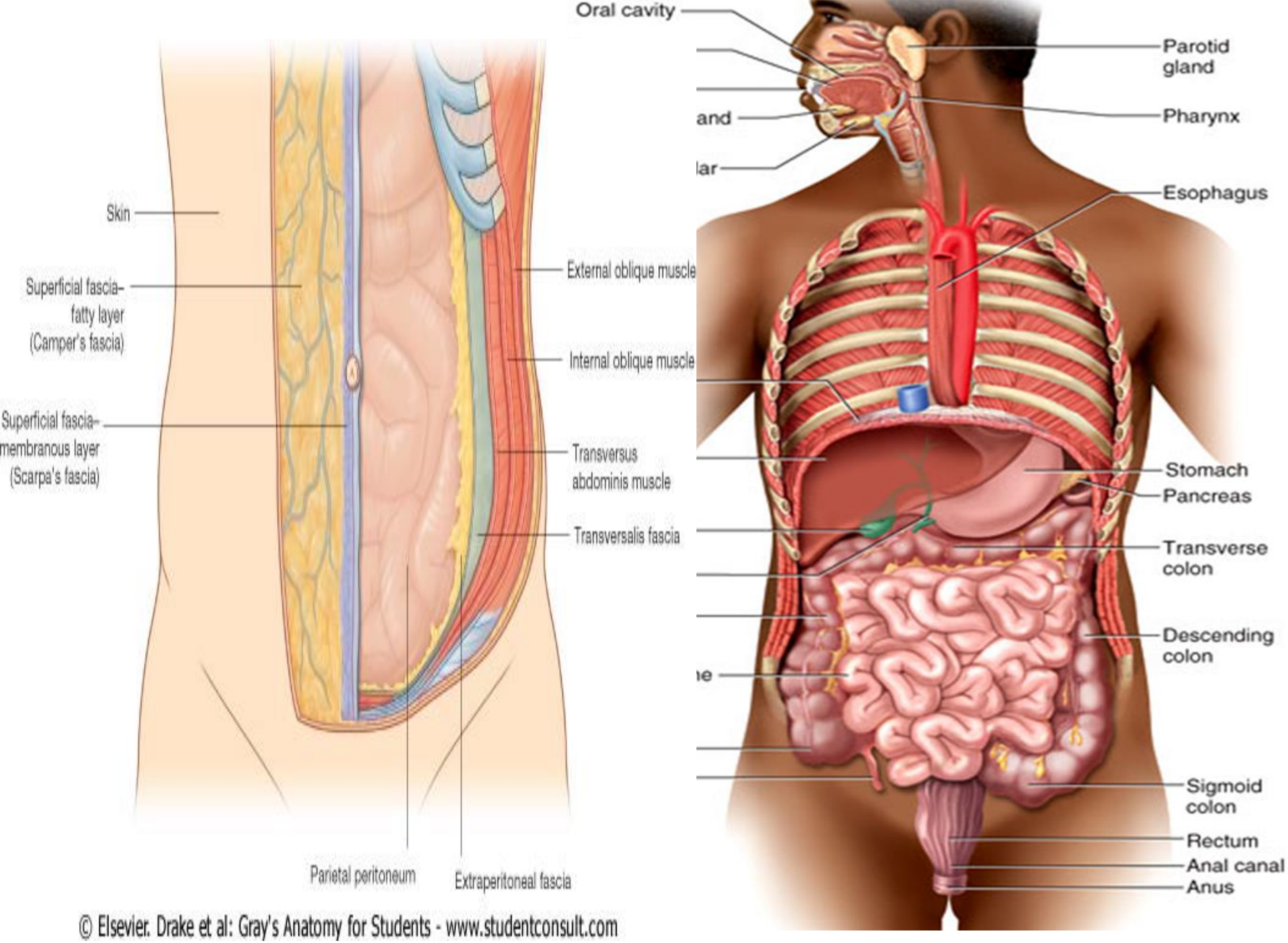
Peritoneum

Dr. ALSHIKH YOUSSEF Haiyan



General features

- The peritoneum is a thin serous membrane
- Consisting of:

1- Parietal peritoneum

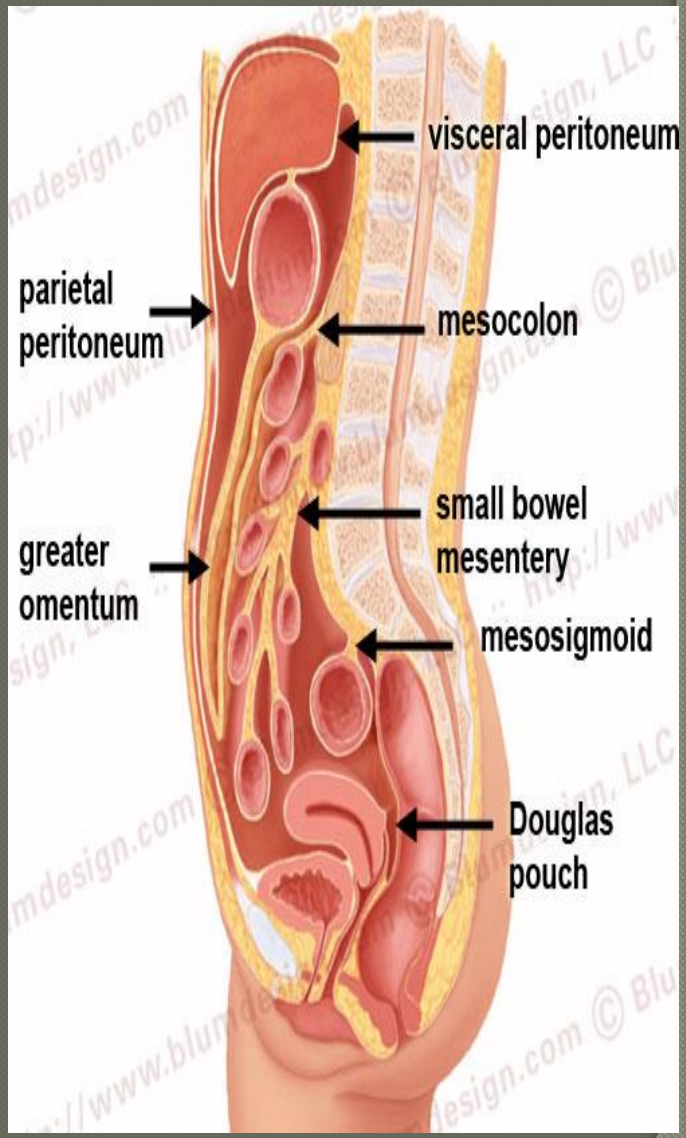
—lines the ant. Abdominal wall and the pelvis

2- Visceral peritoneum

- covers the viscera

3- Peritoneal cavity

- the potential space between the parietal and visceral layer of peritoneum
- in male, is a closed sac
- but in the female, there is a communication with the exterior through the uterine tubes, the uterus, and the vagina

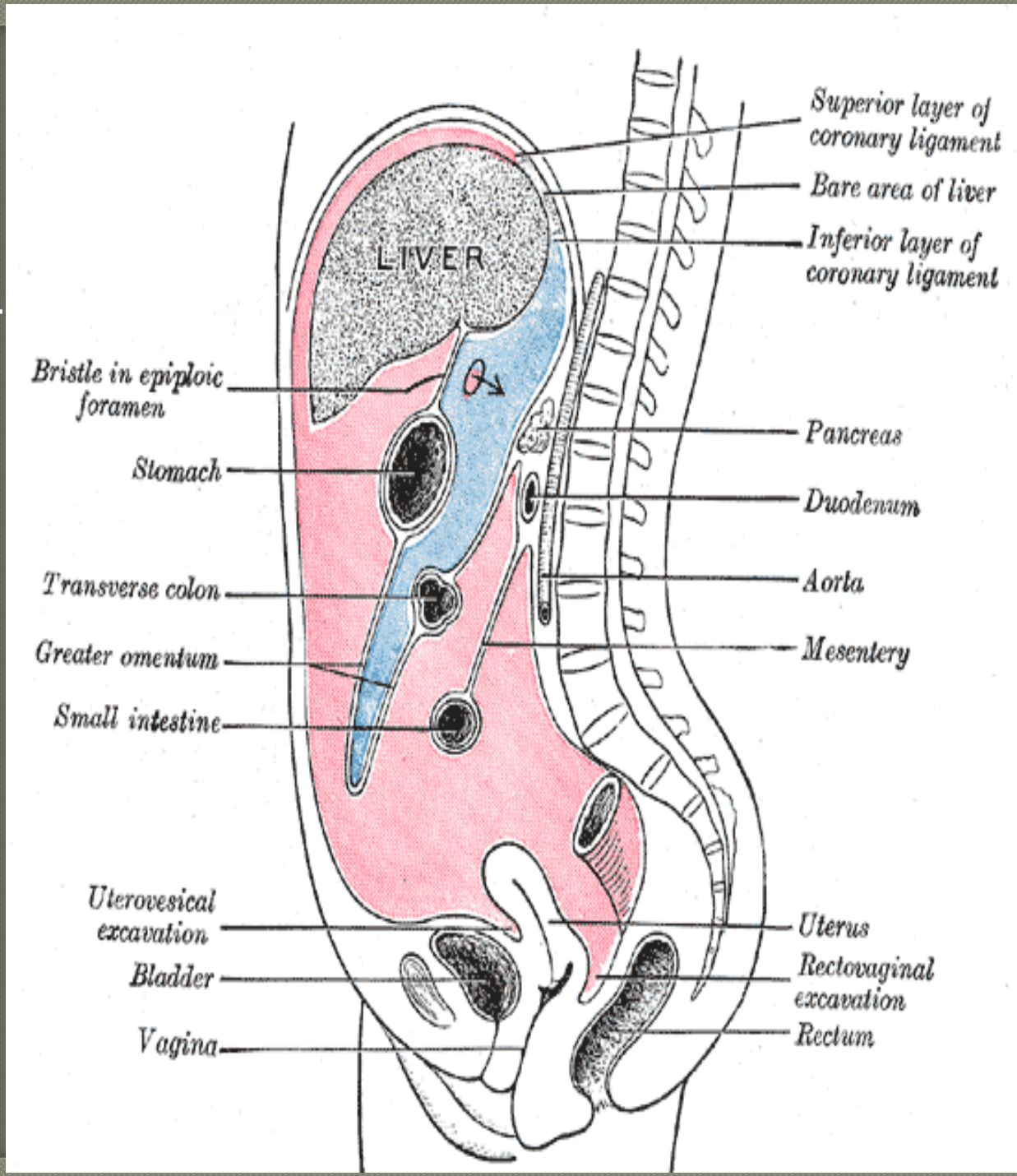


- Peritoneum cavity divided into

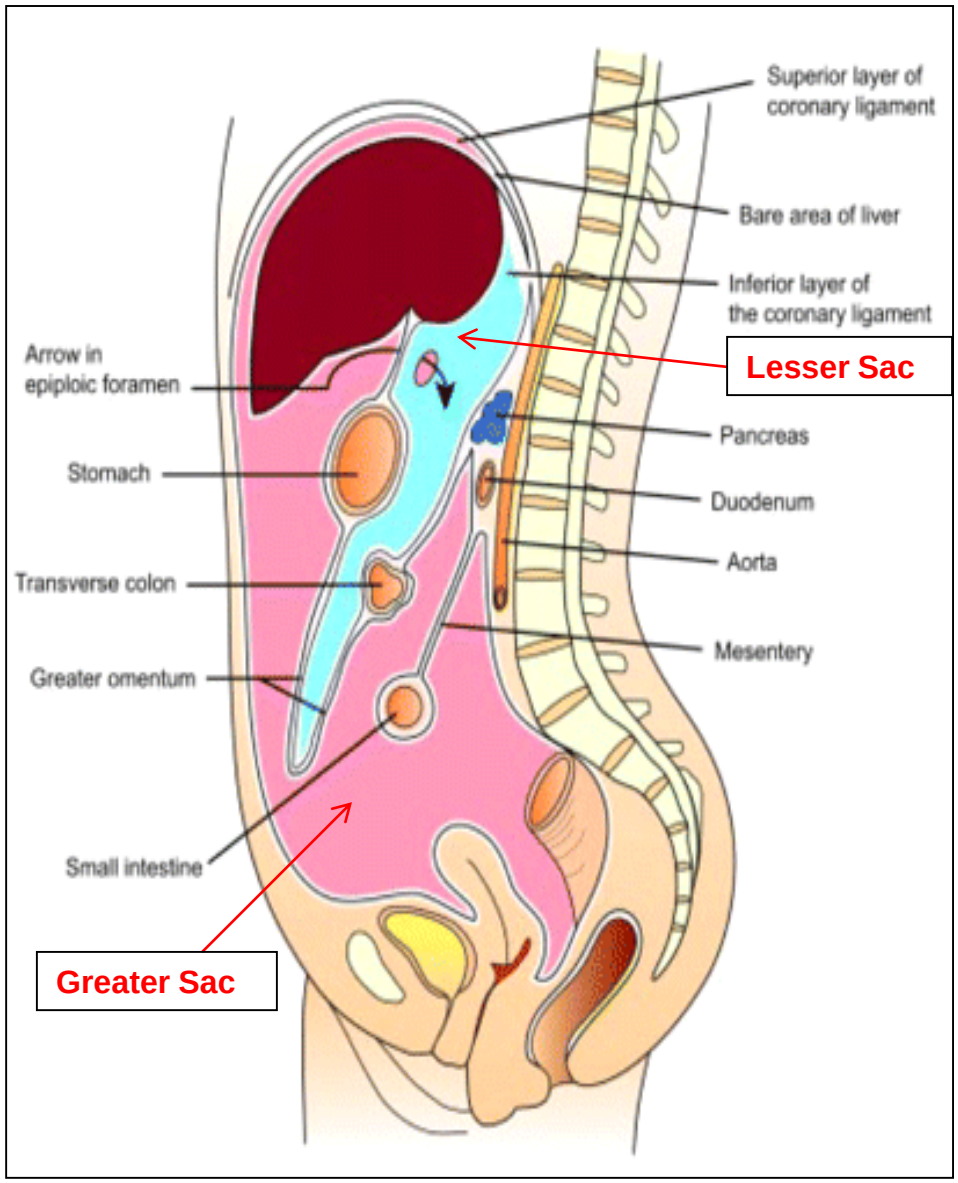
Greater sac

Lesser sac

- Communication between them by the epiploic foramen



The peritoneum



❖The peritoneal cavity is the largest one in the body.

❖**Divided into tow sac :**

- **Greater sac;** extends from diaphragm down to the pelvis.
- **Lesser sac or omental bursa**; lies behind the stomach.
- Both cavities are interconnected through the **epiploic foramen(winslow)**.
- In male : the peritoneum is a closed sac .
- In female : the sac is not completely closed because it communicates with the exterior through the uterine tubes, uterus and vagina.

Peritoneum in transverse section

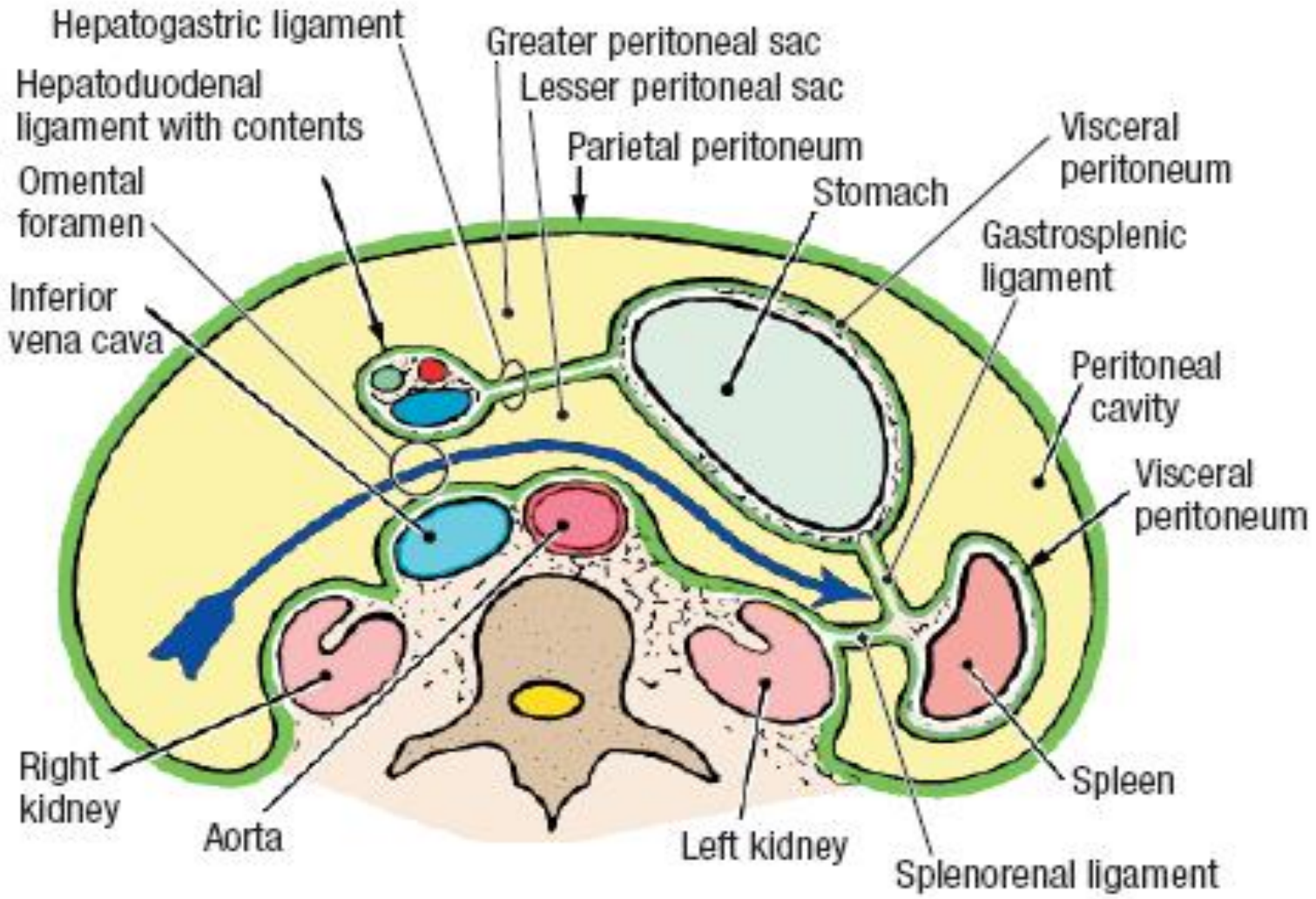
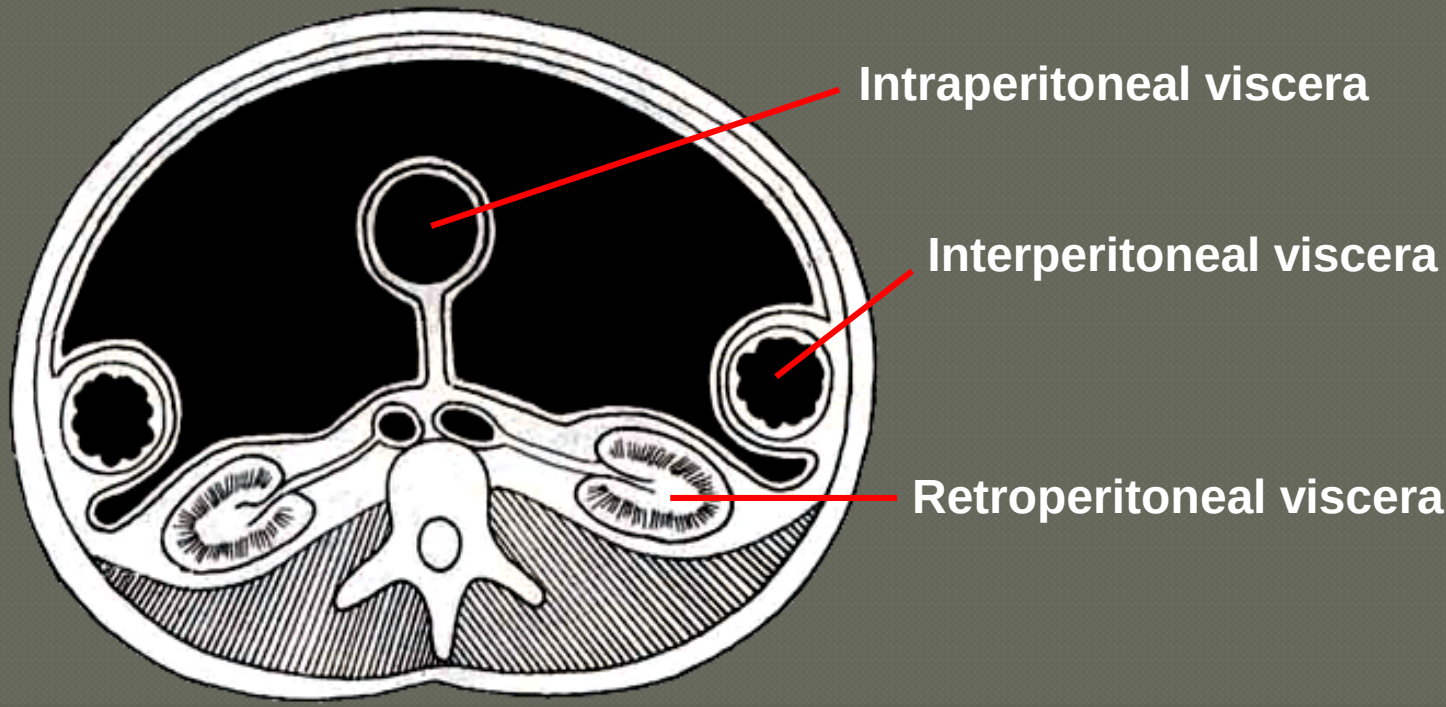


Figure 4.24. Schematic drawing of the peritoneal cavity in transverse section—inferior view. The arrow passes through the orrental foramen.

The relationship between viscera and peritoneum

- **Intraperitoneal viscera**
- viscera is almost totally covered with visceral peritoneum
- example, stomach, 1st & last inch of duodenum, jejunum, ileum, cecum, vermiform appendix, transverse and sigmoid colons, spleen and ovary

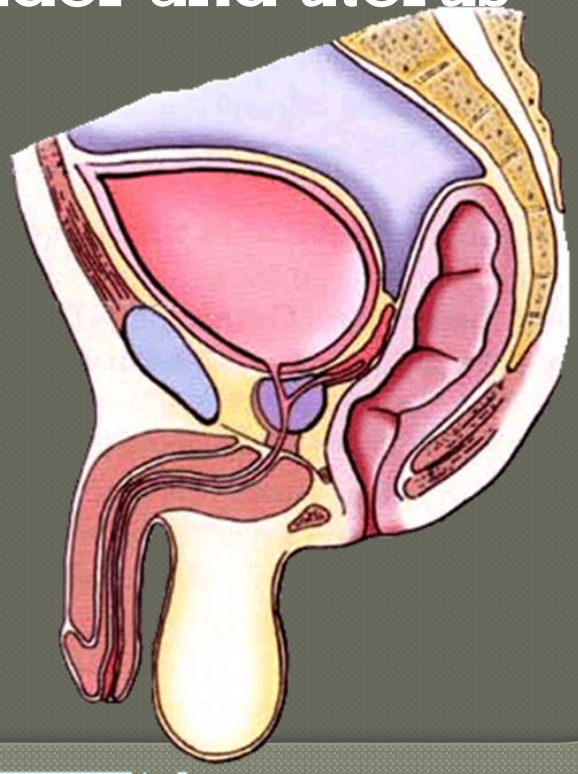


Interperitoneal viscera

- Such organs are not completely wrapped by peritoneum
- one surface attached to the abdominal walls or other organs.
- **Example**

liver, gallbladder, urinary bladder and uterus

- Upper part of the rectum,
- Ascending and
- Descending colon



Retroperitoneal viscera

- some organs lie on the posterior abdominal wall

- Behind the peritoneum
- they are partially covered by peritoneum on their anterior surfaces only
- **Example**

kidney, suprarenal gland, pancreas, upper 3rd of rectum

duodenum, and ureter, aorta and I.V.C

The Peritoneal Reflection

The peritoneal reflection include: omentum, mesenteries, ligaments, folds, recesses, pouches and fossae.

Many of them contain the blood vessels, lymphatics, and nerves that from the abdominal wall passed to viscera.

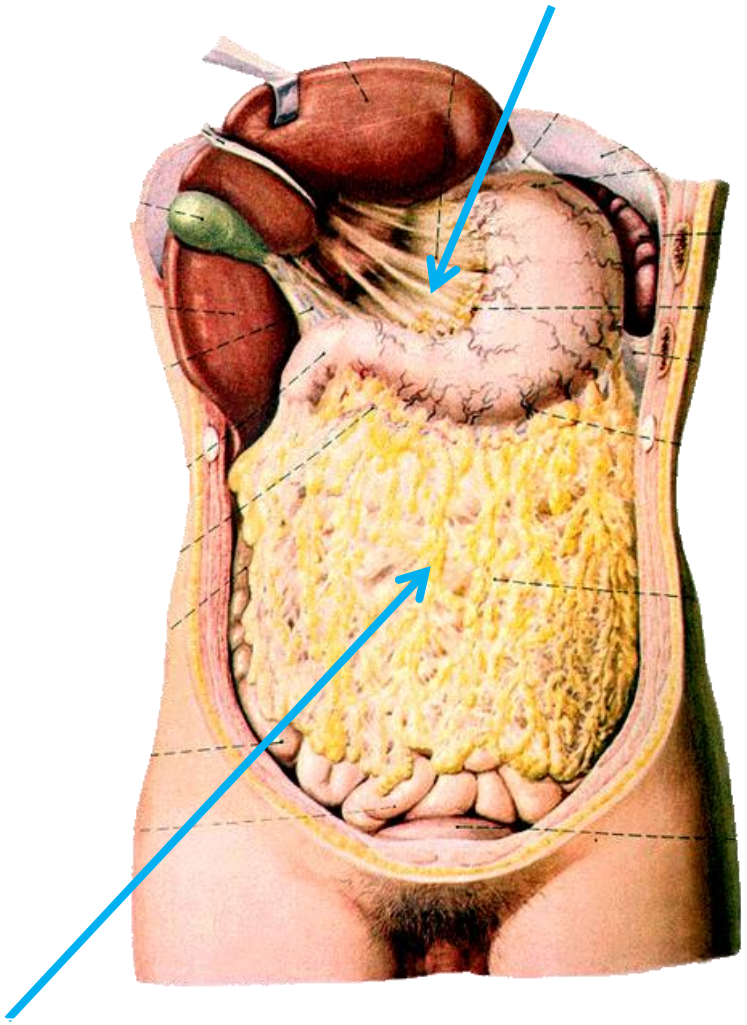
Folds of the peritoneum

Type :

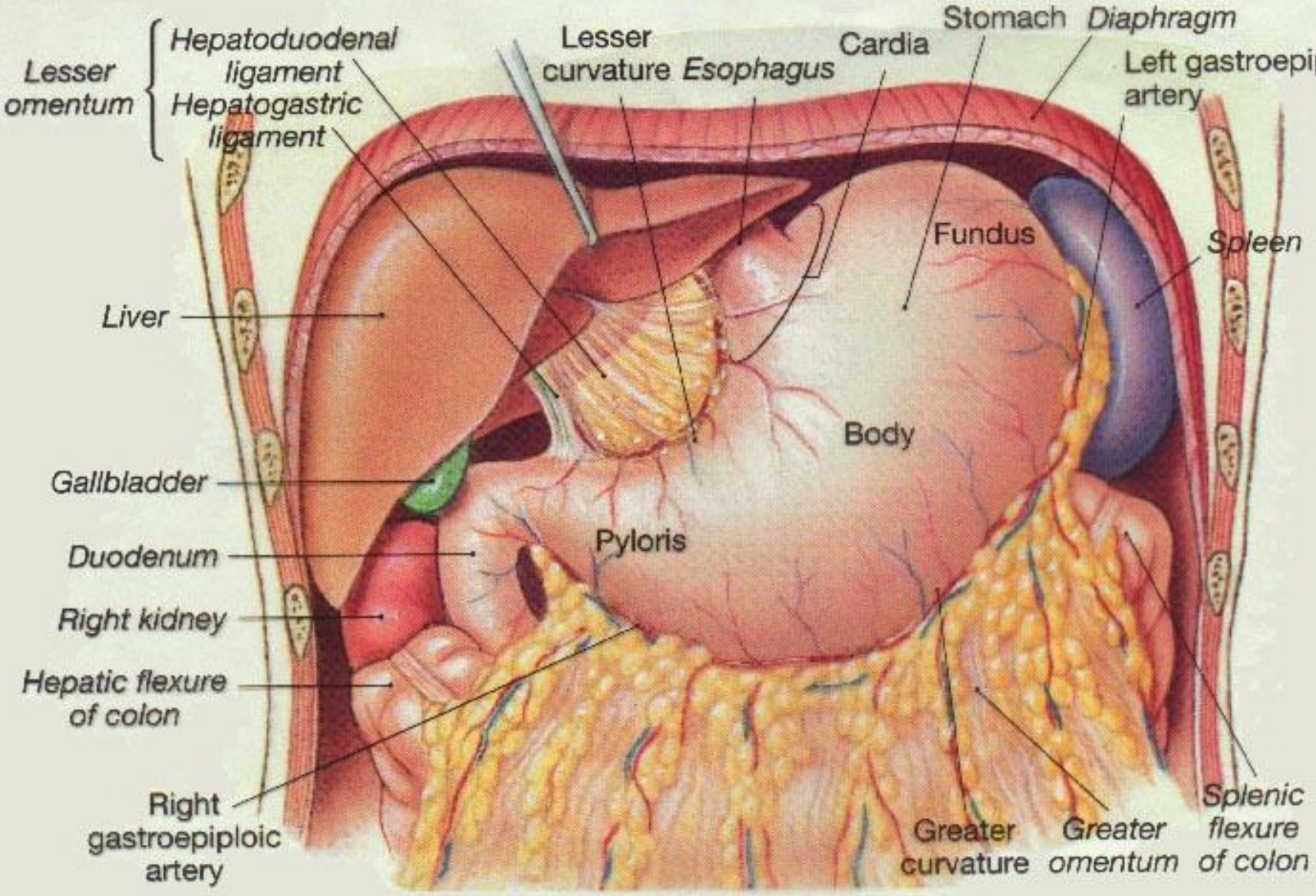
- Omenta
- Mesentery
- Ligamentes
- Fossae and recesse
- Pouches
-
-

Omenta

- Two layered fold of peritoneum connecting the stomach to another viscus.
- The **lesser omentum** attaches the lesser curvature of the stomach to the liver.
- The **greater omentum** connects the greater curvature of the stomach to the transverse colon.

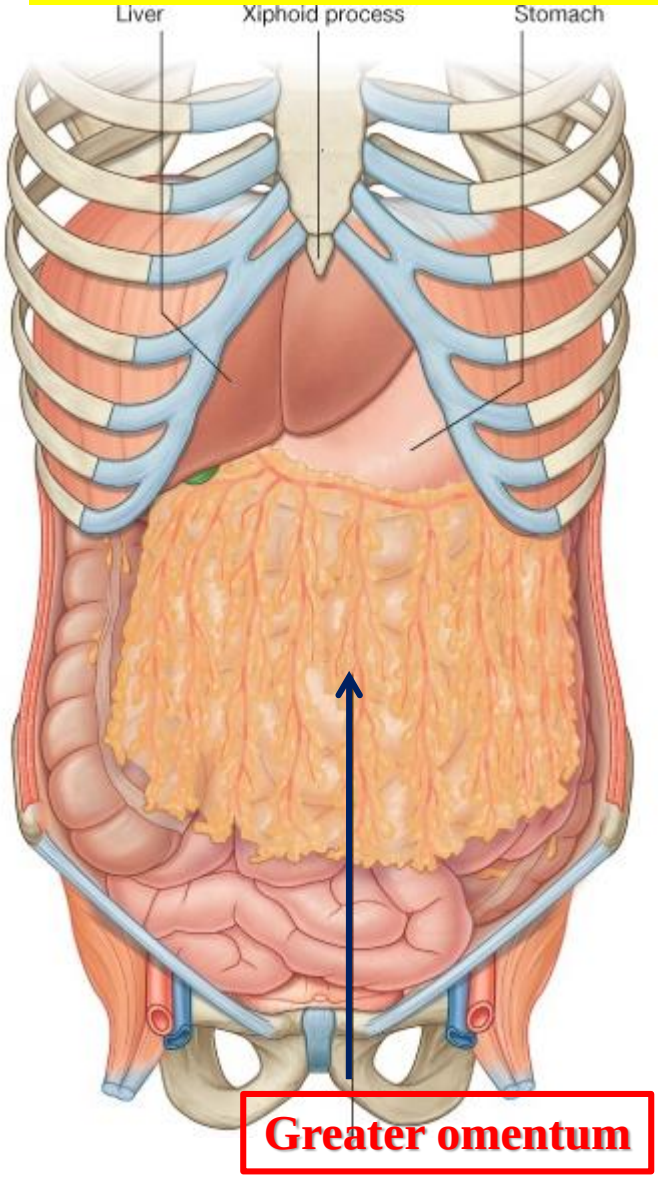


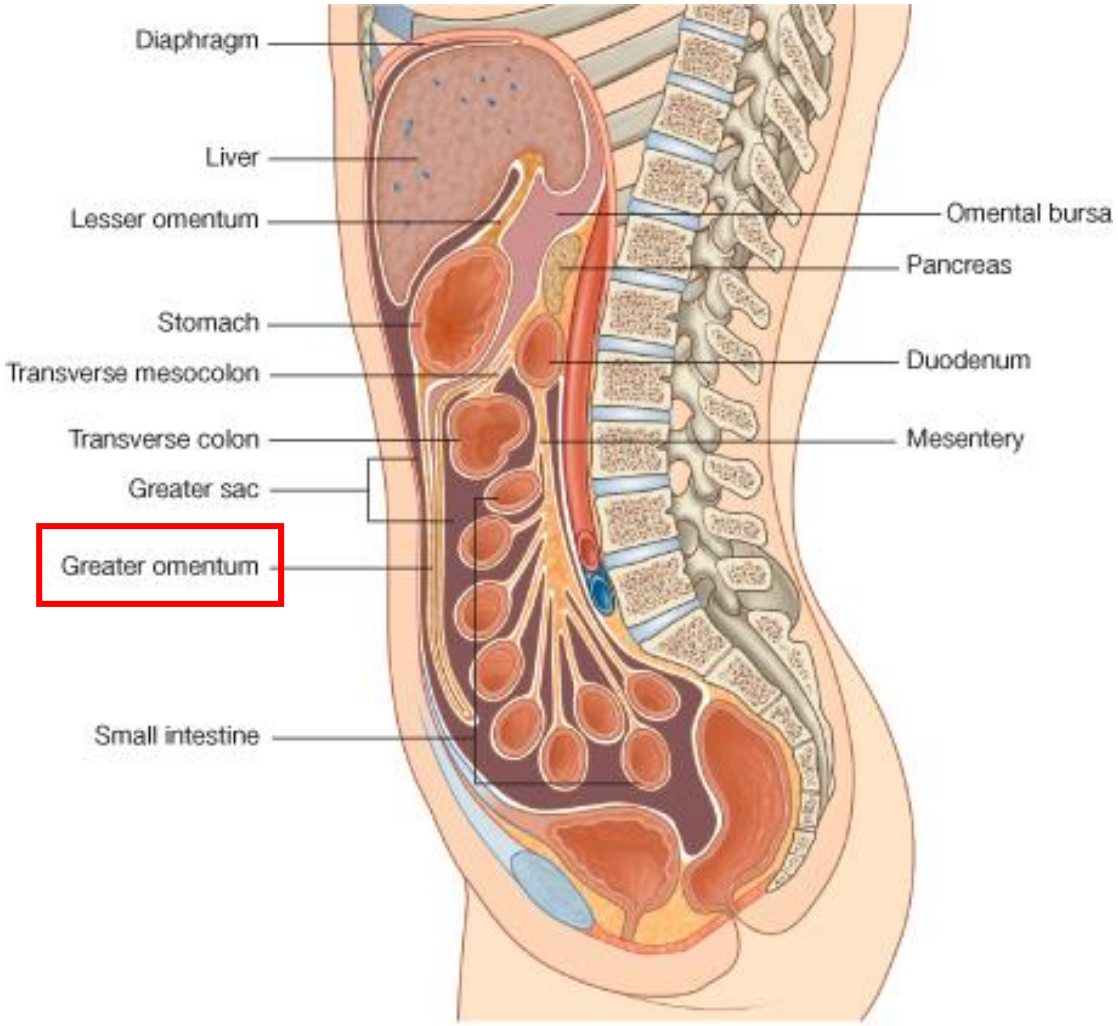
The Stomach and Omenta



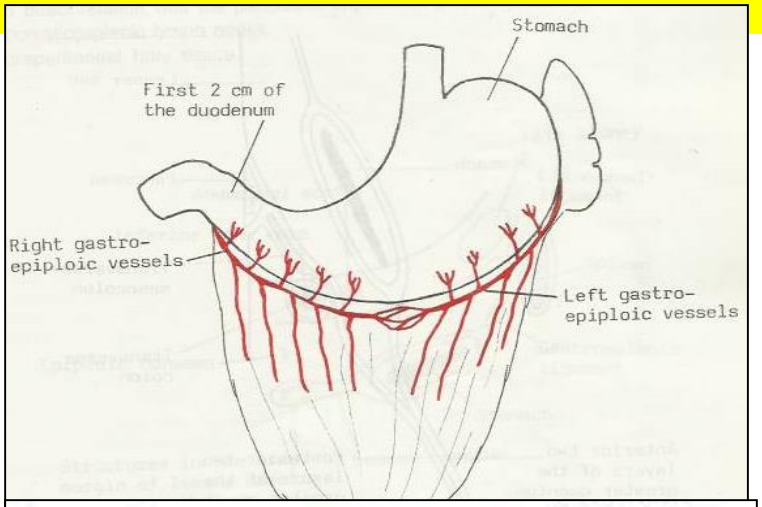
Stomach, anterior view

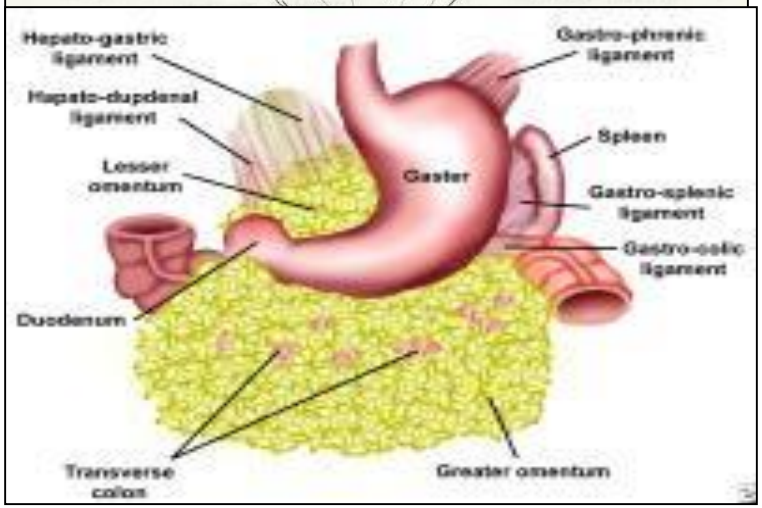
Greater omentum





Greater omentum





- The largest peritoneal fold, contains some adipose tissue.
- It consists of a <u>double sheet</u> of peritoneum, <u>folded on itself</u> so that it is made up of <u>four layers</u> (anterior 2 layers + posterior 2 layers).
- The two layers which descend from the greater curve of the **stomach** and commencement of the duodenum, pass downward in front of the small intestines, then turn upon themselves, and ascend to the **transverse colon,** where they separate and enclose it.
- The **left** border of the greater omentum is continuous with the **gastrosplenic ligament.**
- Its **right** border extends as far as the commencement of the duodenum.
- **Contents** : the anastomosis between the **right and left gastroepiploic vessels.**

Greater omentum

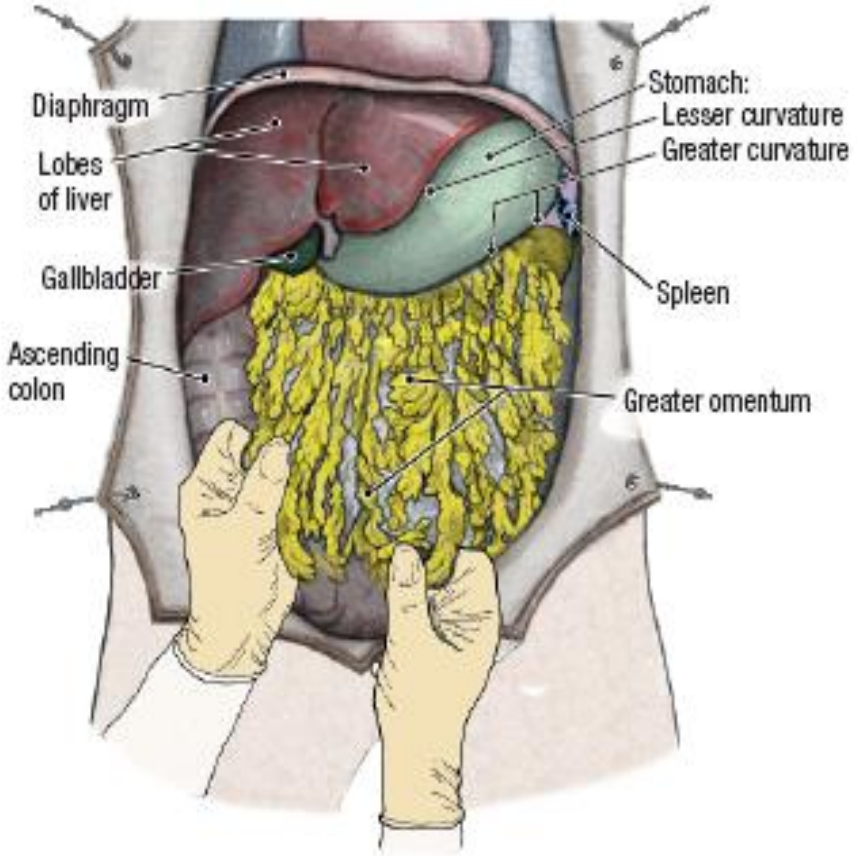


Figure 4.21. The relationship of the greater omentum to the abdomina viscera.

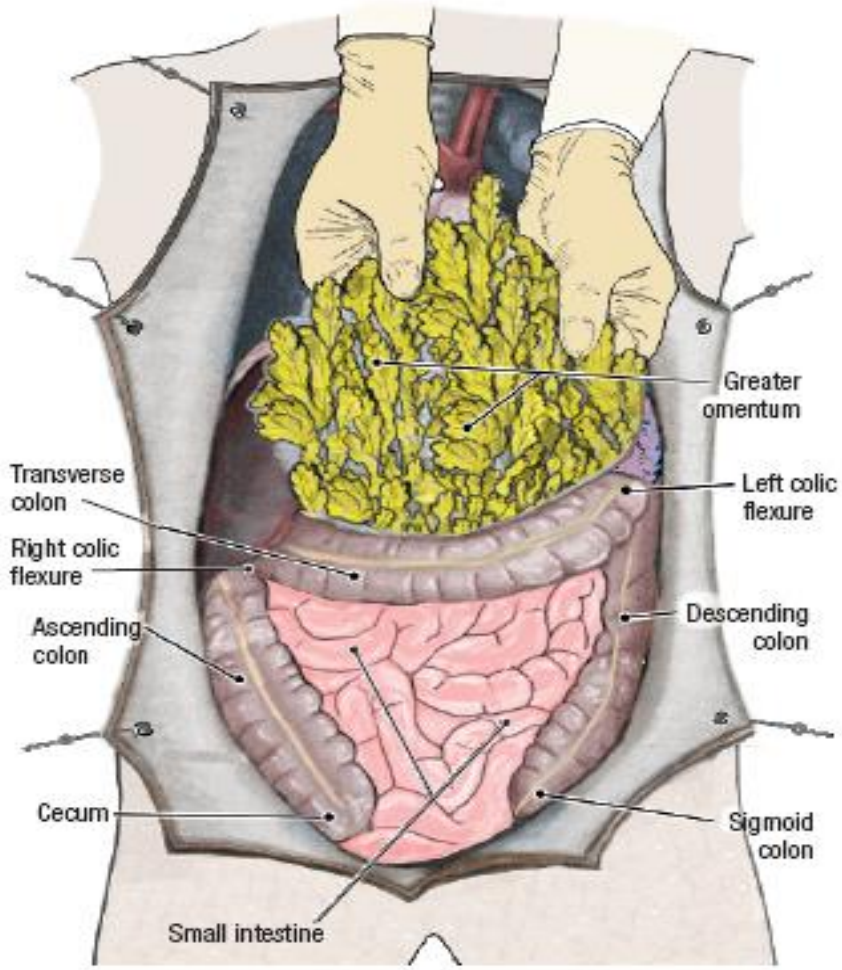
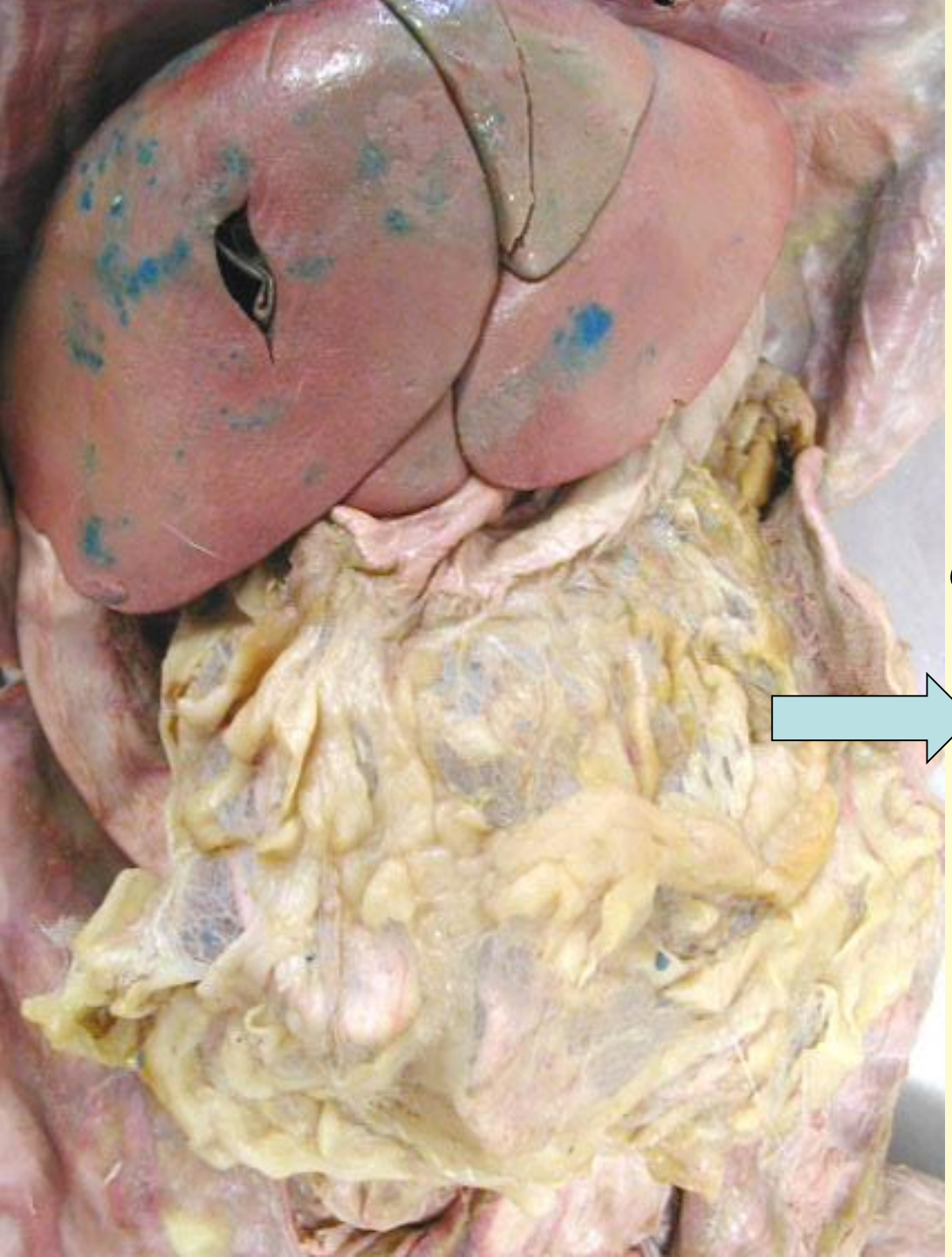
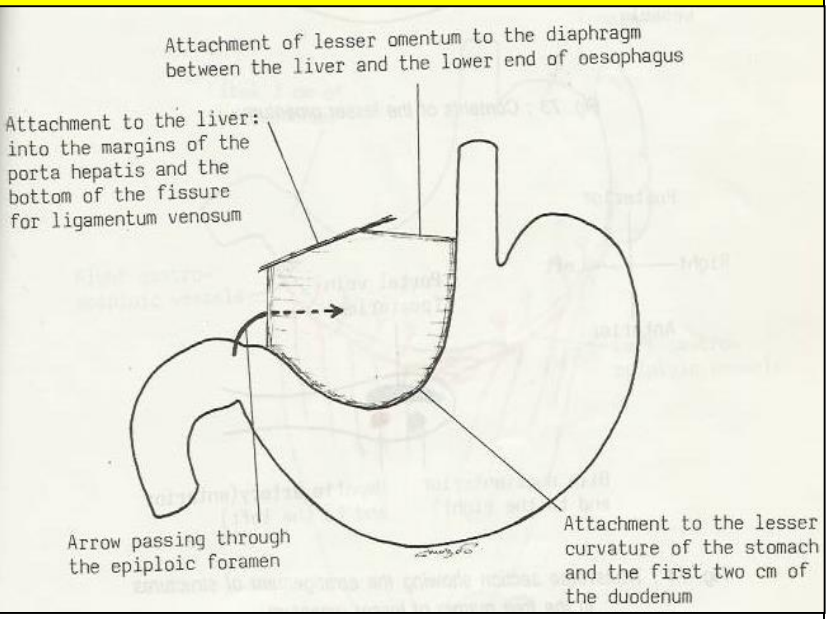


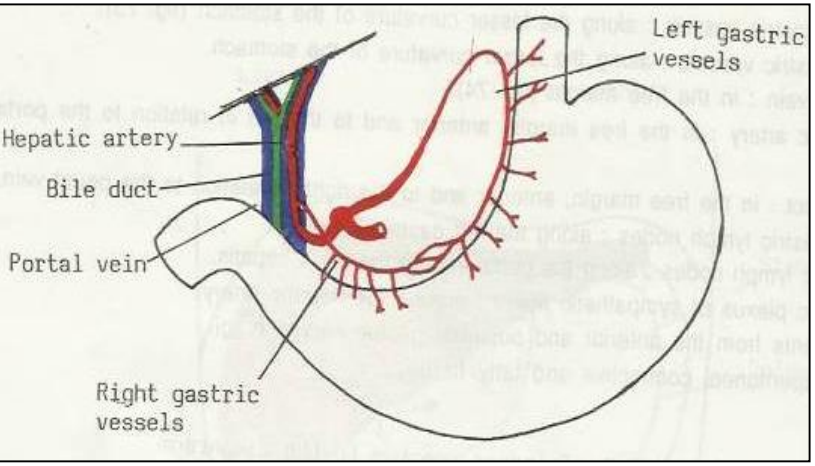
Figure 4.22. Reflect the greater omentum superiorly to expose the small intestine and large intestine.



This thin flesh-colored covering is the greater omentum.

Lesser omentum





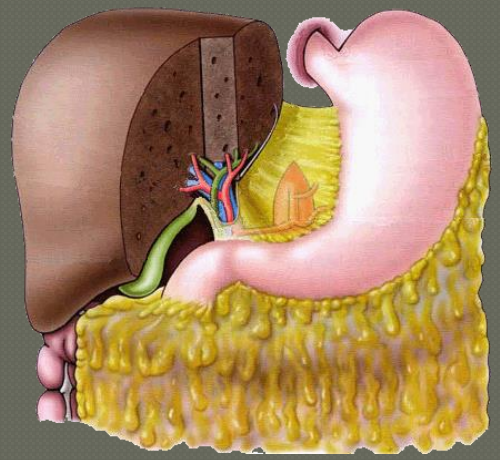
- Extends between the liver and the lesser curvature of the stomach.
- It is continuous with the two layers of peritoneum which cover the anterior & posterior surfaces of stomach and 1st part of the duodenum.
- Ascend as a double fold to the porta hepatis of liver, and fissure for ligamentum venosum.
- To the left of porta hepatis it is carried to the diaphragm.
- Its right border is a free margin; constitutes the anterior boundary of the epiploic foramen.

Contents between the two layers of the lesser omentum :

- Close to the right free margin, are the hepatic artery, the common bile duct, the portal vein, lymphatics, and the hepatic plexus of nerves.
- At the attachement to the stomach, run the right and left gastric vessels.

Lesser omentum

- **Hepatogastric ligament** from porta hepatis to lesser curvature of stomach
- **Hepatoduodenal ligament**



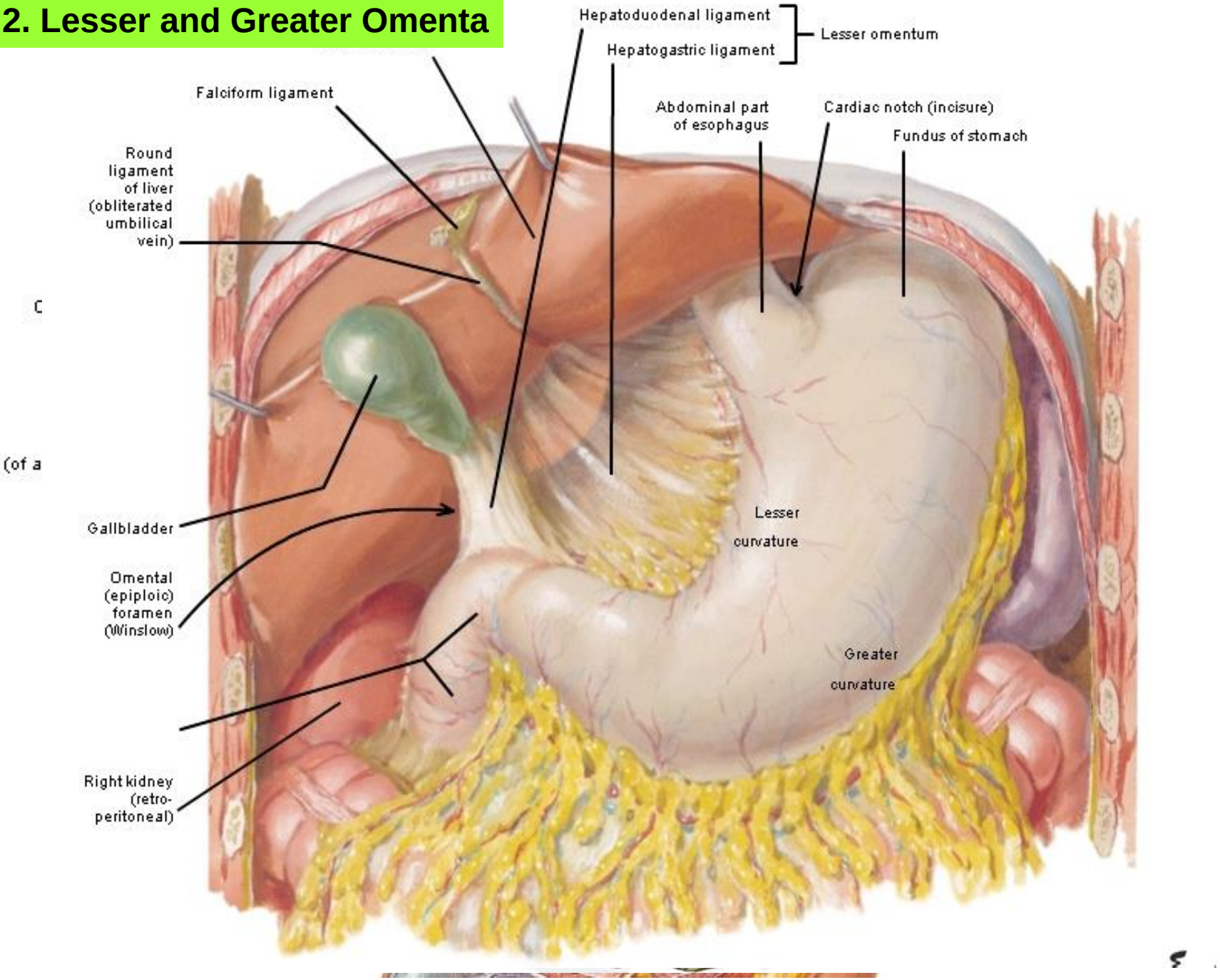
- Extends from porta hepatis to superior part of duodenum,
- at its free margine enclose 3 structures(3 key structures)

common bile duct→ Ant.
proper hepatic a→ At the Lt. of the common bile duct
hepatic portal v→ post.

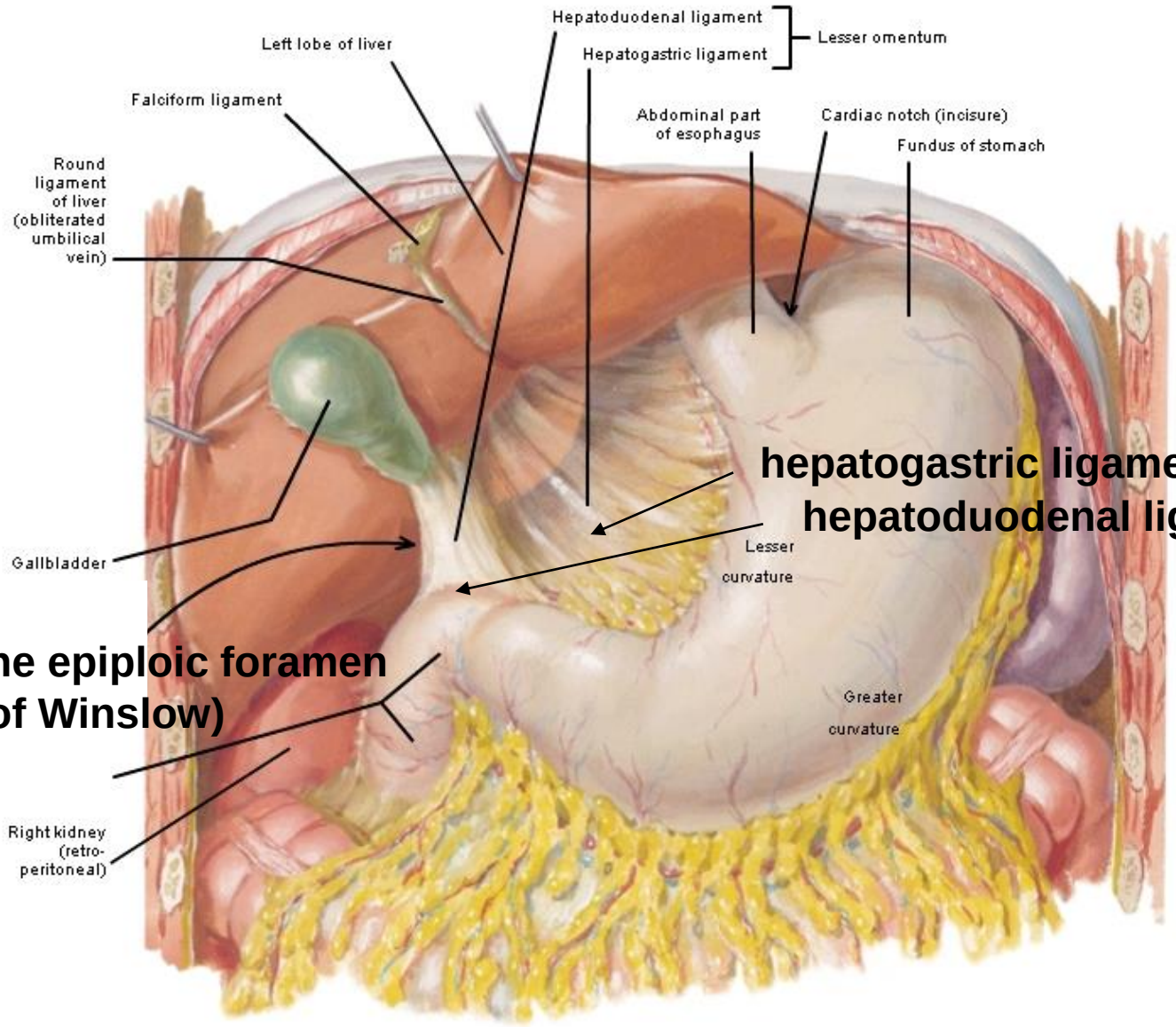
Contents of lesser omentum

- Blood vessels→ Rt. & Lt. gastric vessels
- Lymph nodes & lymphatic vessels
- Fat
- Autonomic N.S→ sympathetic + parasympathetic (vagus nerve)

2. Lesser and Greater Omenta



Lesser and Greater Omenta

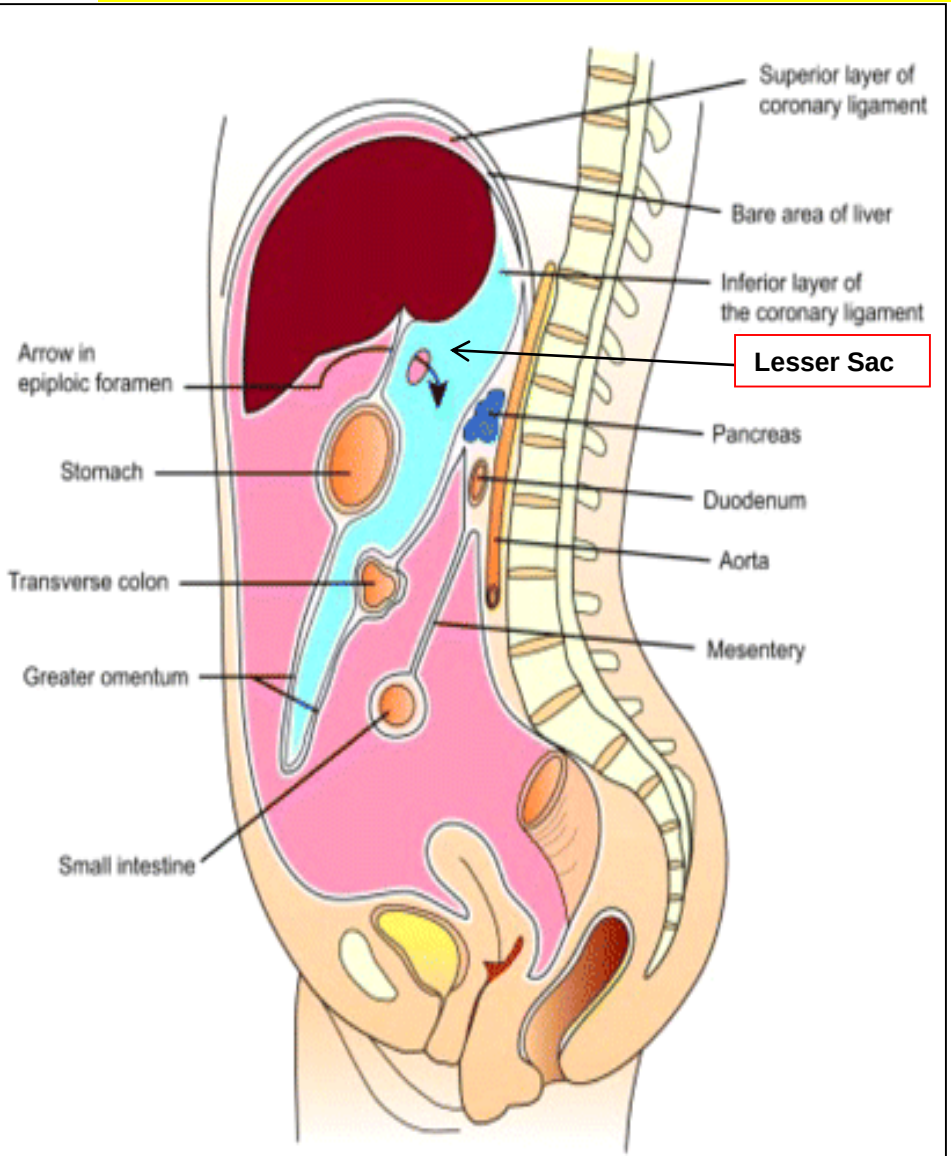


hepatogastric ligament
hepatoduodenal ligament

Lesser Omentum

the epiploic foramen (of Winslow)

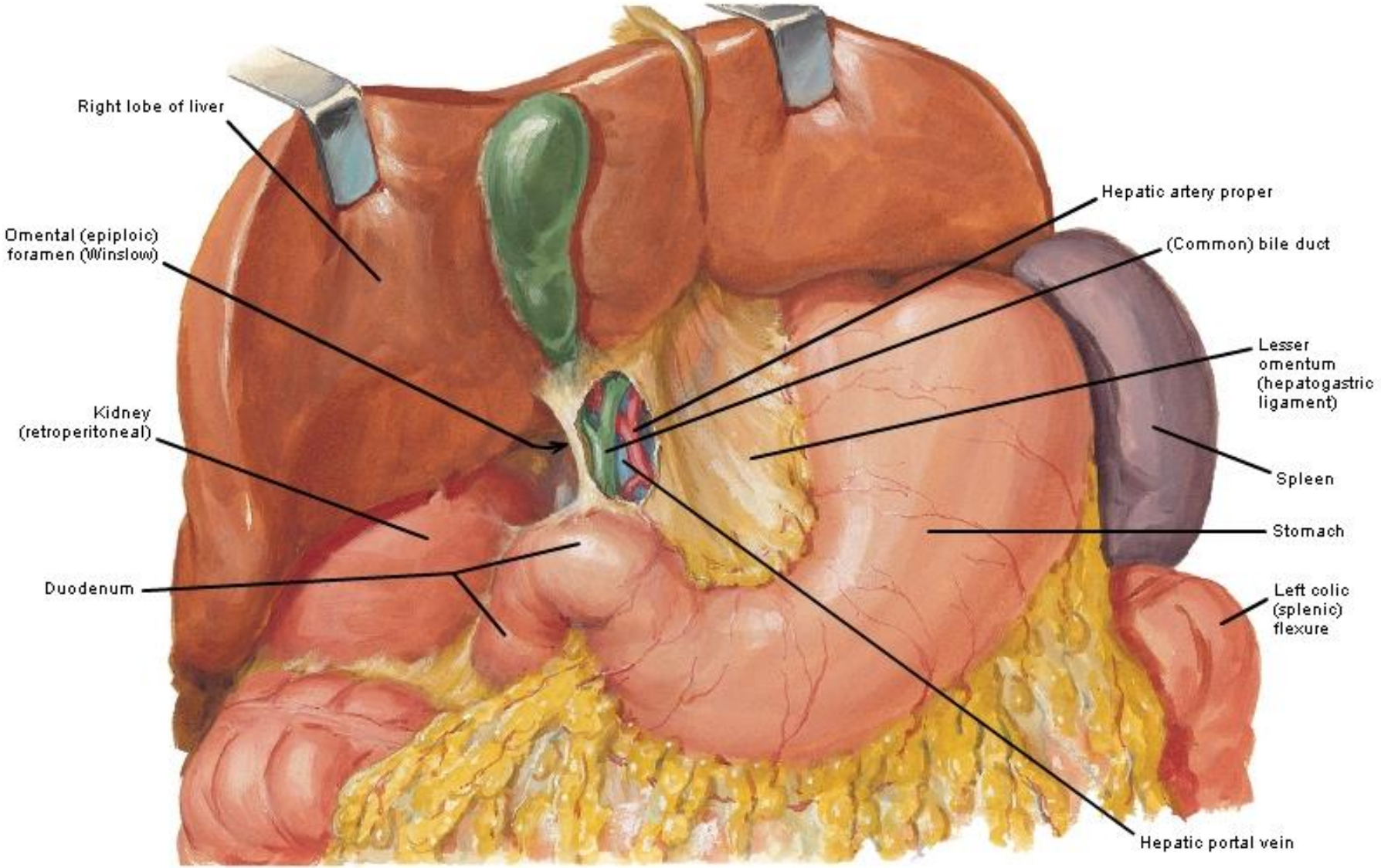
Omental bursa,
(Lesser Sac)



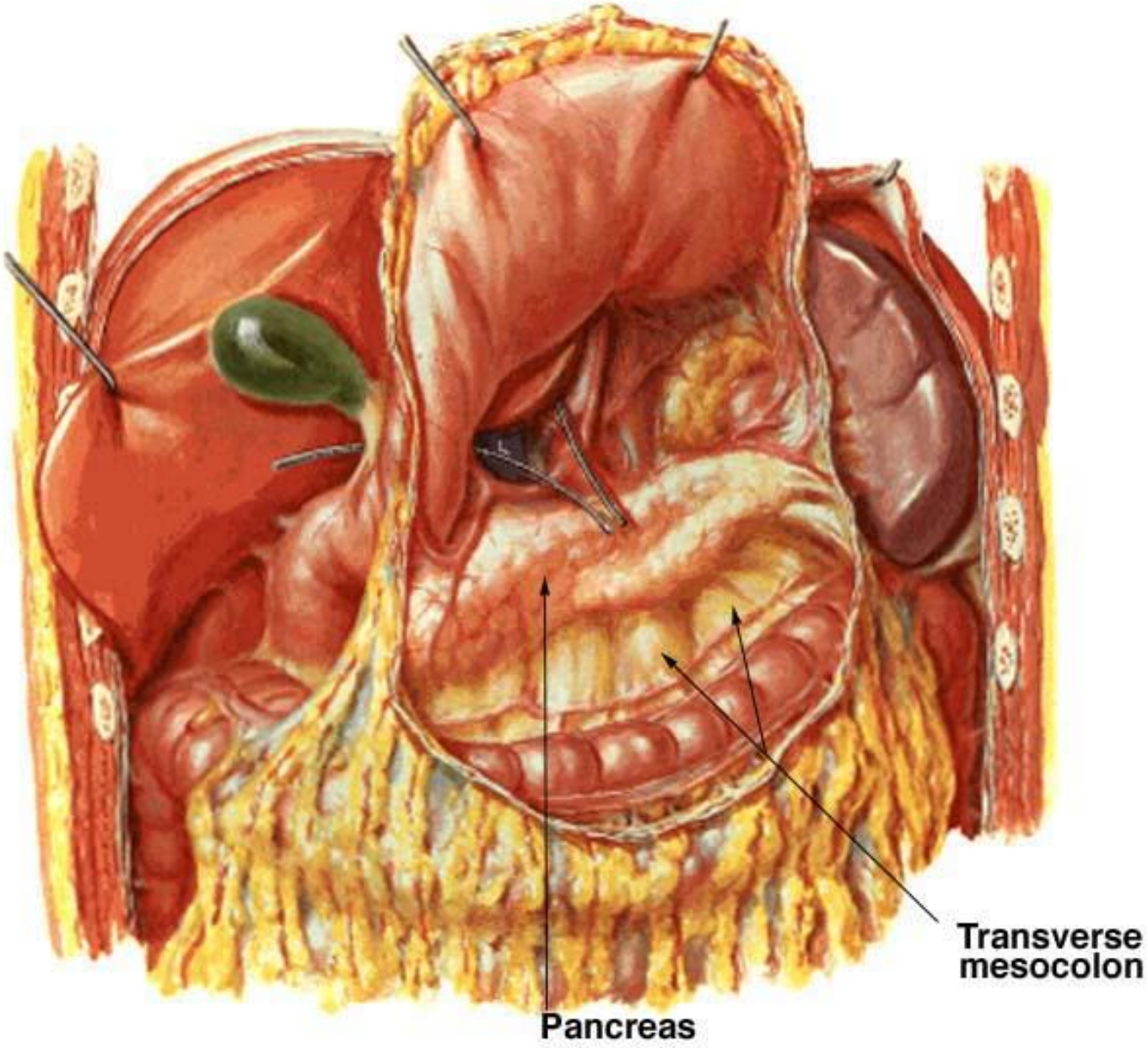
❑**It is a part of the peritonial cavity behind the stomach.**

❑**Boundaries of the *omental bursa* ;**

- **Anterior wall, from above downward, by the caudate lobe of the liver, the lesser omentum, back of the stomach, and the anterior two layers of the greater omentum.**
- **Posterior wall, from below upward, by the posterior two layers of the greater omentum, the transverse colon, and the ascending layer of the transverse mesocolon, the upper surface of the pancreas, the left suprarenal gland, and the upper end of the left kidney.**


Right lobe of liver
Omental (epiploic) foramen (Winslow)
Kidney (retroperitoneal)
Duodenum
Hepatic artery proper
(Common) bile duct
Lesser omentum (hepatogastric ligament)
Spleen
Stomach
Left colic (splenic) flexure
Hepatic portal vein

Omental Bursa



Omental bursa……cont

Walls :

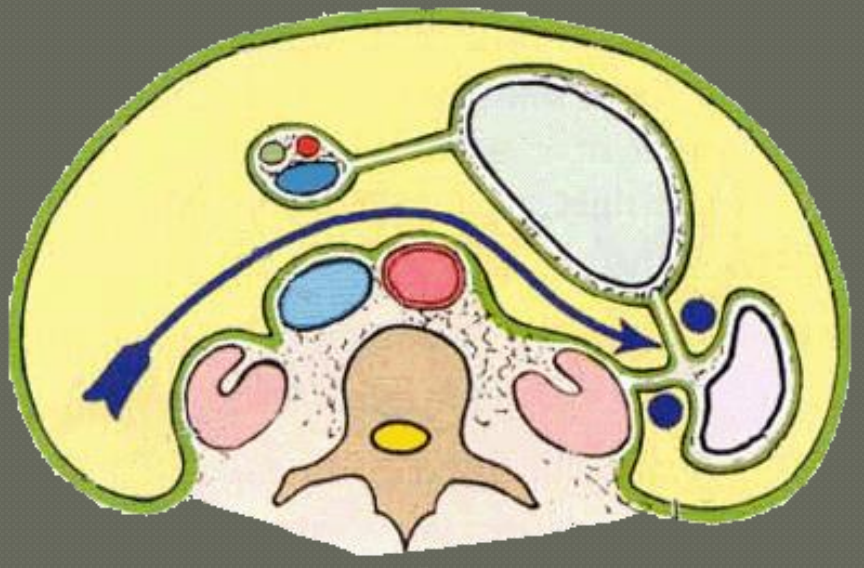
- **Superior**—peritoneum which covers the caudate lobe of liver and diaphragm
- **Anterior**—lesser omentum, peritoneum of posterior wall of stomach, and anterior two layers of greater omentum

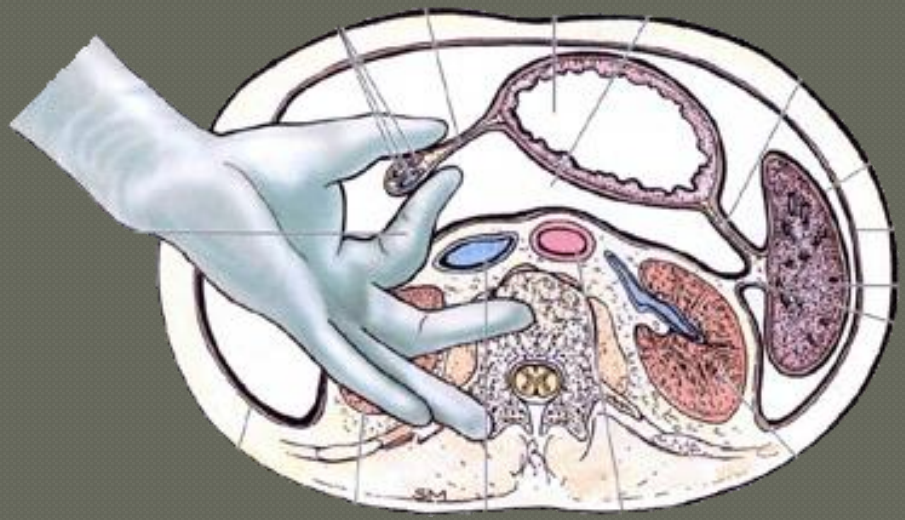
Omental bursa :

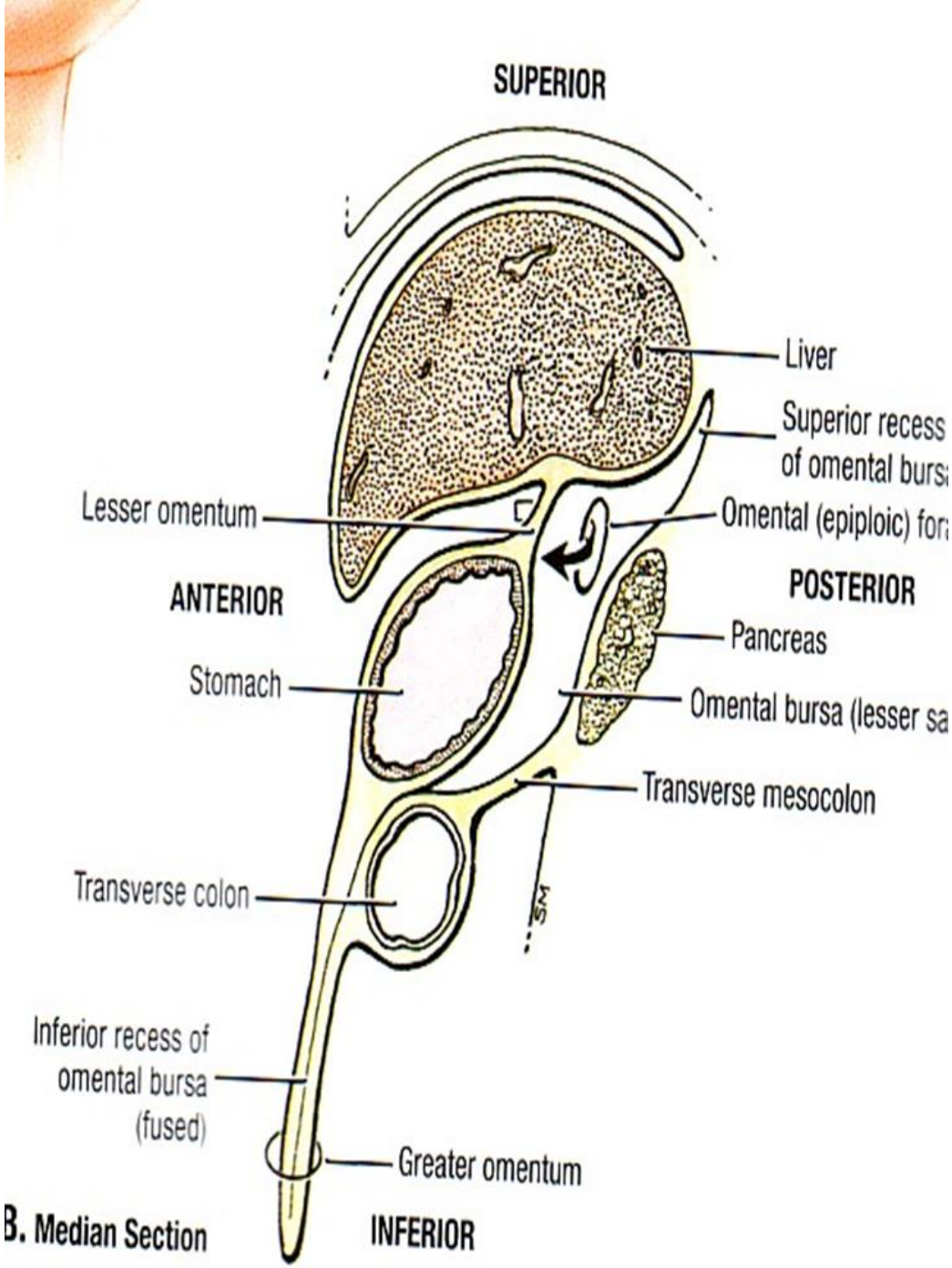
- **Inferior**—conjunctive area of anterior and posterior two layers of greater omentum
- **Posterior**—posterior two layers of greater omentum, transverse colon and transverse mesocolon, peritoneum covering posterior abdominal wall.

