ANATOMY OF THE DUODENUM

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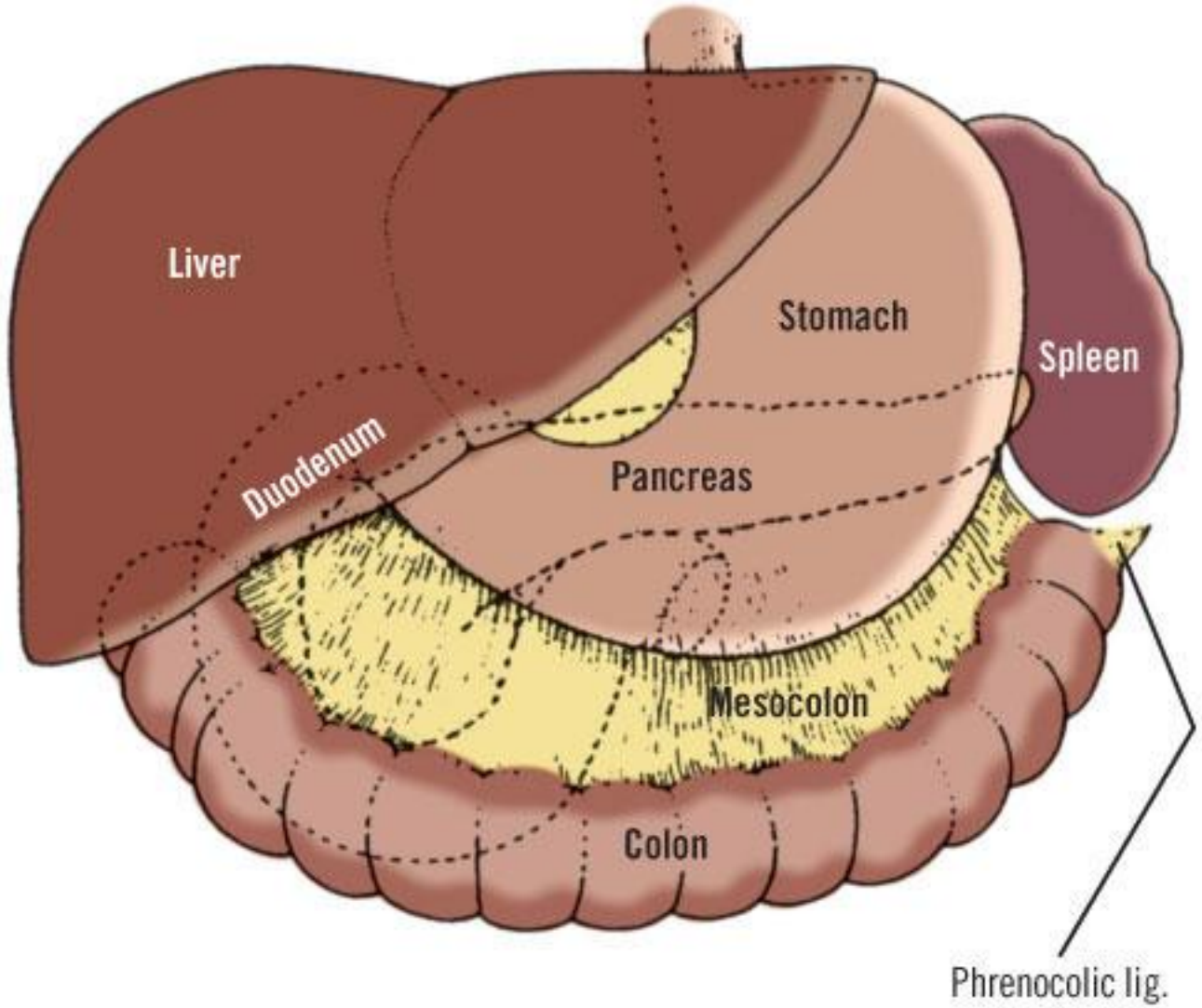
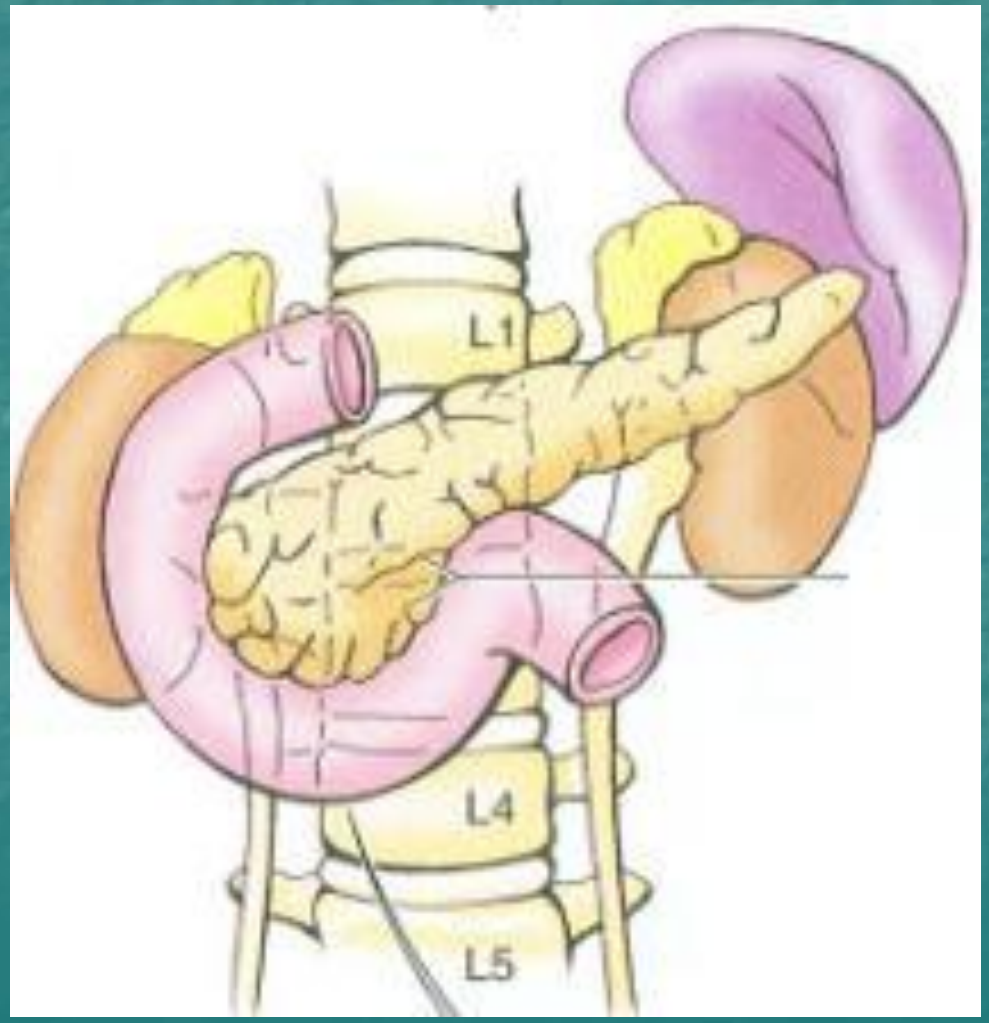
The Duodenum



Duodenum

Shortest (25cm) part of the small intestine.
Joins the stomach to the jejunum.
Pursues a C–shaped course around the head of pancreas.
Begins at the pylorus on the right side L1.
Ends at the duodenojejunal junction on the left (L2).
A retroperitoneal structure except 1st inch.
Receives the opening of bile & pancreatic duct.



