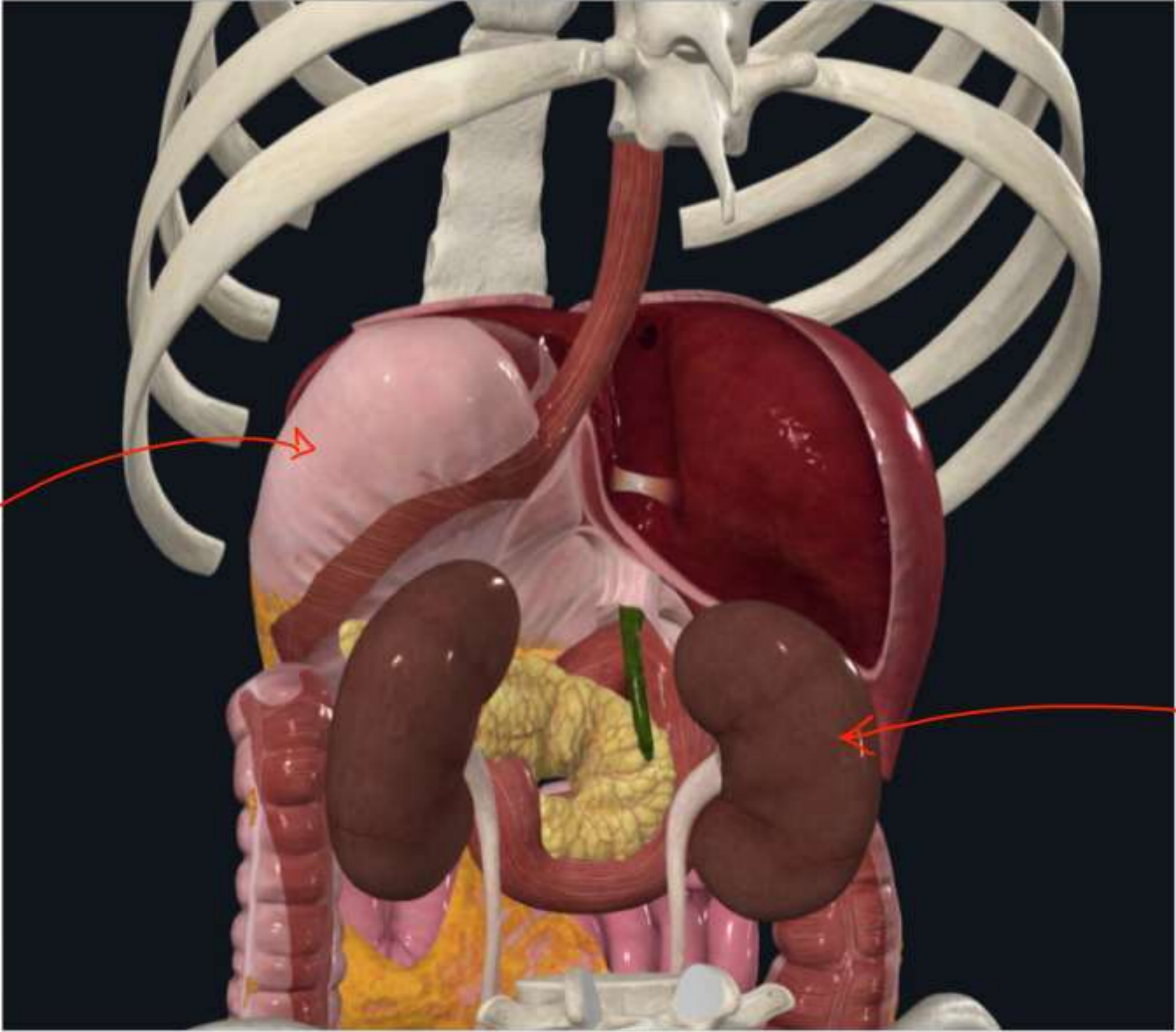
5. Inferior surface of liver:

* It shows the following:

1. Gastric impression.
2. Fissure for ligamentum teres. *Round ligament*
3. Quadrate lobe.
4. Gall bladder in its fossa.
5. Renal impression.







Stomach

Kidney.