Omental bursa

- **Left**—spleen, gastrosplenic ligament splenorenal ligament
- **Right**—omental foramen

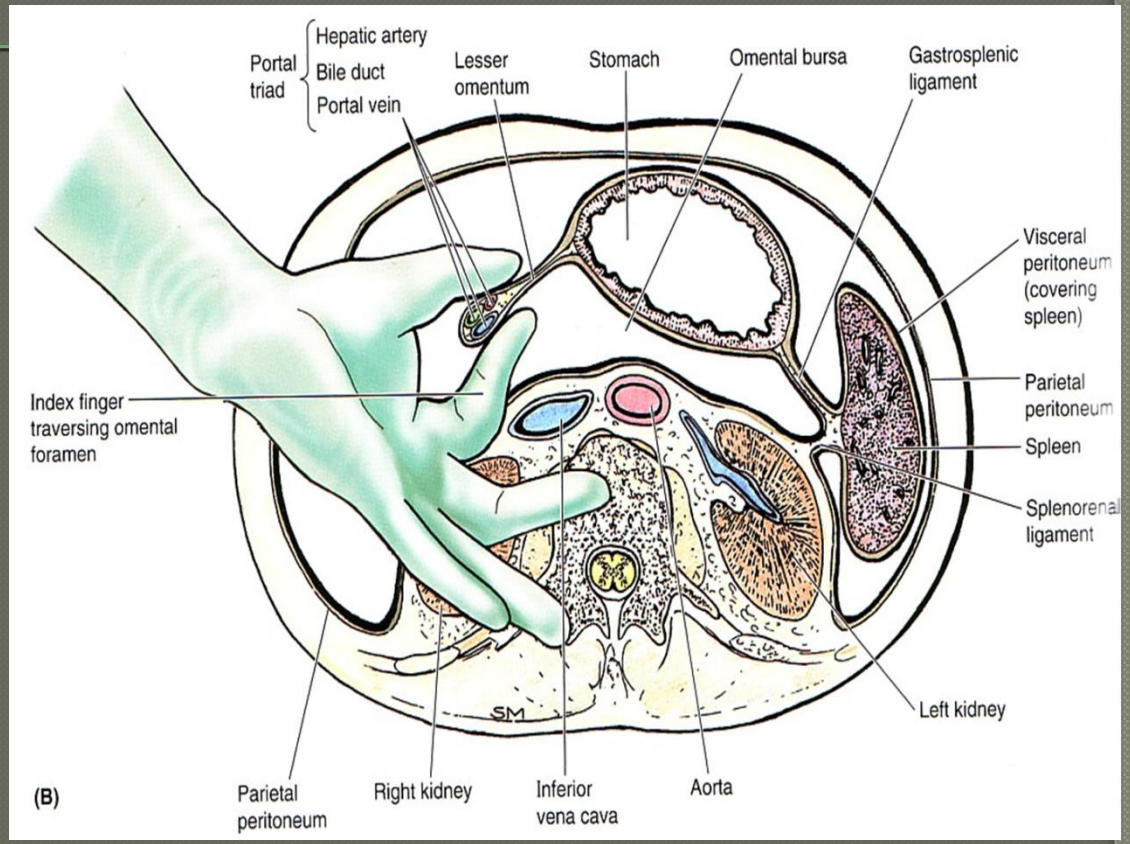


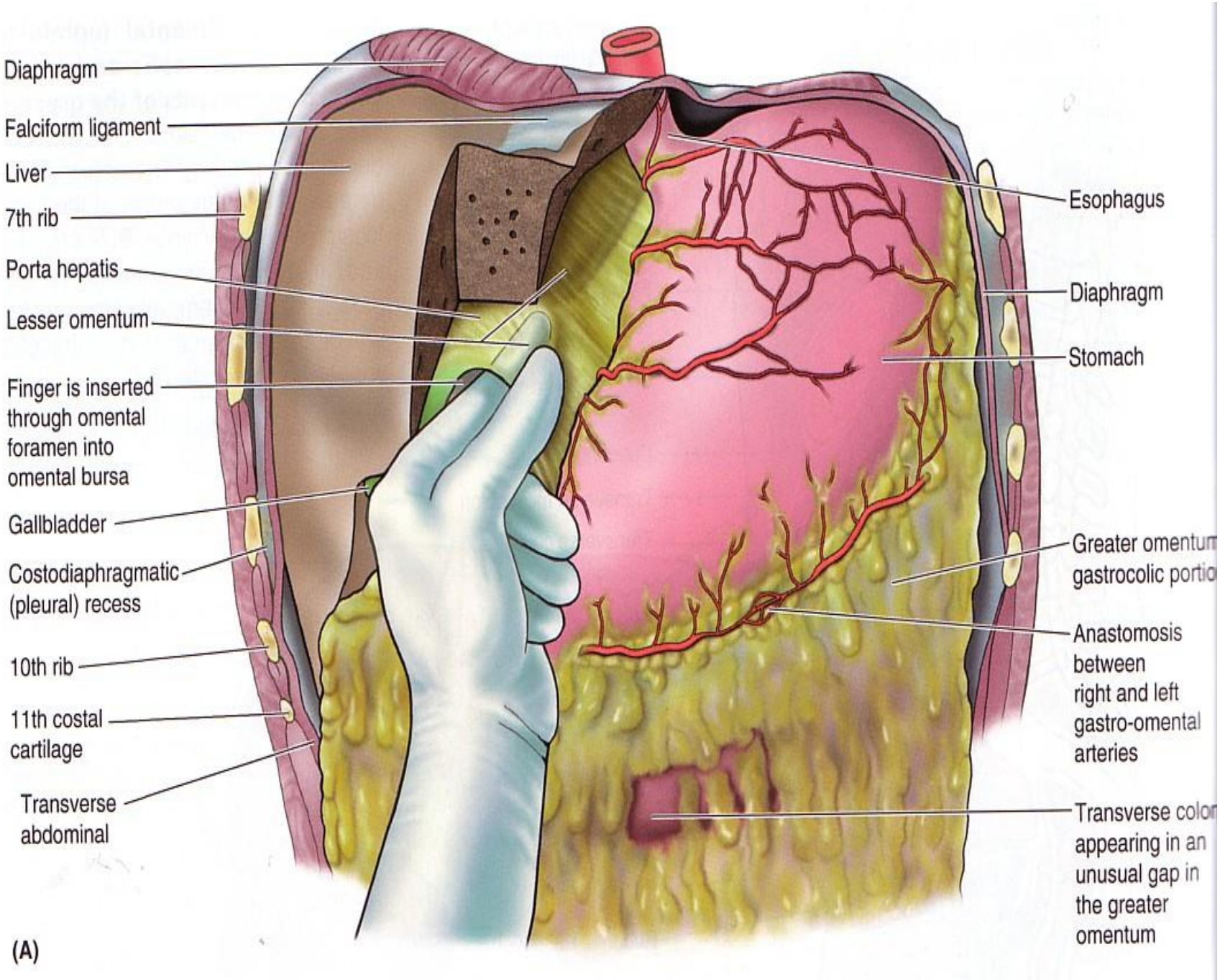



SUPERIOR
Liver
Superior recess
of omental bursa
Lesser omentum
Omental (epiploic) for
ANTERIOR
POSTERIOR
Pancreas
Stomach
Omental bursa (lesser sa
Transverse mesocolon
Transverse colon
SM
Inferior recess of
omental bursa
(fused)
Greater omentum
B. Median Section
INFERIOR

Epiploic foramen

- Boundaries
- Anteriorlly
  - Free border of lesser omentum contain
  1- Bile duct(Rt & ant)
  2- Hepatic artery(Lt & anT)
  3- Portal vein(post.)
- Posteriorly
  I.V.C
- Superiorly
  Caudate process of caudate lobe of liver
- Inferiorly
- First part of duodenum




Diaphragm
Falciform ligament
Liver
7th rib
Porta hepatis
Lesser omentum
Finger is inserted through omental foramen into omental bursa
Gallbladder
Costodiaphragmatic (pleural) recess
10th rib
11th costal cartilage
Transverse abdominal
Esophagus
Diaphragm
Stomach
Greater omentum gastrocolic portio
Anastomosis between right and left gastro-omental arteries
Transverse colon appearing in an unusual gap in the greater omentum
(A)

The Omental foramen(winslow)

Boundaries:

- Anterior: Hepatic portal vein, hepatic artery and bile duct contained within the lesser omentum.
- Posterior: Inferior vena cava & right crus of the diaphragm covered with parietal peritoneum.
- Superior: Caudate lobe of the liver covered with visceral peritoneum.
- Inferior: First part of the duodenum

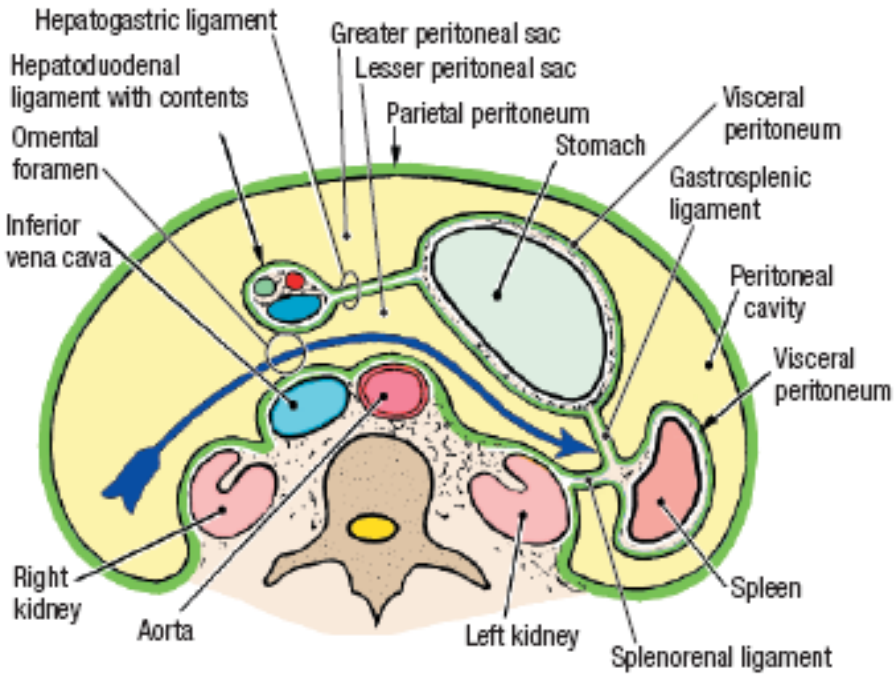


Figure 4.24. Schematic drawing of the peritoneal cavity in transverse section—inferior view. The arrow passes through the omental foramen.

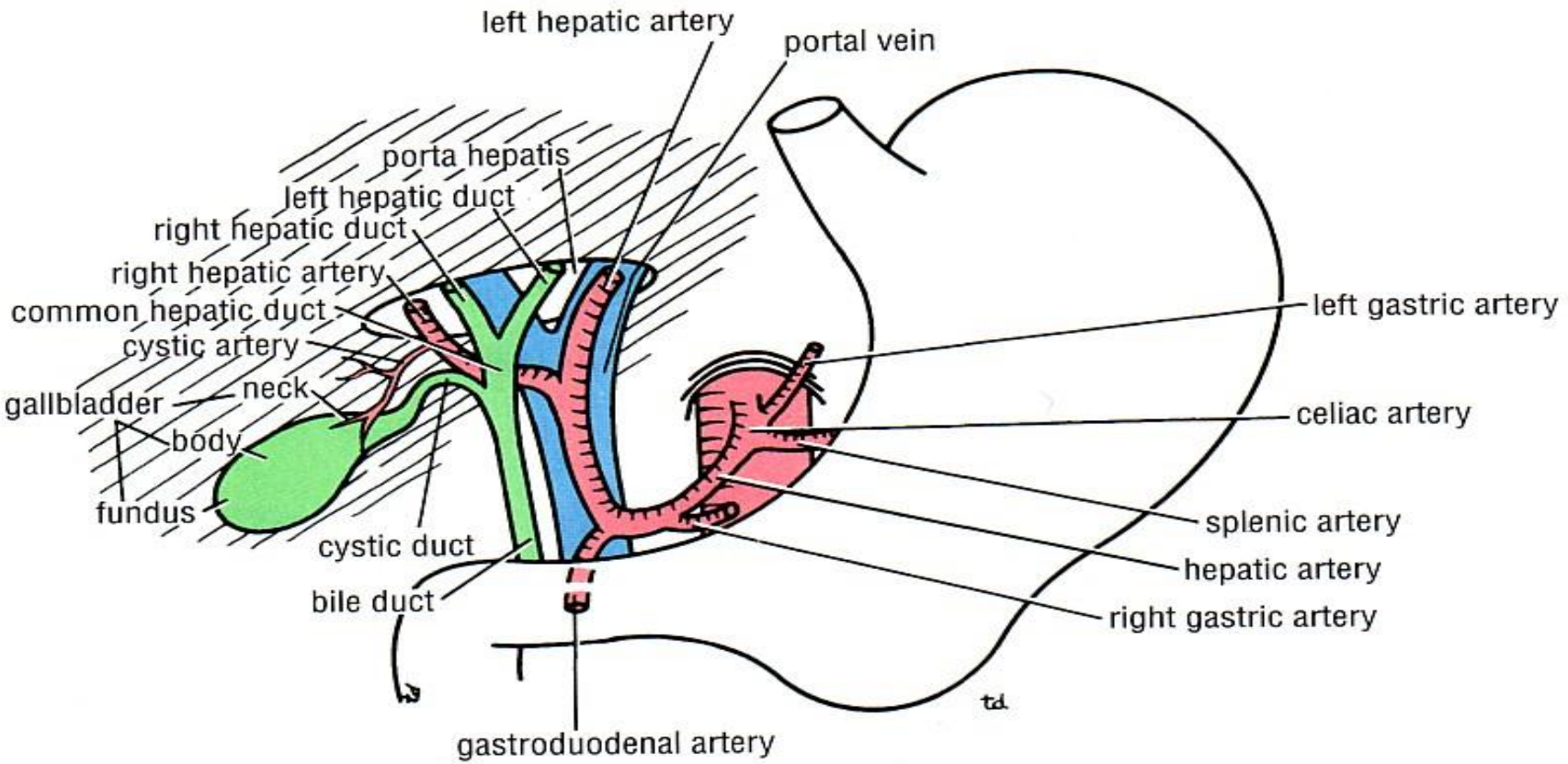
Epiploic Foramen: Boundaries

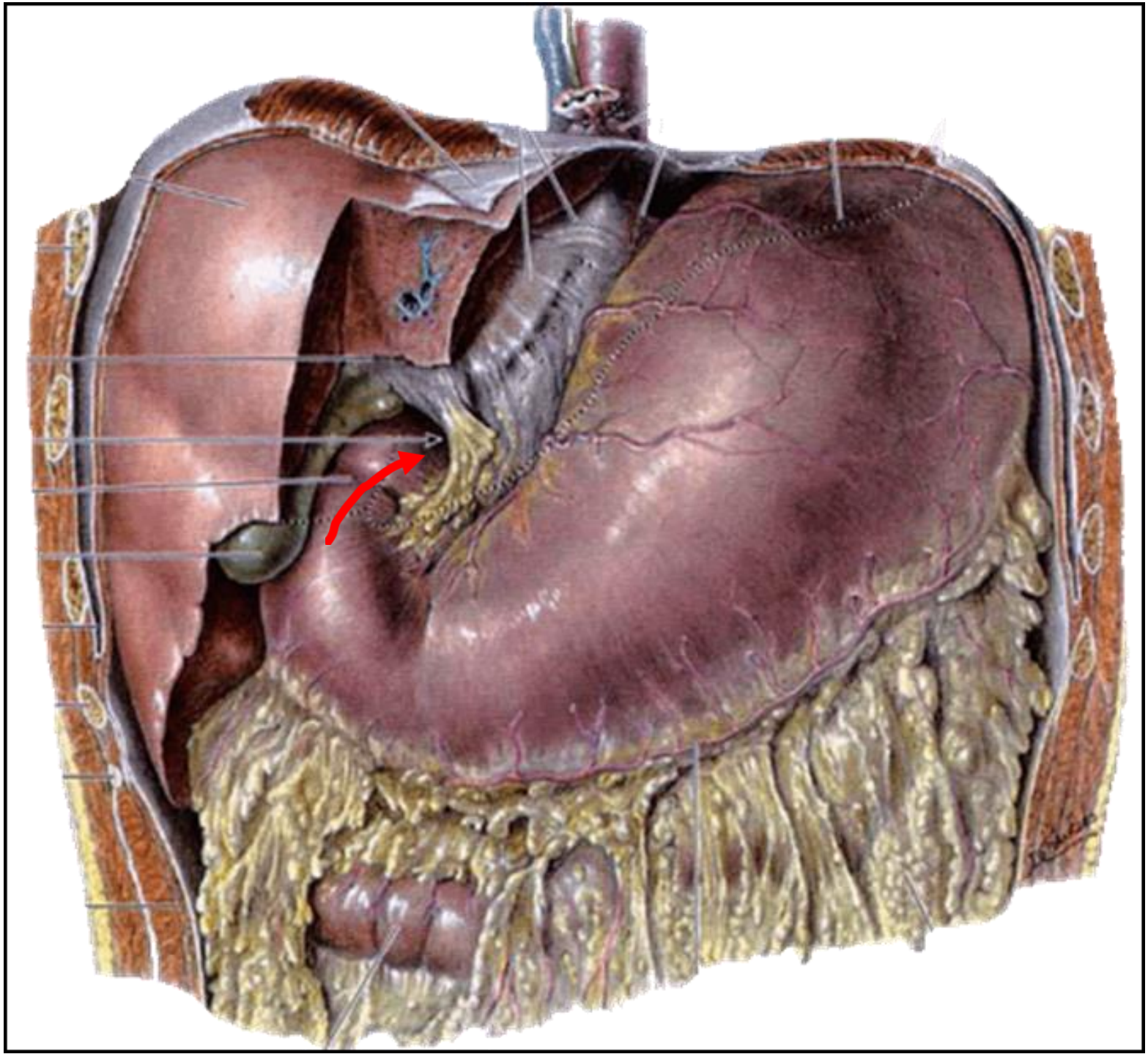
Anterior: free margin of lesser omentum, containing (hepatic artery, bile duct and portal vein)

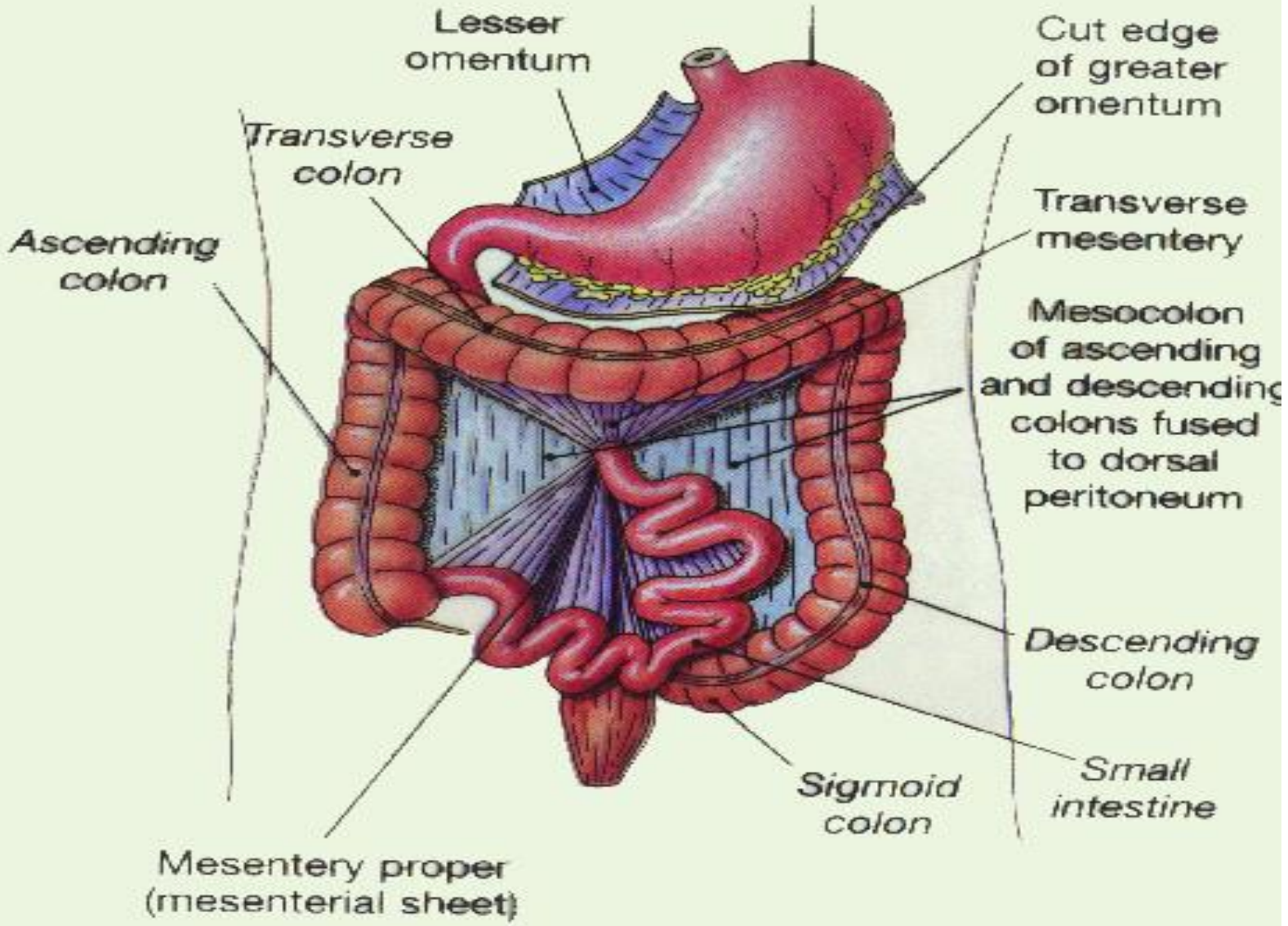
Posterior: peritoneum covering IVC.

Superior: Caudate process of the caudate lobe of the liver.

Inferior: 1st inch of the1st part of duodenum.

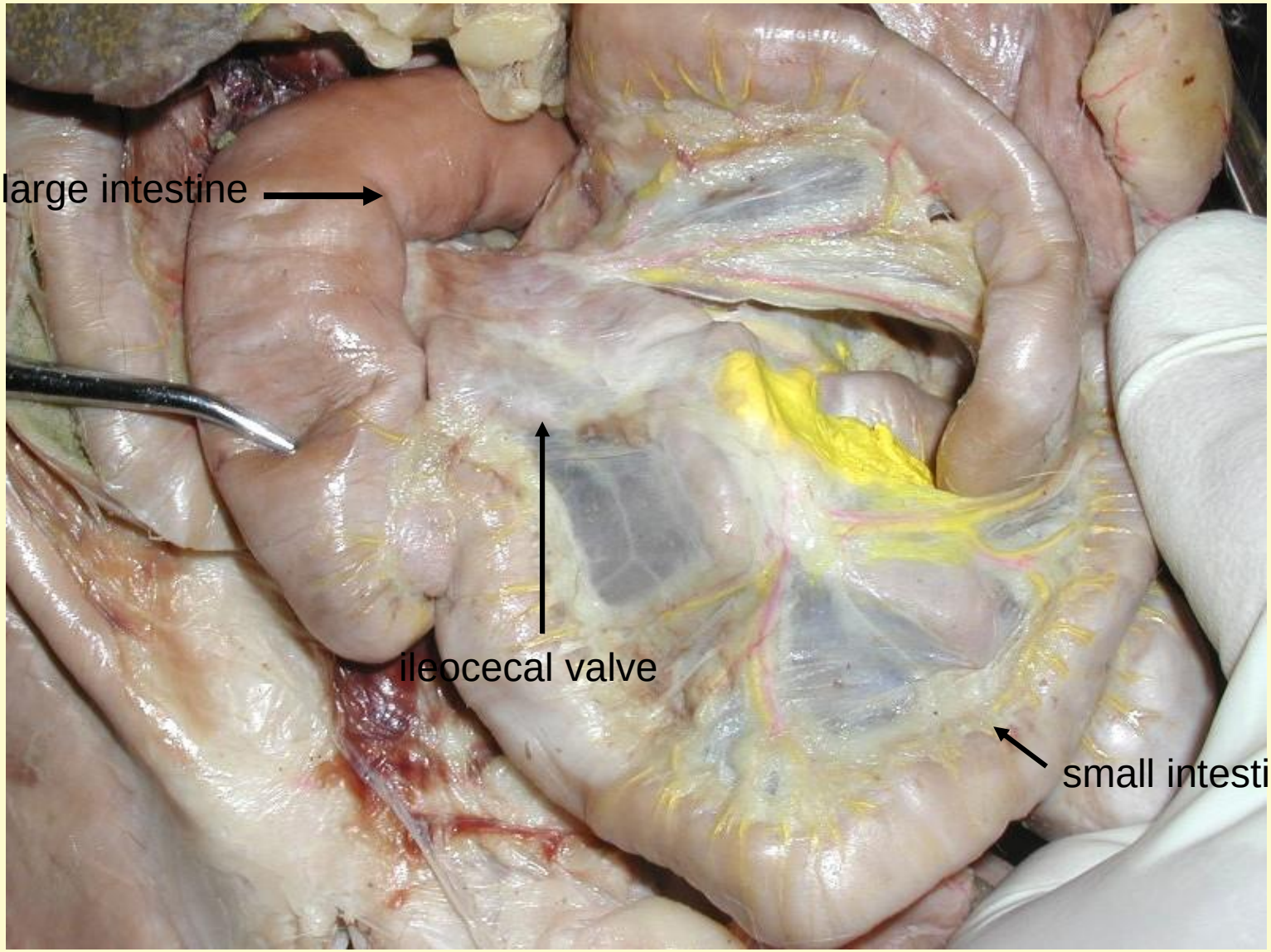






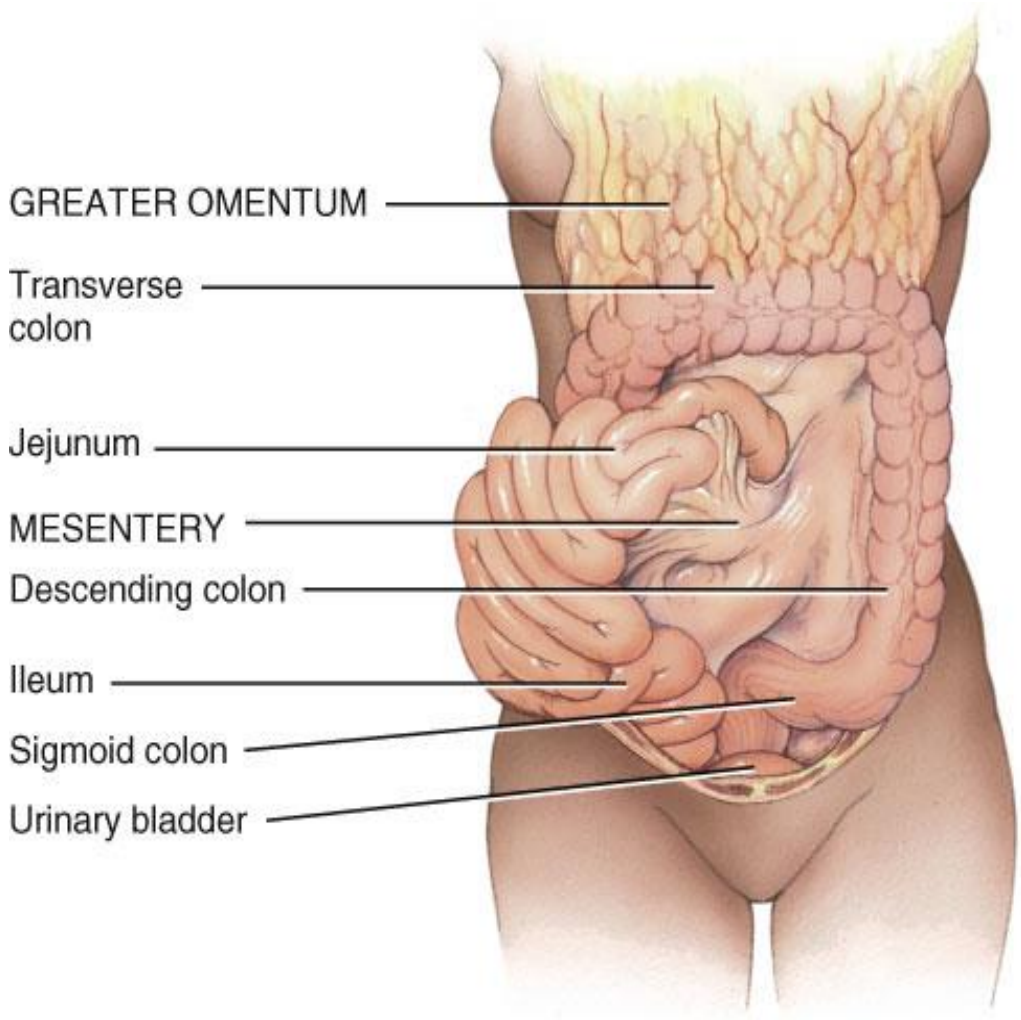
(d) Organization of mesenteries, anterior view

II) The mesenteries and mesocolons :



Mesentery of the small intestine

- The mesentery suspends the jejunum and ileum from the posterior abdominal wall.



(d) Anterior view (greater omentum lifted and small intestine reflected to right side)

- **Mesentery**

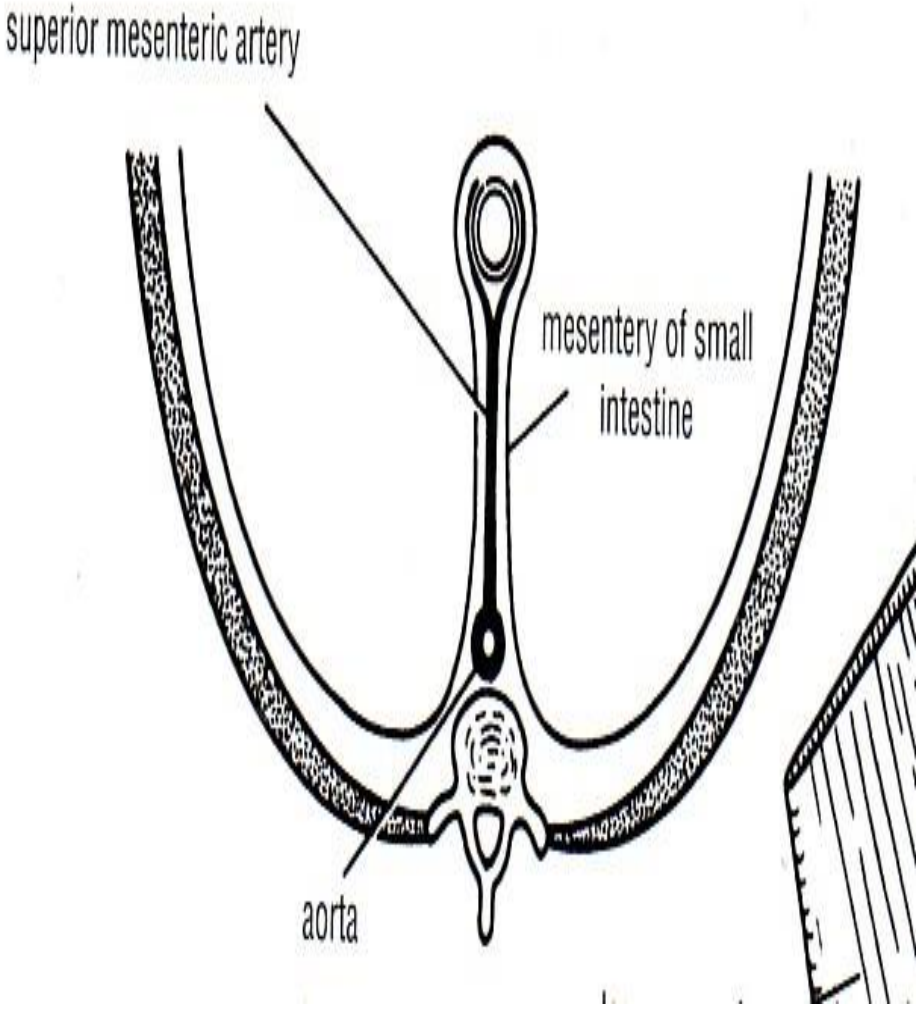
Two layers of peritoneum connecting small intestine to post abdominal wall.

It has 2 borders

1- A*ttached border*: to post abdominal wall &

2- F*ree border*: which encloses the jejunum & ileum.

- Vessels, nerves. Lymphatic enter small intestine between the two layers.



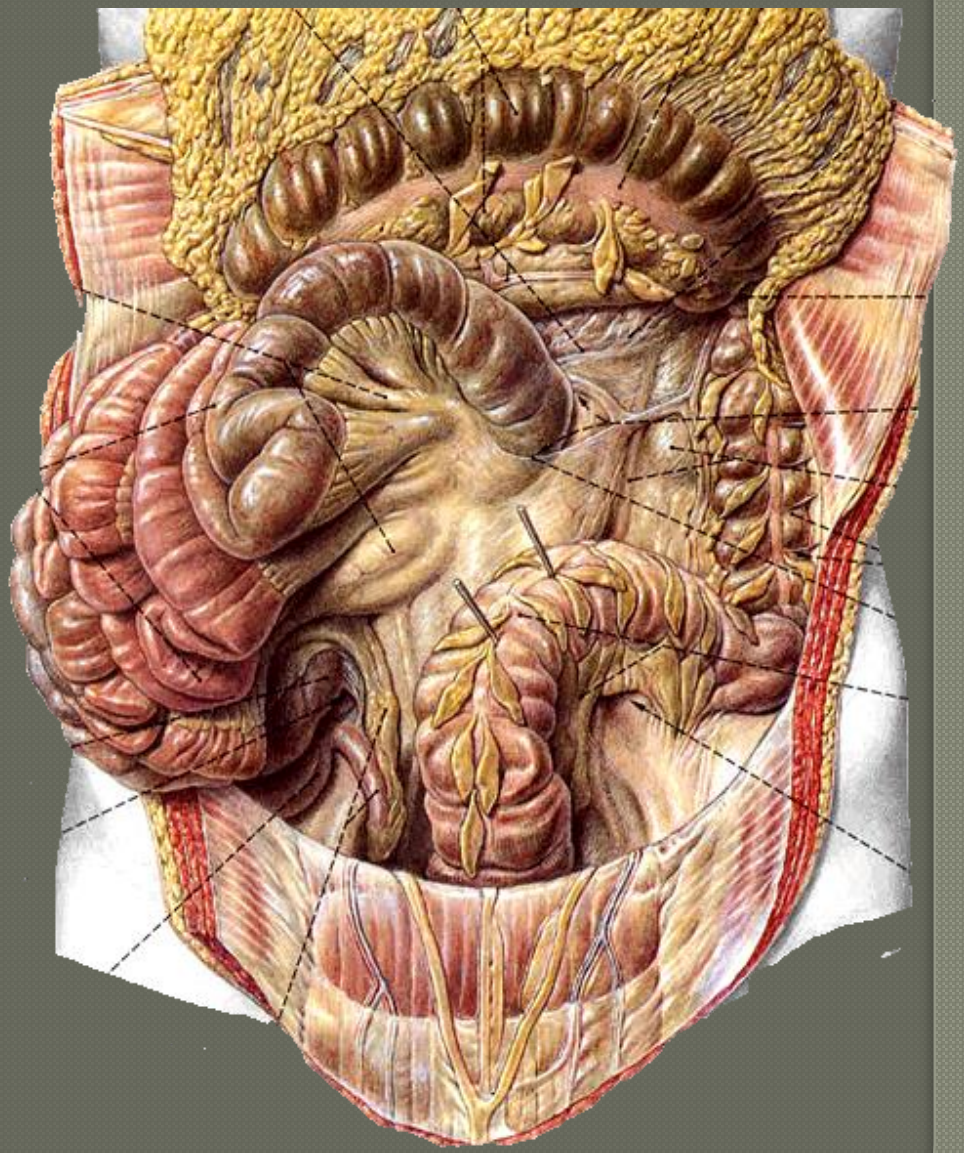
1- Mesentery of small intestine - suspends the small intestine from the posterior abdominal wall

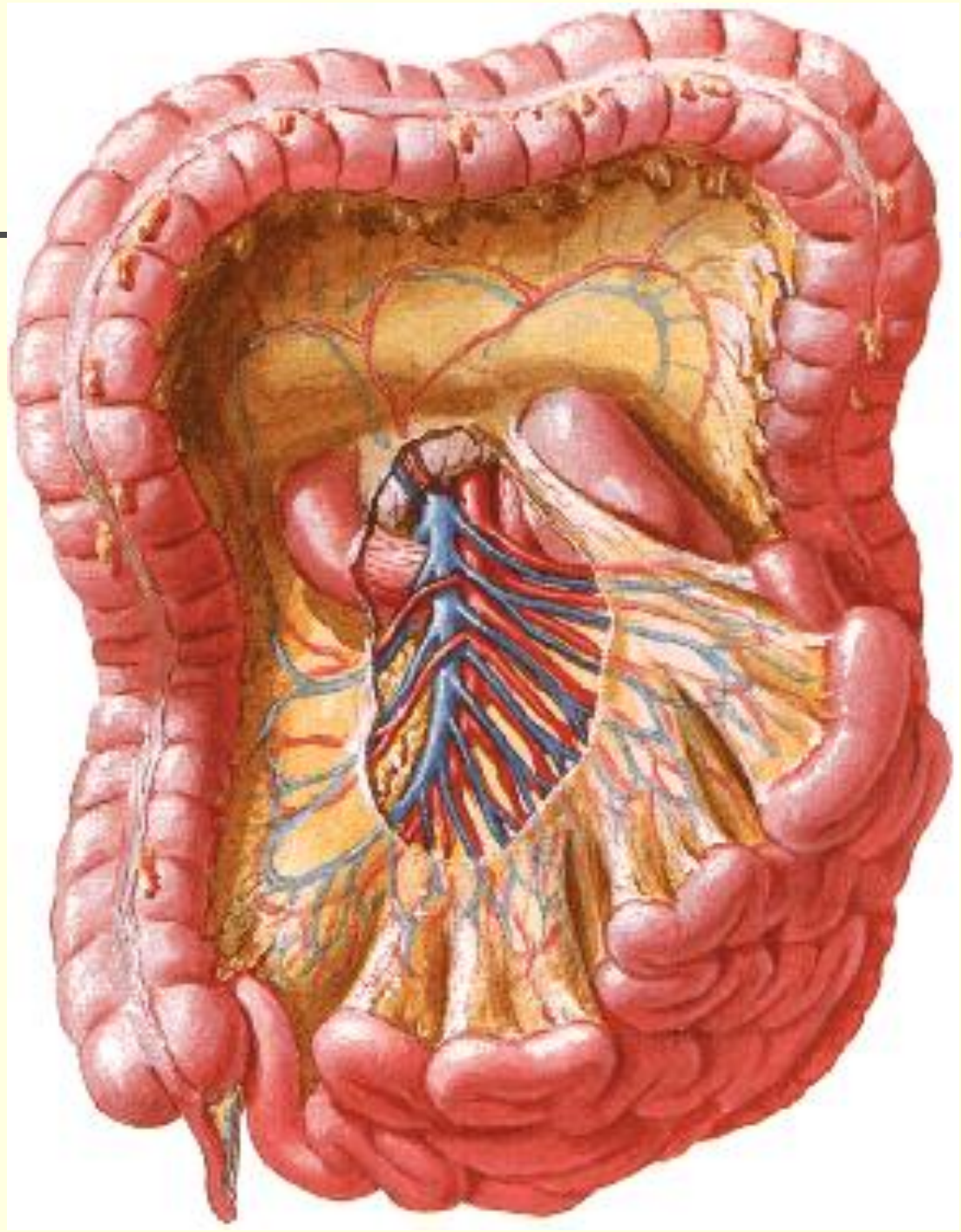
-Broad and a fan-shaped

- Root of mesentery
  - 15 cm long
  - Directed obliquely from left side of L2 vertebra to right sacroiliac joint

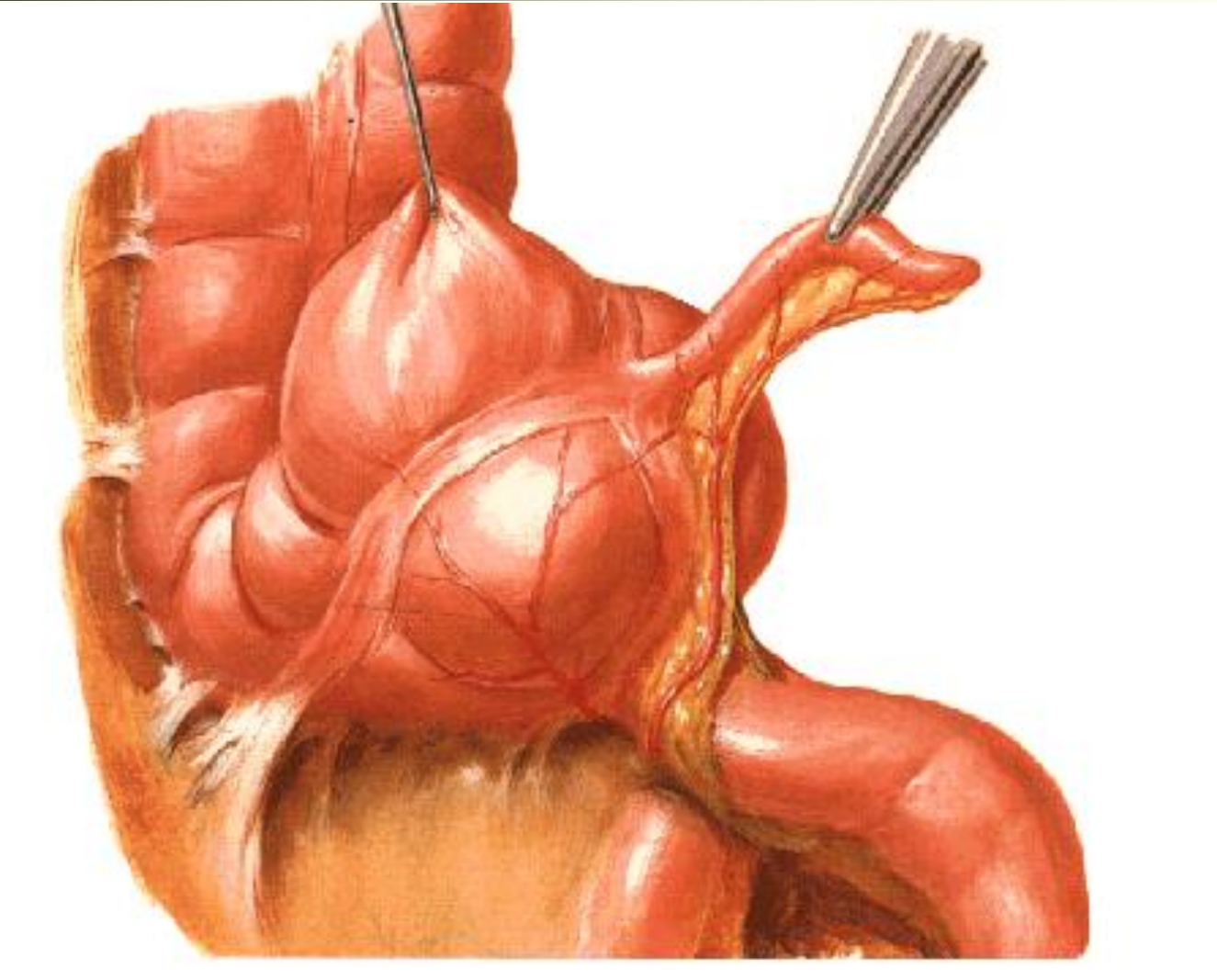
Contents of the mesentery

- the jejunal and ileal branches of the superior mesenteric artery &veins
- nerve plexuses
- lymphatic vessels
- the lymphatic nodes,
- connective tissue
- fat





2. The mesoappendix (mesentery of the appendix)



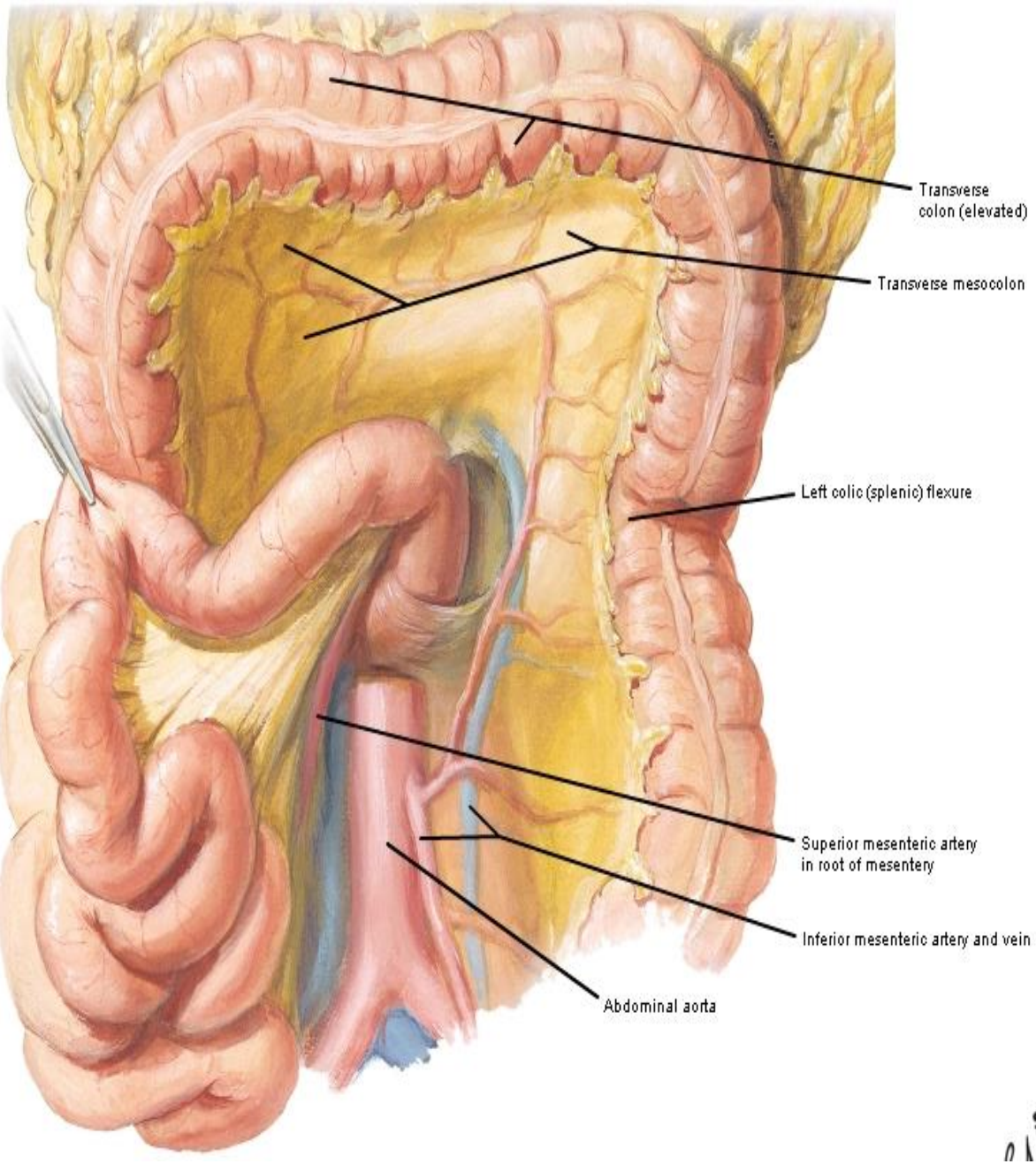
The mesenteries

Contents ?

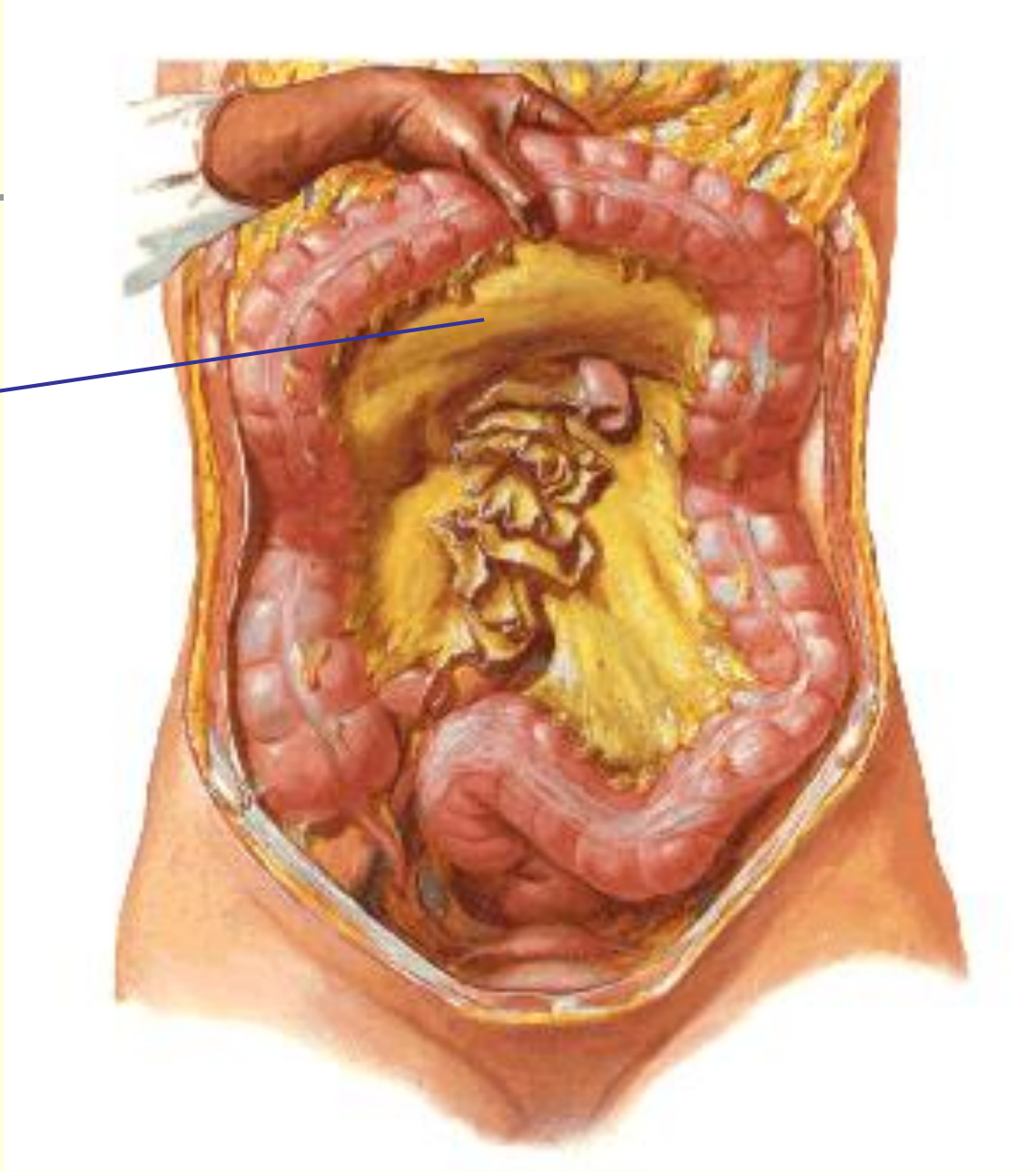
mesentery of the small intestine

transverse mesocolon

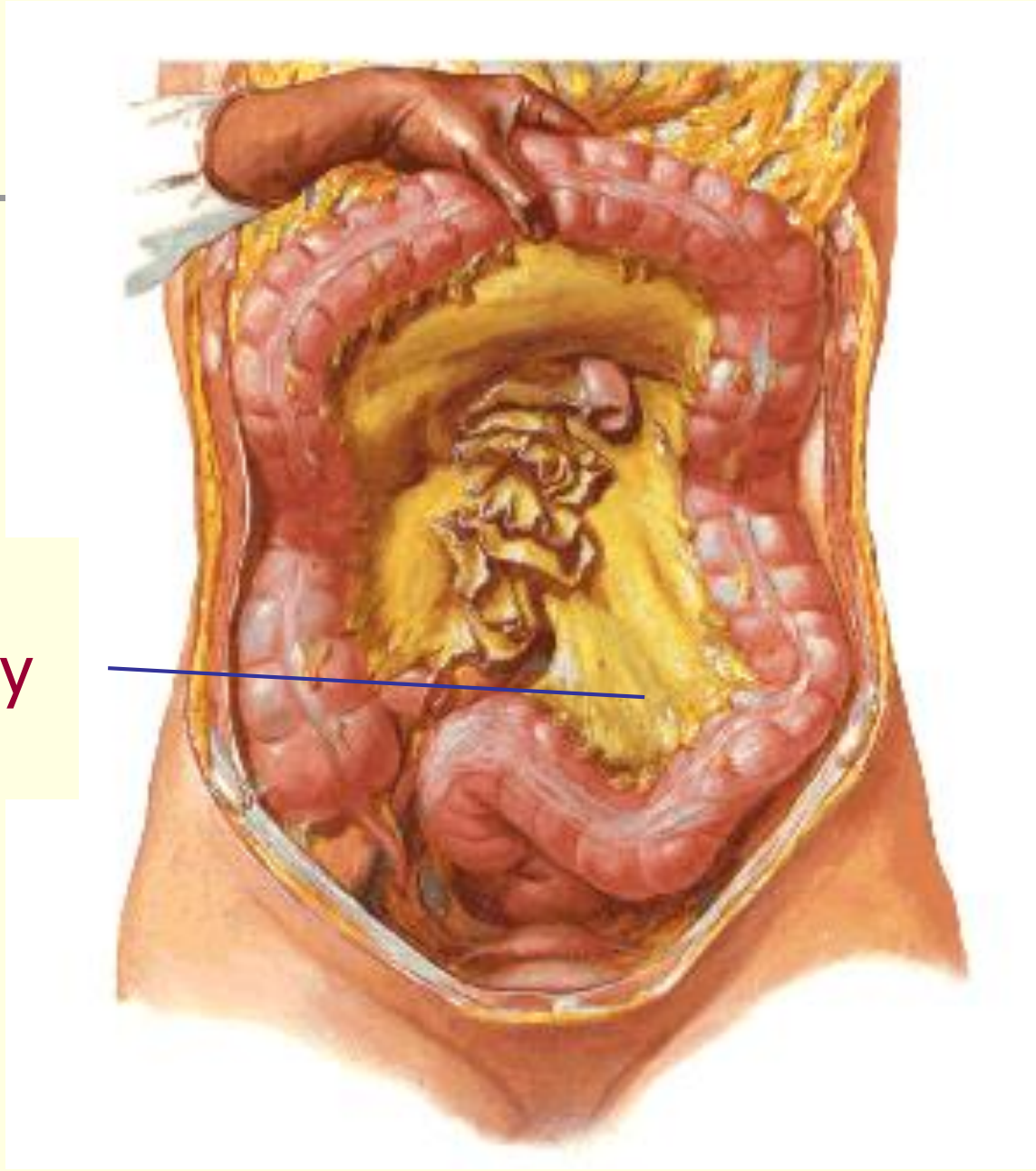
sigmoid mesocolon



3. The transverse mesocolon (mesentery of the transverse colon)



4. The sigmoid mesocolon (mesentery of the sigmoid colon)



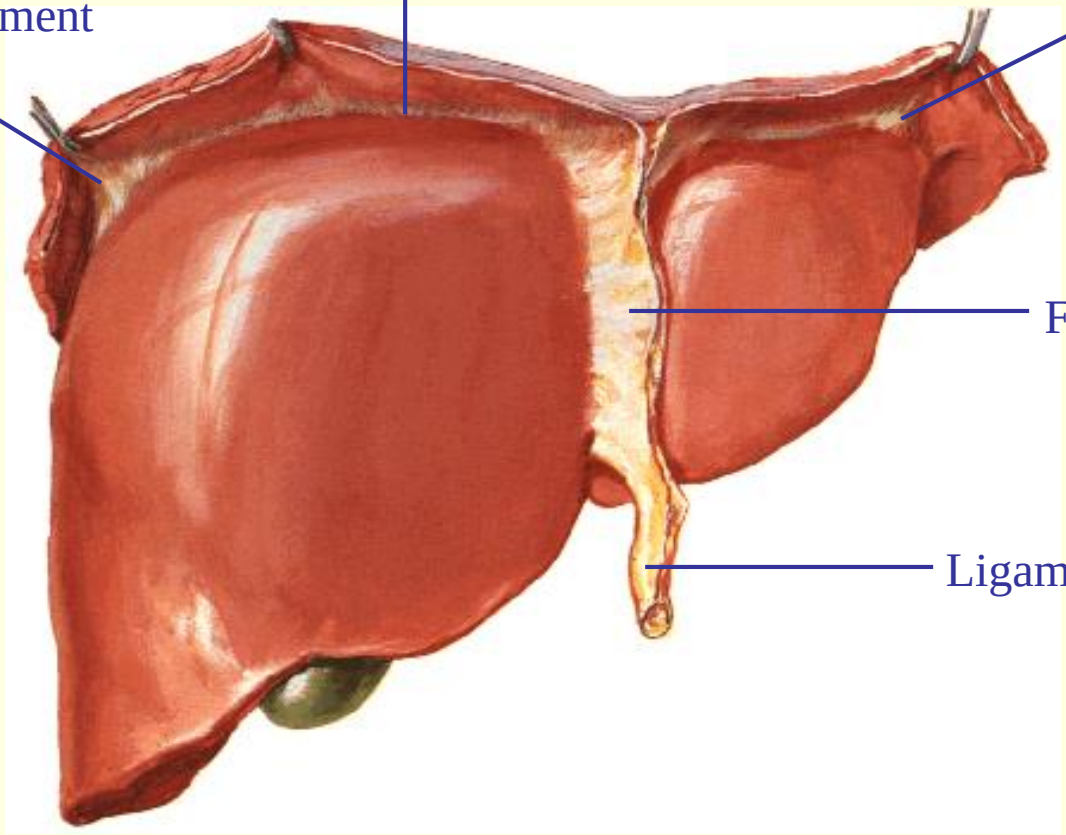
3- ligaments of the peritoneum

1. The ligaments of the liver

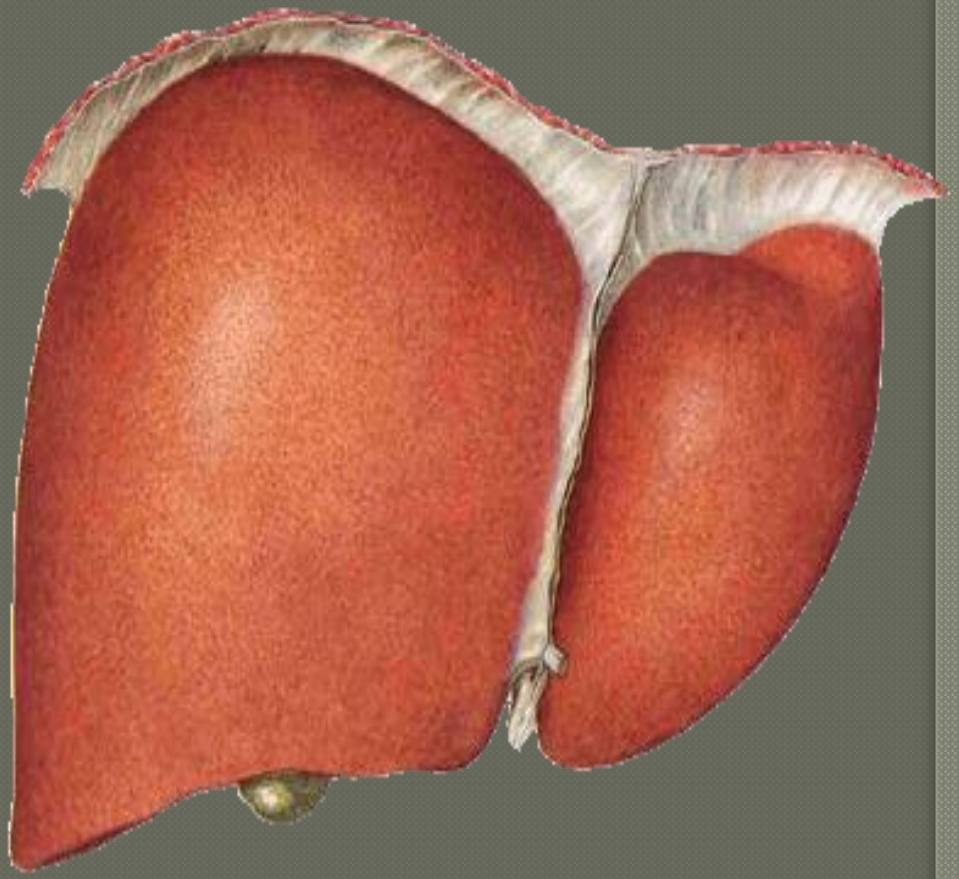
1- The **Falciform ligament of liver**
2- The **Ligamentum teres hepatis**
3- The **coronary ligament**
4- The **right triangular ligament**
5- The **left triangular ligament**
6- The **Hepatogastric ligament**
7- The **hepatoduonedenal ligament**
8- The Ligamentum Venoosum

III) The ligaments

1. The ligments of the liver

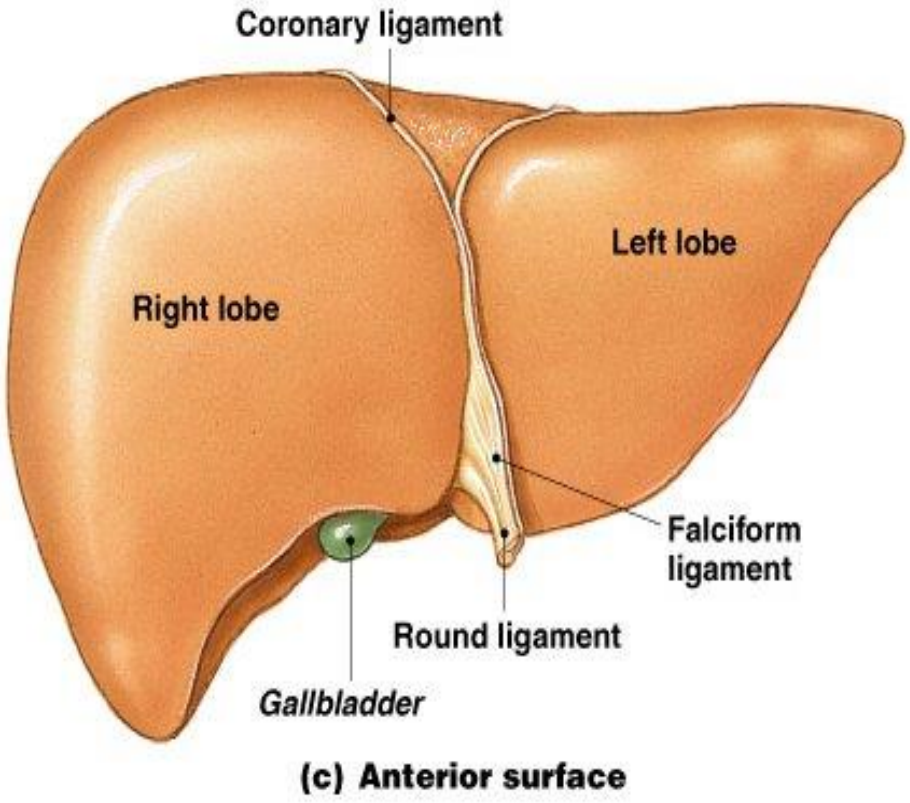


- **Falciform ligament of liver**
  - Consists of double peritoneal layer
  - Sickeleshape
  - Extends from anterior abdominal wall (umbilicus) to liver
  - Free border of the ligament contains Ligamentum teres (obliterated umbilical vein)

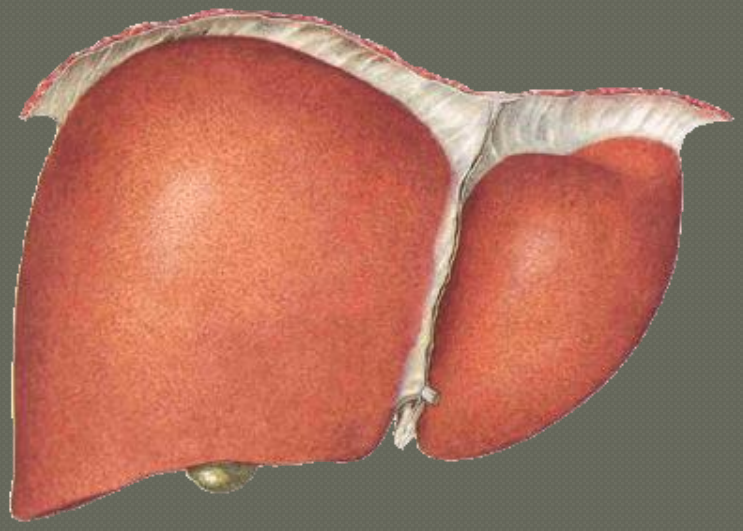


Peritoneal folds related to the Liver

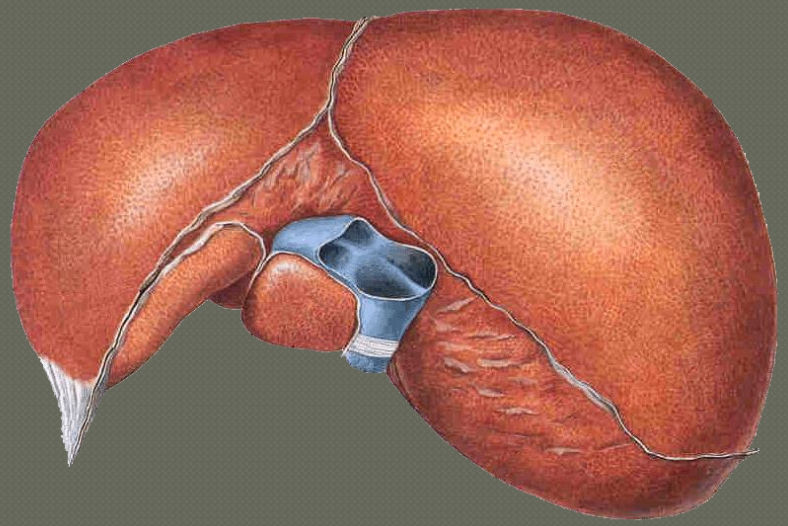
- The Falciform ligament:
  Passes from the parietal peritoneum on the anterior abdominal wall to the visceral peritoneum on the surface of the liver.
- The round ligament of the liver (ligamentum teres hepatis):
- Is the obliterated umbilical vein and it is found in the inferior free margin of the Falciform ligament.



- **Coronary ligament** the area between upper and lower layer of the coronary ligament is the bare area of liver which contract with the diaphragm;



- **Left and right triangular ligaments** formed by left and right extremity of coronary ligament



Peritoneal folds related to the Liver

- Coronary ligament:

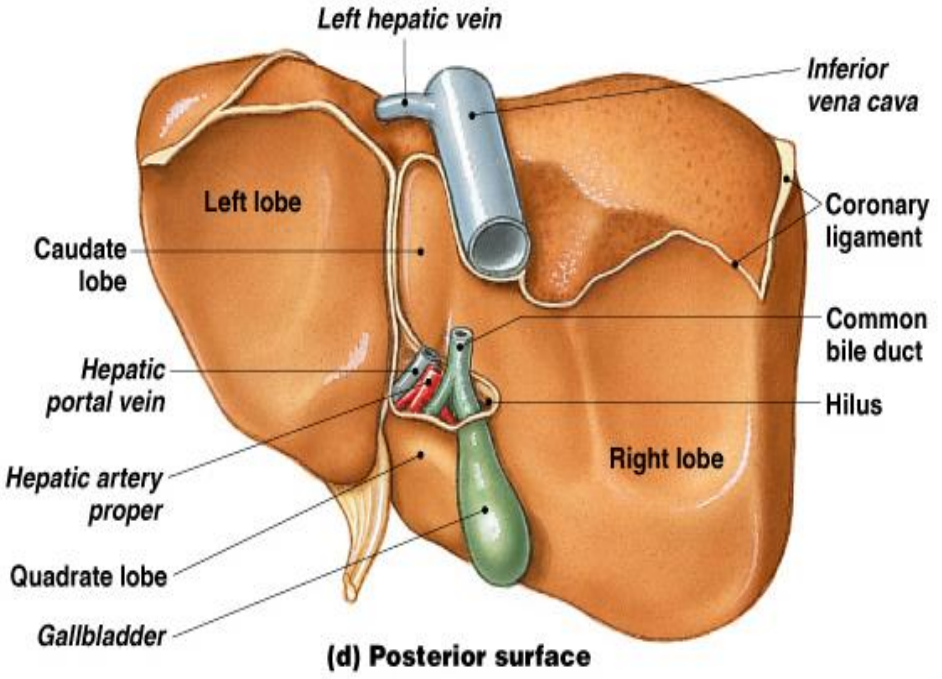
Attaches the liver to the diaphragm. Two peritoneal ligaments are parts of the coronary ligament:

1. Left triangular ligament:

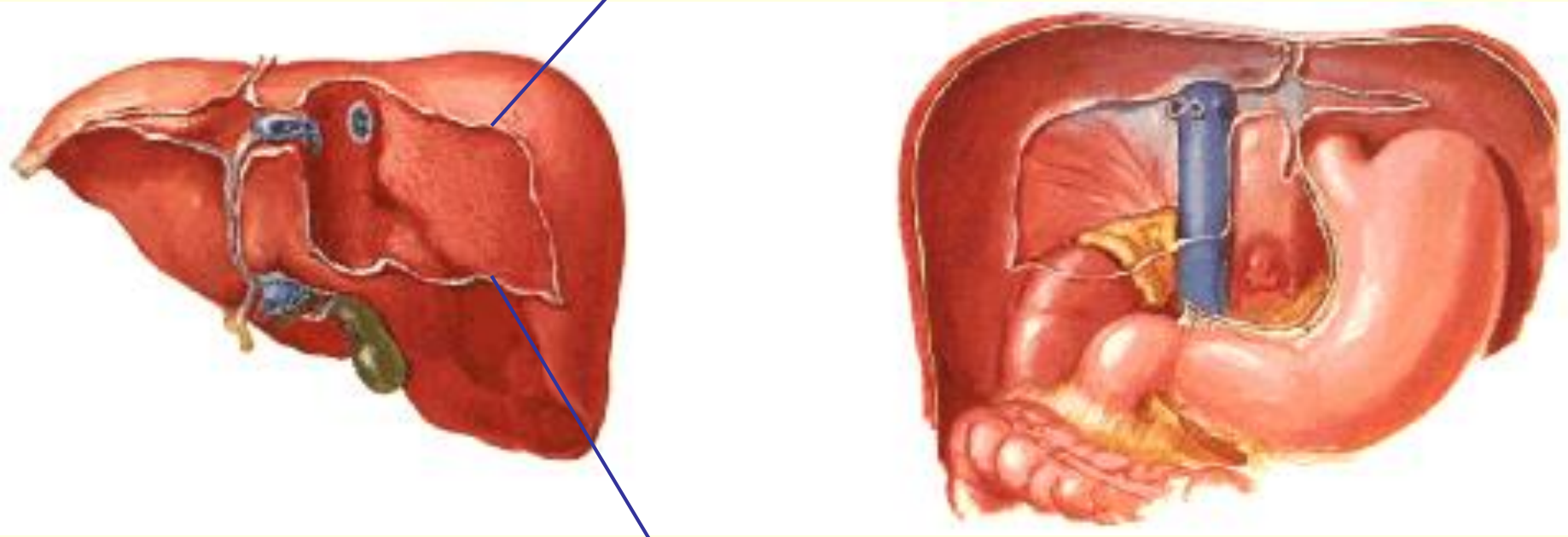
Is between the left lobe of the liver and the diaphragm.

2. Right triangular ligament:

Is between the right lobe of the liver and the diaphragm.



