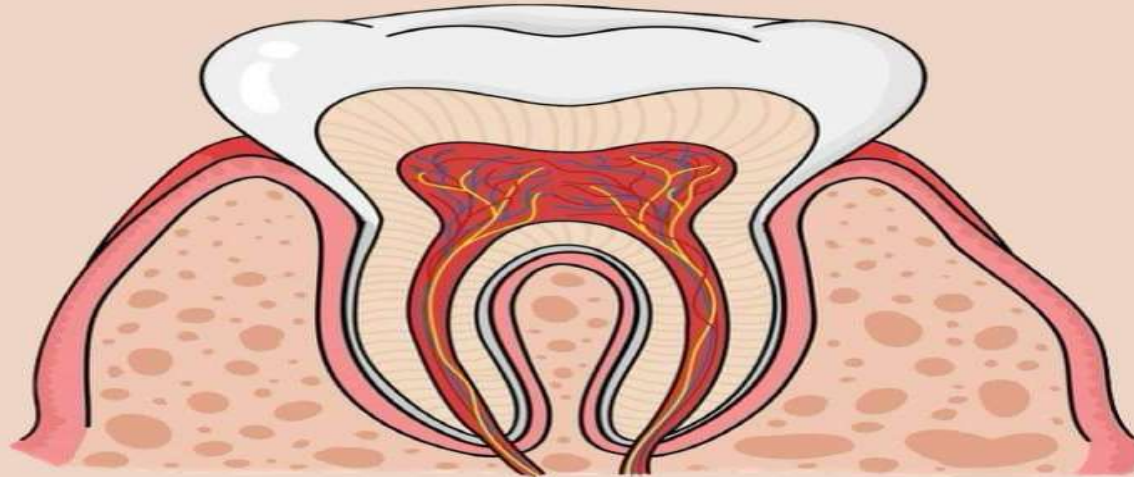




ANATOMY



LEC NO. : 11 + 12

DONE BY : Nour Al-amoush

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

DIGESTIVE SYSTEM (GI System)

By Dr Ahmed Amer

DIGESTIVE SYSTEM

System : group of organs have a specific function such as muscular system

Cells > tissues > organs > system

The digestive system consists of:

A. ^{القناة الهضمية} **digestive tract**

B. ^{الهضم} associated organs of digestion: **teeth**, ^{اللسان} **tongue**, ^{الغدة اللعابية} **salivary glands**, ^{الكبد} **liver**, ^{المرارة} **gallbladder** and **pancreas**.

Main function of digestive system :

⇒ **It provides water, electrolytes, vitamins and nutrients to the body with the help of the circulatory system.**

Proteins & lipids & carbohydrates

+ **elimination of wasted material**

DIGESTIVE SYSTEM

⇒ This is done by **the following steps** (The functions of digestive system):

عملية الاكل

1. **Ingestion**: taking in food through mouth.

اللسان و الفك يتحركوا على الطعام يلي اكلناه ف يعملوا طحن لاله و تتكون عنا bolus و هي اللقمة يعني

المضغ

2. **Mastication**: movements of the lower jaw during chewing to pulverize food and mix it with the saliva.

عملية البلع

3. **Deglutition**: swallowing of food so that it passes from mouth to stomach.

بتروح bolus للpharynx يلي هو البلعوم بعدين ينزل على esophagus و هو المريء و من ثم بتكمل

DIGESTIVE TRACT

عملية الهضم اول مرحلة تتم في الفم
بعدين في المعدة يكون هو الأساسي
لانه المعدة تفرز احماض كثيرة عشان
تهضم الطعام

4. Digestion: chemical breakdown of food material. Stomach

الامتصاص في الامعاء الدقيقة

5. Absorption: nutrient molecules absorbed into circulatory system through mucous membrane of small intestine.

الحركة الدودية

زي كأنه بعمل موجة من الانقباضات عشان تنتقل من region to another

6. Peristalsis: rhythmic wave-like intestinal contractions that move food through digestive tract.

بعد عملية الامتصاص رح تجيتكون عنا فضلات رح تروح للlarge intestine و هي
على شكل ملفوف لغاية ما تنزل تحت لعند rectum و بصيرله تمدد عن طريق
استقباله ل الإشارات

7. Defecation: elimination of solid/semisolid/liquid waste material of food (i.e. feces) through anus.

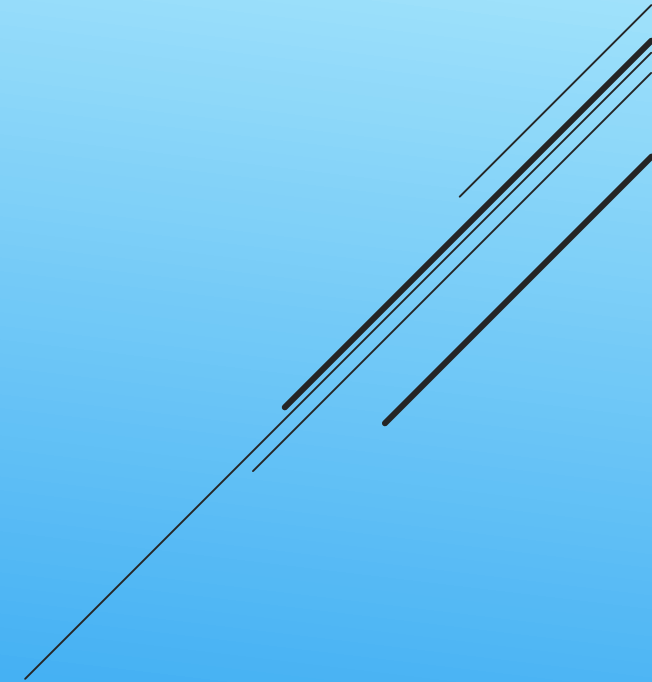
بتطلع من rectum
يلي تجمعت فيه

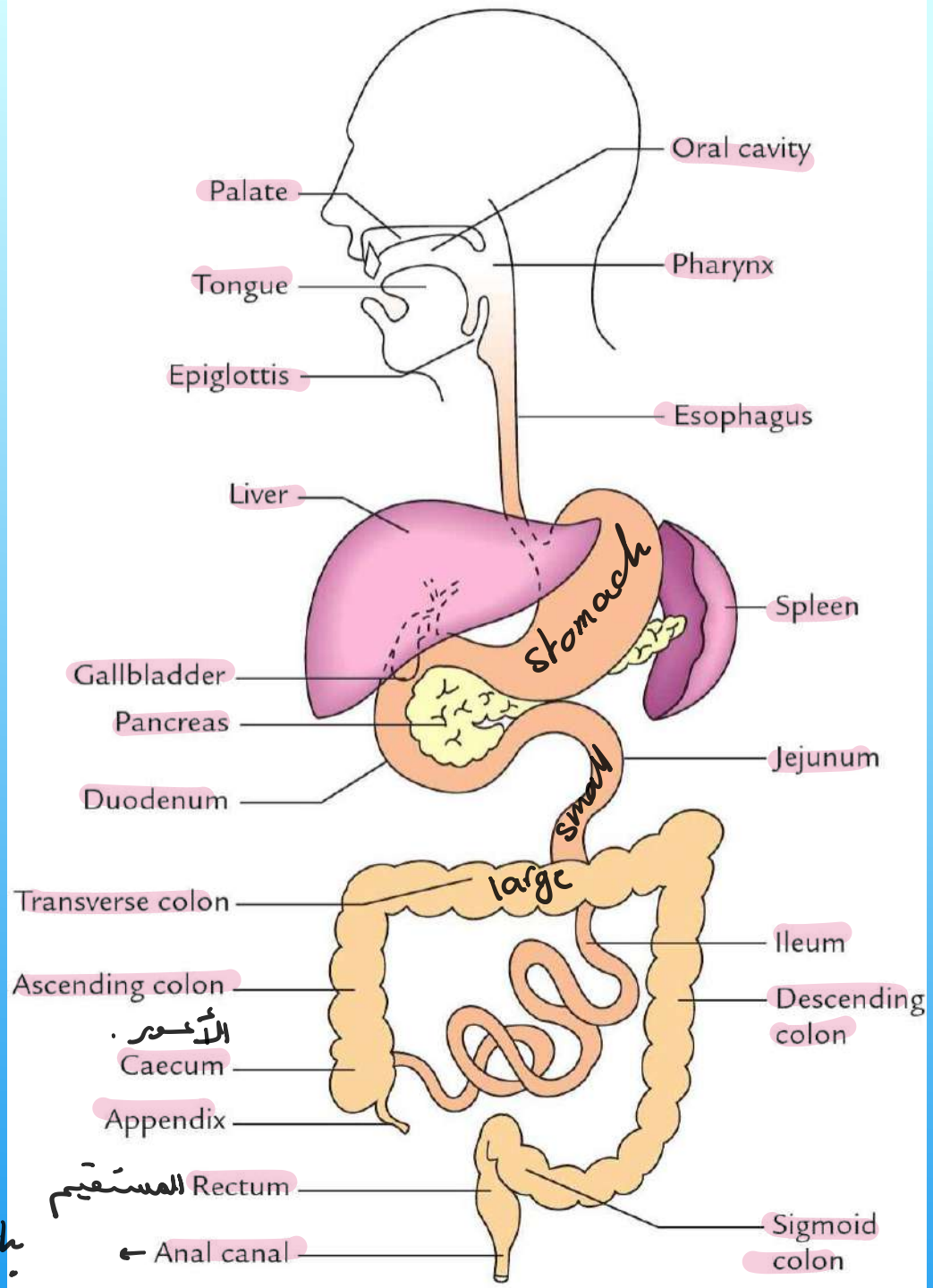
DIGESTIVE TRACT

فتحة الشرج

- ⇒ The digestive tract extends from the mouth to the anus.
- ⇒ Roughly, it is a tubular passage and measures about 10 m (30 ft) in length.
- ⇒ The digestive tract consists of the following parts from proximal to distal ends in succession:

1. Mouth (oral cavity)
2. Pharynx
3. Esophagus
4. Stomach
5. Small intestine
6. Large intestine
7. Rectum
8. Anal canal





Ends with anus.

DIGESTIVE TRACT

ينقسم الى قسمين :

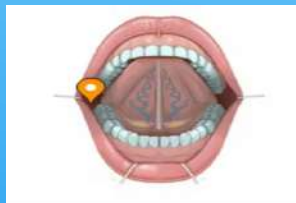
1. Mouth (Oral Cavity) Oral orifice oropharyngeal isthmus

- ⇒ The mouth or oral cavity is the **first** part of the digestive tract.
- ⇒ The oral cavity communicates externally through a cleft, between the upper and lower lips, called **oral orifice** and internally through **oropharyngeal isthmus**.
- ⇒ Oral cavity is divided into two parts:

شق (mouth opening)

فاتحة على pharynx

(a) vestibule



(مدخل الفم)

(b) oral cavity proper.

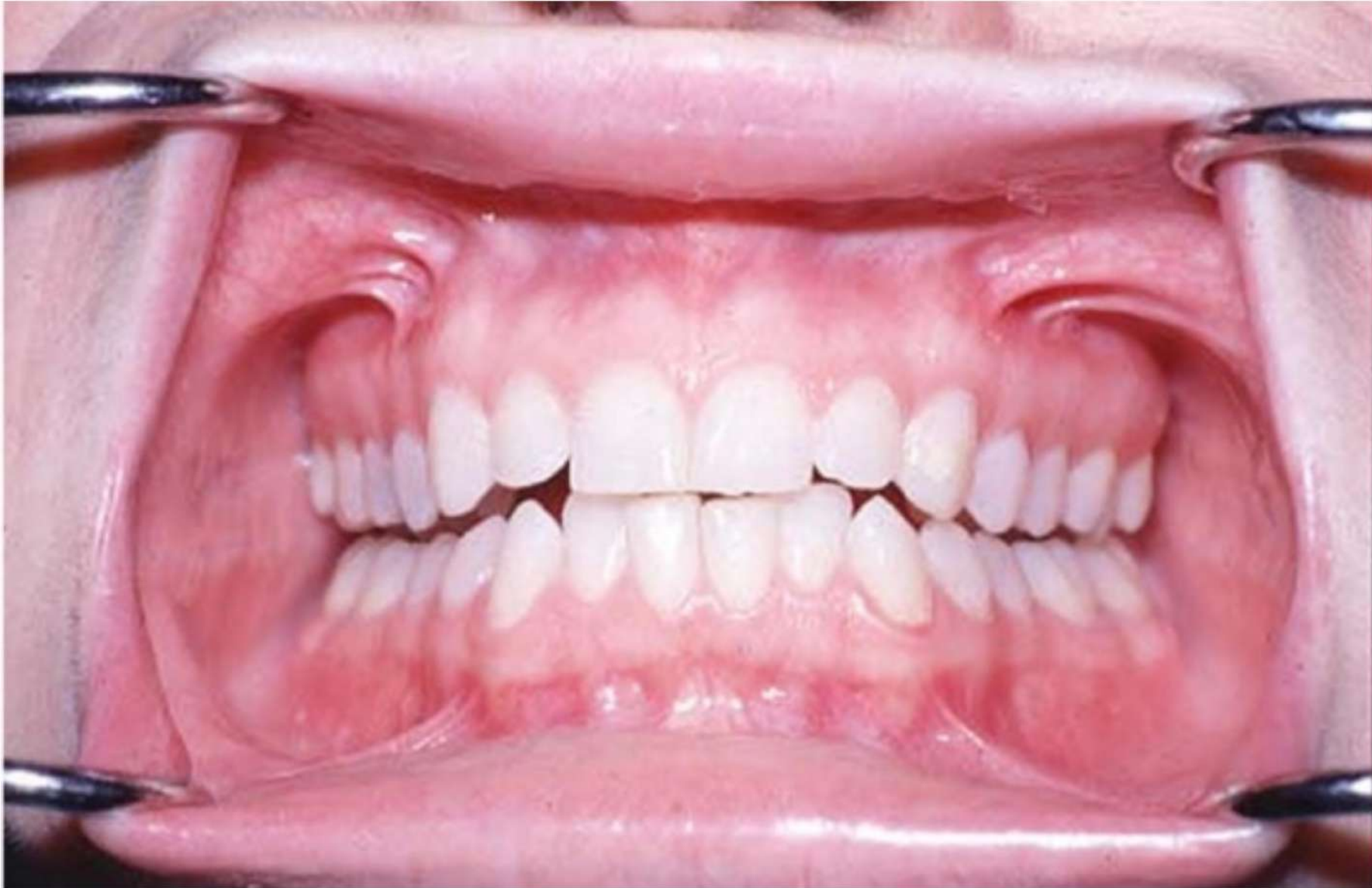
DIGESTIVE TRACT

A. The Vestibule:

- ⇒ 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**.

B. The Mouth Cavity Proper:

- ⇒ Extends from **teeth** to **oropharyngeal isthmus** through which it communicates with the **oral part of the pharynx**.
- ⇒ **Roof**: formed by **hard palate ant.** & **soft palate post.**
سقف الحلق *قدام* *سما* *palate → hard* *soft*
- ⇒ **Floor**: formed mainly by **tongue & reflection of the mucous membrane on the gums**.



The Oral Vestibule

DIGESTIVE TRACT

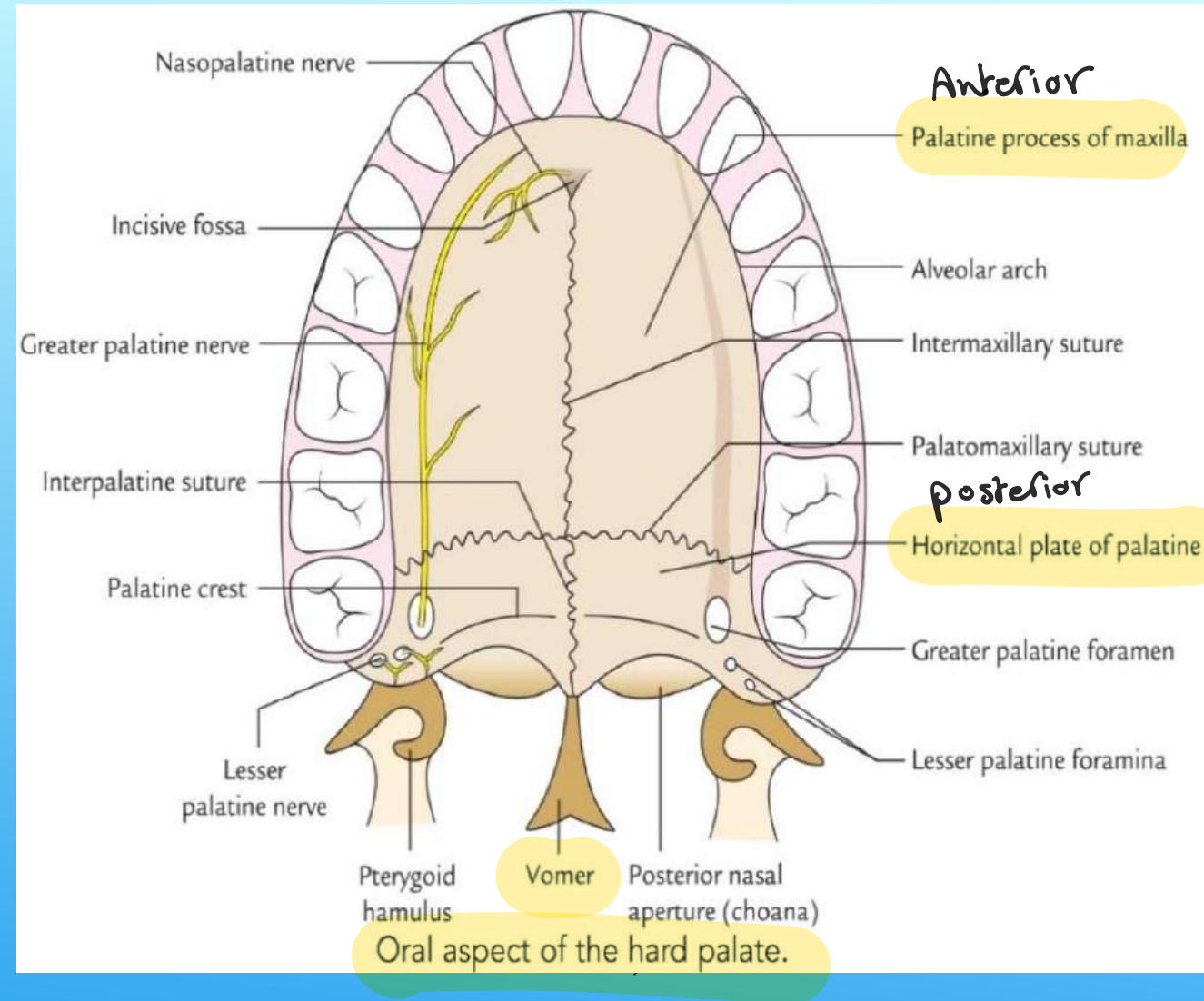
#palate → hard
→ soft

A. Hard palate Bone covered with mucus

Each half is formed by 2 parts: They are 2 bones.

a) Anterior 3/4: formed by palatine process of maxilla.

b) Posterior 1/4: formed by the horizontal plate of the palatine bone.



DIGESTIVE TRACT

في عنا soft tissues

B. Soft palate

① ماسك بالعظمة من قدام

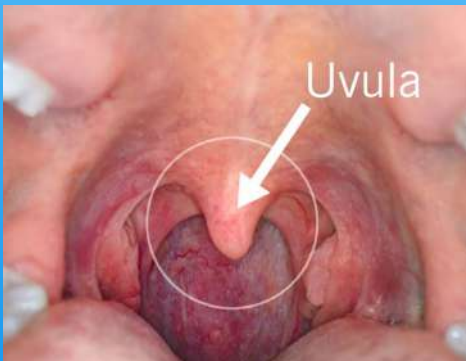
②

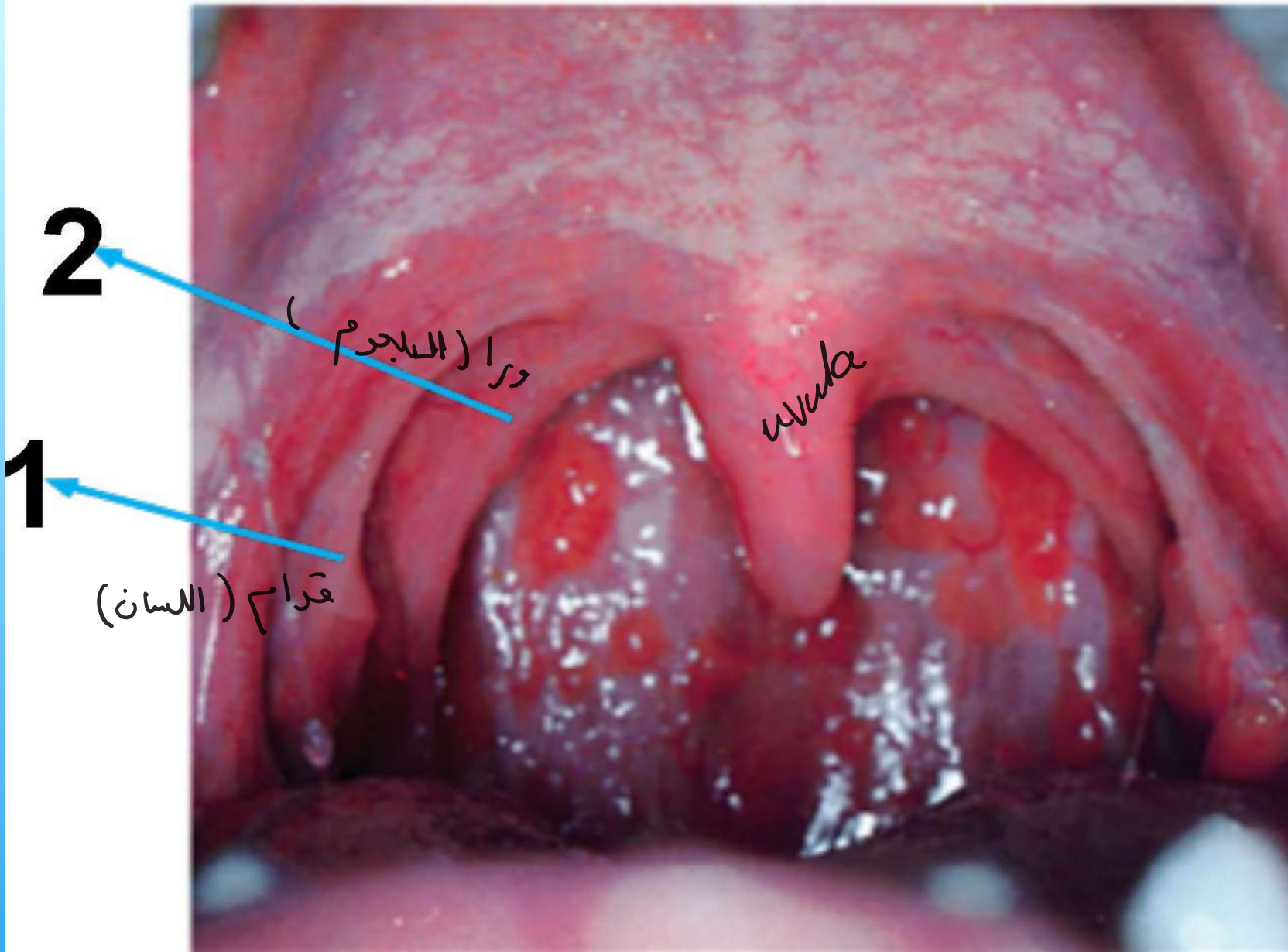
الجزء السفلي

⇒ It has attached (upper) border & Free (lower) border.