هو مكان دخول وفروج الشرايين والأوردة على عضو

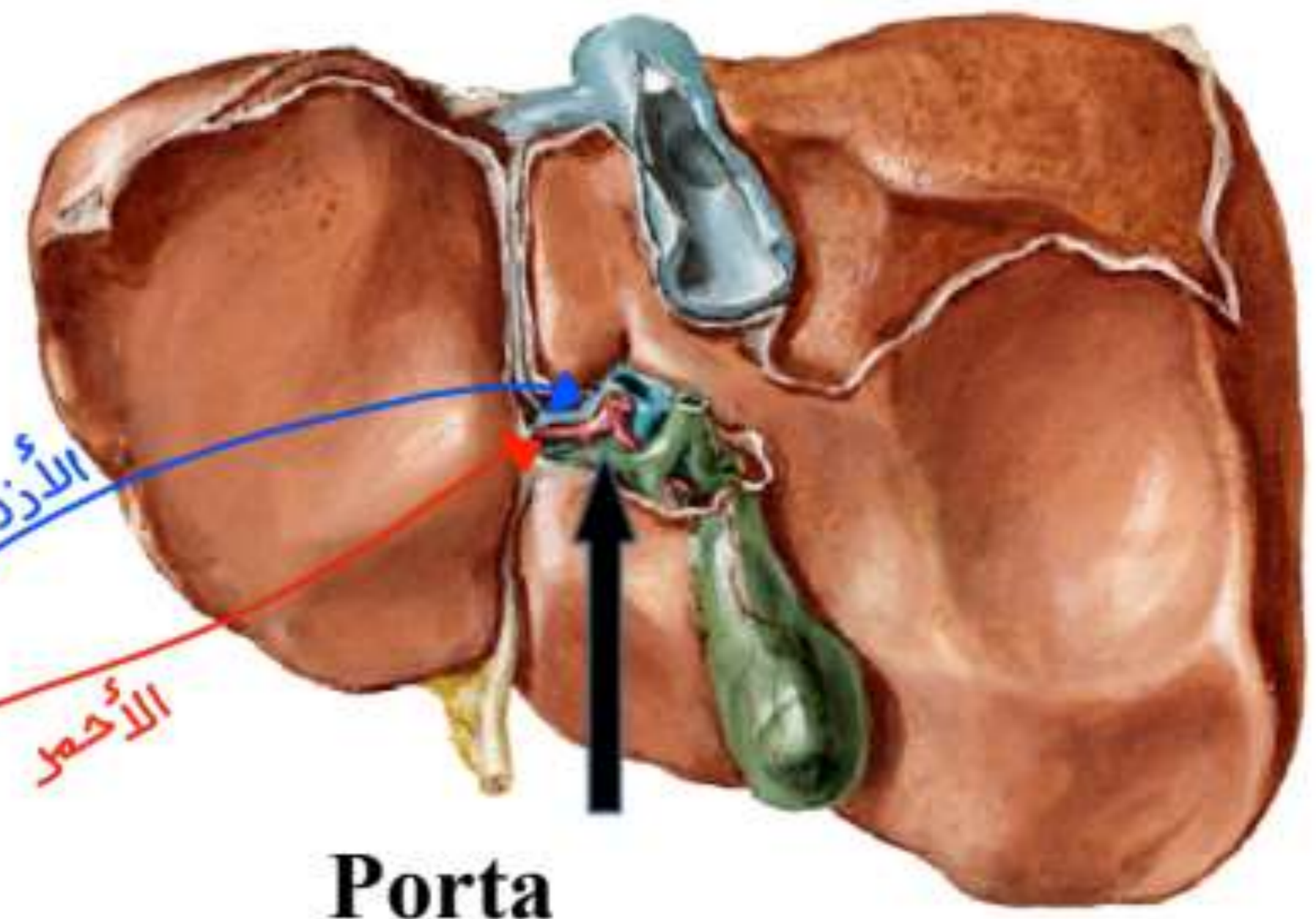
** Porta hepatis:

- * It is the hilum of the liver.
- * It lies between the caudate and quadrate lobes of the liver.
- * Structures passing through it:

1. Portal vein and its branches.
2. Hepatic artery and its branches.
3. Hepatic ducts.

Carry structures out of the liver.

Carry structures to inside the liver.