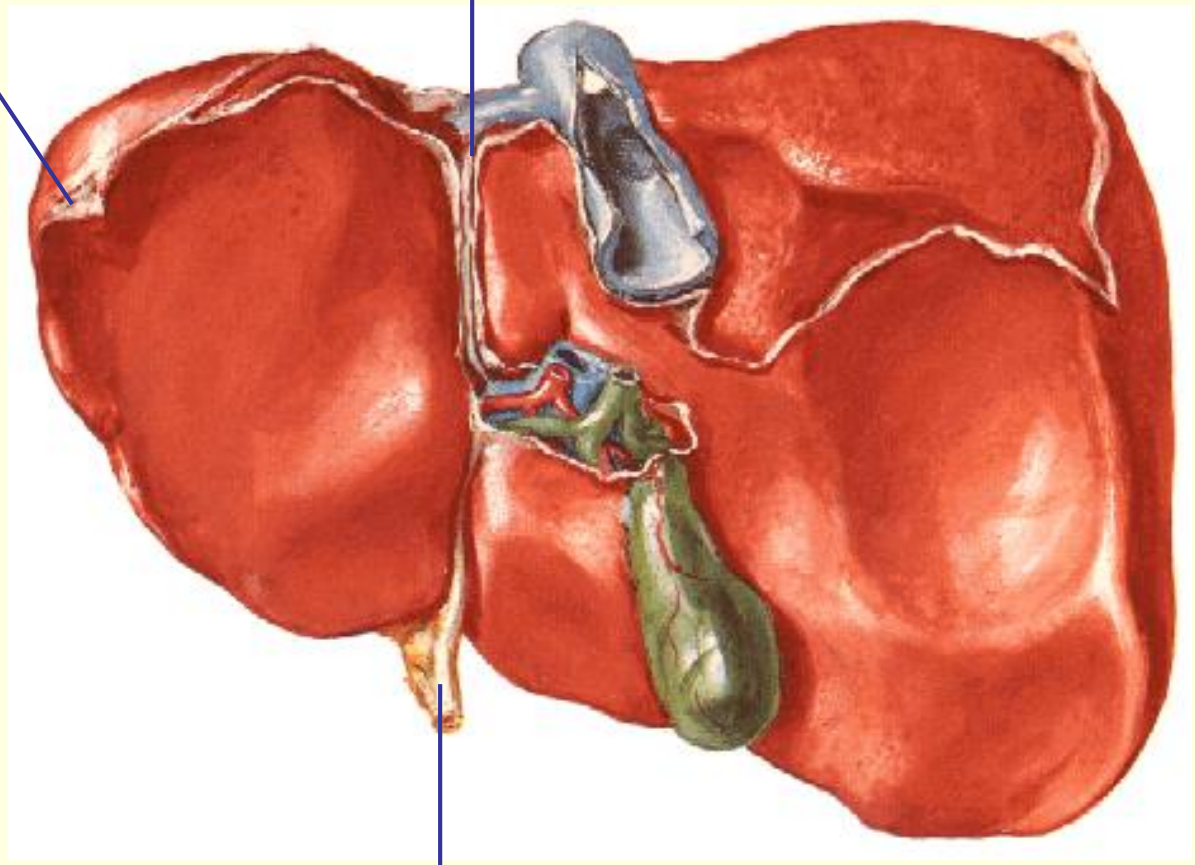
Posterior coronary ligament



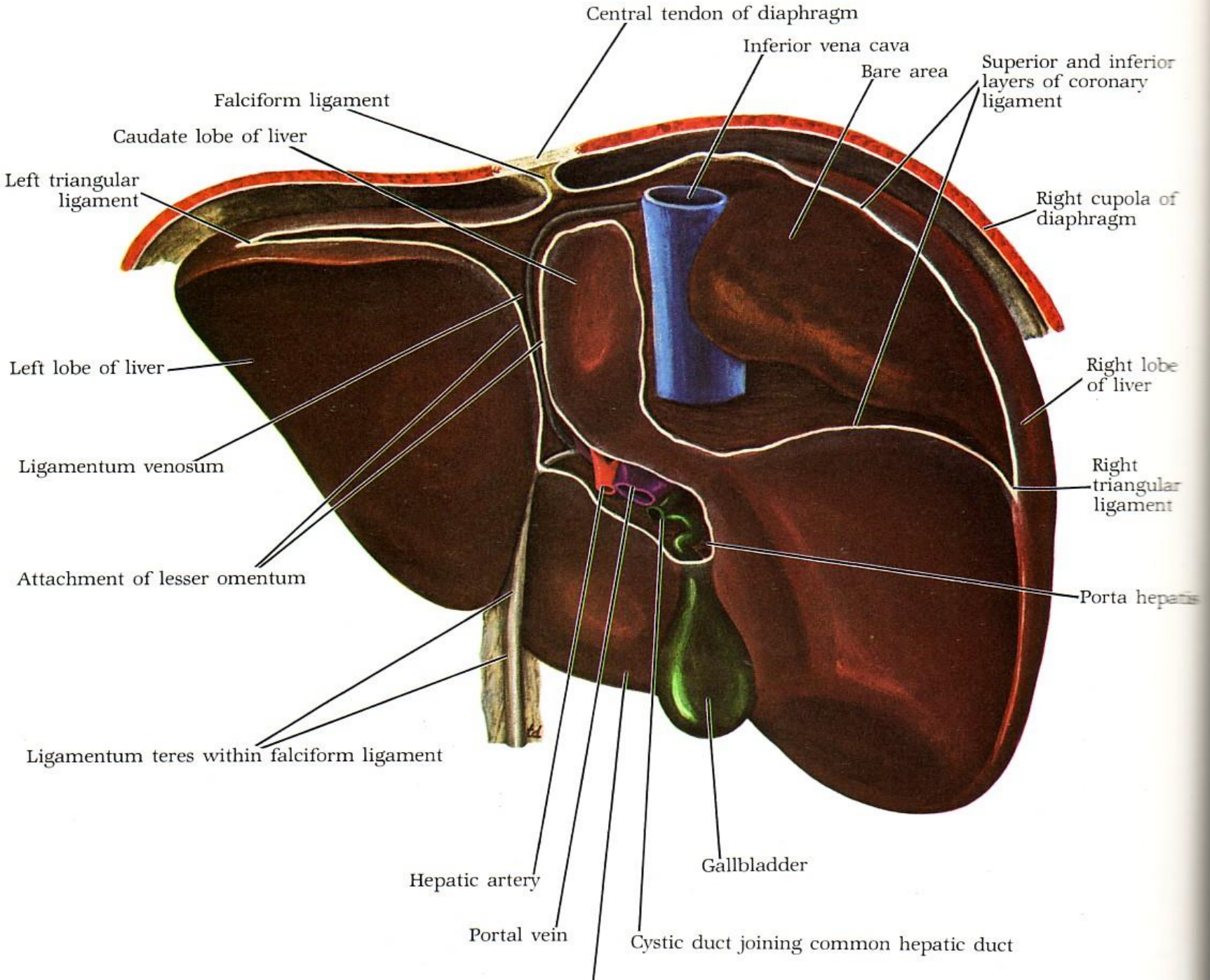
Anterior coronary ligament

Ligament venosum

Left triangular ligament



Ligamentum teres hepatis


Central tendon of diaphragm
Inferior vena cava
Bare area
Superior and inferior layers of coronary ligament
Falciform ligament
Caudate lobe of liver
Left triangular ligament
Right cupola of diaphragm
Left lobe of liver
Right lobe of liver
Ligamentum venosum
Right triangular ligament
Attachment of lesser omentum
Porta hepatis
Ligamentum teres within falciform ligament
Hepatic artery
Gallbladder
Portal vein
Cystic duct joining common hepatic duct

2. The ligaments of the stomach

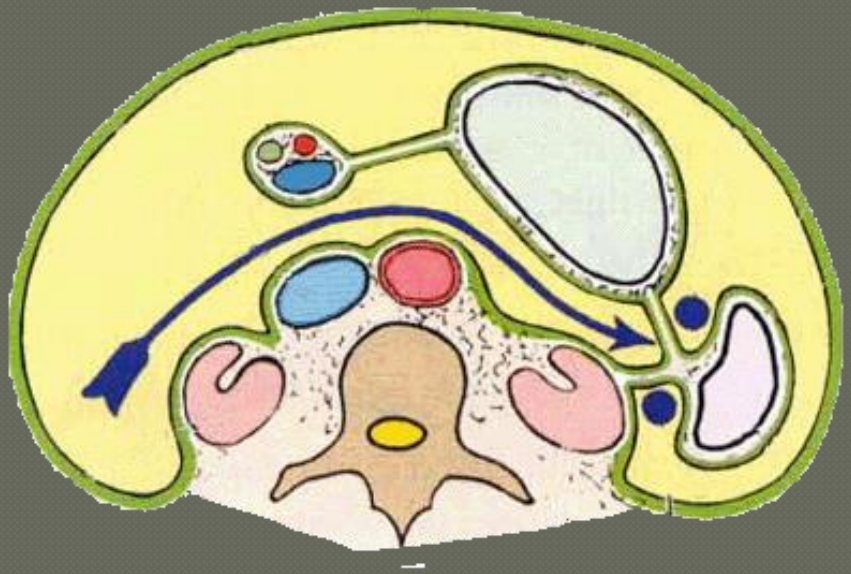
① The **gastrohepatic ligament**

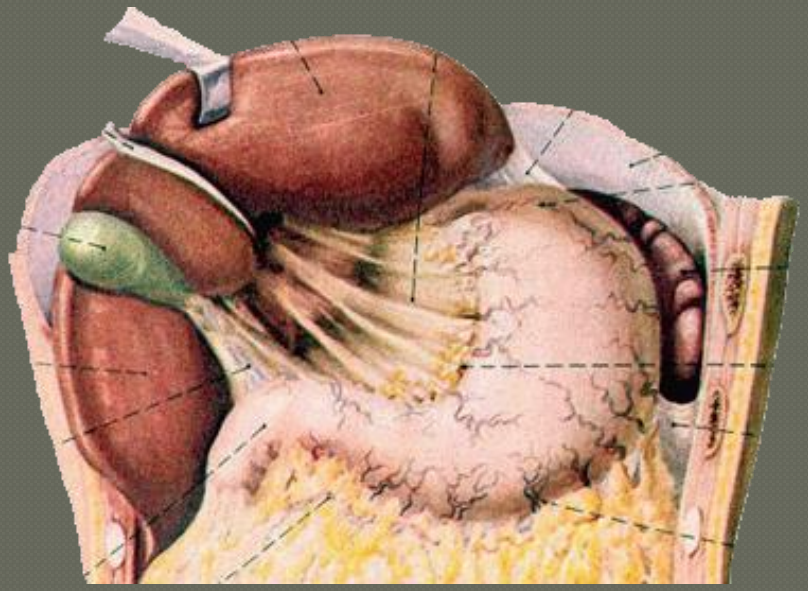
② The **gastrocolic ligament**

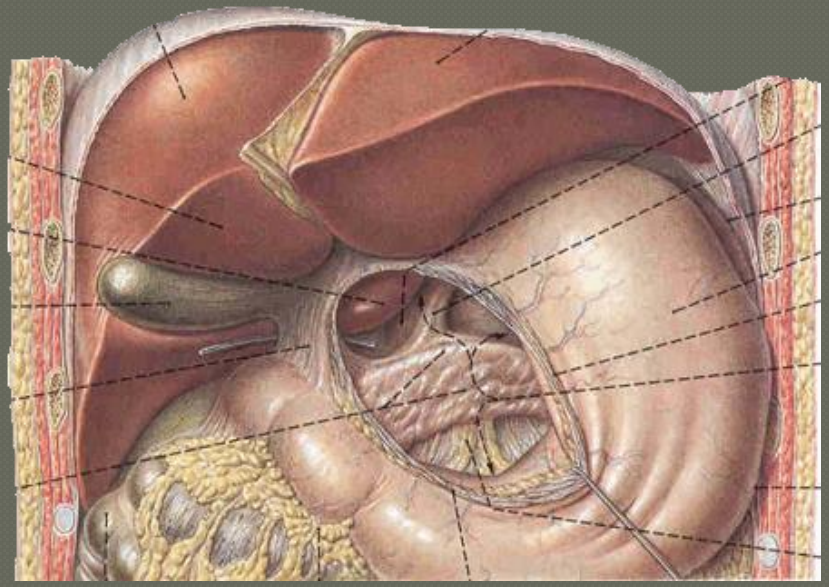
③ The **gastrosplenic ligament**

2- Ligaments of stomach

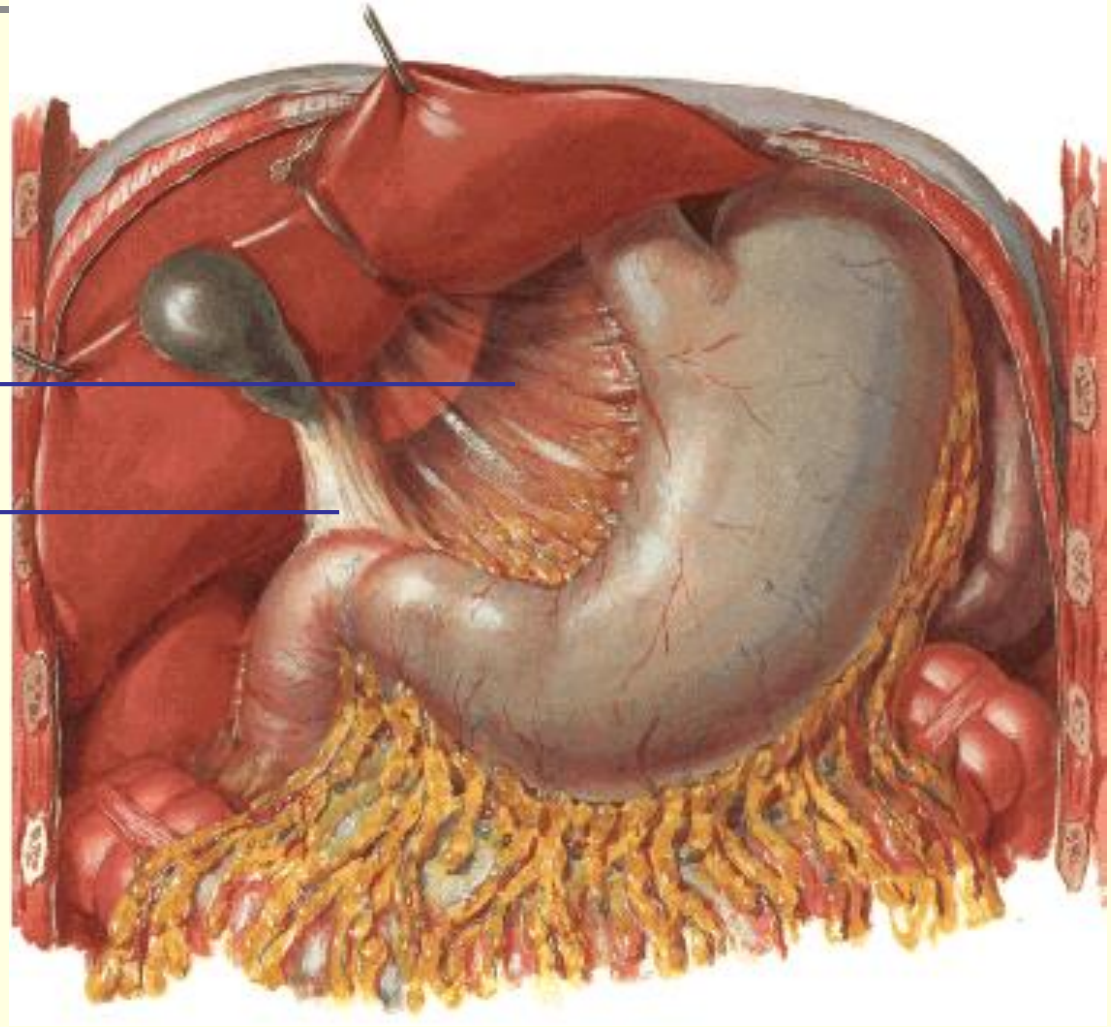
- Hepatogastric ligament
- Gastrosplenic ligament
- Gastrophrenic ligament
- Gastrocolic ligament
- **Gastropancrestic ligament**



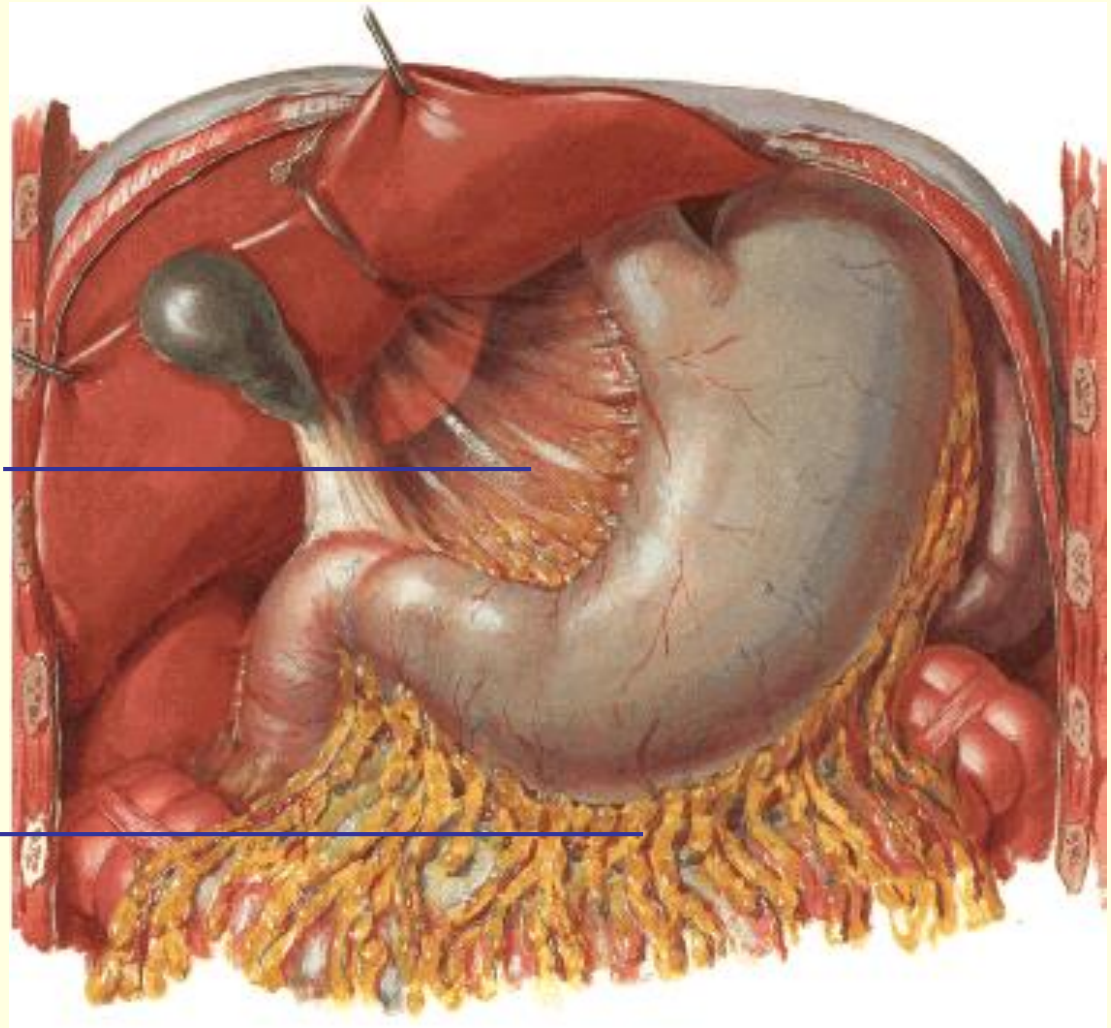




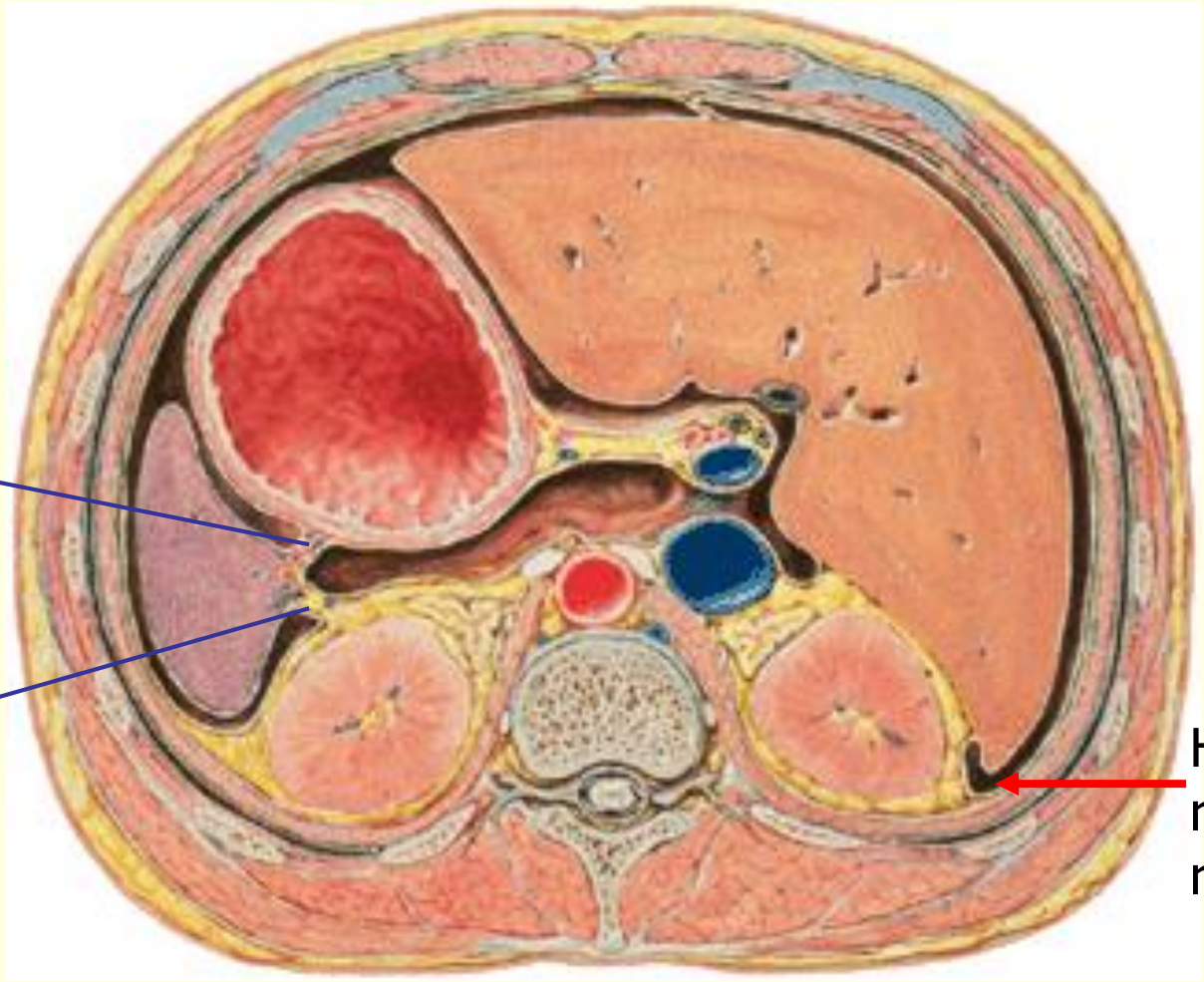
Omentum
- Hepatogastric lig.
- Hepatodudenal lig.



. The ligaments of the stomach



3. The ligaments of the spleen

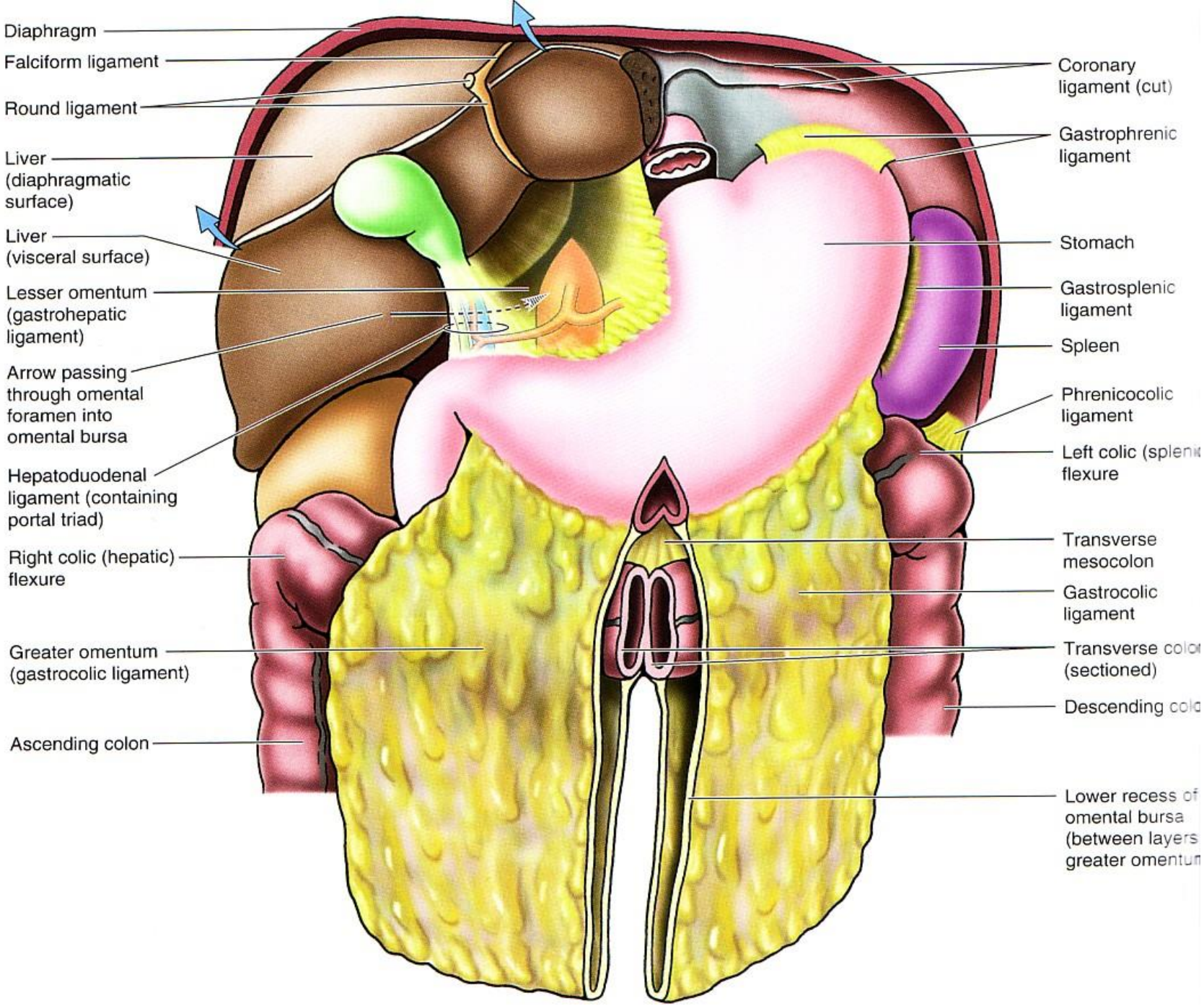


Spleen

- Peritoneum
- The spleen is completely covered with peritoneum → intraperitoneal organ
- Two ligaments

1- the gastrosplenic omentum (ligament)→ between the spleen & the greater curvature of the stomach (carrying the short gastric and left gastroepiploic vessels)

2- splenicorenal ligament→ between spleen & kidney (carrying the splenic vessels and the tail of the pancreas).


Diaphragm
Falciform ligament
Round ligament
Liver (diaphragmatic surface)
Liver (visceral surface)
Lesser omentum (gastrohepatic ligament)
Arrow passing through omental foramen into omental bursa
Hepatoduodenal ligament (containing portal triad)
Right colic (hepatic) flexure
Greater omentum (gastrocolic ligament)
Ascending colon
Coronary ligament (cut)
Gastrophrenic ligament
Stomach
Gastrosplenic ligament
Spleen
Phrenicocolic ligament
Left colic (splenic) flexure
Transverse mesocolon
Gastrocolic ligament
Transverse colon (sectioned)
Descending colon
Lower recess of omental bursa (between layers of greater omentum

- **Phrenicosplenic ligament**
- **Splenocolic ligament**

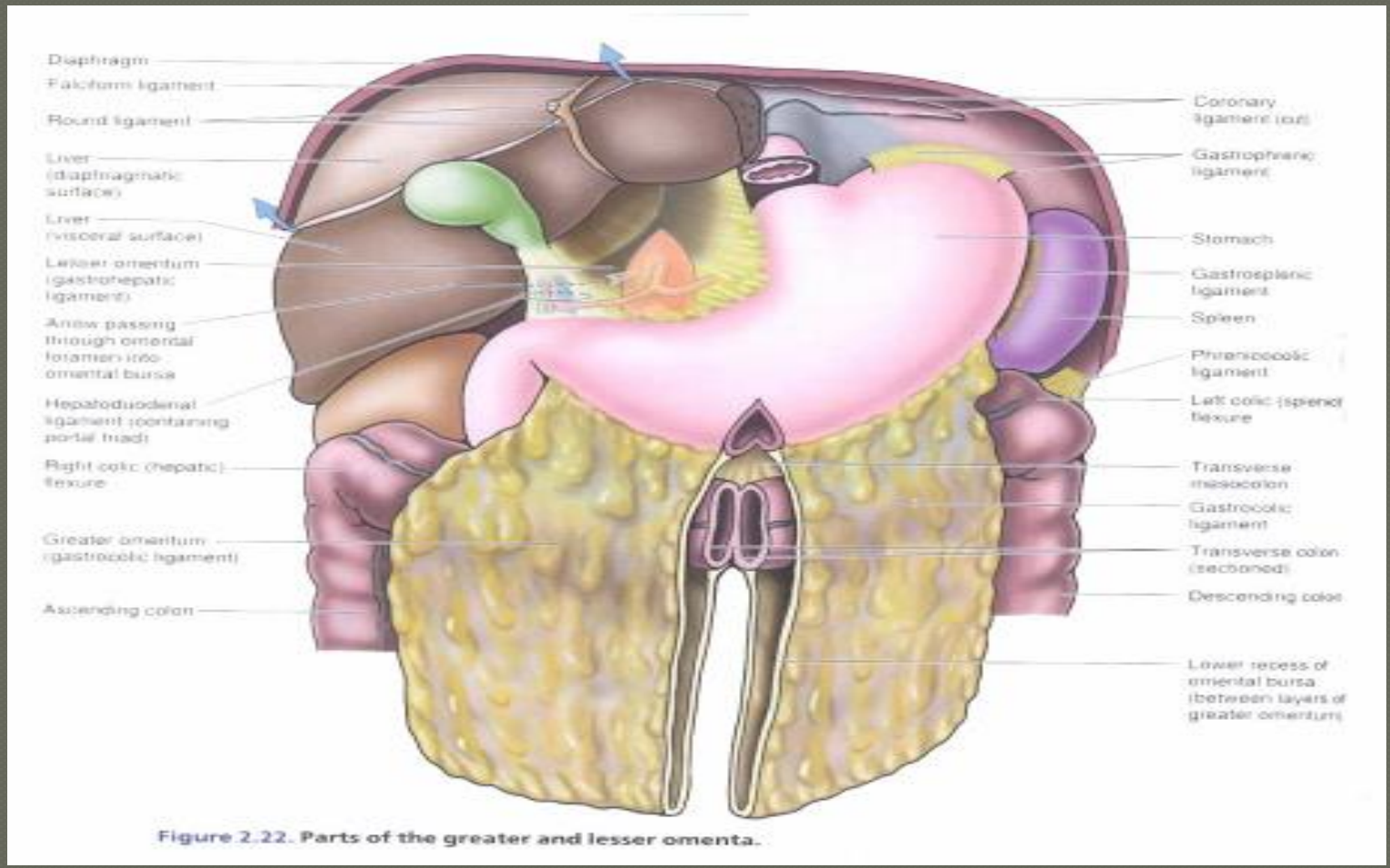


Figure 2.22. Parts of the greater and lesser omenta.

4. The suspensory ligament of the duodenum

Ligament of Treitz it is a fold containing the suspensory muscle of duodenum.

5. The **phrenicocolic ligament**

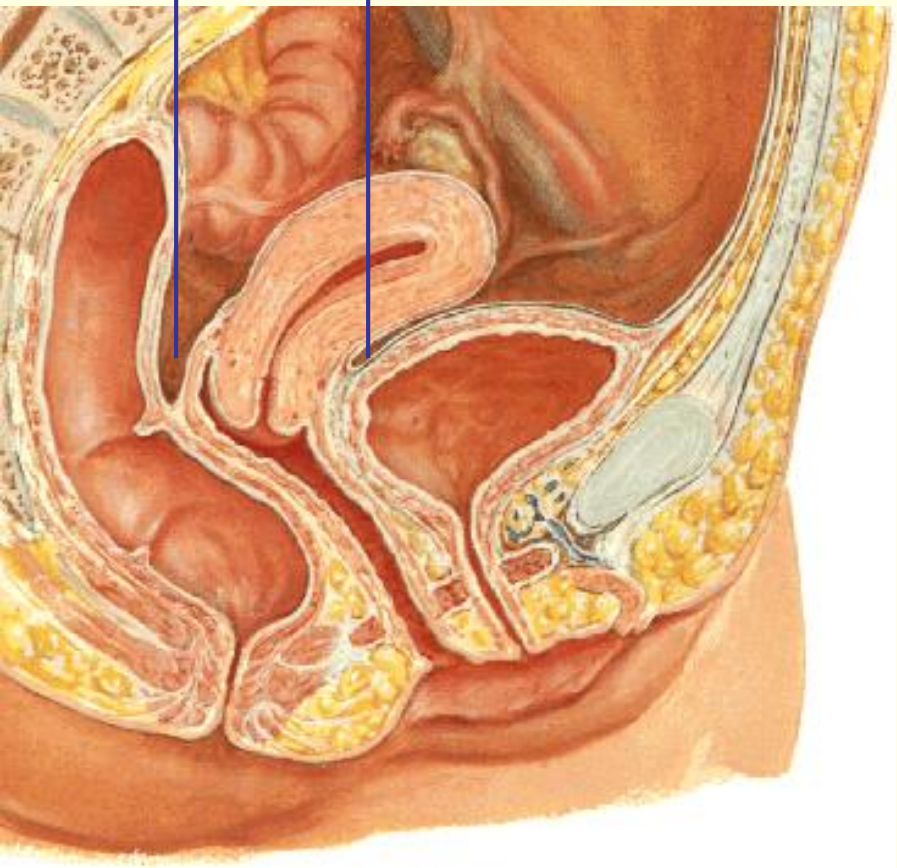
It is a fold of peritoneum which is continued from the left colic flexure to the diaphragm opposite the 10^{th} and 12^{th} ribs.

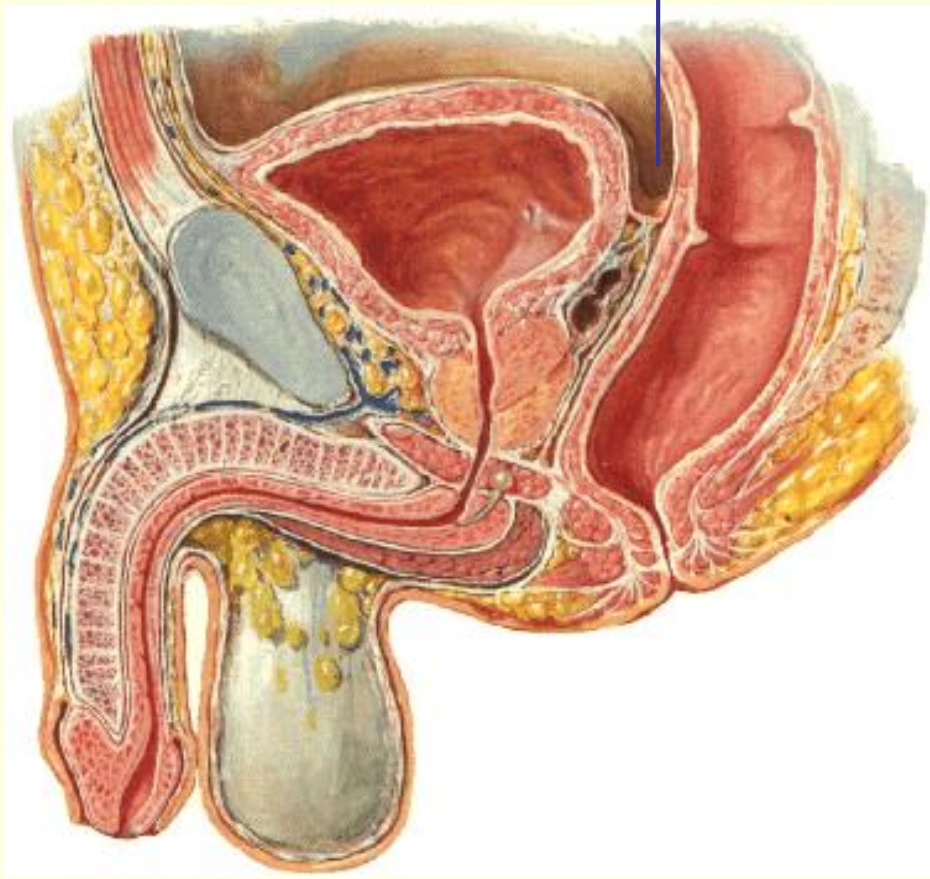
2. The pouches

Rectouterine pouch

Vesicouterine pouch

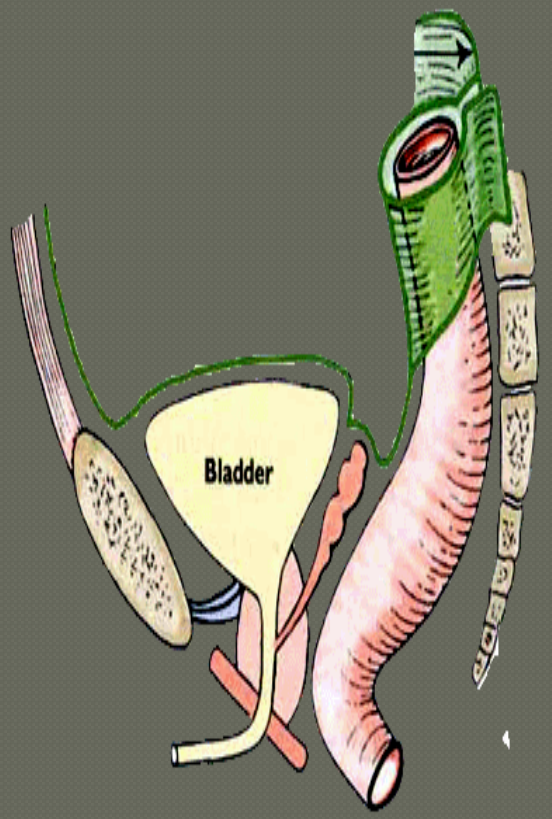
Rectovesical pouch





Pouches

- In male
- **rectovesical pouch**
- lies between rectum and urinary bladder (or the seminal vesicles and ampullae ductus deferentes).
- The rectovesical pouch is the lowest part of the peritoneal cavity in anatomical position in male.



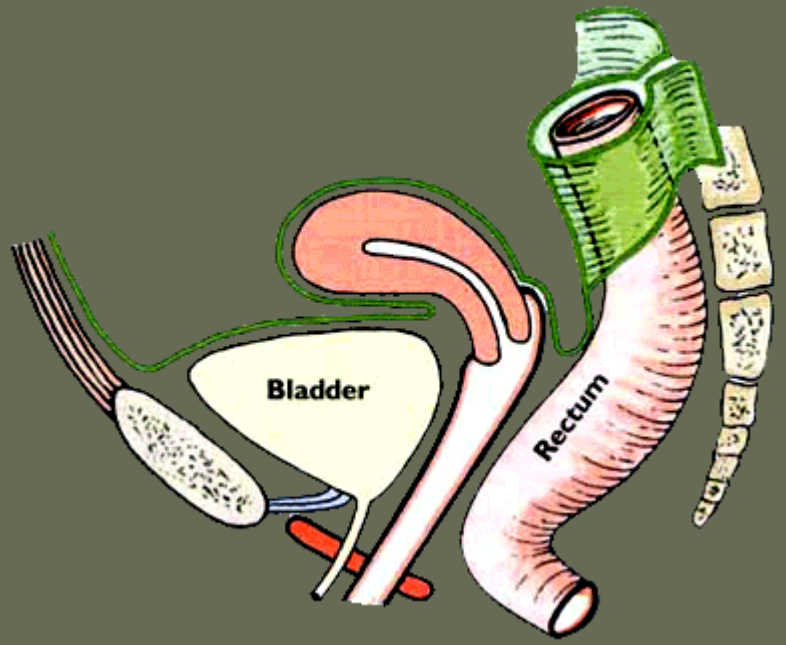
Pouches

In female

1- Rectouterine pouch(douglas)
between rectum and uterus

2- **Vesicouterine pouch**
between bladder and uterus

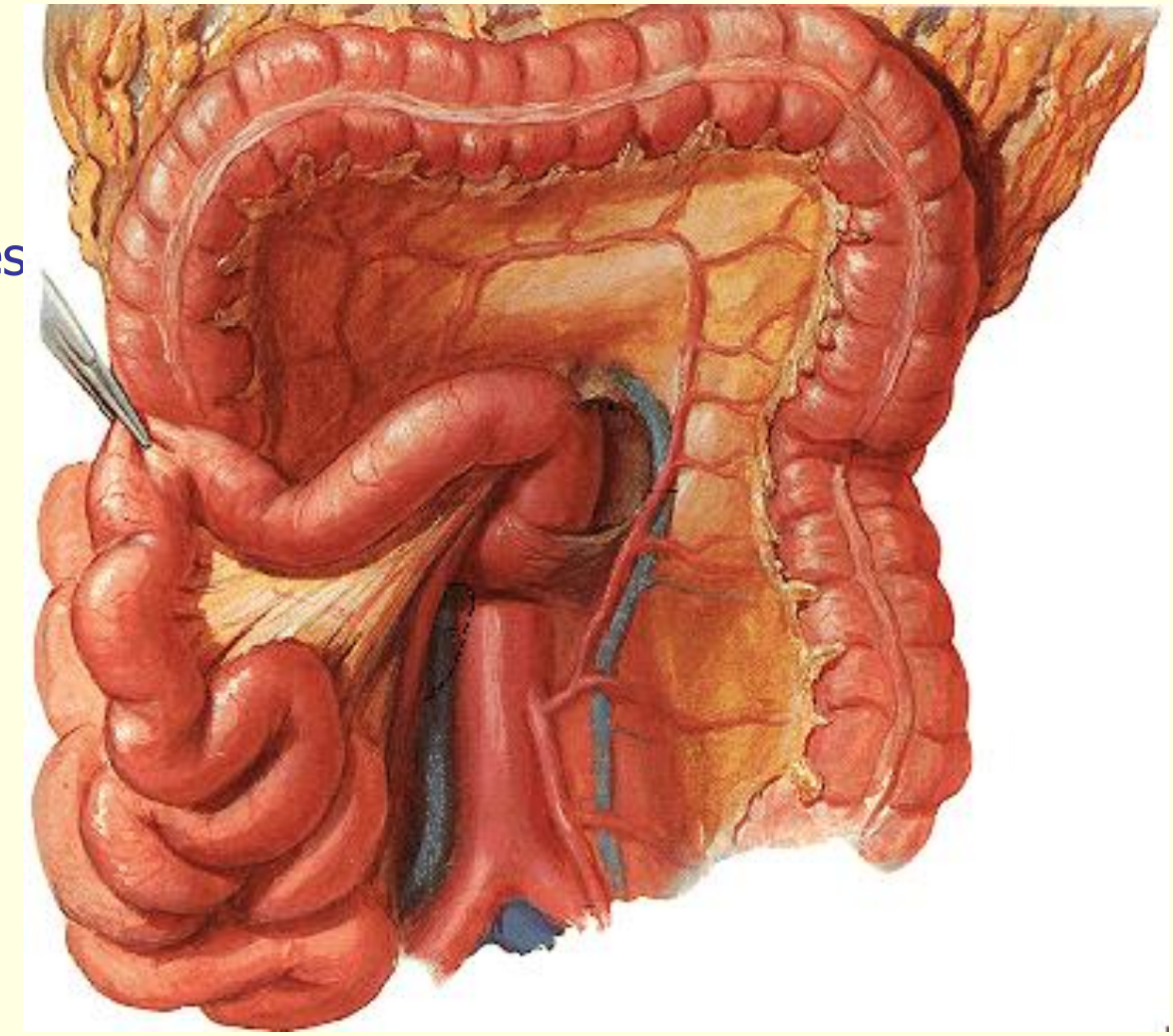
- The rectouterine pouch is formed between the anterior surface of the rectum and the posterosurface of the uterus and the upper part of vagina.



IV) The peritonal recesses, pouches, fossae and folds

1. The recesses

(1) The duodenal recesses



1. Duodenal Recesses

- The superior duodenal recess
- The inferior duodenal recess
- The paraduodenal recess
- The duodenojejunal recess

2. Cecal recesses

- The superior ileocecal,
- The inferior ileocecal
- The retrocecal recesses
- The rectocolic recess

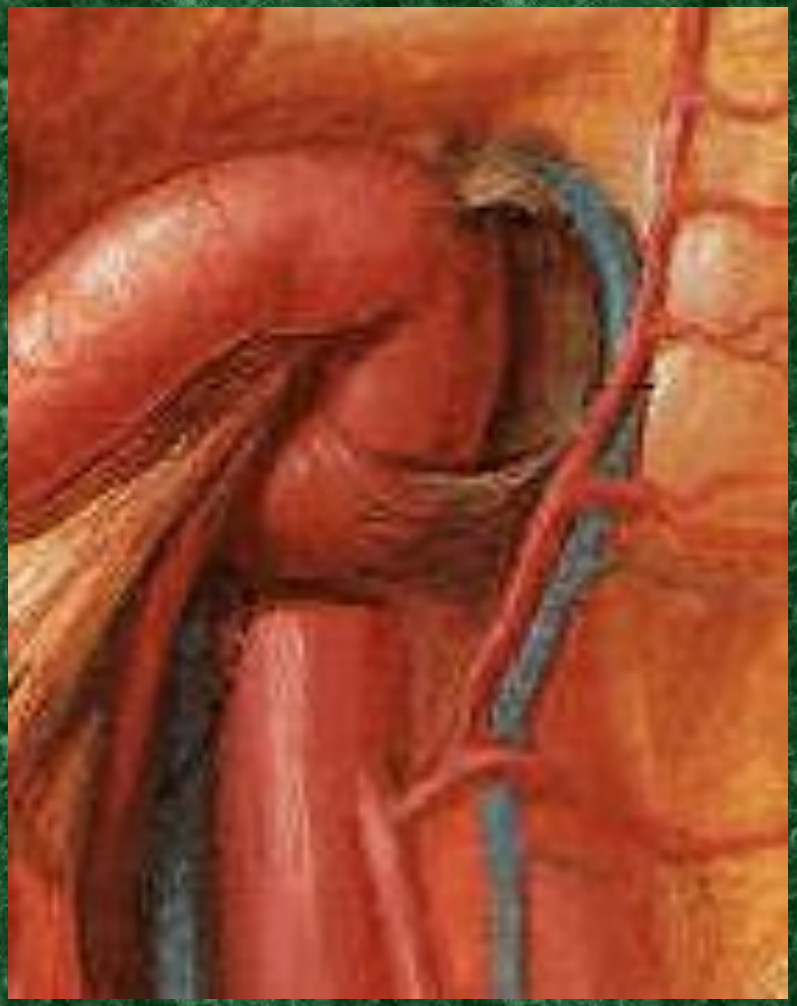
3. The intersigmoid recess

The Peritoneal Reflections

4. The folds

1) supraduodenal fold

2) infraduodenal fold

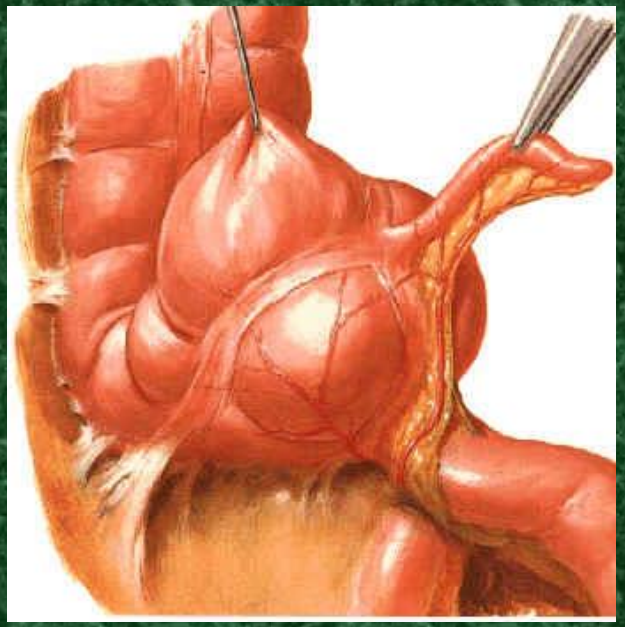


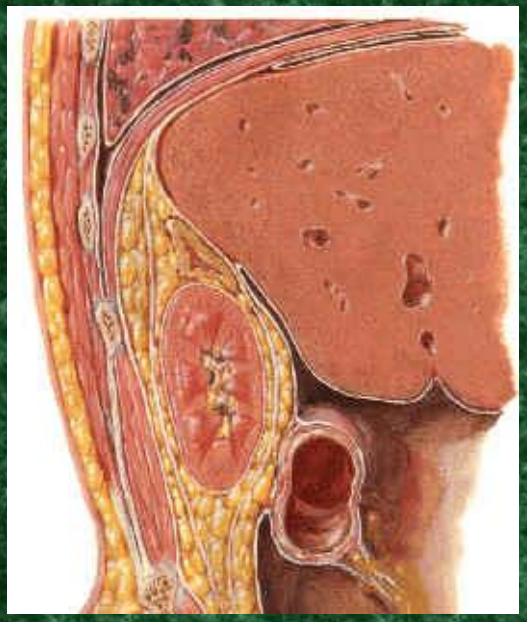
The Peritoneal Reflections

3) retrocecal recess

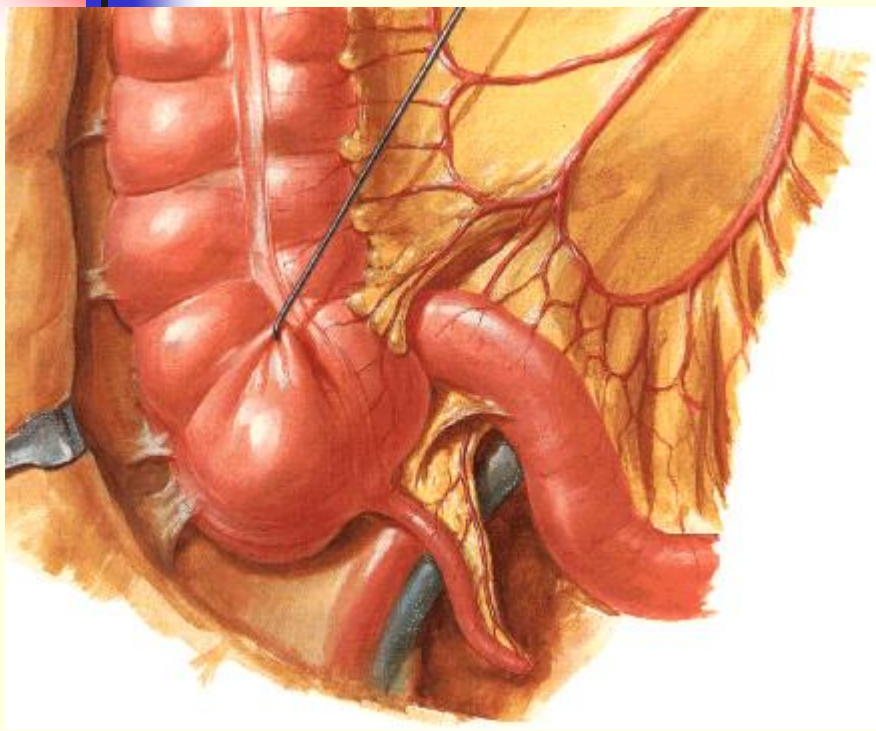
4) hepatorenal recess

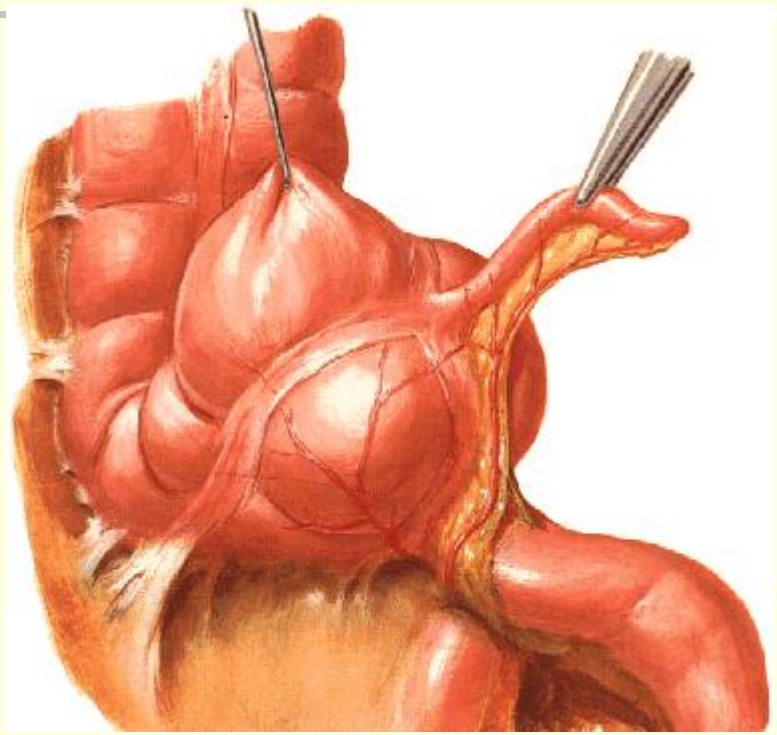
5) intersigmoid recess



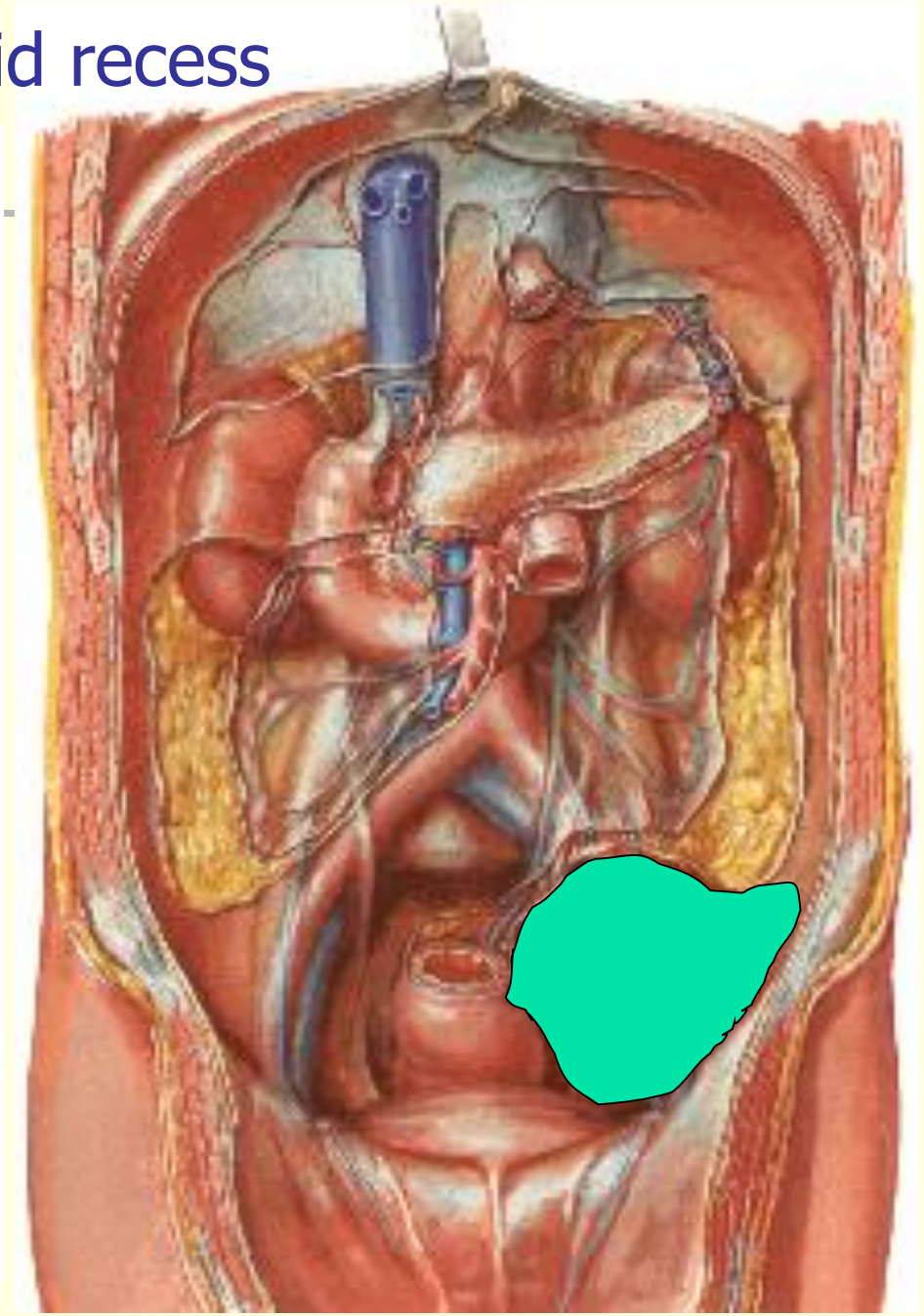


(2) The cecal recesses

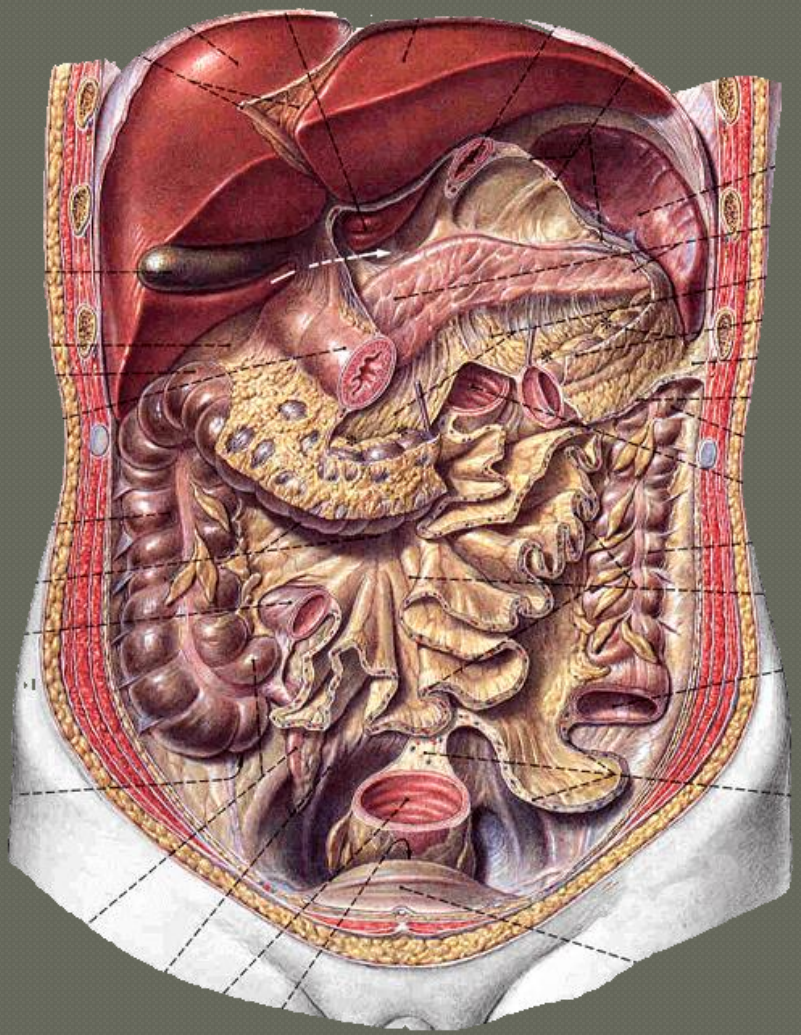




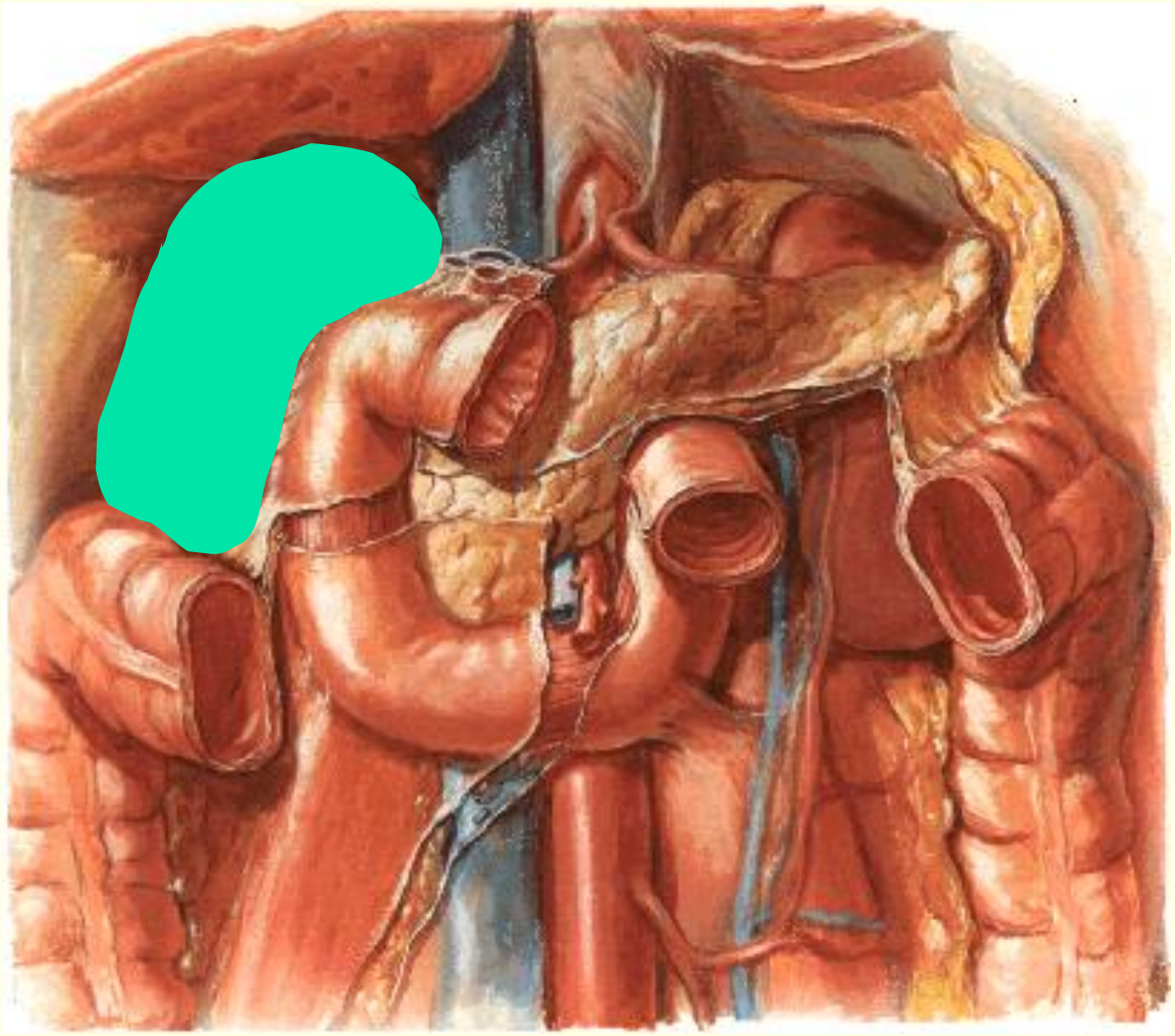
(3) The intersigmoid recess



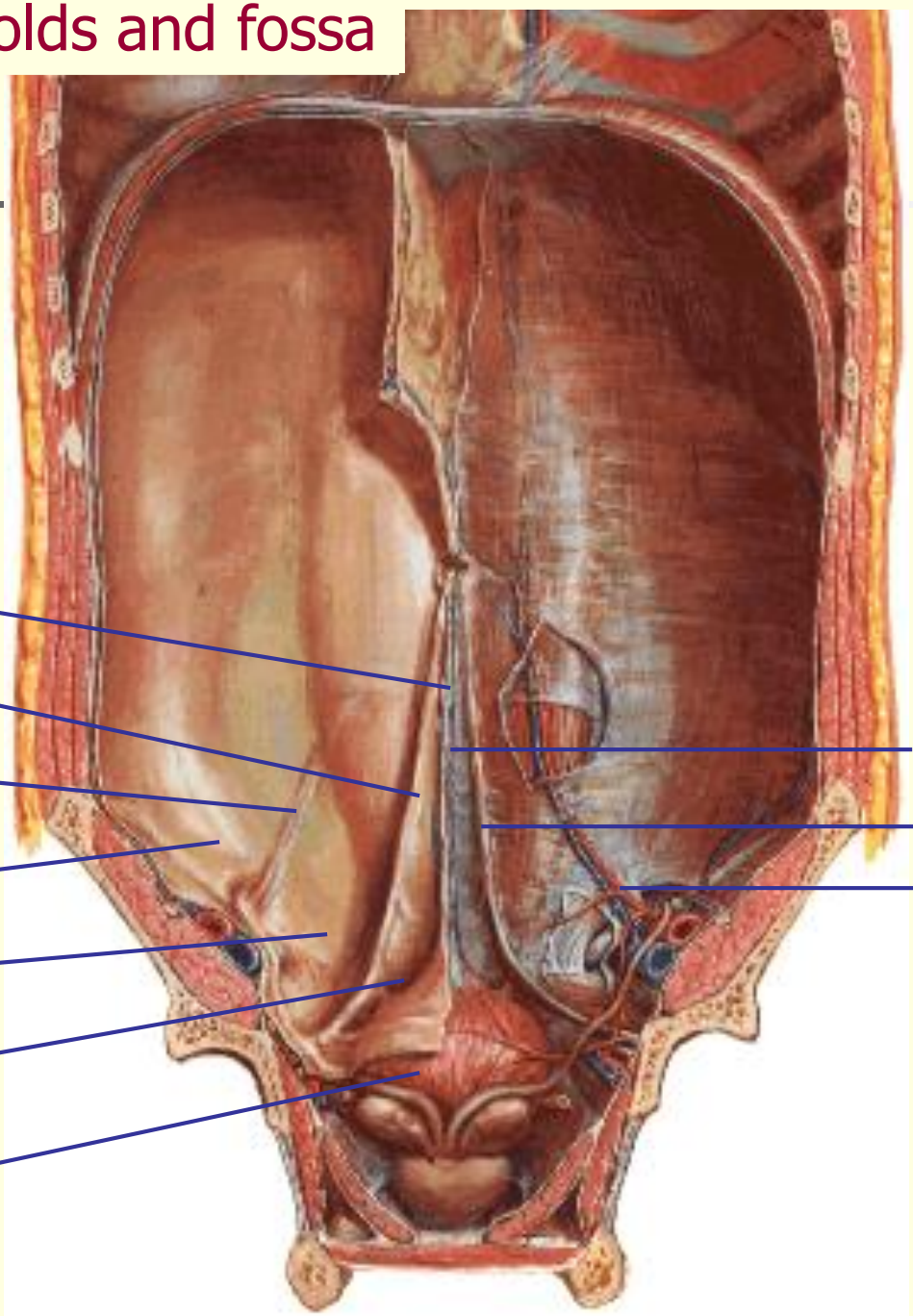
- **Retrocecal recess** in which the appendix frequently lies
- **Hepatorenal recess** lies between the right lobe of liver, right kidney, and right colic flexure, and is the lowest parts of the peritoneal cavity when the subject is supine



(4) The hepatorenal recess



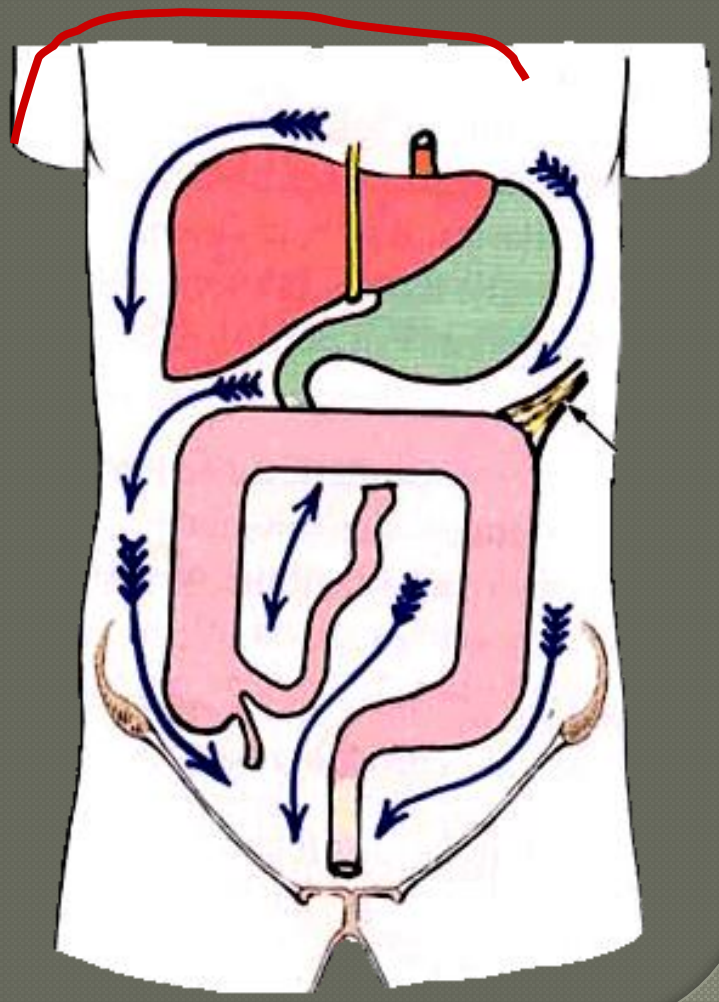
3. The folds and fossa



Peritoneal subdivisions

The transverse colon and transverse mesocolon divides the greater sac into

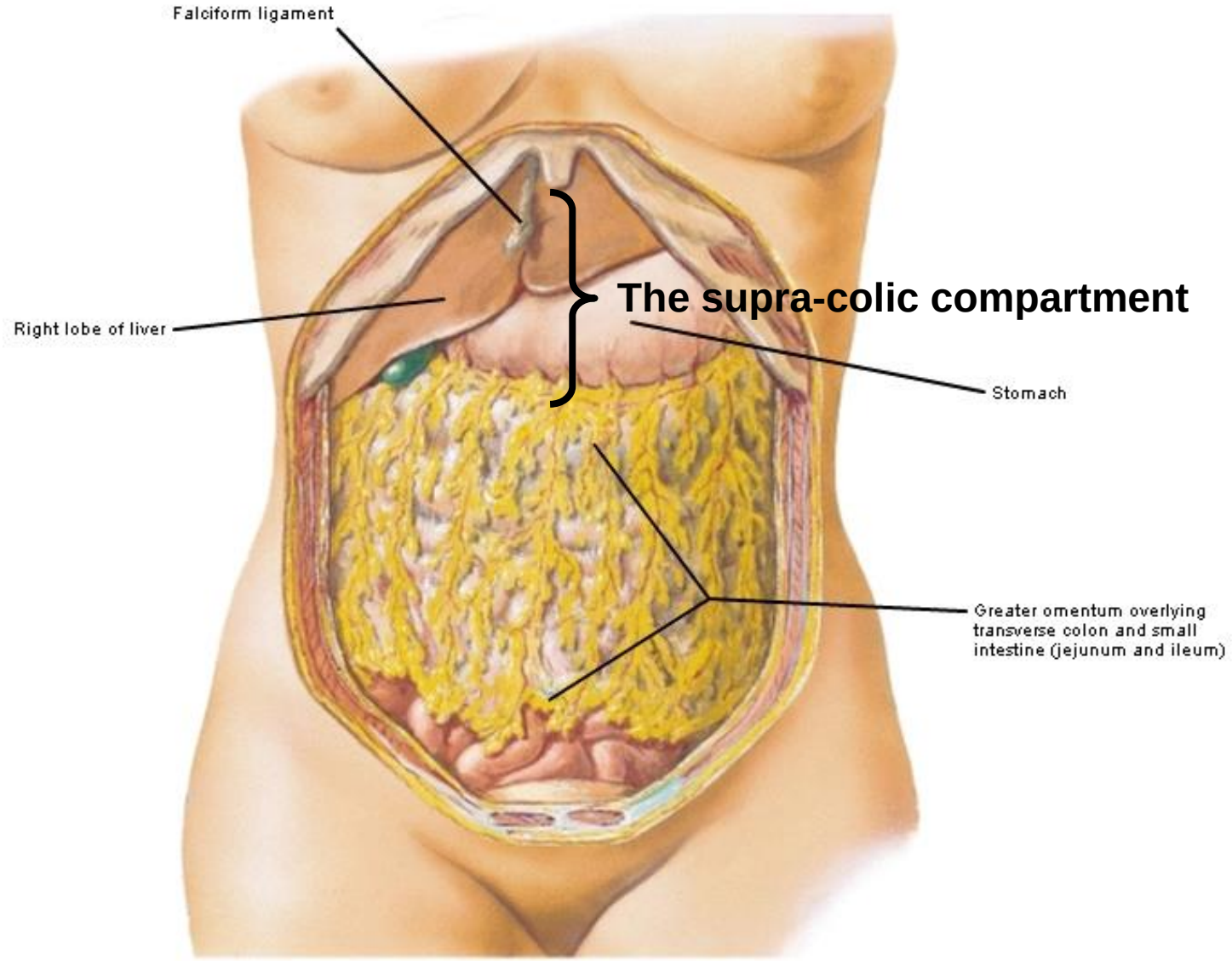
- Supracolic compartments
- Infracolic compartments.
- Rt.extraperitoneal space.(bare area of liver & diaphragm)