⇒ The lower border Bounds the oro-pharyngeal isthmus

⇒ Shows: Uvula, Palatoglossal fold & Palatopharyngeal fold.
(related to the tongue)





1: Palatoglossal Arch (Fold)

2: Palatopharyngeal Arch (Fold)

يَاي لَبْرَا

يَاي بَجْوَا

DIGESTIVE TRACT

عبارة عن muscle وفي عناء intrinsic & extrinsic

intrinsic its origin & insertion inside the tongue

C. The Tongue

- **Definition:** a muscular organ formed of mass of muscles covered by mucous membrane غشاء مخاطي

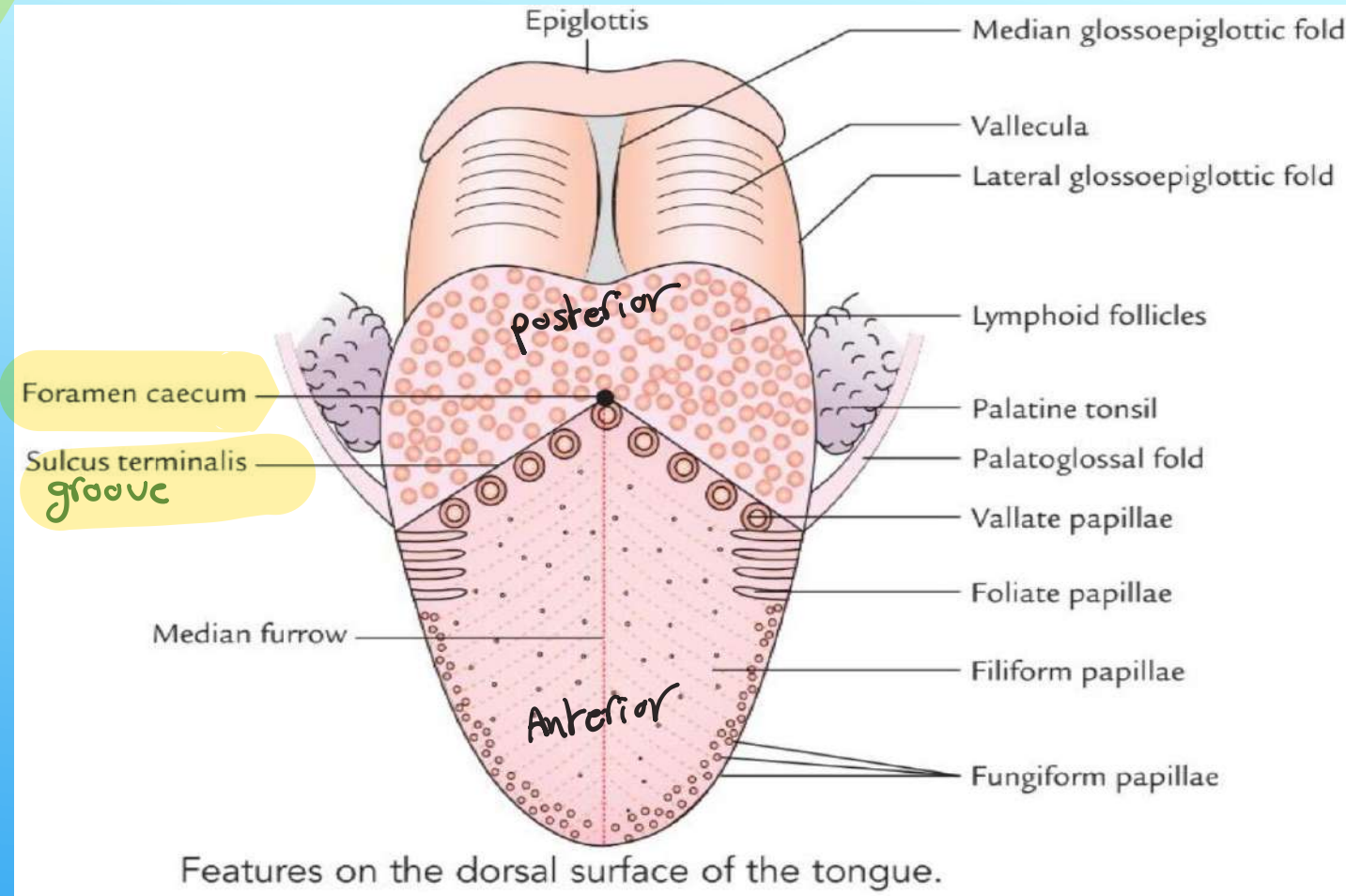
- **Functions:** the tongue performs the following functions:

1. **Taste.** التذوق

2. **Speech.**

3. **Mastication.** المضغ

4. **Deglutition.** تكوين bolus



GESTIVE TRACT



Tip

طرف اللسان

- Parts of the tongue:

1. **Tip:** tapering anterior end & lies opposite to teeth & gums.

2. **Root:** Attached to the mandible and hyoid bone by group of muscles.

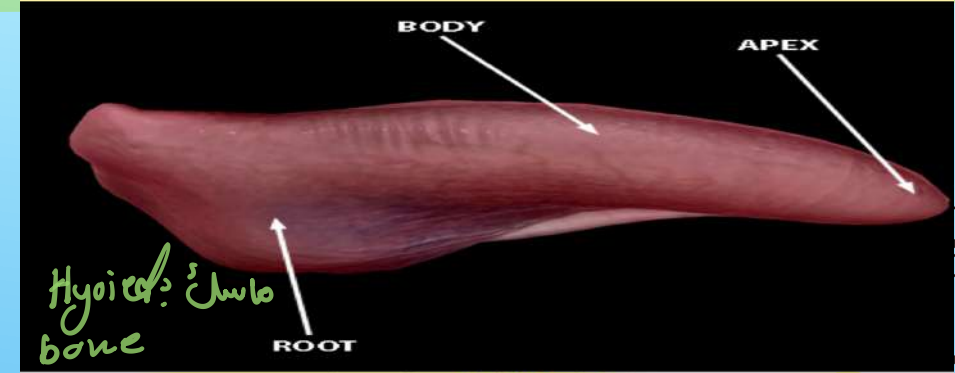
3. **Body:** which has:

في الوسط

A. Dorsal surface:

①

→ Divided by V-shaped groove (sulcus terminalis) which shows blind opening at the apex called (foramen cecum) into oral part (anterior $\frac{2}{3}$) & pharyngeal part (posterior $\frac{1}{3}$).



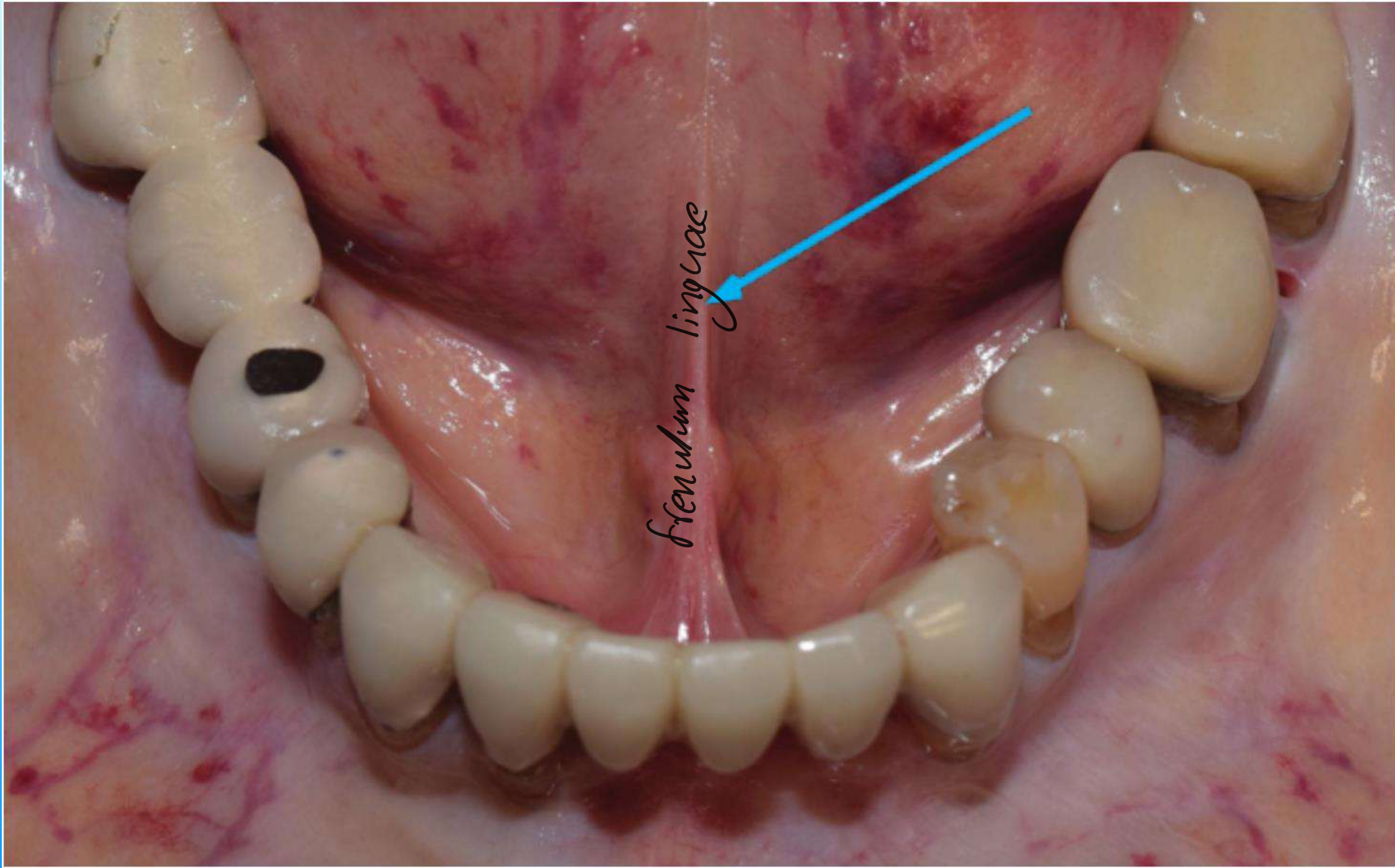
B. Ventral or Inferior surface:

ماسك بأرضية الـ mouth عن طريق لحمية

floor

→ connected to floor of mouth by frenulum linguae and covered by transparent mucosa

لها وظيفة مهمة لو كانت زيادة شوي ف بتعمل عقدة في اللسان و بتمنعه يحكي



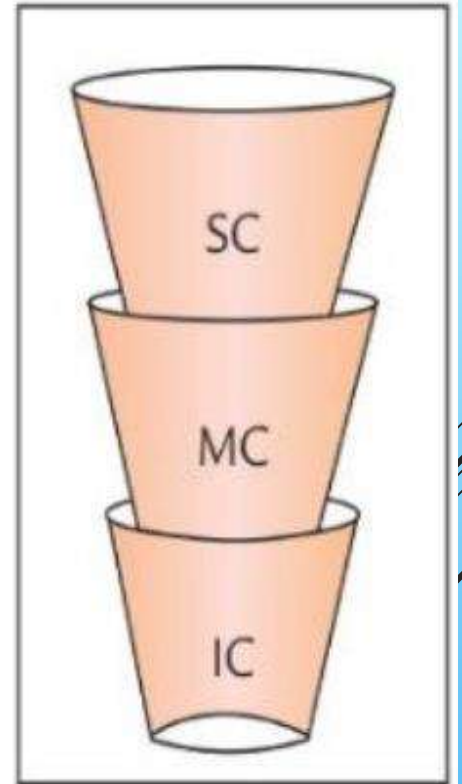
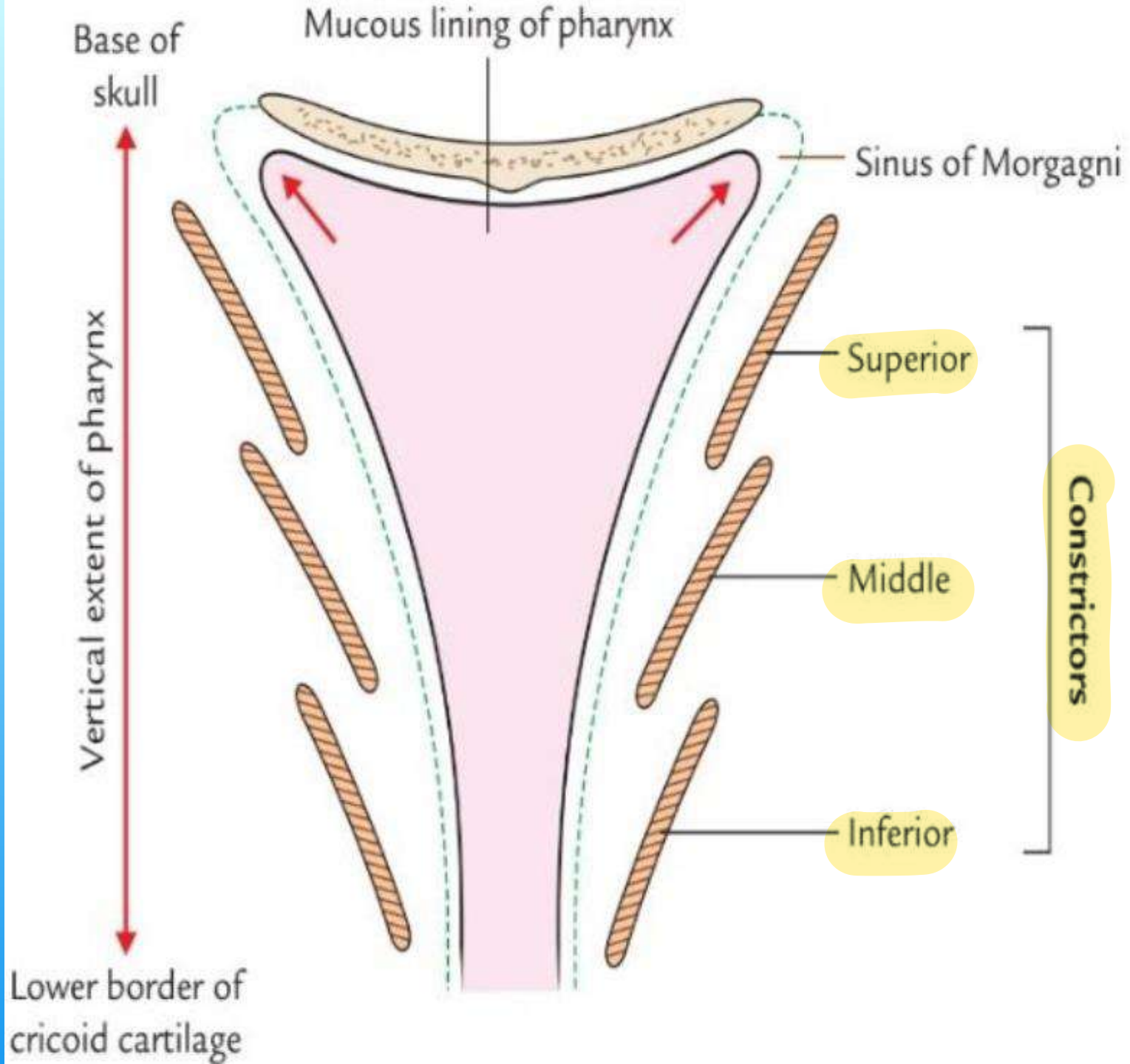
frenulum linguae

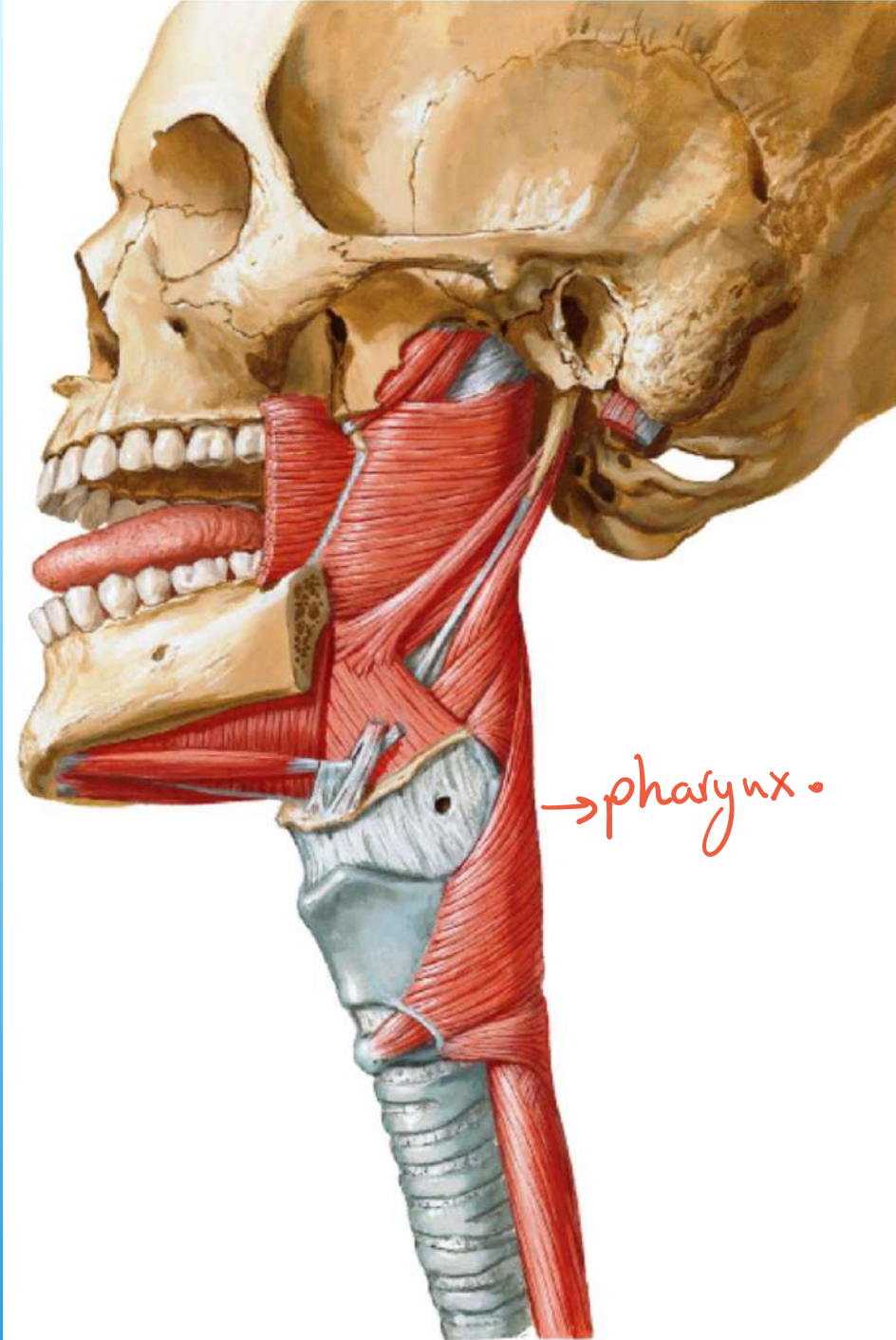
DIGESTIVE TRACT

2. Pharynx

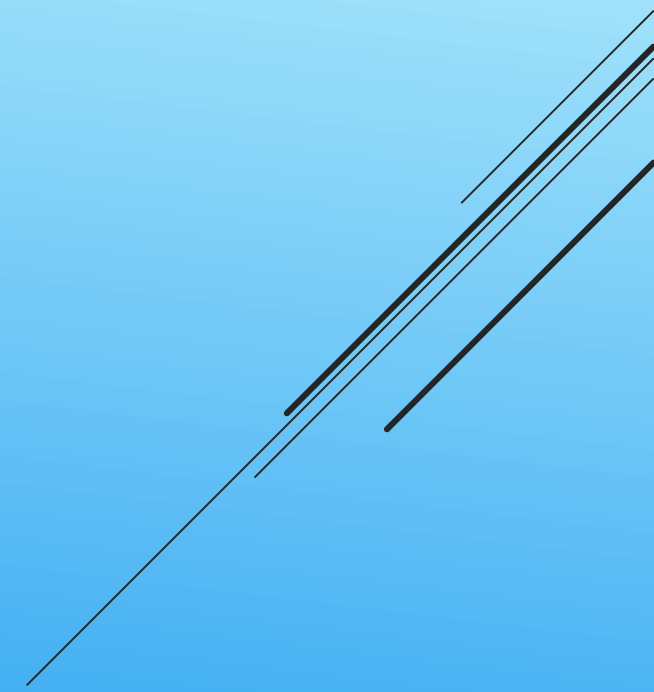
• اللجويم

- **Definition:** it is a muscular tube Extending from base of skull to the lower border of C6 vertebra. موجودة بشكل دائري
- **Size & shape:** 5 inches long & funnel shaped. على شكل قمع
- **The wall of the pharynx has:** 2 layers → circular
→ longitudinal
 - Three circular muscles (superior, middle and inferior constrictors) → بغير تحريك
bolus
 - Three longitudinal muscles (stylopharyngeus, palatopharyngeus, and salpingopharyngeus muscles). styloid process
palate auditory tube.
- **The main function of the pharynx:** It receives bolus of food from oral cavity and directs it to the esophagus. ببعمولوا رفع لل pharynx لحتى ما يدخل الاكل للحنجرة





→ pharynx.