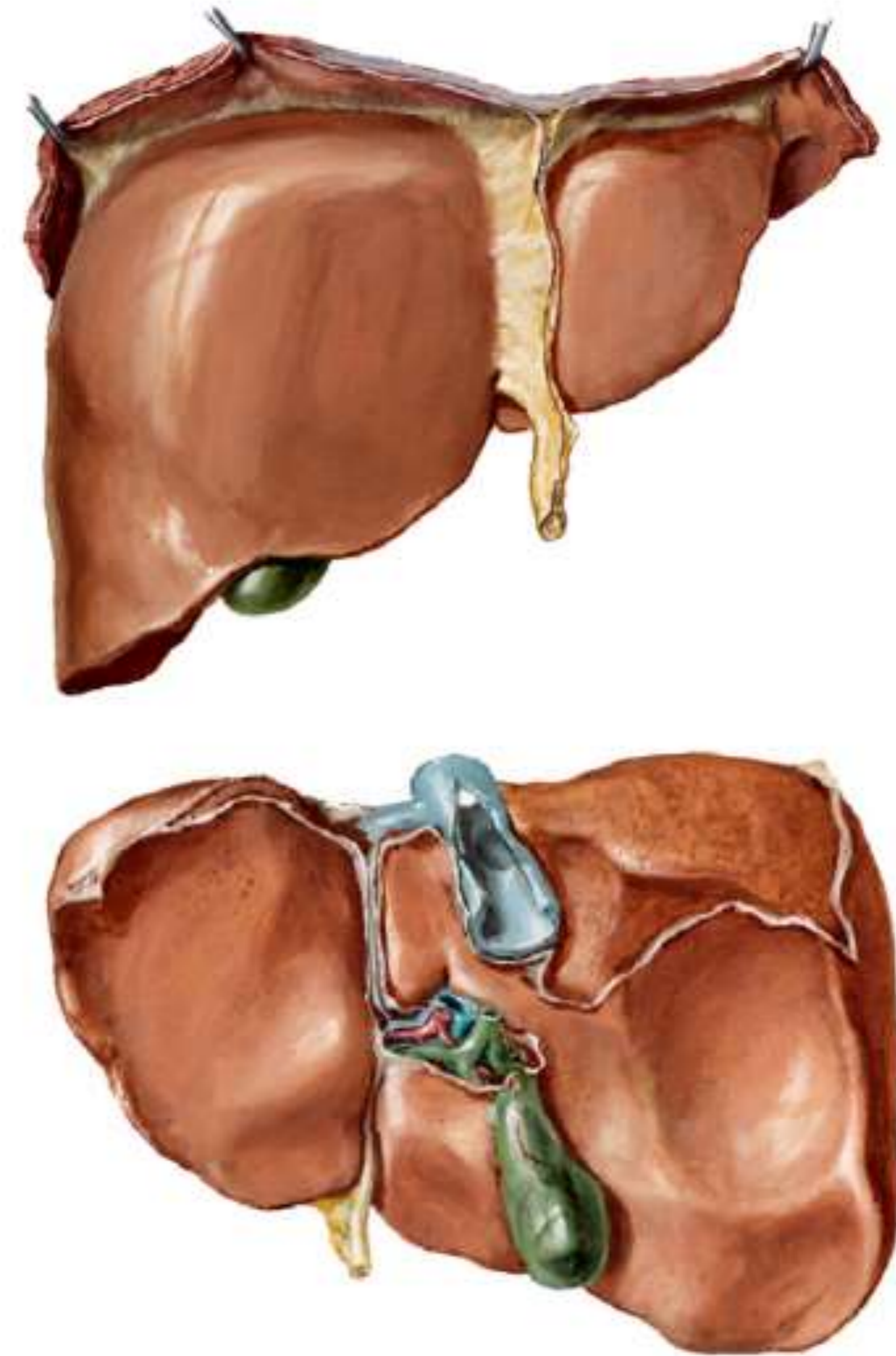
Porta hepatis

**** Lobes of liver:**

*** Anatomically** → the liver is divided by falciform ligament, fissure for ligamentum venosum and fissure for ligamentum teres, into:

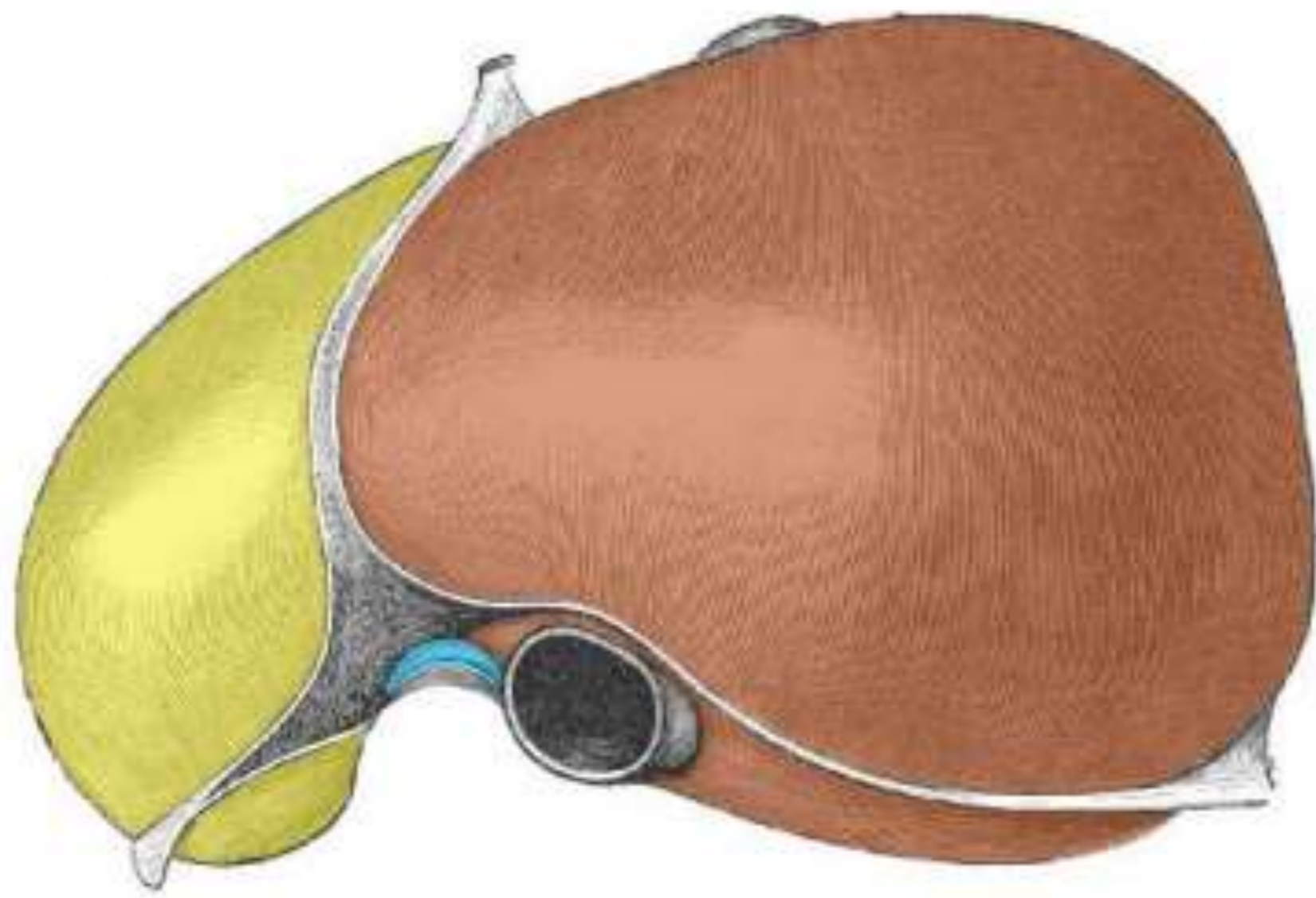
1. **Larger right lobe (including caudate & quadrate lobes).**
2. **Smaller left lobe.**