Parts of the Duodenum

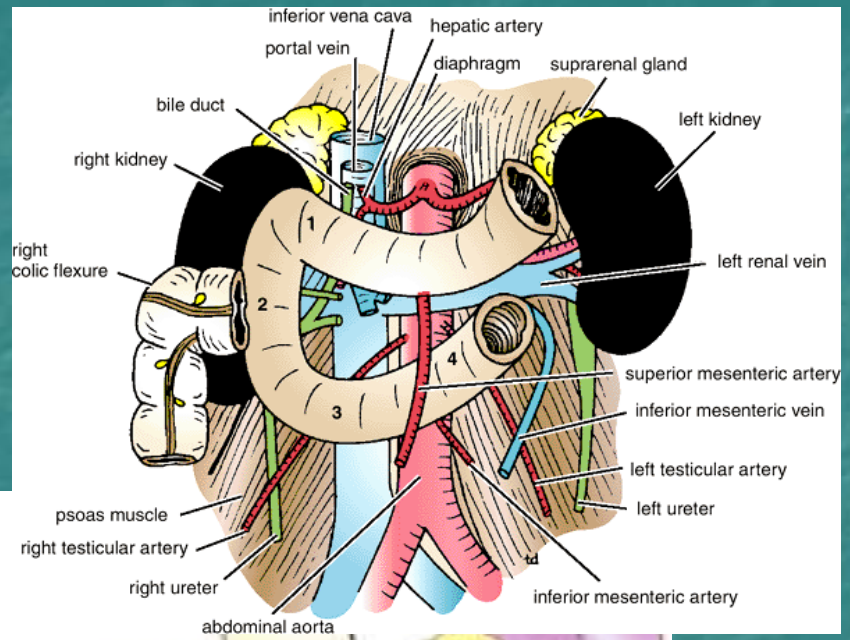
Divided into four parts

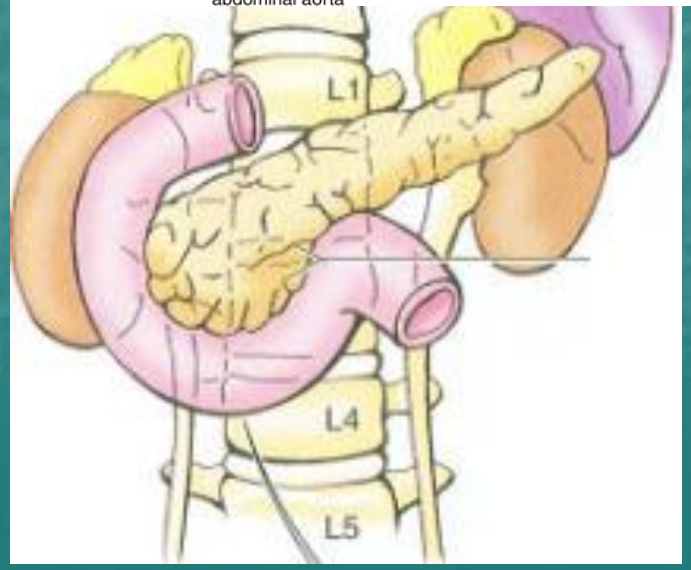
1. Sup. (1st part) 5cm--Lies ant. to the body of the L1.

2. Descending (2nd part) 7-10cm descends along the side of the L1 – L3.

3. Horizontal (3rd part) 6-8cm--crosses the L3.

4. Ascending (4th part) 5cm -- begins at left of L3 & rises as for as the upper border of L2





- **First Part (Superior):** 5 cm long. The proximal half is mobile; the distal half is fixed.
- The duodenum passes upward from the pylorus to the neck of the gallbladder (Fig. 16-7). It is related (1) posteriorly to the common bile duct, portal vein, inferior vena cava, and gastroduodenal artery; (2) anteriorly to the quadrate lobe of the liver; (3) superiorly to the epiploic foramen; and (4) inferiorly to the head of the pancreas.

- The initial 2.5 cm is freely movable and is covered by the same two layers of peritoneum that invest the stomach. The hepatoduodenal portion of the lesser omentum attaches to the superior border of the duodenum; the greater omentum attaches to its inferior border. The distal 2.5 cm is covered with peritoneum only on the anterior surface of the organ, so that the posterior surface is in intimate contact with the bile duct, the portal vein, and the gastroduodenal artery. The duodenum is separated from the inferior vena cava by a small amount of connective tissue.

First Part

Begins at the pylorus & runs upward & backward of the 1st lumbar vertebra

Relation

Anteriorly

Quadrate lobe of the liver & Gall bladder

Posteriorly

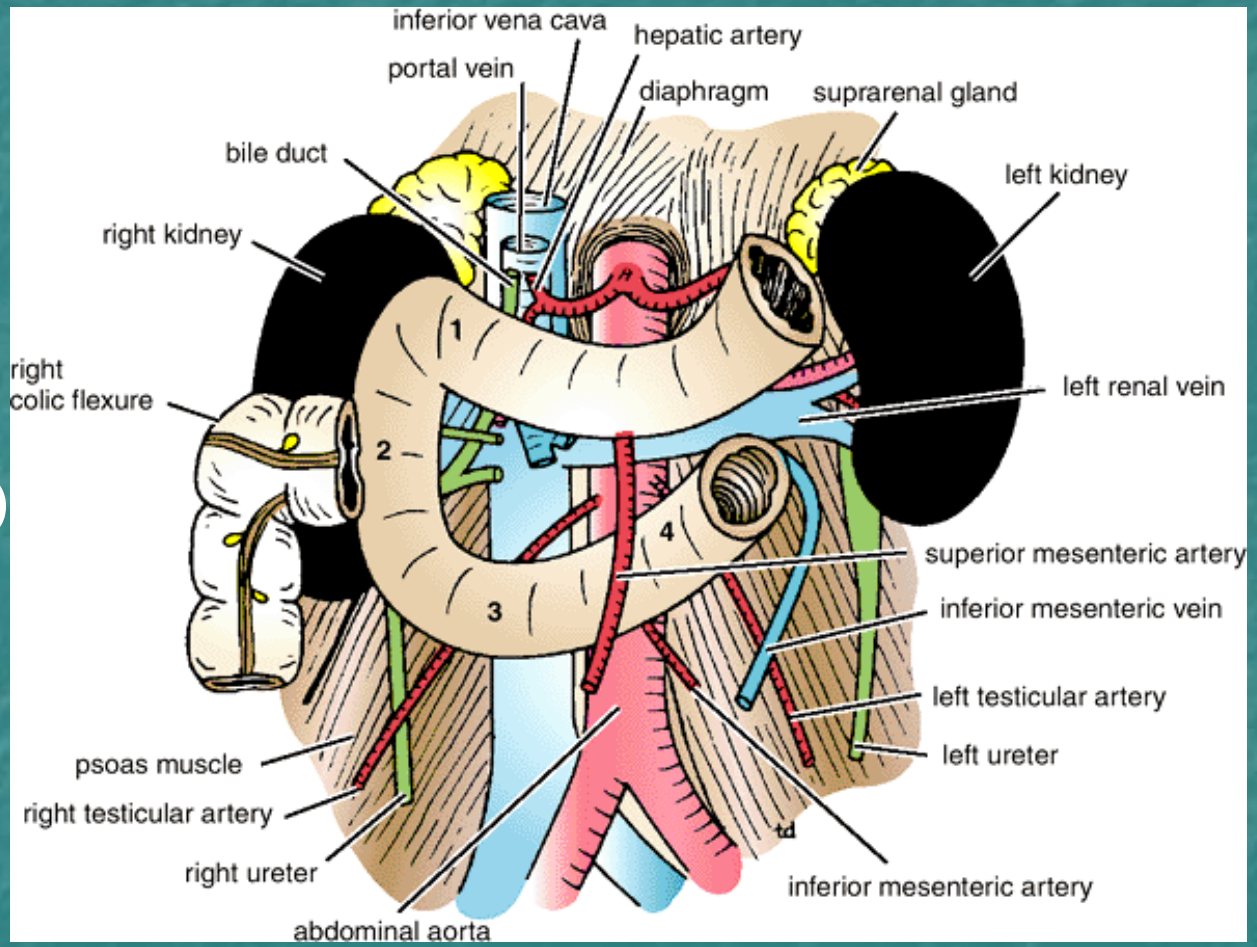
Lesser sac (1st inch only) gastroduodenal artery, bile duct, & IVC