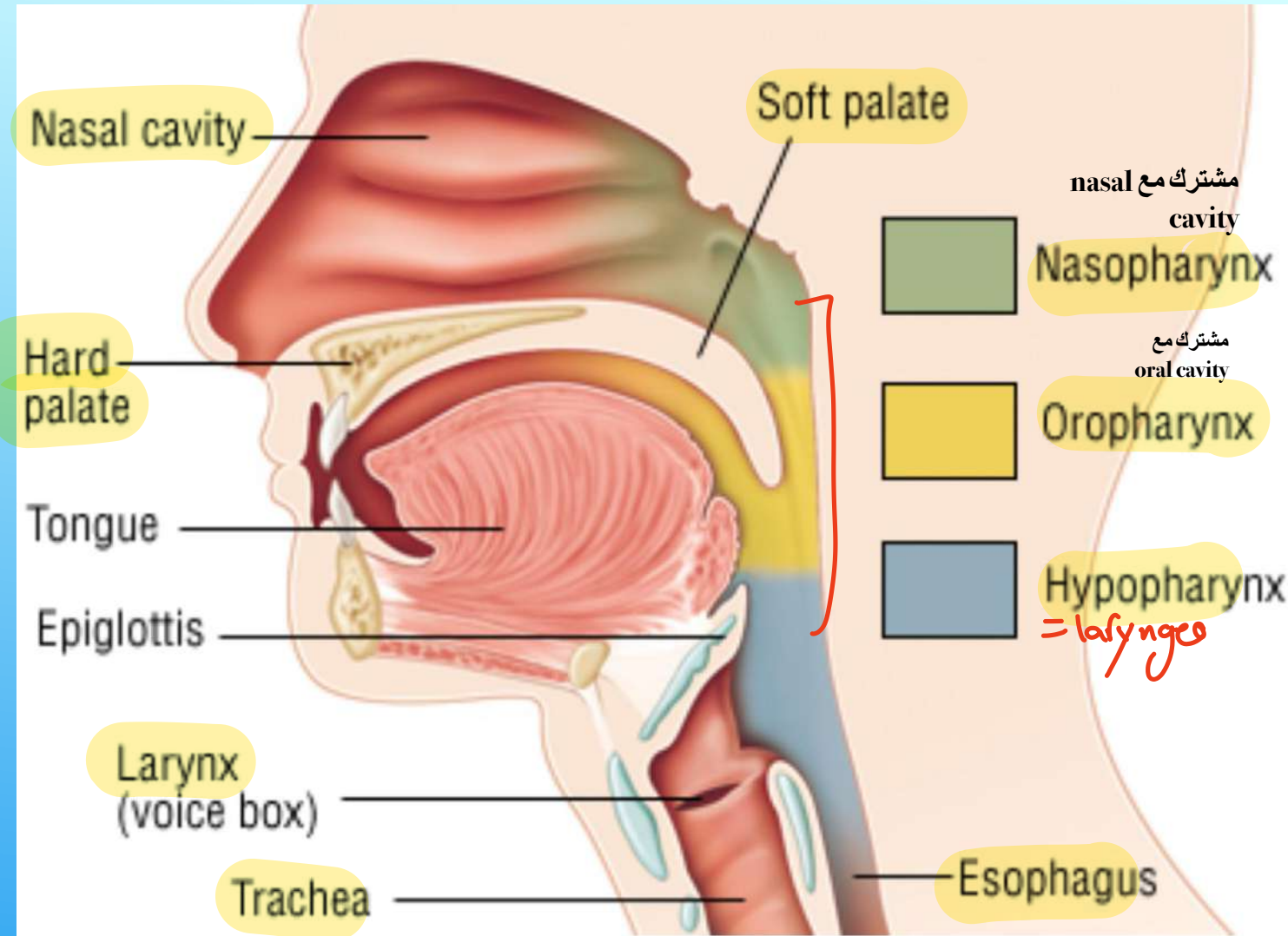
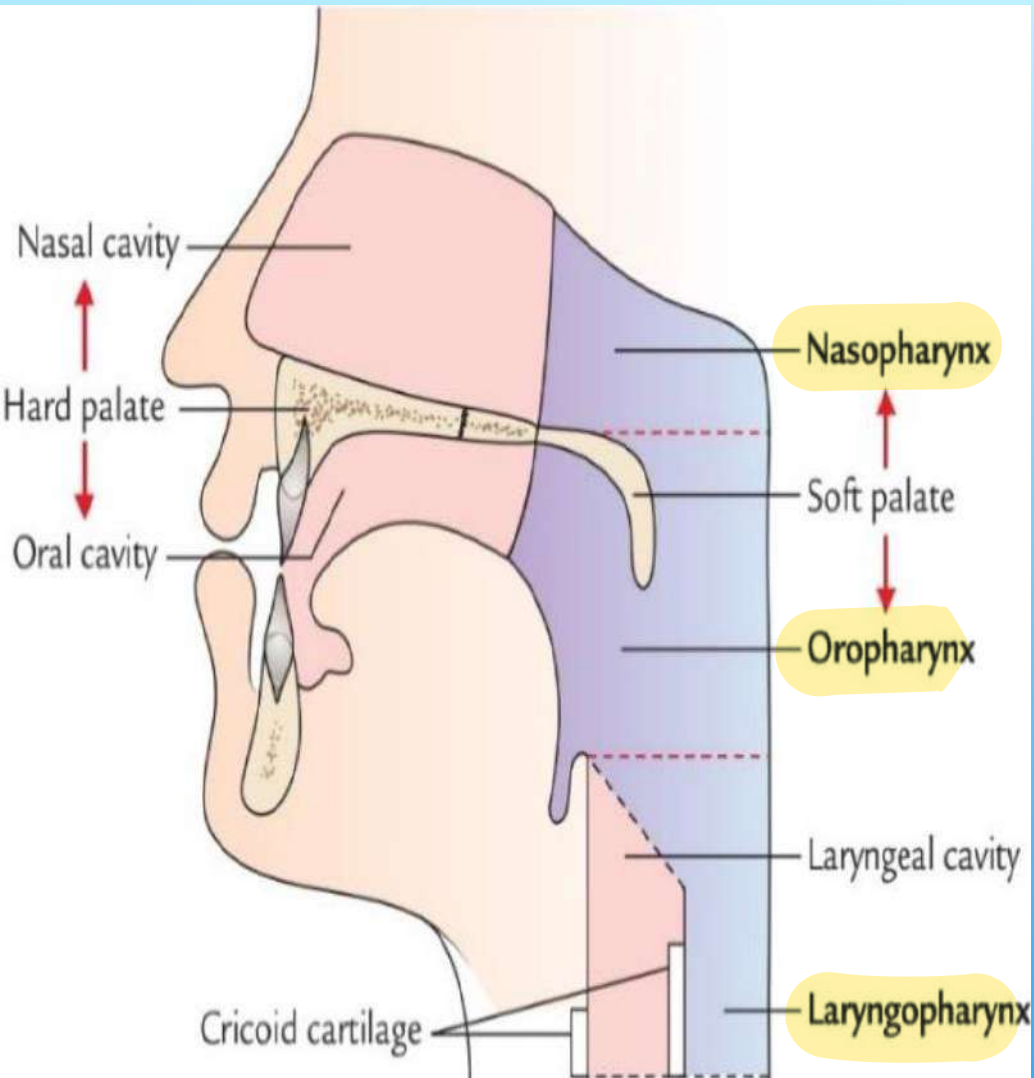
DIGESTIVE TRACT

Function of the pharynx:

- The successive contraction of the constrictor muscles propels the bolus of food down into the esophagus.
- The longitudinal muscles elevate the pharynx and larynx during swallowing. *عالية البلع*

DIGESTIVE TRACT

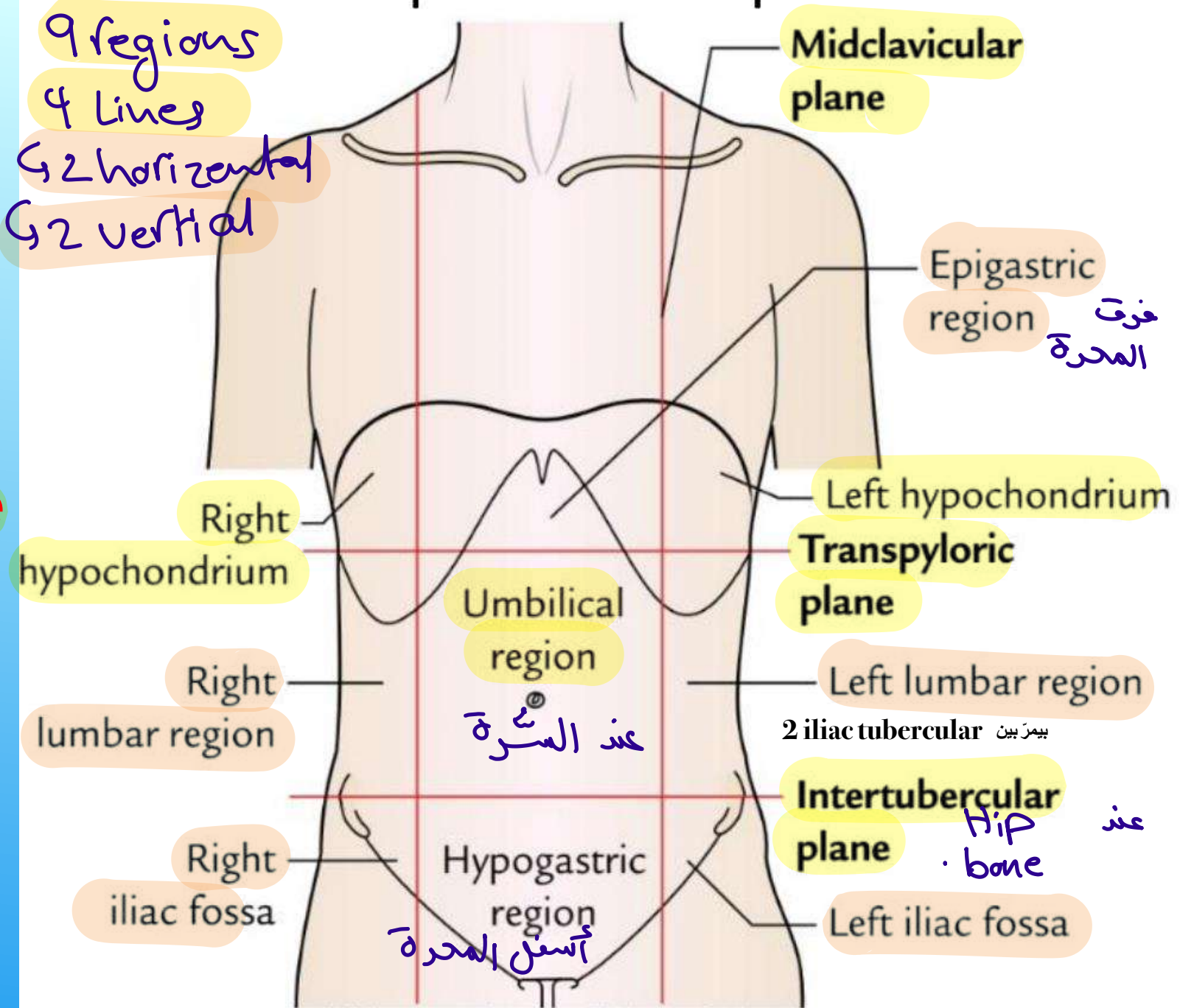
Parts of the pharynx



DIGESTIVE TRACT

9 regions
4 lines
↳ 2 horizontal
↳ 2 vertical

Regions of the Abdominal Cavity



Nine regions of the abdomen.

3. Oesophagus → المريء

• امتداد للبلعوم

□ 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. (C₇ To cardiac orifice)

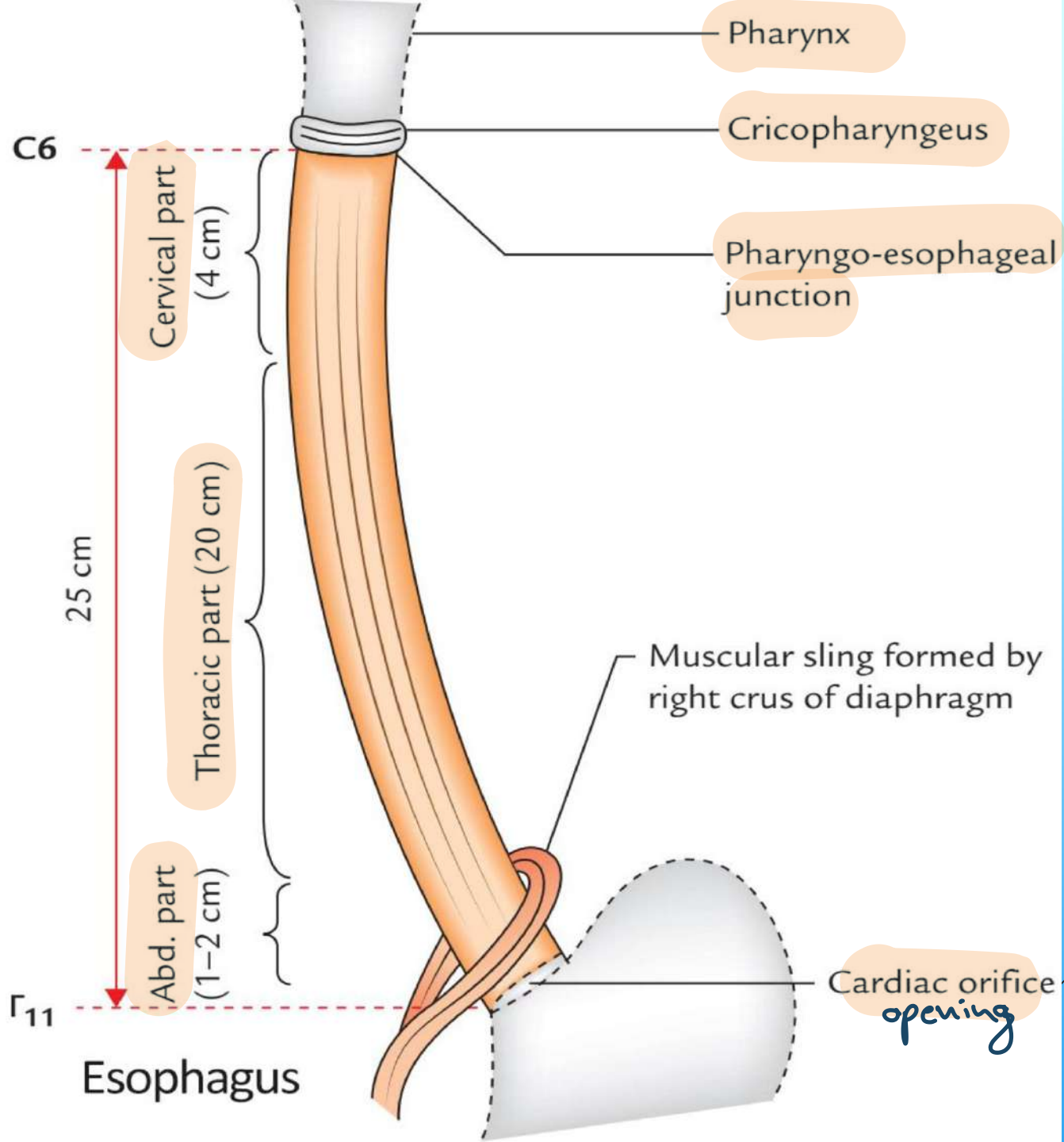
□ Parts:

1. A short cervical part.

2. A long thoracic part. → جوف الصدر

3. A short abdominal part which opens in the stomach.

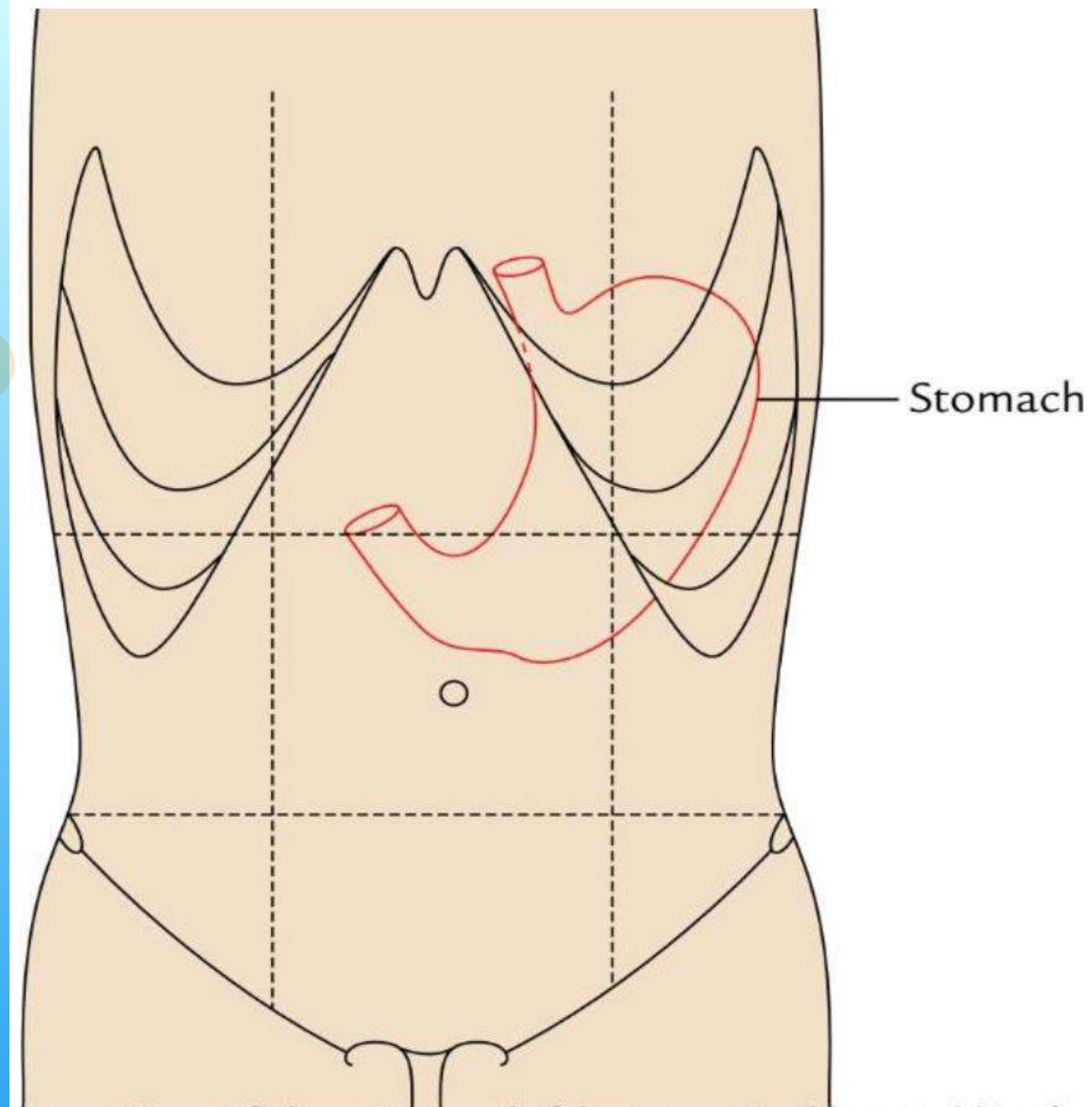
□ Esophagus transports bolus of food from pharynx to stomach by peristaltic movements. Main function:



DIGESTIVE TRACT

4. Stomach

- **Definition:** the widest & most distensible part of the G.I.T. قابل للنفخ
- **Site:** LT. hypochondrium, epigastrium & umbilical regions.
- **Shape:** J-shaped (commonest shape)



Location of the stomach (demarcated by red line).

DIGESTIVE TRACT

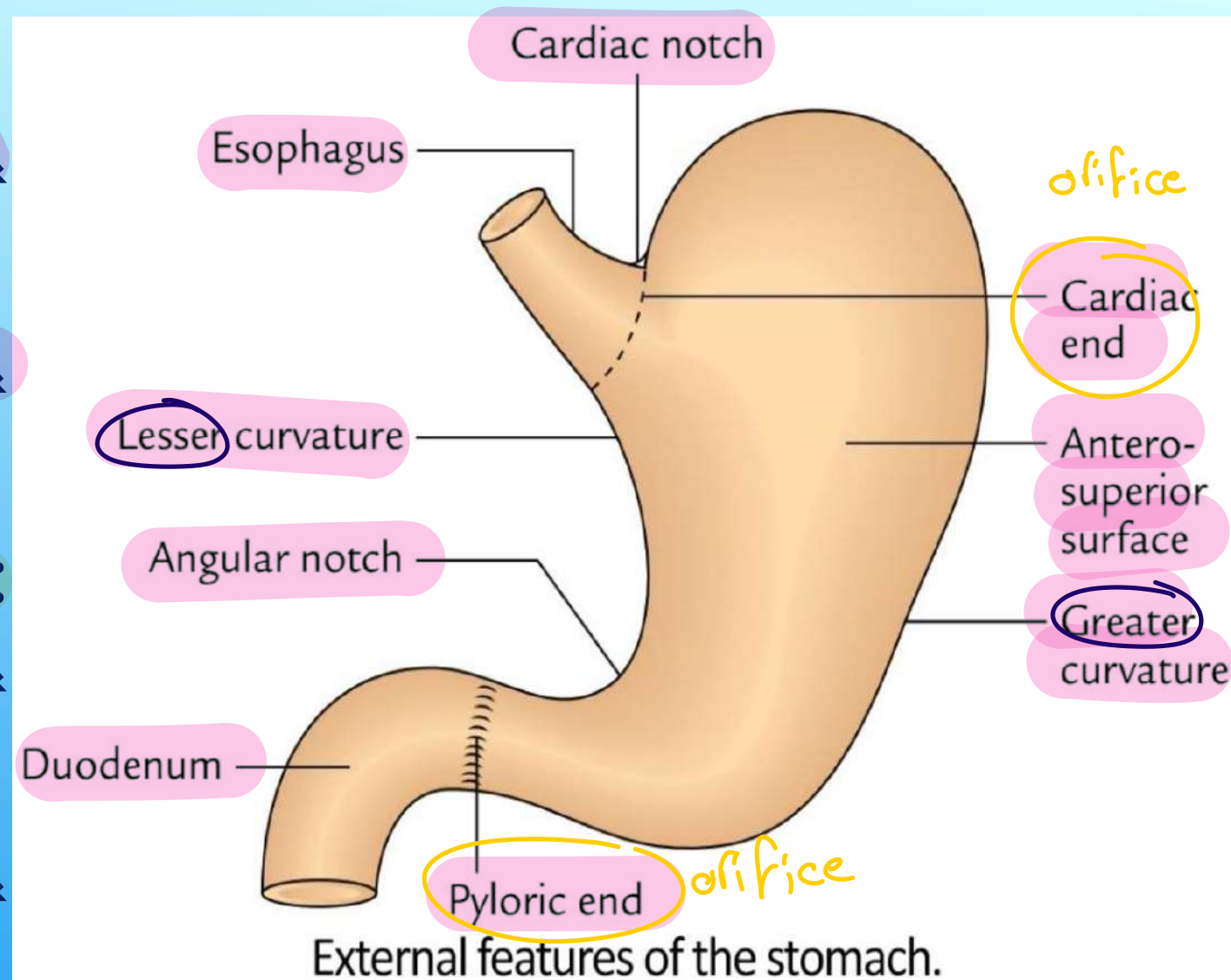
□ The stomach has:

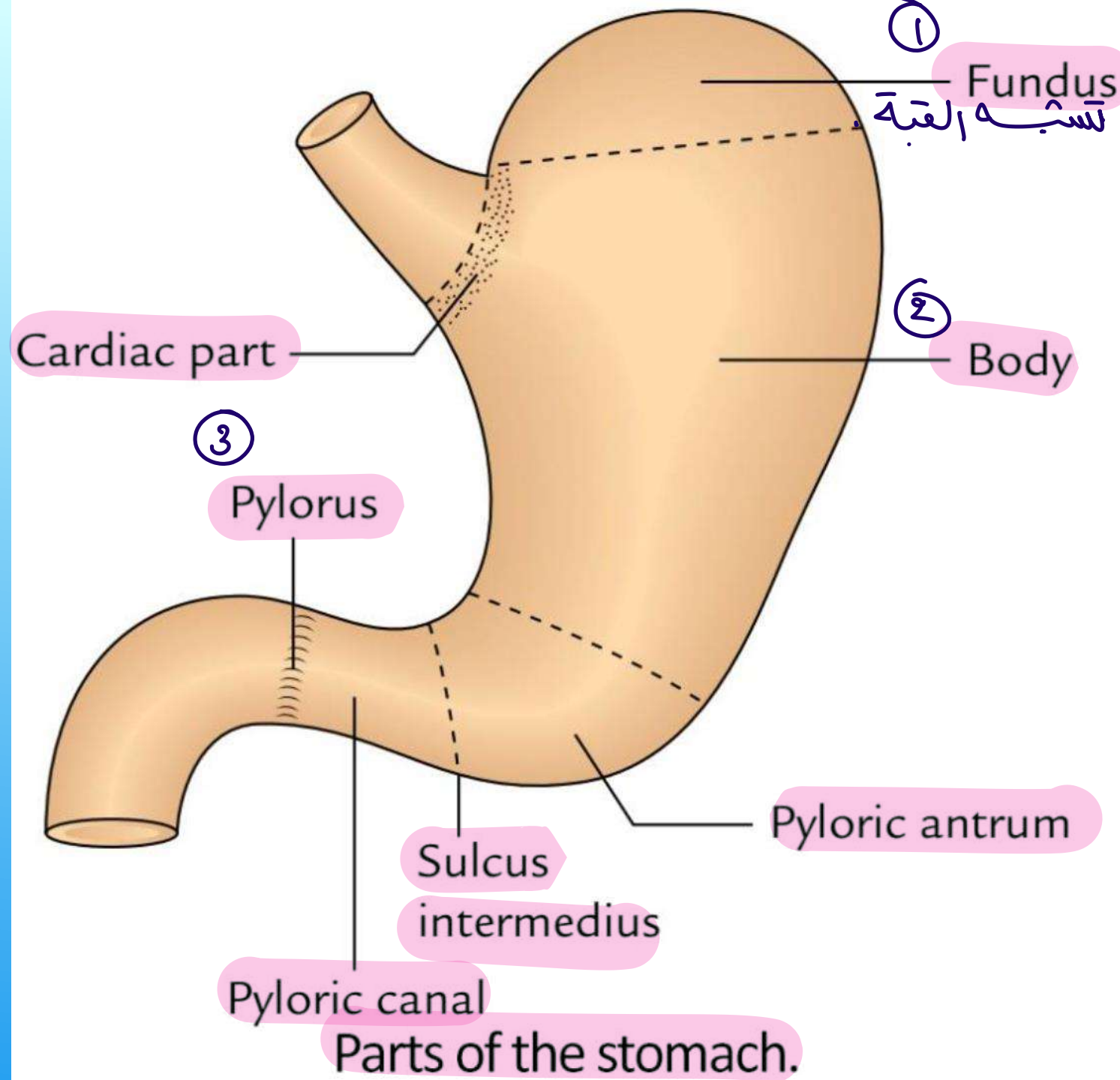
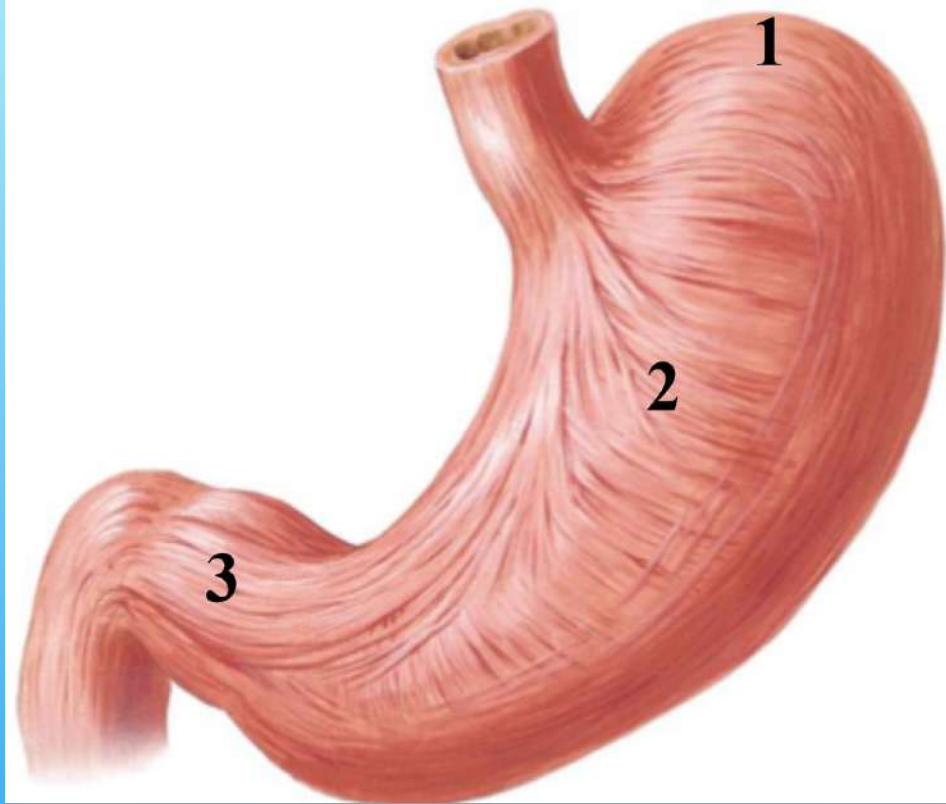
a) 2 ^{Opening} orifices: **cardiac** & **pyloric**
فوق (البراية) جاي من heart
(العلية) تحت

b) 2 borders: **lesser** & **greater curvatures**
تقوس

c) 2 surfaces: **anterosuperior** & **posteroinferior**

d) 3 parts: **fundus**, **body** & **pyloric part**





The functions of the stomach are as follows:

1. To store food as it is mechanically churned with gastric secretions

بتطحن بالاكل و تحوله بالآخر لاشي بيثبه زي العجين و الحركة تاعت المعدة بتقلب
الاكل مع الماء و الحموض و غيره، بالإضافة الى انه بعض البروتينات بتكون
بالمعدة ف هاد يساعد ب عملية digestion of proteins

2. To initiate digestion of proteins

3. To move the food into small intestine as a pasty material called **chime**.

يعني رح يضل يتحرك الاكل من
مكان لمكان

GIT TRACT

5. Small Intestine

جاي بين stomach و
large intestine

Smooth muscles

□ The small intestine is a long hollow muscular tube about **6 m (20 ft)** that connects stomach with the large intestine.