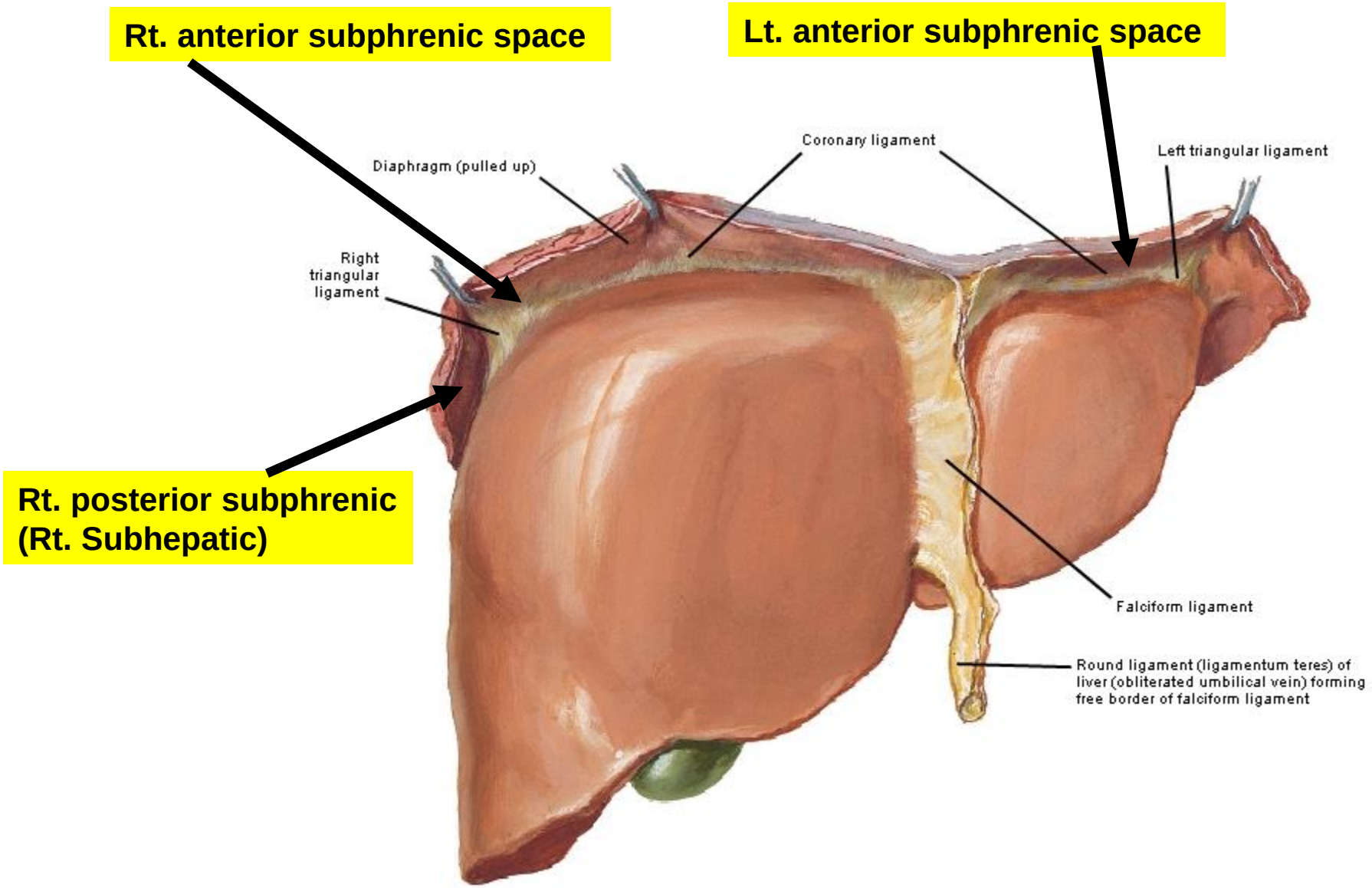


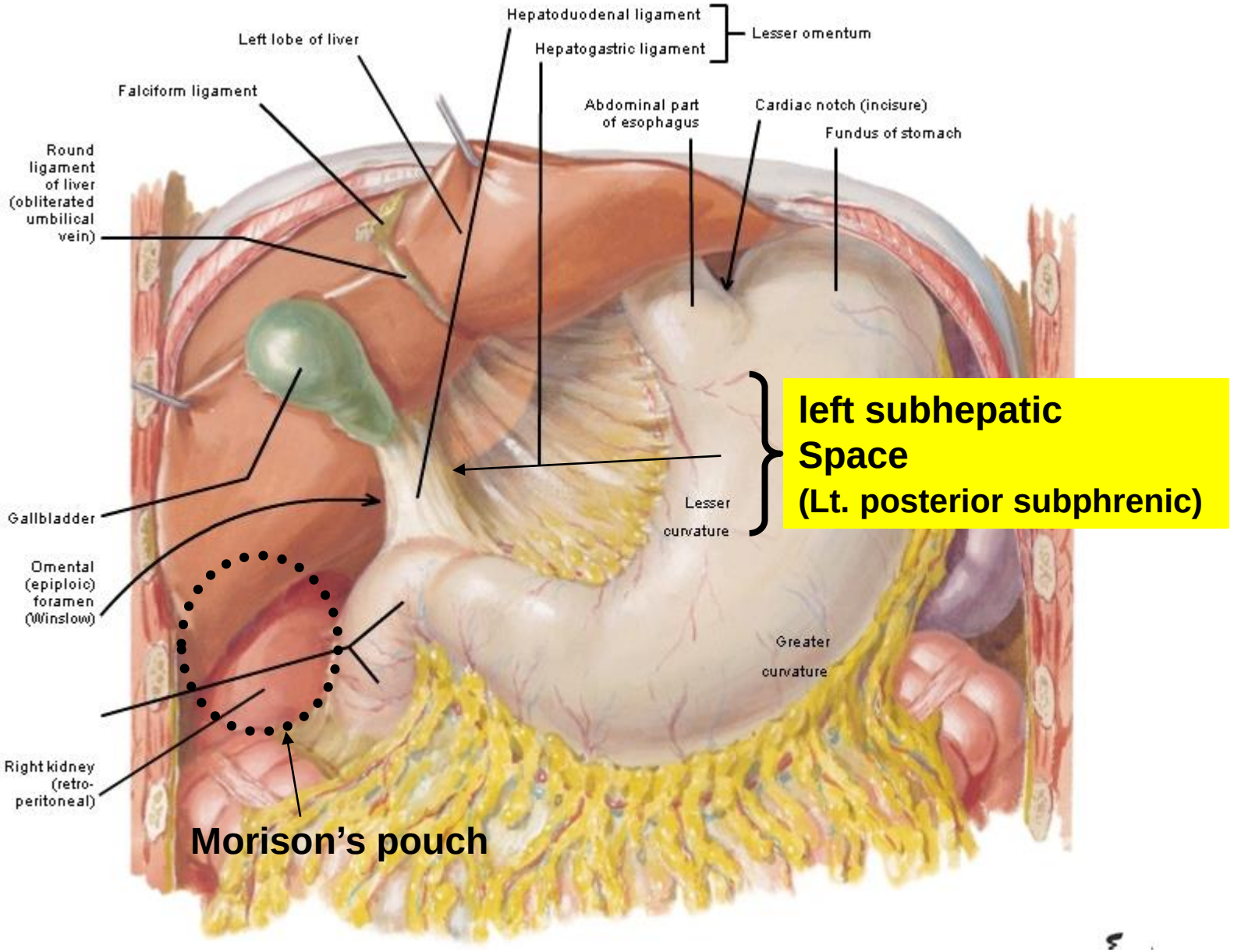
Supracolic compartments

Subphrenic space

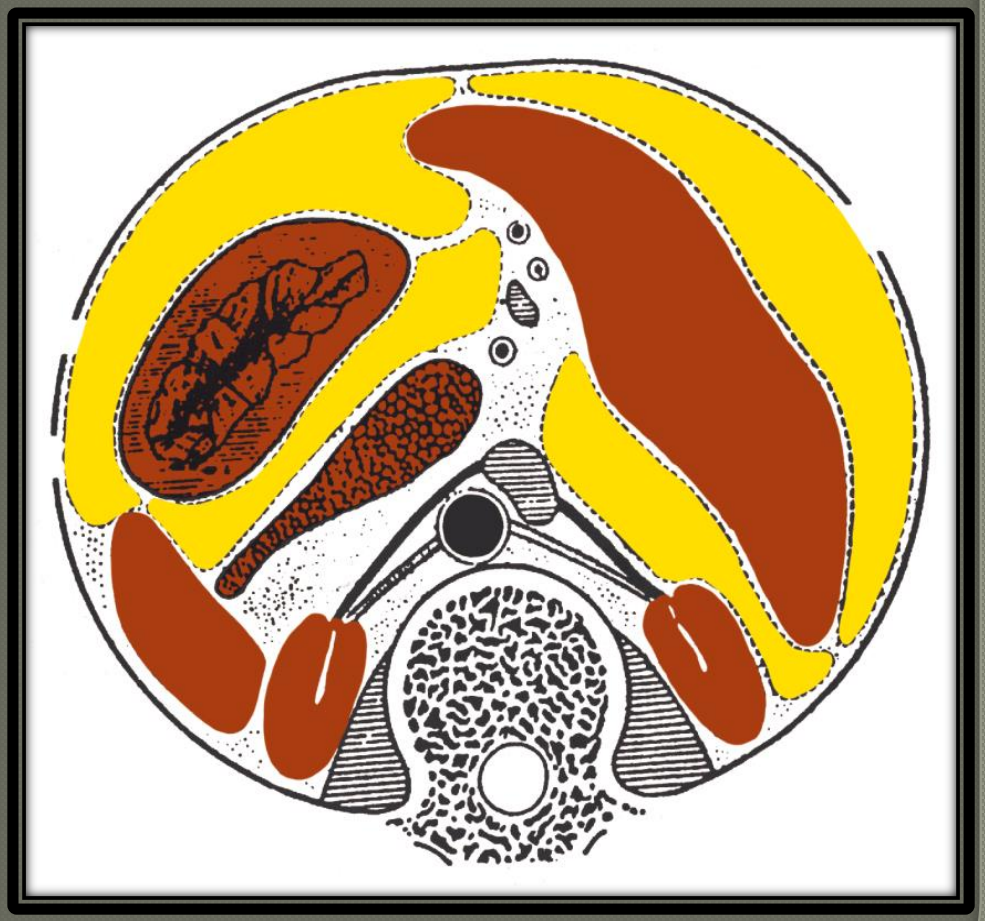
Sub hepatic space


Falciform ligament
Right lobe of liver
The supra-colic compartment
Stomach
Greater omentum overlying transverse colon and small intestine (jejunum and ileum)


Rt. anterior subphrenic space
Lt. anterior subphrenic space
Diaphragm (pulled up)
Coronary ligament
Left triangular ligament
Right triangular ligament
Rt. posterior subphrenic (Rt. Subhepatic)
Falciform ligament
Round ligament (ligamentum teres) of liver (obliterated umbilical vein) forming free border of falciform ligament


Hepatoduodenal ligament
Lesser omentum
Hepatogastric ligament
Left lobe of liver
Falciform ligament
Abdominal part of esophagus
Cardiac notch (incisure)
Fundus of stomach
Round ligament of liver (obliterated umbilical vein)
left subhepatic Space
(Lt. posterior subphrenic)
Lesser curvature
Gallbladder
Omental (epiploic) foramen (Winslow)
Greater curvature
Right kidney (retro-peritoneal)
Morison's pouch

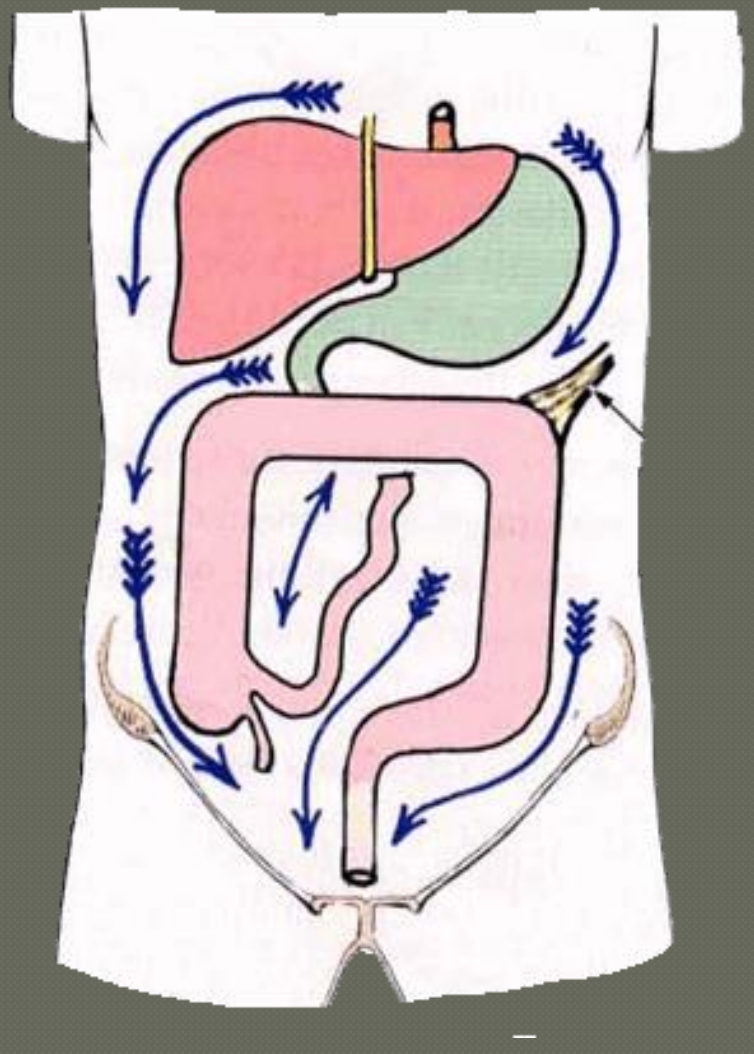
- Subphrenic space
- Divided by the attachment of Falciform ligament into
- Rt.subphrenic space
- Lt.subphrenic space



- Subhepatic space divided into:
- Rt.subhepatic space(morison's pouch)
- Lt.subhepatic space(lesser sac)

Infracolic compartment

- lies below the transverse colon and transverse mesocolon
  - Divided by root of the mesentery of small intestine into:
  - Rt. Infracolic compartment
  - Lt. infracolic compartment



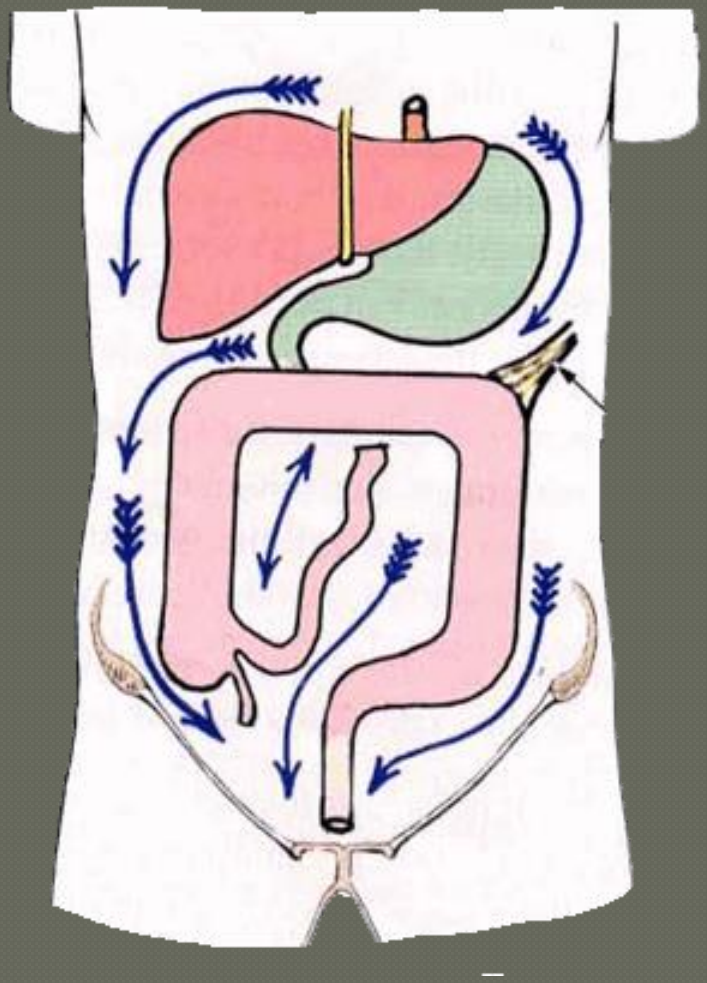
Infracolic compartments

- **Right paracolic sulcus** (gutter)

- Subdivide into:
- - Rt.medial.paracolic
- - Rt.Lateral.paracolic

- Rt.Lateral.paracolic communicates with the hepatorenal recess and the pelvic cavity.

- It provides a route for the spread of infection between the pelvic and the upper abdominal region.

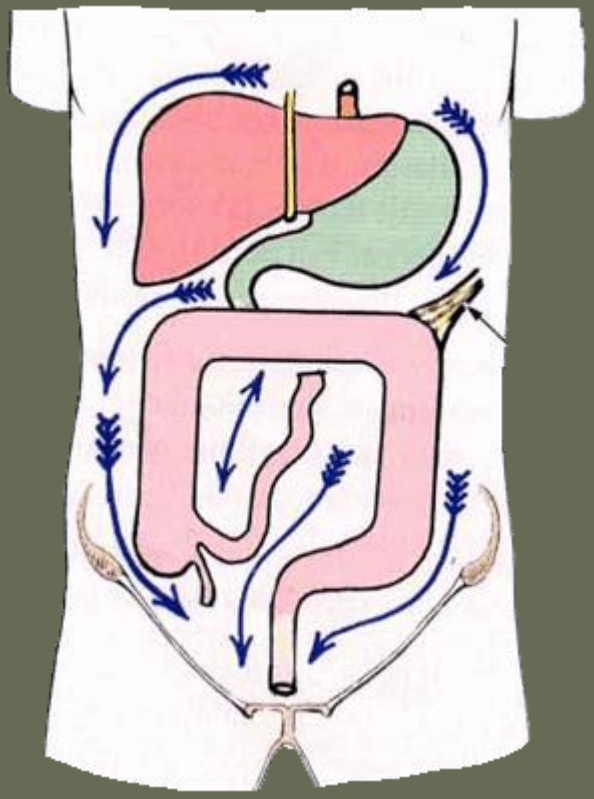


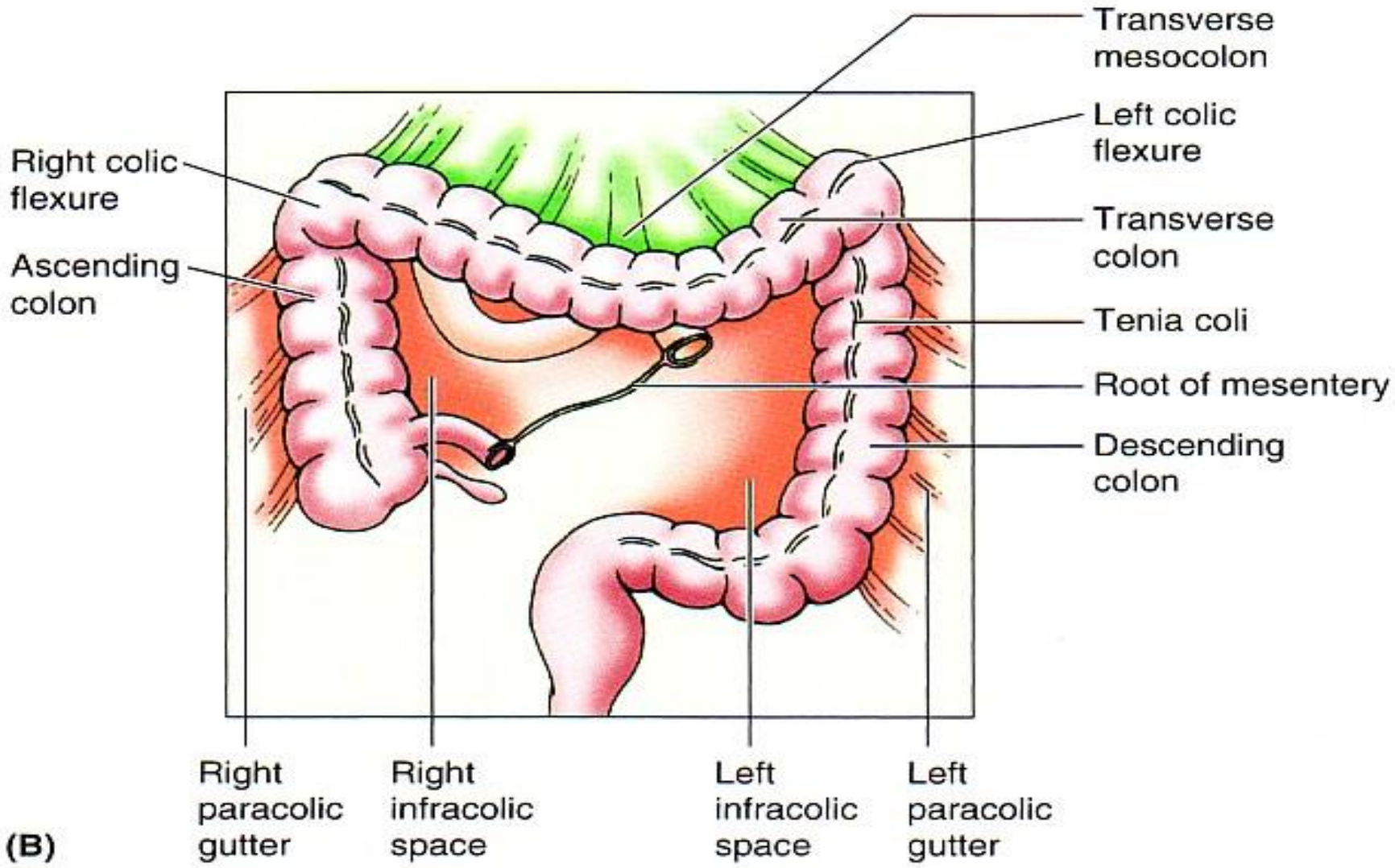
Left paracolic (gutter)

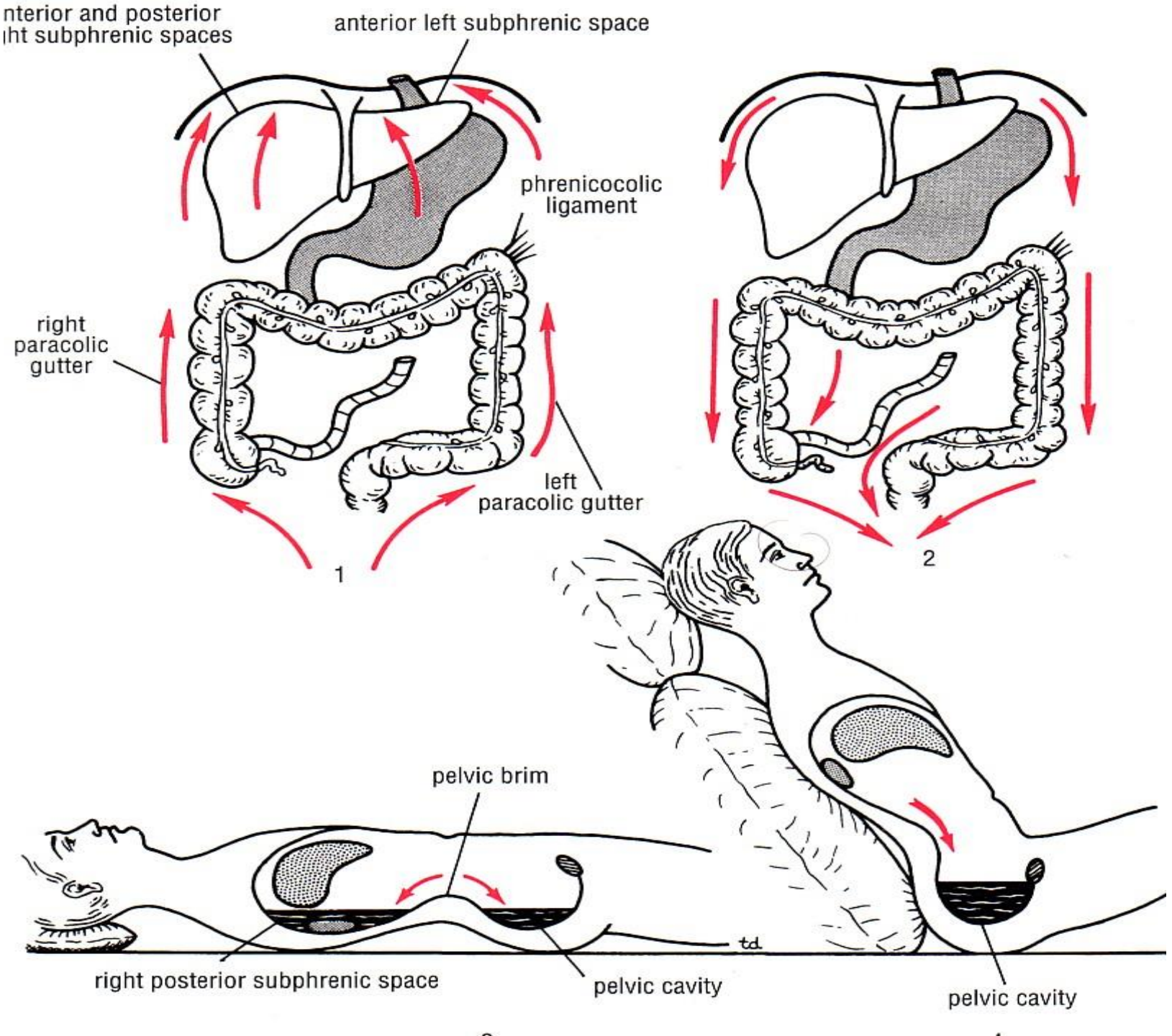
Subdivide into:
- Lt.medial.paracolic
- Lt.Lateral.paracolic

- Lt. lateral paracolic separated from the area around the spleen by the phrenicocolic ligament(a fold of peritoneum that passes from the colic flexure to the diaphragm)

- Lt.medial.paracolic open to the outside through the pelvis

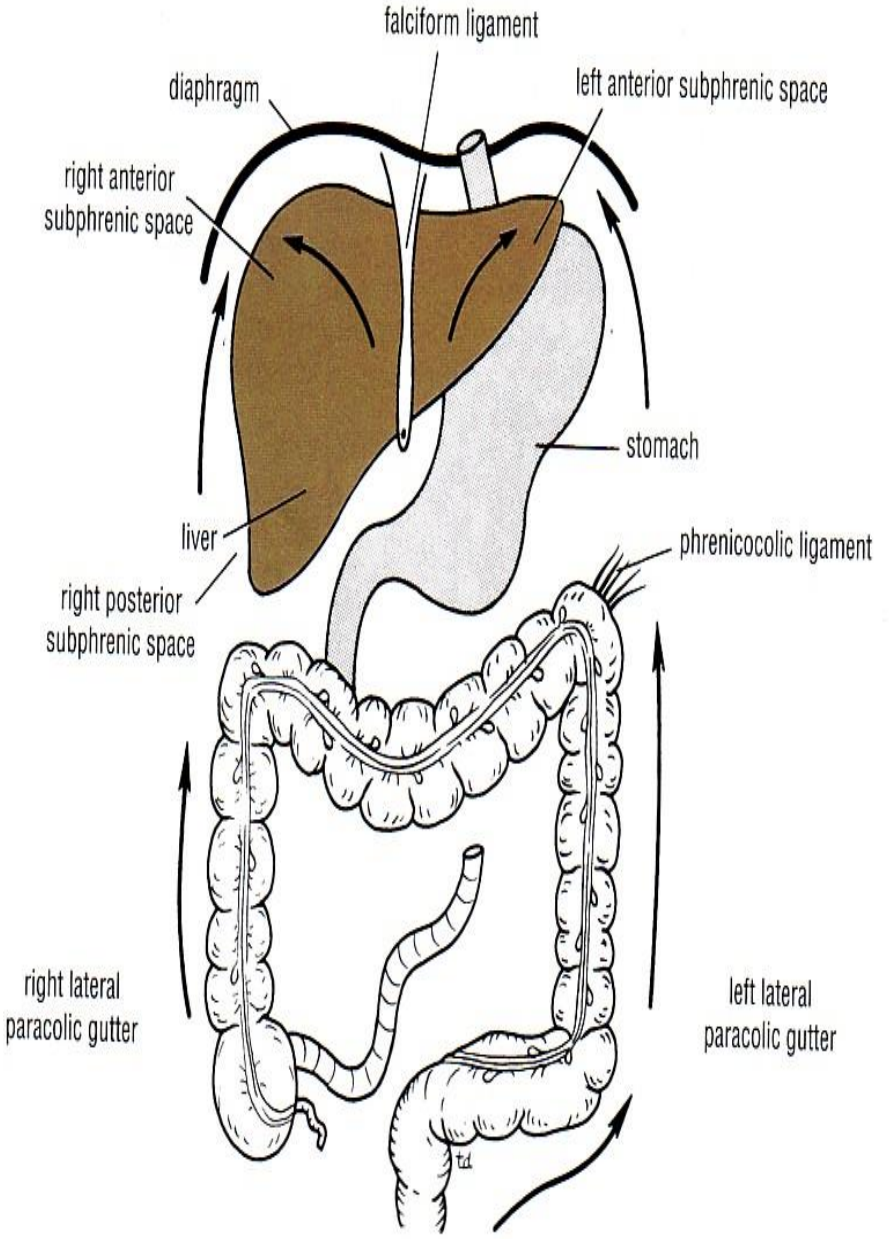



Transverse mesocolon
Left colic flexure
Right colic flexure
Transverse colon
Ascending colon
Tenia coli
Root of mesentery
Descending colon
Right paracolic gutter
Right infracolic space
Left infracolic space
Left paracolic gutter
(B)


nterior and posterior
ght subphrenic spaces
anterior left subphrenic space
phrenicocolic ligament
right paracolic gutter
left paracolic gutter
1
2
pelvic brim
right posterior subphrenic space
pelvic cavity
pelvic cavity
td

• Peritoneal fluid

- Peritoneal fluid is pale yellow fluid rich in leukocytes
- Mobile viscera glide easily on one another.
- Peritoneal fluid moves *upward* towards subphrenic spaces- whatever the position of the body- *by:*
- *1- Movements of diaphragm.*
- *2- Movements of abdominal muscles*
- *3- Peristaltic movements.*
- Peritoneum is extensive in the region of diaphragm.



Nerve supply to the peritoneum

The parietal peritoneum

phrenic nerve

Intercostal (T7-T12)

first lumbar nerves(L1)

obturator nerve for pelvis

The visceral peritoneum

autonomic

Function of the peritoneum

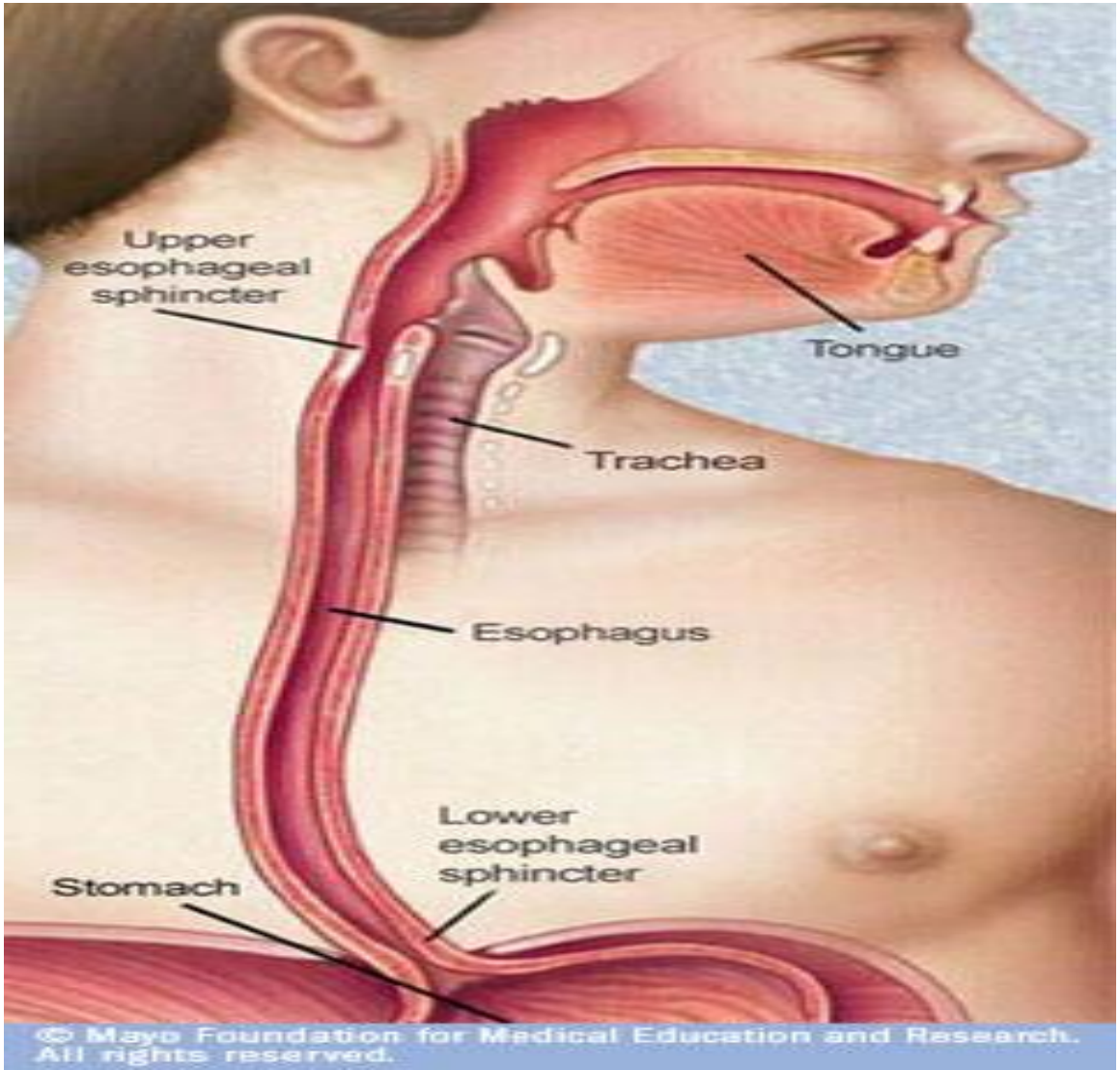
- Secretes a lubricating serous fluid that continuously moistens the associated organs
- Fat storage

Defense role→ the presence of lymphatic vessels & nodes , Greater omentum is called the ***policeman*** of abdomen to prevent spread of infection

It secretes the peritoneal fluid

- Support viscera
- Absorb

Anatomy Of Esophagus



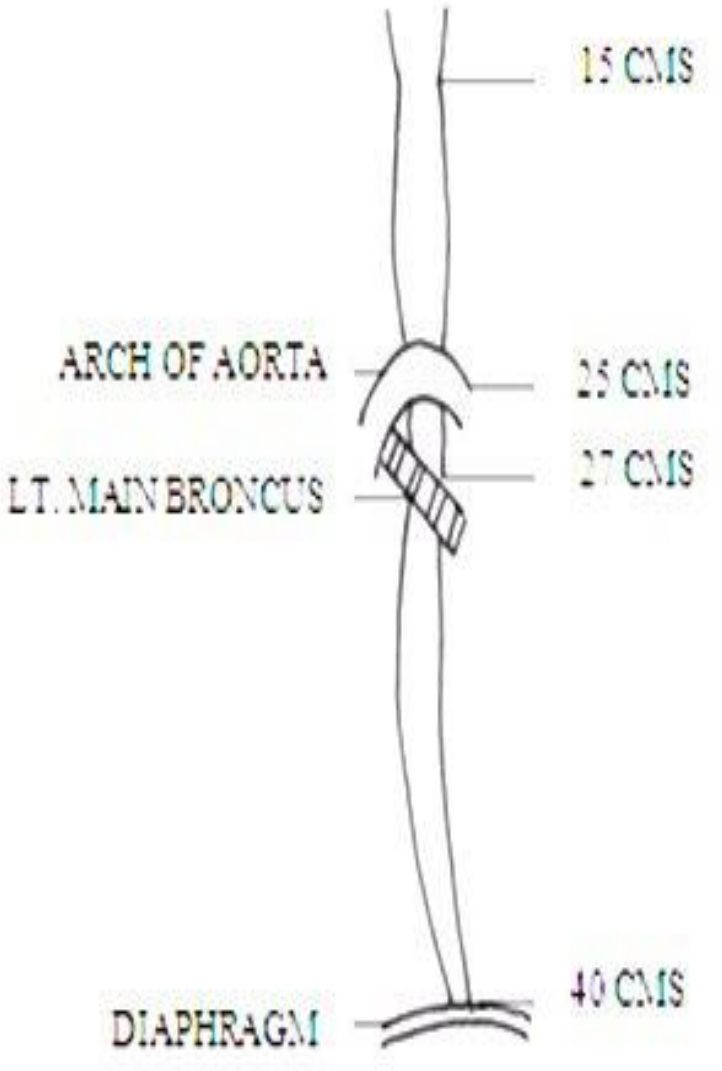
Oesophagus

- A muscular tube; 25 cm in length connecting pharynx to stomach.
- Guarded at both ends by sphincters.
  - Collapsed at rest,
  - Flat in upper 2/3 & rounded in lower 1/3

- Commences at the lower border of the cricoid cartilage.(C6).

- Descends along the front of the spine, through the posterior to trachea and the mediastinum, passes through the Diaphragm, and, entering the abdomen, terminates at the cardiac orifice of the stomach, opposite the eleventh dorsal vertebra.
- In the newborn **Upper limit** at the level of 4th or 5th CerVertb and it ends at 9th Dorsal .
  there are three parts of the esophagus: cervical, thoracic and abdominal esophagus

- Oesophagus is the narrowest region of alimentary tract except vermiform appendix. During its course it has three indentations:
  - **At 15 cm** from incisor teeth is **crico-pharyngues sphincter** (normally closed (UES)
  - **At 25 cm** aortic arch and left main bronchus
  - **At 40 cms** where it pierces the diaphrag where a physiological sphincter is sited (LES)



The two sphincters are at the pharyngo-oesophageal junction (upper) & in the region of the oesophageal opening (hiatus) in the diaphragm.

Both have intrinsic & extrinsic components.

Upper intrinsic sphincter

The main function of preventing access of air to the oesophagus & working in conjunction with laryngeal closure during swallowing.

It relaxes on initiation of the swallowing reflex

The superior constrictor extrinsic component contracts to expel food or liquid into oesophagus where a wave of peristalsis carries it downwards

Lower intrinsic sphincter is the circular smooth muscle of the oesophagus.
Its role is to prevent GE regurgitation & it is normally closed but relaxes in response to the swallowing wave.

The intrinsic sphincter is supplemented by the striated muscle of the right crus, which splits to embrace the lower end of the oesophagus (keeping GEJ closed when intra-abdominal pressure is significantly increased).

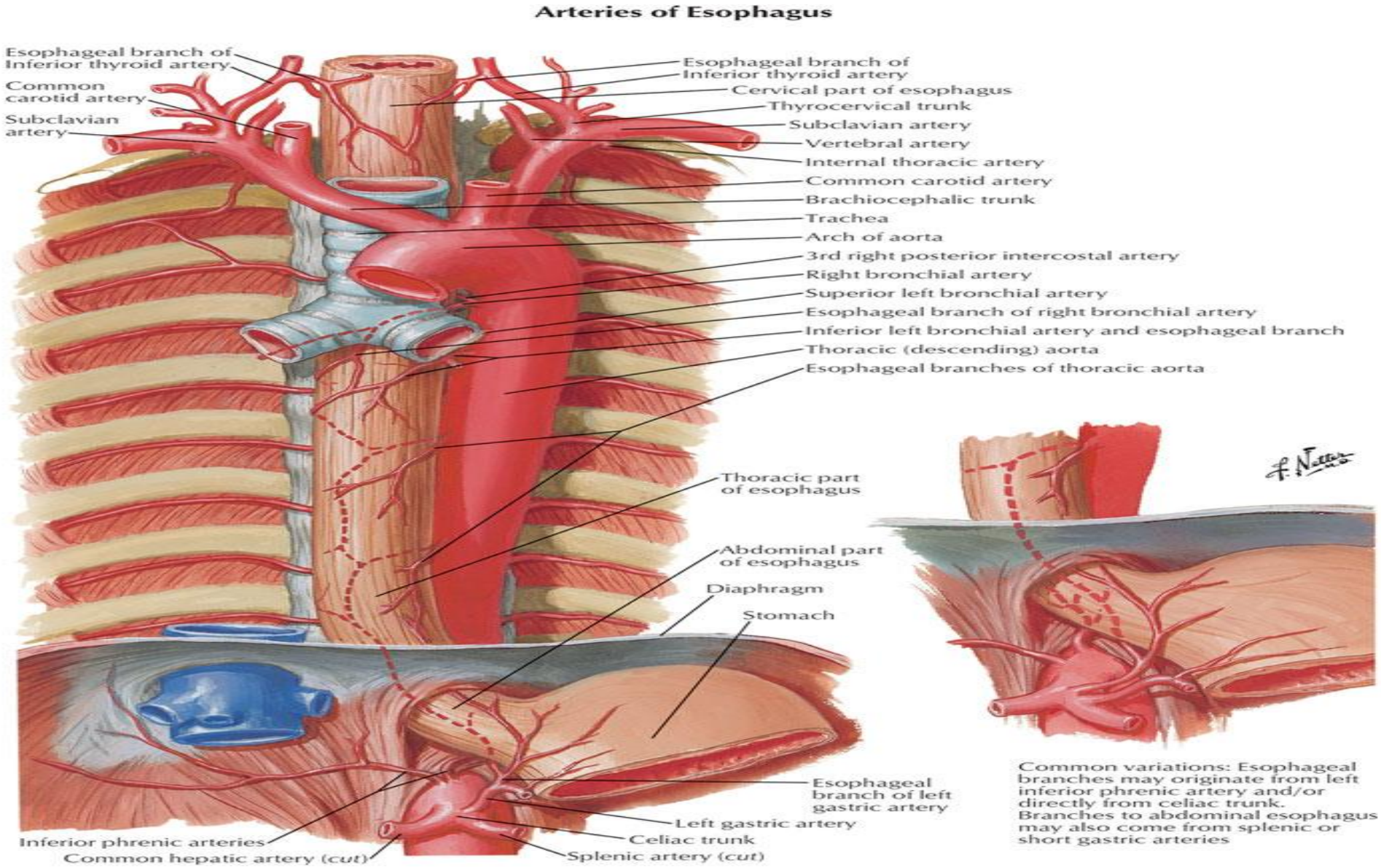
Another factor which prevents reflux from the stomach is the acute angle of insertion of the oesophagus into the stomach which brings the gastric and oesophageal walls in contact when intra-abdominal pressure rises.

Anatomical disorders at the diaphragmatic hiatus reduce the efficacy of the intrinsic sphincter

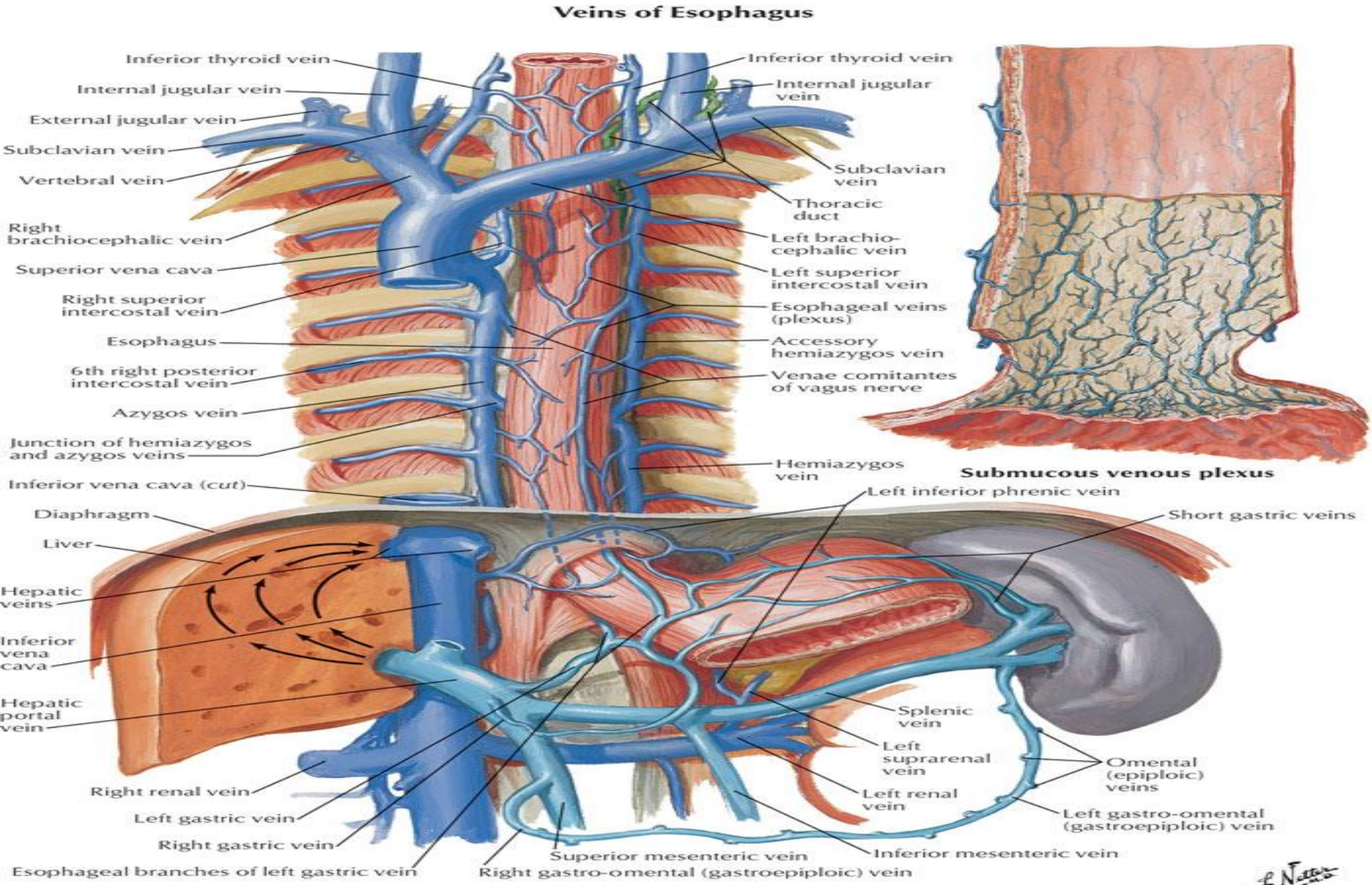
Anatomy of esophagus

- It consists of three layers :
  - mucosa,
  - submucosa
  - muscular layer (circular and longitudinal layer)
- arterial blood supply from:
  - inferior thyroid artery
  - descending aorta
  - left gastric artery
  - inferior phrenic artery
- venous drainage into the superior caval vein portal vein

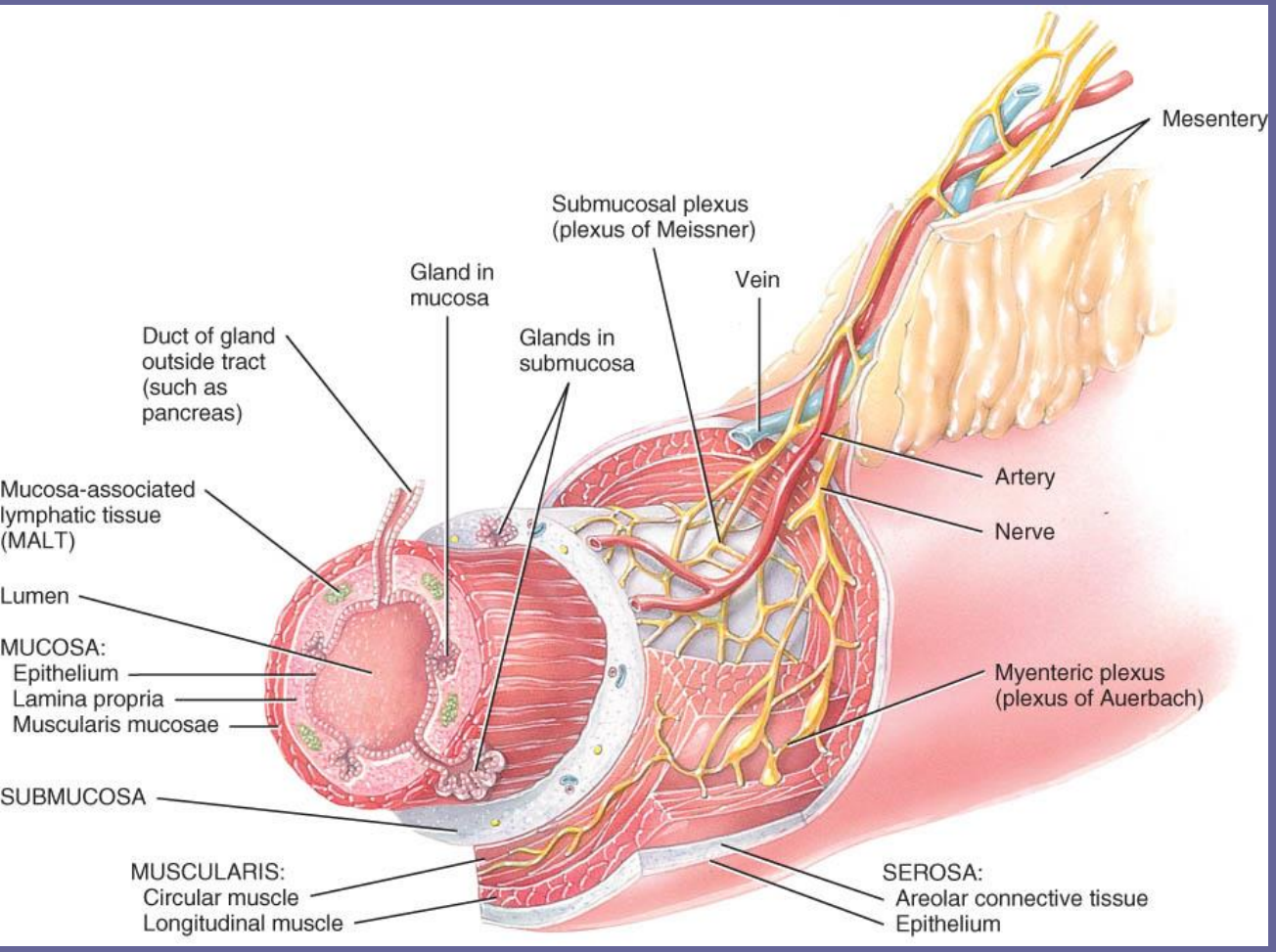
Anatomy Of Esophagus



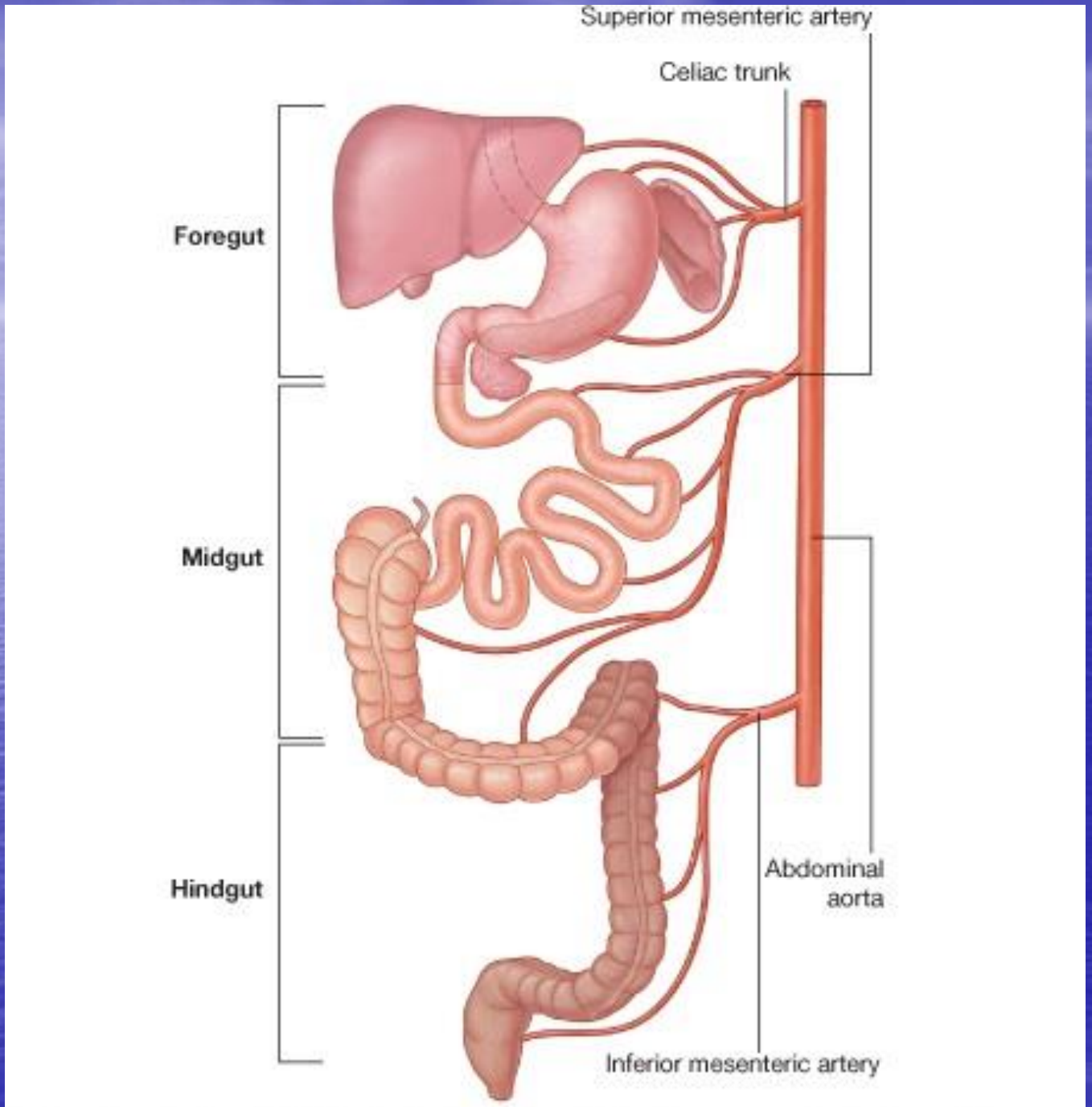
Anatomy Of Esophagus



Layers of the GI Tract

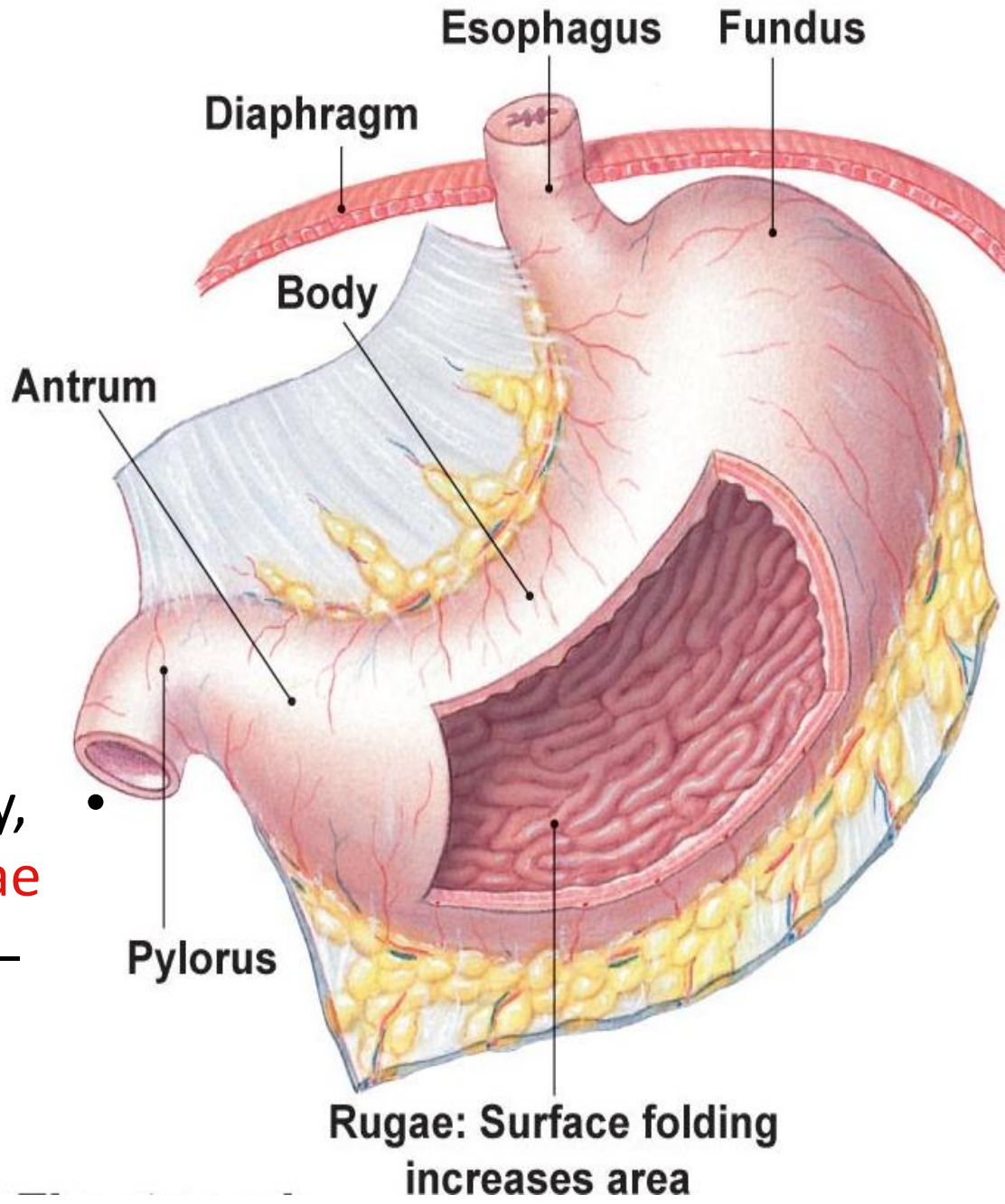


1. Mucosal layer
2. Submucosal layer
3. Muscularis layer
4. Serosa layer

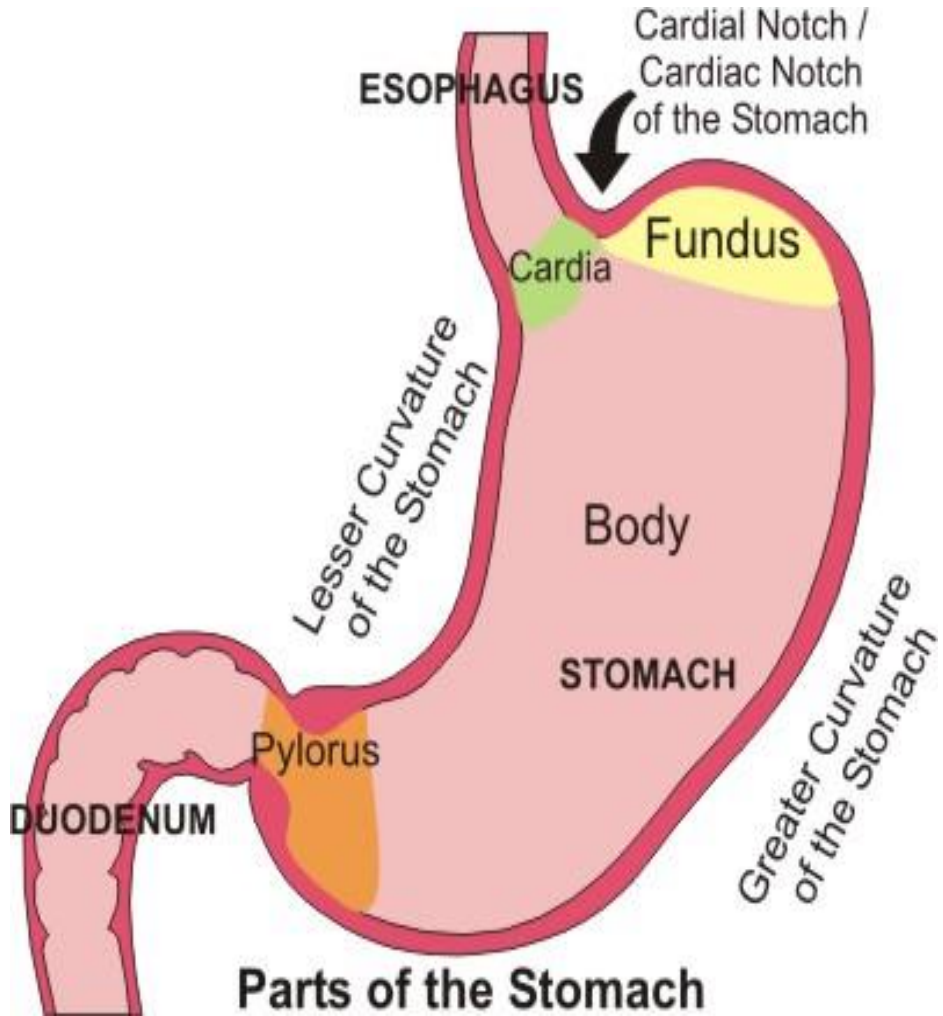


Stomach

- The stomach is divided into the 3 regions: the fundus, the body and the antrum and is able to hold up to **2 liters of** food and fluid when completely filled
- When the stomach is empty, the mucosa folds into rugae when filled, the expanded – wall of the stomach causes these folds to disappear (flatten)



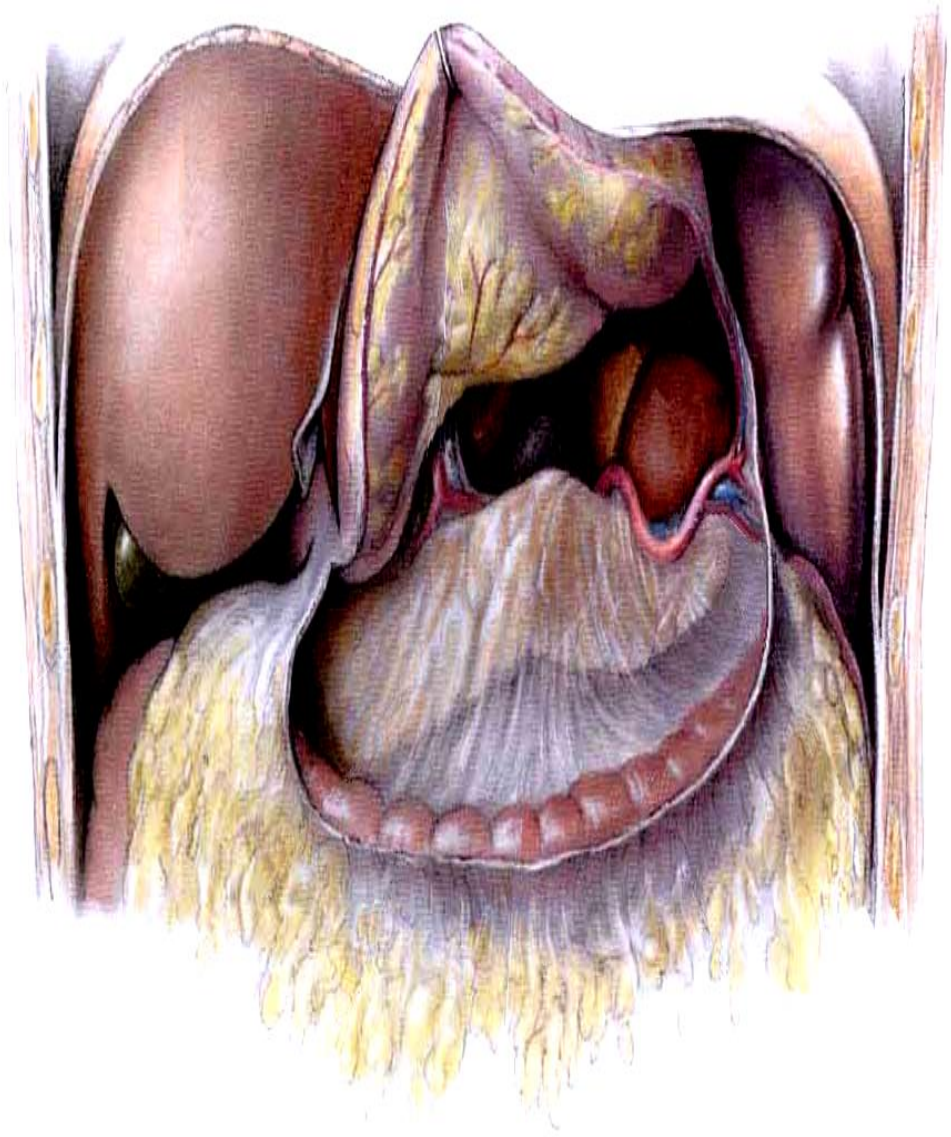
Anatomically, the stomach is divided into



- cardiac part,
- fundus,
- body
- pyloric part (pyloric antrum and pyloric canal)

Relations of the stomach

- **Anteriorly**:
  - Live (right part)
  - Diaphragm (left upper part)
  - Anterior abdominal wall (left lower part)
- **Posteriorly**—separated by peritoneum of lesser sac from the following ("**stomach-bed**")
  - Pancreas
  - Left suprarenal gland
  - Left kidney
  - Spleen
  - Transverse colon and transverse mesocolon



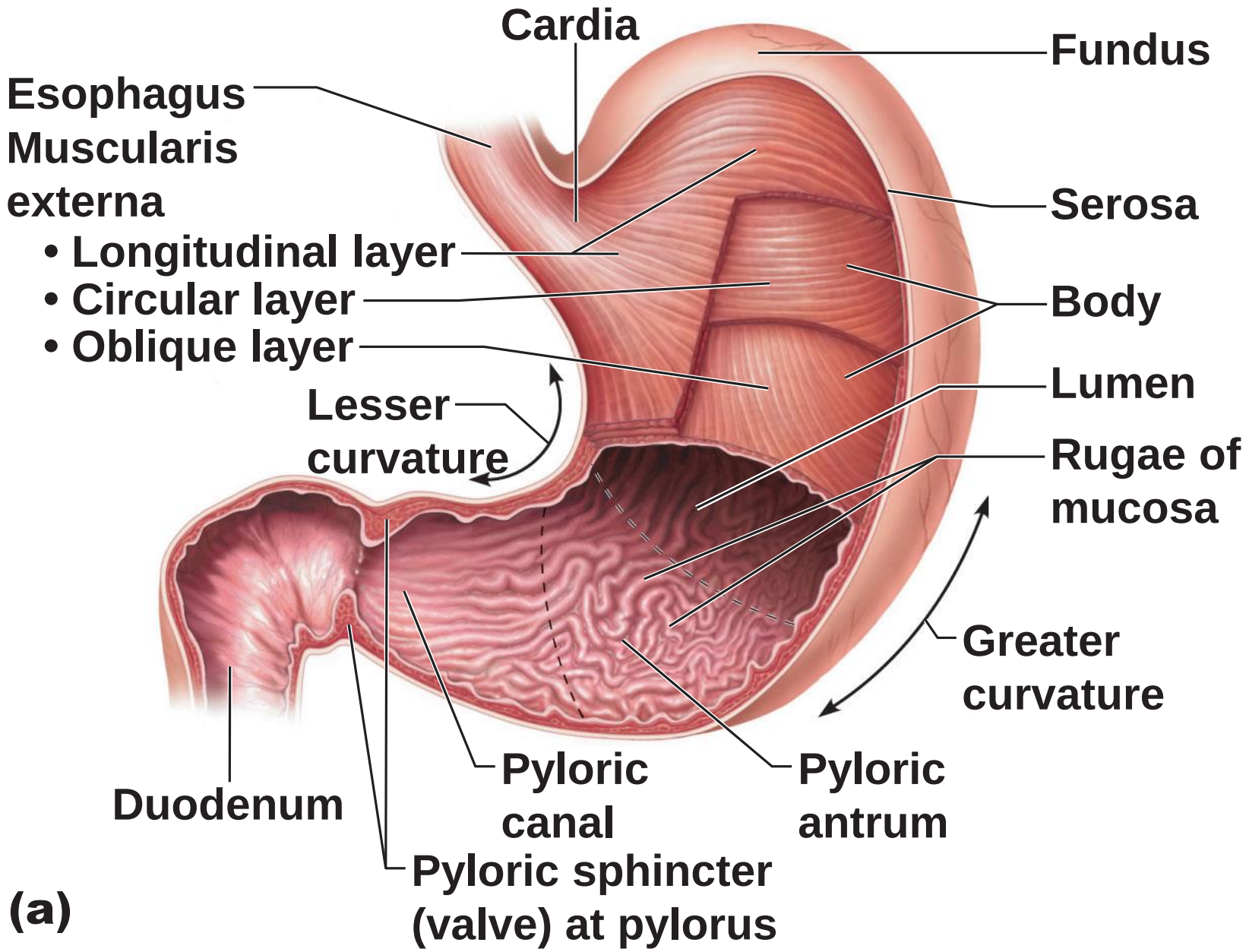
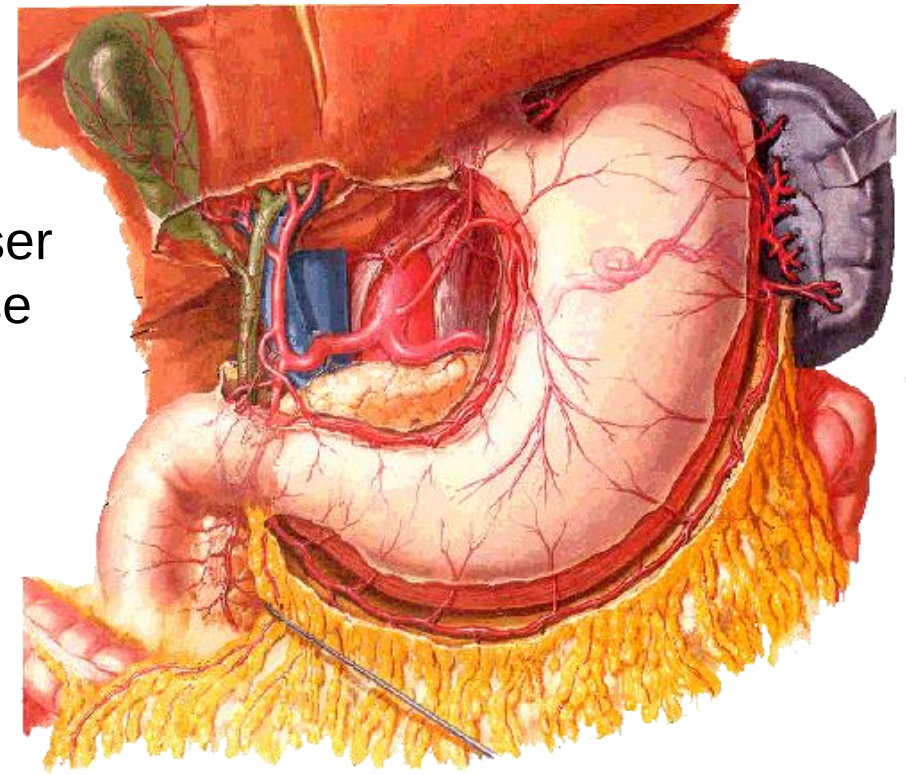


Figure 23.14a

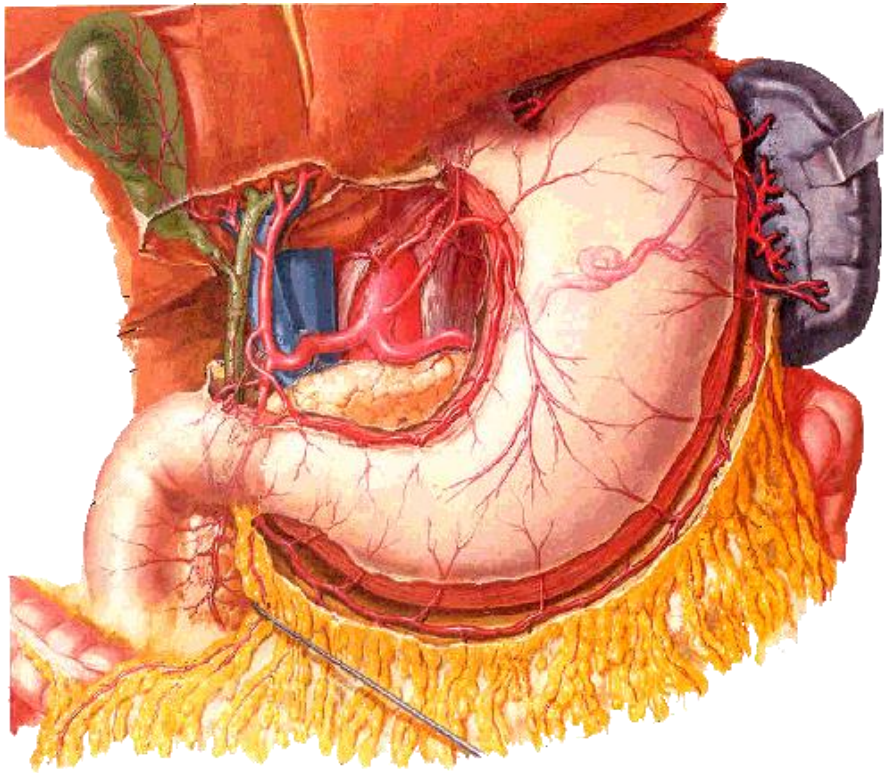
Arteries of stomach

- **Left** and **right gastric arteries**
  - Arise from celiac trunk and proper hepatic artery, respectively.
  - These two vessels run in lesser omentum along lesser curvature , and anastomose end-to-end.



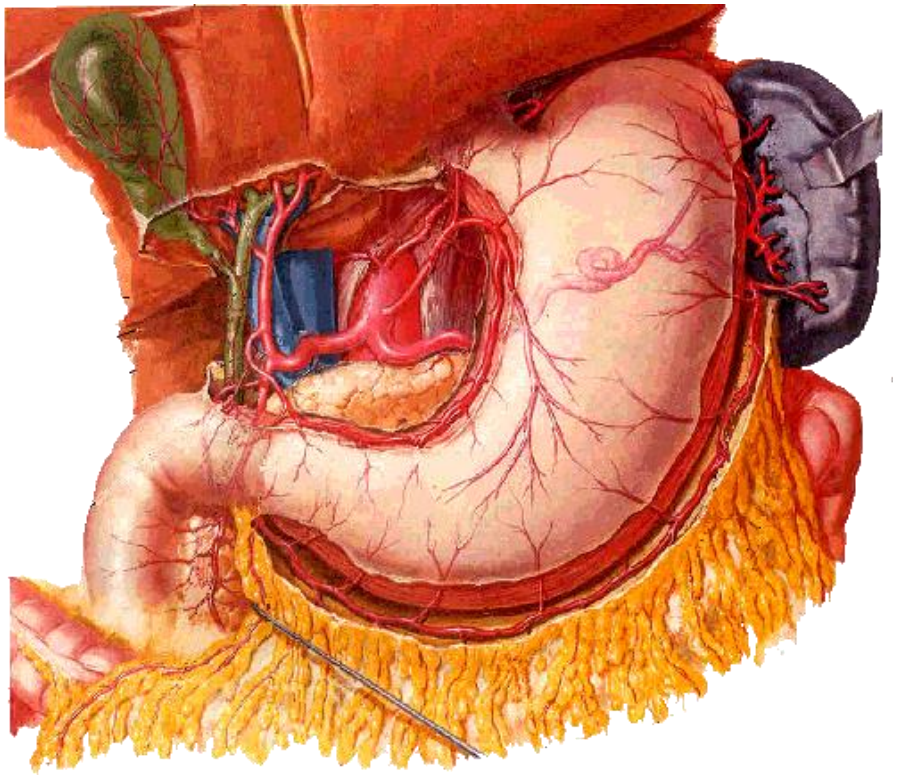
Arteries of stomach

- **Right** and **left gastroepiploic arteries**
  - Arise from the gastroduodenal and splenic artery, respectively.
  - These two vessels pass into the greater omentum, run parallel to the greater curvature, and anastomose end-to-end.



Arteries of stomach

- **Short gastric arteries**
  - Branches of splenic artery
  - Course through the gastrosplenic ligament
  - Supply the fundus of stomach.
- **Posterior gastric artery** (72%)
  - Arise from the splenic artery
  - Course through the gastrophrenic ligament and supply the posterior wall of fundus of stomach.