Superiorly

Epiploic foramen

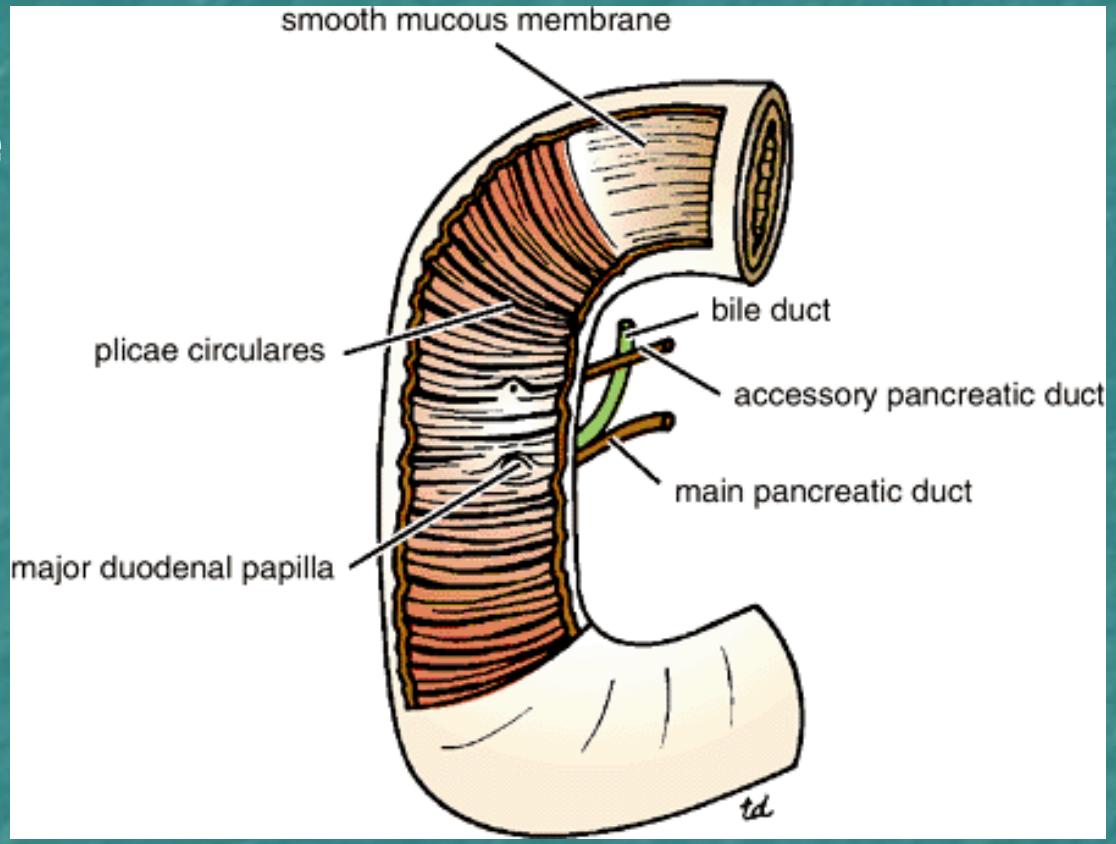
Inferiorly

Head of pancreas



Second Part

Runs vertically downward in front of the hilum of the right kidney on the right side of the L2 & L3.
At posteromedial border, bile & main pancreatic ducts open.
The two ducts unite to form the ampulla that opens on the summit of the *Major duodenal papilla*
opening of accessory pancreatic ducts little higher than the Major papilla *Minor duodenal papilla*



- This part of the duodenum is crossed by the transverse colon and the mesocolon and consists, therefore, of a supramesocolic portion and an inframesocolic portion. The parts above and below the attachment of the transverse colon are covered with visceral peritoneum. The first and second parts of the duodenum join behind the costal margin a little above and medial to the tip of the ninth costal cartilage and on the right side of the first lumbar vertebra.

- The second part of the duodenum forms an acute angle with the first part, and descends from the neck of the gallbladder anterior to the hilum of the right kidney, the right ureter, the right renal vessels, the psoas major, and the edge of the inferior vena cava. It is related anteriorly to the right lobe of the liver, the transverse colon, and the jejunum. At about the midpoint of the second part of the duodenum, the pancreaticobiliary tract opens into its concave posteromedial side. The right side is related to the ascending colon and the right colic flexure.

Relation of the 2nd part

Anteriorly

Fundus of the gall bladder, right lobe of liver, transverse colon, & coils of the small intestine