□ It is located in the **center** of abdominal cavity surrounded by the large intestine.

Umbilical
region

□ The small intestine is divided into three **parts**:

1. **Duodenum** ماخذ شكل حرف C

2. **Jejunum**

3. **Ileum** لغاية secum

GIT TRACT

Liver : detoxification + releases bile salts

Bile salts: في يتجمع في gallbladder

و بتنزل على GIT وظيفتها تذوب الدهون في الماء و عشان

توصل رح تنزل من bile duct

I. Duodenum:

- It is C-shaped and formed of 4 parts.
- It contains the pancreas in its concavity.
- Openings in the second part of duodenum:

The most important

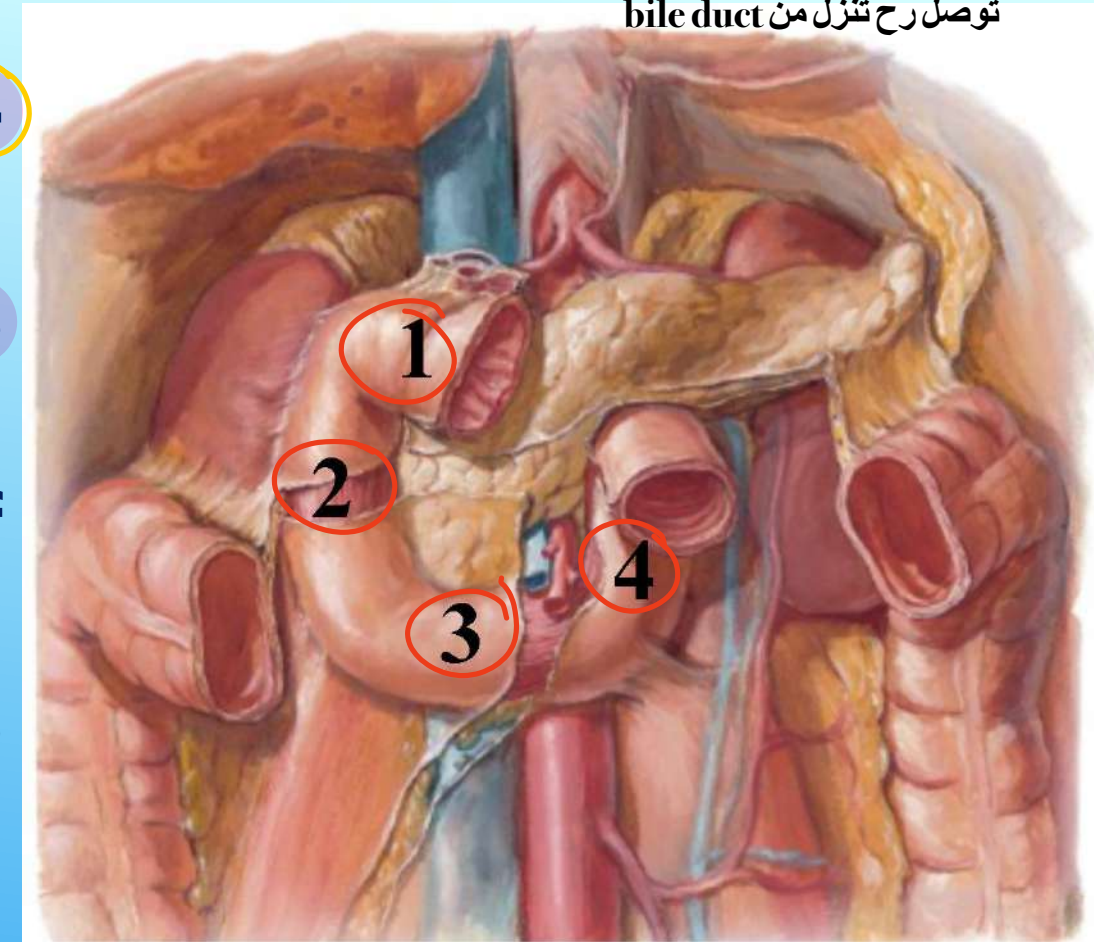
عنا هون فتحات مهمة جدًا

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

2. Accessory pancreatic duct.

Function

- In the duodenum, digestion continues and absorption of water and digestive products begins.

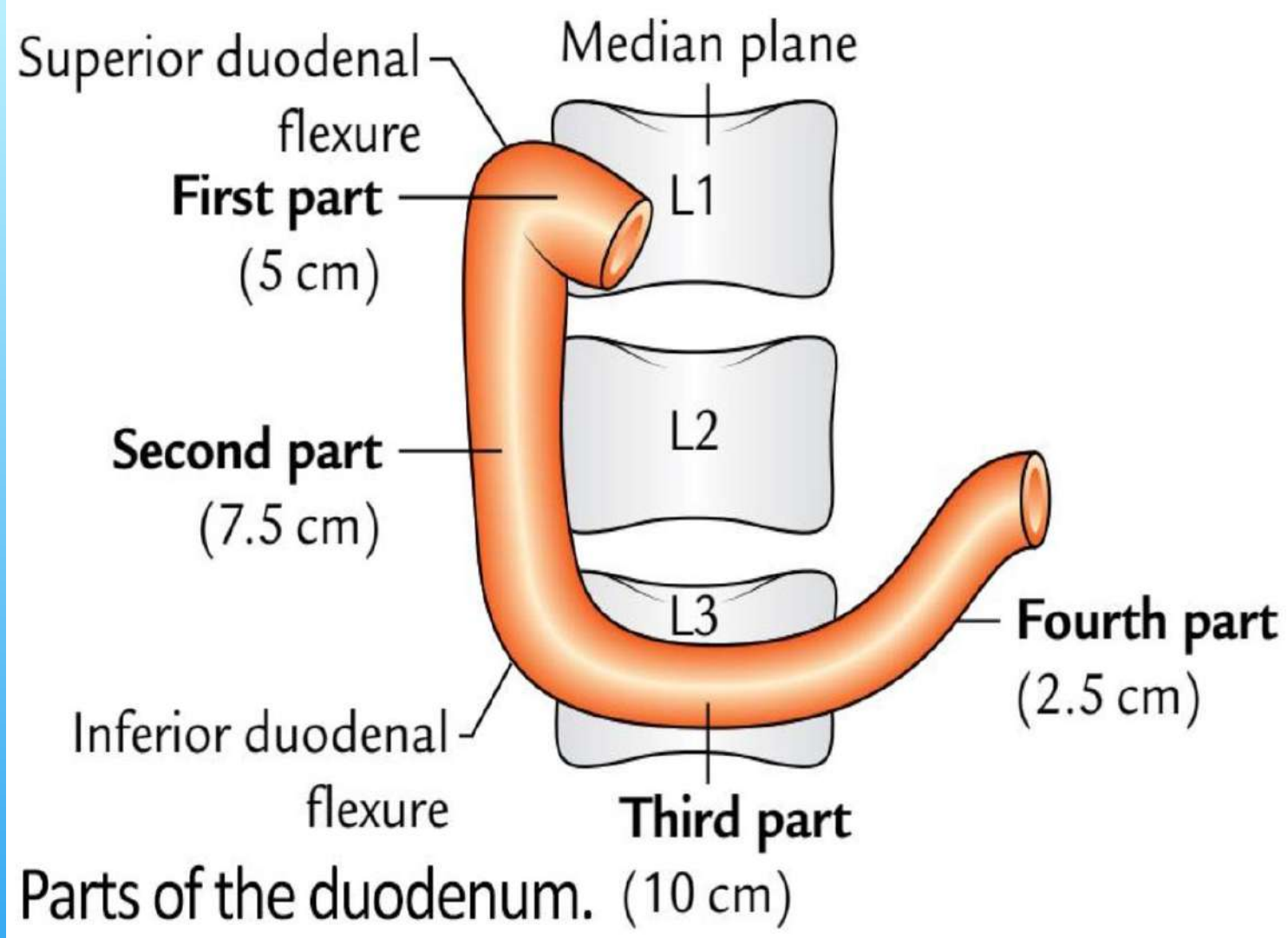
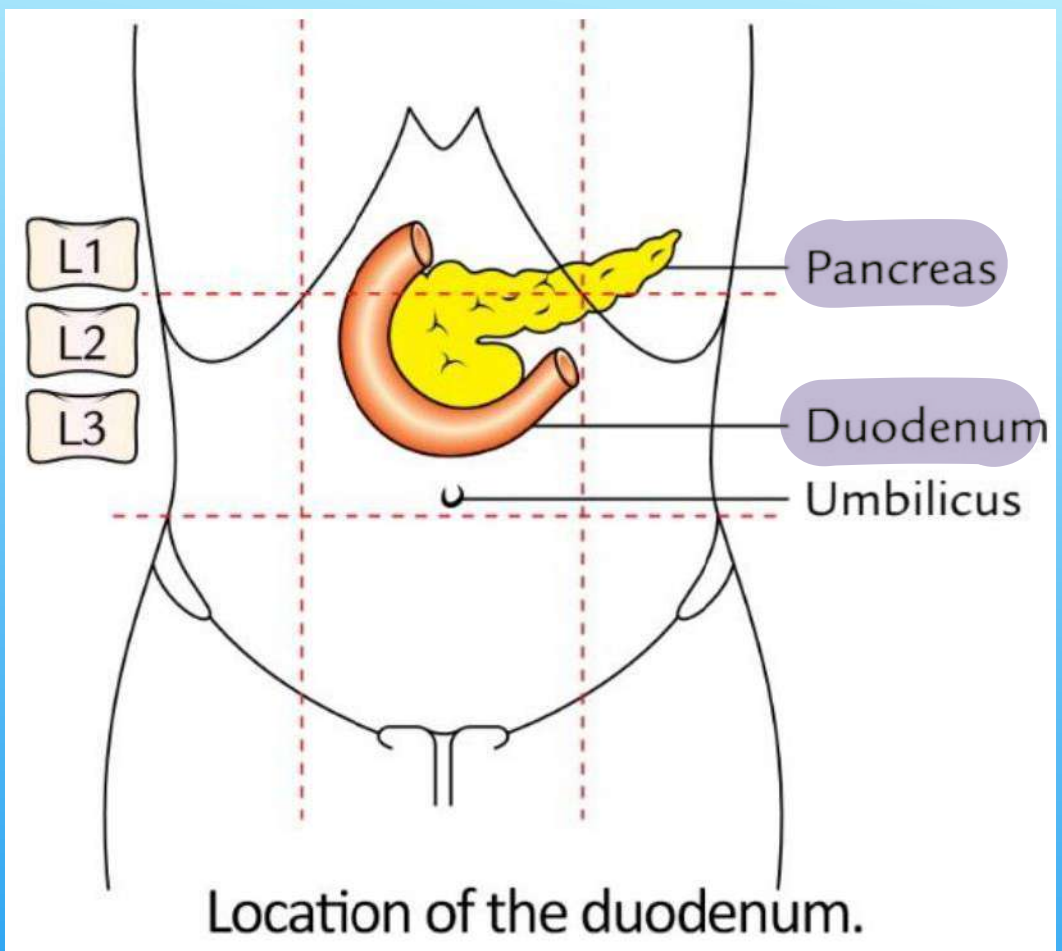


ال duct اللي جاي من فوق
ال liver مع duct يلي تحتها
بتجمعوا ب second part

برضو البنكرياس اله duct
لانه بيفرز مواد و انزيمات
هاضمة بتتجمع فيه.

- Bile duct + main pancreatic duct

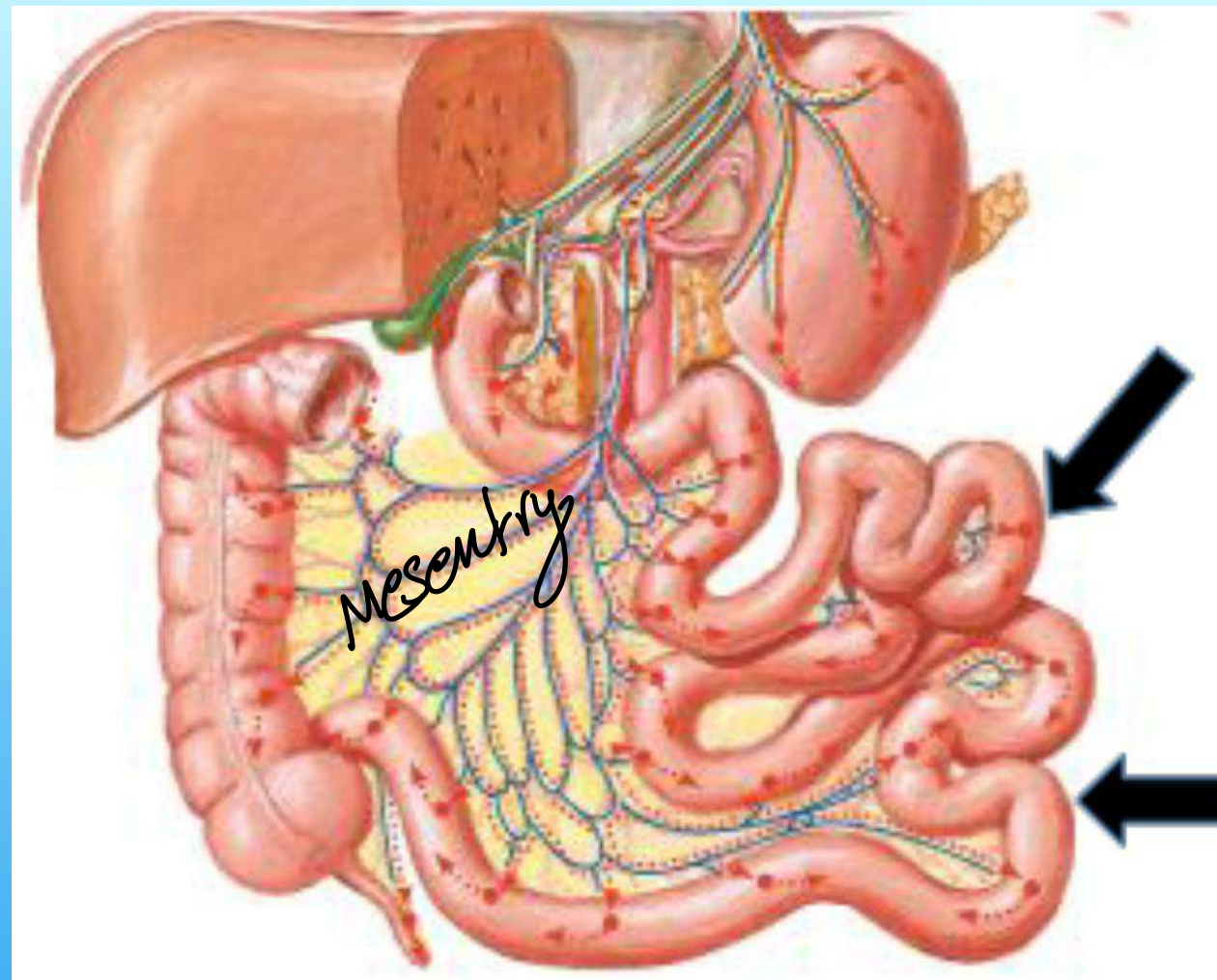
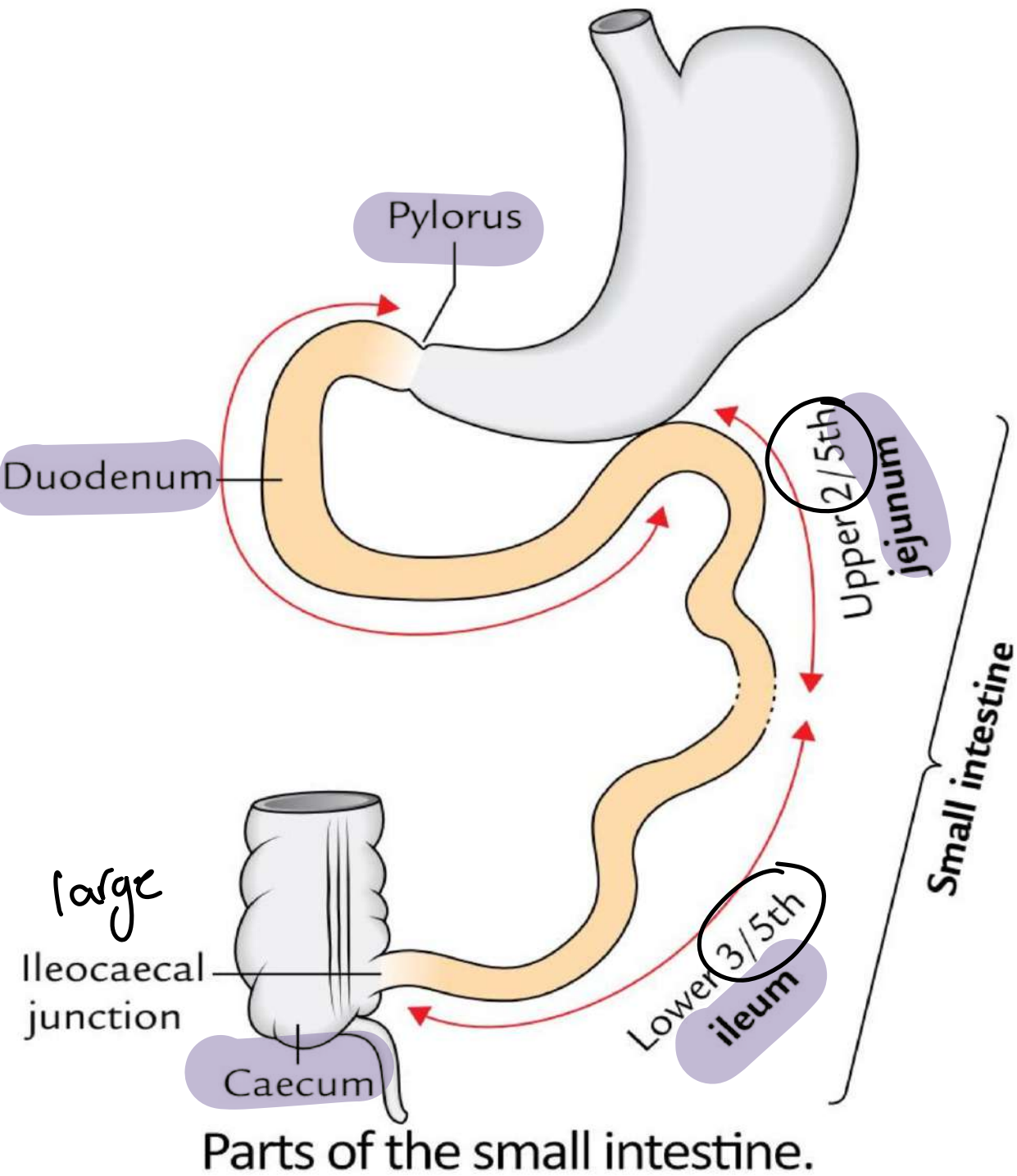
GIT TRACT



او ك بصير في حركة بس بضل ثابت ب
abdominal 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 $3/5$.
ileum > jejunum.
- The ileum opens in the Caecum. *الأعور.*
- They are freely mobile as they are completely covered by peritoneum and suspended by a peritoneal fold called mesentery.
الجزء اللي ماسك ب abdominal wall
ده اللي بيسمح حركة الامعاد الدقيقة براحتها لو كانت ثابتة رح نواجه مشكلة الأمعاء.
- The main function of small intestine is absorption of nutrients from digested food.