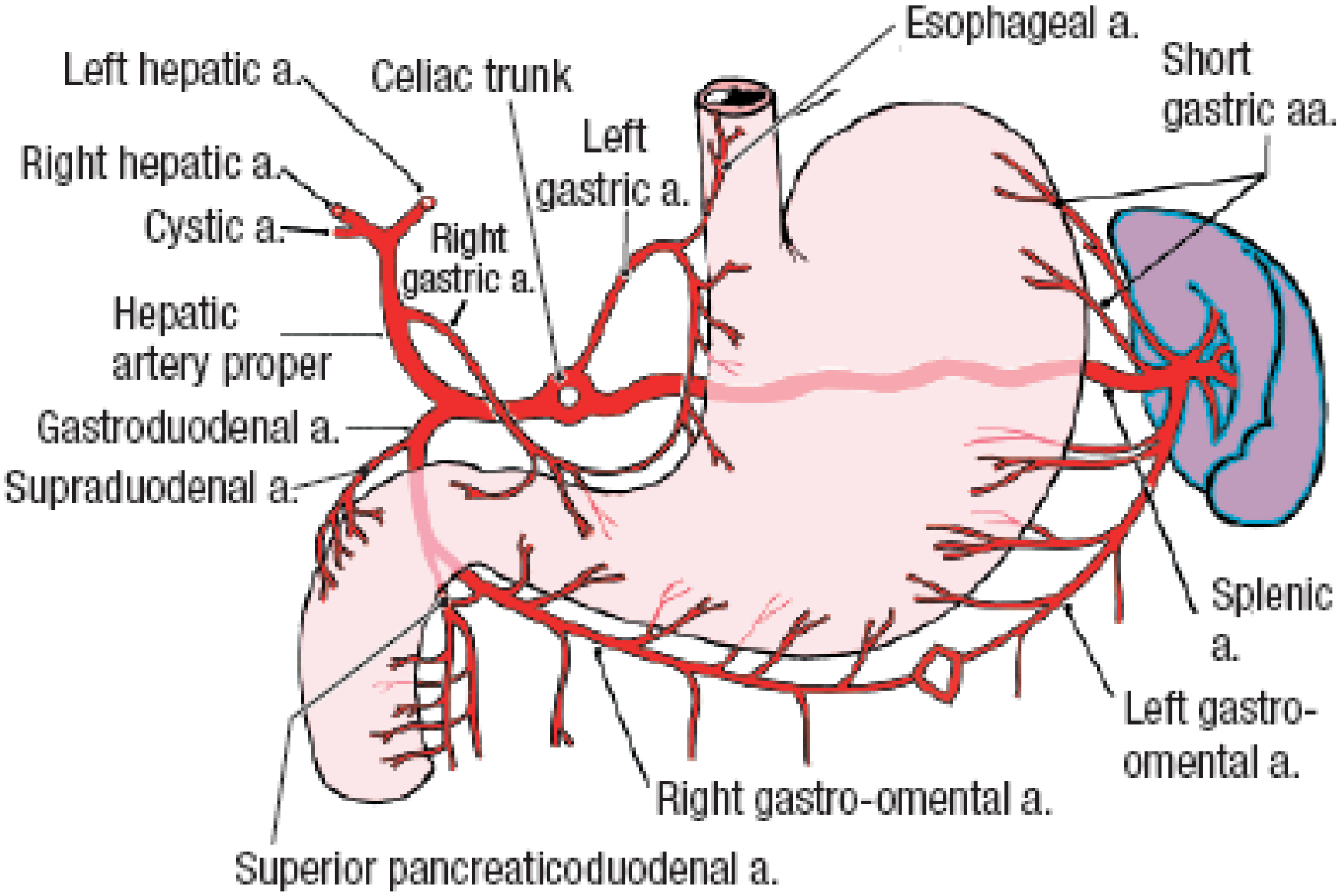
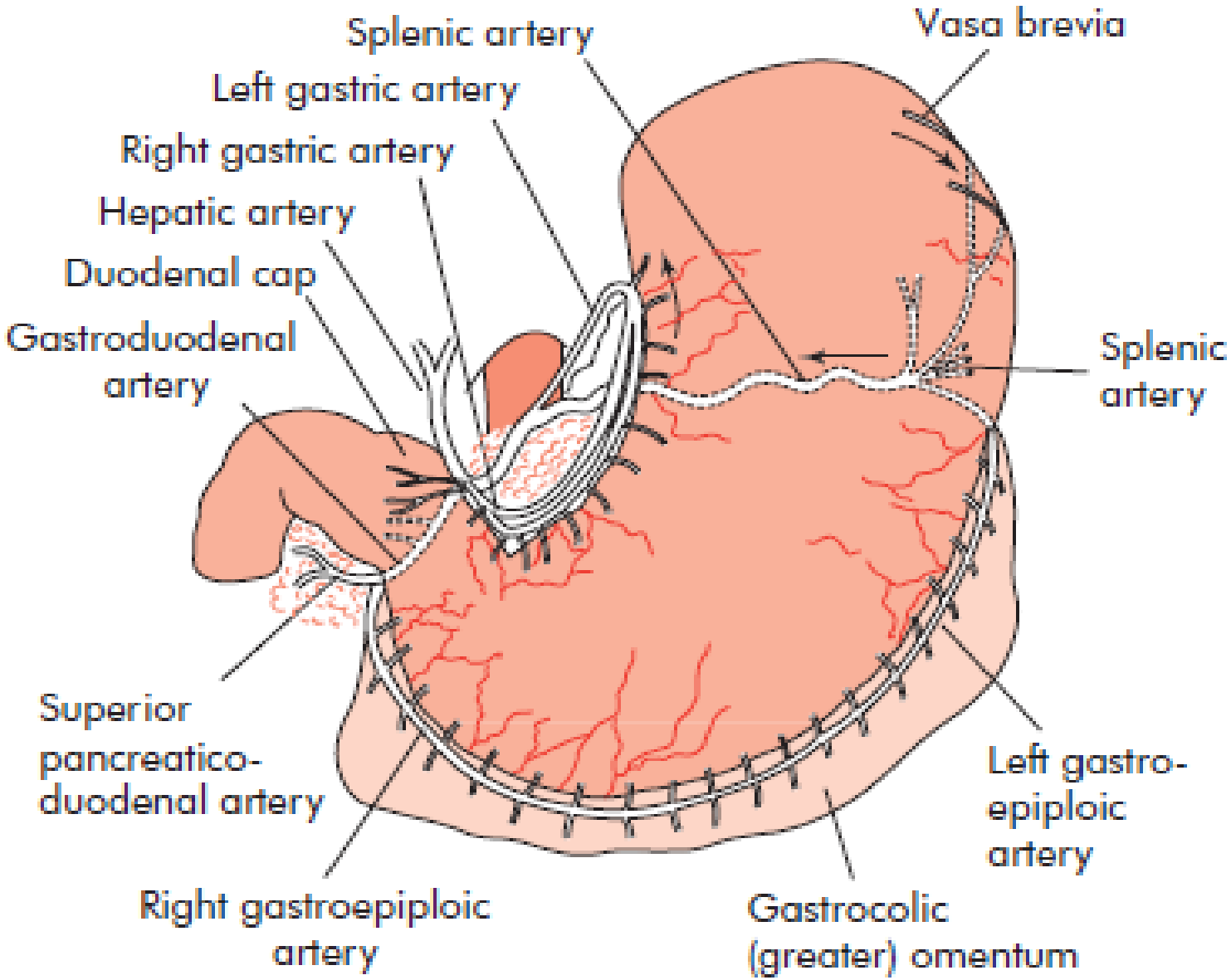
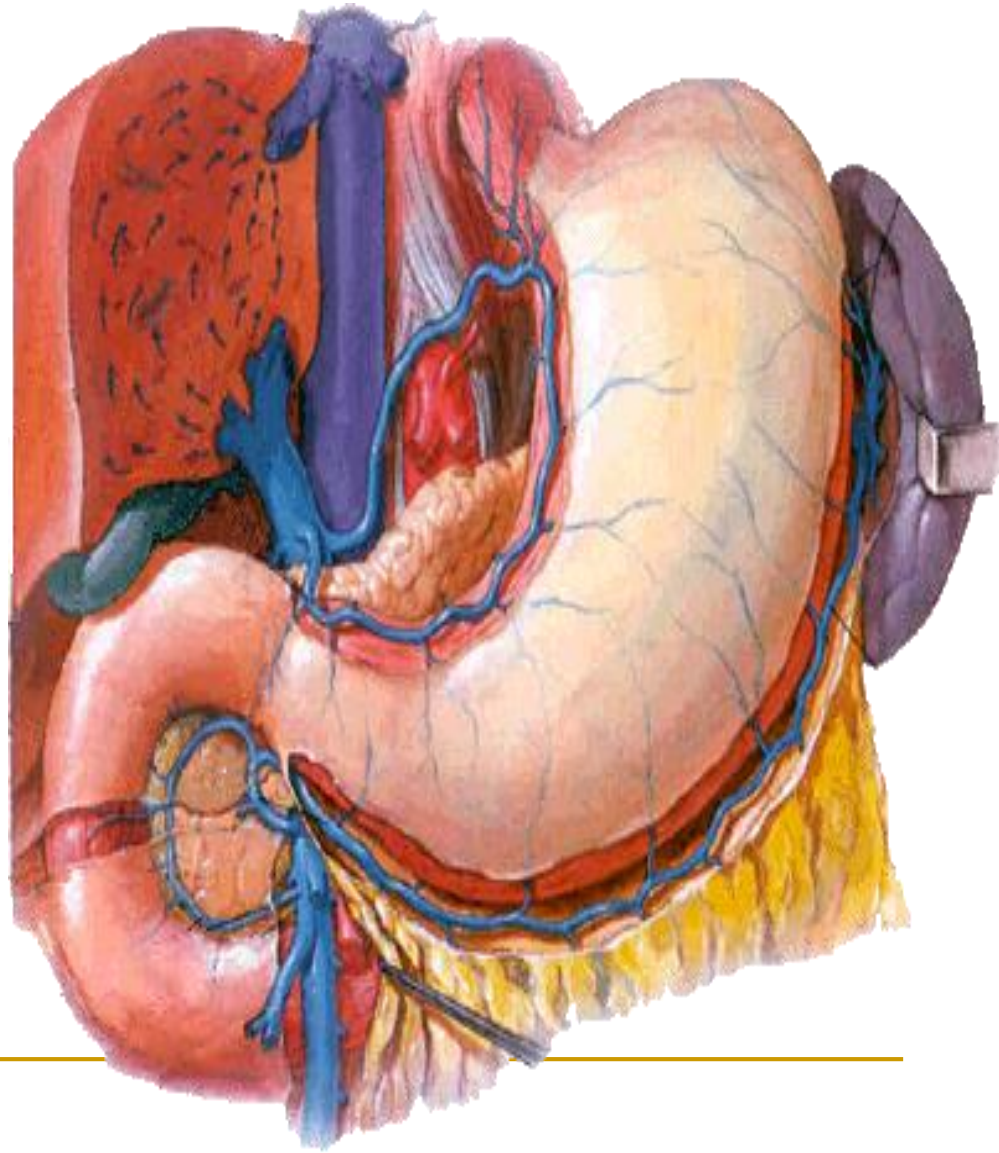


Figure 4.29. Schematic drawing of the branches of the celiac trunk.


Splenic artery
Vasa brevia
Left gastric artery
Right gastric artery
Hepatic artery
Duodenal cap
Gastroduodenal artery
Splenic artery
Superior pancreatico-duodenal artery
Left gastro-epiploic artery
Right gastroepiploic artery
Gastrocolic (greater) omentum

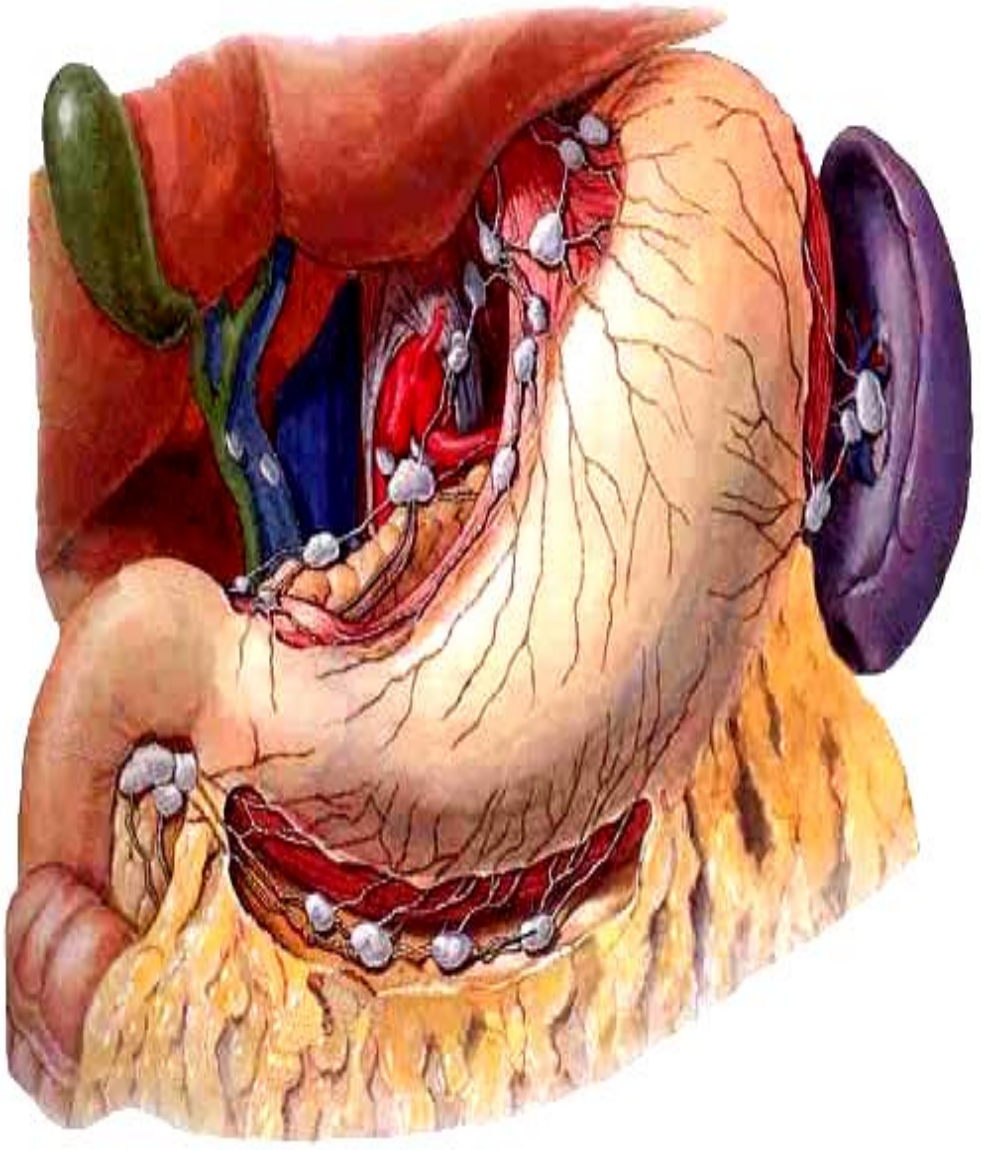
Venous drainage of stomach

- **Right and left gastric veins** empty directly into hepatic portal vein.
- **Left gastroepiploic** and **short gastric veins** drain into hepatic portal vein via the splenic vein.
- **Right gastroepiploic vein** drain into superior mesenteric vein.



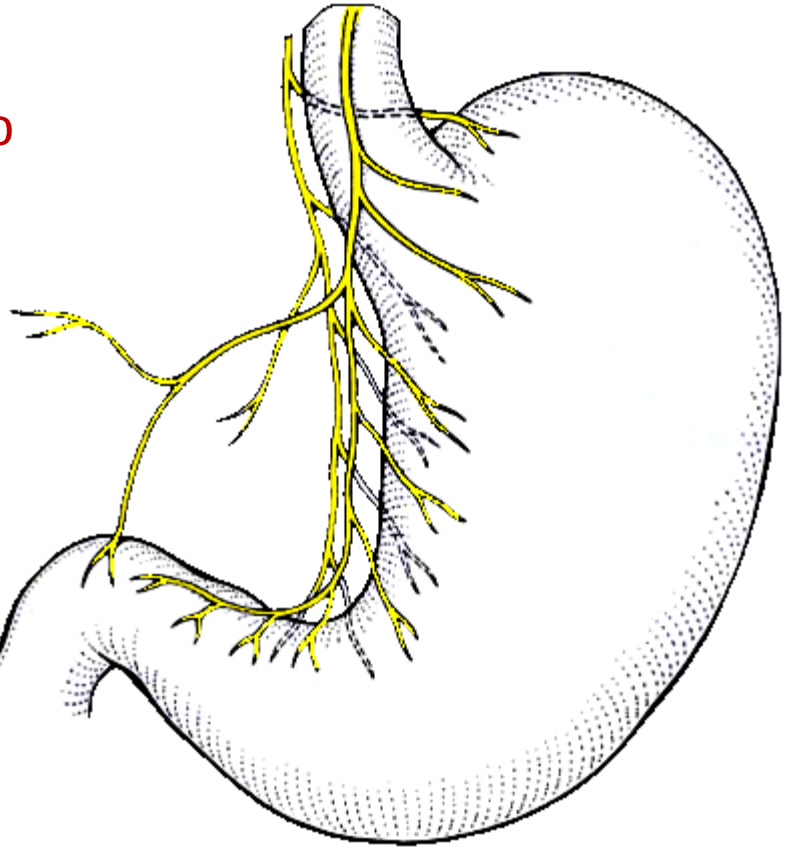
Lymph drainage of stomach

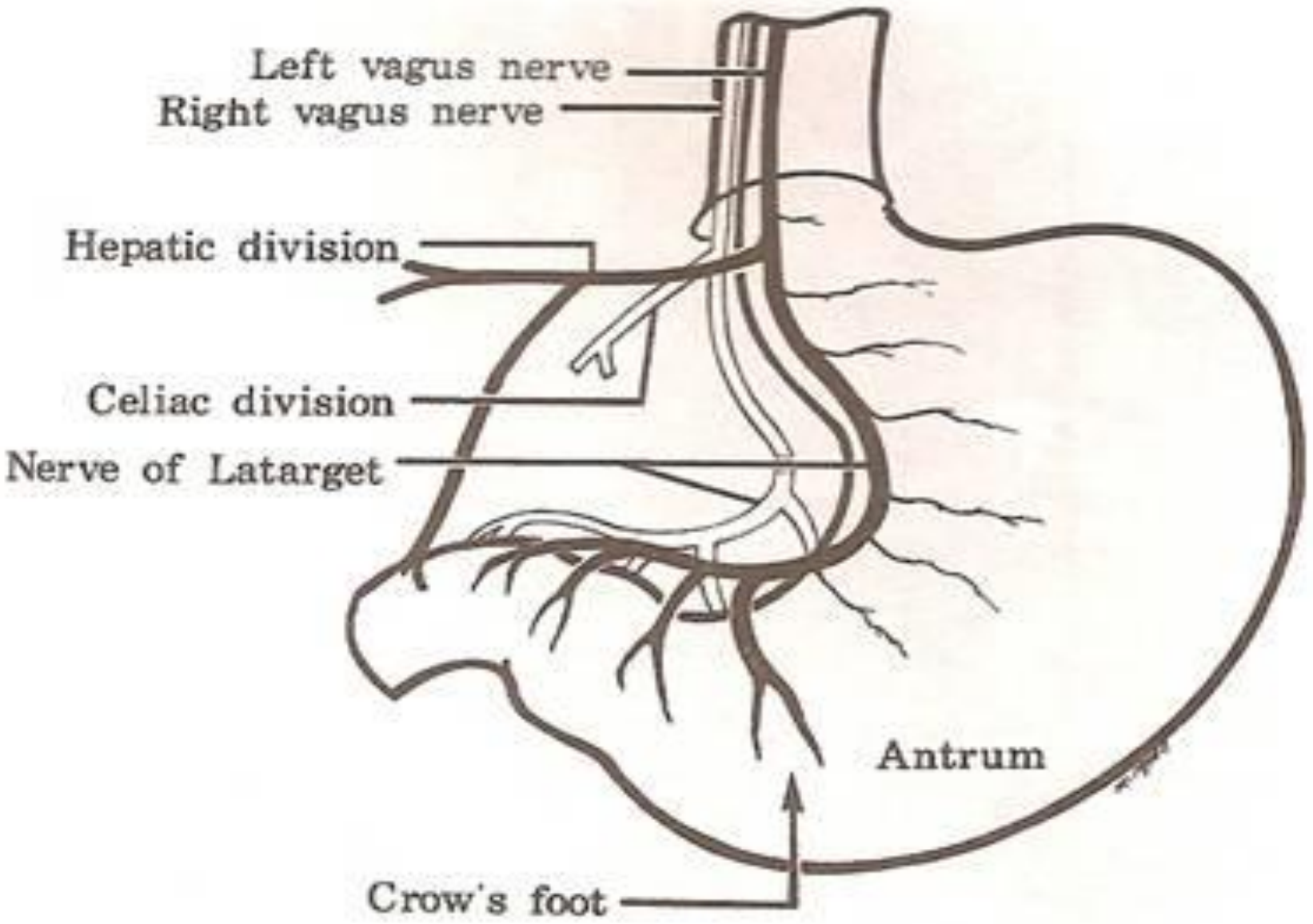
- **Right** and **left gastric ln.** lie along the same vessels and finally to the celiac ln.
- **Right** and **left gastroomental ln.** lie along the same vessels, the former drain into subpyloric ln., the latter drain into splenic ln
- **Suprapyloric** and **subpyloric ln.** receive lymphatics from pyloric part and finally to the celiac ln.
- **Splenic ln.** receive lymphatics from fundus and left third of stomach, and finally to the celiac ln.



Nerve supply of stomach

- **Parasympathetic innervation**
  - The **anterior vagal trunk** divides into **anterior gastric** and **hepatic branches**
  - The **posterior vagal trunk** divides into **posterior gastric** and **celiac branches**
  - The anterior and posterior gastric branches descend on the anterior and posterior surfaces of the stomach as a rule about 1 to 2 cm from the lesser curvature and paralle to it in the lesser omentum as far as the pyloric antrum to fan out into branches called "**crow's foot**" to supply the pyloric part
- **Sympathetic innervation**
  - Mainly from **celiac ganglia**
  - Afferent and efferent fibers derives from thoracic segments (T5 —L1)

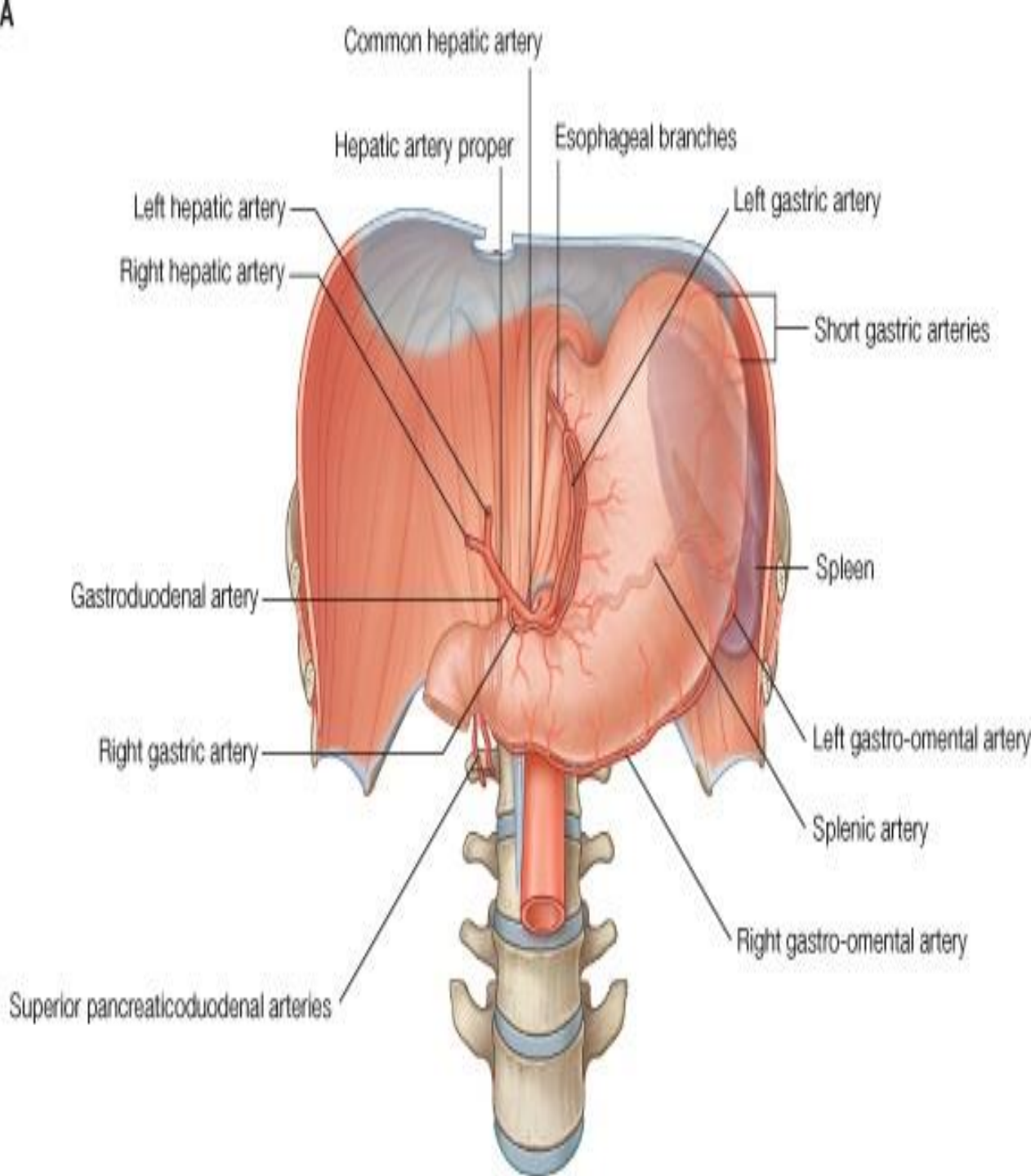



Left vagus nerve
Right vagus nerve
Hepatic division
Celiac division
Nerve of Latarget
Antrum
Crow's foot

- **The celiac trunk**

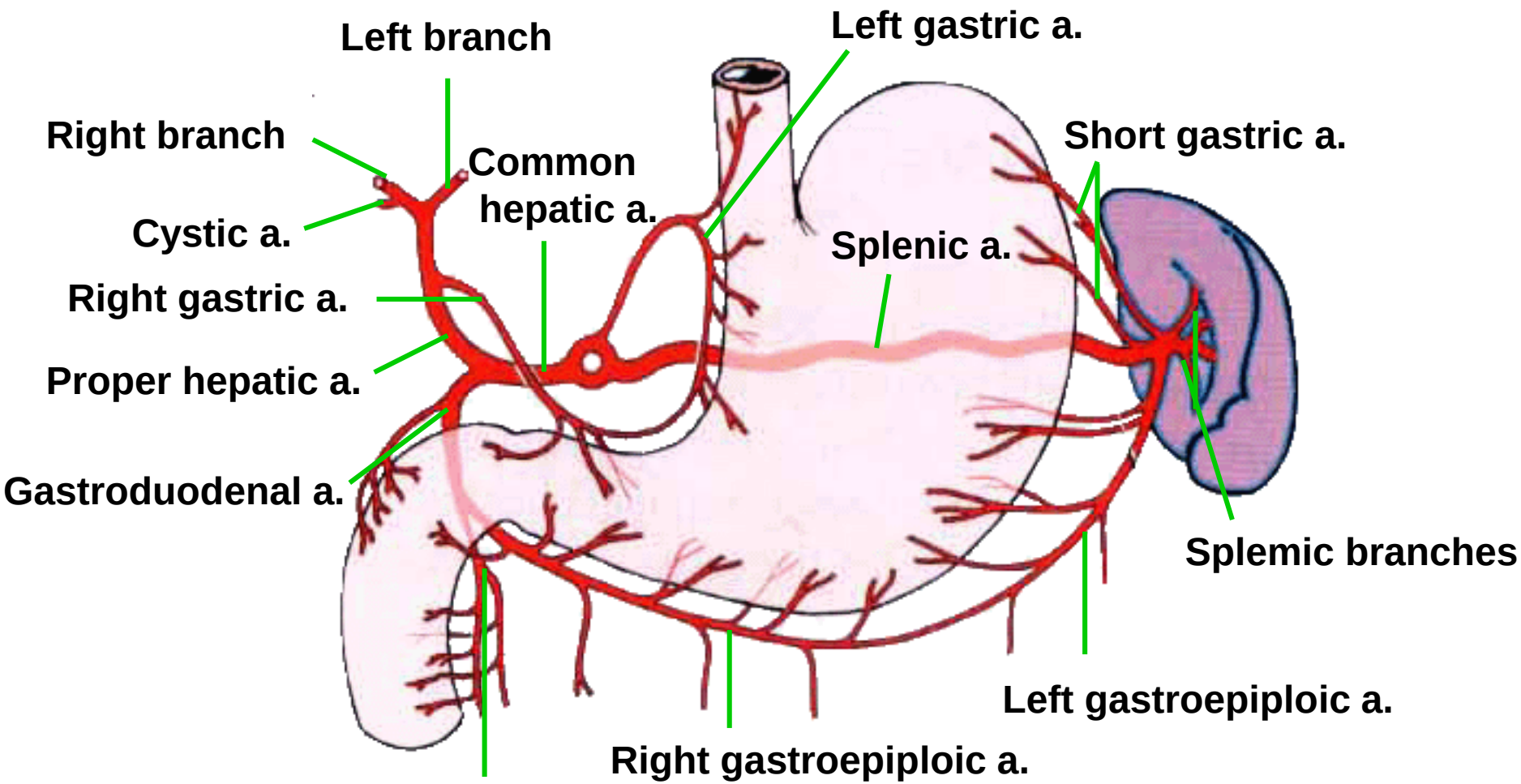
Arises from the abdominal aorta anterio to the upper part of vertebra LI. It divides into:

- **1- Gastric a**
- **2 - Splenic a**
- **3 -Common hepatic arterie**

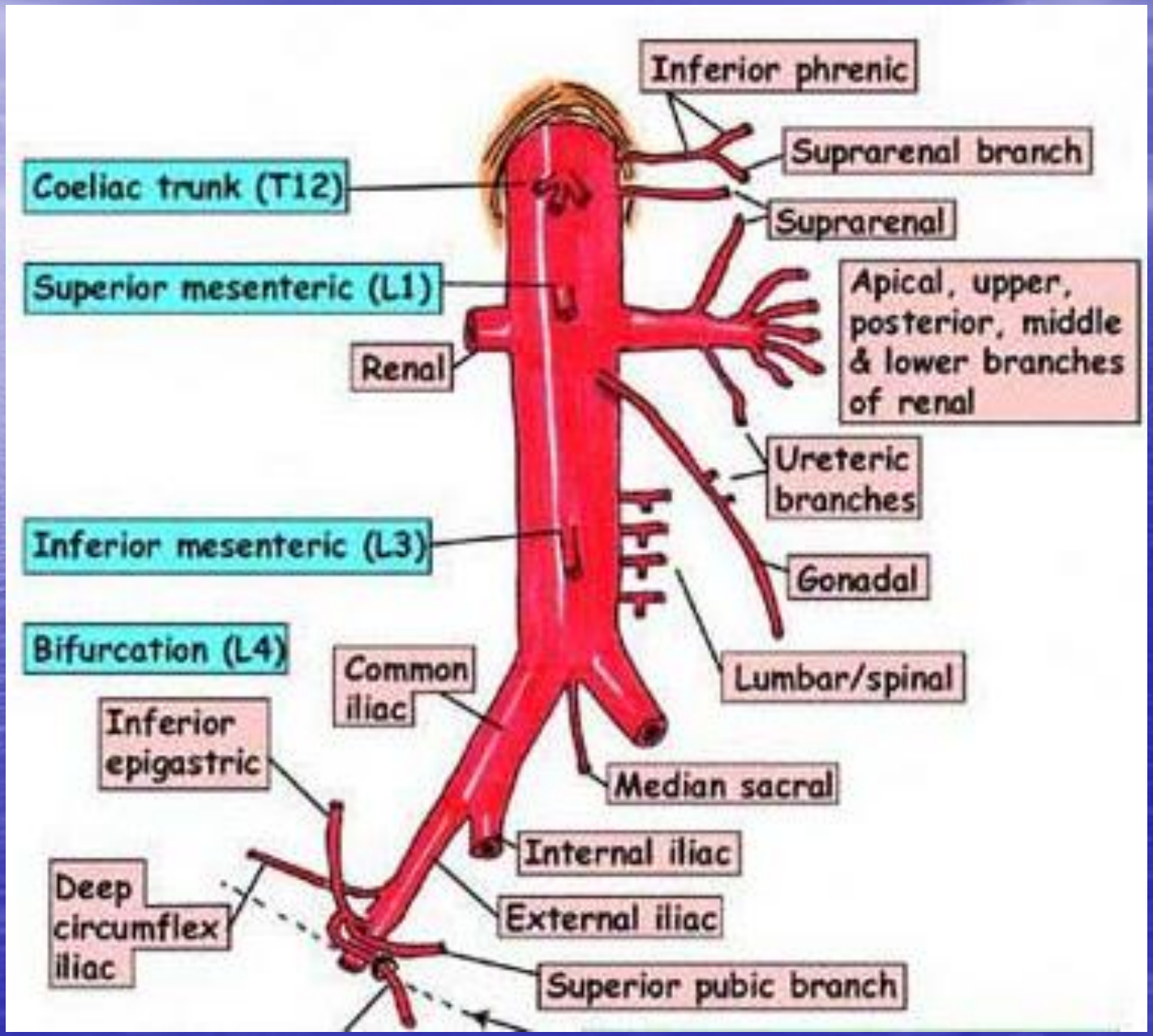


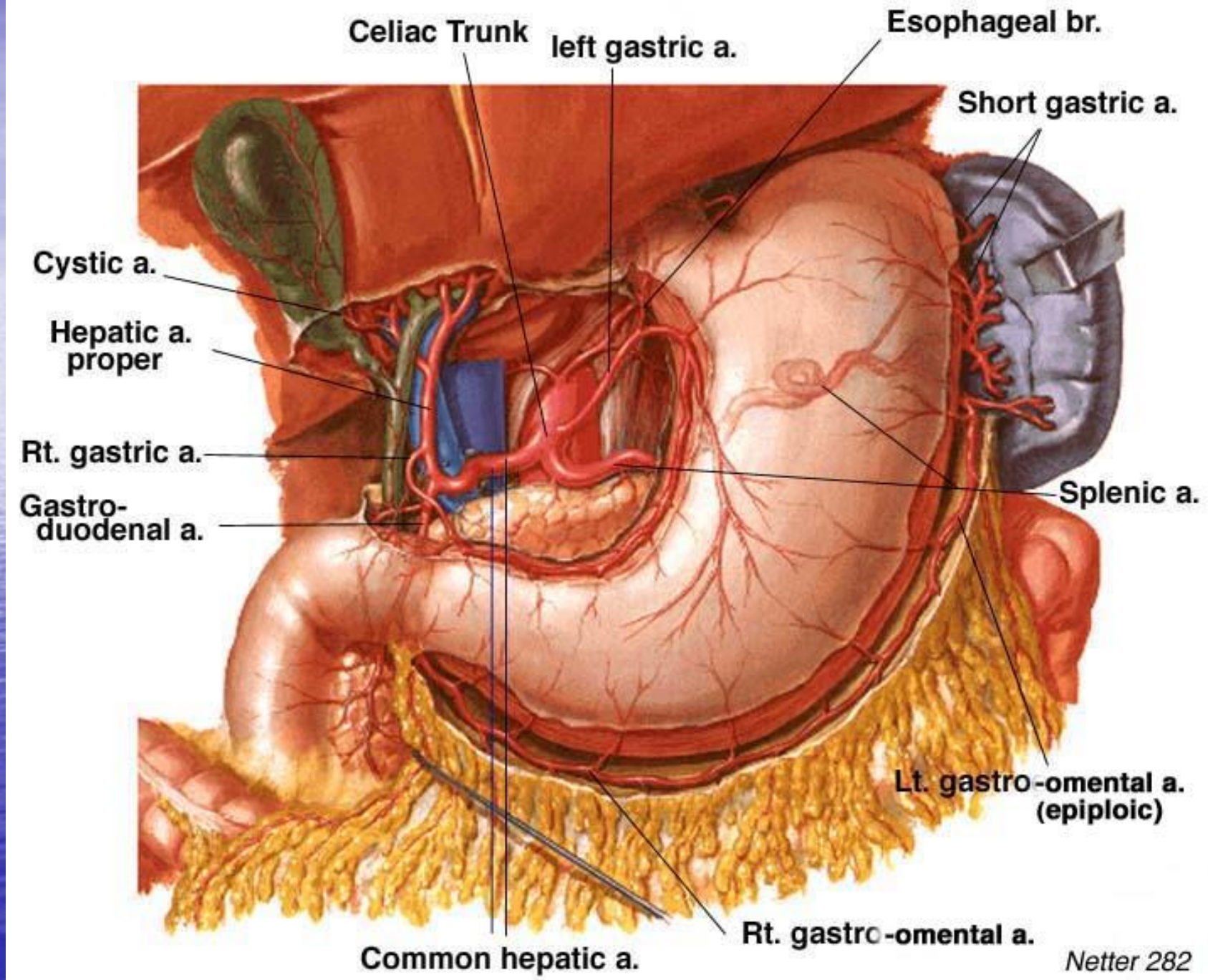
- **The splenic artery :** takes a tortuous course to the left along the superior border of the pancreas .
- The splenic artery gives off
- short gastric arteries
- left gastro-epiploic artery
- **The common hepatic artery :** divides into its two terminal branches,
- **the hepatic artery proper** and divides into the i.right hepatic artery ii.left hepatic artery
- **gastroduodenal artery:**
- right gastro-epiploic(omental)artery
- superior pancreaticoduodenal artery

Celiac trunk

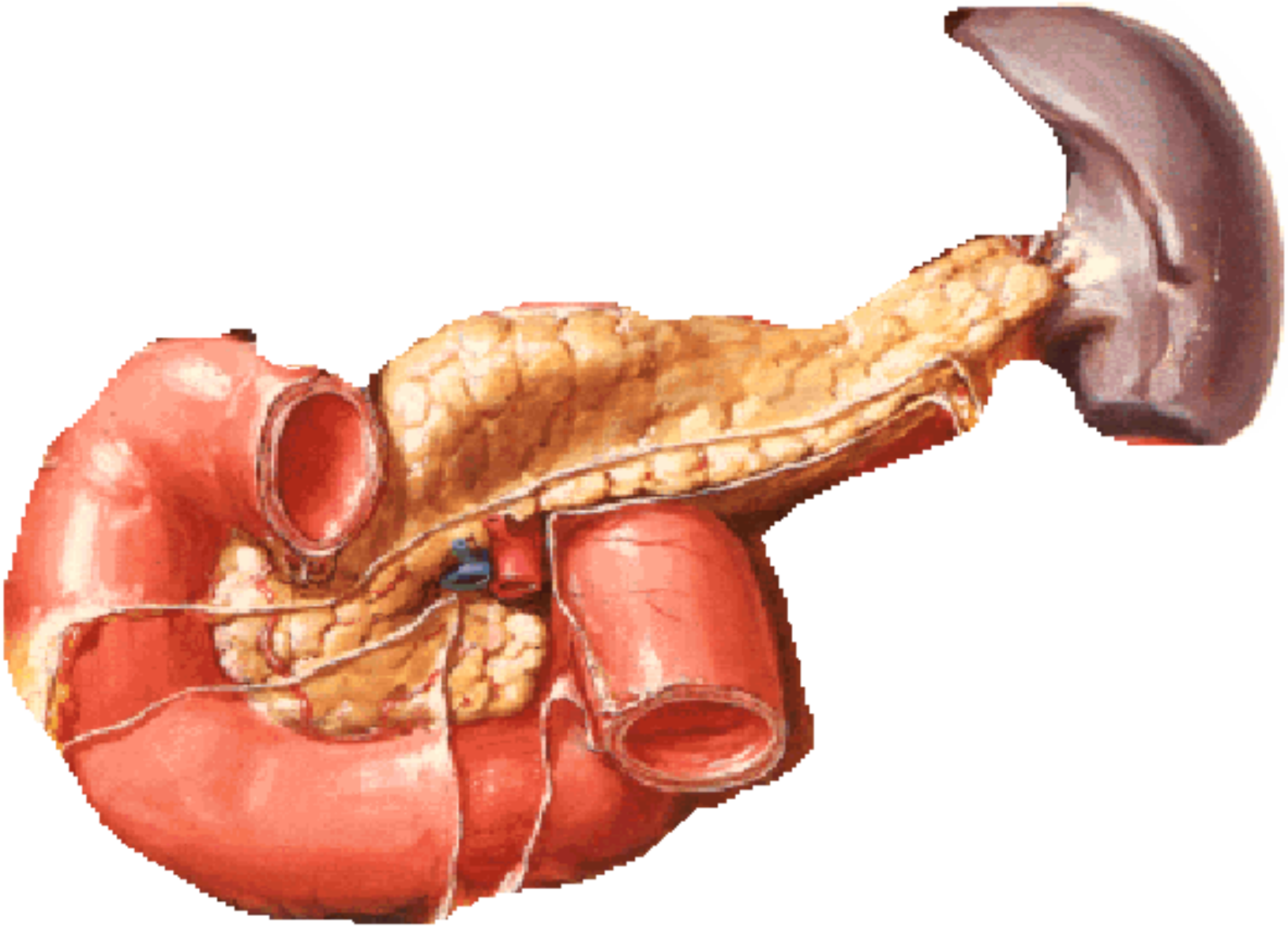


Coeliac Trunk



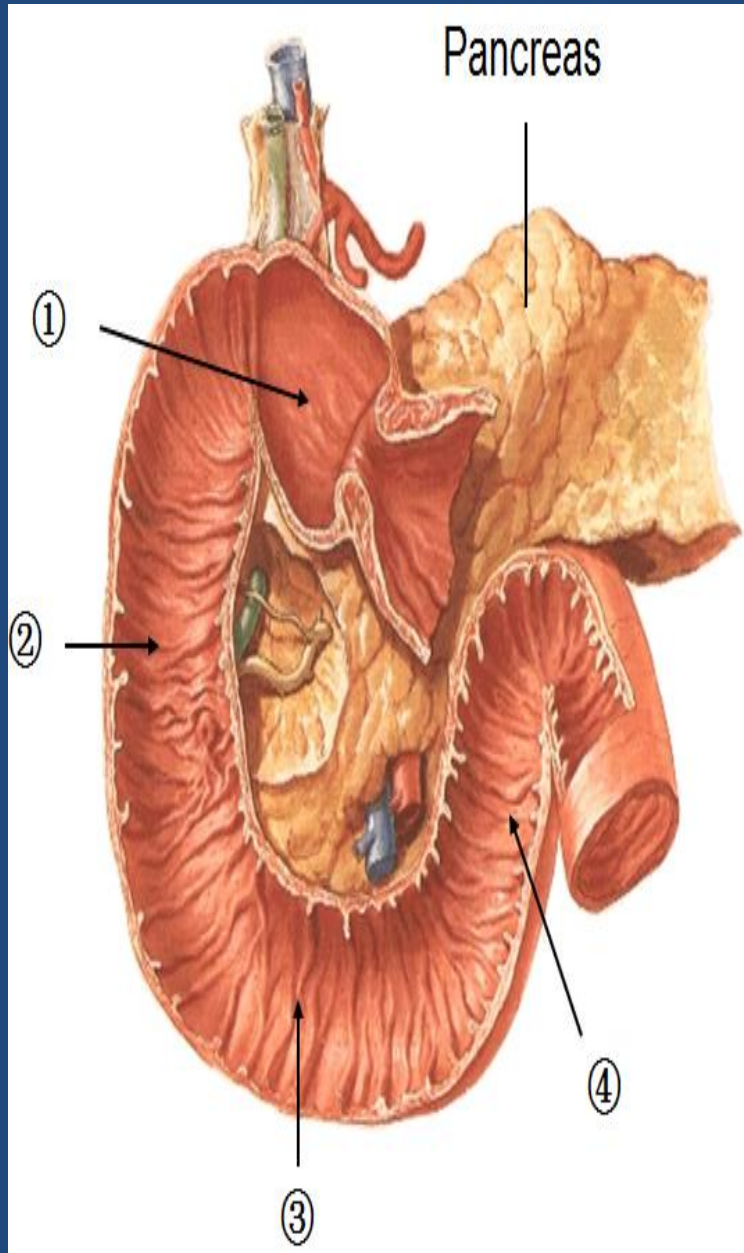

Celiac Trunk
left gastric a.
Esophageal br.
Short gastric a.
Cystic a.
Hepatic a. proper
Rt. gastric a.
Gastro-duodenal a.
Splenic a.
Lt. gastro-omental a. (epiploic)
Rt. gastro-omental a.
Common hepatic a.
Netter 282

Duodenum

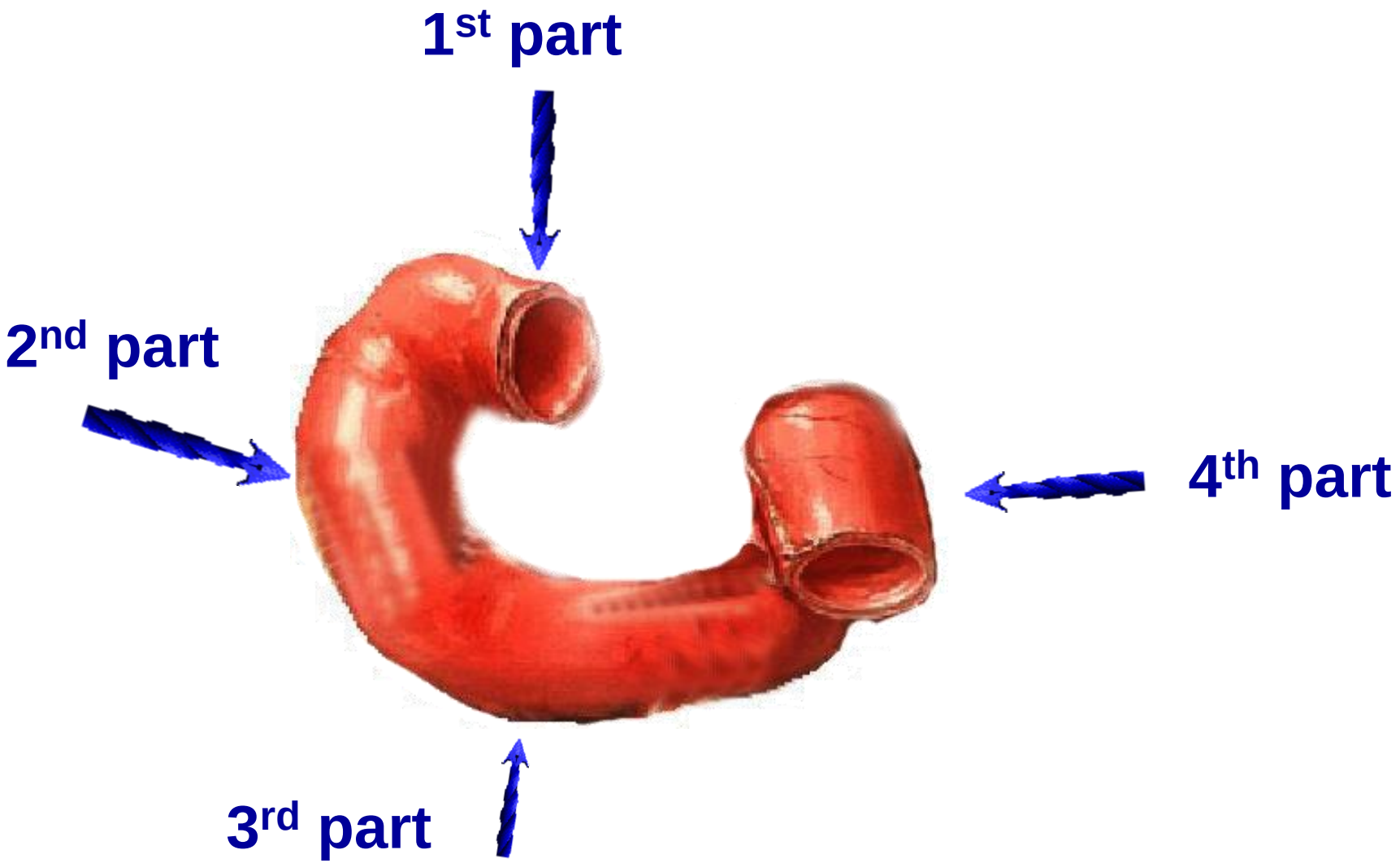


duodenum

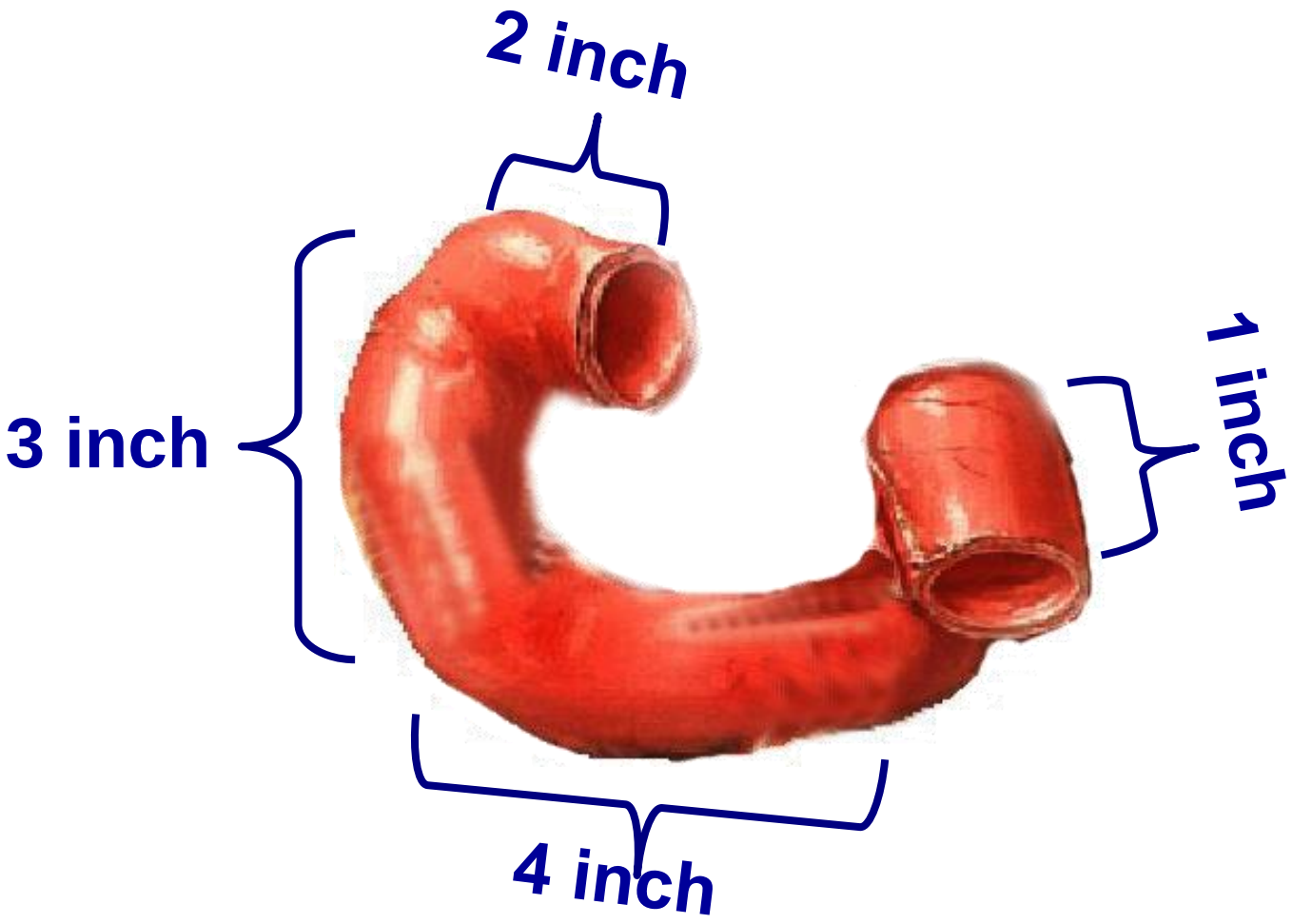
- The duodenum is a c-shaped
- Concave tube
- About 10” in length.
- It joins the stomach to the jejunum.
- It curves around the head of the pancreas to the left and backwards.
- It is important because it receives the opening of the bile and pancreatic ducts.



Parts



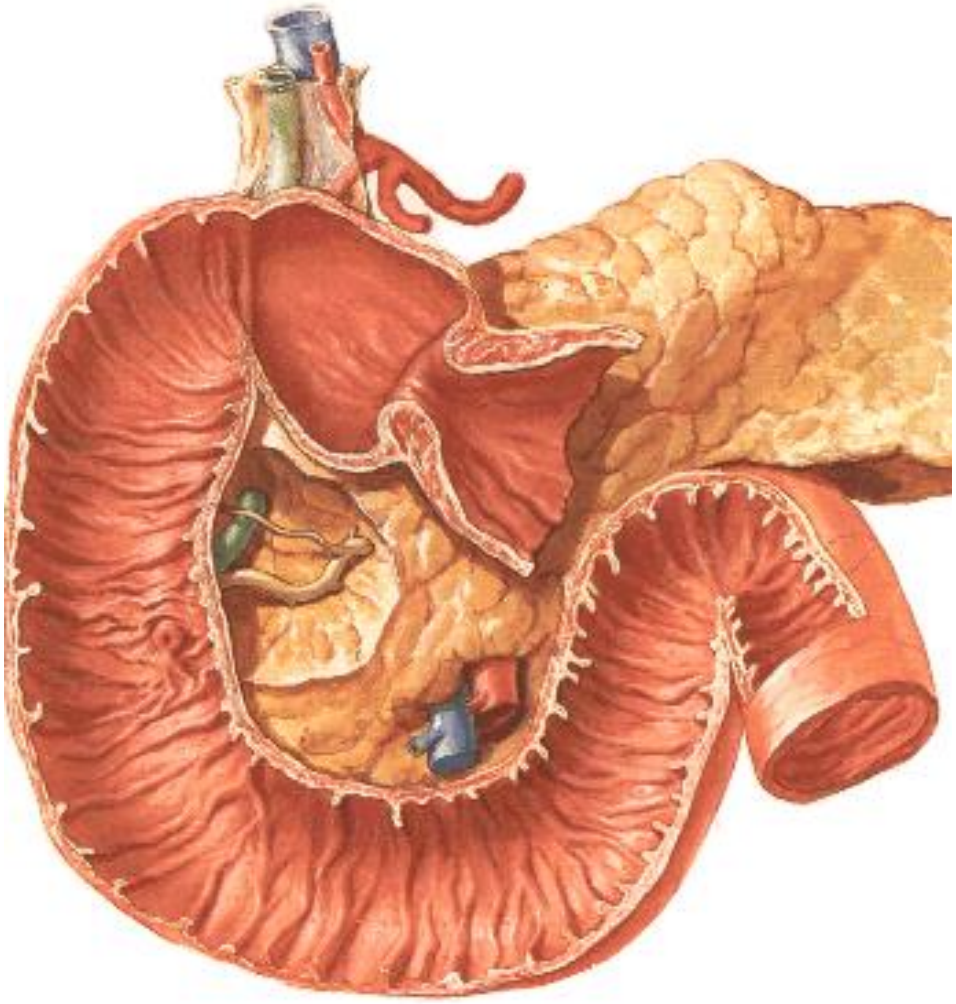
Length



The Duodenum

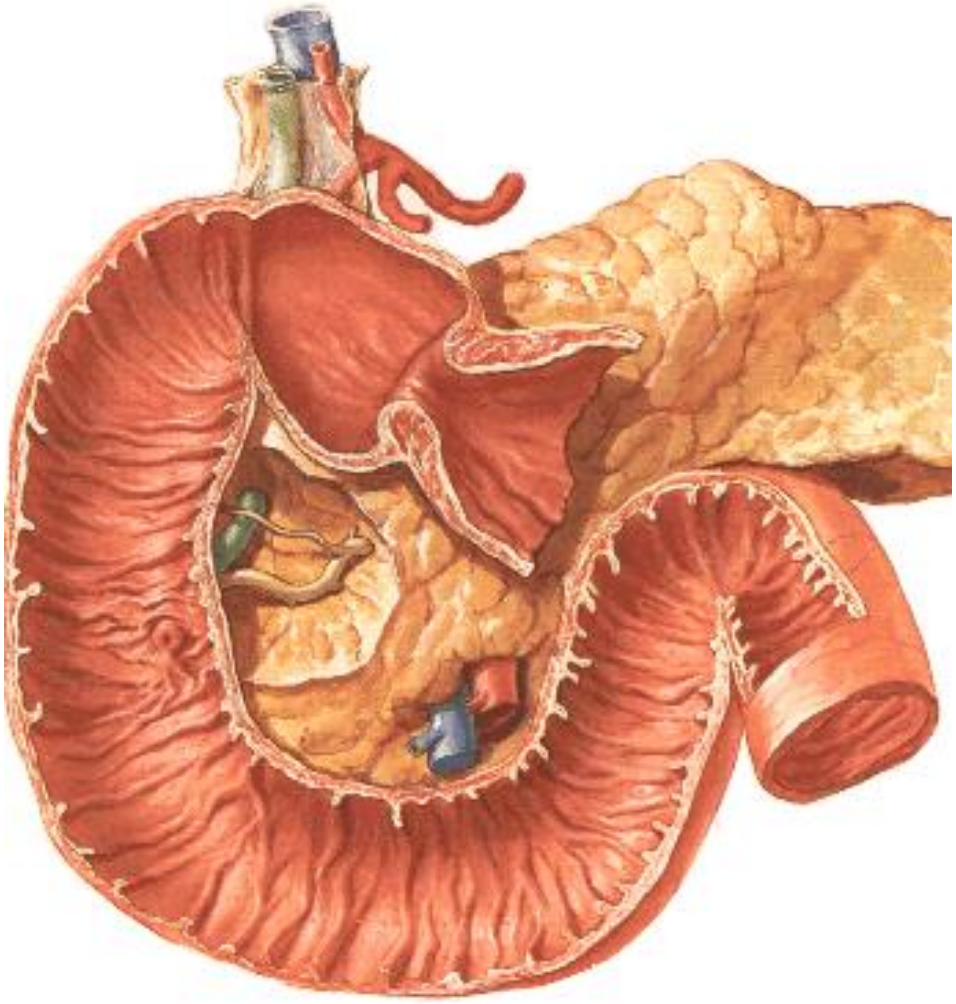
- **Divided into four parts:**
  - Superior- the first
  - Descending- the second
  - Horizontal- the third
  - Ascending- the fourth

  - *Duodenal flexure*



The Duodenum

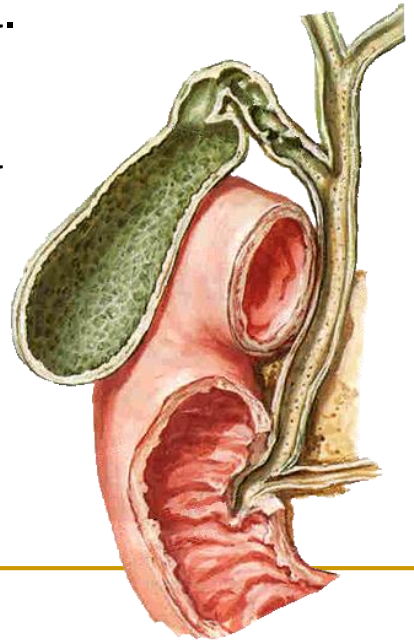
- **Superior part:**
  - Duodenal ampulla or cap
- The first, shortest, widest
  - Forms the inferior margin of the epiploic foramen.
  - Lesser omentum attaches to its upper margin.
  - Greater omentum attaches to its lower margin.

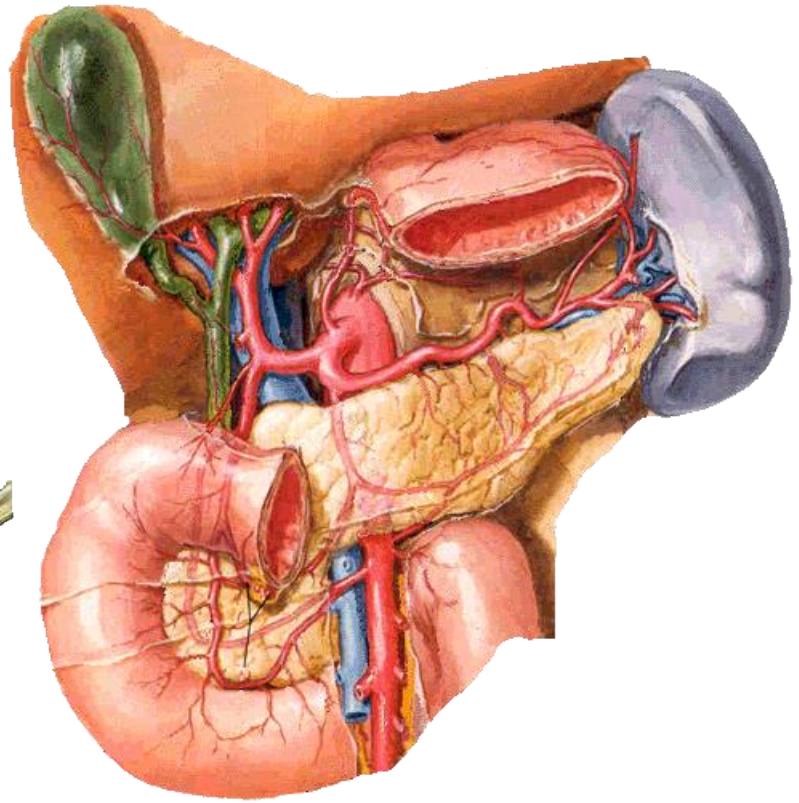


Relations of duodenum

Relations of superior part

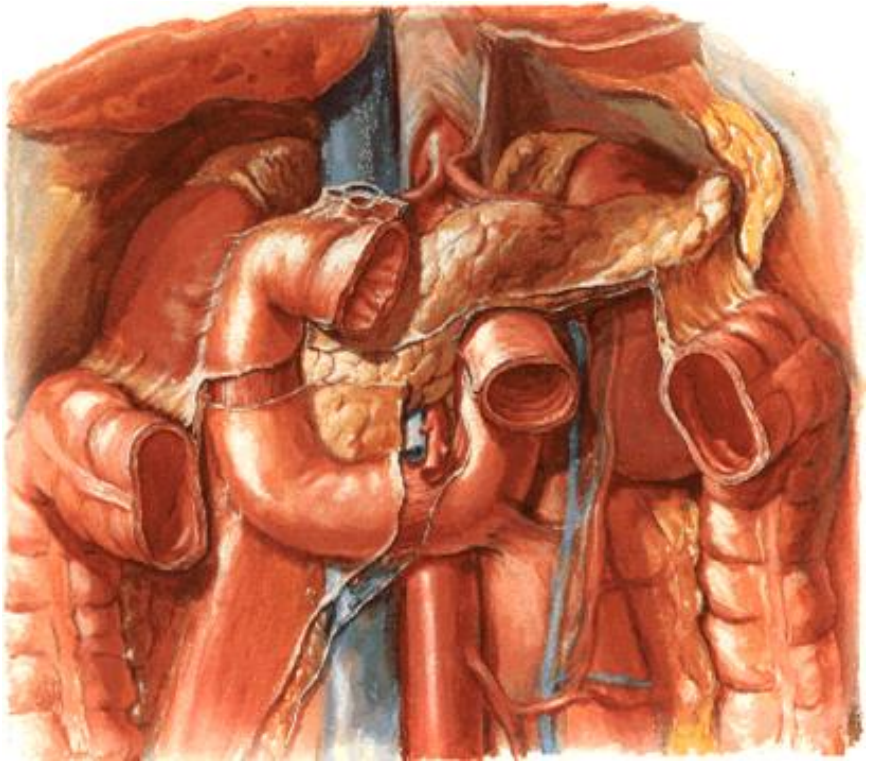
- **Anteriorly**
  - Quadrate lobe of live
  - Gallbladder
- **Posteriorly**
  - Common bile duct
  - Gastroduodenal a.
  - Hepatic portal v.
  - Inferior vena cava
- **Superioely**
  - Omental foramen
- **Inferiorly**
  - Head of pancreas





The Duodenum

- **Descending part:**
  - The anterior surface is covered with peritoneum.
  - The head of the pancreas is in direct contact with it.
  - The common bile duct and the main pancreatic duct open into its lumen.
  - Major duodenal papilla and minor duodenal papilla



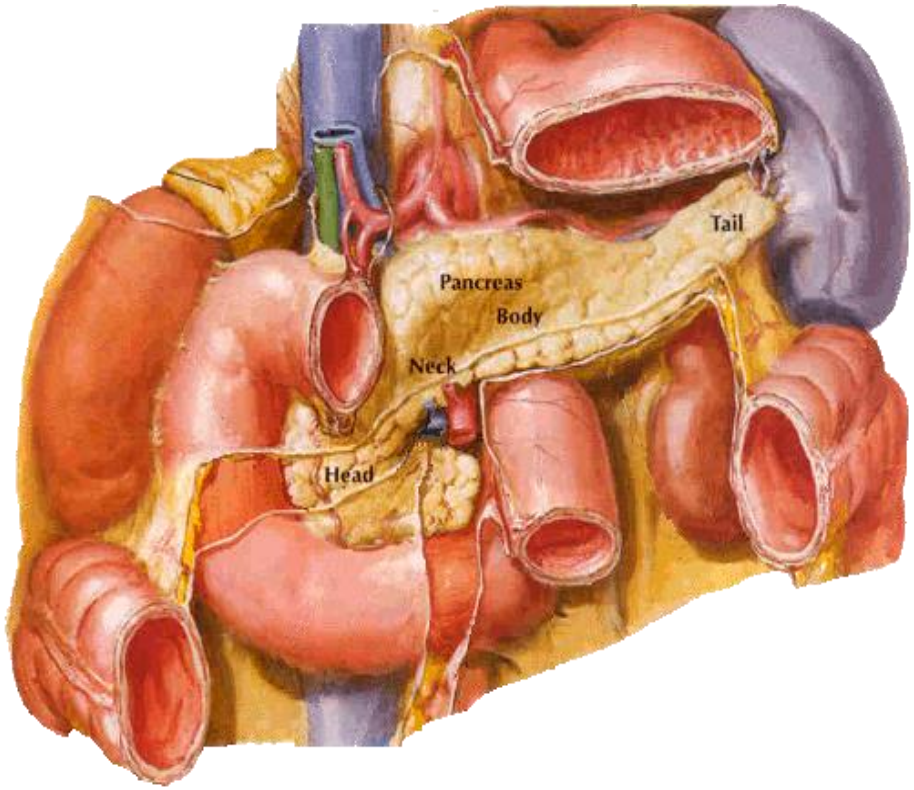
Second part:

Length: three inches long.
Extent: from the neck of gall bladder to L3
Direction: descends vertically.
Peritoneal covering:
covered by the peritoneum only on the anterior surface except the middle part where is crossed by transverse colon.

The Duodenum

Relations of descending part

- **Anteriorly**
  - Liver
  - Transverse colon and transverse mesocolon
  - Loops of small intestine
- **Posteriorly**
  - Right renal hilum and ureter
  - Right renal vessels
- **Medially**
  - Head of pancreas
  - Common bile duct and pancreatic duct
- **Laterally**
  - Right colic flexure

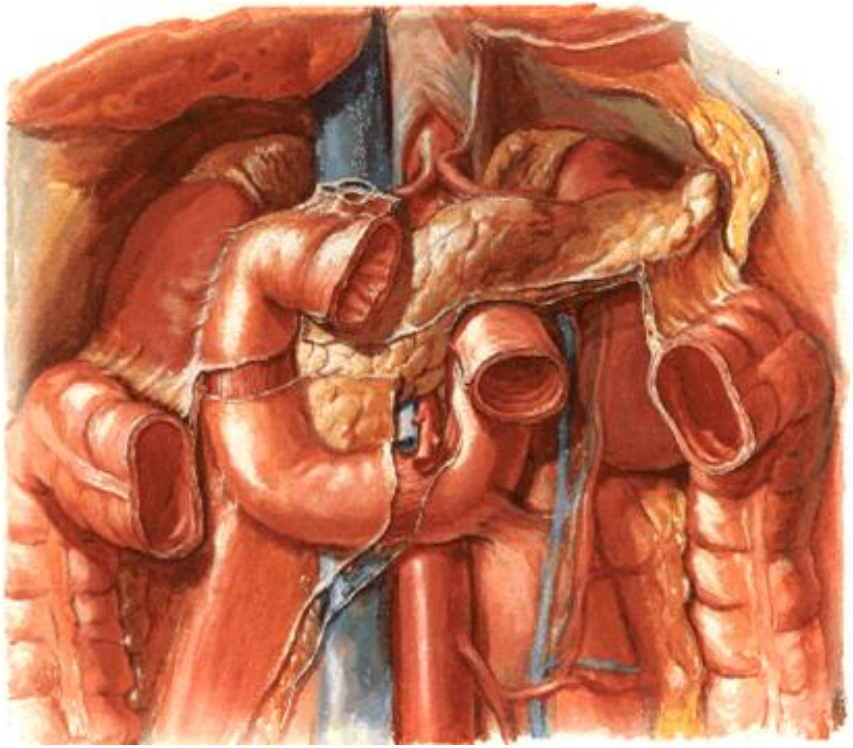


Third part:

Length: four inches
Extent: at the level of the 3rd lumbar vertebra
Direction: horizontal.
Peritoneal covering: is only covered by peritoneum anteriorly and inferiorly except the site of attachment of mesentry.

The Duodenum

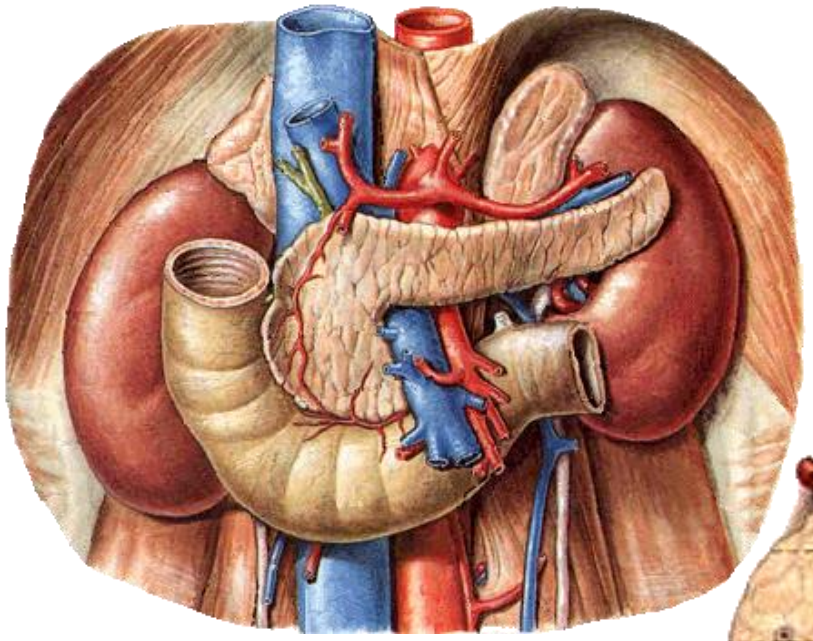
- **Horizontal part:**
  - Crosses to the left in front of.
    - L3 vertebra
    - The inferior vena cava
    - The aorta
    - Continues with the ascending part in front of the aorta.
  - The anterior surface is covered with peritoneum.
    - Except along the attachment line of the mesentery.



The Duodenum

Relations of horizontal part

- **Superiorly**
  - Head of pancreas
- **Inferiorly**
  - Loops of small intestine
- **Anteriorly**
  - Radix of mesentery
  - Superior mesenteric a. and v.
- **Posteriorly**
  - Right ureter
  - Inferior vena cava
  - Abdominal aorta

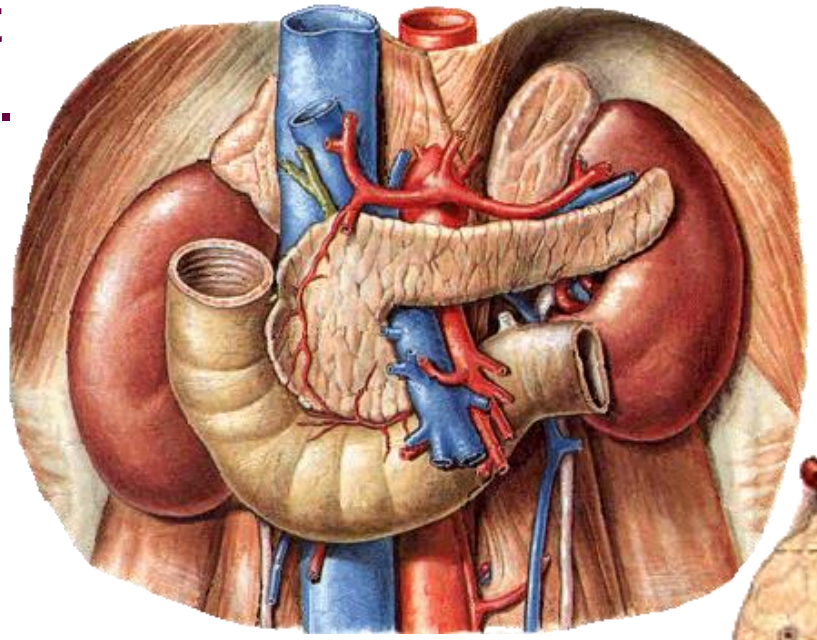


The Duodenum

Relations of horizontal part

- **The superior mesenteric a. / v.**
  - Enters / leaves the root of the mesentery.

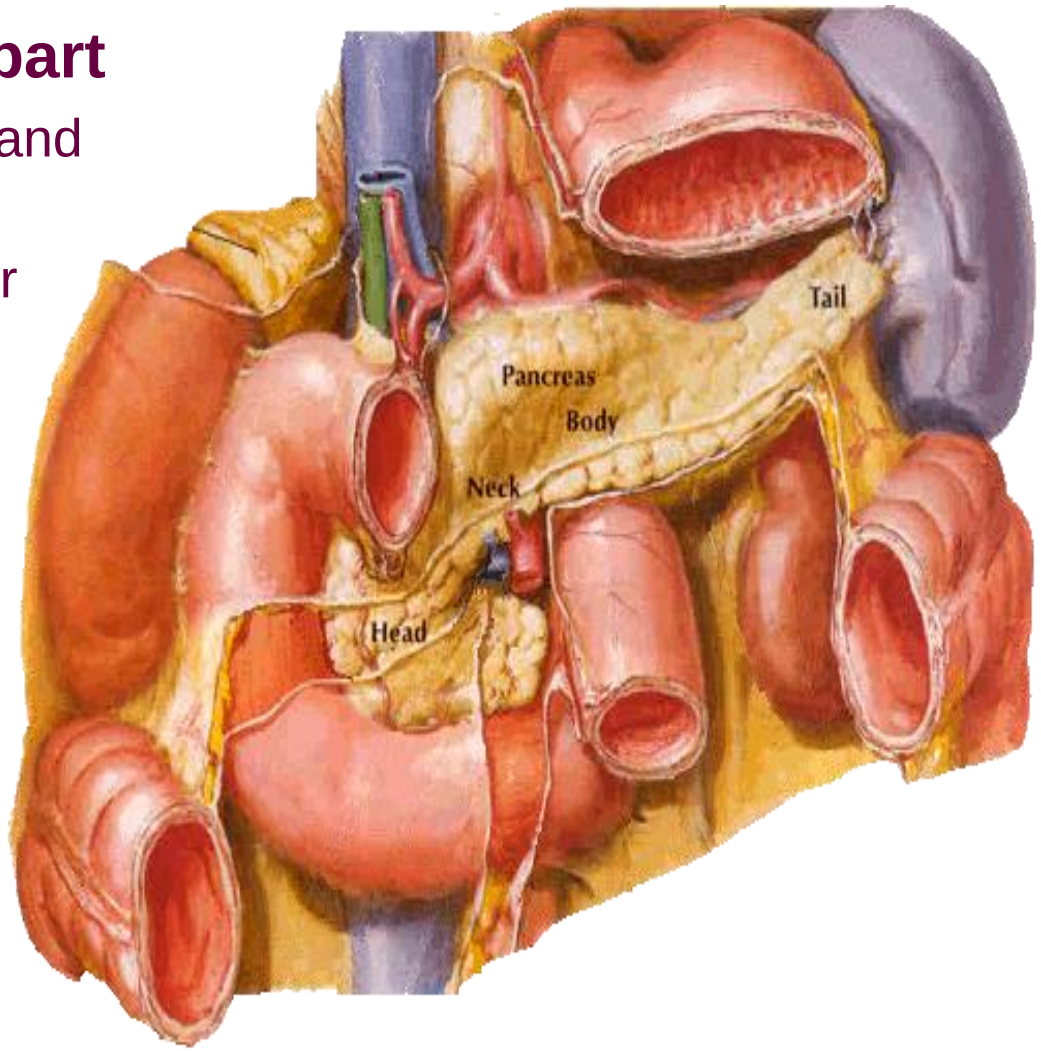
- **Both vessels:**
  - Cross the horizontal segment anteriorly.
  - These vessels may compress the duodenum, leading to distention of the proximal duodenum and stomach



The Duodenum

Relations of ascending part

- **Right** — Head of pancreas and abdominal aorta
- **Left** — left kidney and ureter



The Duodenum

- **Suspensory muscle of the duodenum:**
  - Secures the duodenum to the posterior abdominal wall and has two parts:
    - One derived from the diaphragm, which contains striated muscle.
    - The other part derived from the duodenal wall, which contains smooth muscle.