Posteriorly

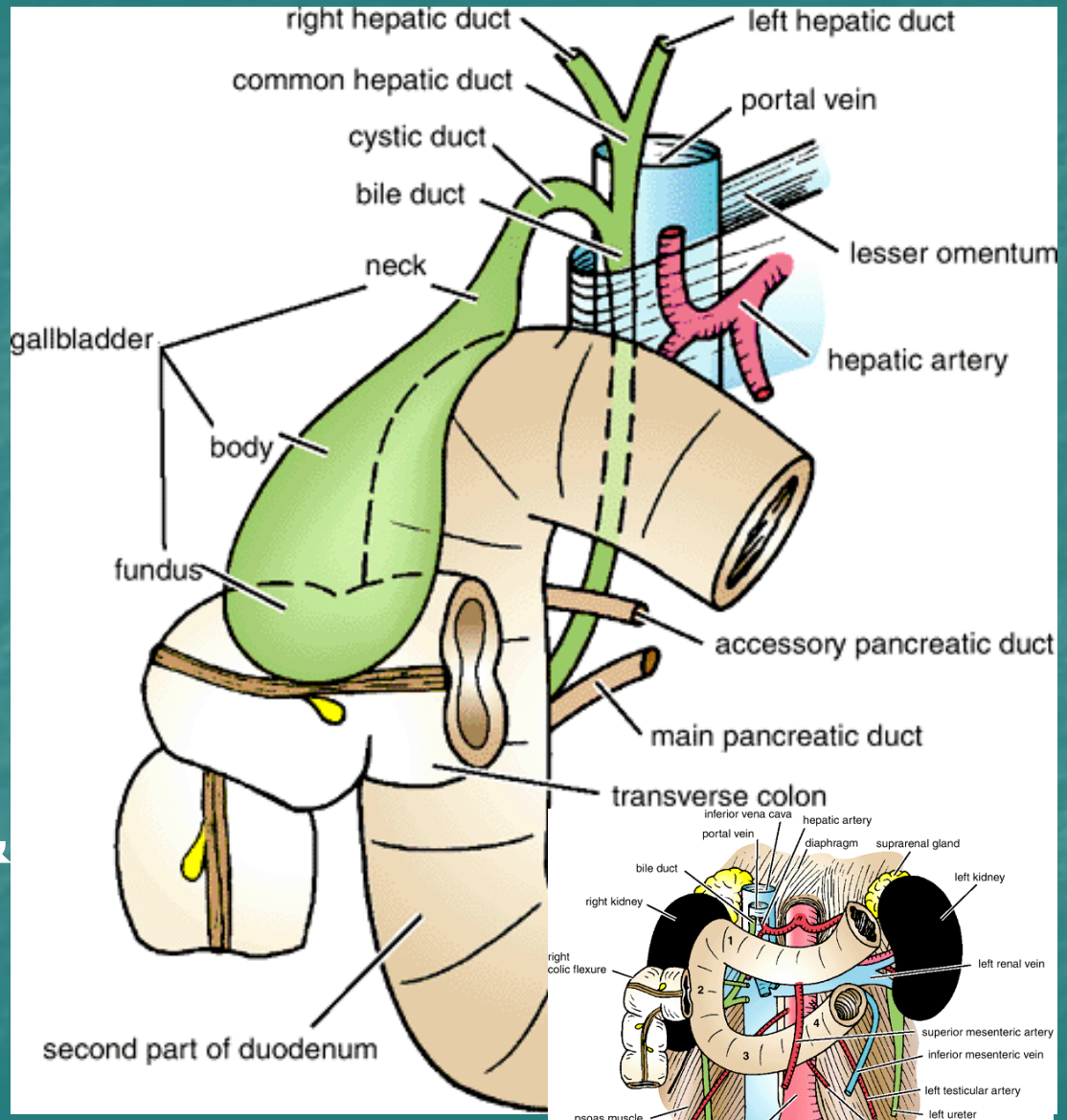
Hilum of the right kidney & right ureter

Laterally

Ascending colon, right colic flexure& right lobe of liver

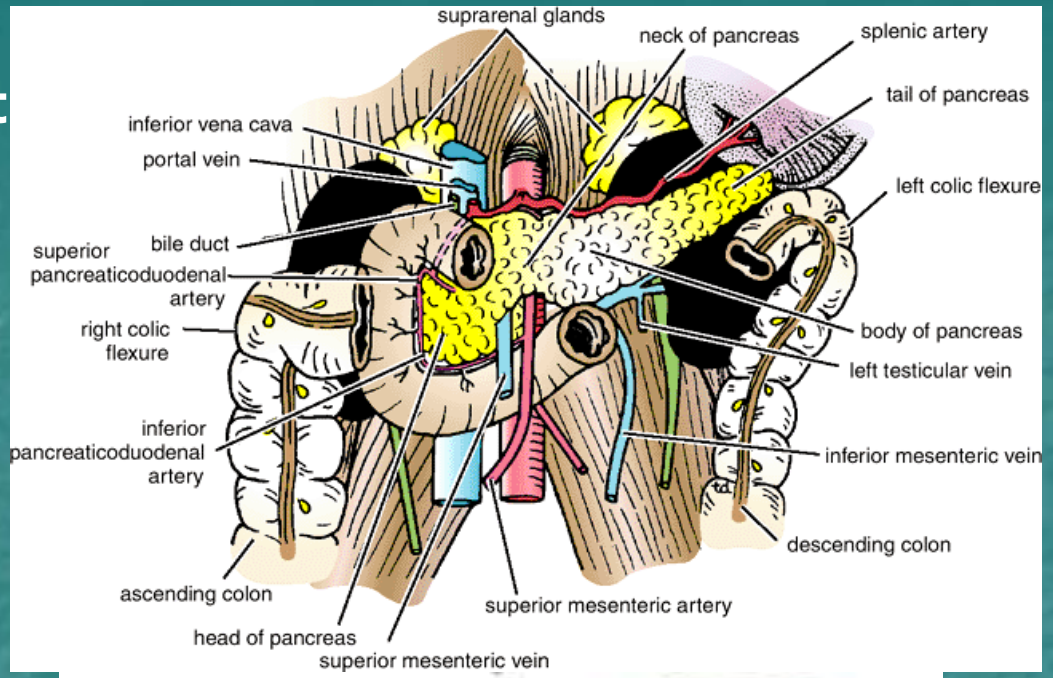
Medially

Head of pancreas, the bile & min pancreatic ducts



Third Part

Runs horizontally to the left on the subcostal plain, passing the vertebral column in front of L3 following the lower margin of pancreas



Relation

Anteriorly

Mesentery of small intestine, SMA, SMV, coils of jejunum

Posteriorly

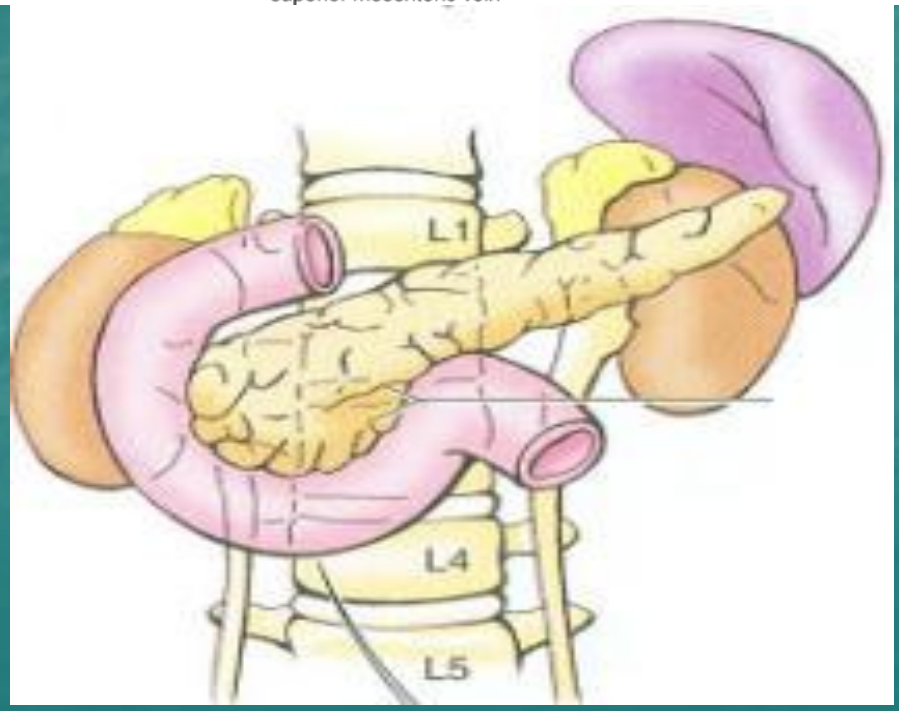
Right ureter, right psoas muscle, IVC & aorta