GIT TRACT

6. Large Intestine

- **Length:** about 1.5 m long and
- **Extensions:** from the caecum in the right iliac fossa to the anus in the perineum.
- **Functions:**

عشان تقلل من water content

1. Absorption of water from fluid contents in it to help form the feces.

ترطيب

2. Storage, lubrication, and expulsion of feces.

بتخزن الفضلات و ترطبها لانها لو

خشنة رح تجرح large intestine

عن طريق انها بتفرز

mucus

3. Synthesis of vitamin B complex by normal bacterial flora present its lumen.

4. Protection from invasion by microorganisms by its mucoid secretion which is rich in IgA group of antibodies.

GIT TRACT

- **Parts:** divided into the following **four** parts:

الزائدة الدودية

1. **Caecum and appendix.**

2. **Colon:** is further divided into four parts:

i. **ascending colon.**

ii. **transverse colon.**

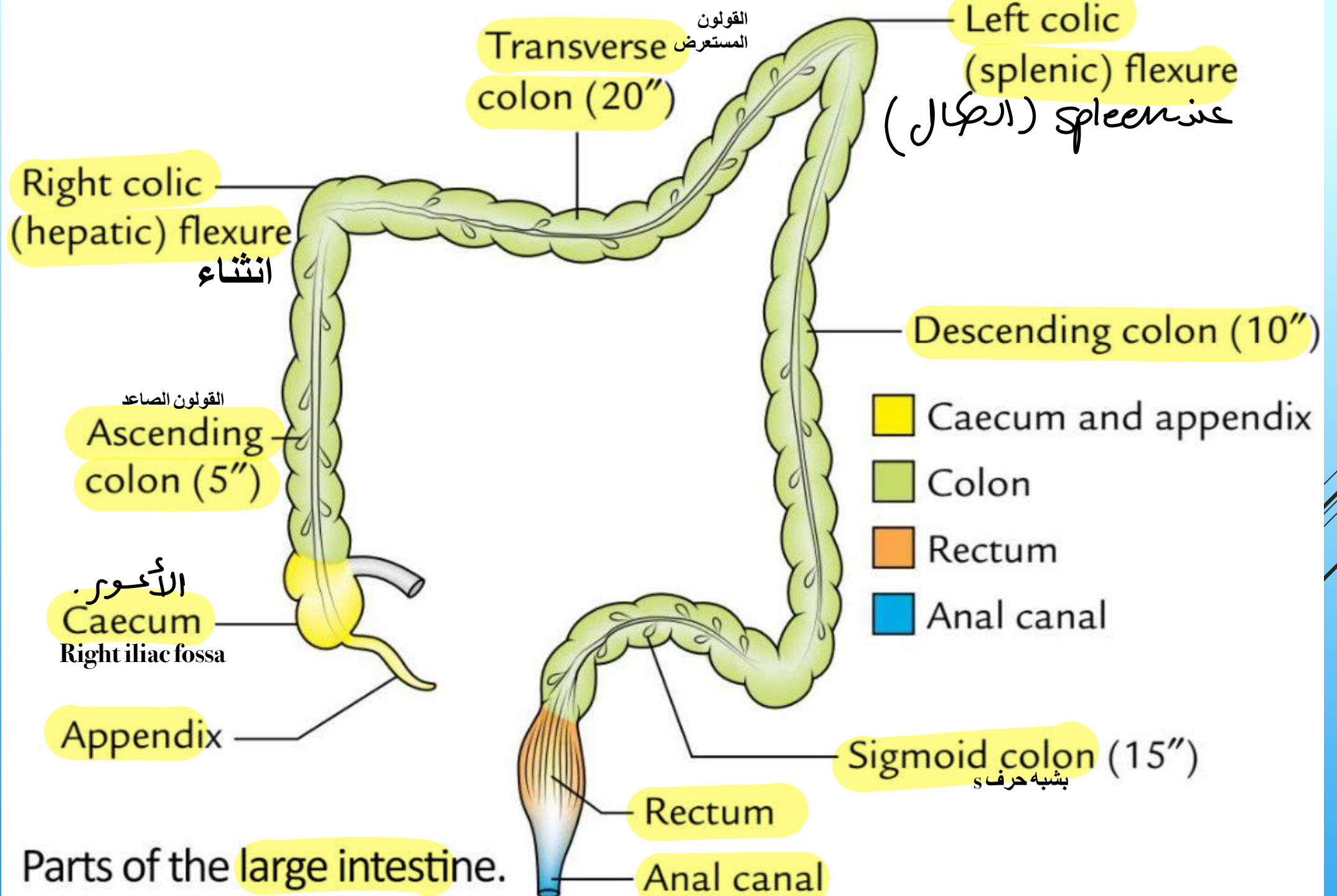
iii. **descending colon.**

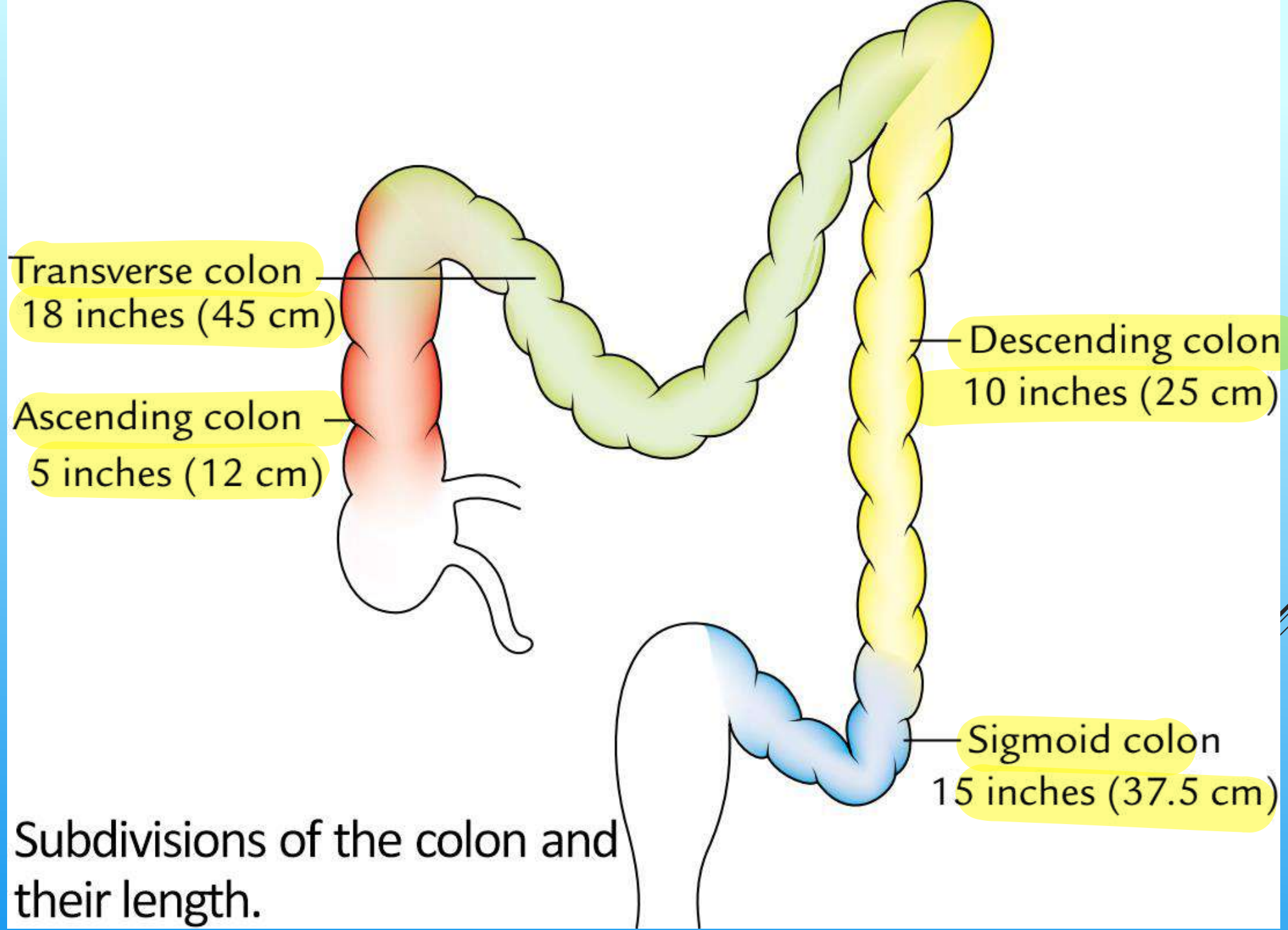
iv. **sigmoid colon**

3. **Rectum.** Waste products are stored here

لما يتعبى رح ينتفخ هاد الجزء ف
بحس بالشعور انه لازم يخرج
الفضلات هاي

4. **Anal canal.**



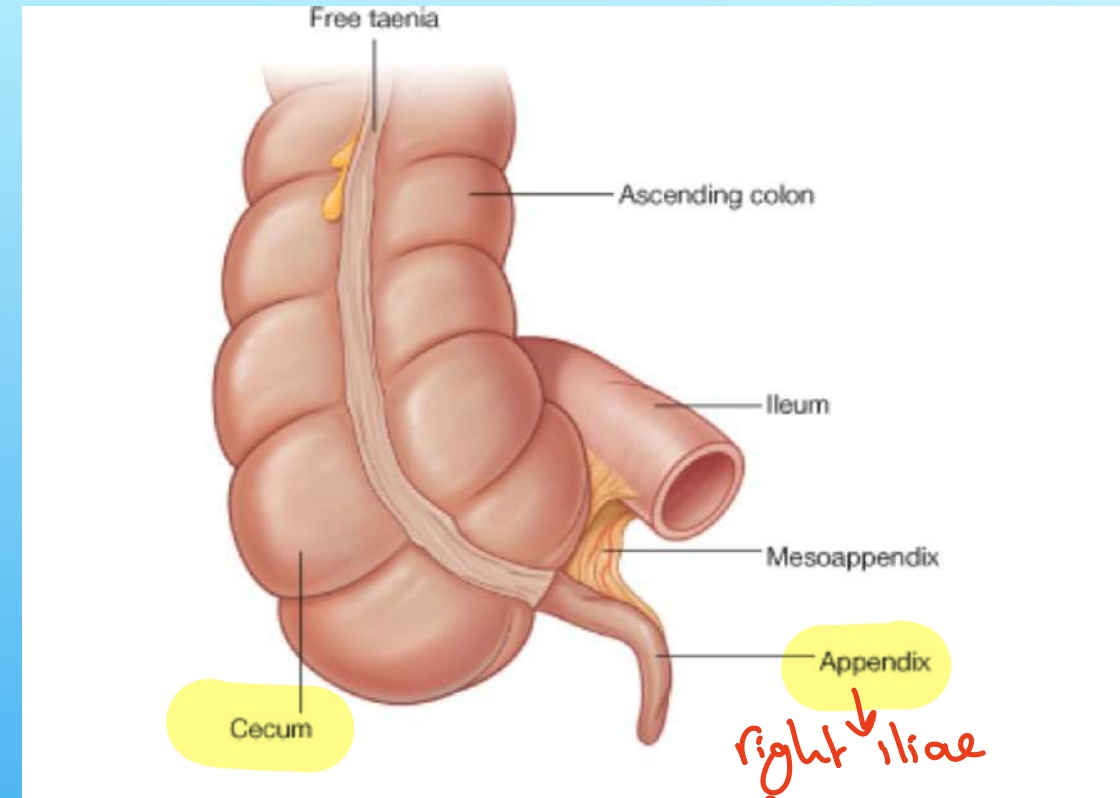


Subdivisions of the colon and their length.

GIT TRACT

1. Caecum:

- It is a **sac** which receives the ileum and opens in the ascending colon. *(The final part)*
- 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*



right iliac fossa.

GIT TRACT

2. Colon

i. Ascending colon:

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

ii. Transverse colon: ممسوك ب mesentry

- 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.

iii. Descending colon:

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

GIT TRACT

vi. Sigmoid colon (Pelvic colon):

- It extends from the end of descending colon, enters the **pelvis** and takes an S-shape.

اللفافة

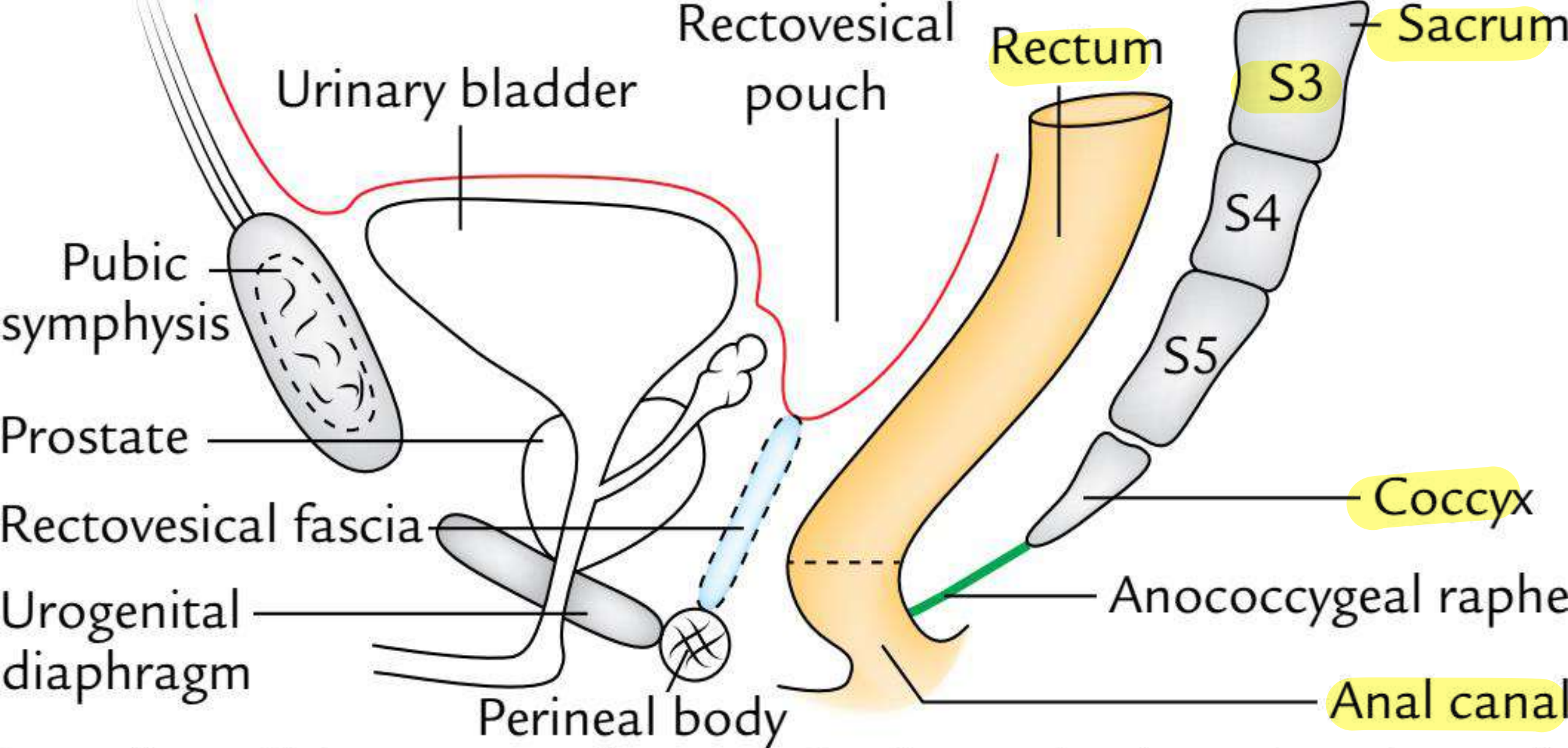
It ends in front of the 3rd sacral vertebra where the rectum begins.

3. Rectum:

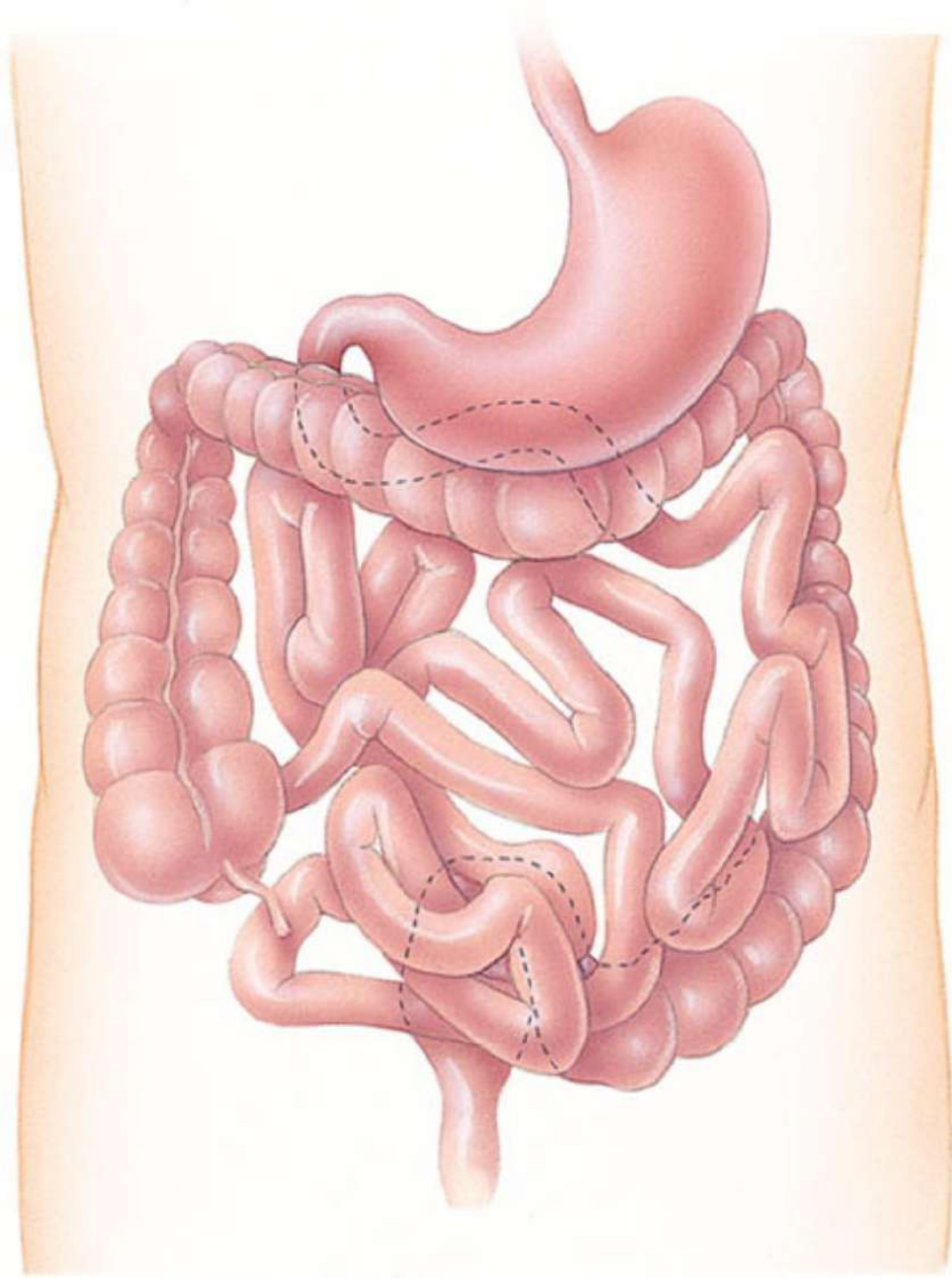
- It begins in front of the sacrum (at the level of 3rd sacral vertebra) and ends one inch in front and below the coccyx.

4. Anal canal:

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



Location of the rectum (as seen in the sagittal section through the male pelvis).



GIT TRACT

الها علاقة بالأجنة

Embryological basis of GIT

- The developing gut is divided from above downward into three parts: foregut, midgut, and hindgut.
الامامي الوسط الخلفي
- Each part has its own artery—a ventral branch of the abdominal aorta. → اكبر شريان طالع من القلب و ينزل لتحت في عنا abdominal & thoracic parts
 - The coeliac artery is the artery of foregut, Abdominal part has 3 branches
 - Superior mesenteric artery is the artery of midgut
 - Inferior mesenteric artery is the artery of hindgut
- The venous blood of the gut is drained by the portal vein.

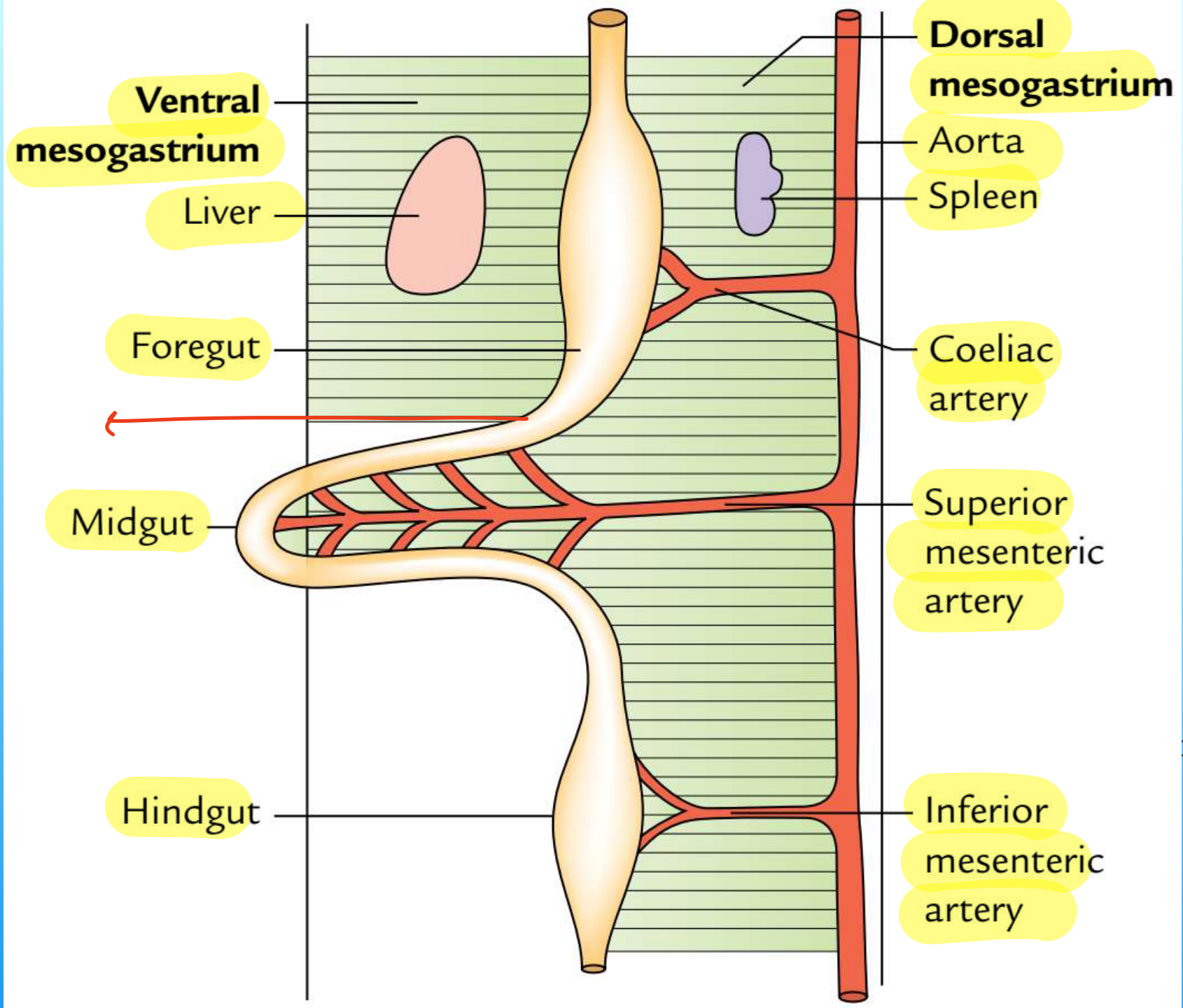
GIT TRACT

The derivatives of the foregut, midgut, and hindgut are given in table.

| Part | Derivatives | |
|---------|--|---|
| Foregut | ① Esophagus | ② Stomach |
| | ③ Upper half of the duodenum (up to the opening of common bile duct) | |
| Midgut | ① Lower half of the duodenum (distal to the opening of common bile duct) | |
| | ② Jejunum | ③ Ileum |
| | ④ Appendix | ⑤ Caecum |
| | ⑥ Ascending colon | ⑦ Right two-third of the transverse colon |
| Hindgut | ① Left one-third of the transverse colon | |
| | ② Descending colon | ③ Sigmoid colon |
| | ④ Rectum | ⑤ Upper part of the anal canal |
| | ⑥ | |

$\left(\frac{1}{3} \text{ left}, \frac{1}{3}, \frac{1}{3} \text{ right} \right)$

الكراف من



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

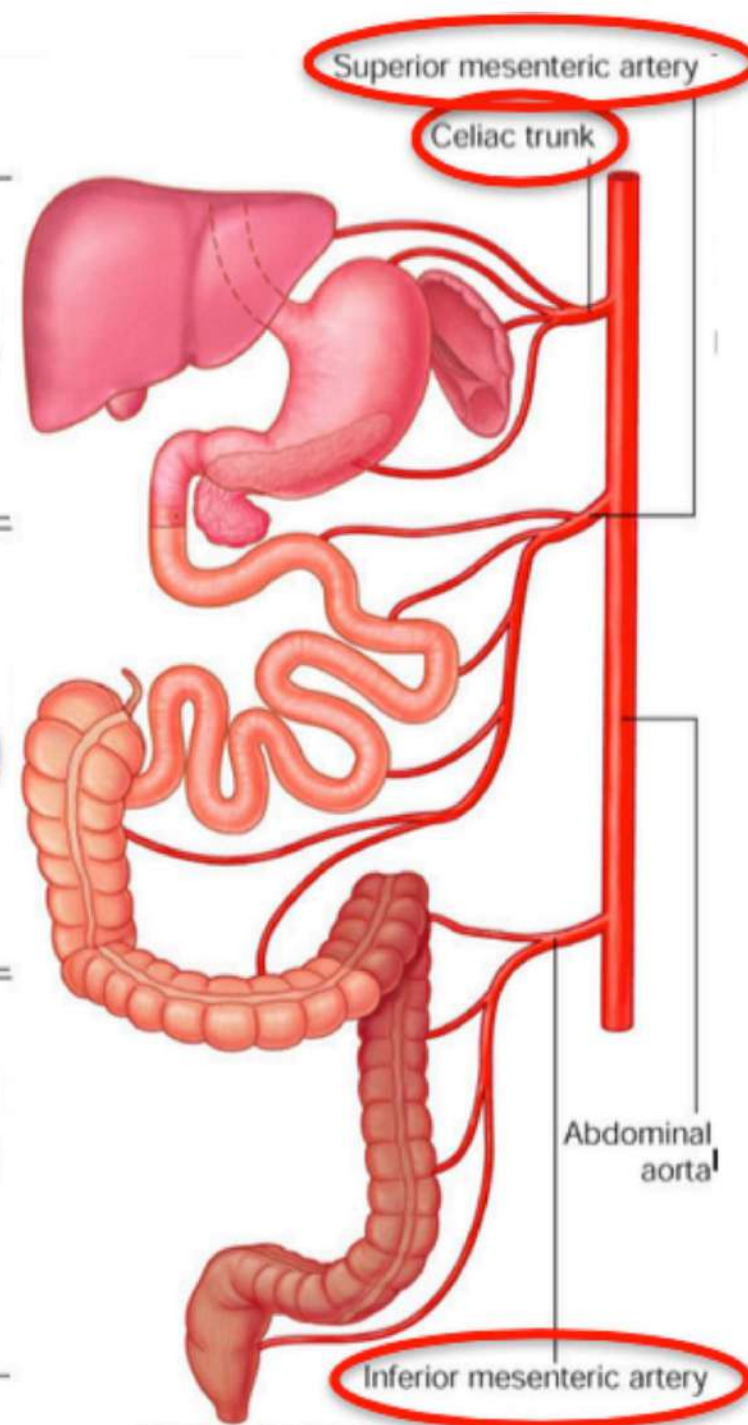
Foregut

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

Midgut

From distal 1/3 of transverse colon to rectum.