Superior (first) part:

Relations

2. The second inch of the duodenum:

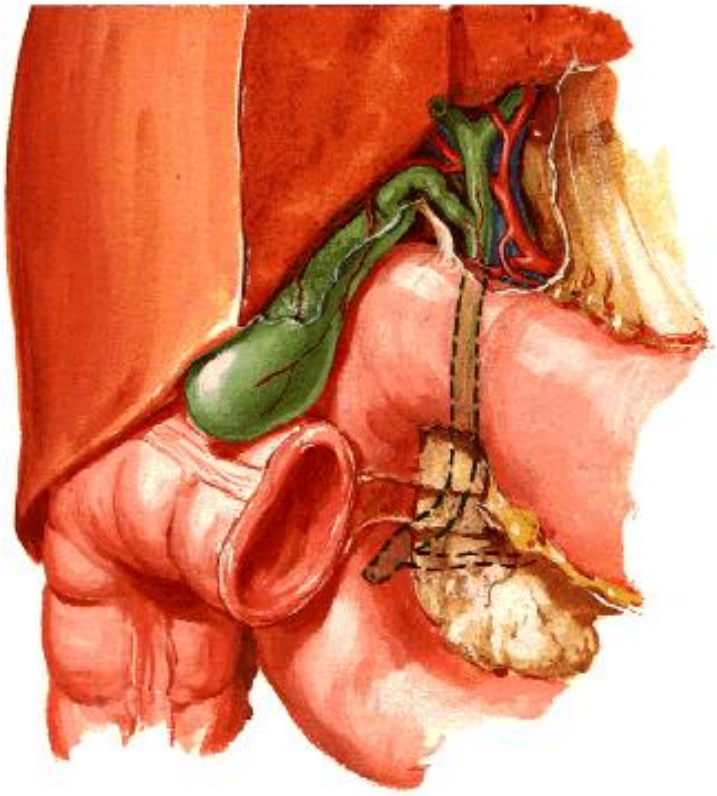
- **Anteriorly:**

a. The quadrate lobe of the liver,
b. The neck of the gall bladder

- **Posteriorly:**

a. The bile duct.
b. The gastroduodenal artery.
c. The portal vein.
d. The inferior vena cava.

- **Superiorly:** the opening into the lesser sac.
- **Inferiorly:** pancreas.



Second part:

Relations of the second part:

- **Anteriorly:**

1. **Upper part: right lobe of the liver.**
2. **The middle part: transverse colon.**
3. **Lower part: loops of the jejunum.**

- **Laterally:**

The right colic flexure.
The fat in front of the right kidney.

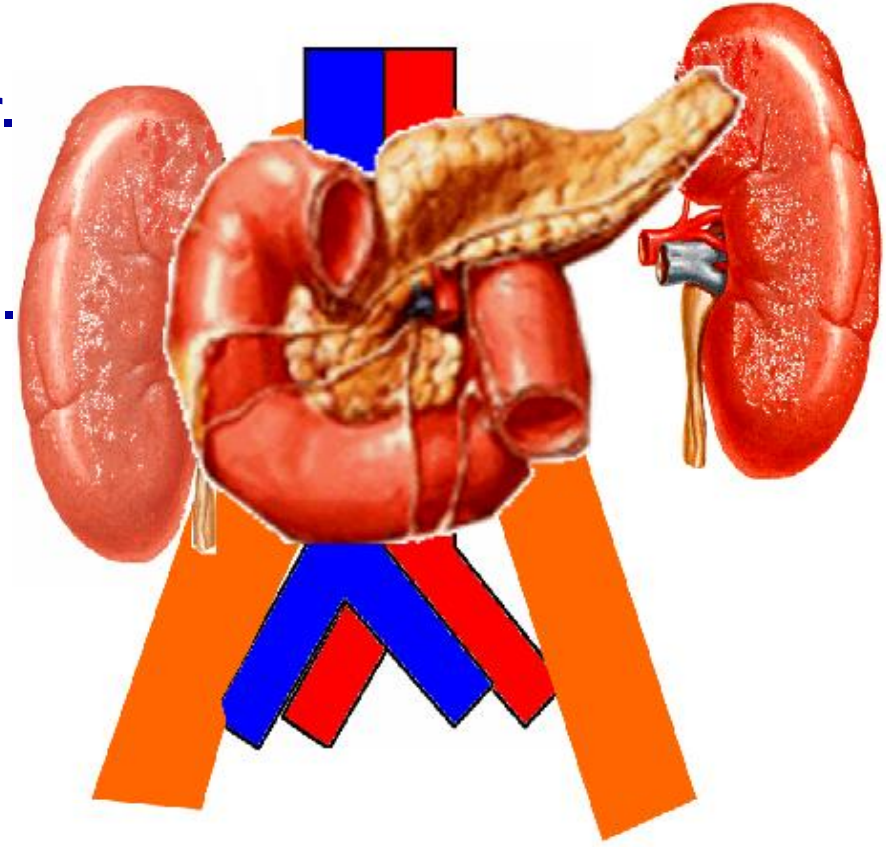
- **Medially:**

The head of pancreas
The bile duct

- **Posteriorly:**

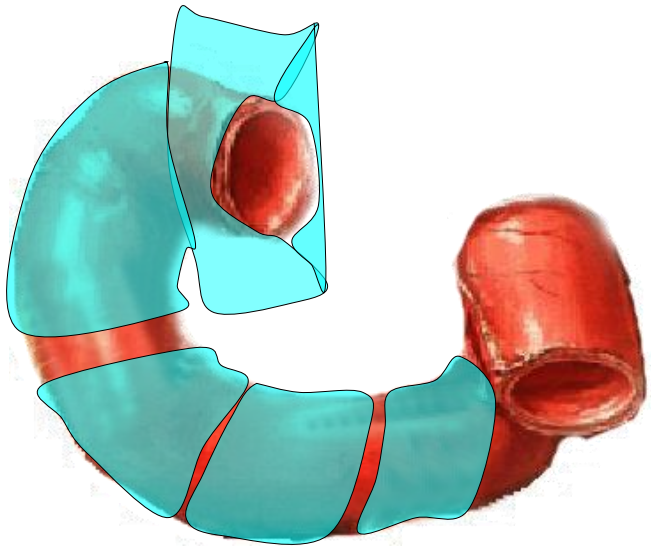
The hilum of right kidney.
The right renal vessels.
The right psoas major muscle.

.



Third part:

Length: four inches
Extent: at the level of the 3rd lumbar vertebra.
Direction: lies in a horizontal plane,
Peritoneal covering: is only covered by peritoneum anteriorly and inferiorly except the site of attachment of mesentry.



Third part:

Relations of the 3rd part:

- **Anteriorly:**

1. The root of the mesentery.
2. The coils of jejunum.

- **Posteriorly:**

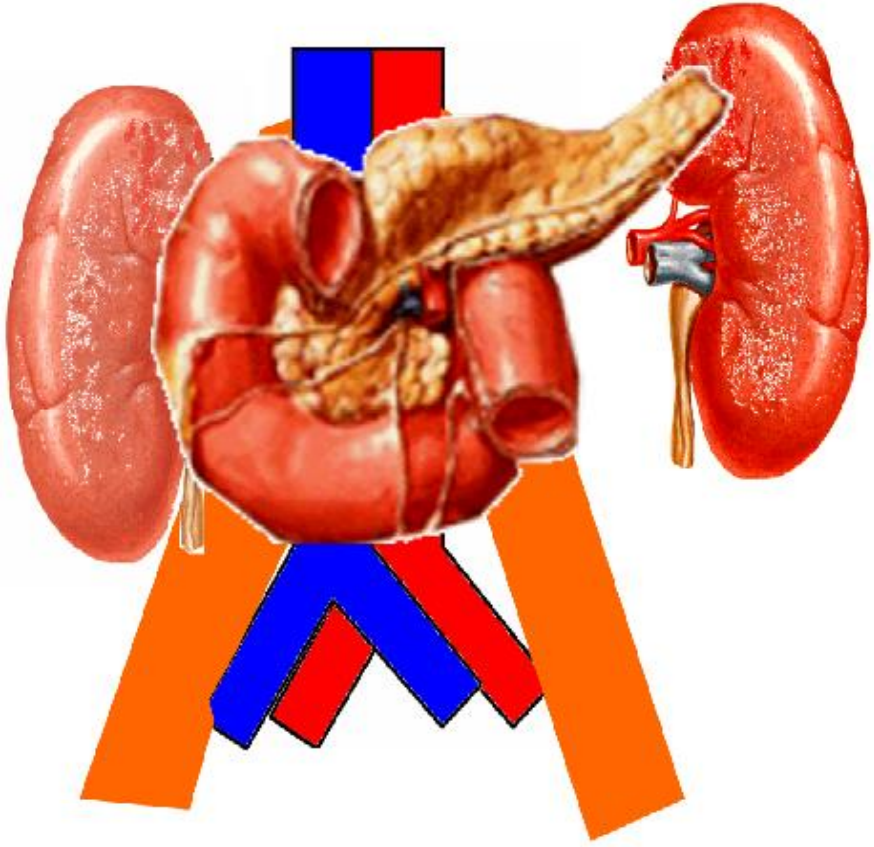
1. The right ureter.
2. The right psoas major muscle.
3. The right testicular (or ovarian) vessels.
4. Inferior vena cava.
5. Abdominal aorta & origin of the inferior mesenteric artery.

- **Superiorly:**

The pancrcas.

- **Inferiorly:**

Coils of the jejunum.



Fourth part:

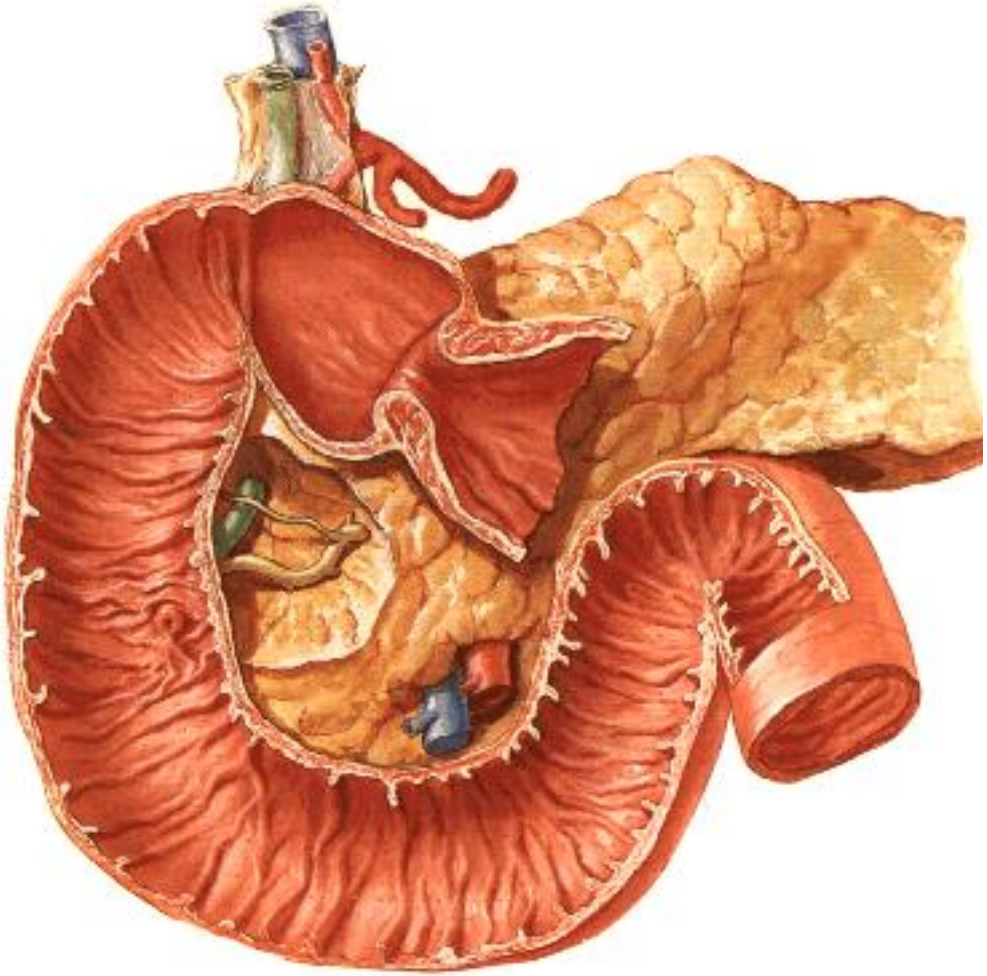
Length: one inch long.

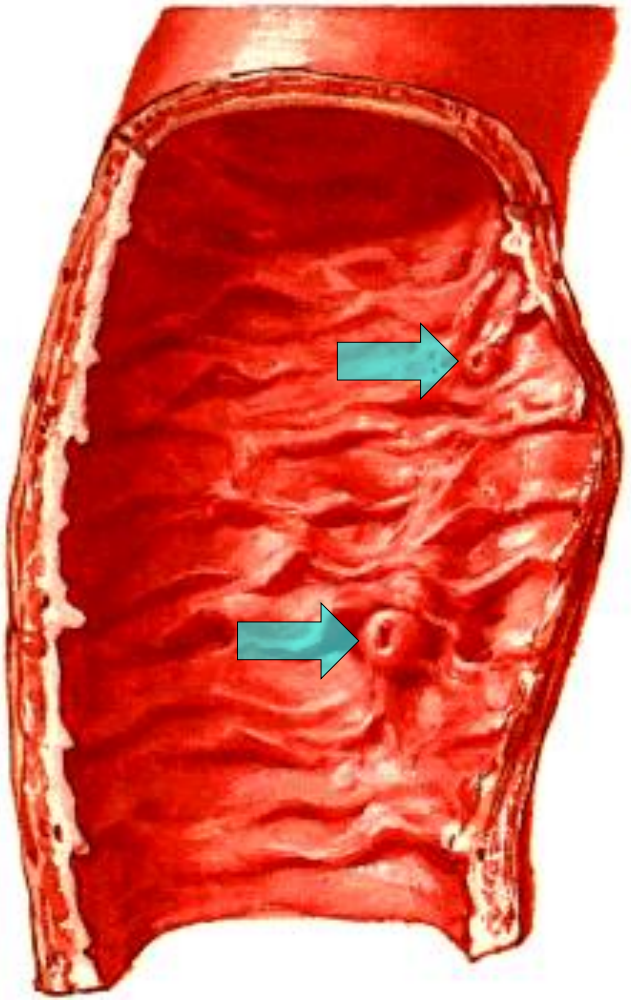
Extent: from the level of the 3rd to the level of the 2nd lumbar vertebrae.

Direction: ascends to end by forming the duodenojejunal flexure.

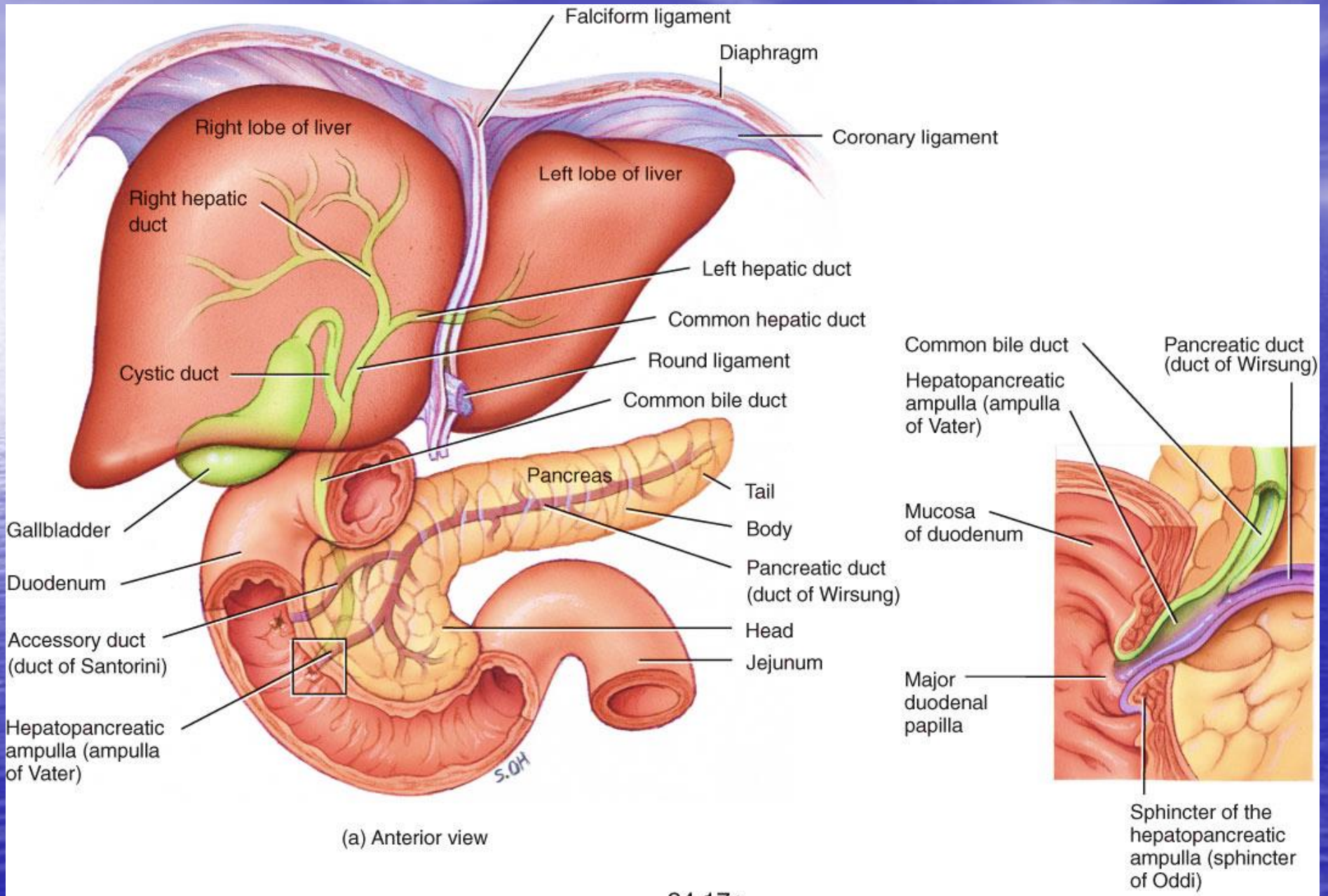
Peritoneal covering: is covered by the peritoneum anteriorly and to the left.

Structures opening in the 2nd part of the duodenum





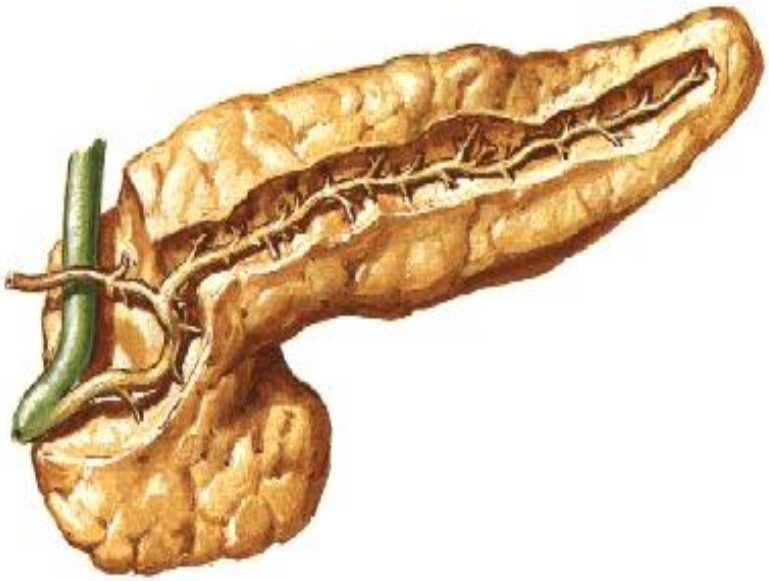
Structures opening in the 2nd part of the duodenum



24.17a

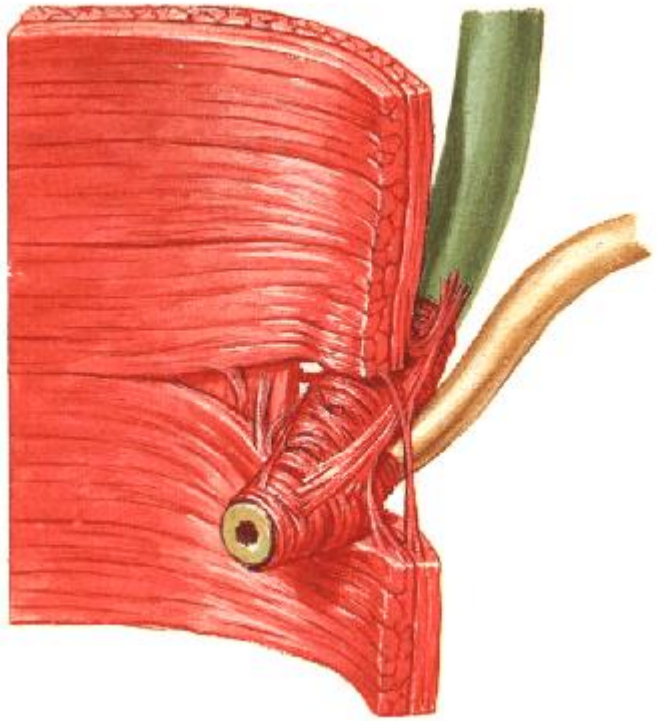
Structures opening in the 2nd part of the duodenum

- The bile duct unites with the pancreatic duct forming a dilatation called the **hepatopancreatic ampulla** (ampulla of Vater).
- The ampulla opens on an elevation called the **major duodenal papilla.**
- The accessory pancreatic duct opens one-inch above the major duodenal papilla, forming a smaller elevation called the **minor duodenal papilla.**



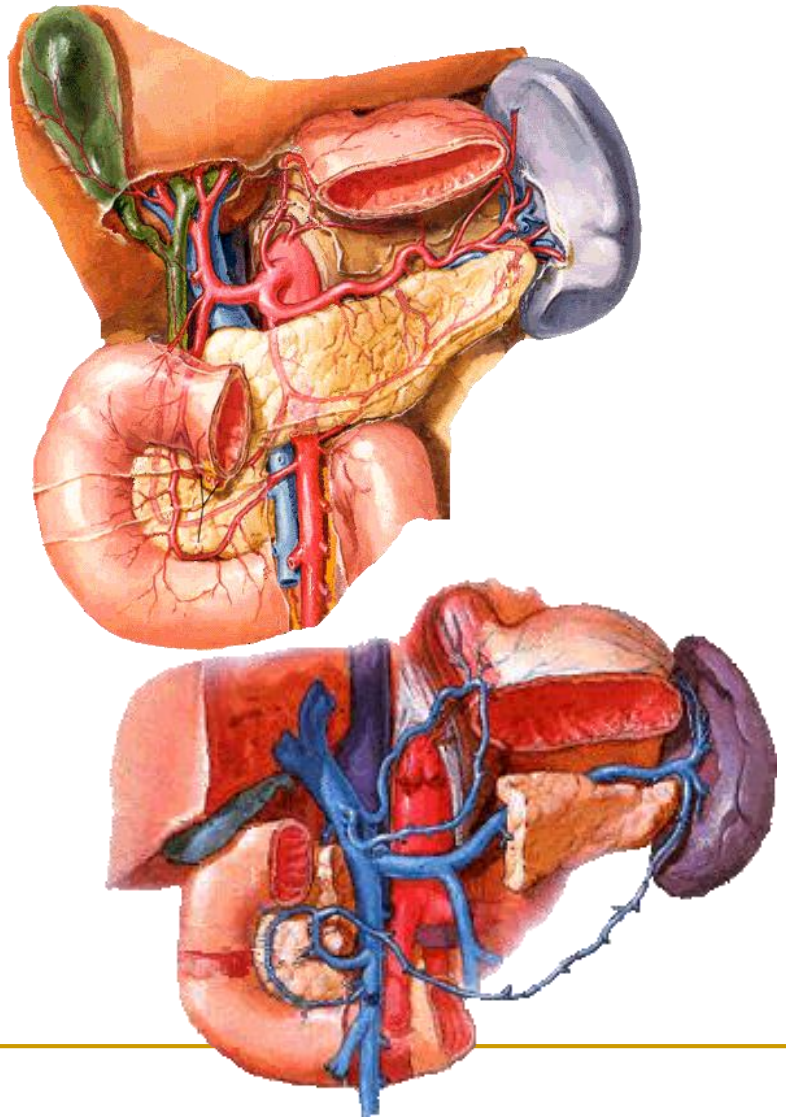
Structures opening in the 2nd part of the duodenum

- The bile duct unites with the pancreatic duct forming a dilatation called the hepatopancreatic ampulla (ampulla of Vater).
- The ampulla opens on an elevation called the major duodenal papilla.
- The accessory pancreatic duct opens one-inch above the major duodenal papilla, forming a smaller elevation called the minor duodenal papilla.

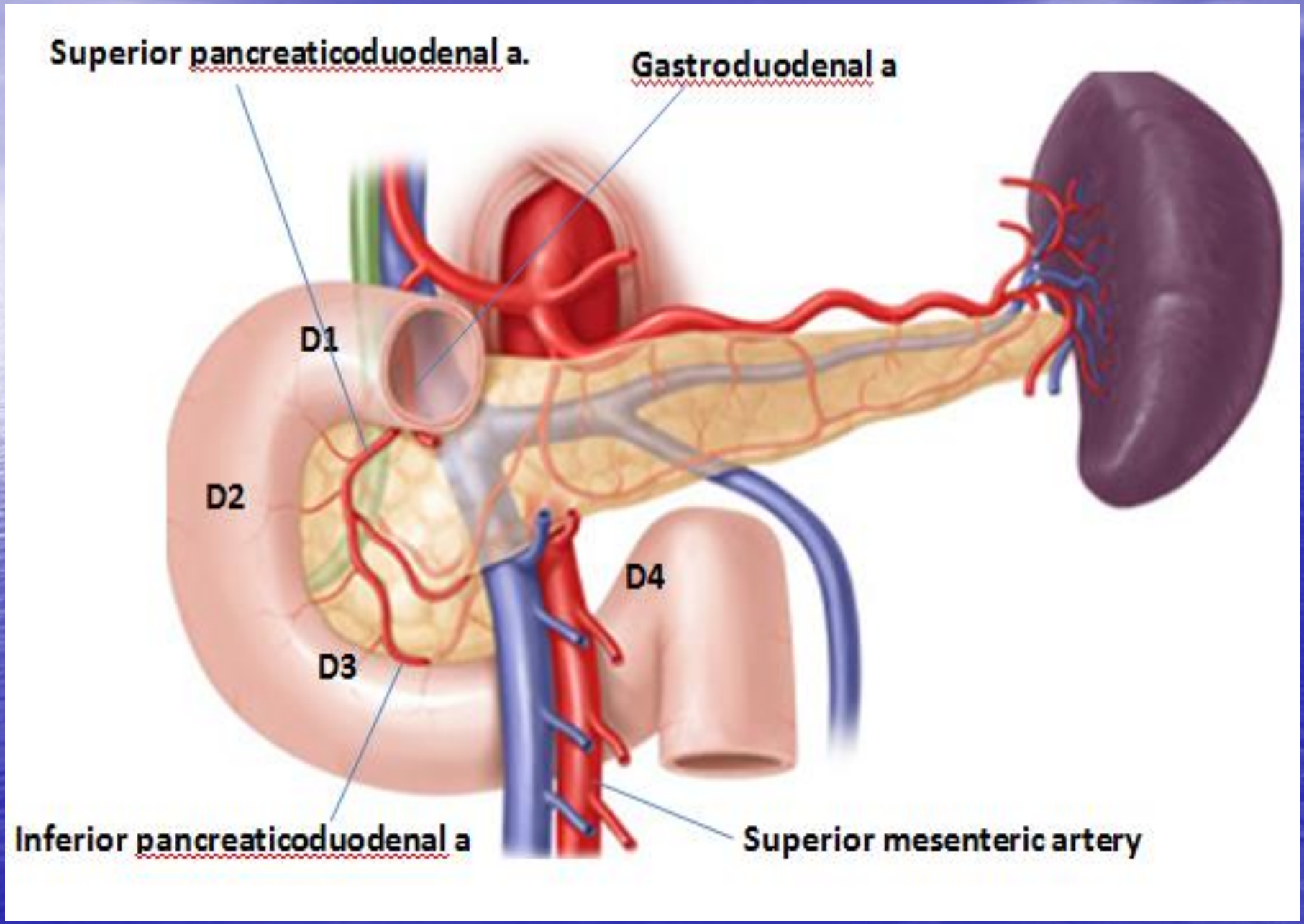


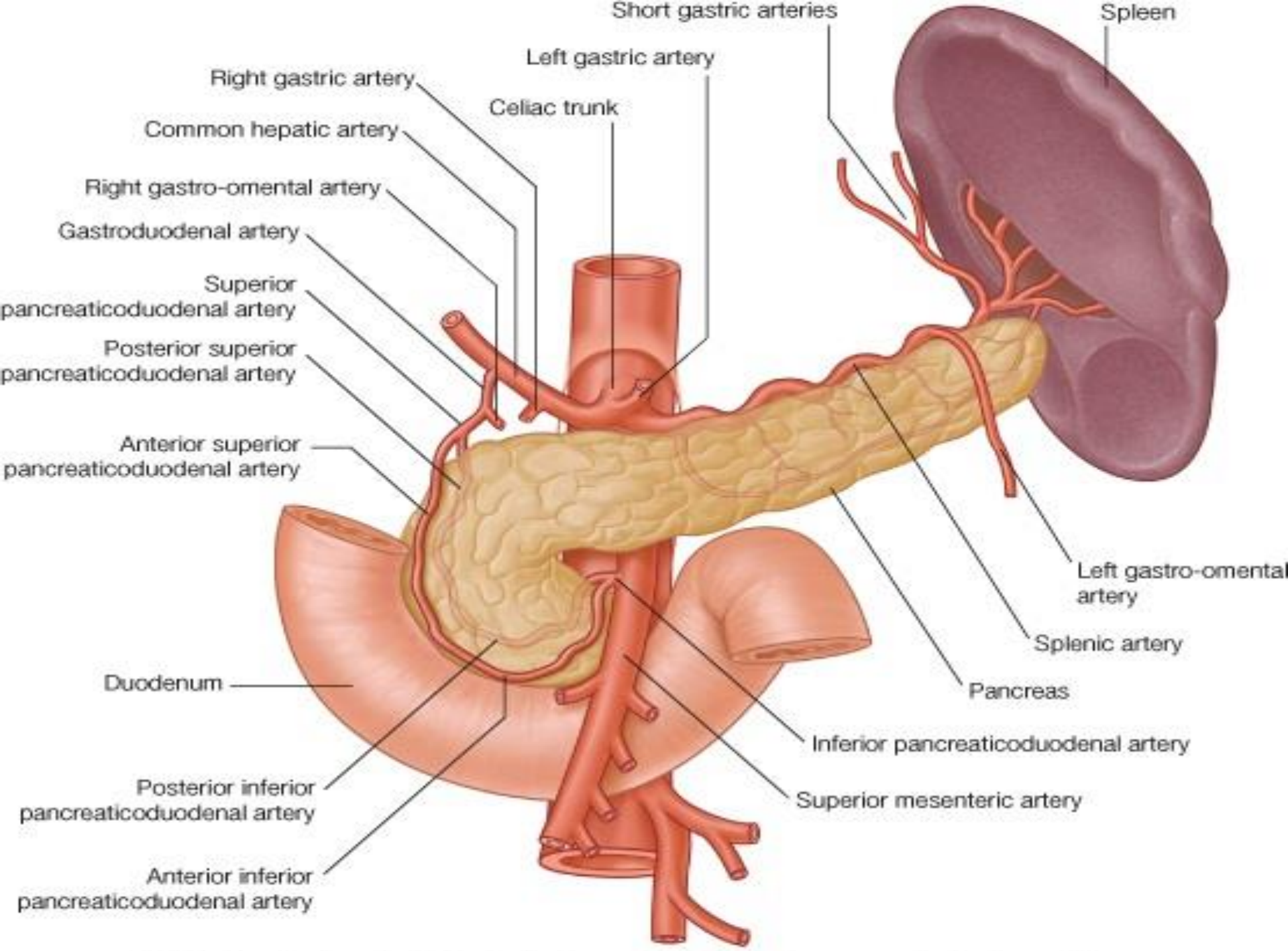
Blood supply of duodenum

- **Arteries**
  - Superior pancreaticoduodenal a.
  - Inferior pancreaticoduodenal a.
- **Veins**—follow arteries, draining directly into superior mesenteric and hepatic portal veins



Blood supply of duodenum




Short gastric arteries
Spleen
Left gastric artery
Right gastric artery
Celiac trunk
Common hepatic artery
Right gastro-omental artery
Gastroduodenal artery
Superior pancreaticoduodenal artery
Posterior superior pancreaticoduodenal artery
Anterior superior pancreaticoduodenal artery
Left gastro-omental artery
Splenic artery
Pancreas
Duodenum
Inferior pancreaticoduodenal artery
Superior mesenteric artery
Posterior inferior pancreaticoduodenal artery
Anterior inferior pancreaticoduodenal artery

Lymphatic drainage

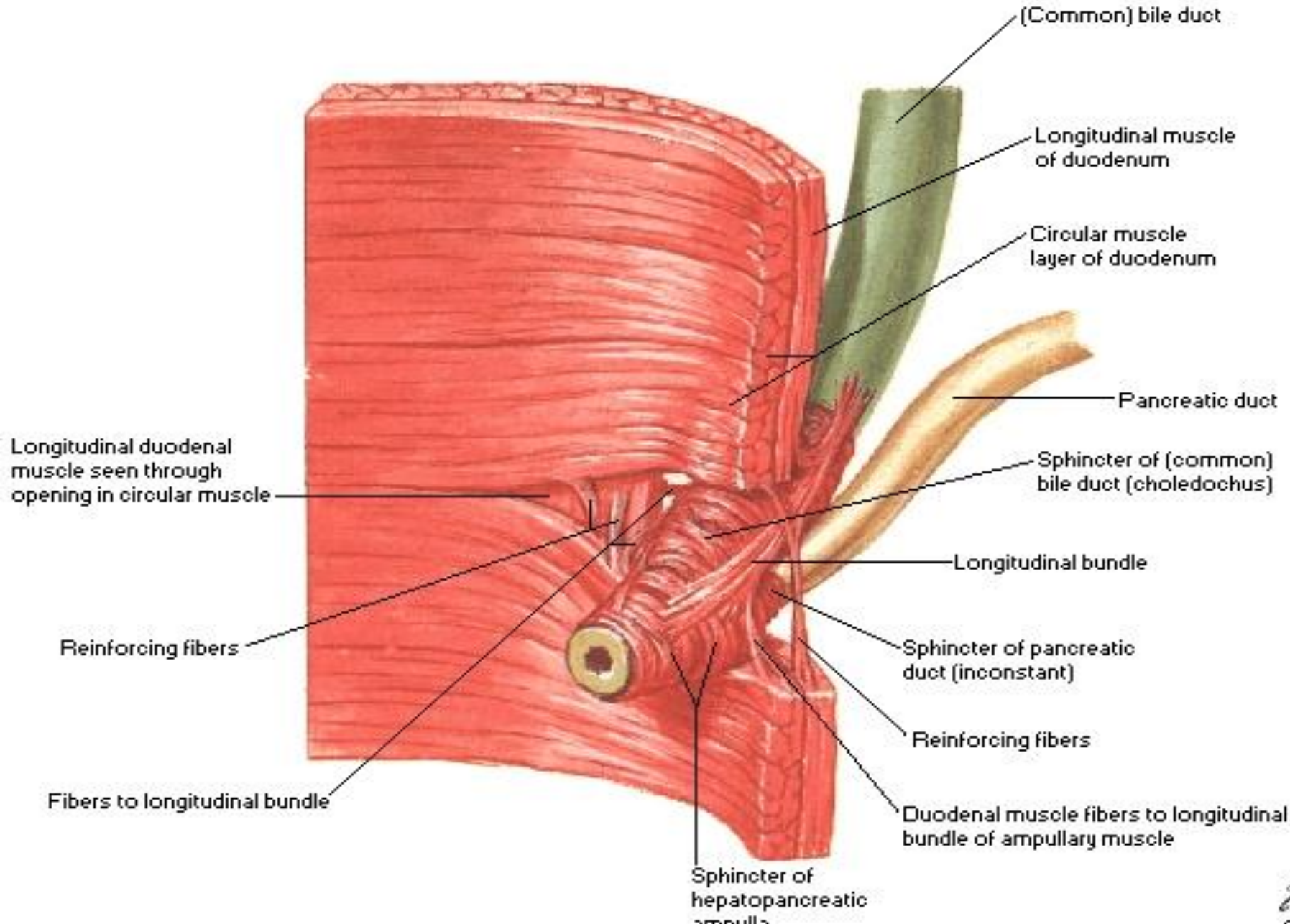
- The lymph vessels follow the arteries
- **drain upward**→ via pancreaticoduodenal nodes → the gastroduodenal nodes → the celiac nodes
- **drain downward** →via pancreaticoduodenal nodes→ the superior mesenteric nodes around the origin of the superior mesenteric artery.

Nerve supply

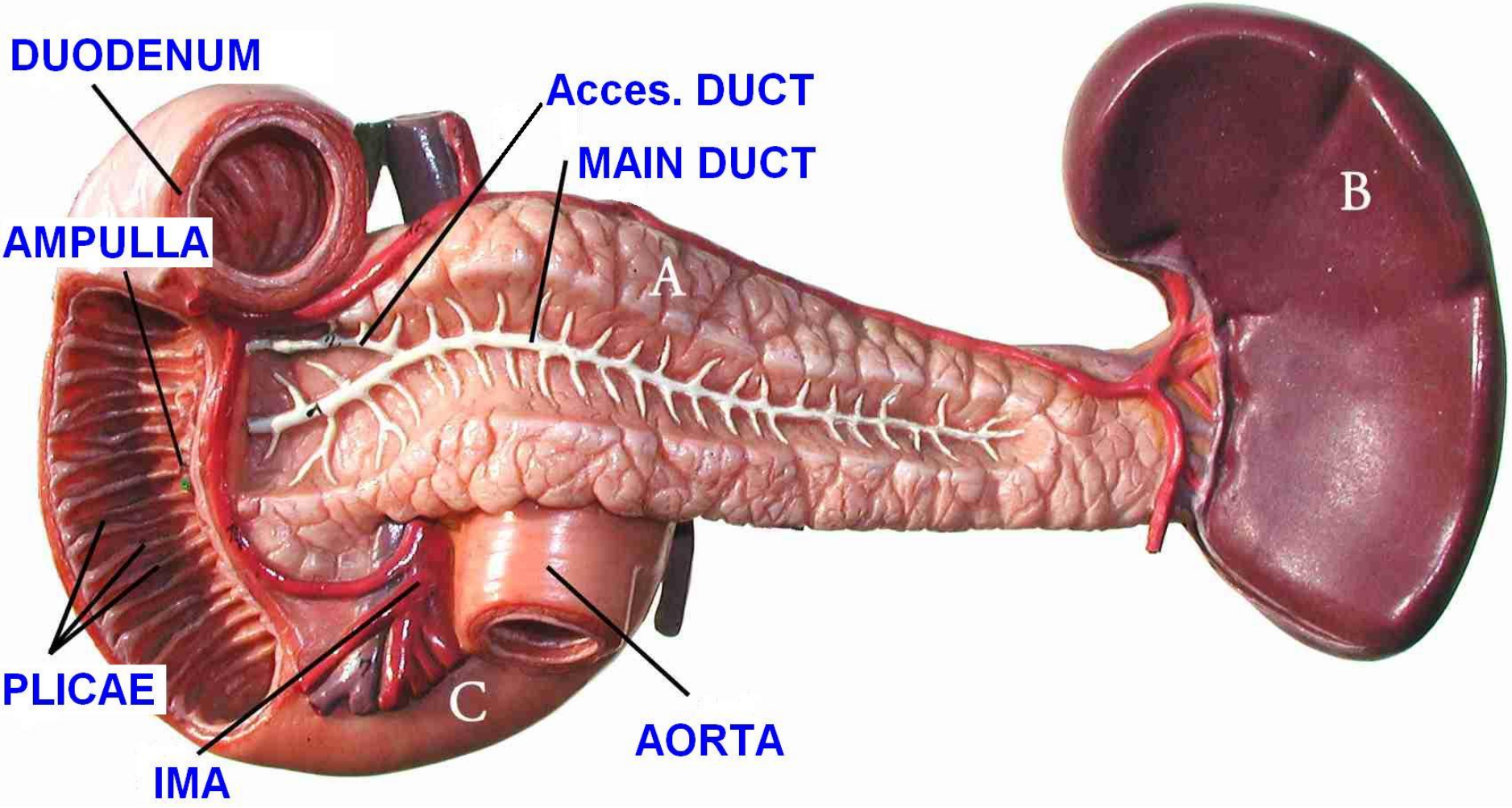
- Sympathetic nerve
- parasympathetic nerves from:
  1- The celiac plexus
  2- Superior mesenteric plexus.

Junction of Bile Duct and Duodenum

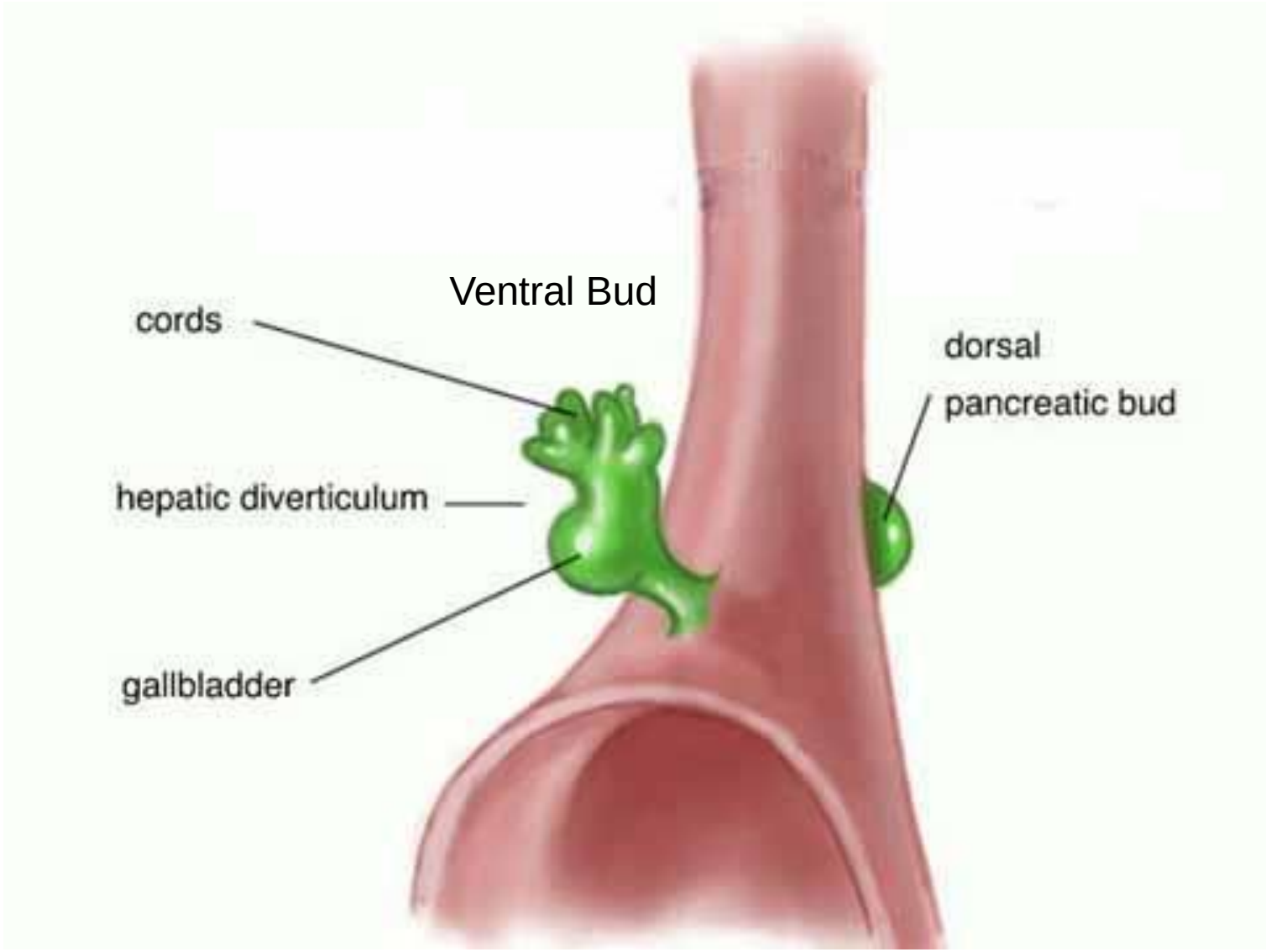
Dissection

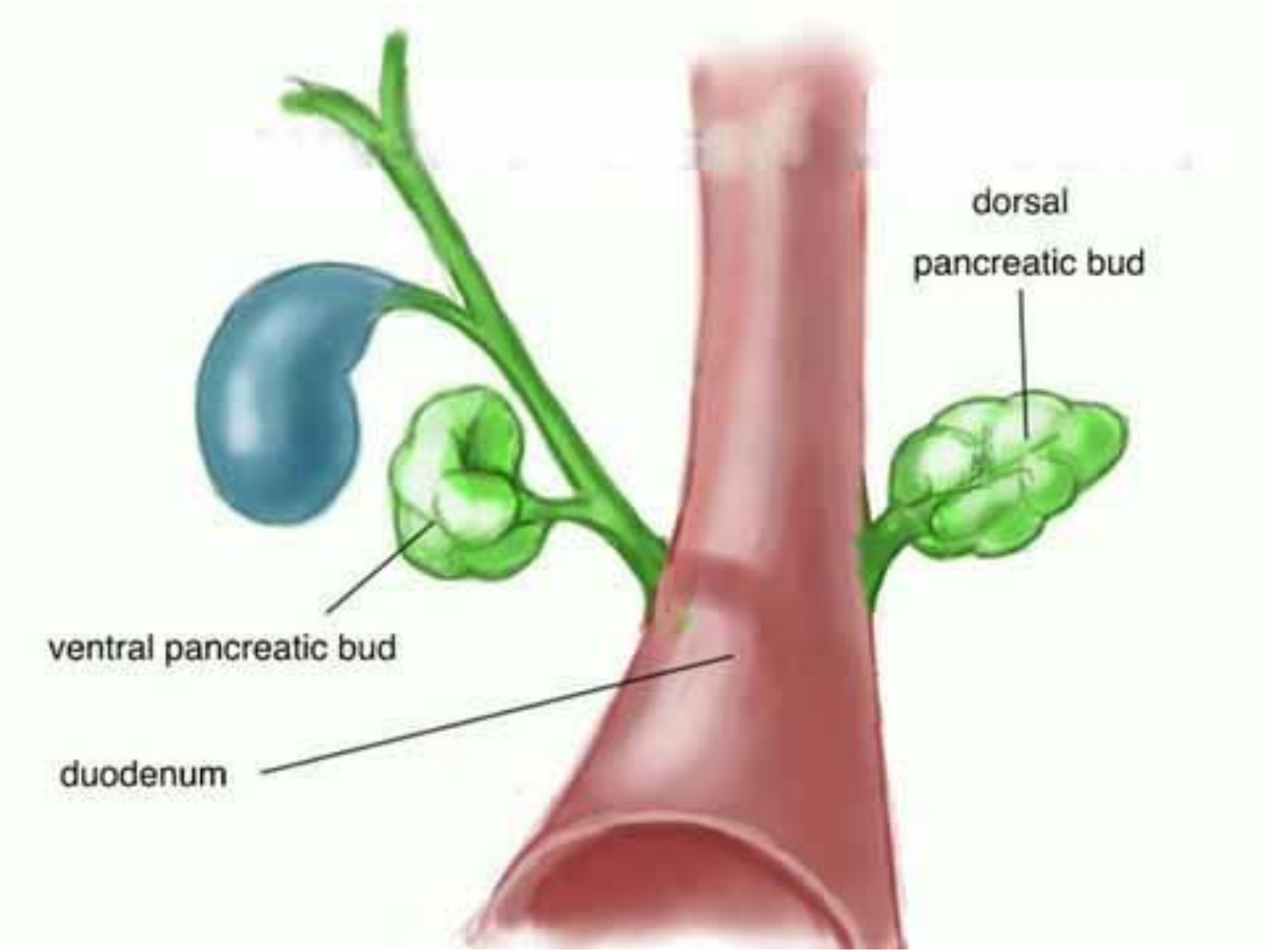


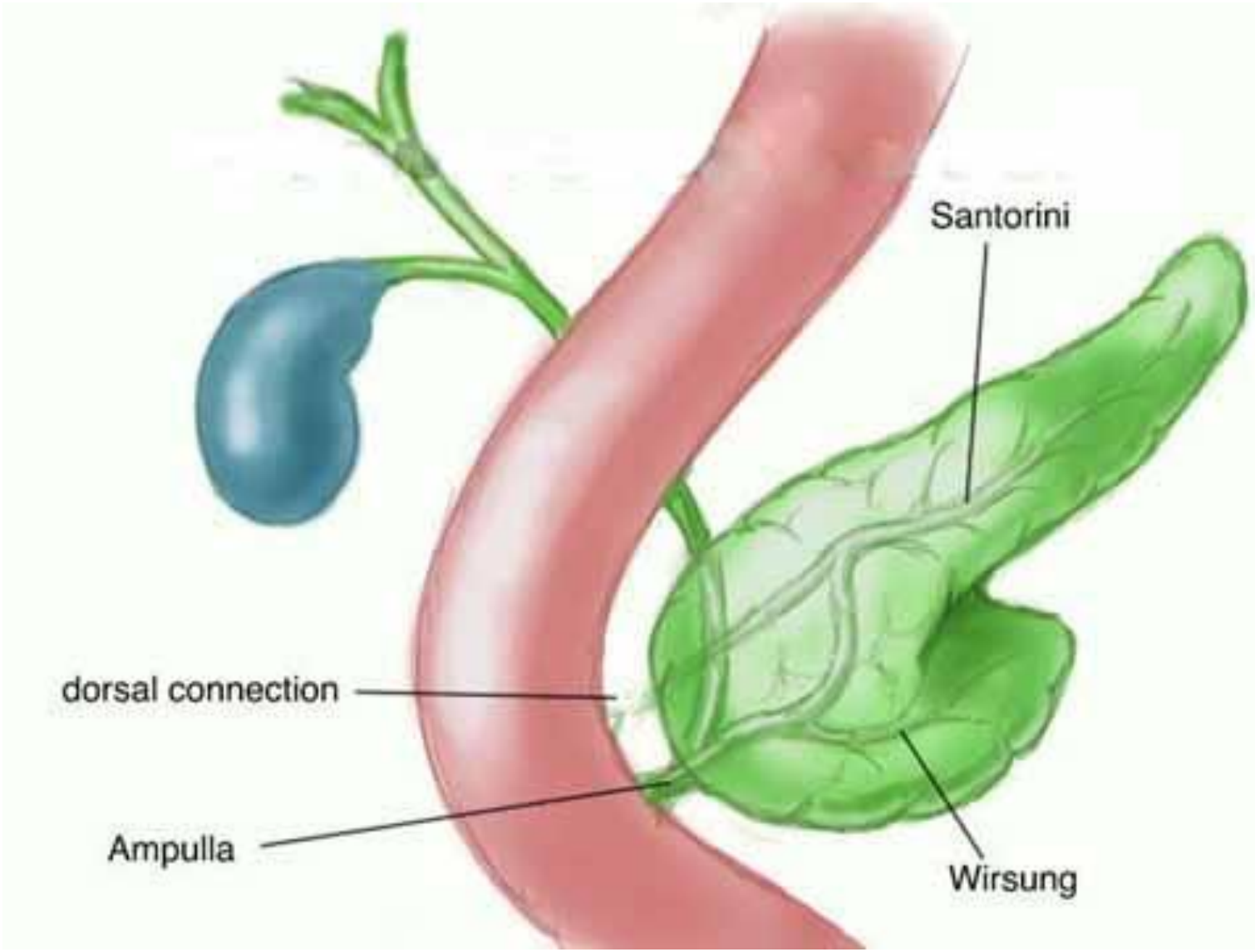
Hepaticopancreatic ampulla (Ampulla of Vater)



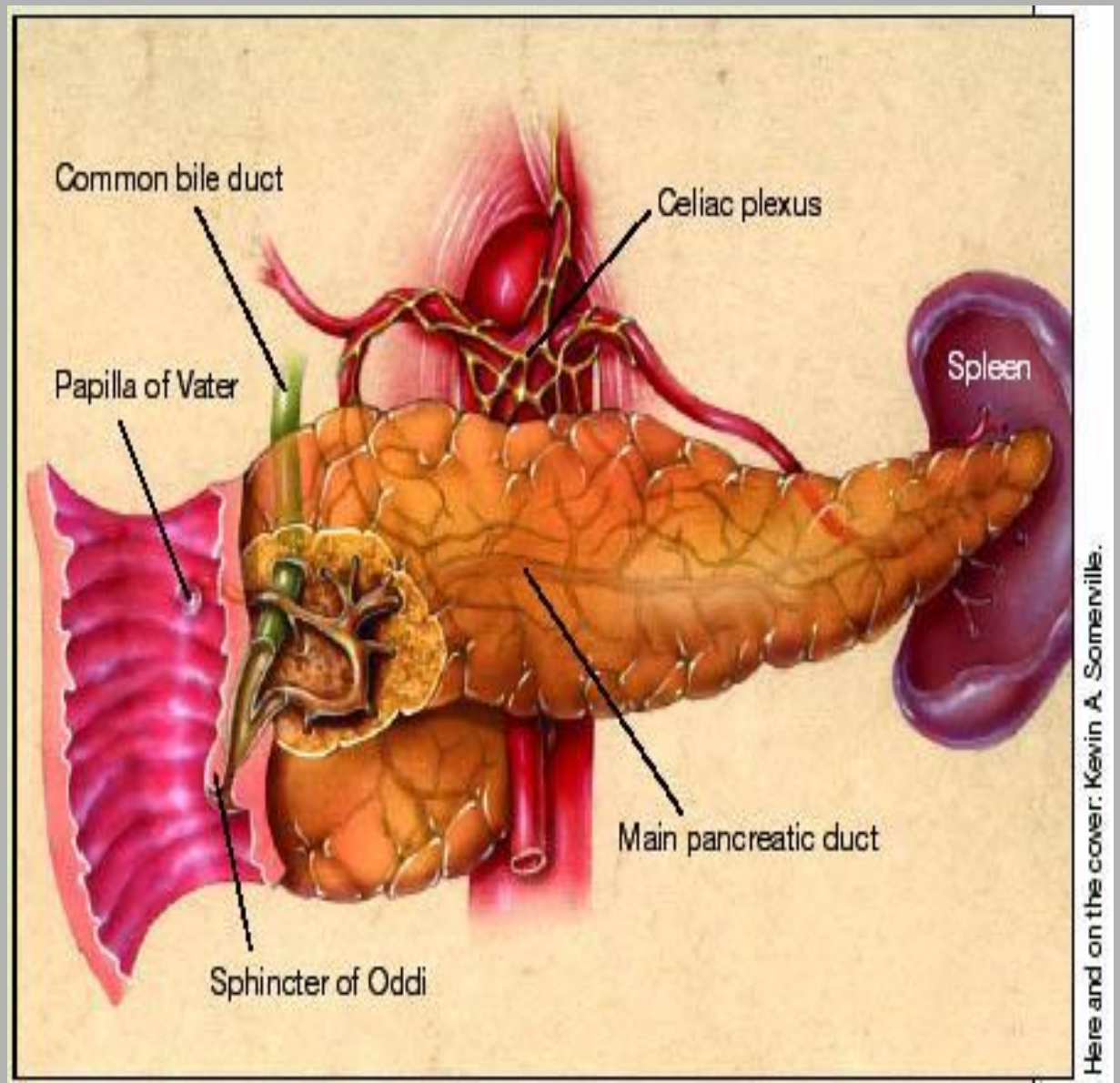
PANCREAS


Ventral Bud
cords
dorsal
pancreatic bud
hepatic diverticulum
gallbladder


dorsal
pancreatic bud
ventral pancreatic bud
duodenum


Santorini
dorsal connection
Ampulla
Wirsung

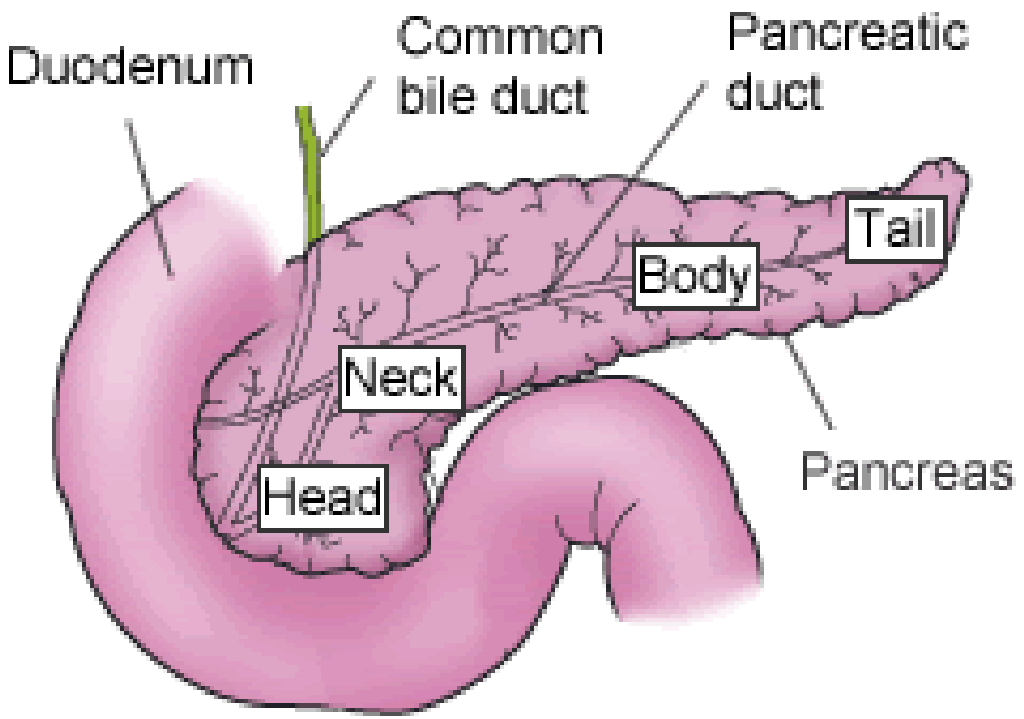
Normal Anatomy of the Pancreas



The pancreas is a retroperitoneal organ and is positioned in the anterior pararenal space. It is posterior to the stomach and lesser sac and anterior to the abdominal aorta and upper lumbar vertebrae.

Parts of pancreas :

- Head
- Neck
- Body
- Tail



Four parts

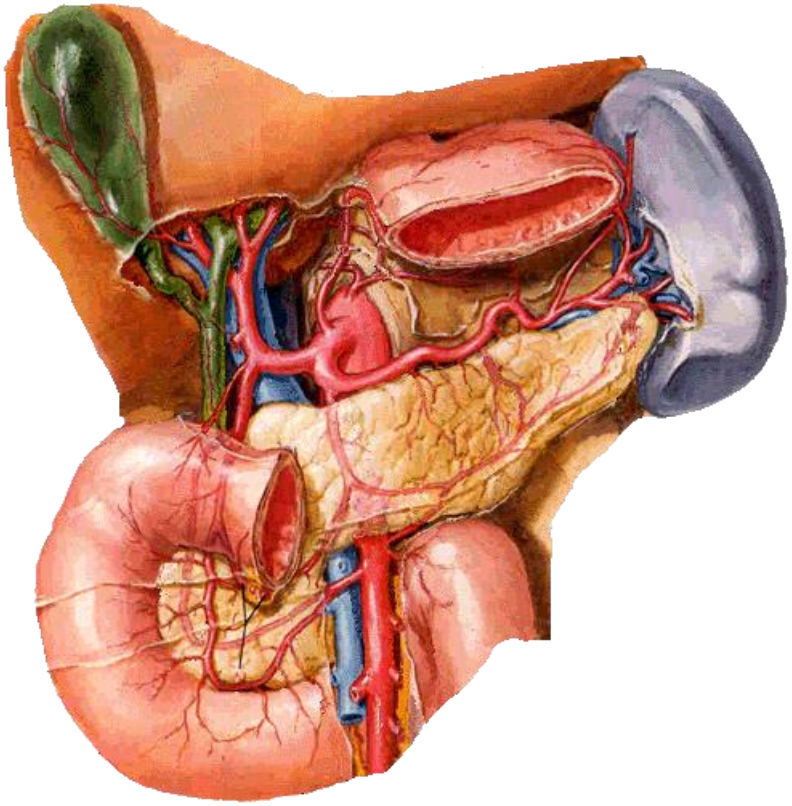
- **Head**
  - Lies within the concavity of the C-shaped curvatune of duodenum
  - **Uncinate process**— a projection to the left from the lower part of the head behind the superior mesenteric vessels.
- **Neck**—narrow part, overlies the superior mesenteric vessels and beginning of the portal vein

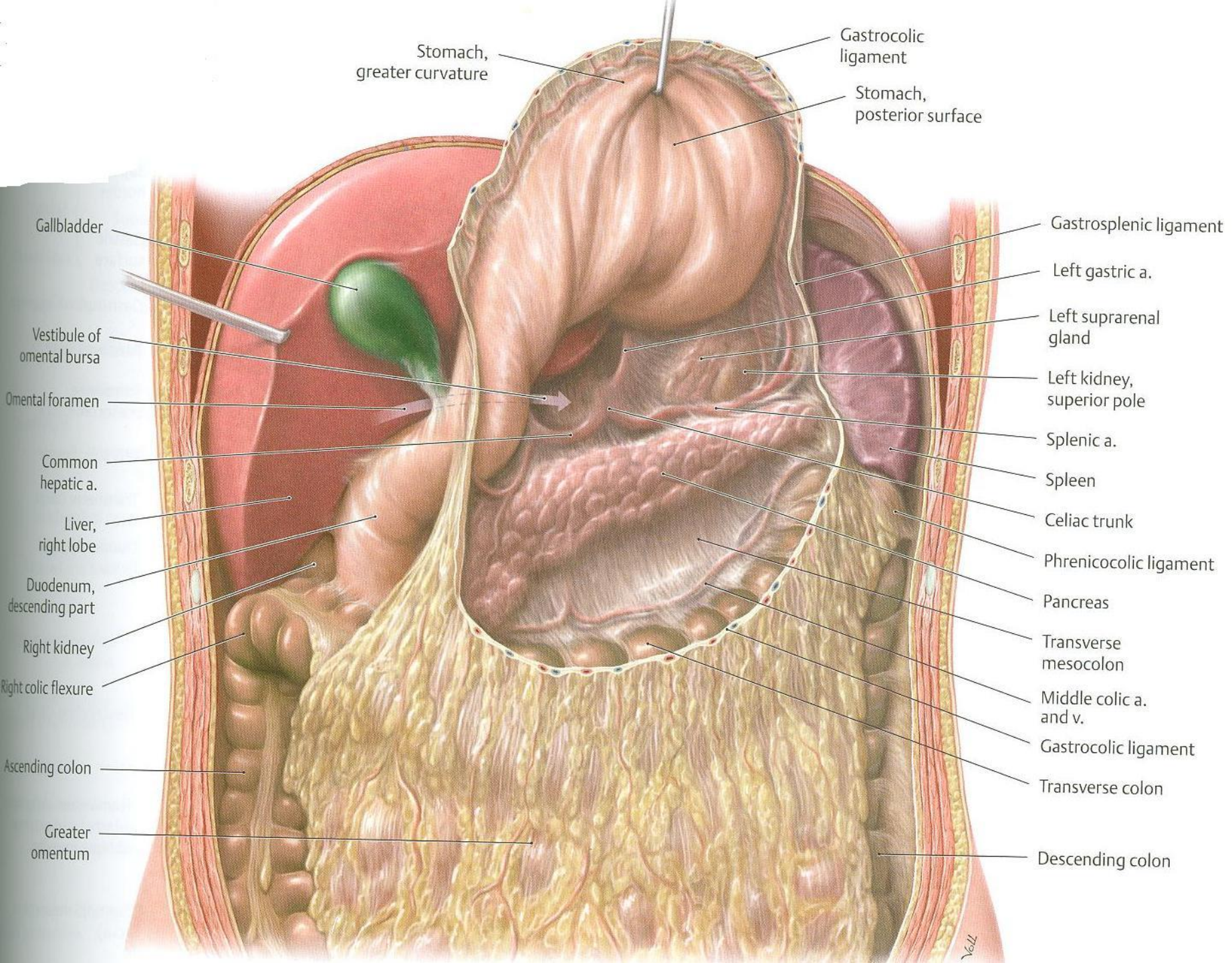
Body—

• Continues from the neck and lies to the left of the superior mesenteric vessels, passing over the aorta and L2 vertebra

• The posterior surface of the body is devoid of peritoneum and is in contact with the aorta, SMA, left suprarenal gland and left kidney and renal vessels

- **Tail**— Lies anterior to the left kidney extends to the hilum of spleen in the splenorenal ligament

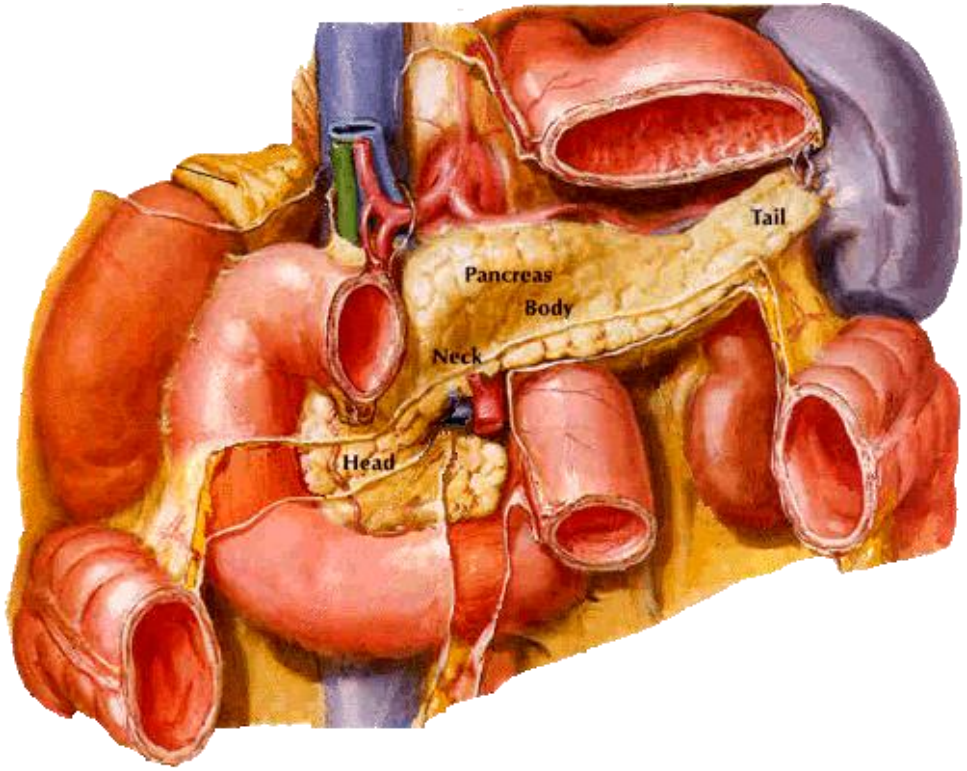



Stomach, greater curvature
Gastrocolic ligament
Stomach, posterior surface
Gallbladder
Gastrosplenic ligament
Left gastric a.
Vestibule of omental bursa
Left suprarenal gland
Omental foramen
Left kidney, superior pole
Splenic a.
Common hepatic a.
Spleen
Liver, right lobe
Celiac trunk
Duodenum, descending part
Phrenicocolic ligament
Pancreas
Right kidney
Transverse mesocolon
Right colic flexure
Middle colic a. and v.
Gastrocolic ligament
Ascending colon
Transverse colon
Greater omentum
Descending colon

Relations of pancreas

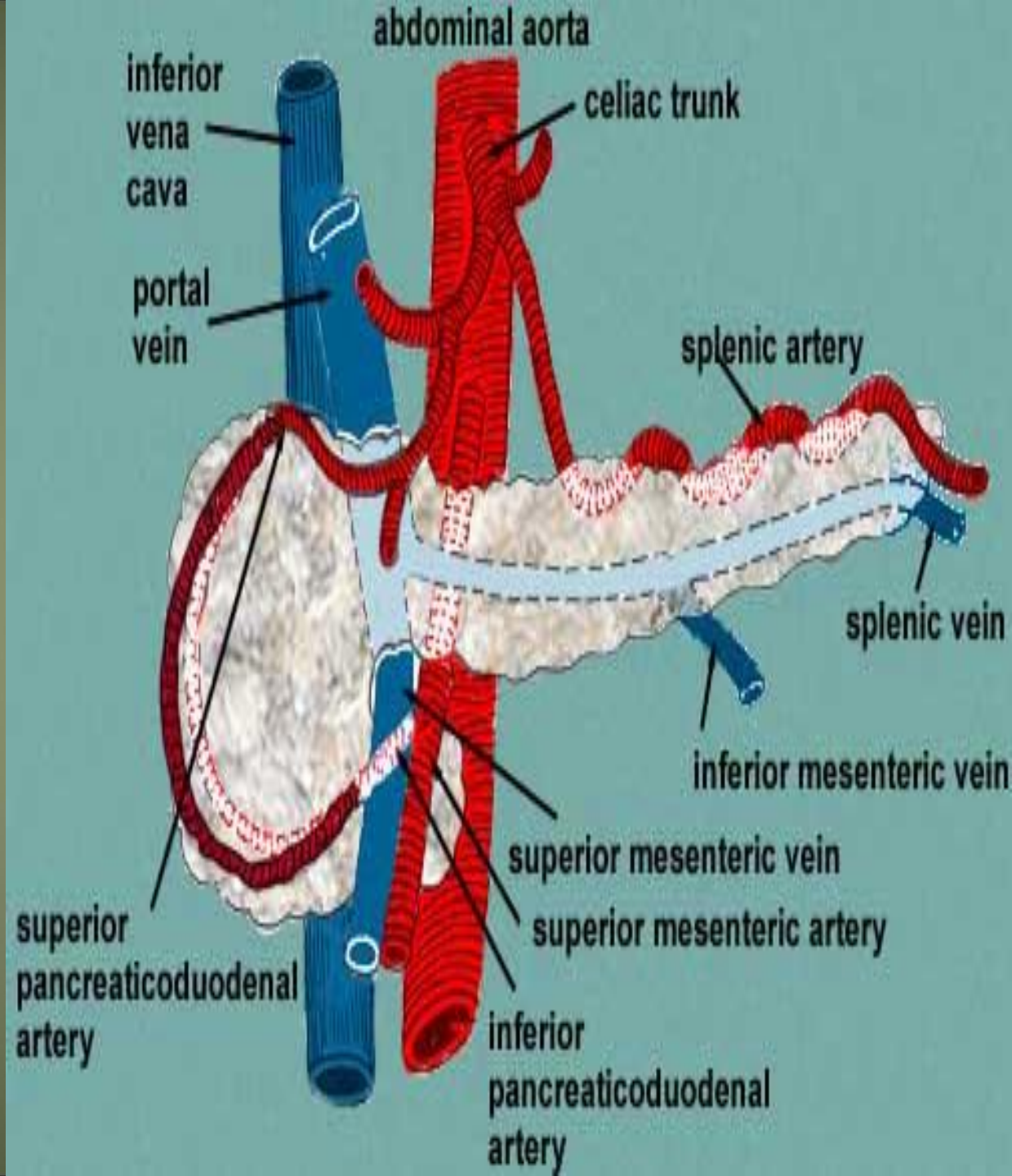
Head of pancreas

- Located in C-shapes curvature of doudenum
- **Anteriorly**
  - Transverse mesocolon
- **Posteriorly**
  - Inferior vena cava
  - Right renal vessels
  - Common bile duct



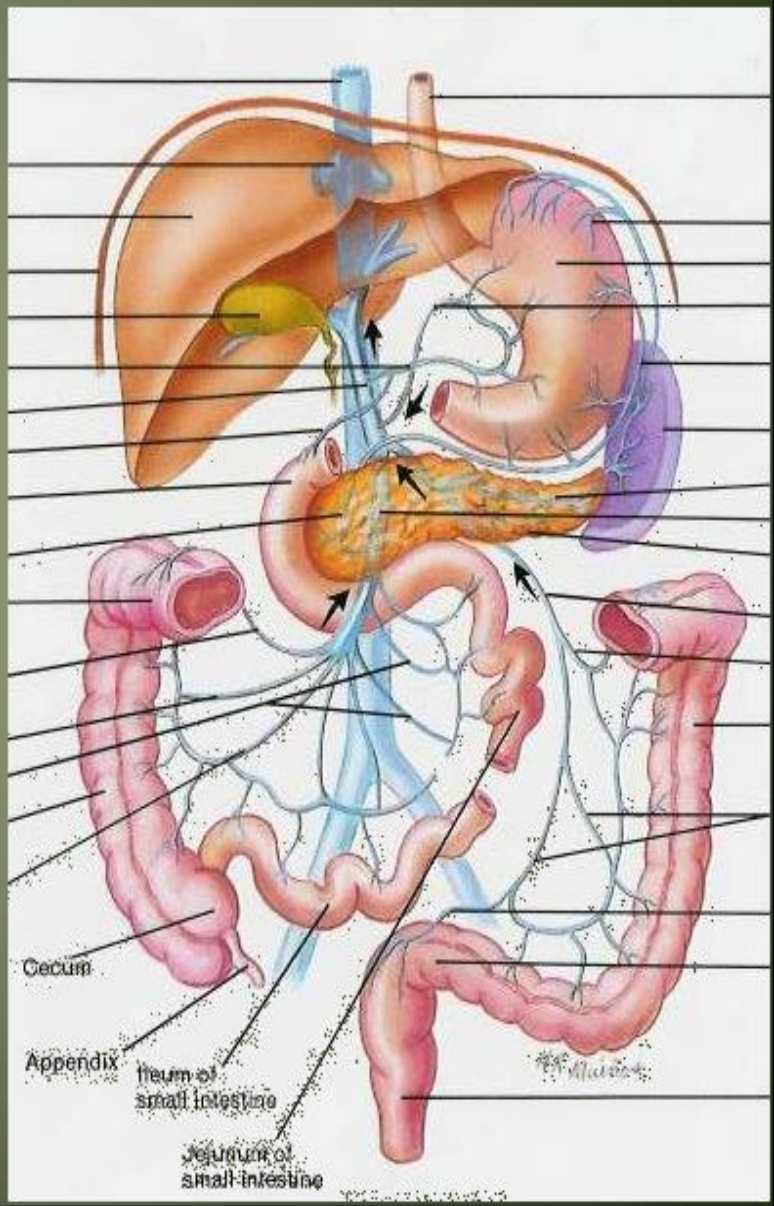
The neck

- It is the constricted portion of the pancreas
- connects the head to the body.
- It lies in front of the beginning of the portal vein the origin of the



Body of pancreas...cont

- Three surfaces: **anterior, posterior,** and **inferior.**
- **Three borders: ant ,post & inf**



The **anterior surface**

1- Covered by peritoneum of post. Wall of lesser sac

2- Tuber omental *:*

where the ant. surface of pancreas join the neck

Body of pancreas…cont

The **posterior surface**

- devoid of peritoneum
- in contact with

1- the aorta

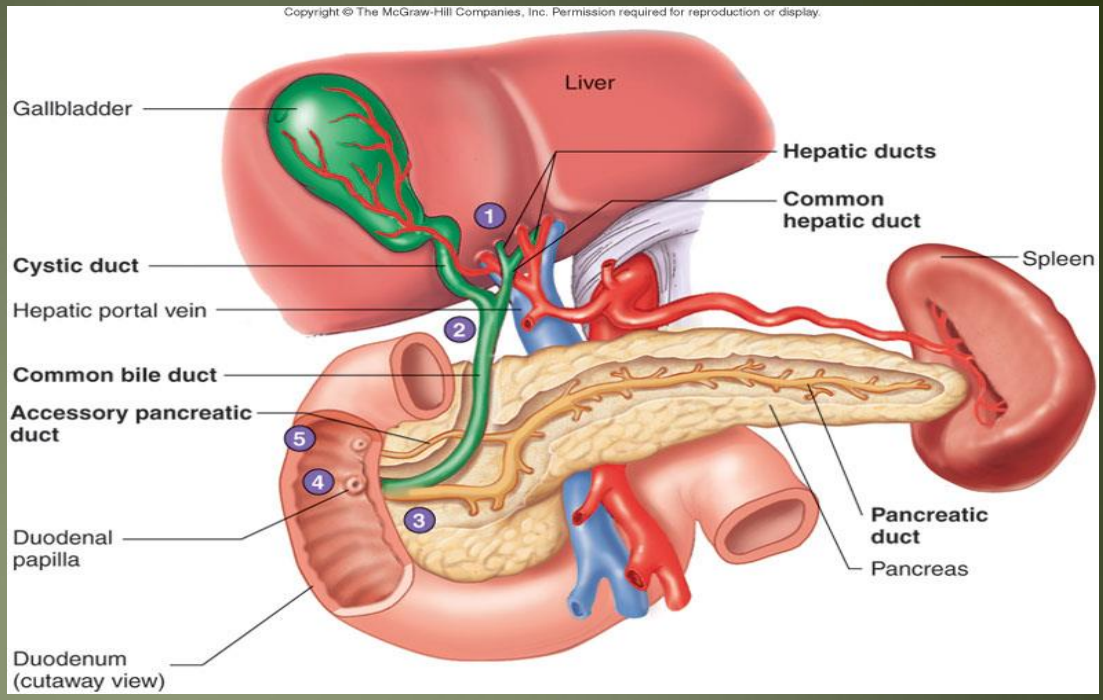
2- the splenic vein

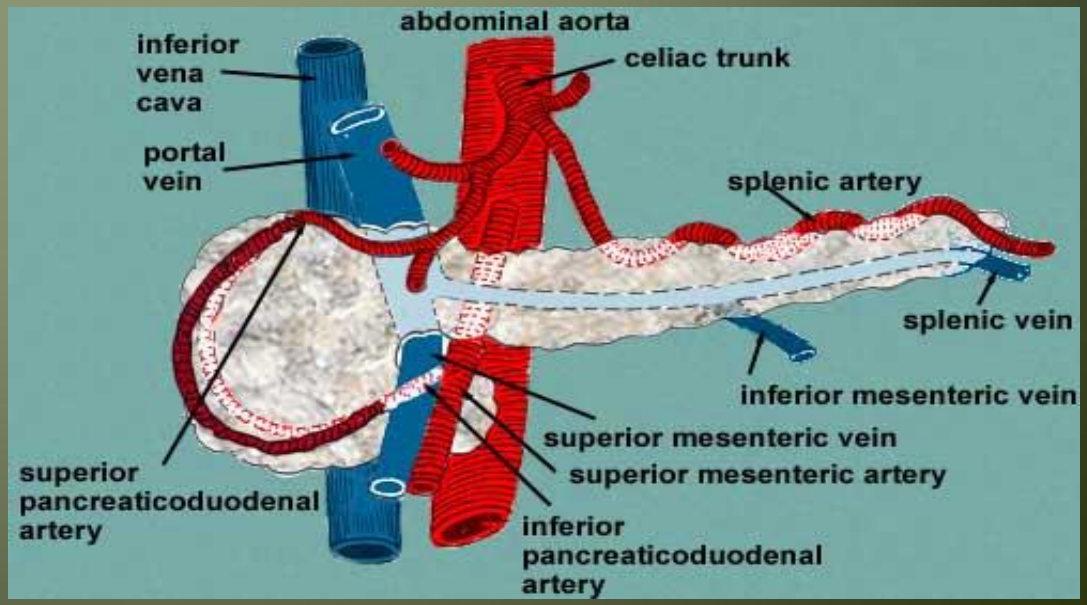
3- the left kidney and its vessels

4- the left suprarenal gland

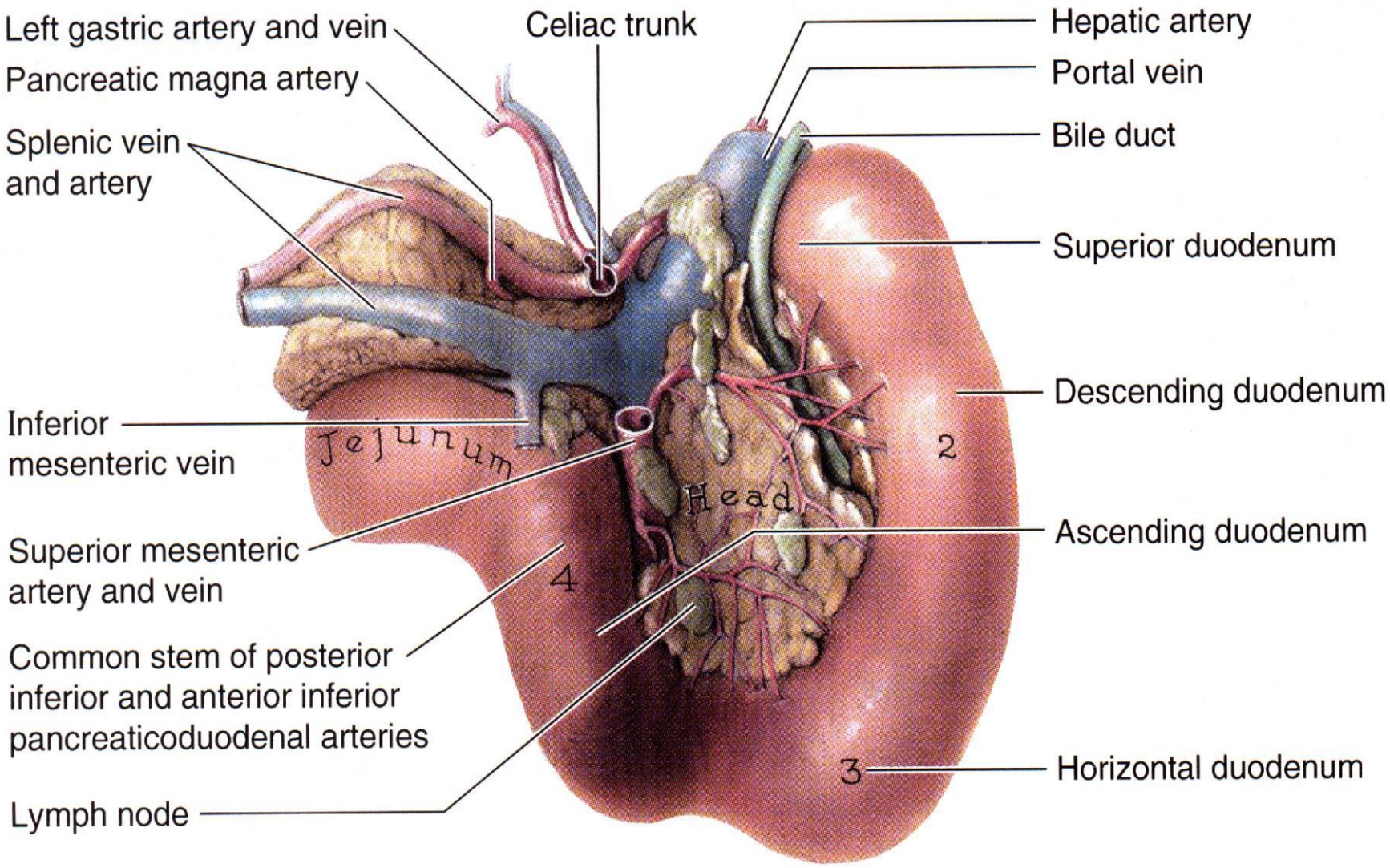
5- the origin of the superior mesenteric artery

6- and the crura of the diaphragm.