Superiorly

Head of pancreas

Inferiorly

Coils of jejunum

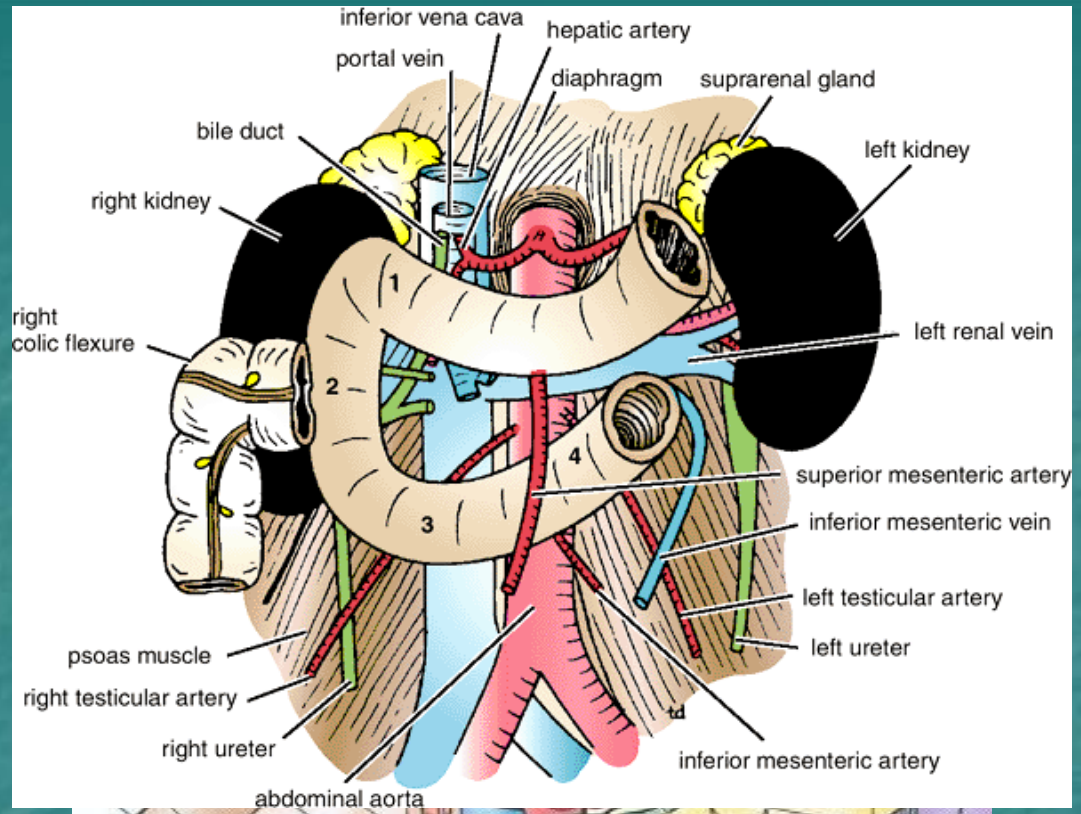


- The third part of the duodenum begins about 5 cm from the midline, to the right of the lower end of the third lumbar vertebra, at about the level of the subcostal plane. The third, or transverse, part passes to the left, anterior to the ureter, the right gonadal vessels, the psoas muscle, the inferior vena cava, the lumbar vertebral column, and the aorta. It ends to the left of the third lumbar vertebra.

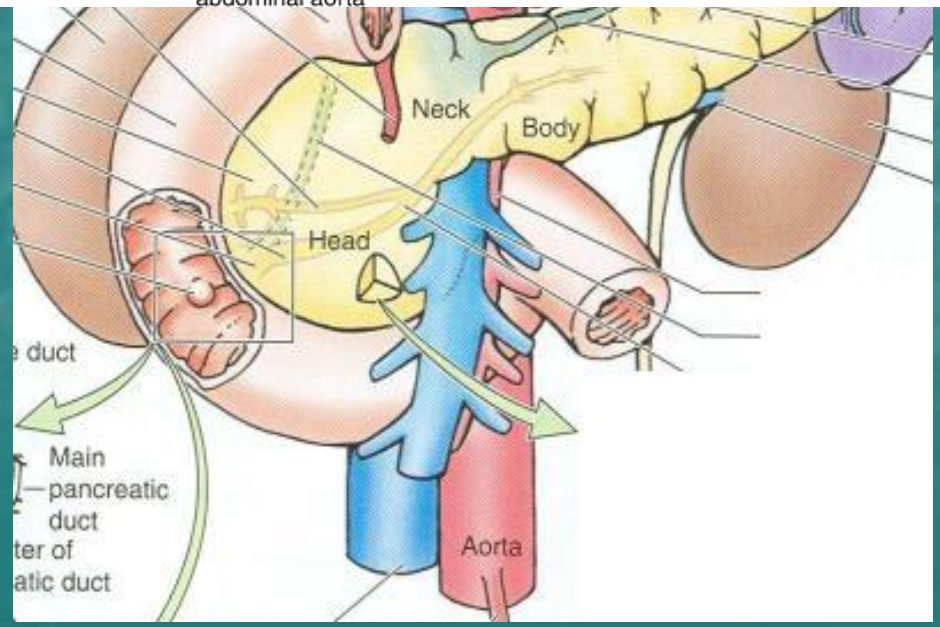
- This inframesocolic portion of the duodenum is covered anteriorly by the peritoneum. It is crossed anteriorly by the superior mesenteric vessels and, near its termination, by the root of the mesentery of the small intestine. The third part is related superiorly to the head and uncinate process of the pancreas. The inferior pancreaticoduodenal artery lies in a groove at the interface of the pancreas and the duodenum. Anteriorly and inferiorly, this part of the duodenum is related to the small bowel, primarily to the jejunum.

Fourth Part

Runs upward along the left side of the aorta & curves ant to join jejunum forms an acute angle *duodenojejunal flexure* The flexure is held in position by a peritoneal fold the



***ligament of Treitz* which is attached to the right curse of the diaphragm, fixes the terminal part of the duodenum and prevents it from moving inferiorly**



- The fourth, or ascending, part of the duodenum is directed obliquely upward. It ends at the duodenojejunal junction to the left and at the level of the second lumbar vertebra at the root of the transverse mesocolon. This junction occurs at about 4 cm below and medial to the tip of the ninth costal cartilage. The fourth part is related posteriorly to the left sympathetic trunk, the psoas muscle, and the left renal and gonadal vessels. Its termination is very close to the terminal part of the inferior mesenteric vein, to the left ureter, and to the left kidney. The upper end of the root of the mesentery also attaches here. The duodenojejunal junction is suspended by the ligament of Treitz, a remnant of the dorsal mesentery, which extends from the duodenojejunal flexure to the right crus of the diaphragm.