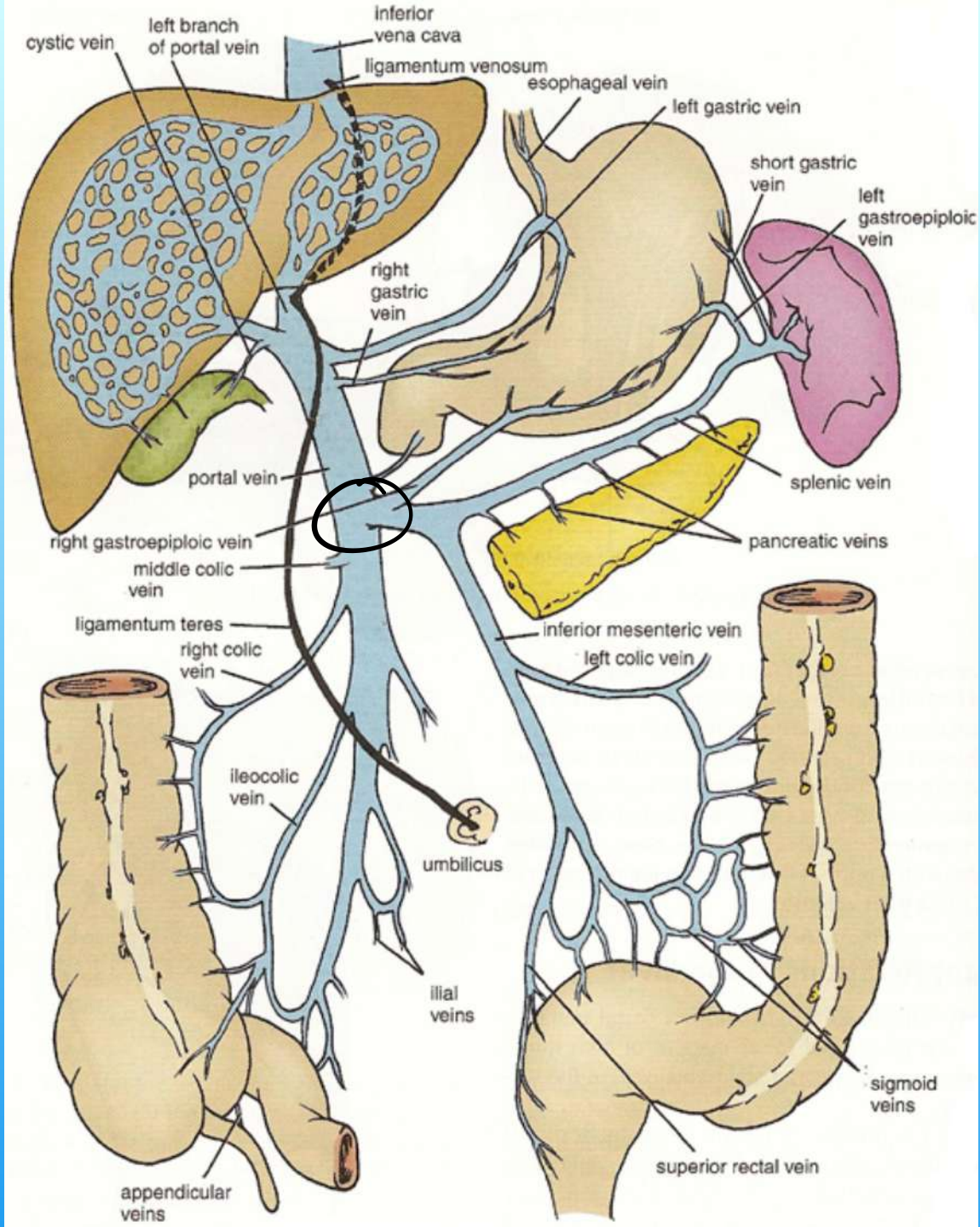
Hindgut



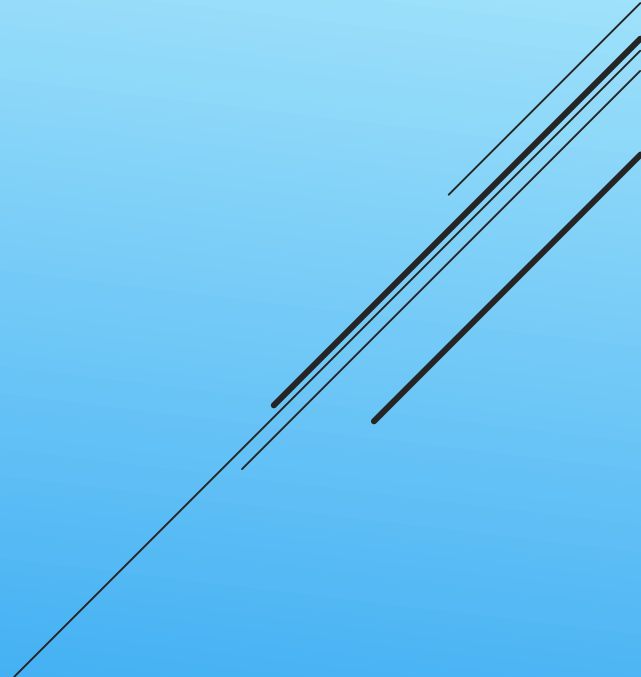


ارحجولها بس خالصا

Anatomy of liver !!



portal circulation:
(دورة الدم الكبدية)



عندنا الجسم عشان ياخذ التغذية،
اول اشى لازم نعرف انه الدم يلي حامل O_2 رح يروح ب artery،
اسهل طريقة انى اودي التغذية للجسم عن طريق vein ف عندي حاجة اسمها portal veins
بيعملوا drain of nutrients from intestines،
فى عنا برضو من spleen طالع splenic vein يتحدّ مع superior mesentric vein و
بيعطونى portal vein و هاي هي بداية circulation،
يروح بعدها portal vein لل liver يروح يتقسم واحد يروح لل RT lobe و واحد ل LT lobe
و يدخلوا جوا liver و بيعملوا اشى بيشبه الجيوب،
الدم يلي جاي من intestines رح يصب برضو ب portal vein بيحي ال liver يعملها
detoxification و لو فيها مثلاً drugs بعملهم activation يعنى بالمختصر بياخذ يلي بده
اياه و يلي ما بده اياه بطلعه

السؤال اللي بطرح نفسه!

الكبد بكل هاي العملية محتاج طاقة ف هو من وين رح يحصل عليها؟ من $C_6H_{12}O_6$ و O_2 ، هو اصلا
بيحتوي على غلوكوز بس بده اكسجين، رح ياخده من hepatic artery يلي اصلا فيه دم محتوي على
اكسجين.

فى الاخر خالص بتطلع العصارة الصفراوية bile يلي بستخدمها فى
الهضم و بتطلع من الجيوب و برضو بتطلع من hepatic ducts
فى عنا بالاخر هما متجمعين فى شبكة هي hepatic veins عشان يروح
يصب فى (IVC) inferior vena cava عشان تدخل الدم على
systemic circulation.

MAJOR DIGESTIVE GLANDS

Major digestive glands

الغدد اللعابية

1. Salivary glands

- These are accessory glands of digestion that produce saliva.
- The saliva acts as a solvent in cleaning the teeth and dissolving the food chemicals so that they can be tasted.
- The salivary glands can be classified into two types:
 1. Minor salivary glands → mouth
 2. Major salivary glands
- The minor salivary glands are located in the mucous membranes of palate, cheeks and lips and they produce small quantity of saliva.

MAJOR DIGESTIVE GLANDS

Major salivary glands: they lie outside the oral cavity

1. **Parotid**
2. **Submandibular** → mandibular
3. **sublingual** → كَبَدِ اللِّسَانِ

The parotid gland is largest and located below and in front of the external ear.

The parotid duct opens into the vestibule of mouth opposite the second upper molar tooth.

MAJOR DIGESTIVE GLANDS

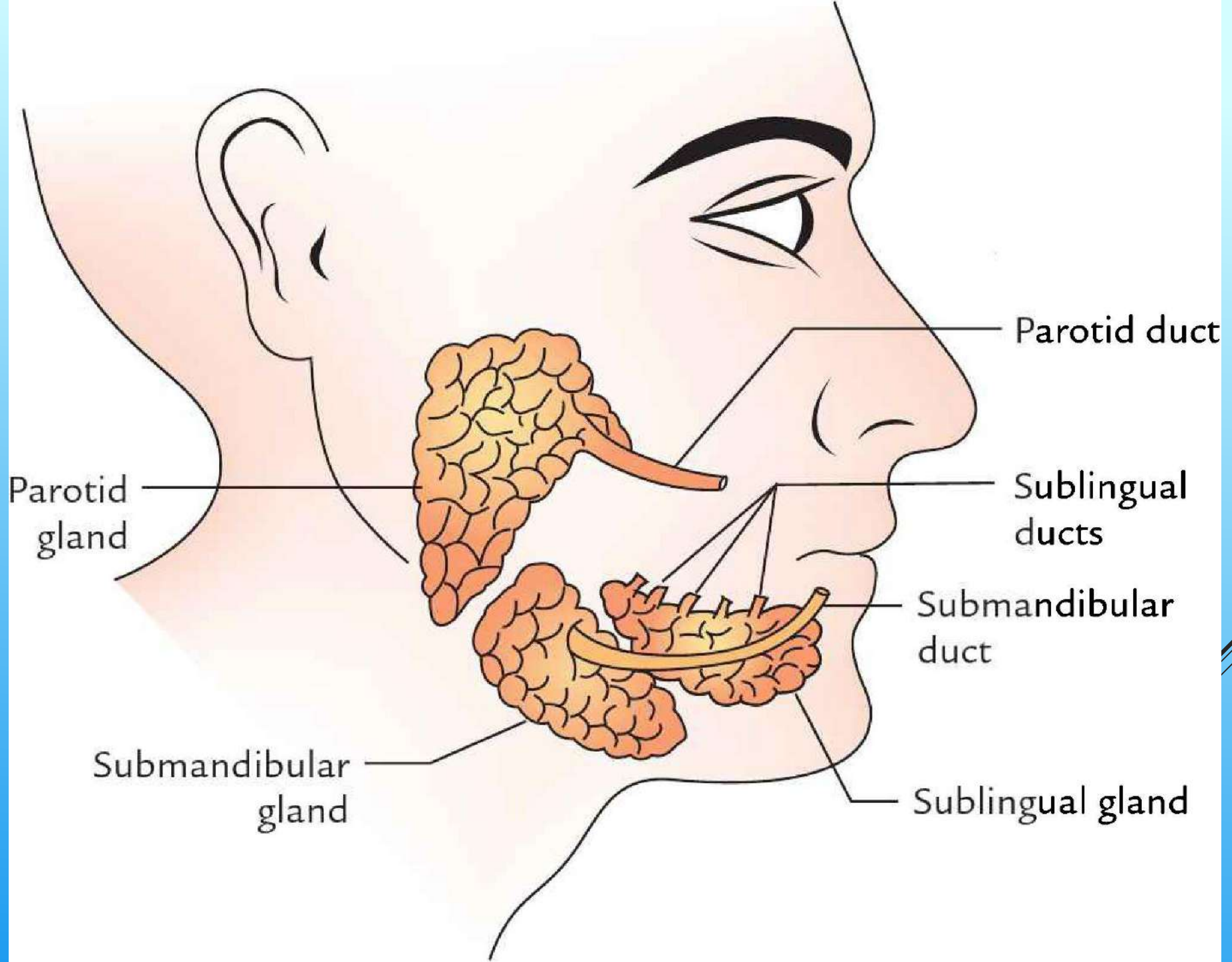
The **submandibular gland** is located inside and below the mandible.

The **submandibular duct** opens in the **floor of oral cavity proper onto a papilla on the side of root of frenulum of tongue** behind the lower incisor teeth.

The **sublingual gland** lies underneath the mucosa of the floor of mouth on the side of the tongue.

قعر اللسان

The **sublingual ducts**, several in number and small, **open into the floor of mouth.**



MAJOR DIGESTIVE GLANDS

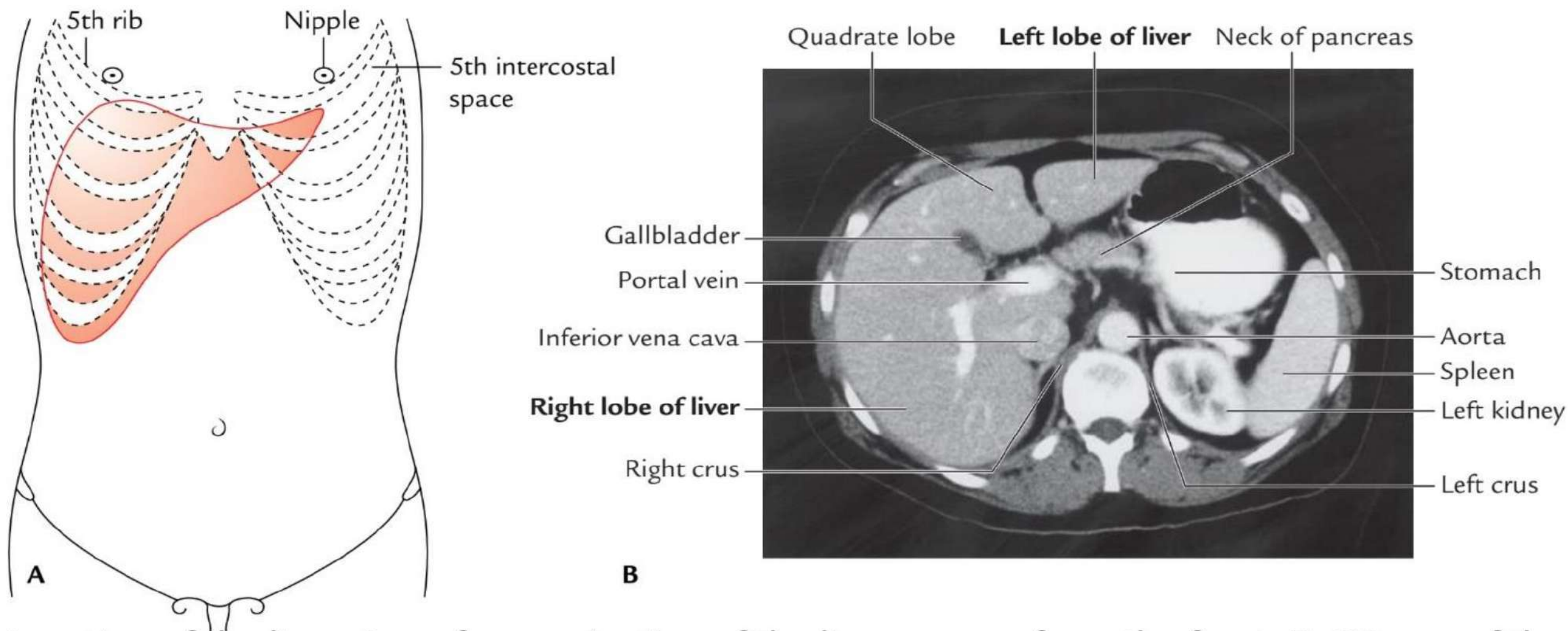
2. Liver

The liver is the largest gland of the body. It consists of both exocrine and endocrine parts.

Location: حسب اللي حسب طناه فرقة.

- The right hypochondrium.
- Upper part of the epigastrium.
- Part of the left hypochondrium.

MAJOR DIGESTIVE GLANDS



Location of the liver: A, surface projection of the liver as seen from the front; B, CT scan of the abdomen showing the location of the liver.

MAJOR DIGESTIVE GLANDS

- Functions:

إفراز الصفراء

1. It secretes bile and stores glycogen.

يأخذ الجلوكوز و يحوله ل غلايكوجين و لما الجسم يكون بحاجة السكر بيروح بيحطم الغلايكوجين بعملية .glycogenolysis

مثل albumin
البروتينات في الدم

2. It synthesizes the serum proteins and lipids.

3. It detoxifies blood from endogenous and exogenous substances (toxins, drugs, alcohol, etc.) that enter the circulation.

خلايا الدم (Blood cells) .

4. It produces hemopoietic cells of all types during fetal life.

أثناء المرحلة الجنينية .
بدون يبي يتكون Blood cells
عظم نخاع . Bone marrow

MAJOR DIGESTIVE GLANDS

- **Shape:** wedge shaped and resembles a four-sided pyramid lies on one side with its

شکل هروی یا له اربع حواف.

base directed towards the **right** and apex directed towards the **left**.

- **Weight:** It is $1/50$ of body weight of the adult (about **1.5 kg**).

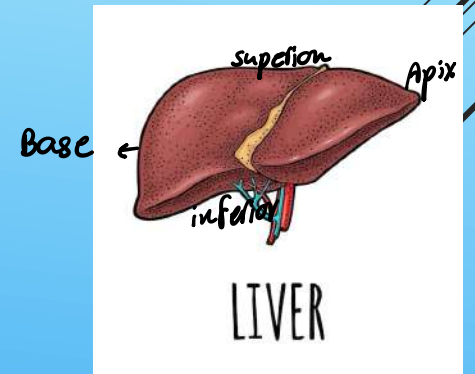
- **Color:** red-brown in colour. بني محمر

- **External features:** The liver presents;

1. **Diaphragmatic surface**

2. **Visceral surface.** (*inferior surface*)

3. **One well-defined border, inferior border.**



Diaphragmatic surface

Related to the diaphragm

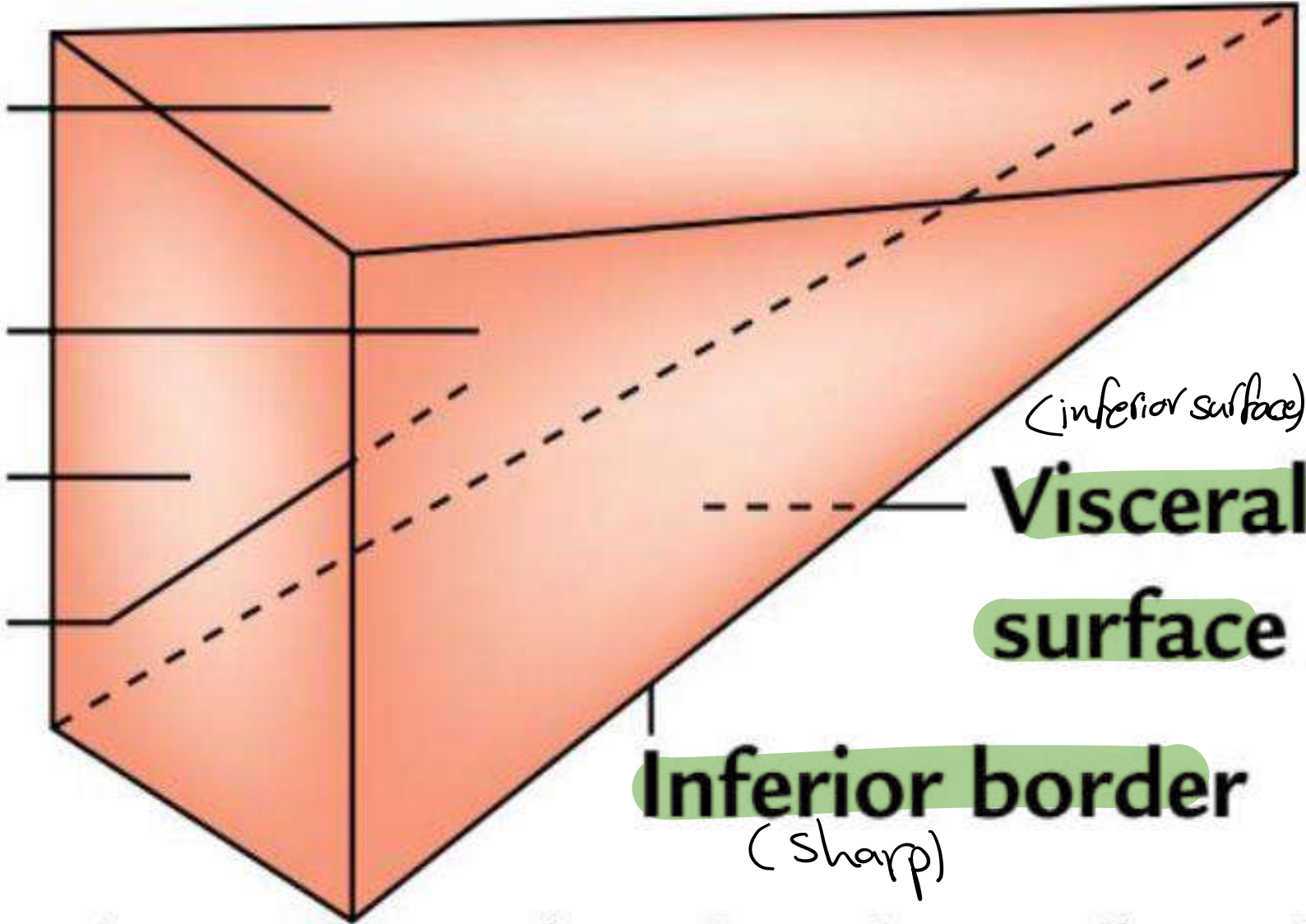
surface

Superior

Anterior

Right lateral

Posterior



Schematic diagram to show shape (wedge shaped) and surfaces of the liver.