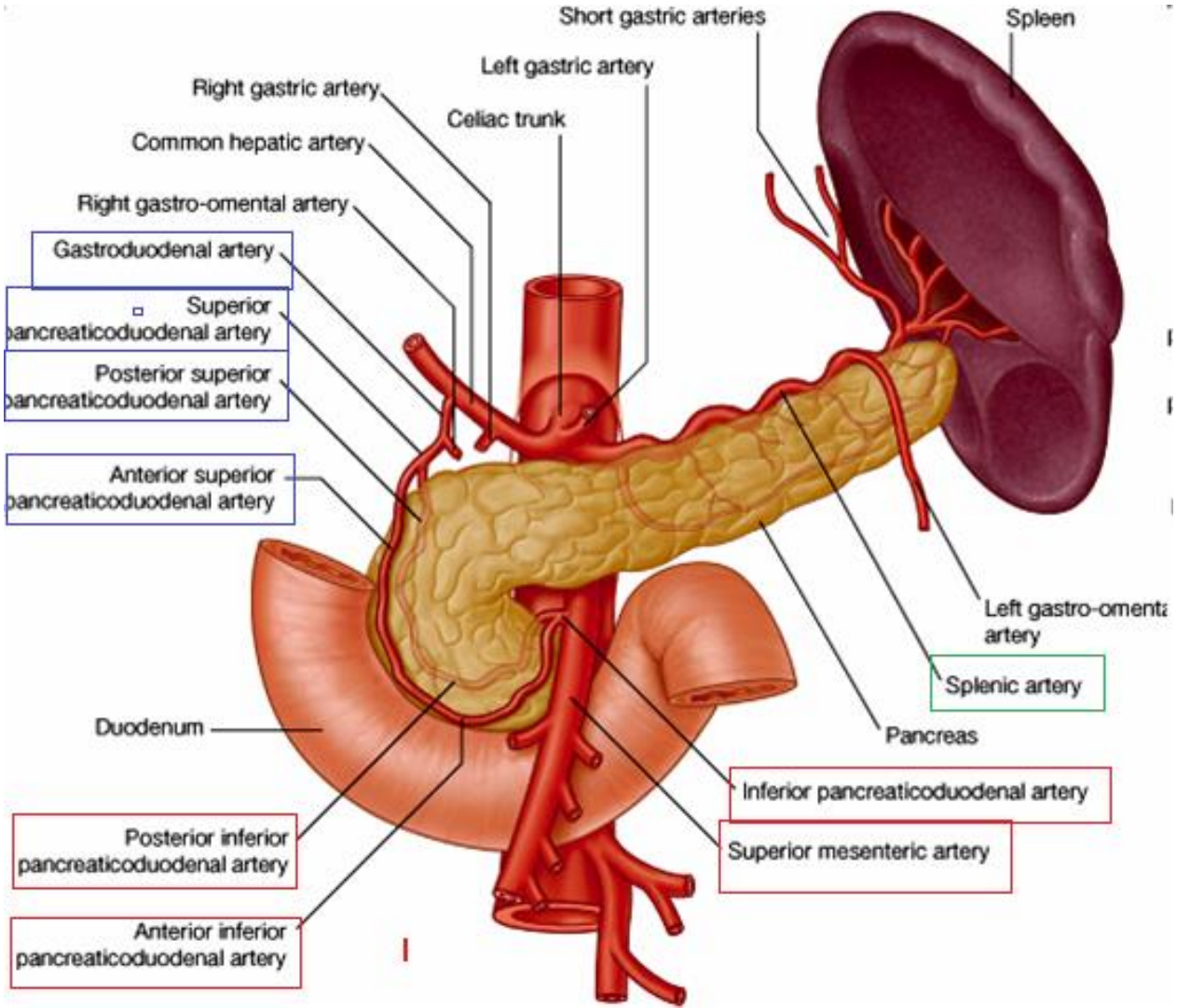
Posterior view of duodenum/pancreas



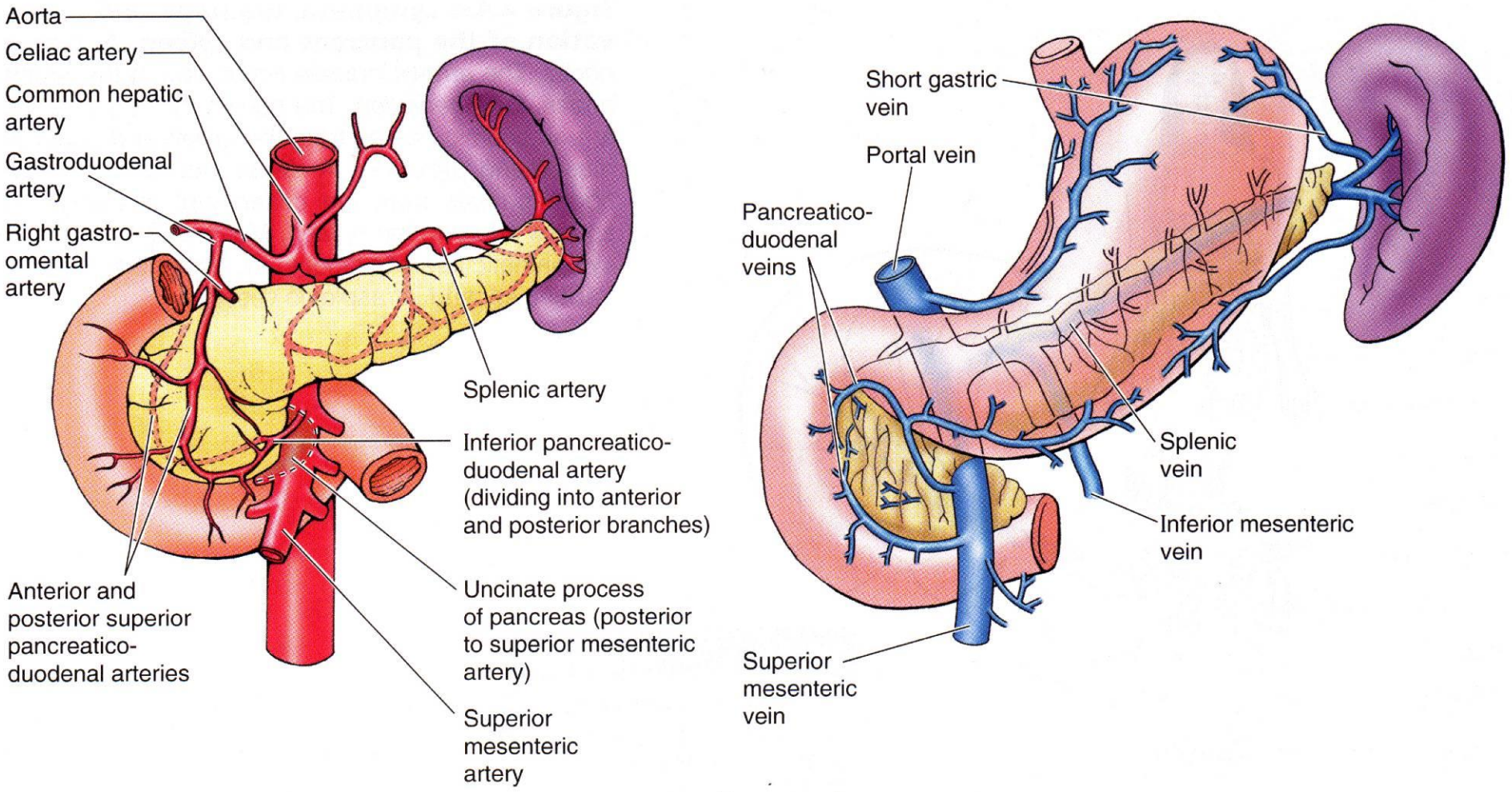
-The **pancreatic arteries** derive mainly from the branches of the splenic artery

-**The anterior and posterior superior pancreaticoduodenal arteries**, branches of the gastroduodenal artery

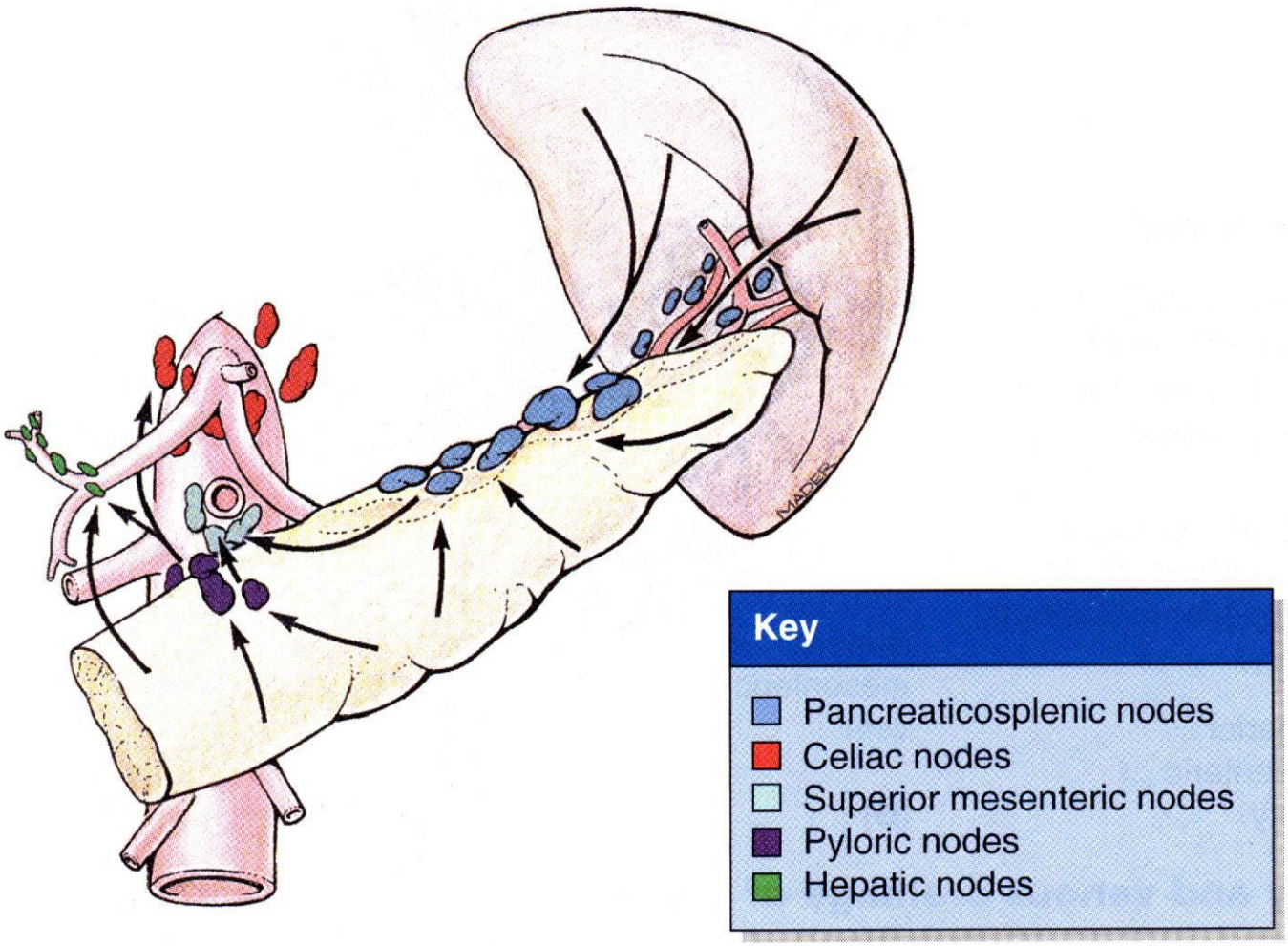
-**The anterior and posterior inferior pancreaticoduodenal arteries**, branches of the SMA



Arterial supply and venous drainage of the pancreas and spleen



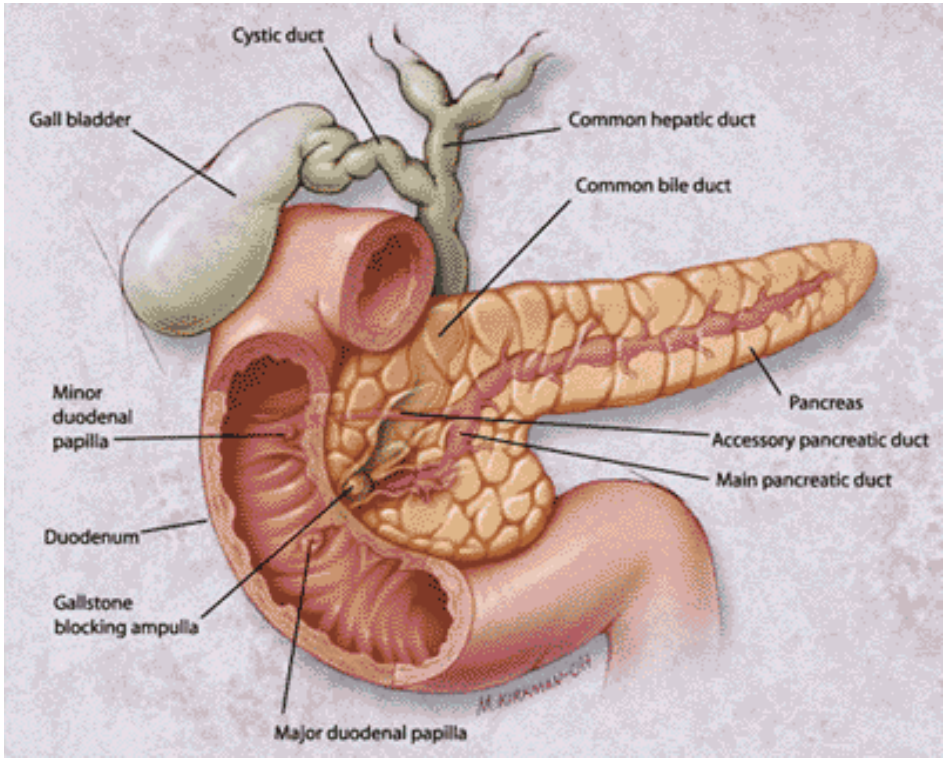
Lymphatic drainage of the distal pancreas and spleen

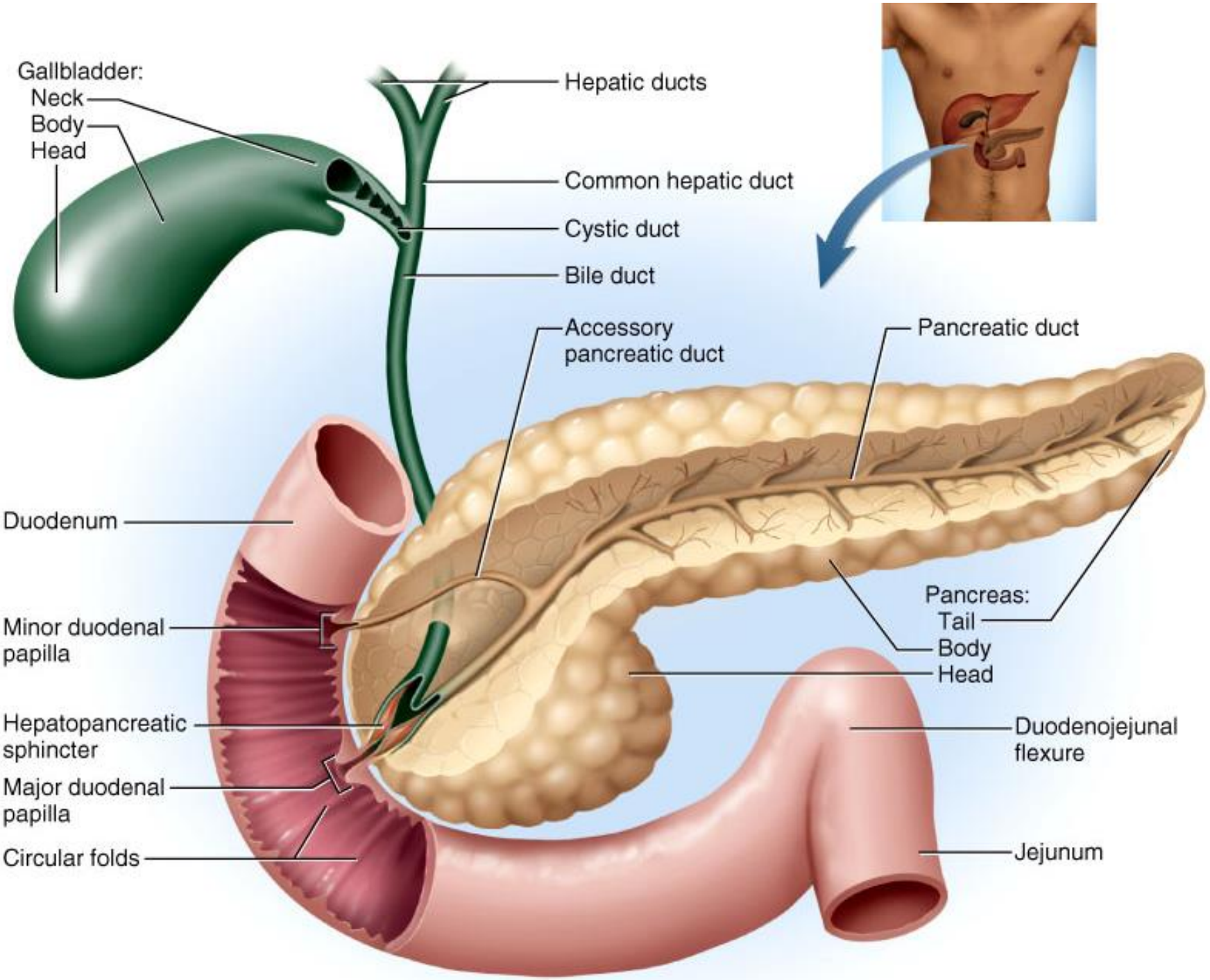


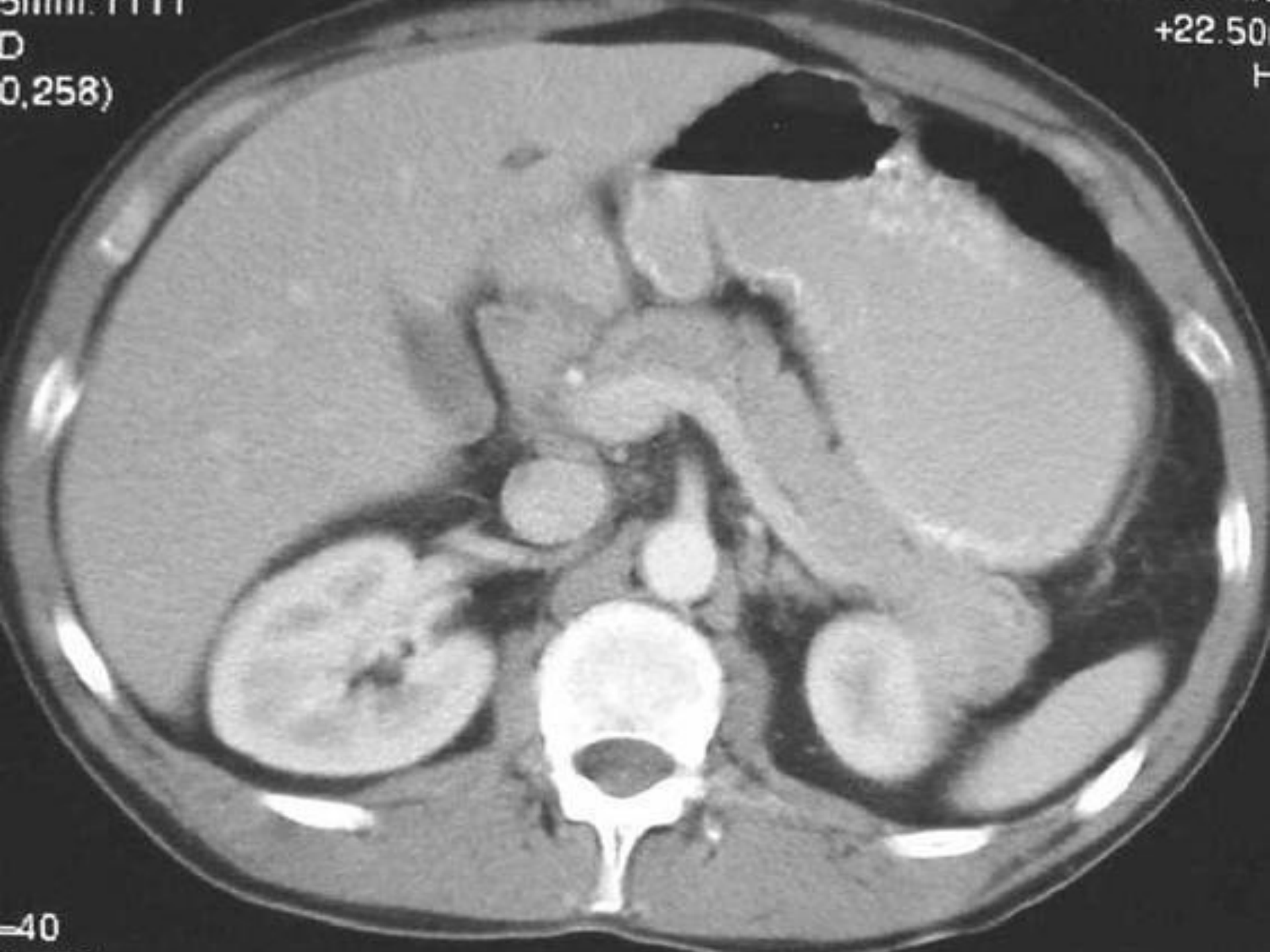
The main pancreatic duct

- Begins in the tail of the pancreas and runs through the parenchyma of the gland to the pancreatic head, here it turns inferiorly and is closely related to the bile duct.

- Most of the time, the main pancreatic duct and the bile duct unite to form the short, dilated hepatopancreatic ampulla (of vater), which opens into the descending part of the duodenum at the summit of the major duodenal papilla



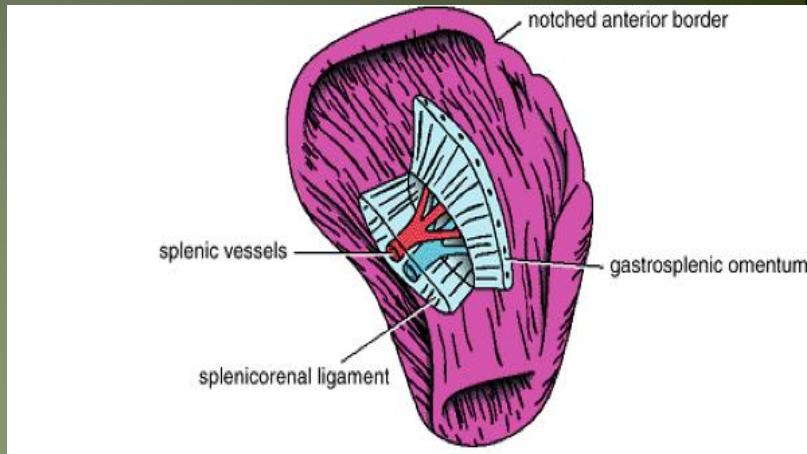

Gallbladder:
Neck
Body
Head
Hepatic ducts
Common hepatic duct
Cystic duct
Bile duct
Accessory pancreatic duct
Pancreatic duct
Duodenum
Minor duodenal papilla
Hepatopancreatic sphincter
Major duodenal papilla
Circular folds
Pancreas:
Tail
Body
Head
Duodenojejunal flexure
Jejunum

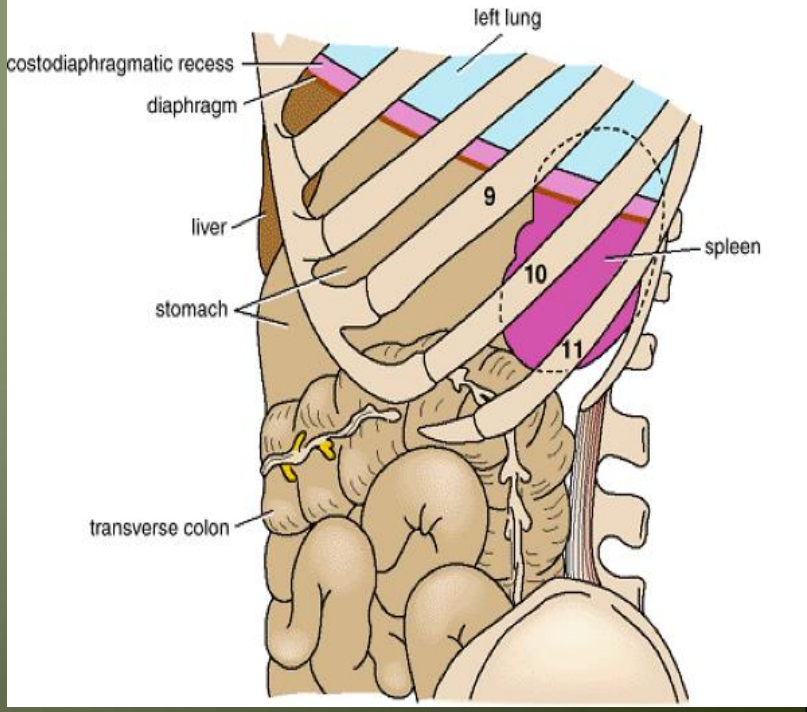

5mm. 1111
D
0.258)
+22.50
H
-40

Spleen

Location and Description

- it is reddish & oval shaped
- the largest single mass of lymphoid tissue in the body.
- and
- has a notched anterior border.
- location:
- Lt hypochondrium
- It lies just beneath the left half of the diaphragm
- under the 9th, 10th, and 11th ribs.
- Its long axis parallel to the 10th rib
- Medial end is 4 cm away from mid line post
- Lat.end is in left mid axillary line





Spleen

- Peritoneum
- The spleen is completely covered with peritoneum → intraperitoneal organ
- Two ligaments

1- the gastrosplenic omentum (ligament)→ between the spleen & the greater curvature of the stomach (carrying the short gastric and left gastroepiploic vessels)

2- splenicorenal ligament→ between spleen & kidney (carrying the splenic vessels and the tail of the pancreas).

Spleen.....

Size

1 inch thick

3 inch broad

5 inch long

Weight

7 ounce

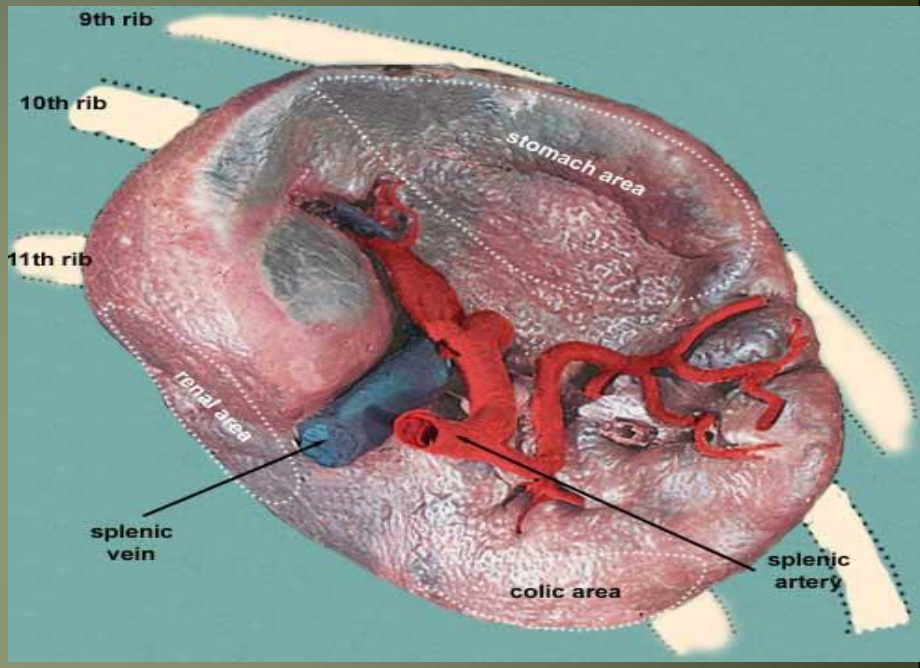
Shape → variable

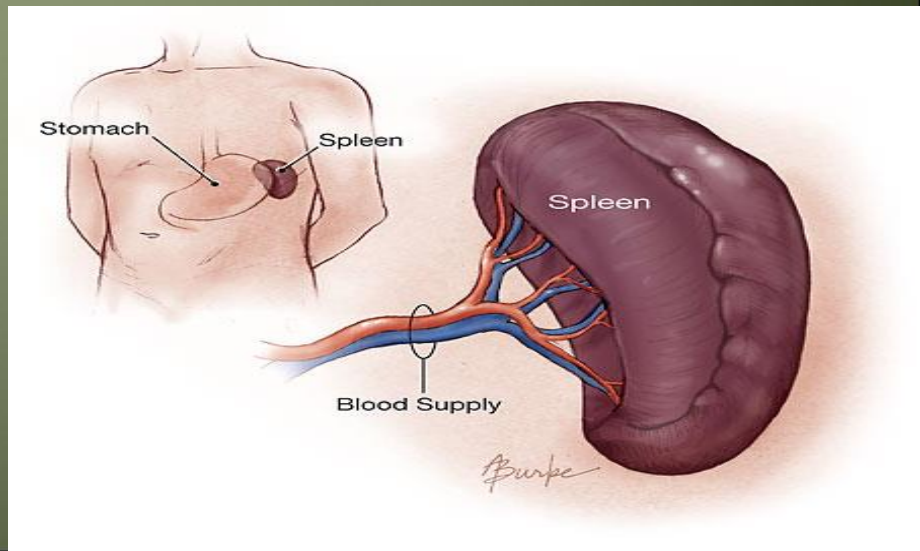
2 ends

2 borders

2 surfaces

Notched





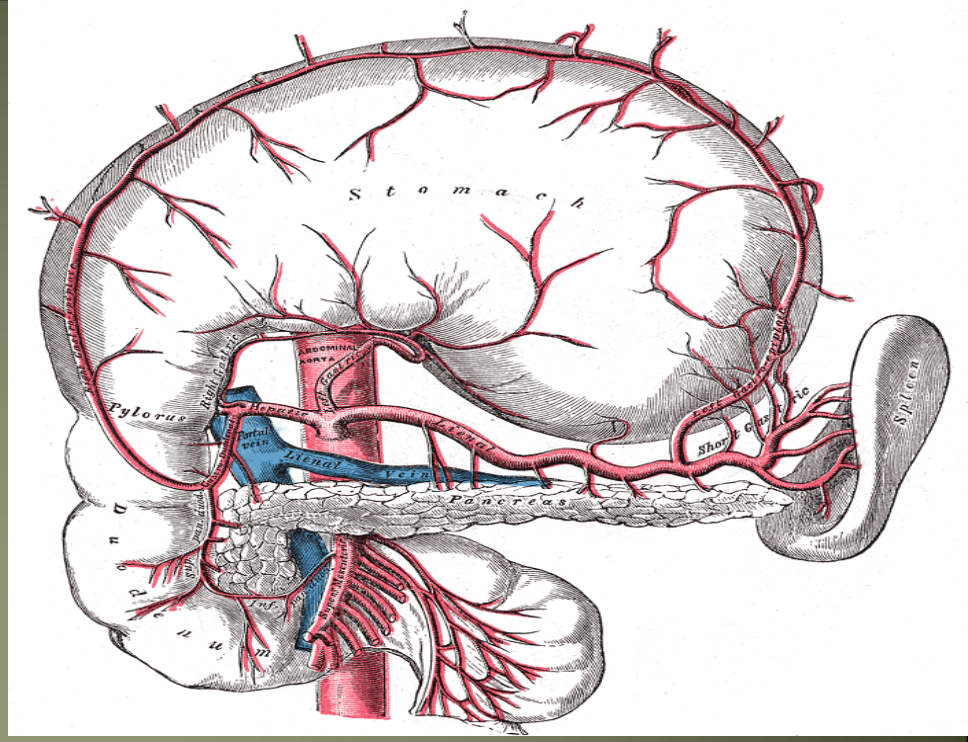
Surfaces of spleen

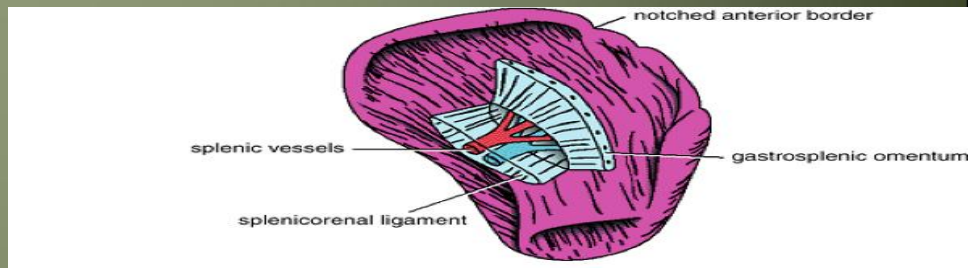
2 surfaces

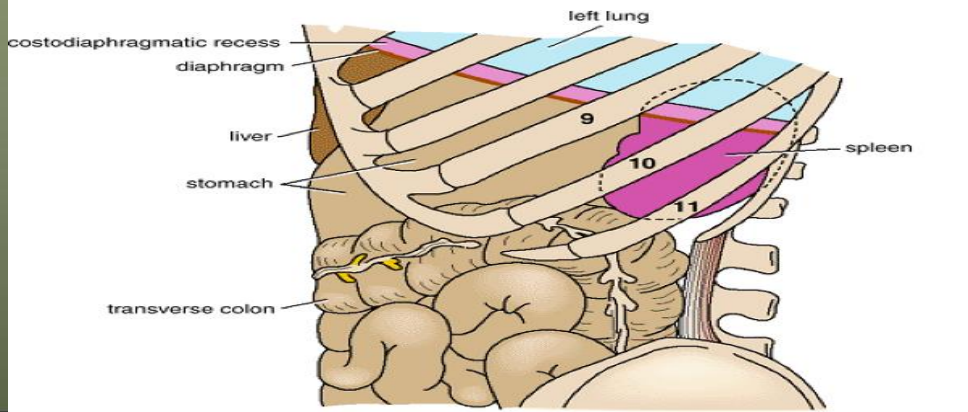
- Diaphragmatic surface
- Visceral surface

1- Diaphragmatic surface

- Has Post- lat.relation
- Convex
- Smooth
- Diaphragm separates it from
  - Pleura & lung
  - Ribs 9,10 ,11







Spleen…..cont

2- Visceral surface

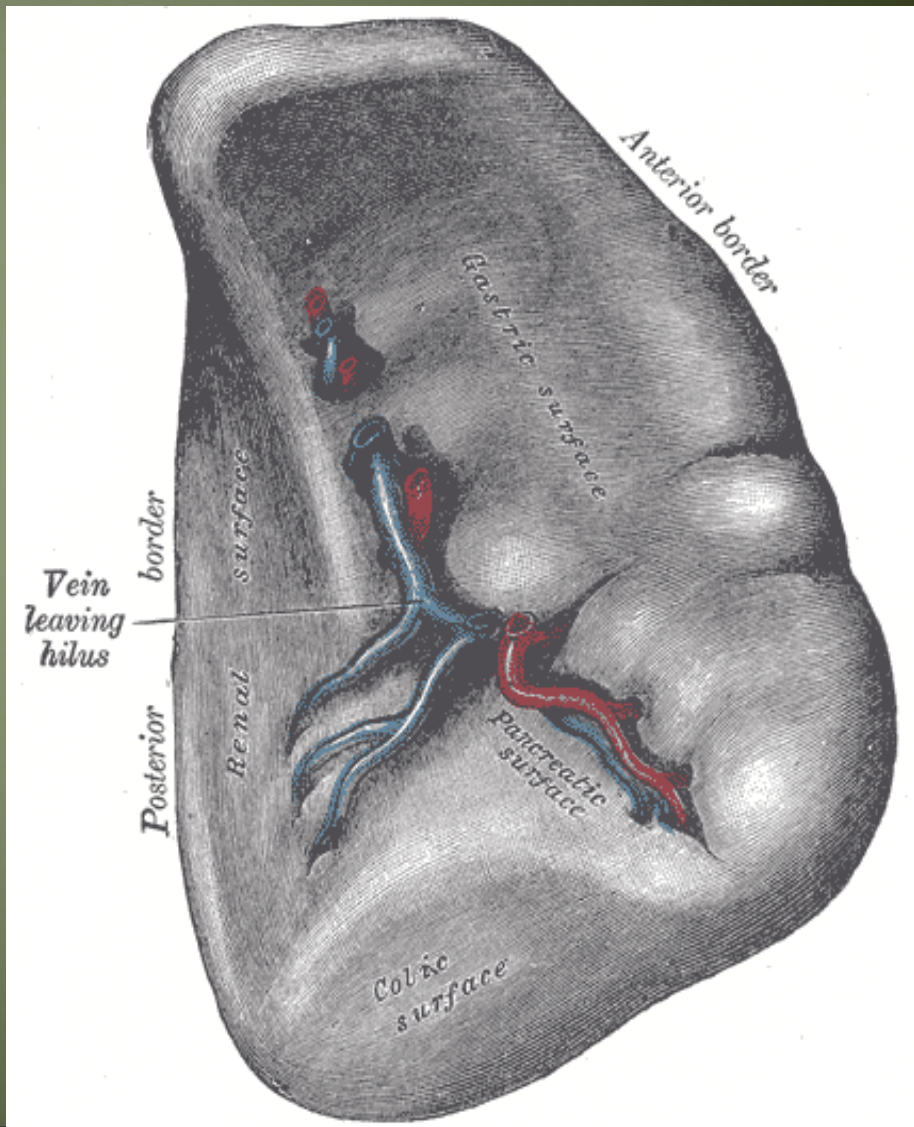
- Has Ant- med. Relations
- **It** is divided by a ridge into

1- An anterior or gastric

2- A posterior or renal portion.

Lower extremity has

- Colic surface
- Pancreatic surface

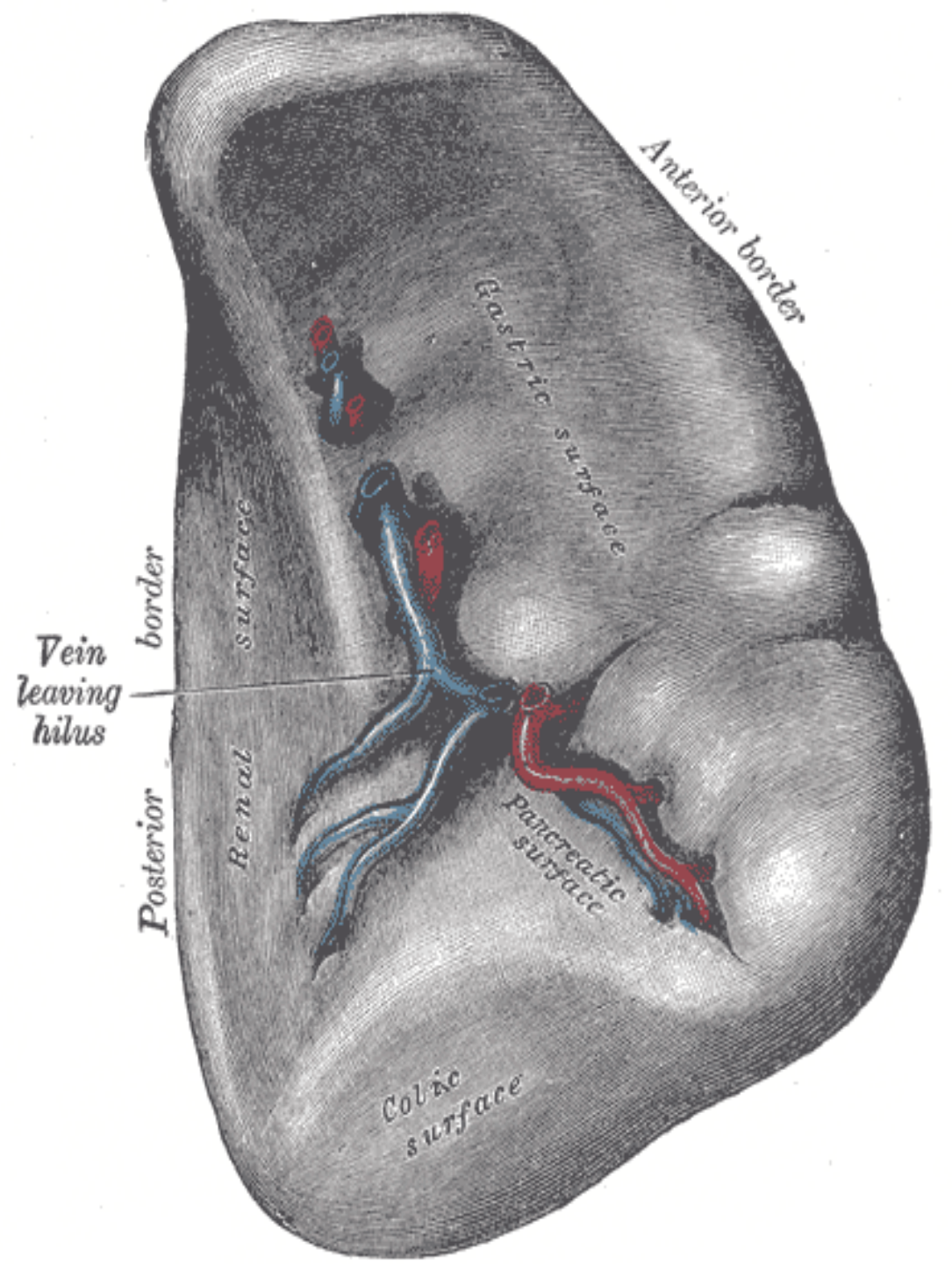


Gastric surface

- Extends forward, upward, and medialward
- Broad and concave
- Related to stomach

Renal surface

- Directed medialward and downward.
-It is somewhat flattened
- Related to Lt.kidney

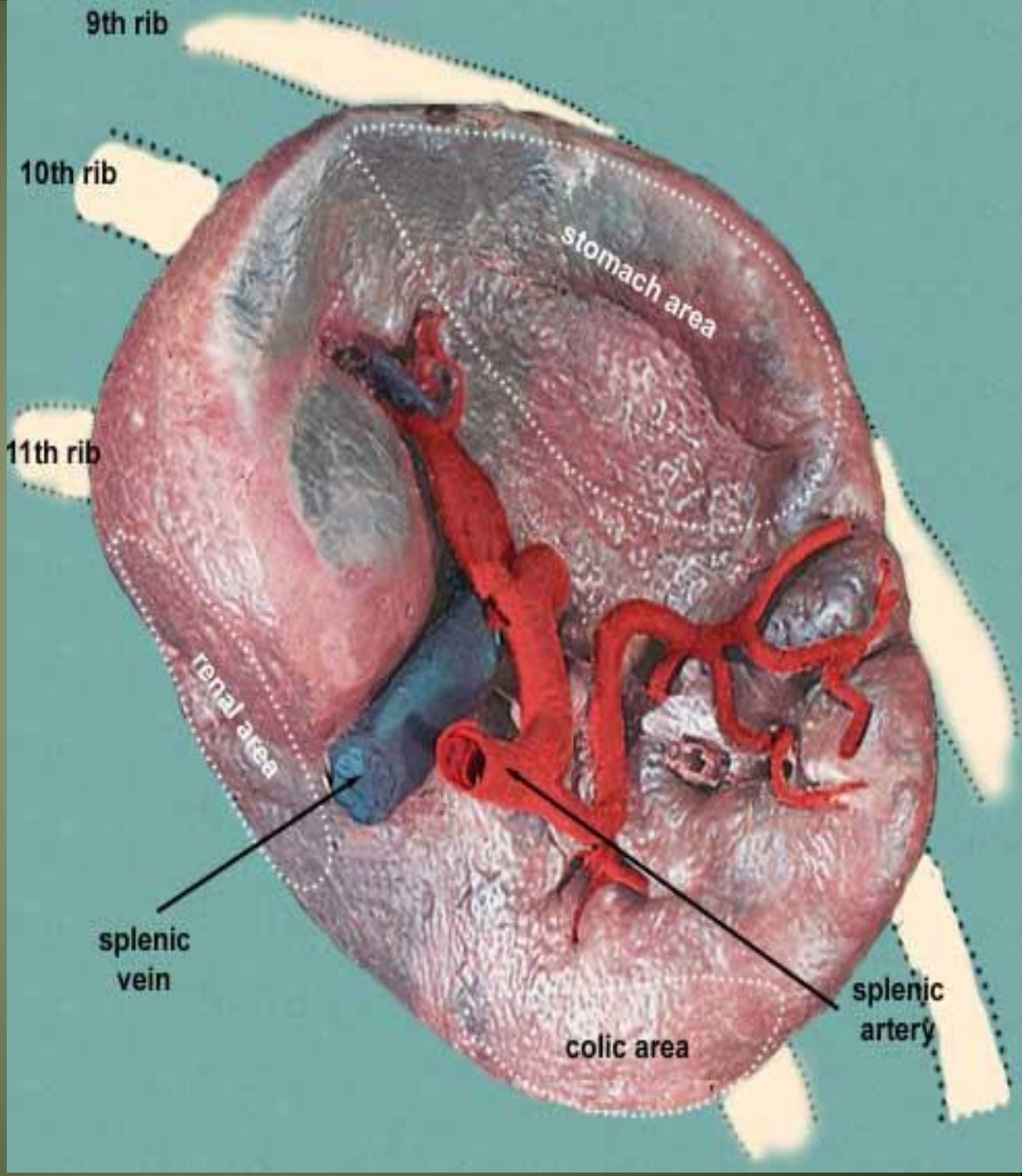


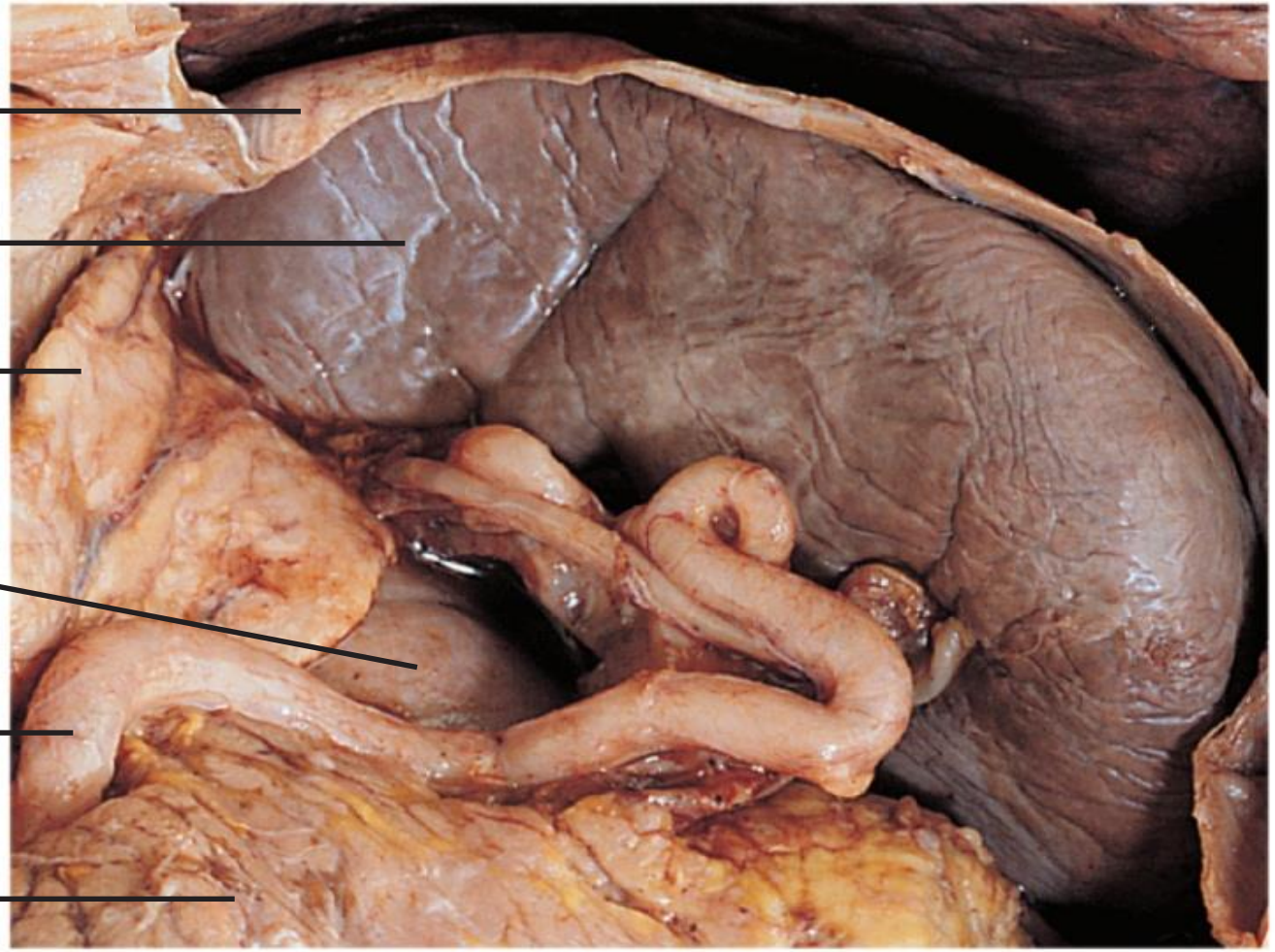
- Hilum of spleen

- Splenic . A→ ant

- Splenic . v → post

- Tail of pancreas





(c) Photograph of the spleen in its normal position in the abdominal cavity, anterior view

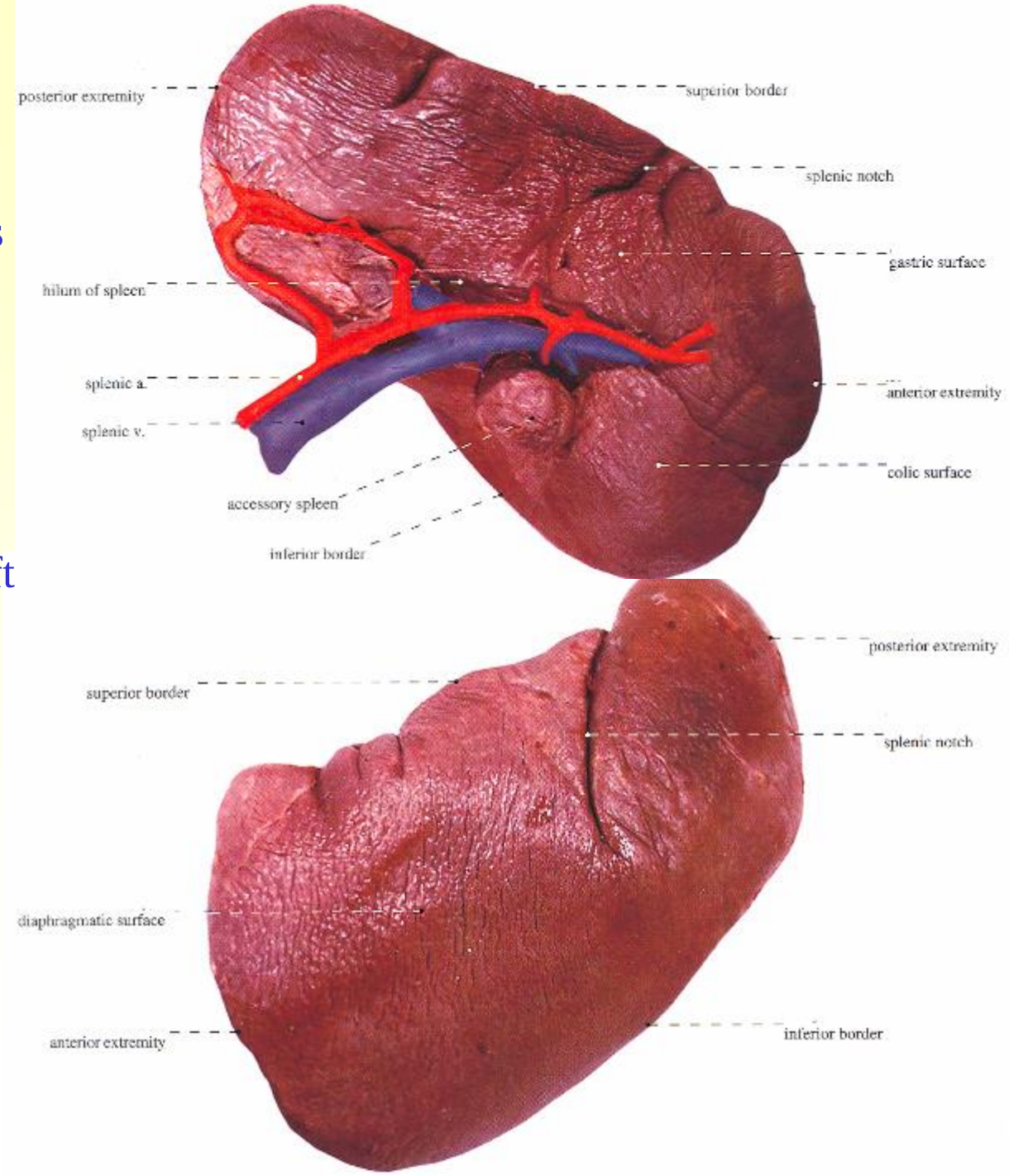
the spleen

The spleen is the largest lymphatic organ. It functions in storing blood, haematogenesis, disposing effete red cells and immunologic response.

the spleen lies deep to the left ninth, tenth and eleventh ribs

hilum of spleen
splenic artery
splenic vein

splenic notches



Blood supply

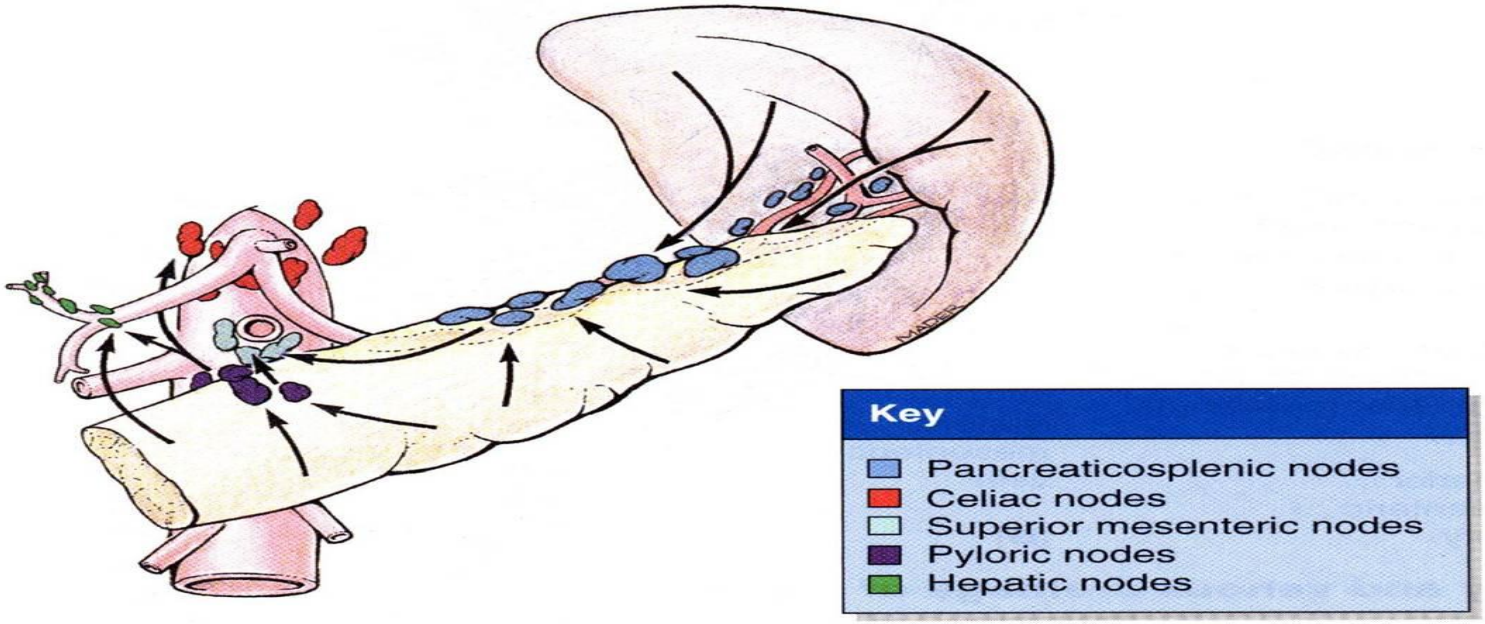
- The large splenic artery is the largest branch of the celiac artery.
- It has a tortuous course
- It runs along the upper border of the pancreas
- The splenic artery then divides into about six branches, which enter the spleen at the hilum

Veins

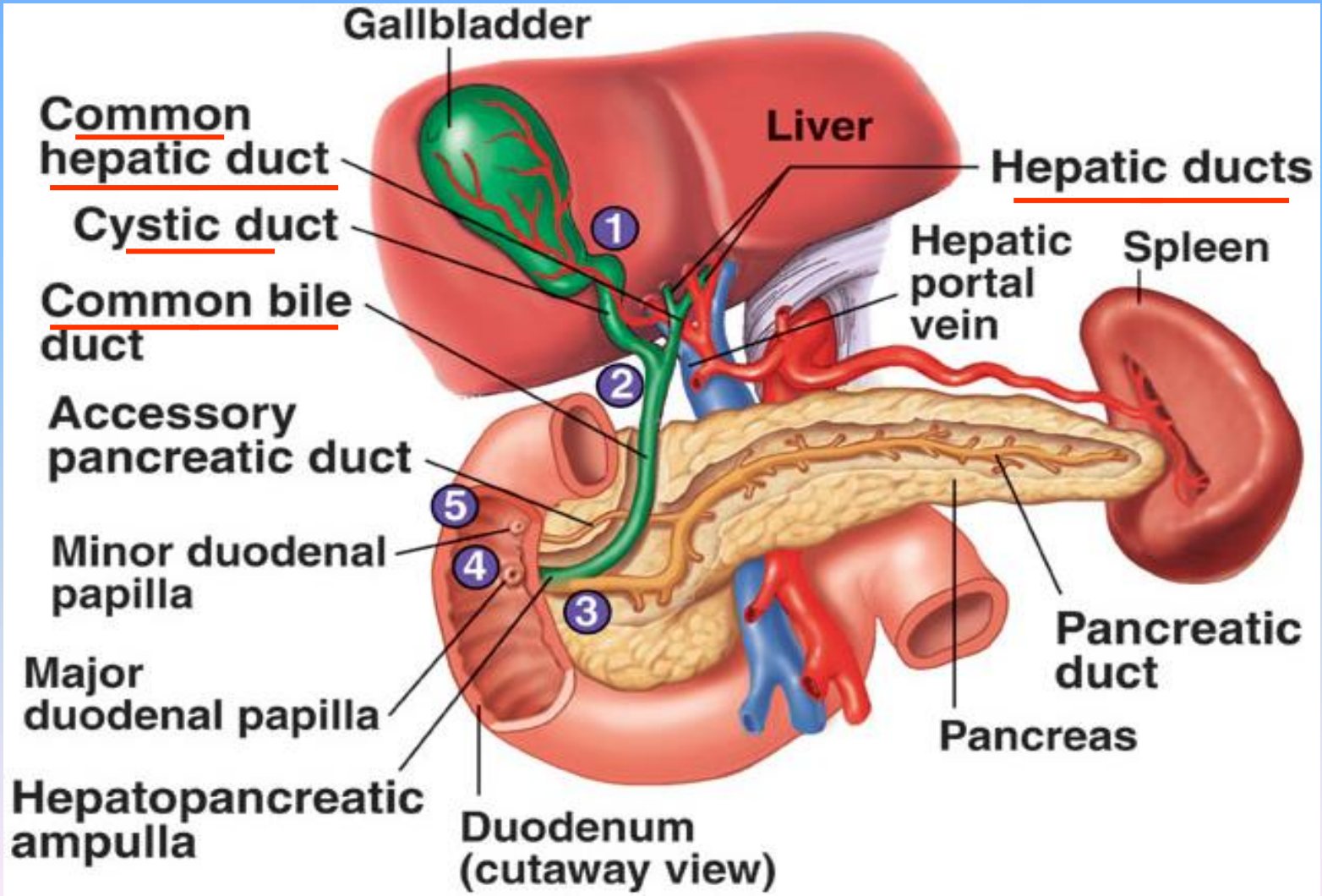
- The splenic vein leaves the hilum and runs behind the tail and the body of the pancreas.
- Behind the neck of the pancreas, the splenic vein joins the superior mesenteric vein to form the portal vein.

Lymphatic Drainage of spleen

- The lymph vessels emerge from the hilum and pass through a few lymph nodes along the course of the splenic artery and then drain into the celiac nodes.



GALLBLADDER



Gallbladder - a bile reservoir, lies in the cystic fossa

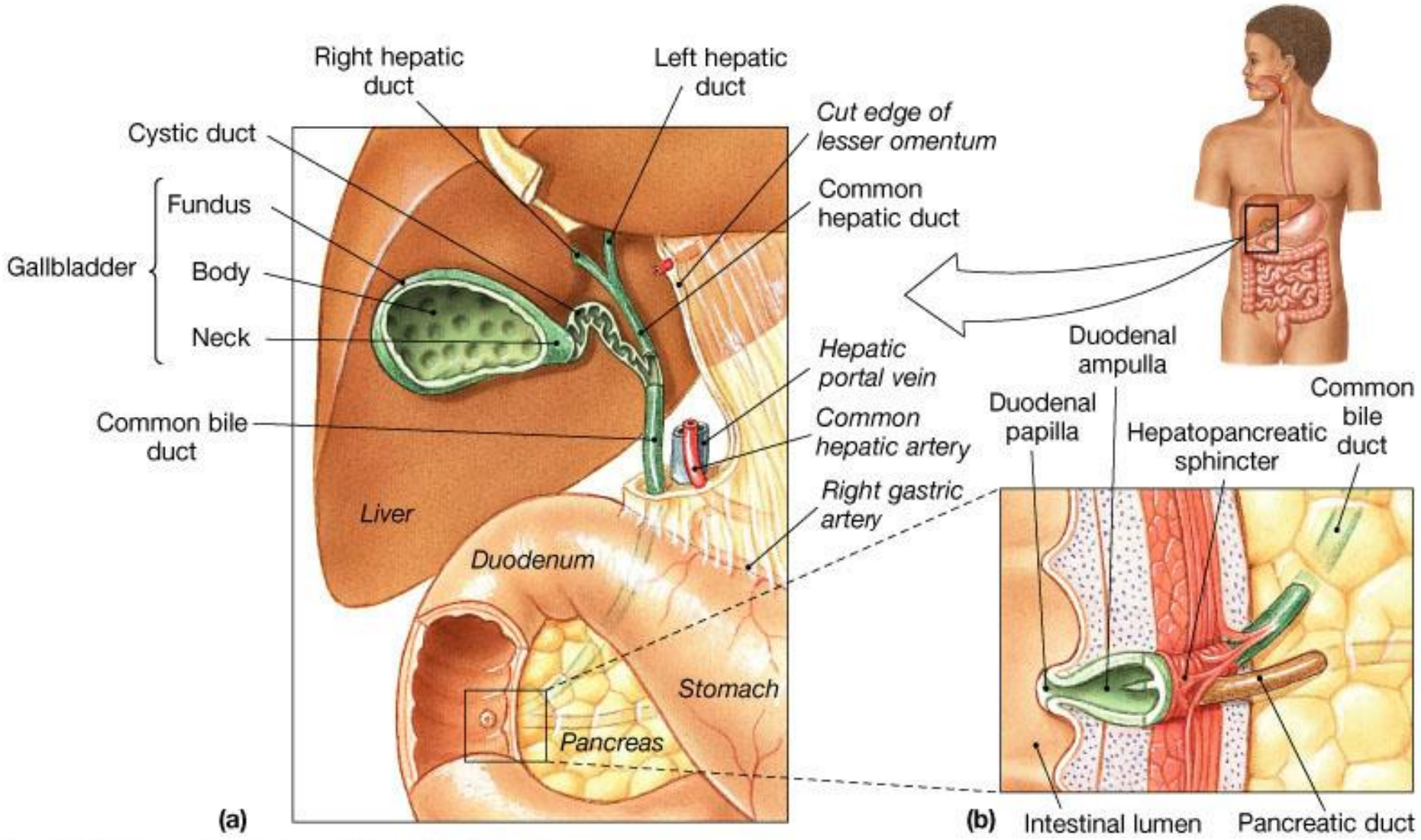


Figure 24.21a, b

Structure of GB

Gallbladder: abile reservoir,lies in th cystic fossa

Fundus

-Ant:ant.abdominal wall

- Post.inf: transverscolon

Body

sup: liver

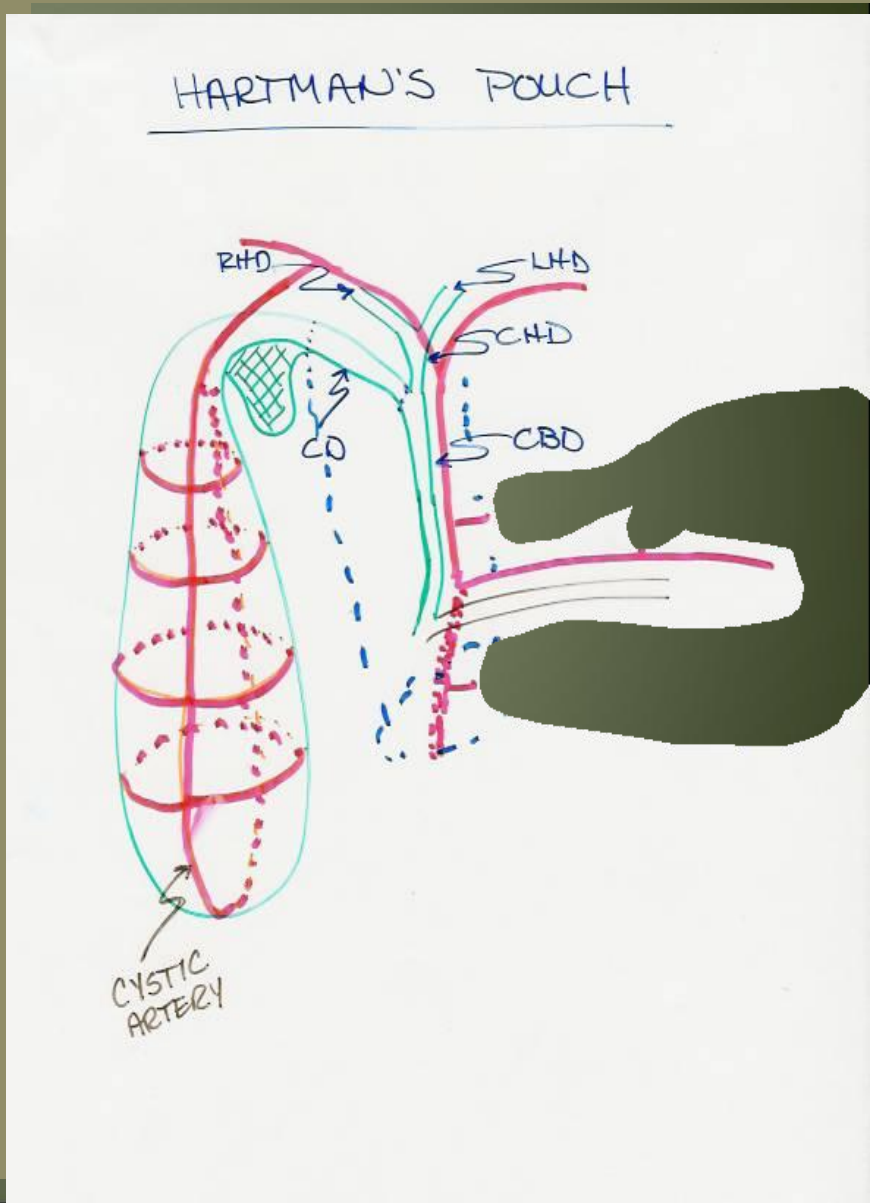
post.inf: Tr.colon. End of 1st part of doudenum , begins of 2nd part of doudenum

Neck

- Form the cystic duct, 4cm

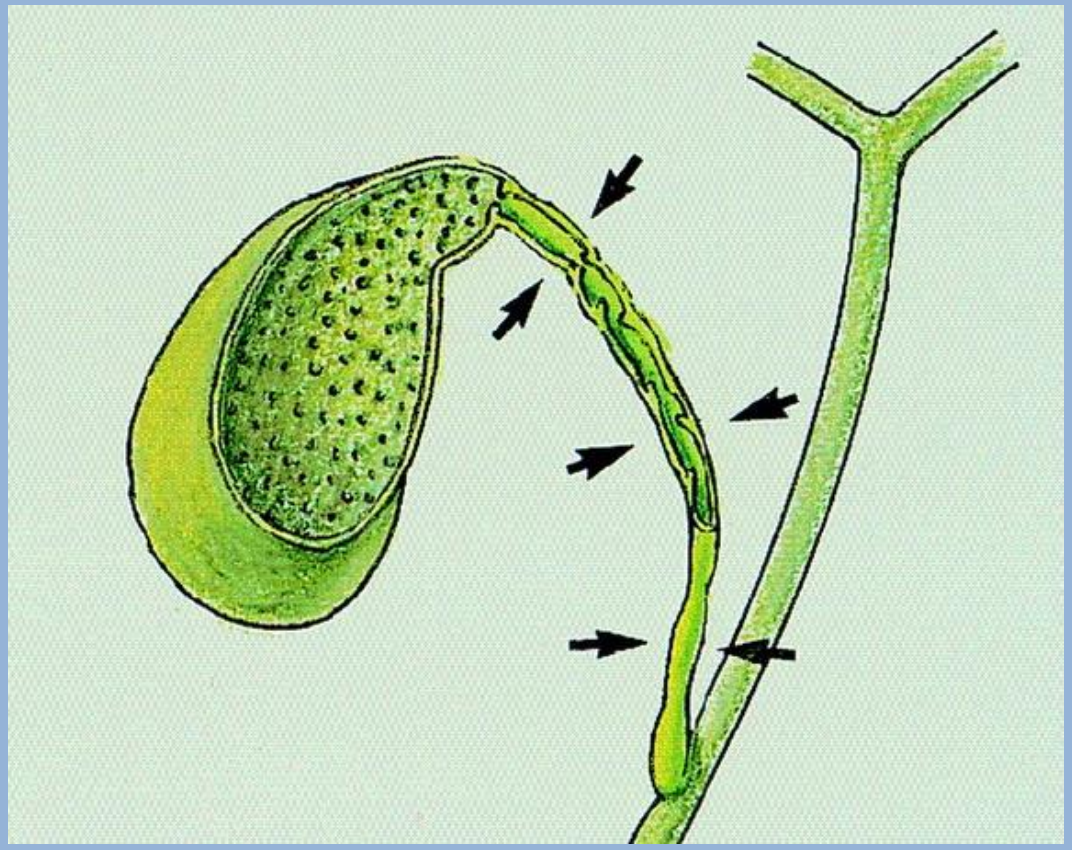
Hartmann's Pouch

1. Lies between body and neck of gallbladder
3. May obscure cystic duct
4. If very large, may see cystic duct arising from pouch



Anatomy

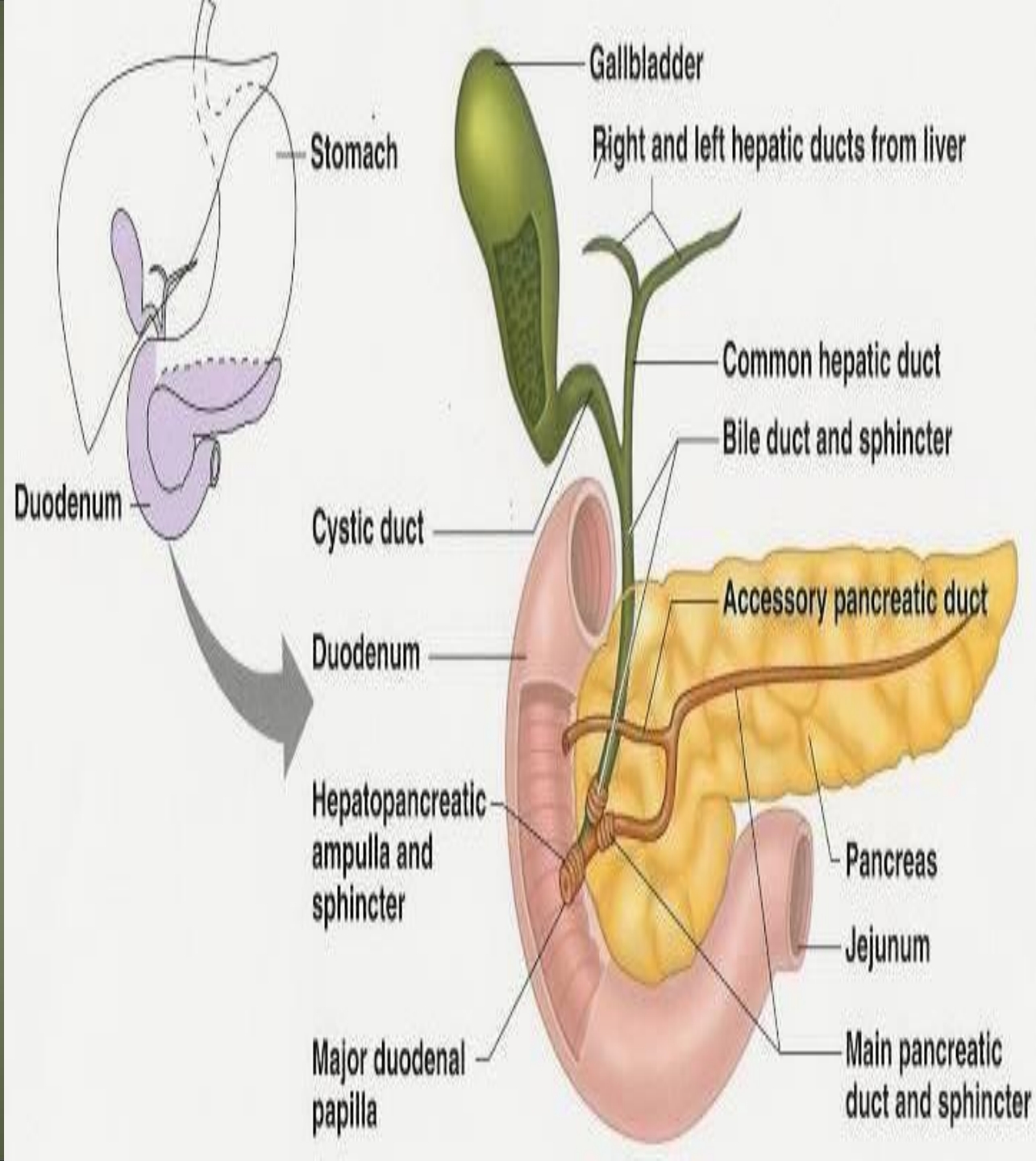
- The Spiral Valves of Heister, and no they do not have any valvular function.