*** Physiologically & functionally** → the **caudate & the quadrate lobes** belong to the left lobe.

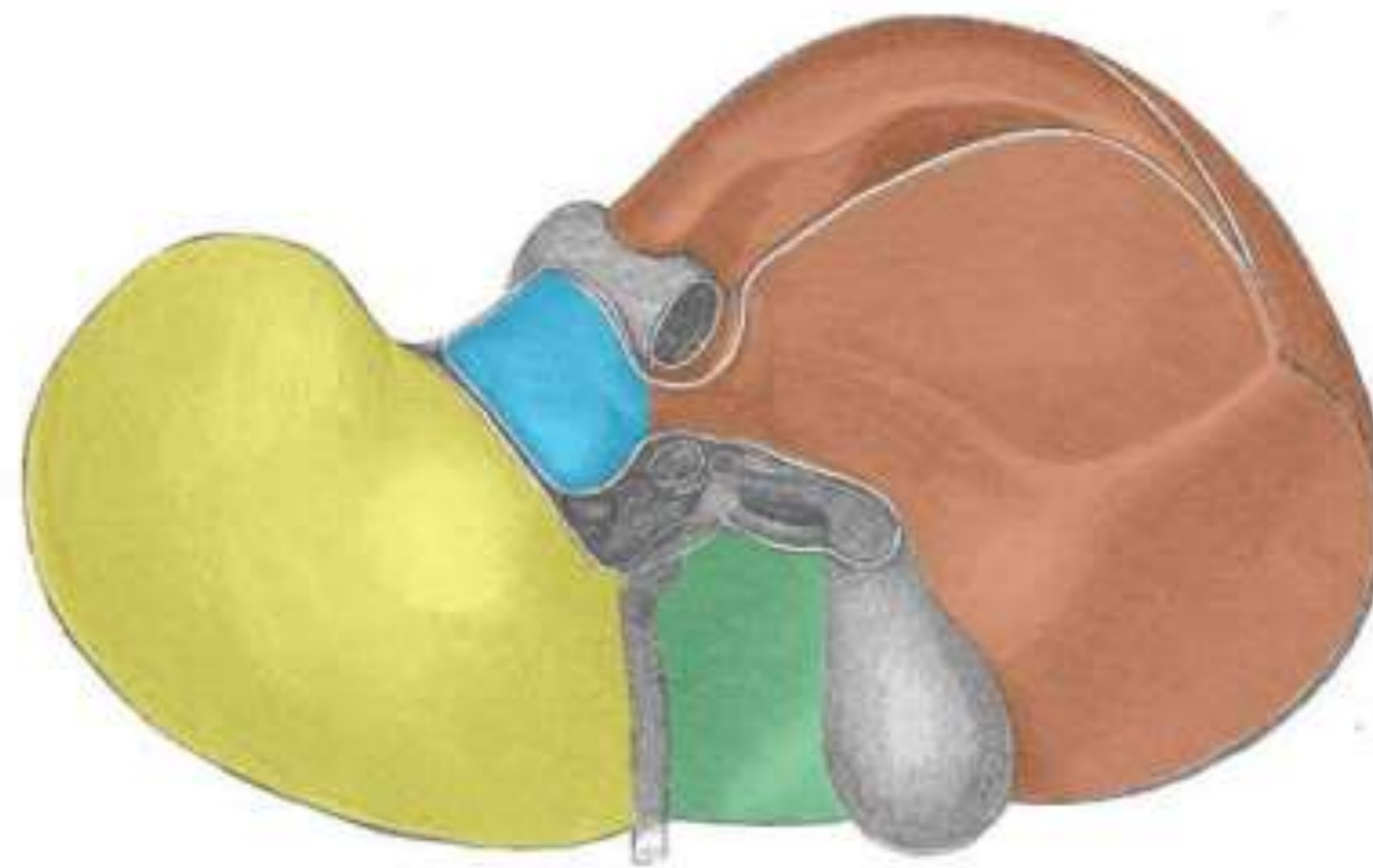


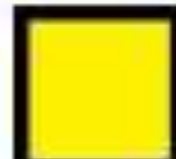
Lobes of The Liver

Superior Surface



Inferior Surface



-  Left
-  Right
-  Caudate
-  Quadrate

**** Blood supply of the liver:**

1. **Hepatic artery.**

2. **Portal vein.**

* Both divide at the porta hepatis into right and left branches.

• Physiologically, hepatic artery → 25 % of blood and 50 % of oxygen demand, while portal vein → 75% of blood and 50 % of oxygen demand.

3. **Right & left hepatic veins** which drain into I.V.C.