MAJOR DIGESTIVE GLANDS

1. Diaphragmatic Surface

□ **Shape:** convex and extensive dome-shaped.

□ **Subdivision:** superior, anterior, right lateral, and posterior surfaces, but there is no distinct demarcation between these surfaces

جای سبب الرقبه

④

①

②

③

2. Visceral Surface (Inferior Surface)

→ Related to the viscera (الاحشاء)

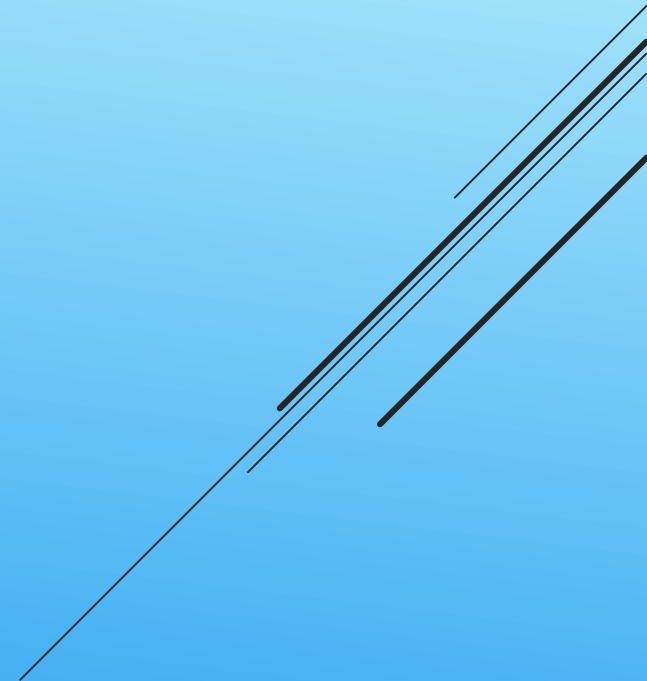
□ **Shape:** relatively flat or concave.

□ **Features:**

a. Fossa for the gallbladder.

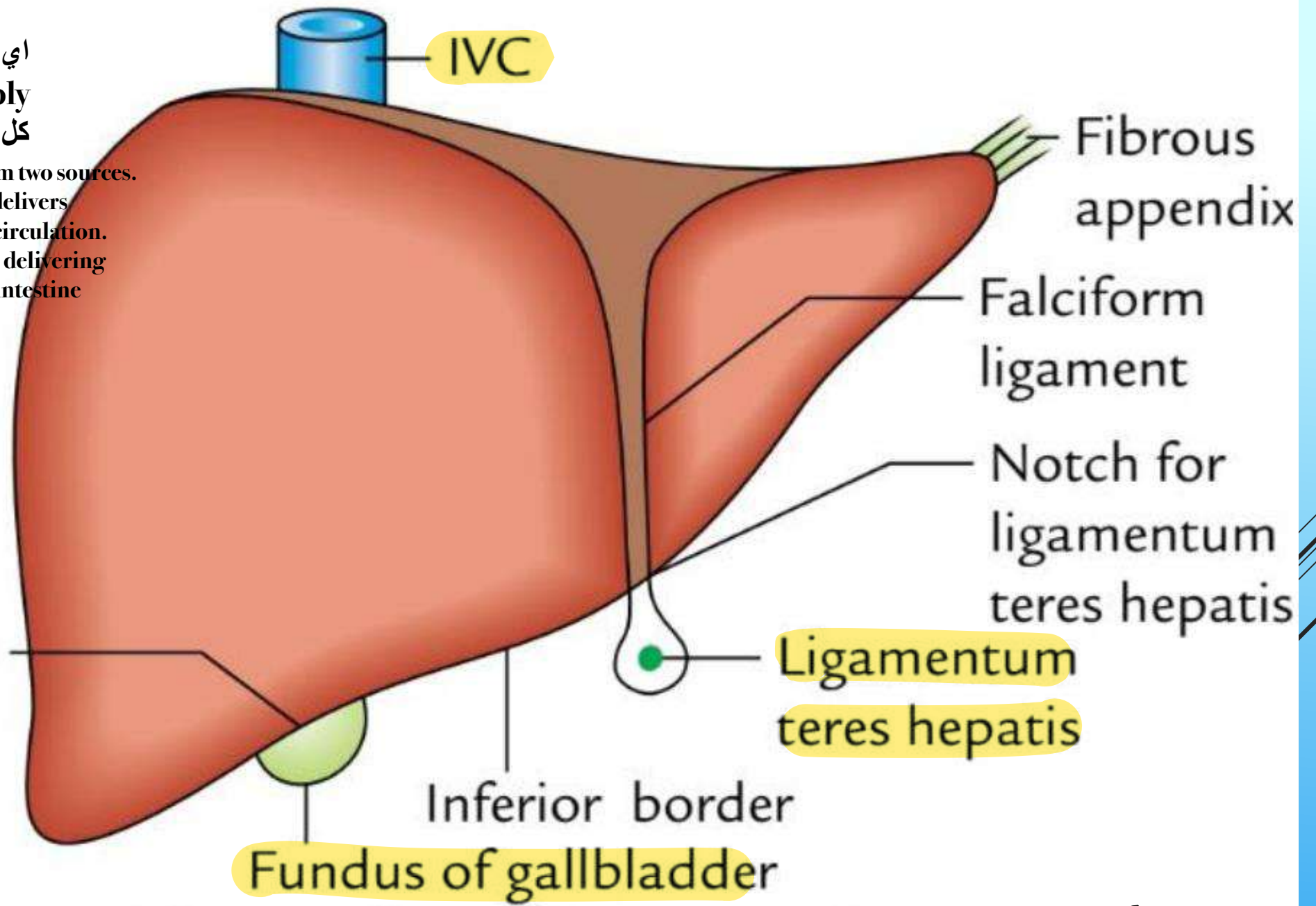
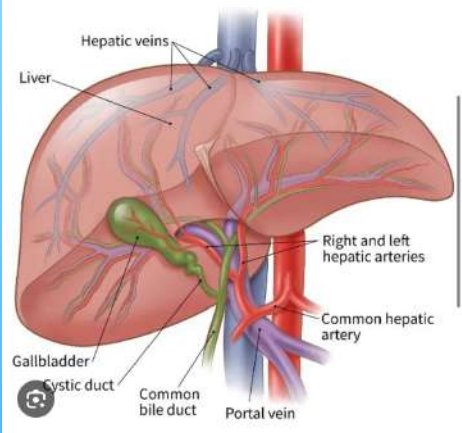
b. Fissure for the ligamentum teres

c. Porta hepatis (Blood supply)



اي organ في الجسم لازم يكون اله
 blood supply عشان يتوزع في
 كل organ
 (استوي خارجي بين الدم)

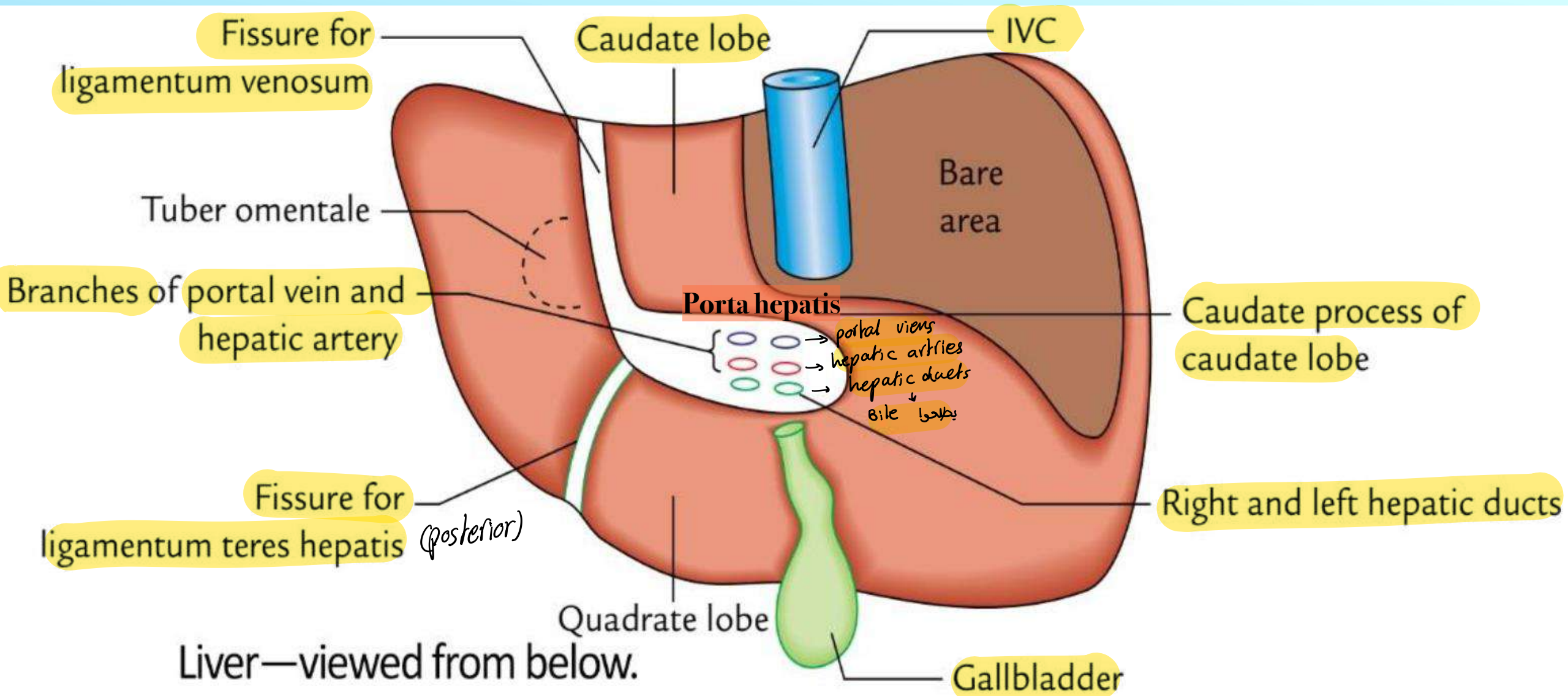
The liver receives a blood supply from two sources.
 The first is the hepatic artery which delivers
 oxygenated blood from the general circulation.
 The second is the hepatic portal vein delivering
 deoxygenated blood from the small intestine
 containing nutrients.



Liver—viewed from the front.

من الأمام

MAJOR DIGESTIVE GLANDS

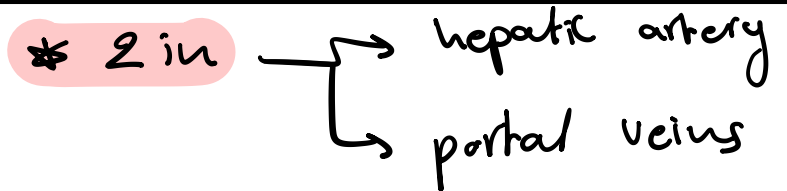


The liver has 3 blood supply:

2 in , 1 out |

porta hepatis contains 3 parts:

- 1- portal veins
- 2- hepatic artery
- 3- hepatic ducts → Bile منقح (الدخارة الحفرارية).



1 out → hepatic vein

طاسق انه في اتان جاب duct excretion
(hepatic ducts) Bile منقح

MAJOR DIGESTIVE GLANDS

- Lobes of the liver

1. Anatomical Lobes

a. On the diaphragmatic surface: the falciform ligament divided the liver into right and left lobes. The right lobe is approximately six times larger than the left lobe.

b. On the visceral surface: the fissures and fossae present on this surface and form an H-shaped fissure divided the liver into four lobes:

1) ^{large} Right lobe: on the right of the fossa for gallbladder.

2) ^{small} Left lobe: on the left of the fissures for ligamentum teres and ligamentum venosum.

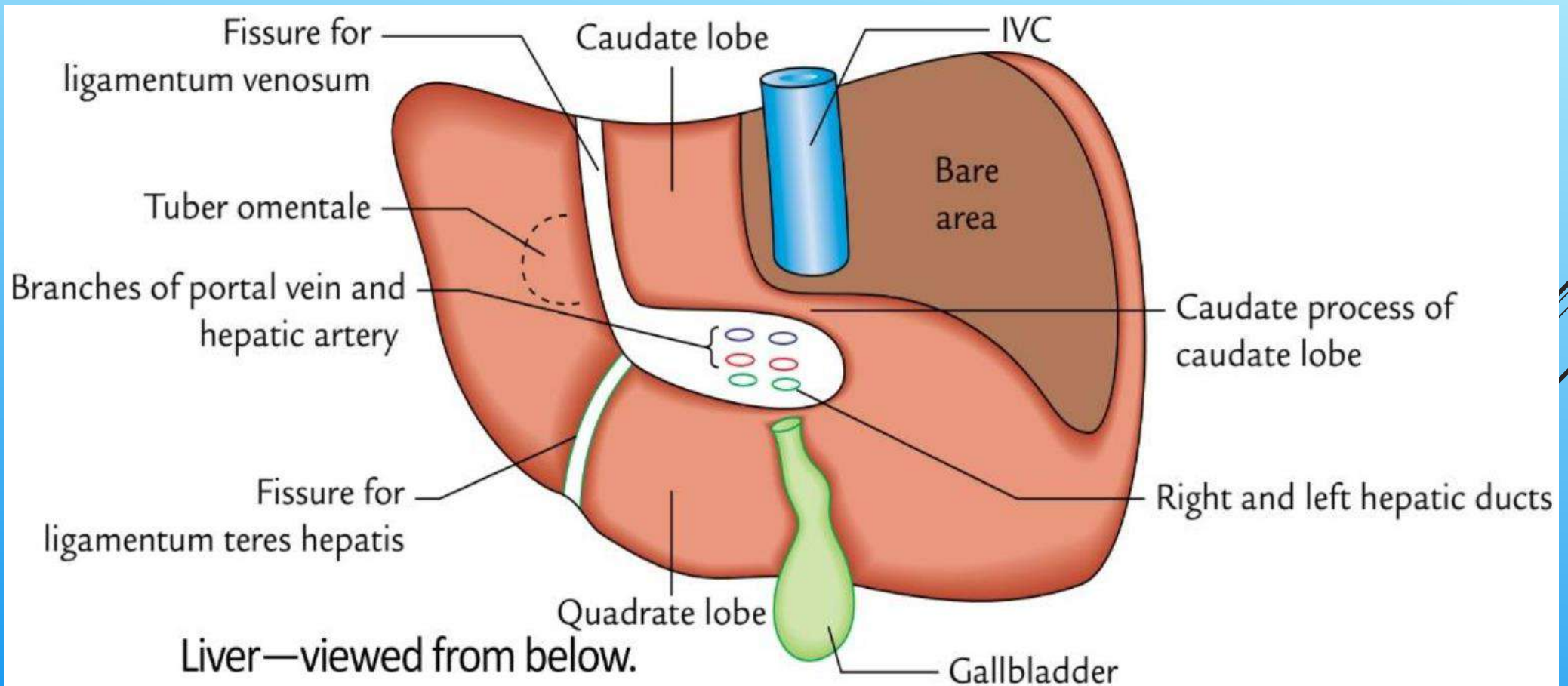
1 + 2 → Anterior surface.

3+4 → posterior surface

MAJOR DIGESTIVE GLANDS

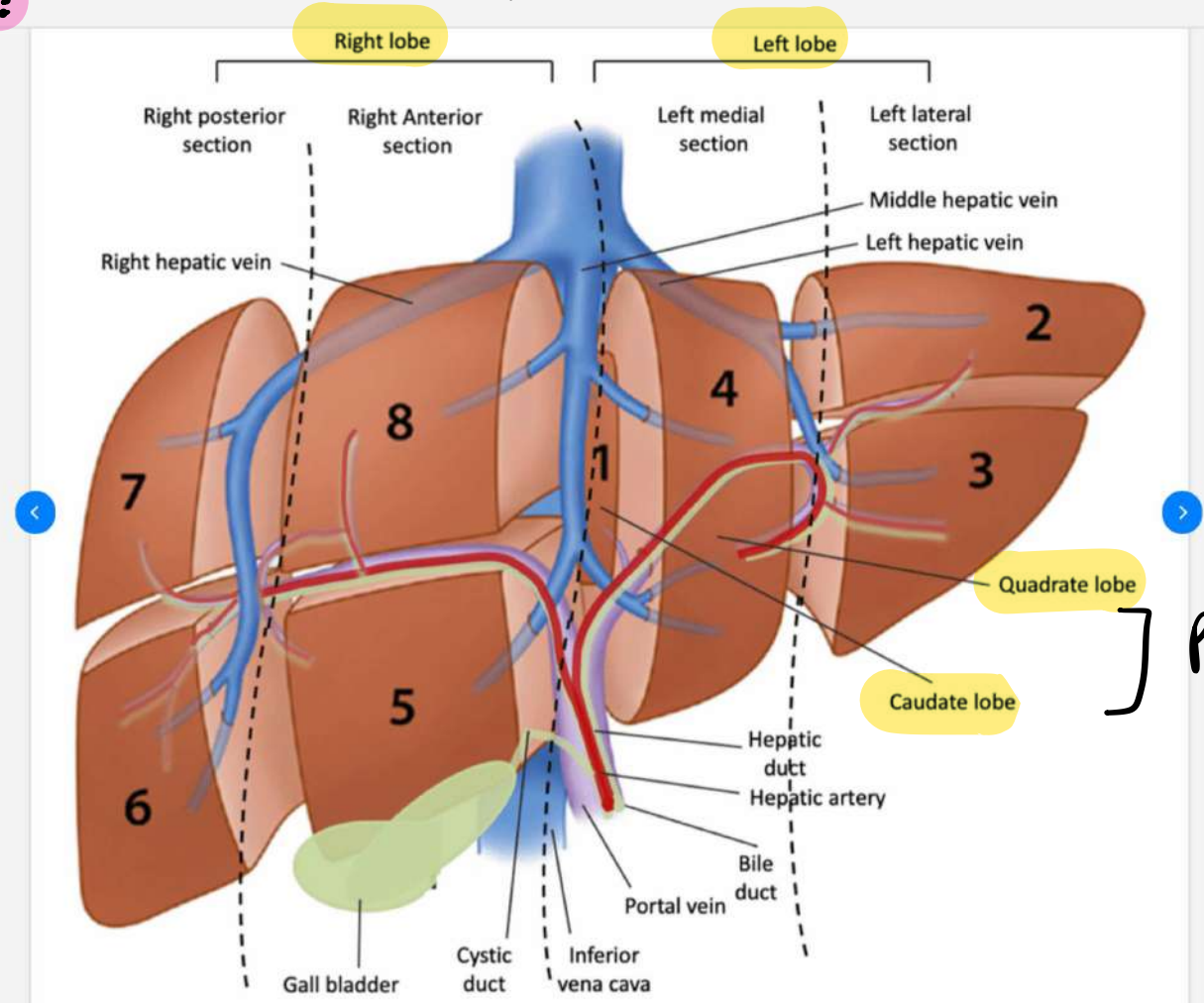
3) **Quadrato lobe:** between the fossa for gallbladder and the fissure for ligamentum teres below the porta hepatis.

4) **Caudate lobe:** between the groove for IVC and the fissure for ligamentum venosum above the porta hepatis.



Anatomical lobes of liver :

Anterior surface

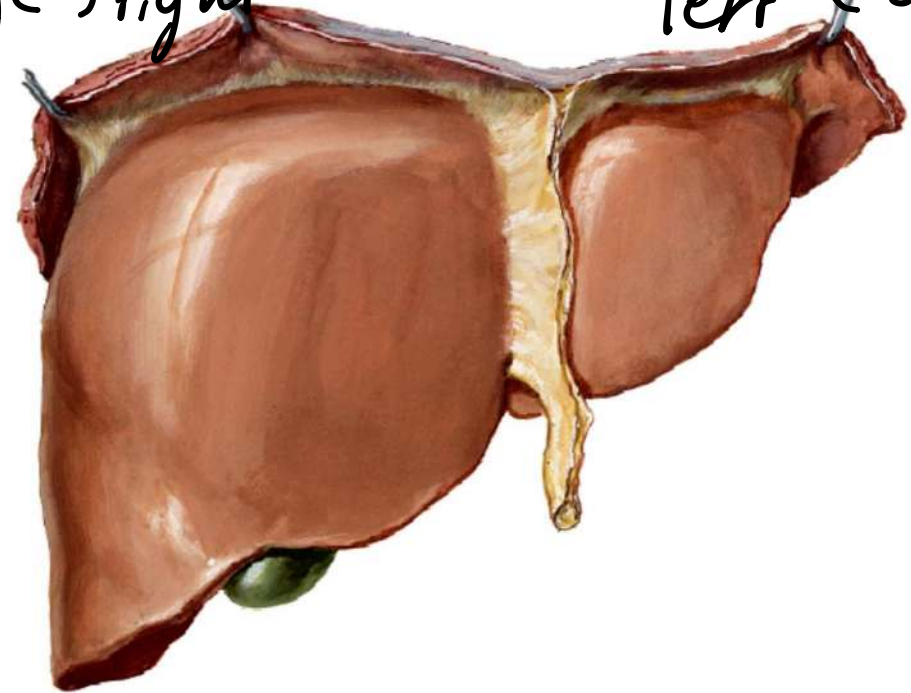


posterior surface

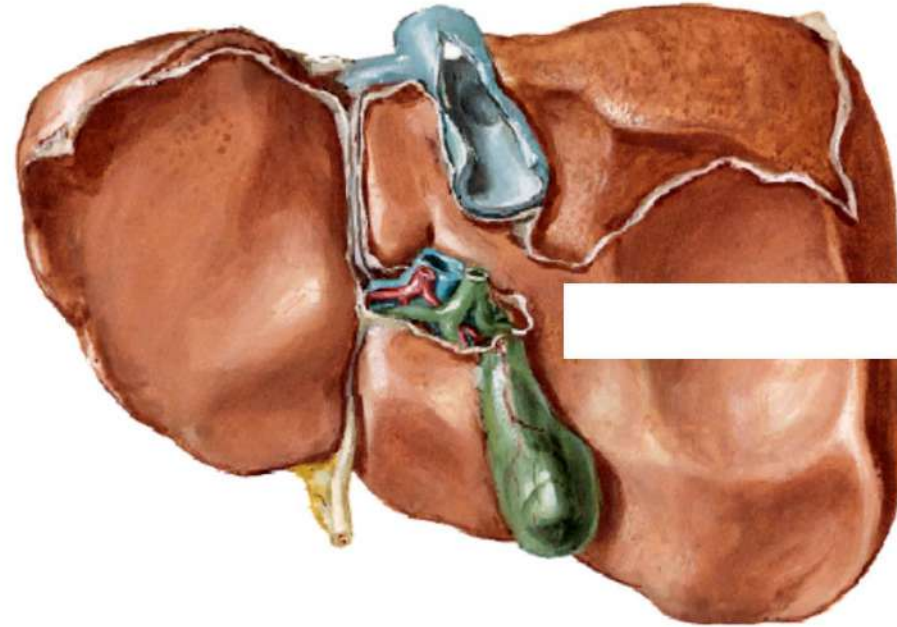
Anatomy of liver. Adapted from Orcutt et al. [29].

(large) right

left (small)



→ Anterior surface



→ posterior surface

MAJOR DIGESTIVE GLANDS

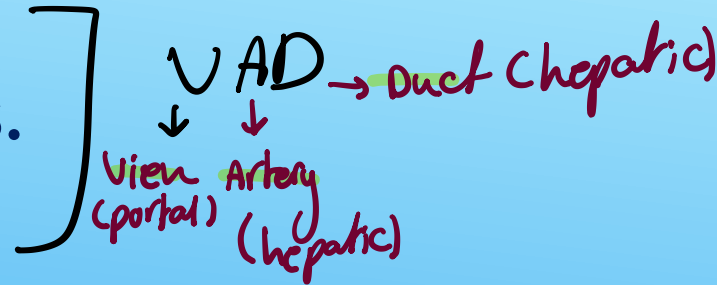
Porta hepatis: *foot of liver* (الشرة تاعت اللبد)

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.