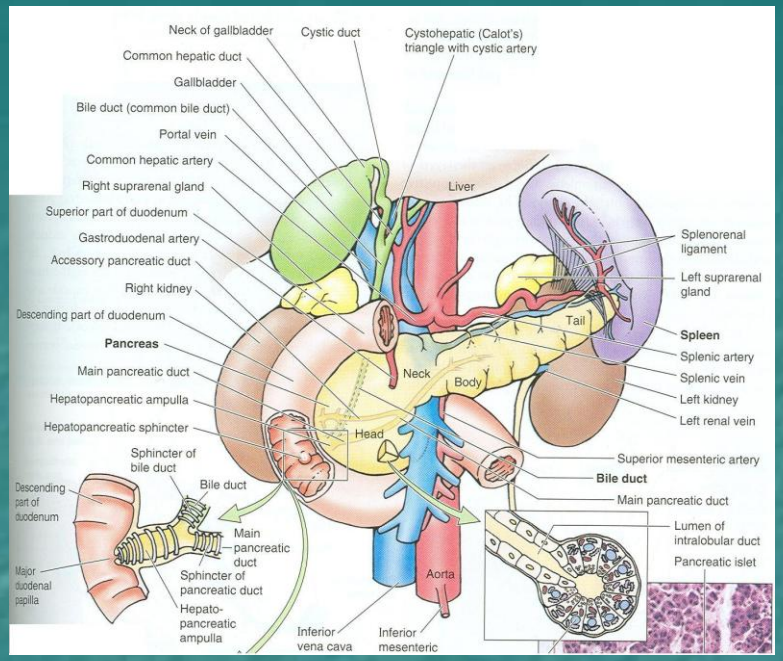
Relation

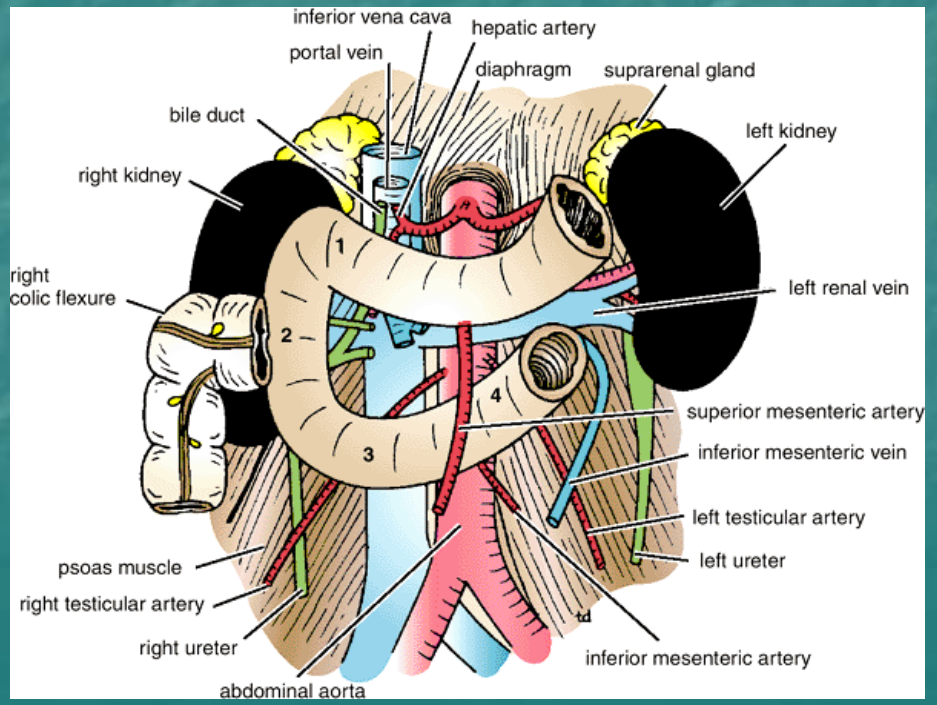
Anteriorly

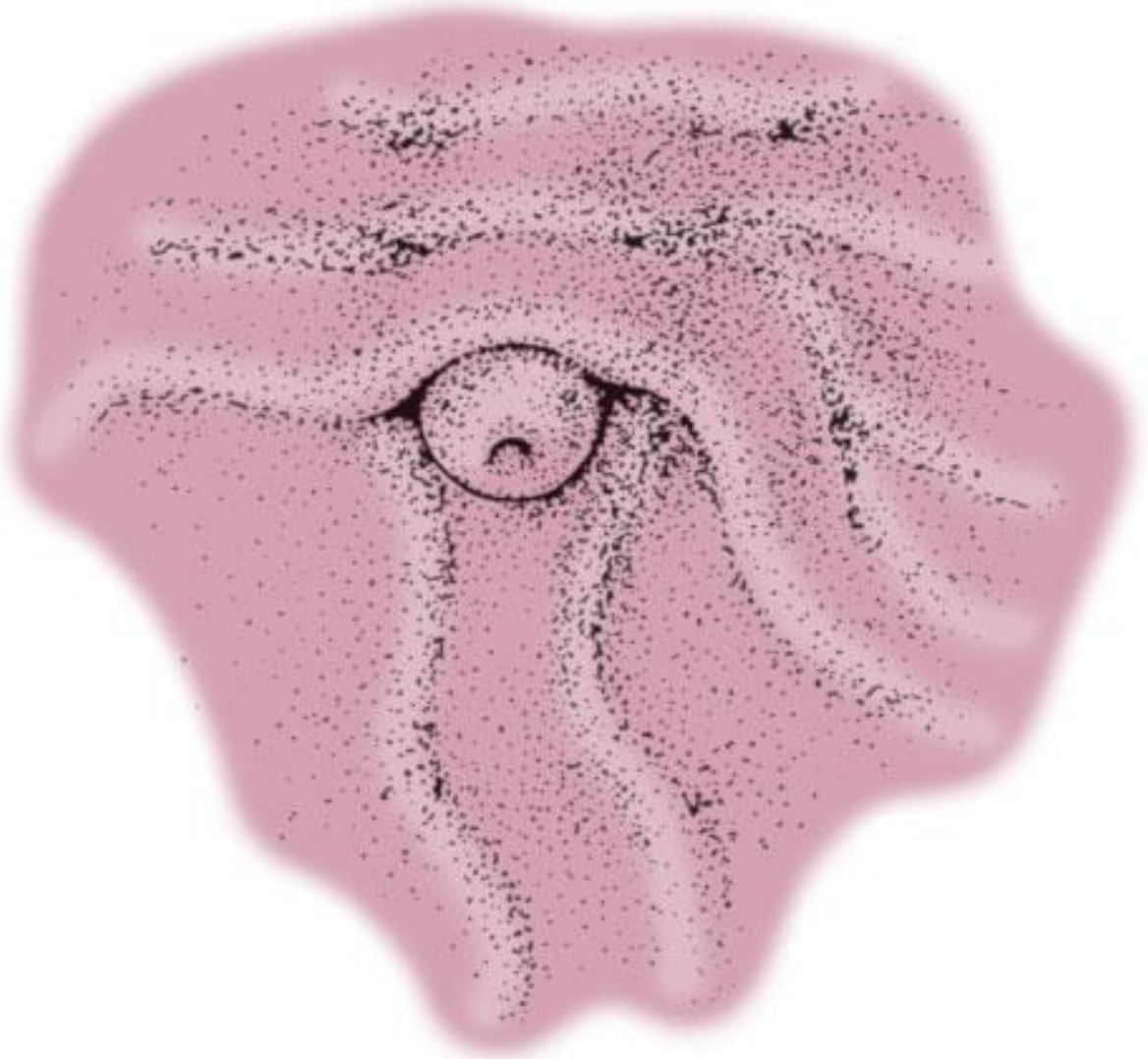
Root mesentery & coils of jejunum