Cystic duct

The cystic duct - lenght 2-4cm, diameter 1-5mm,

joins the common hepatic duct

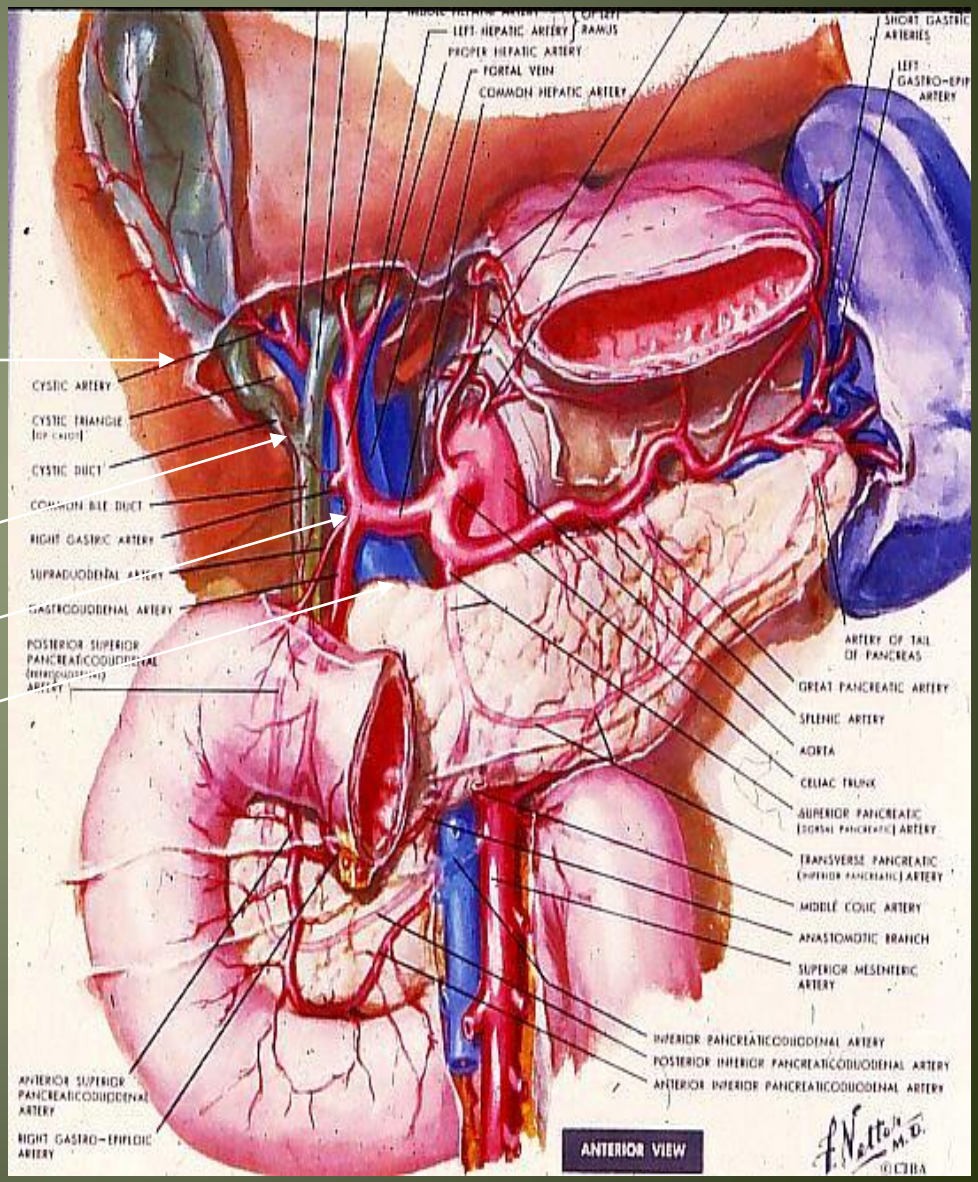


Anatomy

- Name the small ducts which drain directly from the liver into the body of the gallbladder, and are a potential source of biloma post cholecystectomy
  - Ducts of Luschka

Arterial Supply to the Gallbladder

- Cystic artery
- Right hepatic artery
- Proper hepatic artery
- Common hepatic artery

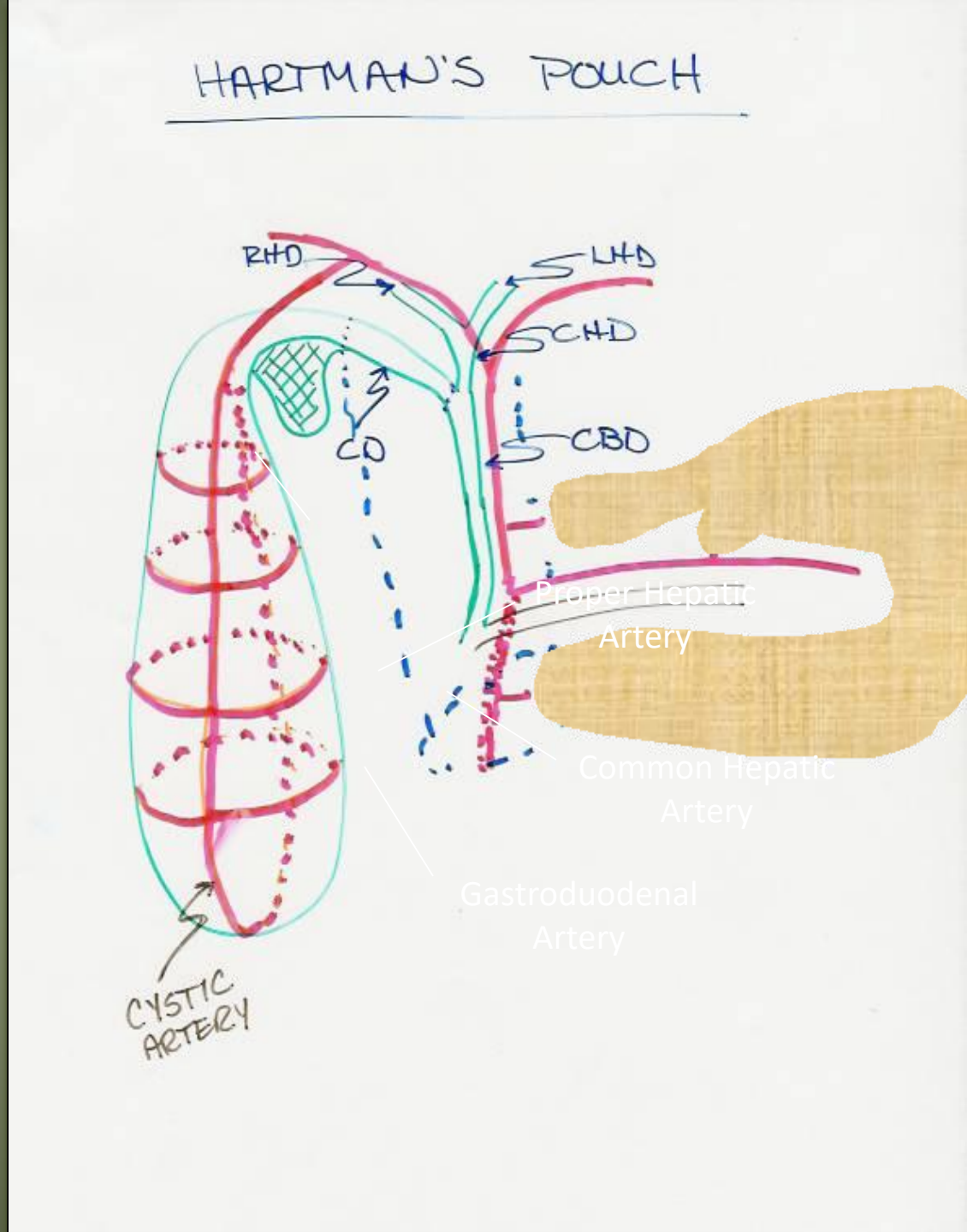


Blood supply of GB:

- Cystic artery→ branch of Rt. Hepatic artery

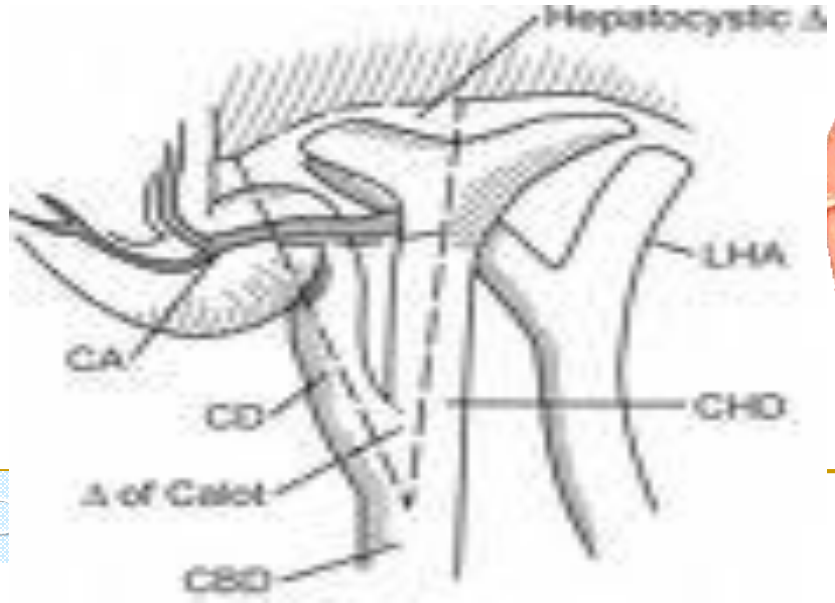
- Cystic vein → end in portal vein

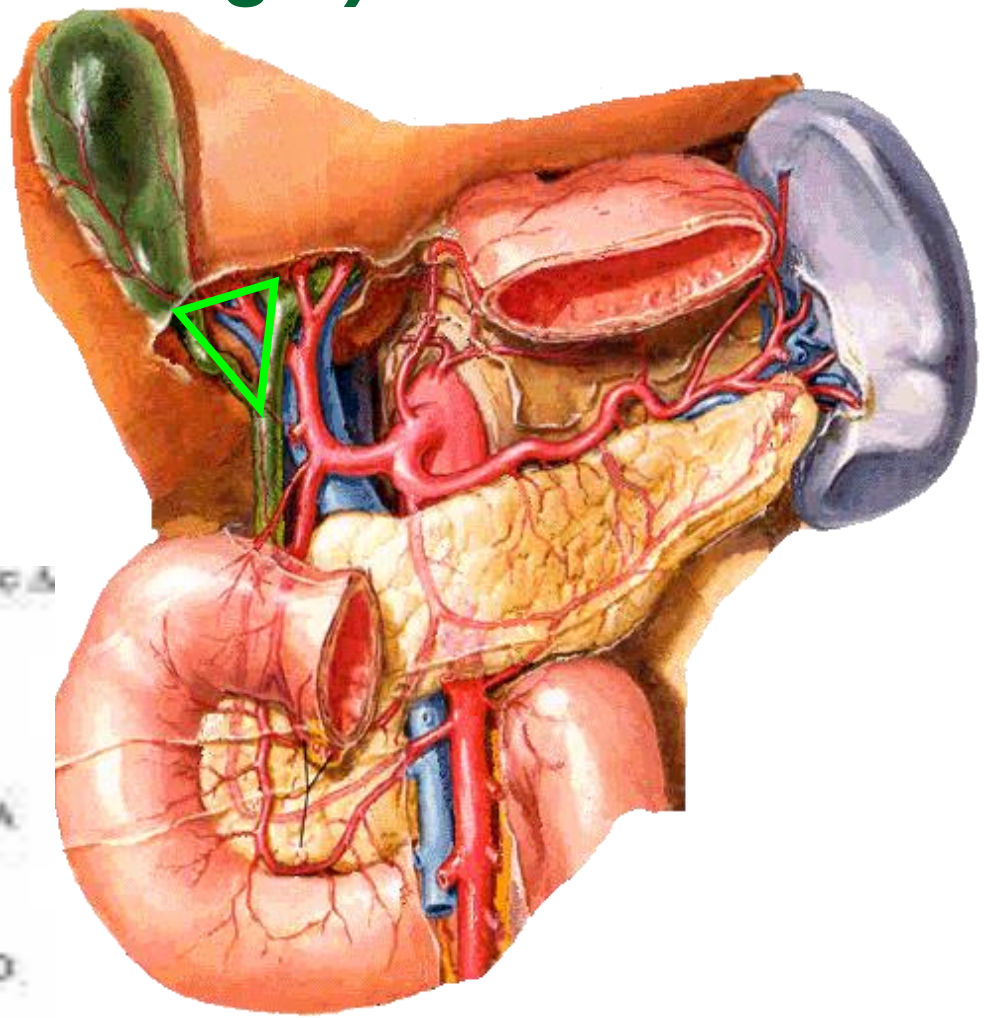
- Small branches (arteries and veins run between liver and gall bladder



Cystohepatic triangle (Calot's Triangle)

- **Boundaries**
  - Common hepatic duct on the left
  - Cystic duct on the right
  - Live superiorly
- Content: **cystic artery**





Nerve supply

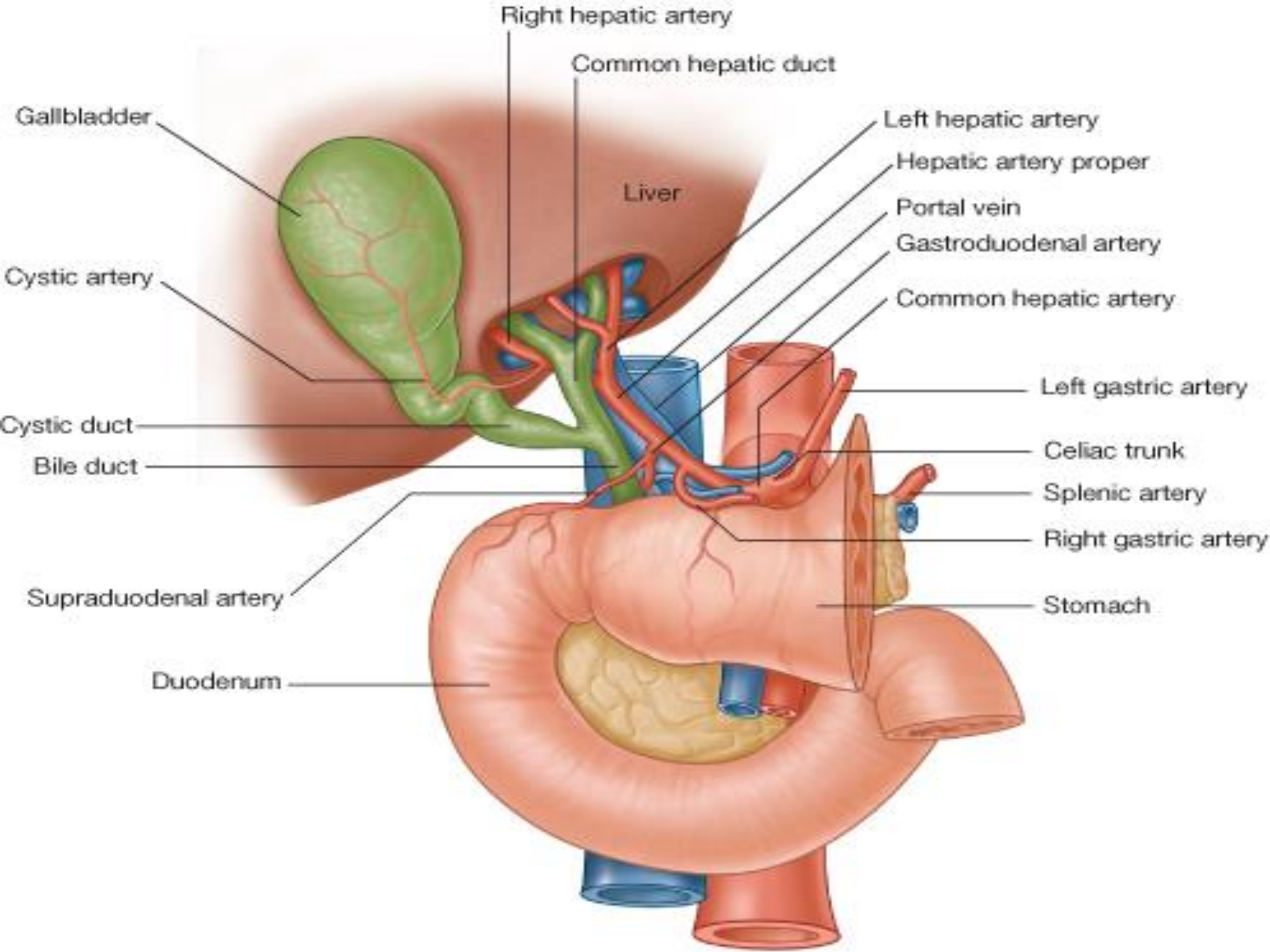
- Sympathetic and parasympathetic from celiac plexus
- Parasympathetic ---- vagous nerve
- Hormone →cholecystokini → duodenum

Biliary tract anatomy

The common bile duct passes inferiorly posterior to the first part of the duodenum and pancreatic head. In the majority it then forms a short common channel with the main pancreatic duct within the wall of the duodenum, termed the ampulla of Vater.

The left hepatic duct drains 3 segmments of the left liver, and the right hepatic duct 4 segments of the right liver.

The caudate lobe (segment 1) has a variable drainage pattern, but in the majority (78%) drainage is into both main ducts.

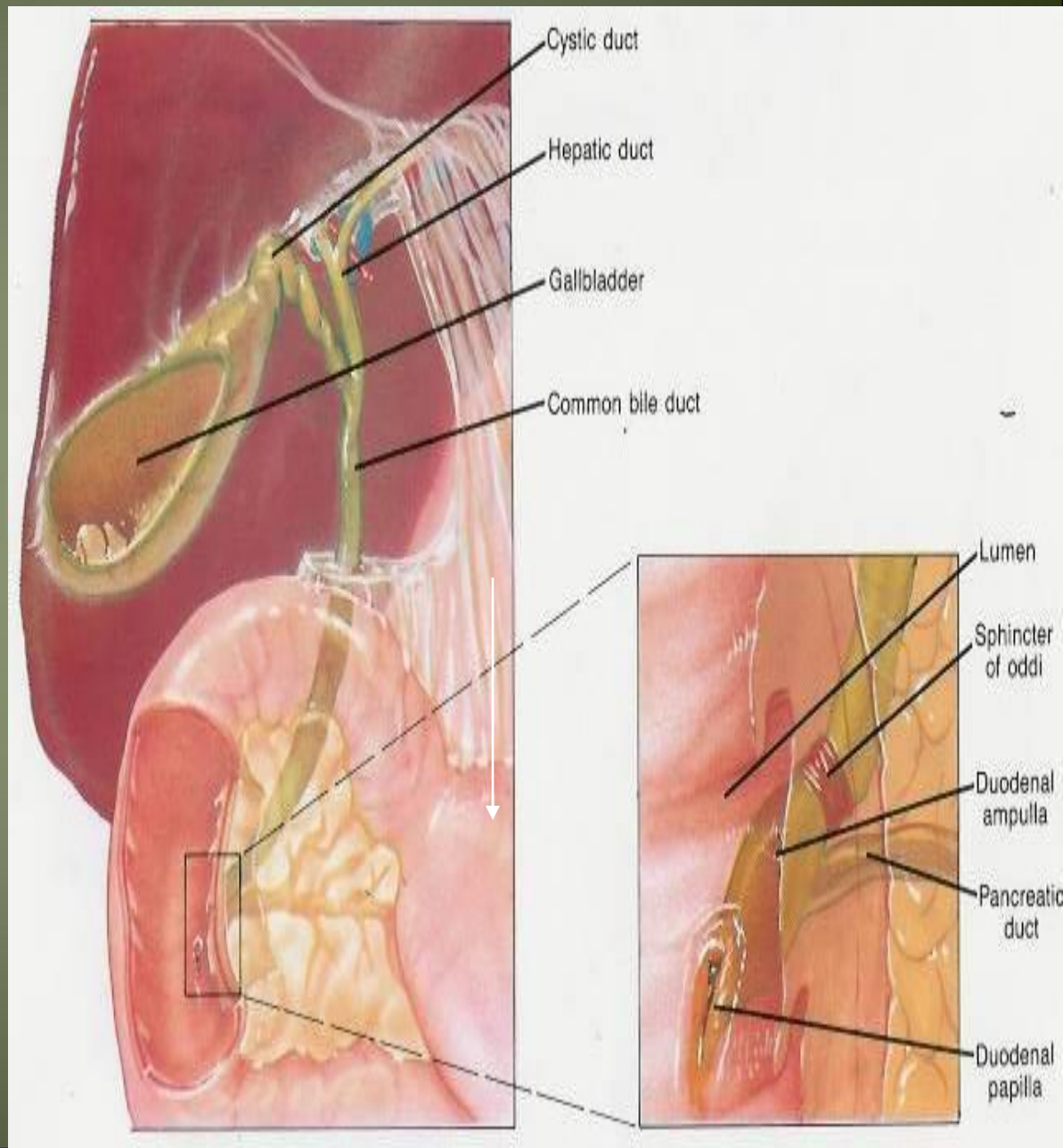

Right hepatic artery
Common hepatic duct
Gallbladder
Left hepatic artery
Hepatic artery proper
Liver
Portal vein
Gastroduodenal artery
Cystic artery
Common hepatic artery
Left gastric artery
Cystic duct
Celiac trunk
Bile duct
Splenic artery
Right gastric artery
Supraduodenal artery
Stomach
Duodenum

Common bile duct

Extra hepatic biliary system

Rt. hepatic duct
+
Lt hepatic duct
↓
Common hepatic duct
+
Cystic duct
↓
Common bile duct

- 4cm
- Descend in free edge of lesser omentum
- Supra duodenal part
  Retro duodenal part
  Retro pancreatic part



Bile duct. parts relations

-3 inc long

-1st part

-Located in right free margin of lesser omentum

- in front of the opening into the lesser sac (Epiploic opening)

-Rt to hepatic artery and portal vein

- 2nd part

-Behind the 1st part of the duodenum

-Rt to the gastroduodenal artery

-3 rd part

-Posterior surface of the head of the pancreas

-Contact with main pancreatic duct

-Related with IVC, gastroduodenal artery, portal vein

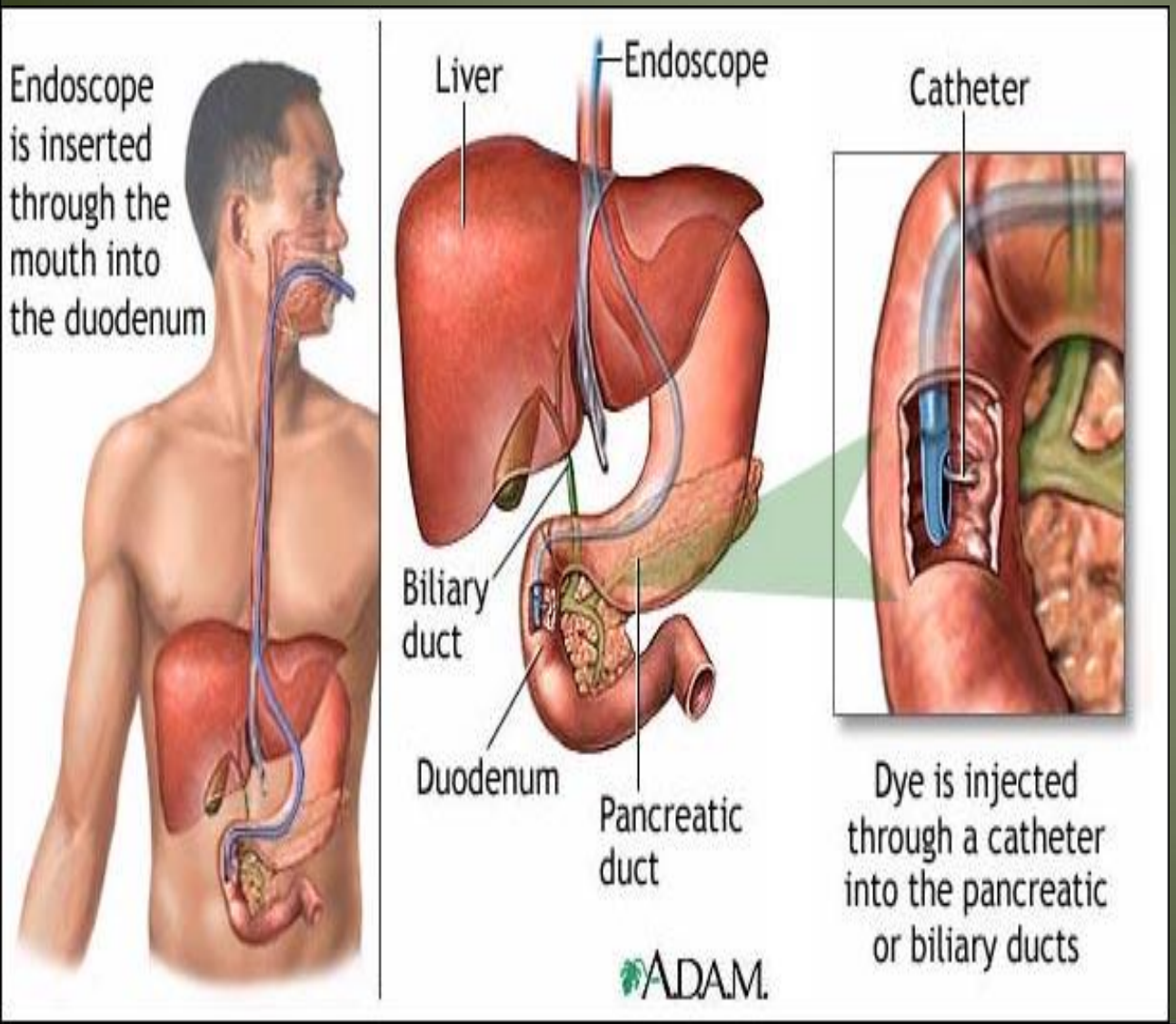
-End in the half second part of duodenum at ampulla of Vater

Blood supply of CBD

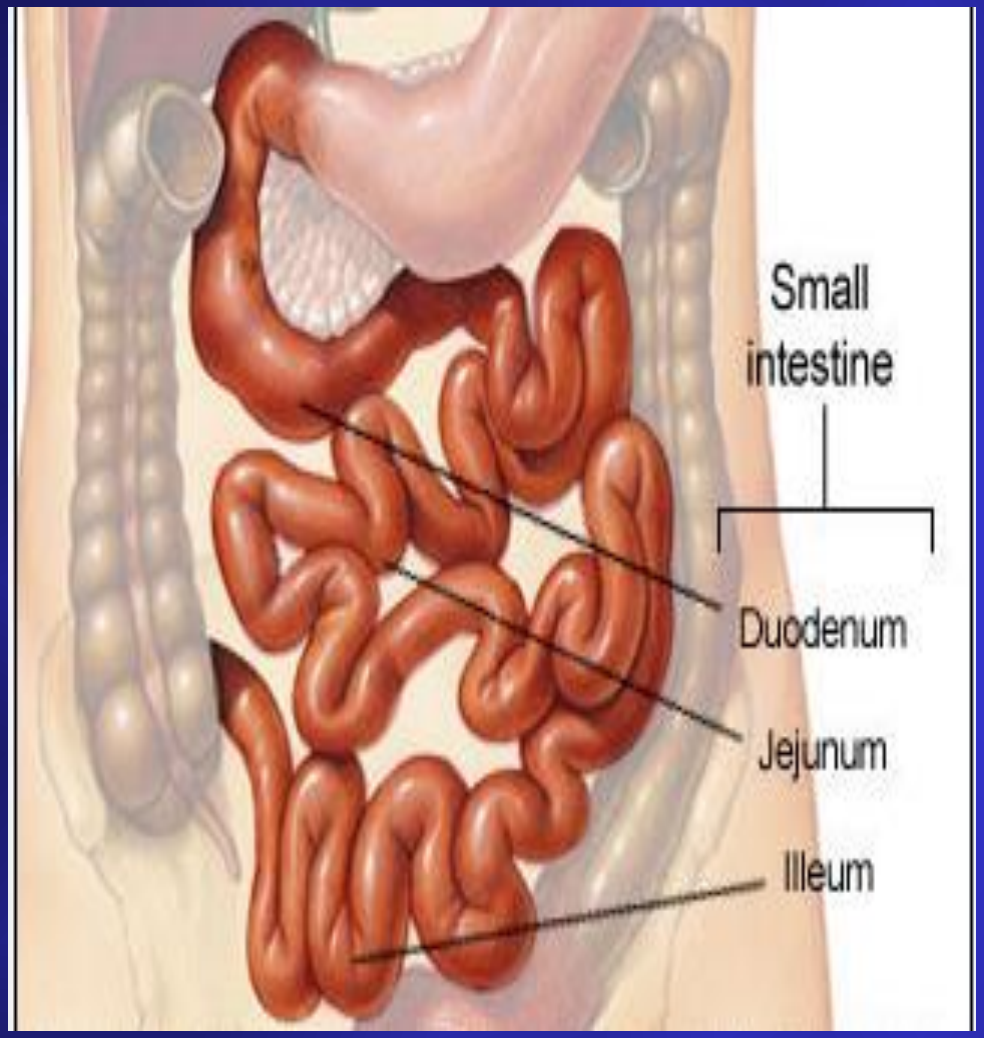
Small arteries supplying CBD

a. Arise from cystic artery
b. Posterior branch of superior pancreaticoduodenal artery

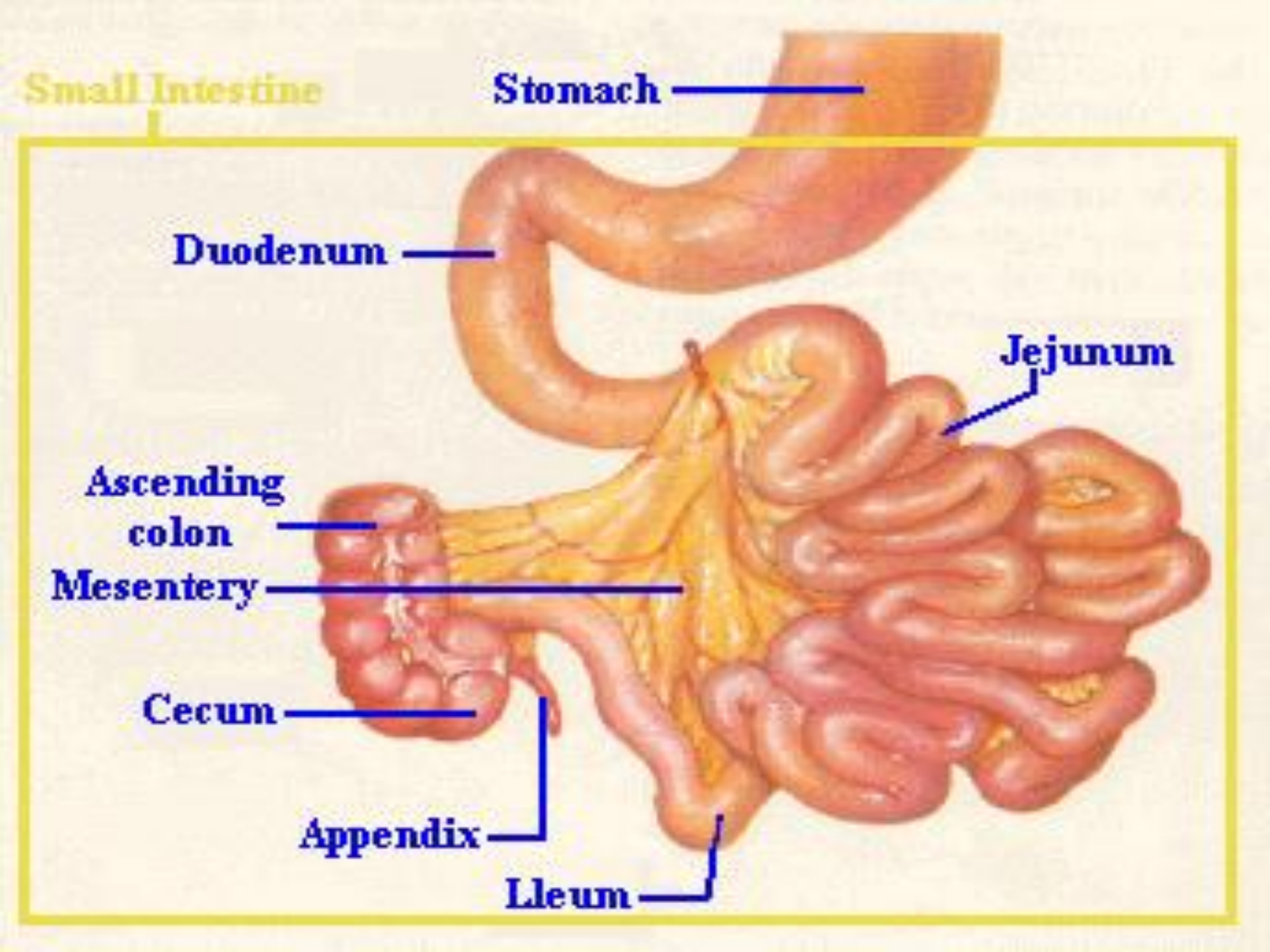
ERCP


Endoscope is inserted through the mouth into the duodenum
Liver
Endoscope
Biliary duct
Duodenum
Pancreatic duct
A.D.A.M.
Catheter
Dye is injected through a catheter into the pancreatic or biliary ducts

SMALL INTESTINE



- The small intestine is divided
- duodenum
- jejunum
- ileum.


Small Intestine
Stomach
Duodenum
Jejunum
Ascending colon
Mesentery
Cecum
Appendix
Lleum

Differences
Large & small intestines

• Teniae coli	• No teniae coli
• Haustra	• No Haustra
• Omental appendices / Appendices epiploica	• No Omental appendices / Appendices epiploica
• Semicircular folds	• Circular folds
• Large diameter	• Small diameter

SMALL INTESTINE

- **DUODENUM: fixed part**
- **JEJUNUM & ILEUM: movable part (with mesentery)**

JEJUNUM & ILEUM

- **Length:** 6 meters (20 feet)
- **Beginning:** duodenojejunal flexure
- **Termination:** ileocecal junction
- **Embryological origin:** midgut
- **Peritoneal fold:** mesentery of small intestine
- **Arterial supply:** jejunal & ileal branches of **superior mesenteric**
- **Lymphatic drainage:** **superior mesenteric** lymph nodes
- **Nerve supply:** **superior mesenteric** plexus: sympathetic & parasympathetic (vagus)

MESENTERY OF SMALL INTESTINE

- **Content of root:** superior mesenteric vessels
- **Contents (structures between its 2 layers):**

1. **Jejunal vessels:** form few arcades
2. **Ileal vessels:** form many arcades
3. **Mesenteric lymph nodes**
4. **Autonomic nerve fibers**
5. **Mesenteric fat**

JEJUNUM

1. **Length:** shorter (proximal 2/5)
2. **Diameter:** wider
3. **Wall:** thicker (more numerous plicae circulares: circular folds of mucosa)
4. **Appearance:** more red in color (more vascular)
5. **Vessels:** less arcades, long terminal branches
6. **Mesenteric fat:** small amount near intestinal border
7. **Aggregations of lymphoid tissue:** few

ILEUM

1. **Length:** longer (distal 3/5)
2. **Diameter:** narrower
3. **Wall:** thinner (less numerous plicae circulares: circular folds of mucosa)
4. **Appearance:** light red in color (less vascular)
5. **Vessels:** more arcades, short terminal branches
6. **Mesenteric fat:** large amount near intestinal border
7. **Aggregations of lymphoid tissue:** numerous (Peyer's patches)

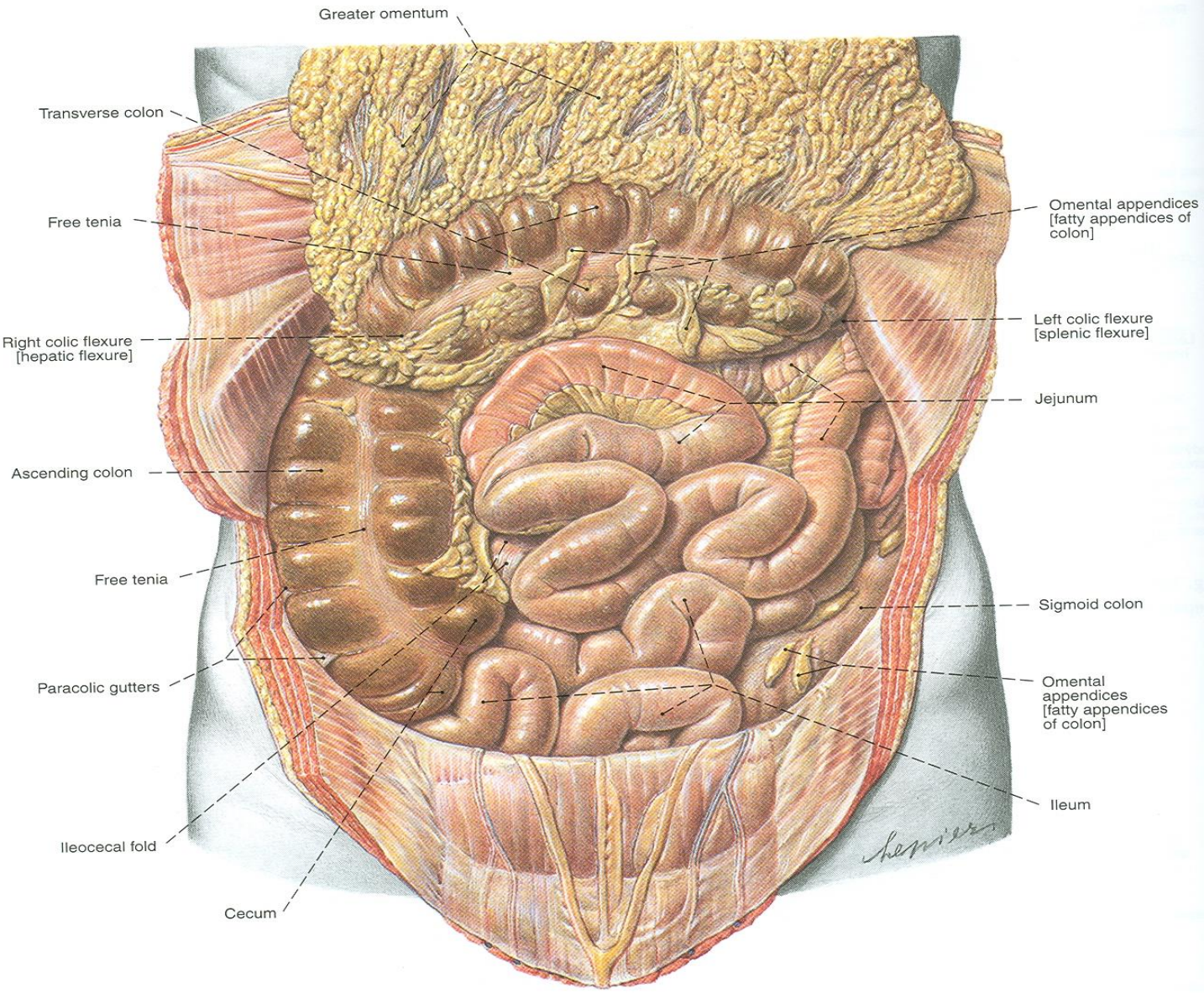
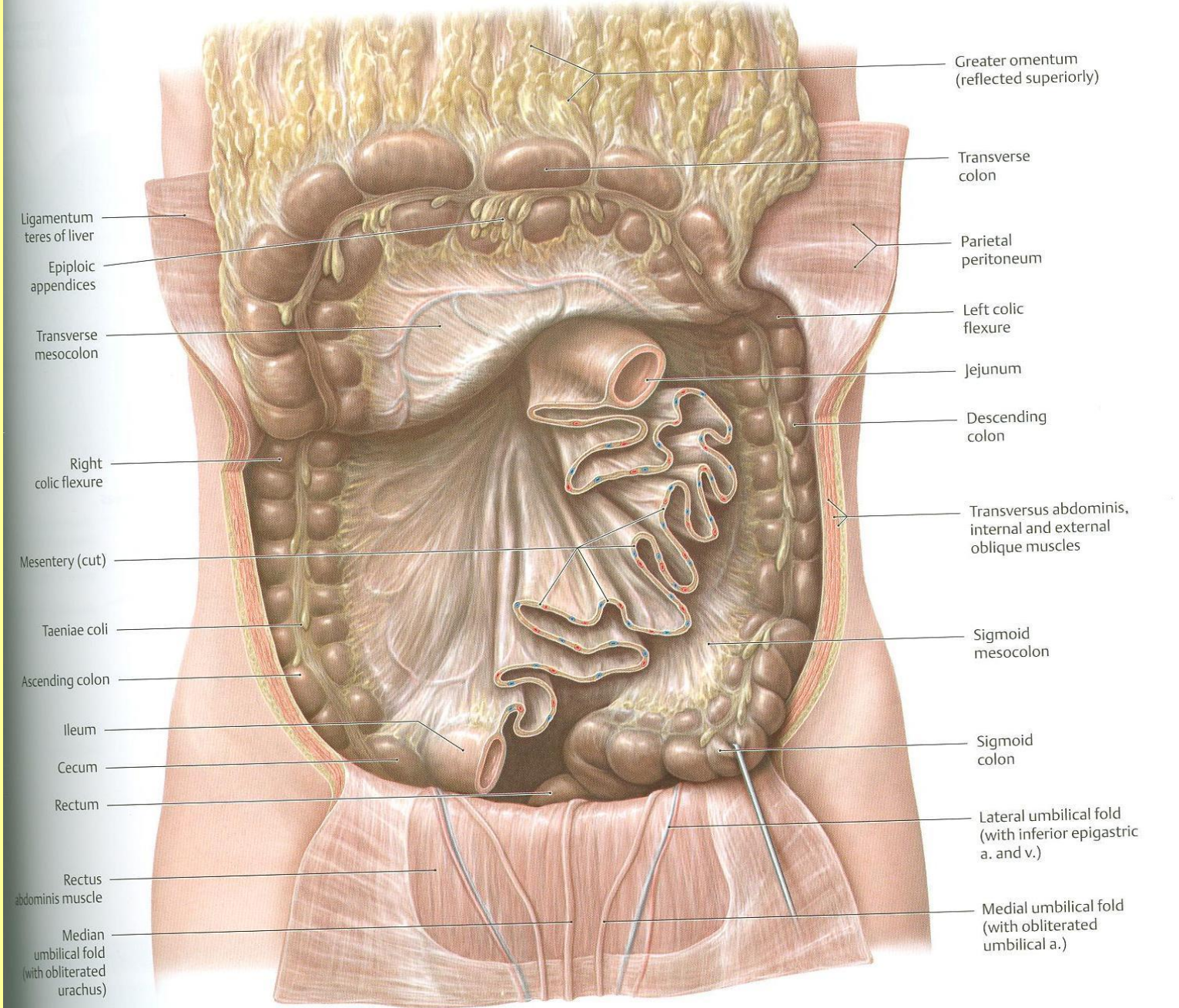


Fig. 1004 Position of abdominal viscera; greater omentum and transverse colon retracted cranially; ventral aspect.



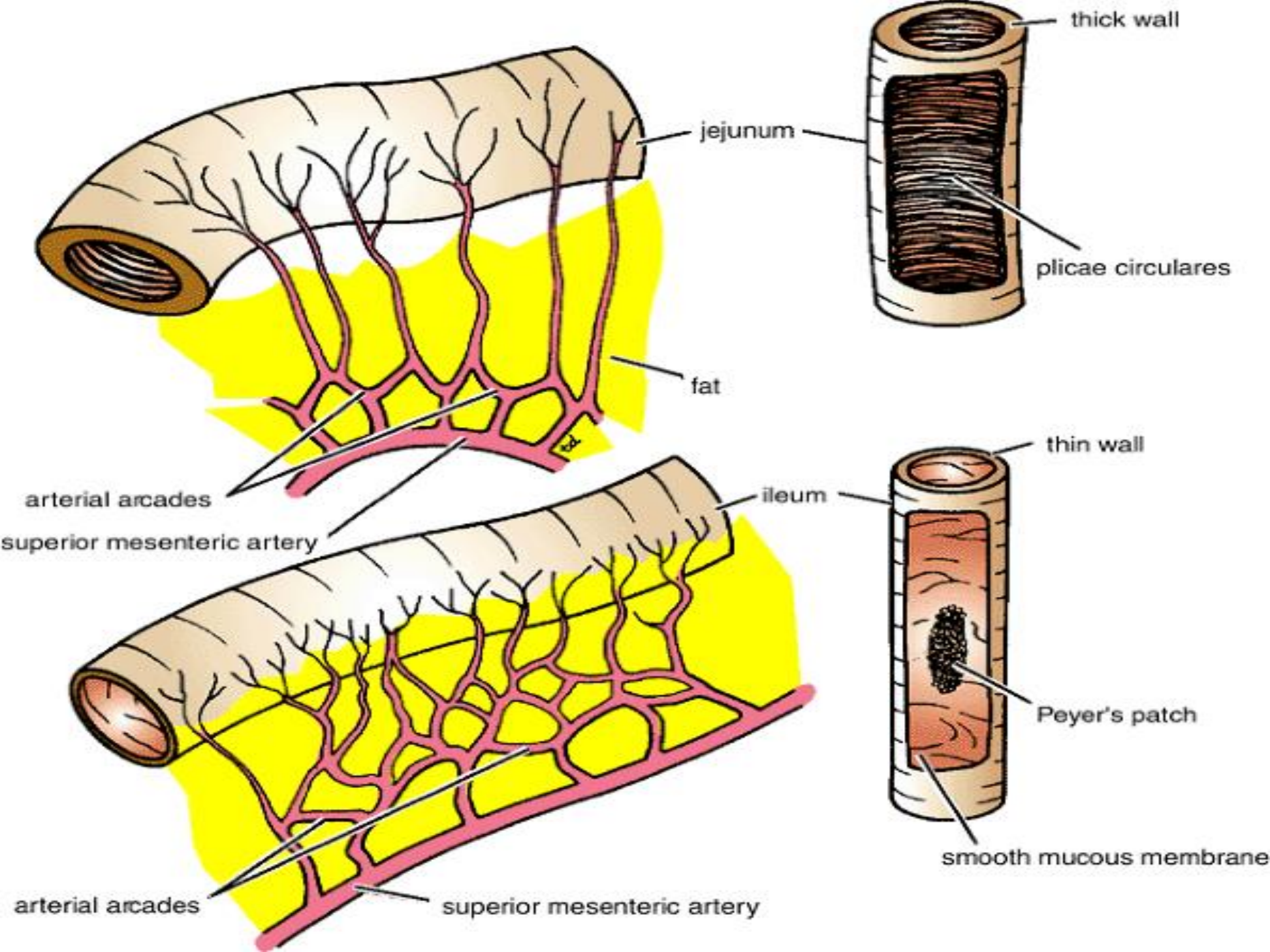
C Mesenteries. *Reflected:* Greater omentum and transverse colon. *Removed:* Intraperitoneal small intestines.

Difference between Jejunum & Ileum

	jejunum	Ileum
length	Proximal 2/5	Distal 3/5
site	in the upper part of the peritoneal cavity below the left side of the transverse mesocolon	in the lower part of the cavity and in the pelvis
wall	thicker wall& redder	Thinner & less redder
Arcades in mesentery	-simple ,only one or two arcades -with long infrequent branches -Long vase recta	numerous short terminal vessels arise from a series of three or four or even more Arcade - Short vase recta
Fat in mesentery	- the fat is deposited near the root - it is scanty near the intestinal wall - Less in amount →appear window	- the fat is deposited throughout mesentery - Big amount - No window appear

Difference between Jejunum & Ileum

	jejunum	Ileum
Diameter	wider	smaller
villi	numerous	Less numerous
Plicae circularis(the permanent enfolding of the mucous membrane& submucosa	They are: 1- larger 2- more numerous 3- closely set	they are: 1- smaller 2- more widely separated 3- in the lower part they are absent .
Lymphatic follicles	No or few	Aggregations of lymphoid tissue (Peyer's patches) are present in the mucous membrane


thick wall
jejunum
plicae circulares
fat
arterial arcades
superior mesenteric artery
thin wall
ileum
Peyer's patch
smooth mucous membrane
arterial arcades
superior mesenteric artery

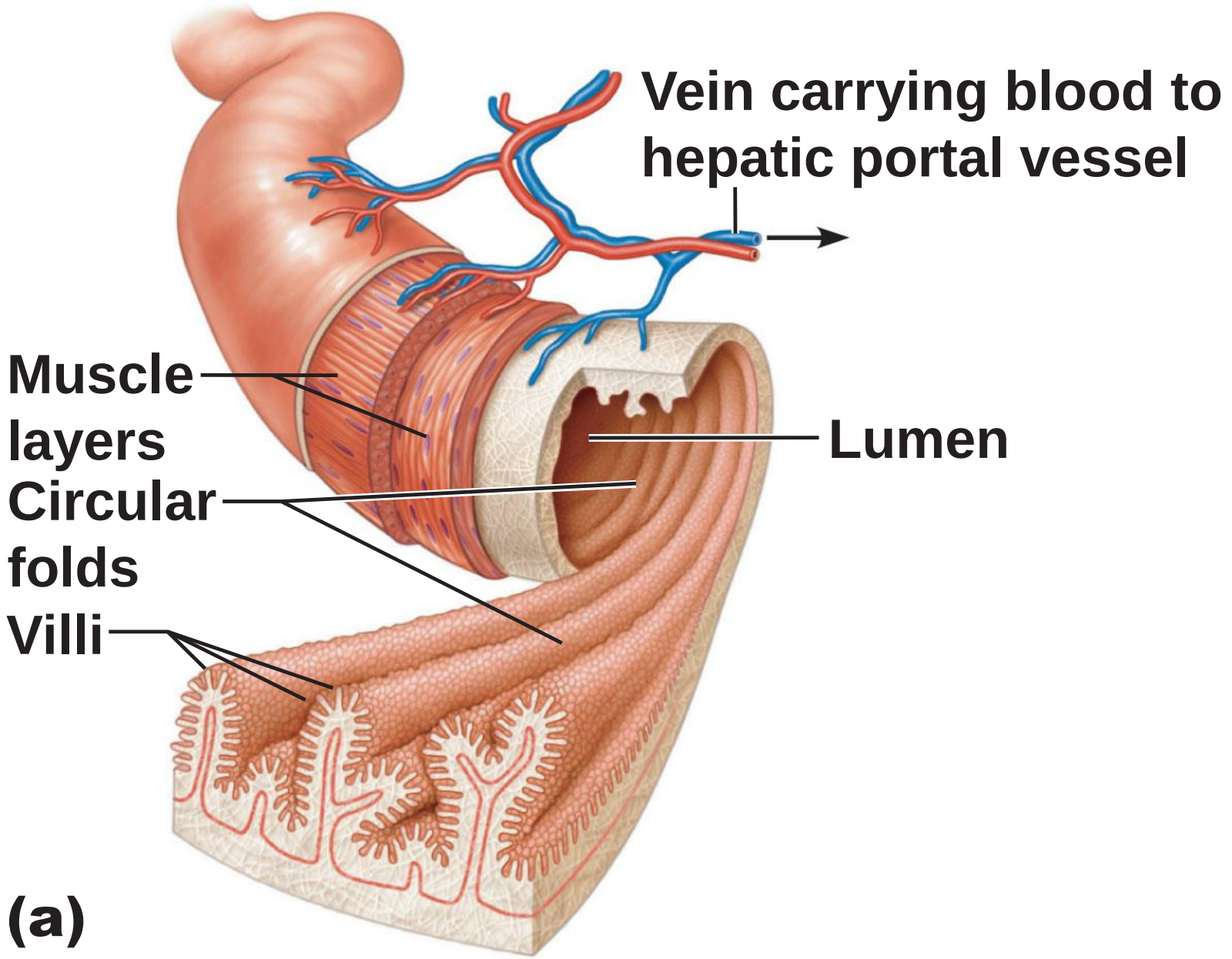
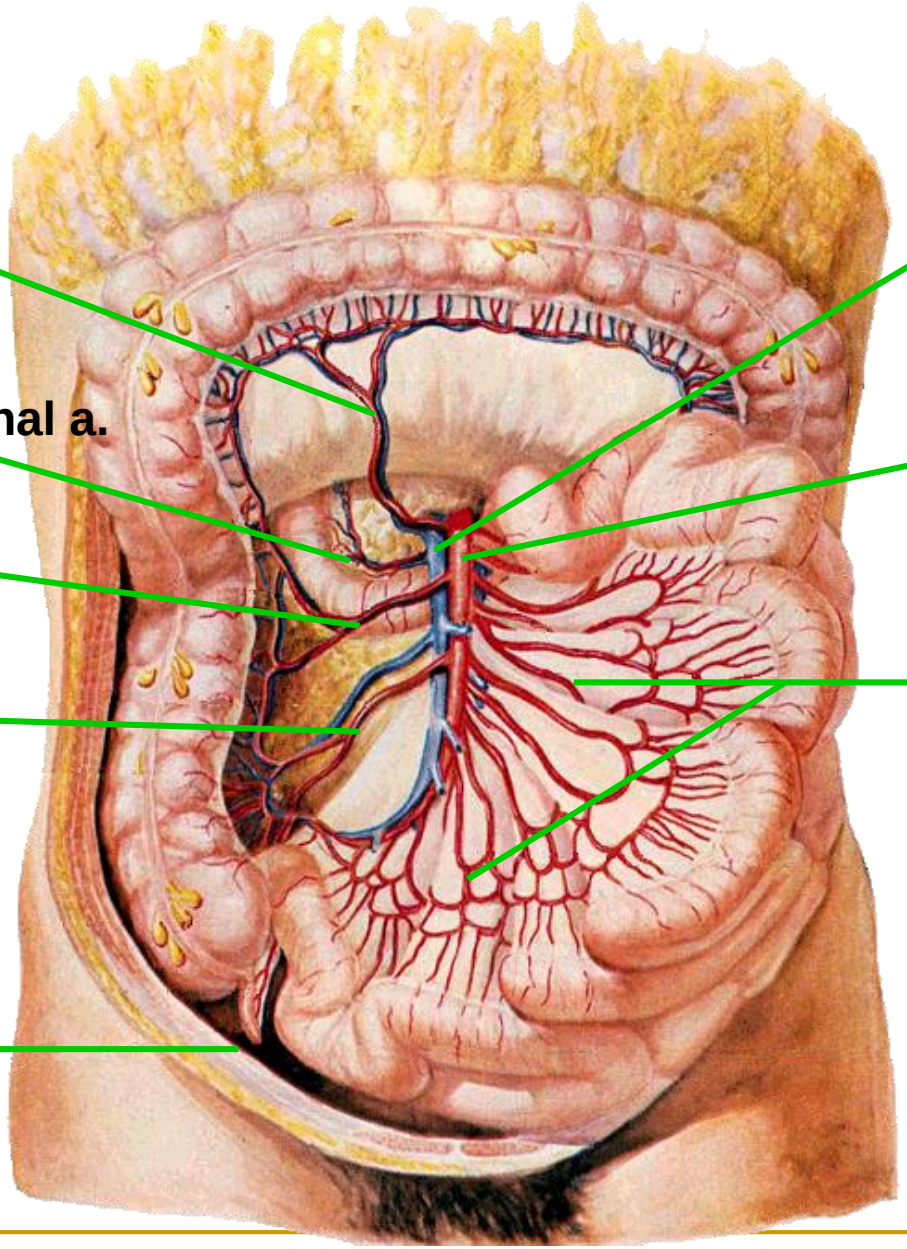
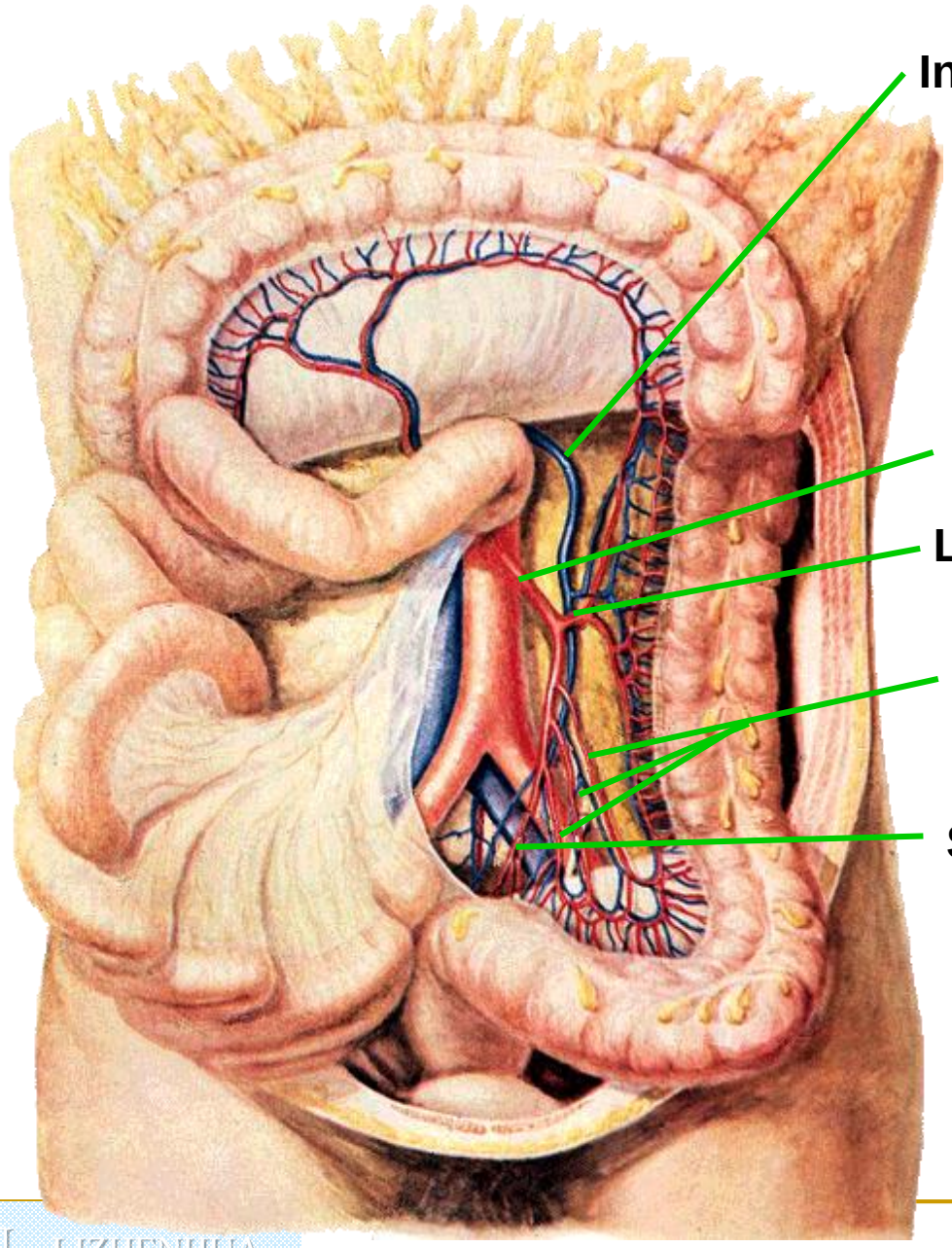
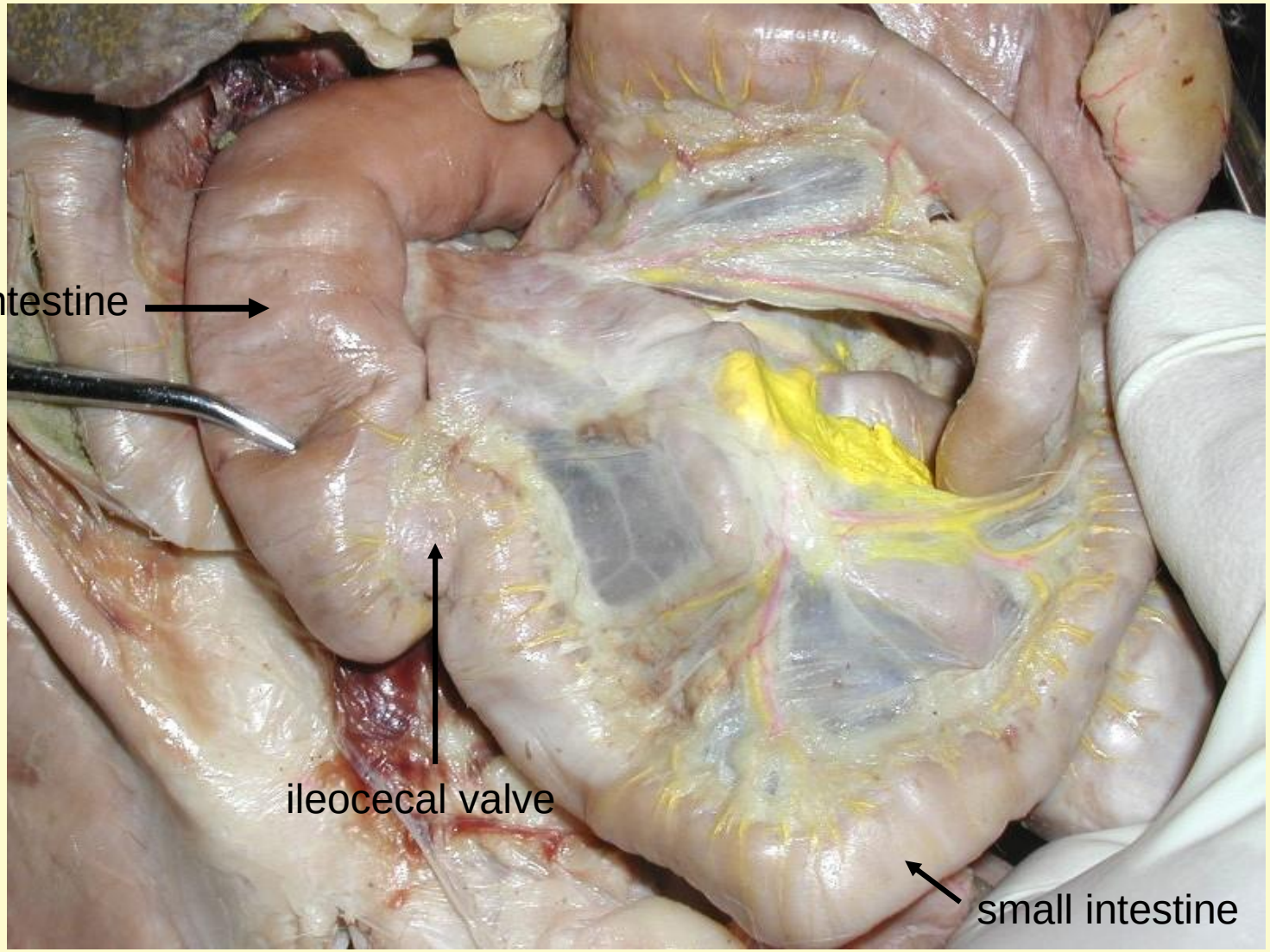


Figure 23.22a


Middle colic a.
Inf. pancreaticodudenal a.
Right colic a.
Ileocolic a.
Appendicular a.
Superior Mesenteric v.
Superior mesenteric a.
Jejunal and ileal a.

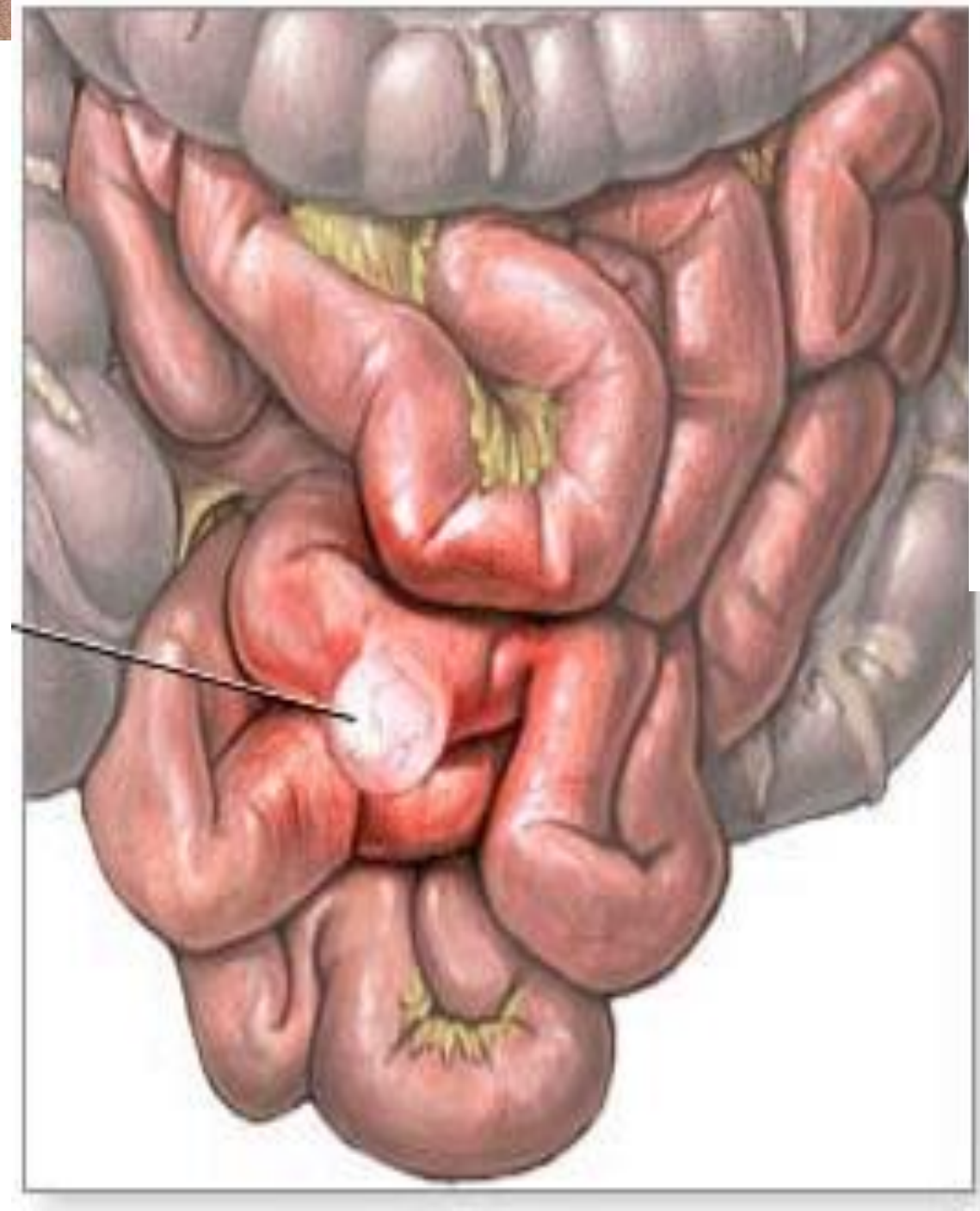

Inferior mesenteric v.
Inferior mesenteric a.
Left colic a.
Sigmoid a.
Superior rectal a.


large intestine
ileocecal valve
small intestine

Congenital anomaly of small intestine

Meckel's Diverticulum:

- a congenital anomaly of the ileum
- Present in 2% of people
- 2 feet from iliocecal junction
- 2 inch long
- contains gastric or pancreatic tissue
- Remains of vitelline duct of embryo



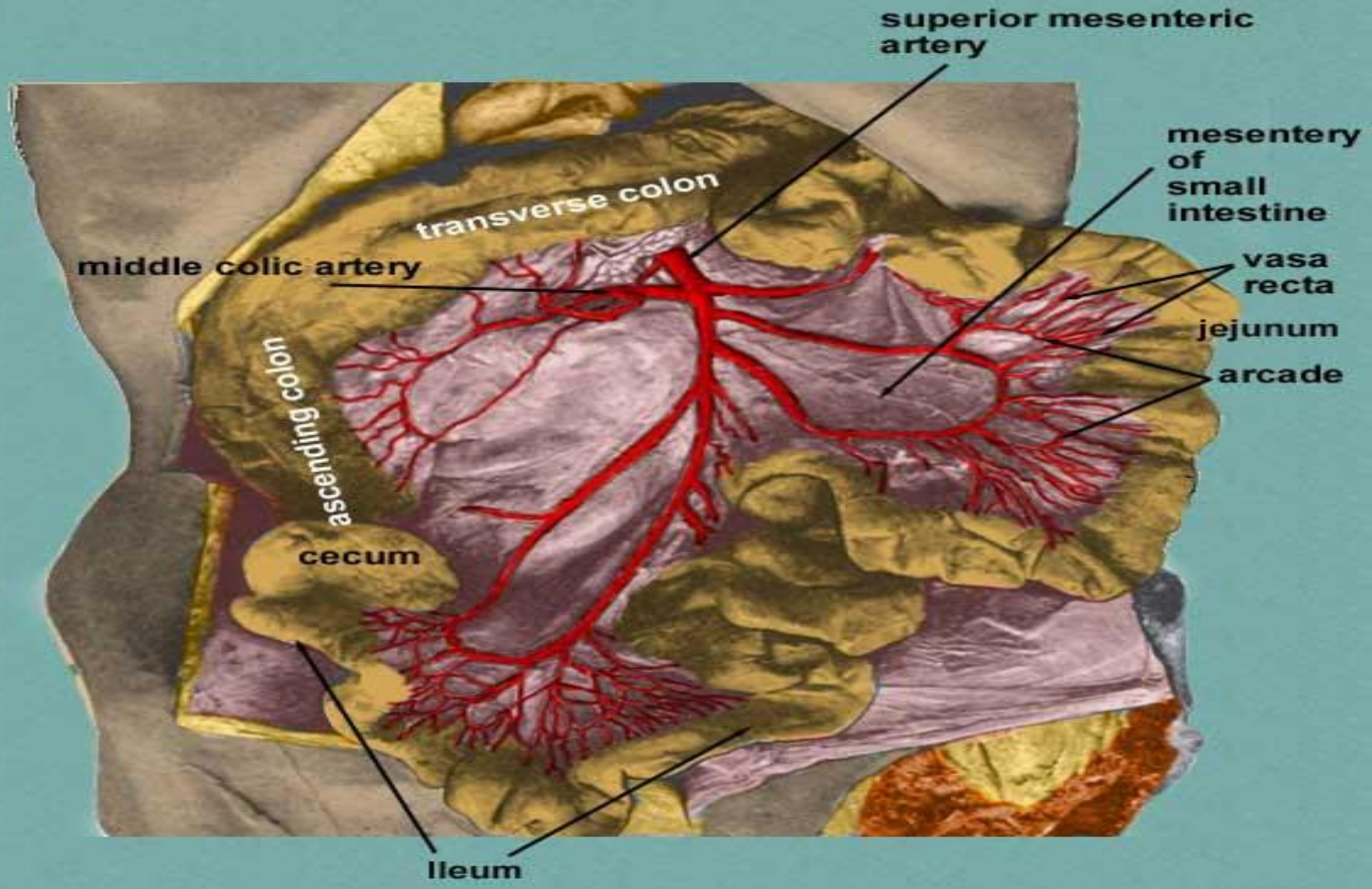

Small intestine
Meckel's diverticulum

Blood supply of Jejunum & Ileum

Arteries:

- The arterial supply is from branches of the **superior mesenteric artery** .
- The intestinal branches arise from **the left side** of the artery and run in the mesentery to reach the gut.
- They anastomosis with one another to form a series of **arcades**.
- The lowest part of the ileum is also supplied by **the ileocolic artery.**

Blood supply for jejunum & Ileum



Nerve supply for small intestine