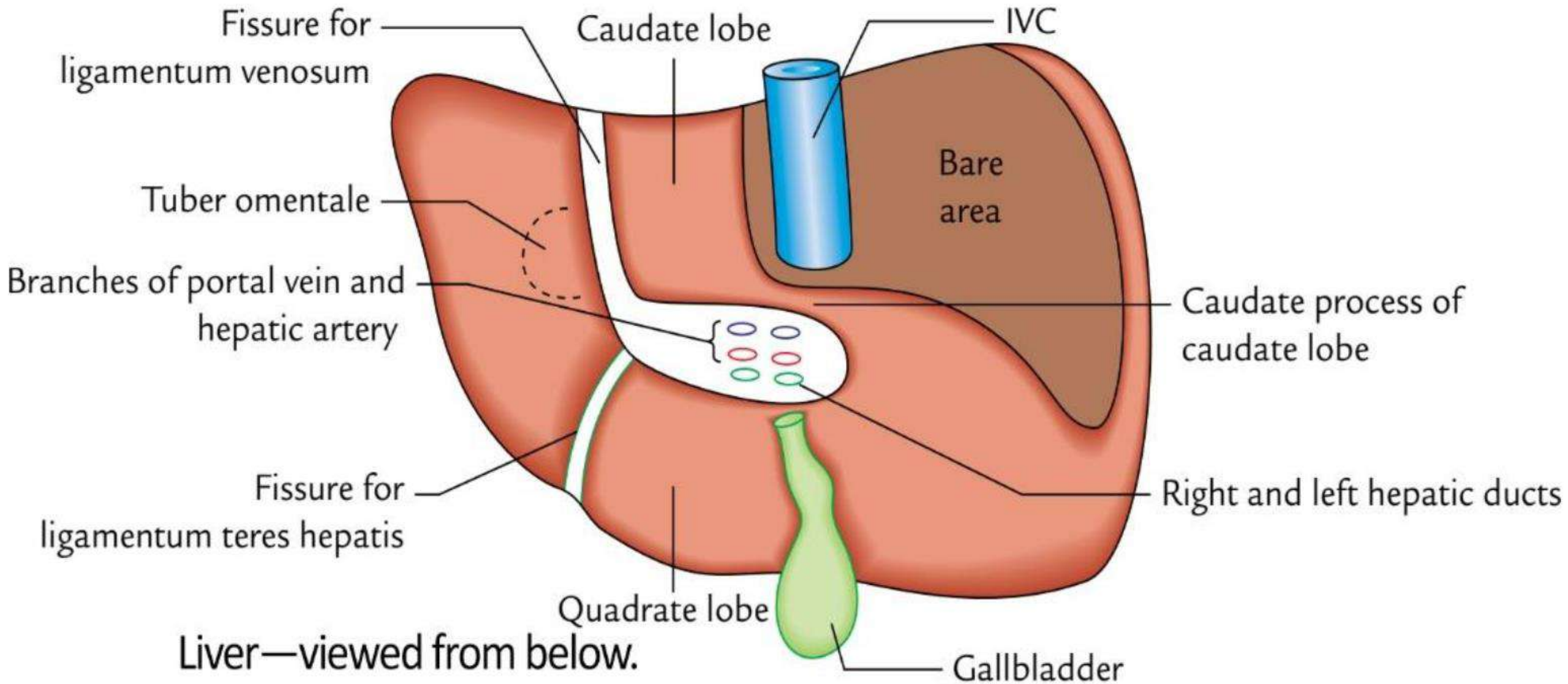


Blood supply of the liver:

1. Rt. & Lt. Hepatic arteries. RT → Right
LT → left
2. Rt. & Lt. Portal veins.
3. Right & left hepatic veins which drain into I.V.C.

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

MAJOR DIGESTIVE GLANDS

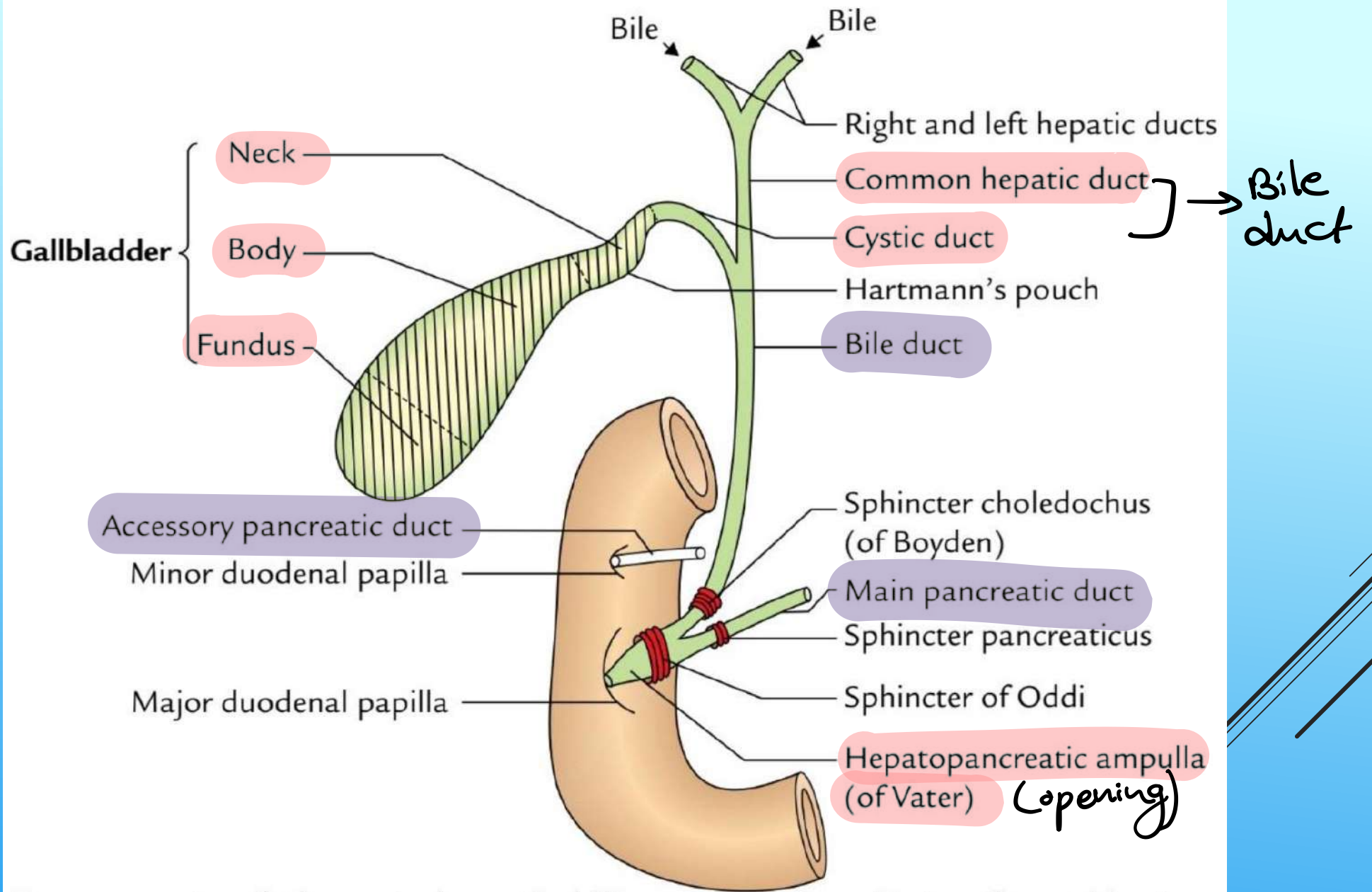


MAJOR DIGESTIVE GLANDS

3. Biliary system → related to the Bile

This system includes:

1. Right and Left hepatic ducts.
2. Common hepatic duct. (RT + LT) بينقلوا bile وبتجمع ب gallbladder عشان تخزنها للتجنب انها تضلها تنزل القاع
3. Gall bladder formed of 3 parts; fundus, body and neck. كيس المرارة
The neck gives rise to cystic duct. →
4. Bile duct : formed by the union of Common hepatic duct and cystic duct ^② Cystic & common > bile duct ^①



Components of the extrahepatic biliary apparatus. Note: the sphincters around hepatopancreatic ampulla and terminal parts of the bile, and main pancreatic ducts.

MAJOR DIGESTIVE GLANDS

4. Pancreas → Gland (endocrine + exocrine)

A mixed endocrine and exocrine gland.

It lies across the posterior abdominal wall from duodenum to spleen.

endocrine → Insulin
exocrine → digestion enzymes.

It is formed of 4 parts:

1. Head.

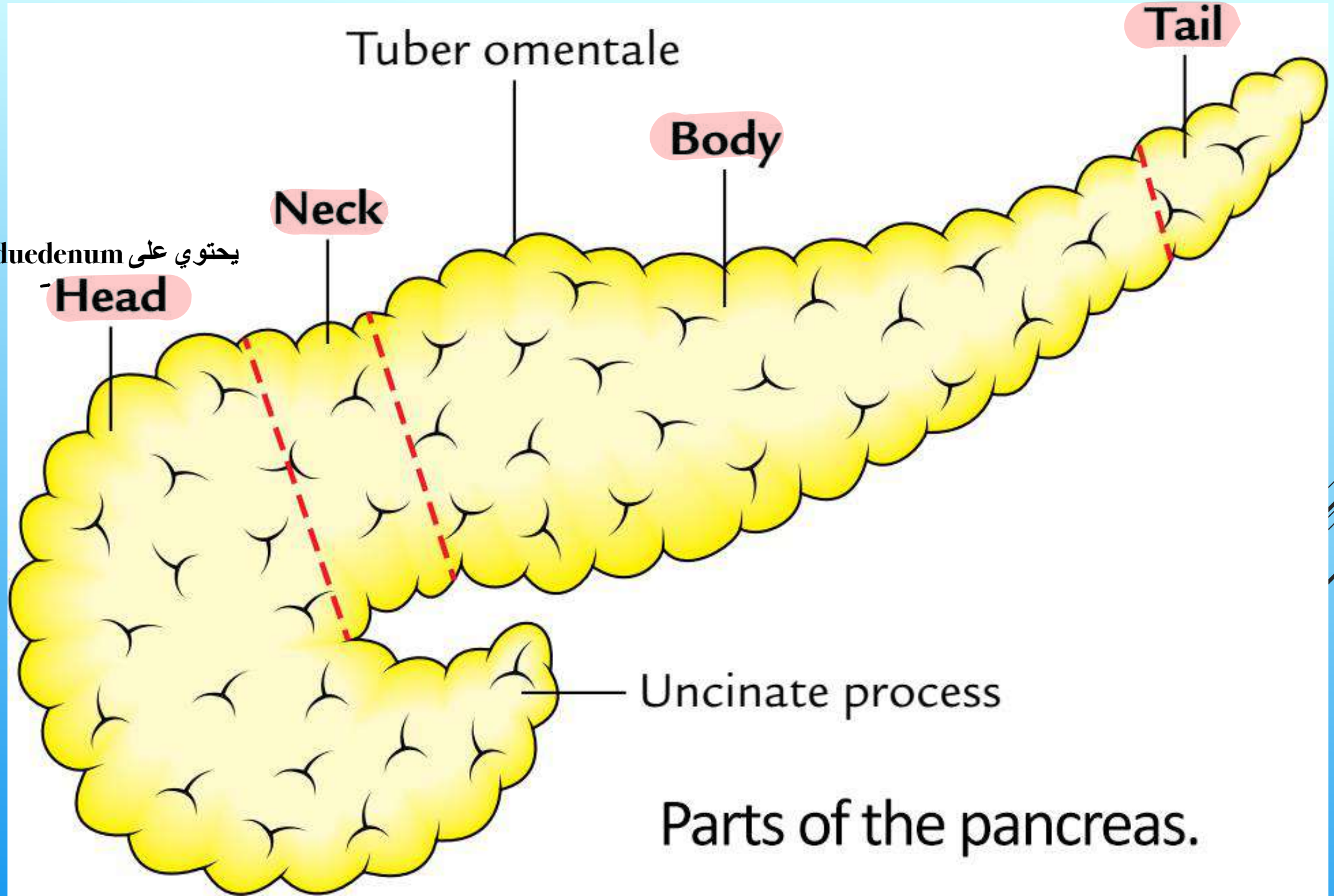
2. Neck.

3. Body.

4. Tail.

Runs through it the main pancreatic duct which joins the bile duct to form the hepatopancreatic ampulla of Vater which opens in the duodenum.

concavity of duodenum يحتوي على



Head

Neck

Tuber omentale

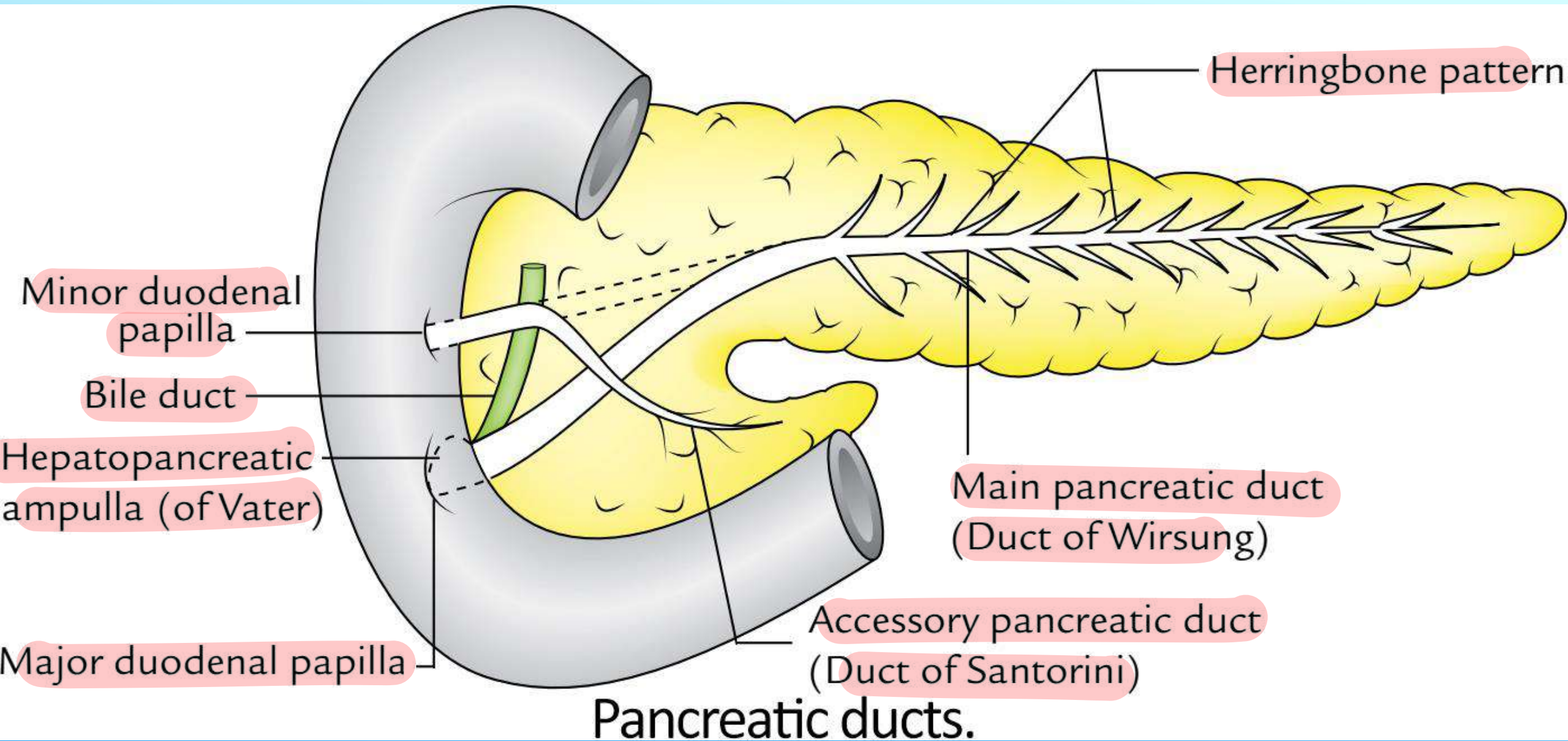
Body

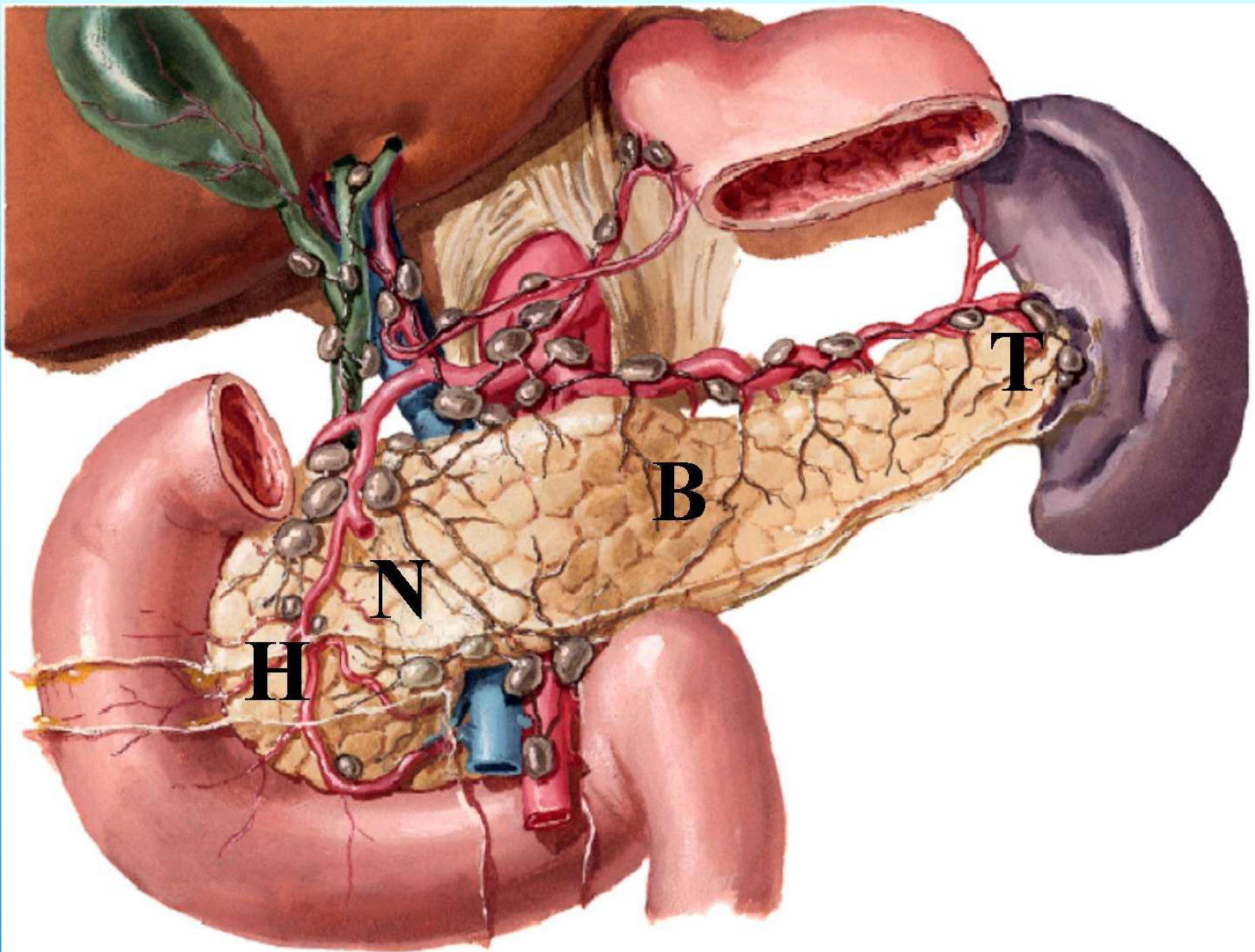
Tail

Uncinate process

Parts of the pancreas.

MAJOR DIGESTIVE GLANDS



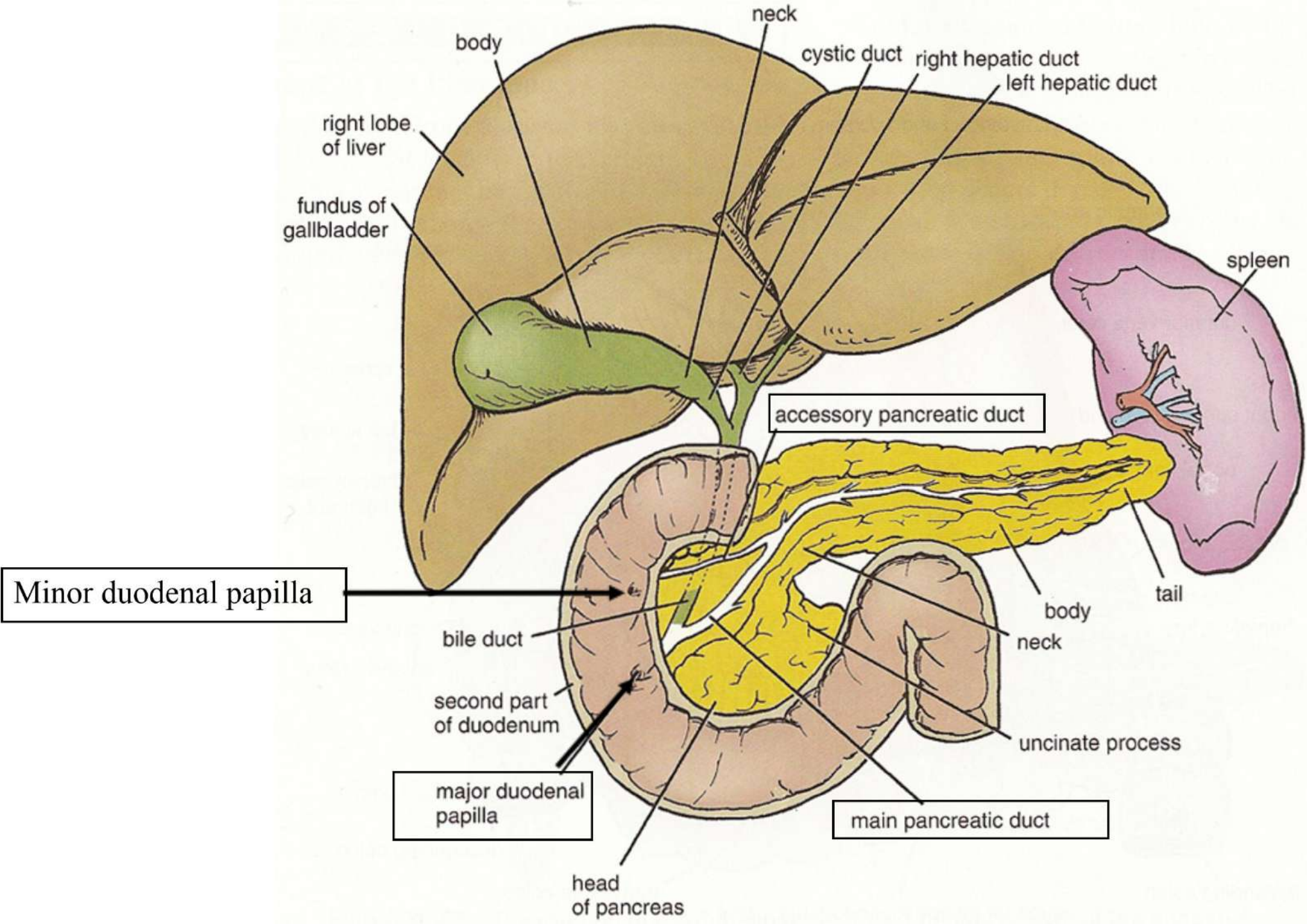


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شکرا