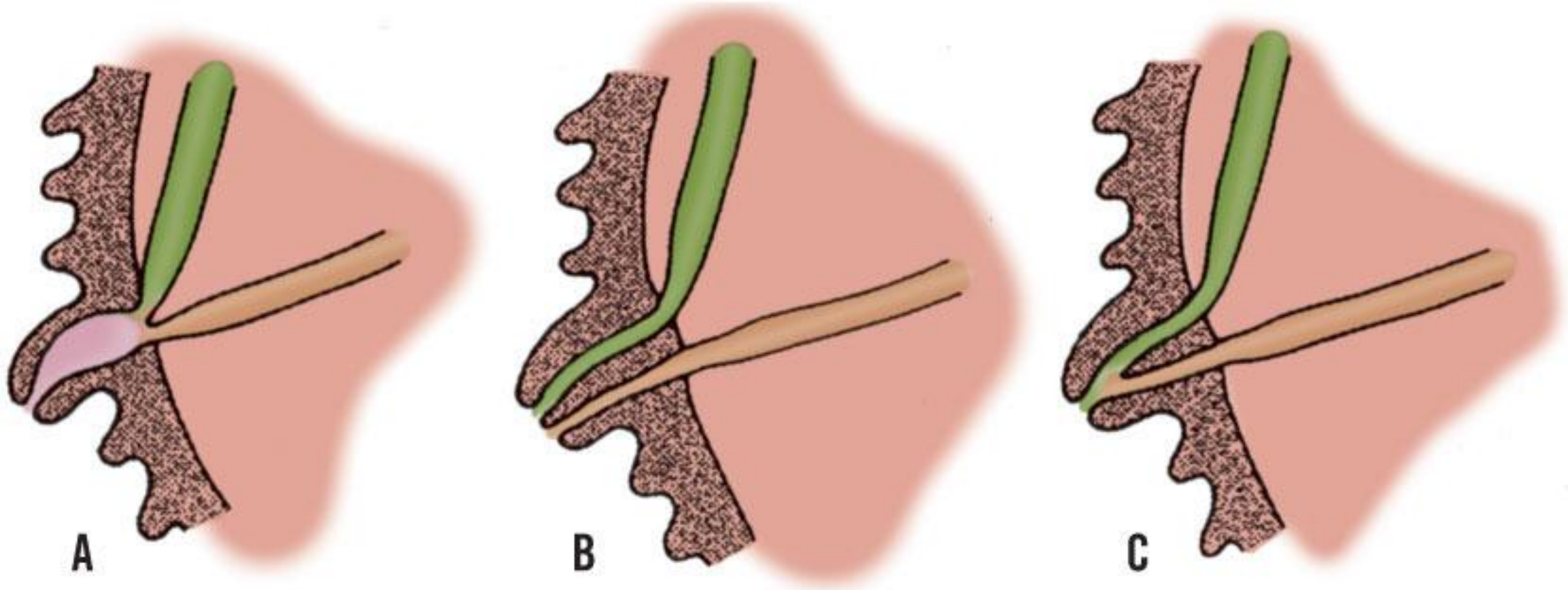
Posteriorly

Left margin of aorta & medial border of left psoas







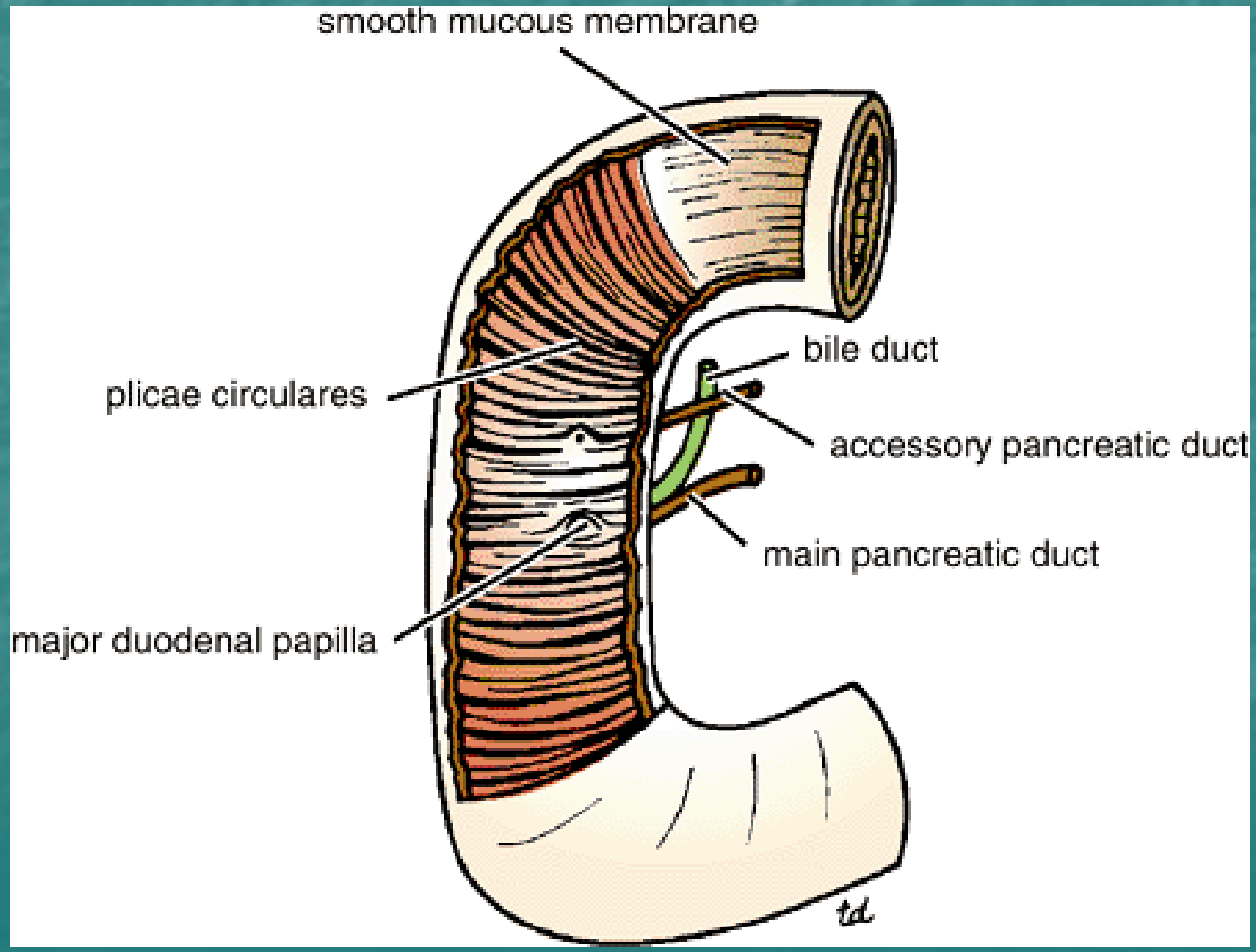


Mucous Membrane and Duodenal Papillae

Mucus membrane is thick.