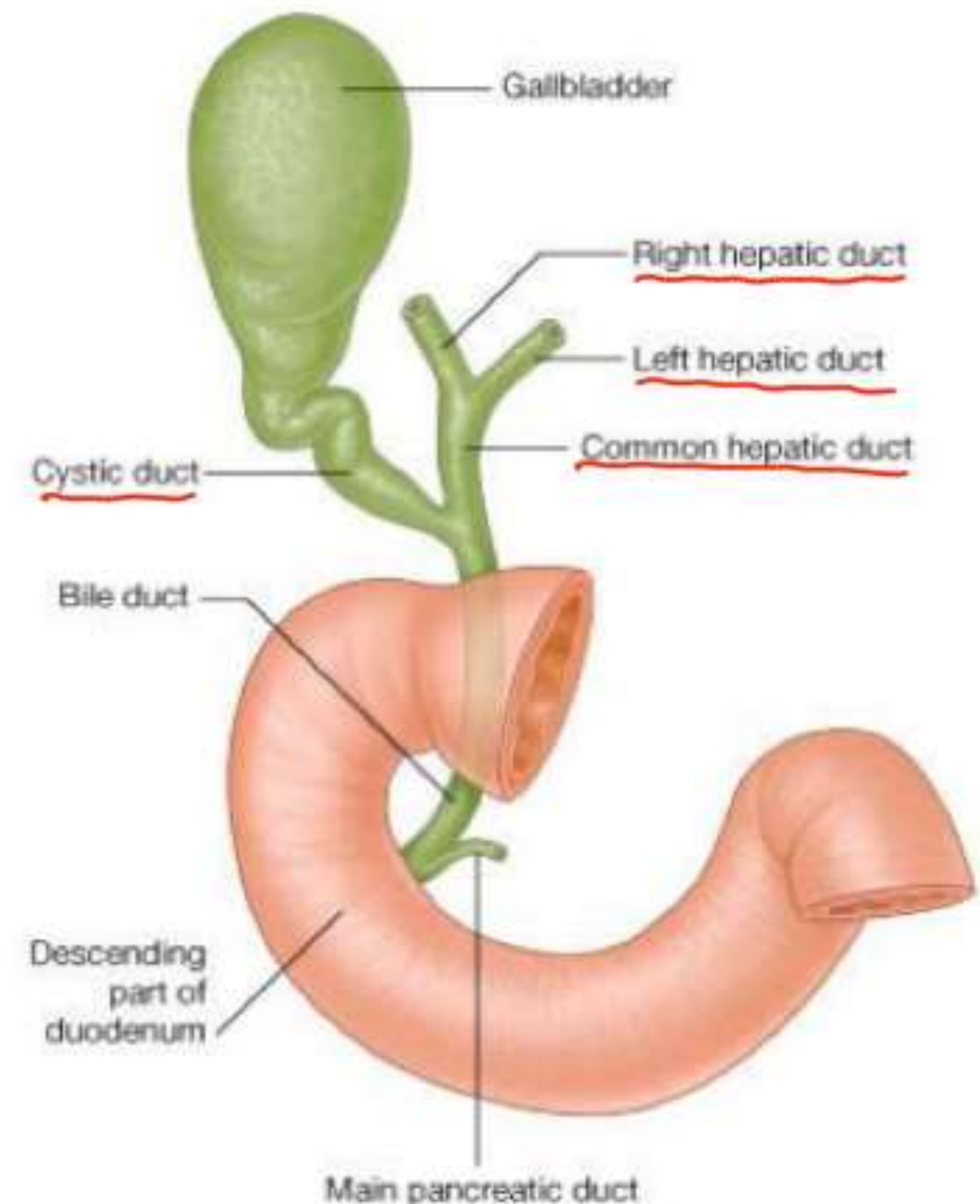
**** Functions of the liver:**

1. It receives venous blood loaded with products of digestion from G.I.T. through portal vein. The liver stores these nutrients and returns them back into circulation as needed e.g. Glycogen.
2. Secretes bile.
3. Detoxification of drugs and other toxins

Biliary system

** **This system includes:**

1. **Right and Left hepatic ducts.**
2. **Common hepatic duct.**
3. **Gall bladder** formed of 3 parts; fundus, body and neck. The neck gives rise to **cystic duct.**
4. **Bile duct** : formed by the union

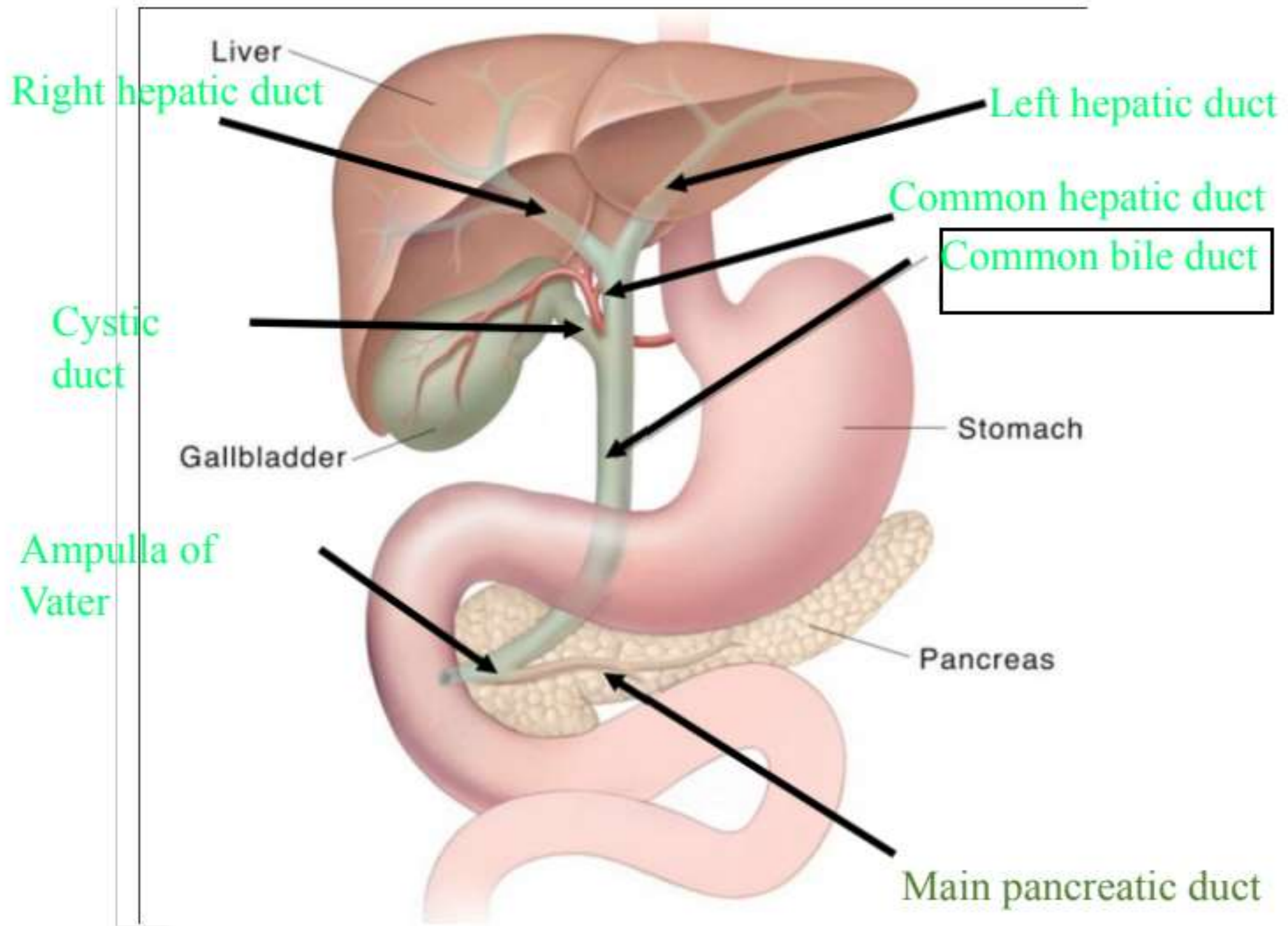


* Right hepatic duct + Left hepatic duct = Common hepatic duct.

* Common hepatic duct + Cystic duct = Common bile duct.

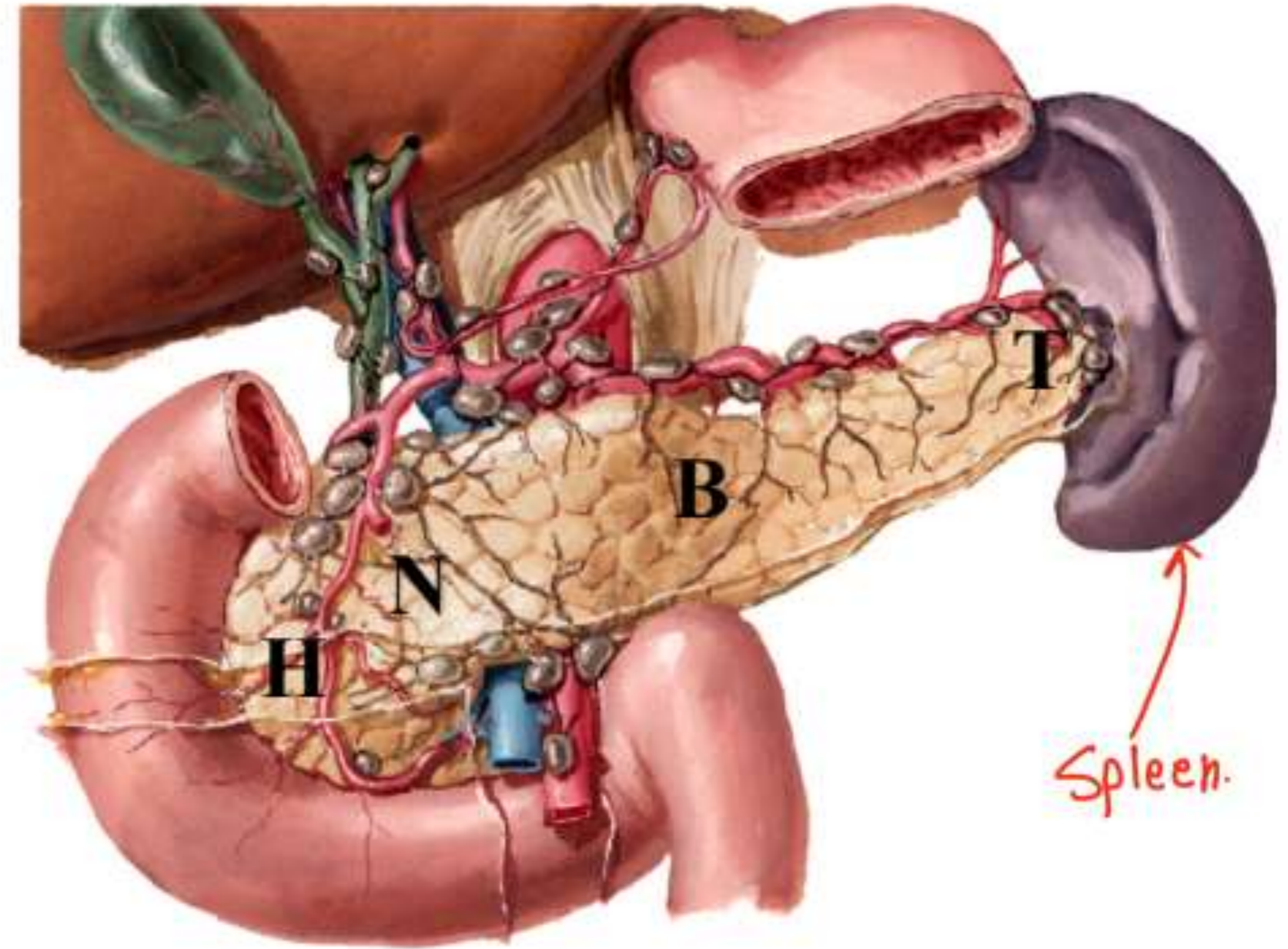
* Common bile duct + Main pancreatic duct = Ampulla of Vater.

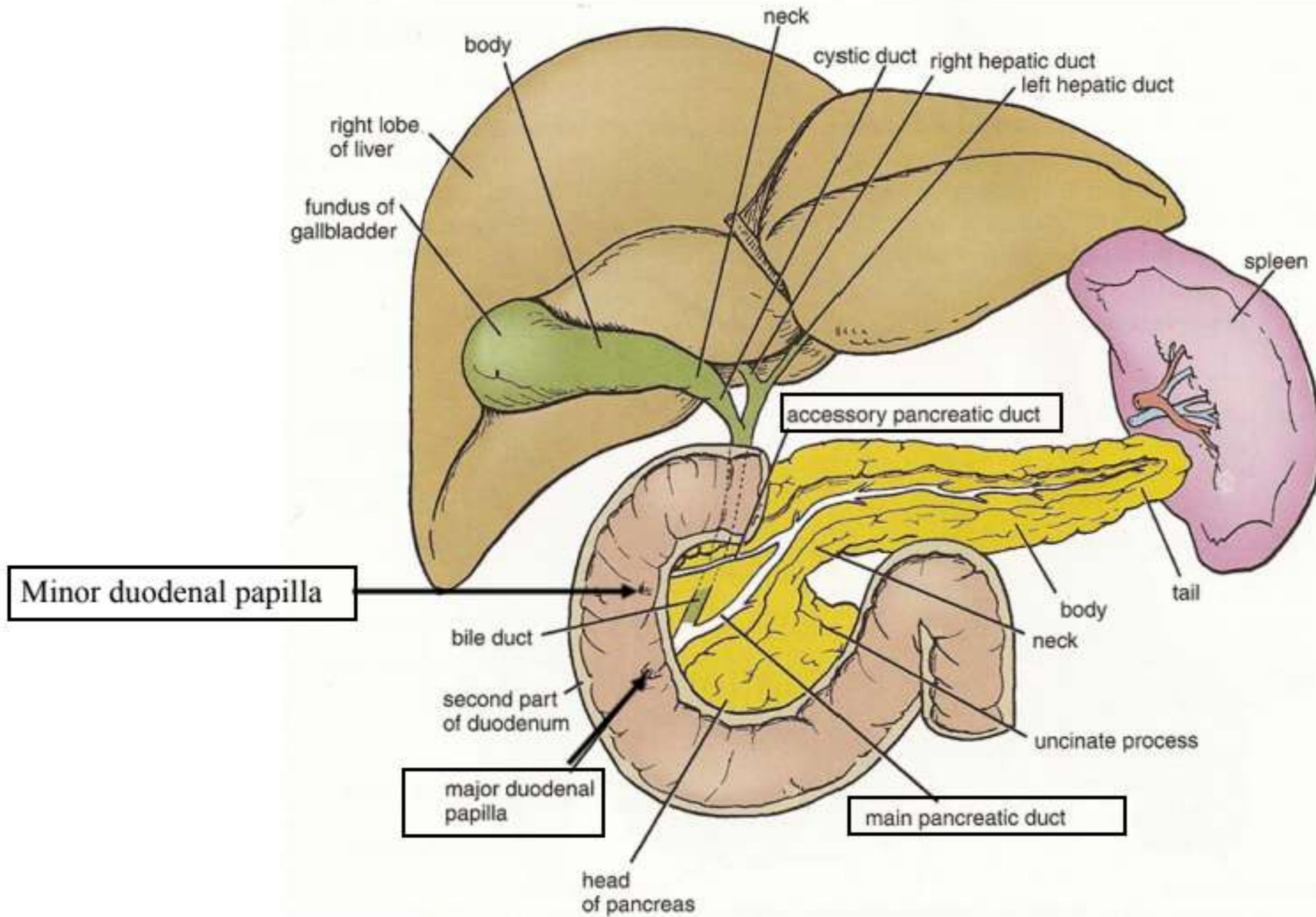
+ :- يعني اتحاد

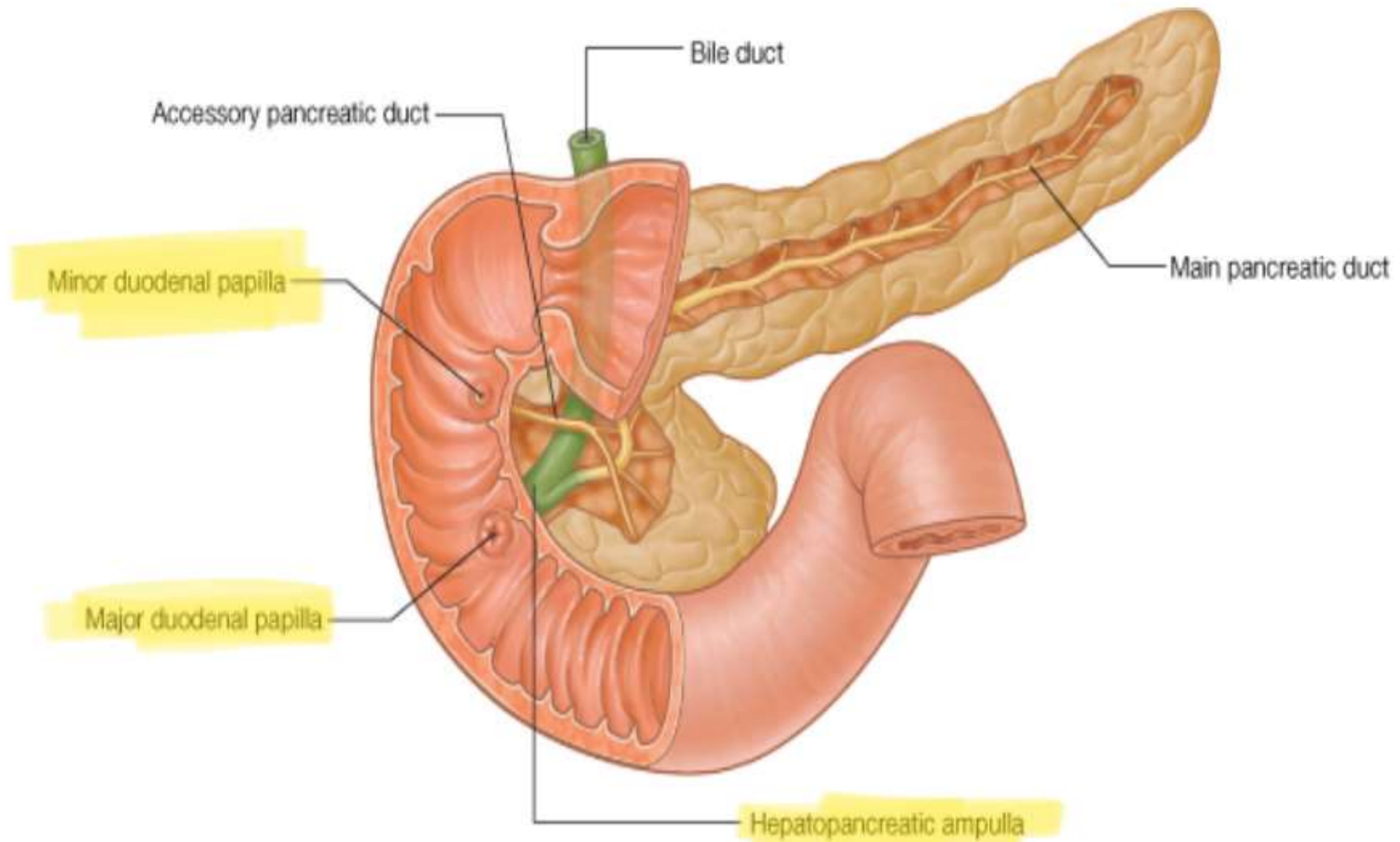


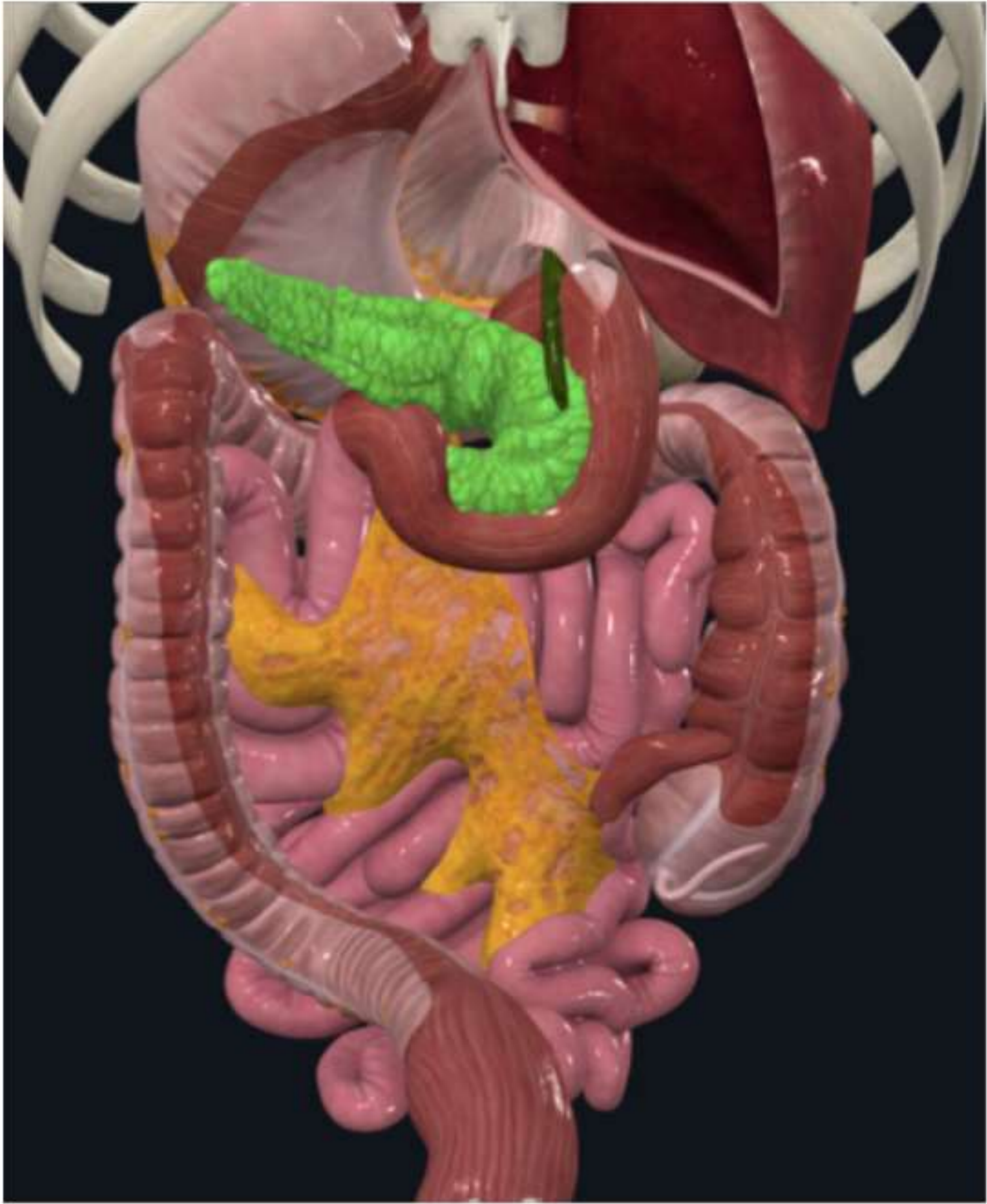
B. Pancreas

- A mixed endocrine and exocrine gland.
- It lies across the posterior abdominal wall from duodenum to spleen.
- * It is formed of 4 parts:
 1. Head. In concavity of duodenum.
 2. Neck.
 3. Body.
 4. Tail. Adjacent to spleen. → طحال









**You don't have to feel like a waste of space
You're original, cannot be replaced
If you only knew what the future holds
After a hurricane comes a rainbow
Maybe a reason why all the doors are closed
So you could open one that leads you to the
perfect road
Like a lightning bolt, your heart will glow
And when it's time, you'll know**

**THANK
YOU**

Dr Ashraf Ramzy