In the first part of the duodenum it is smooth. In the remainder of the duodenum it is thrown into numerous circular folds called the

plicae circularis

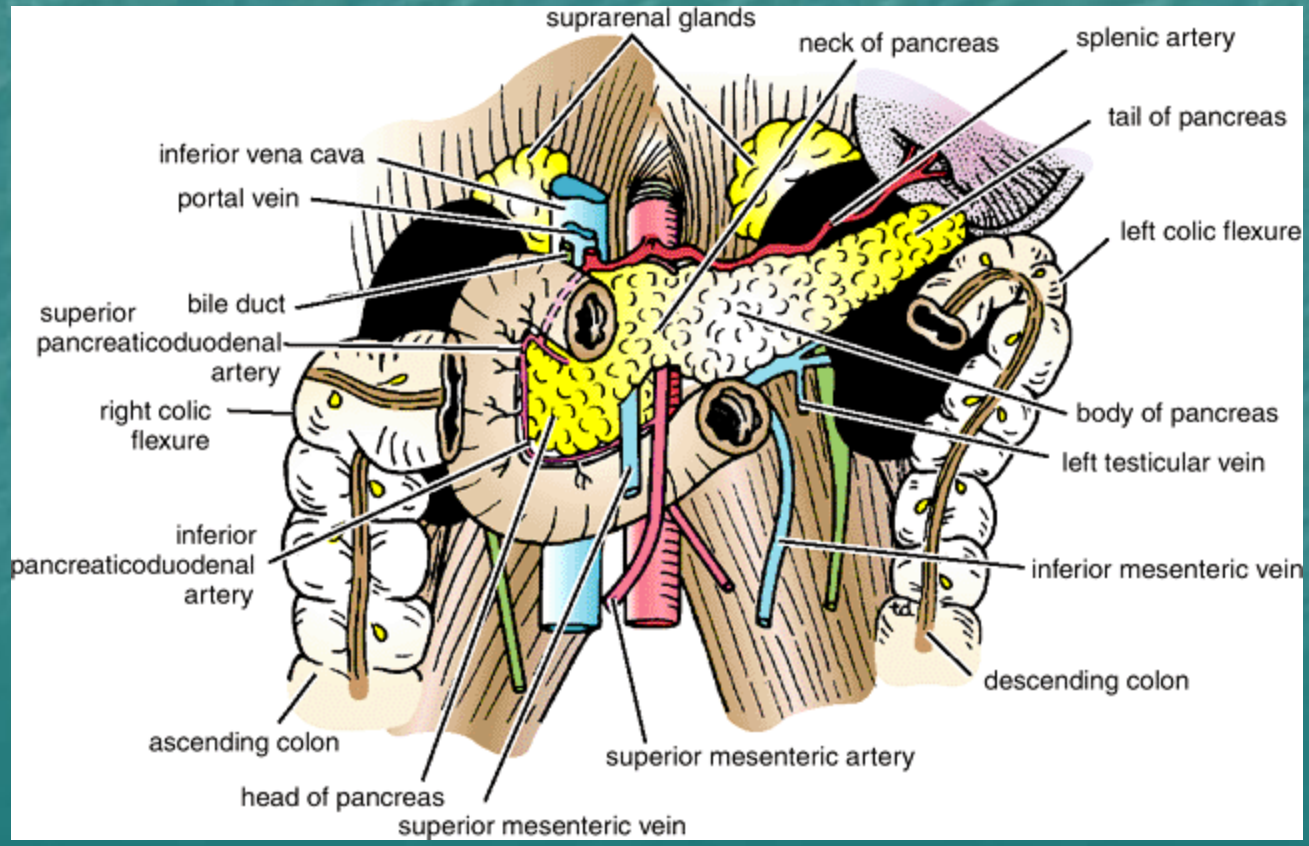


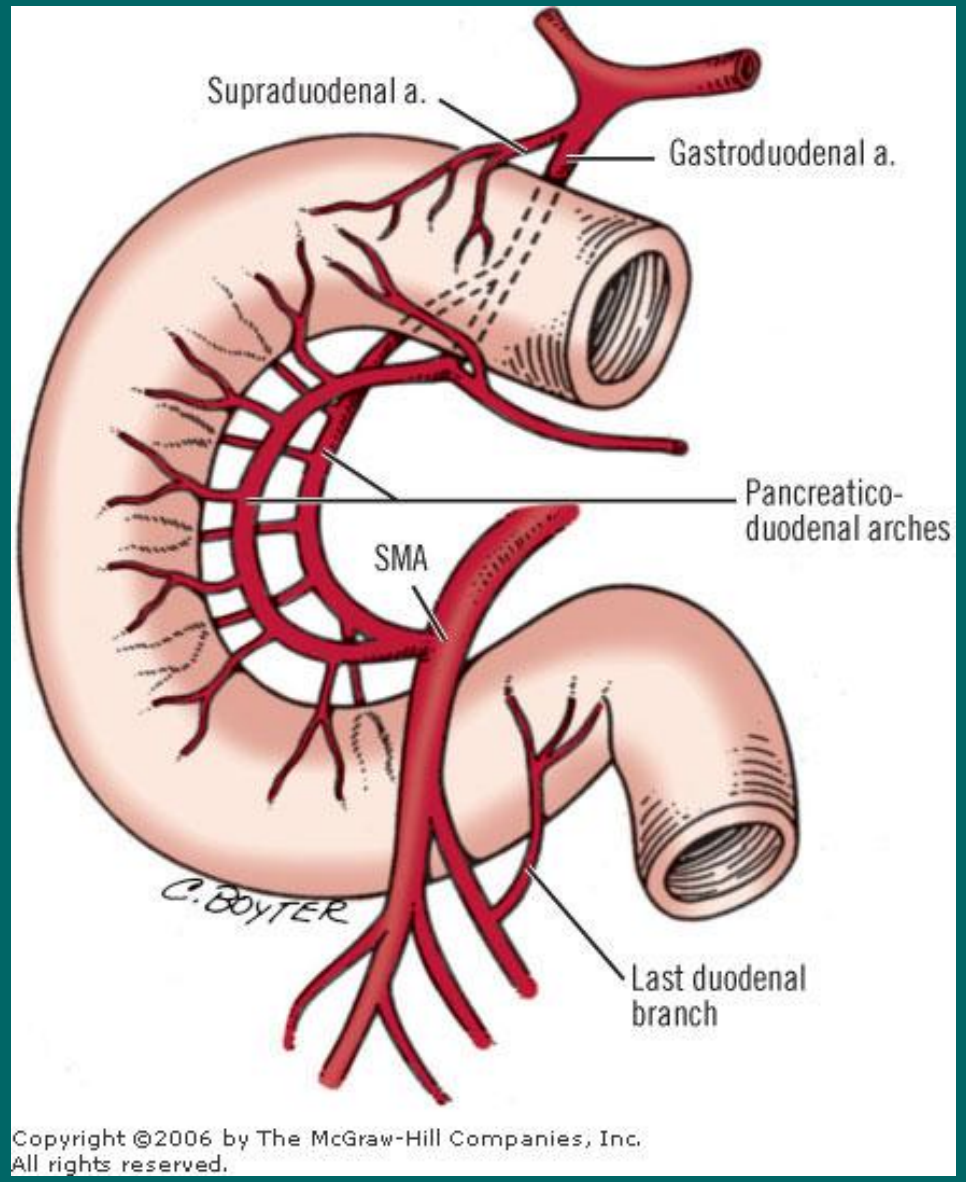
Arteries

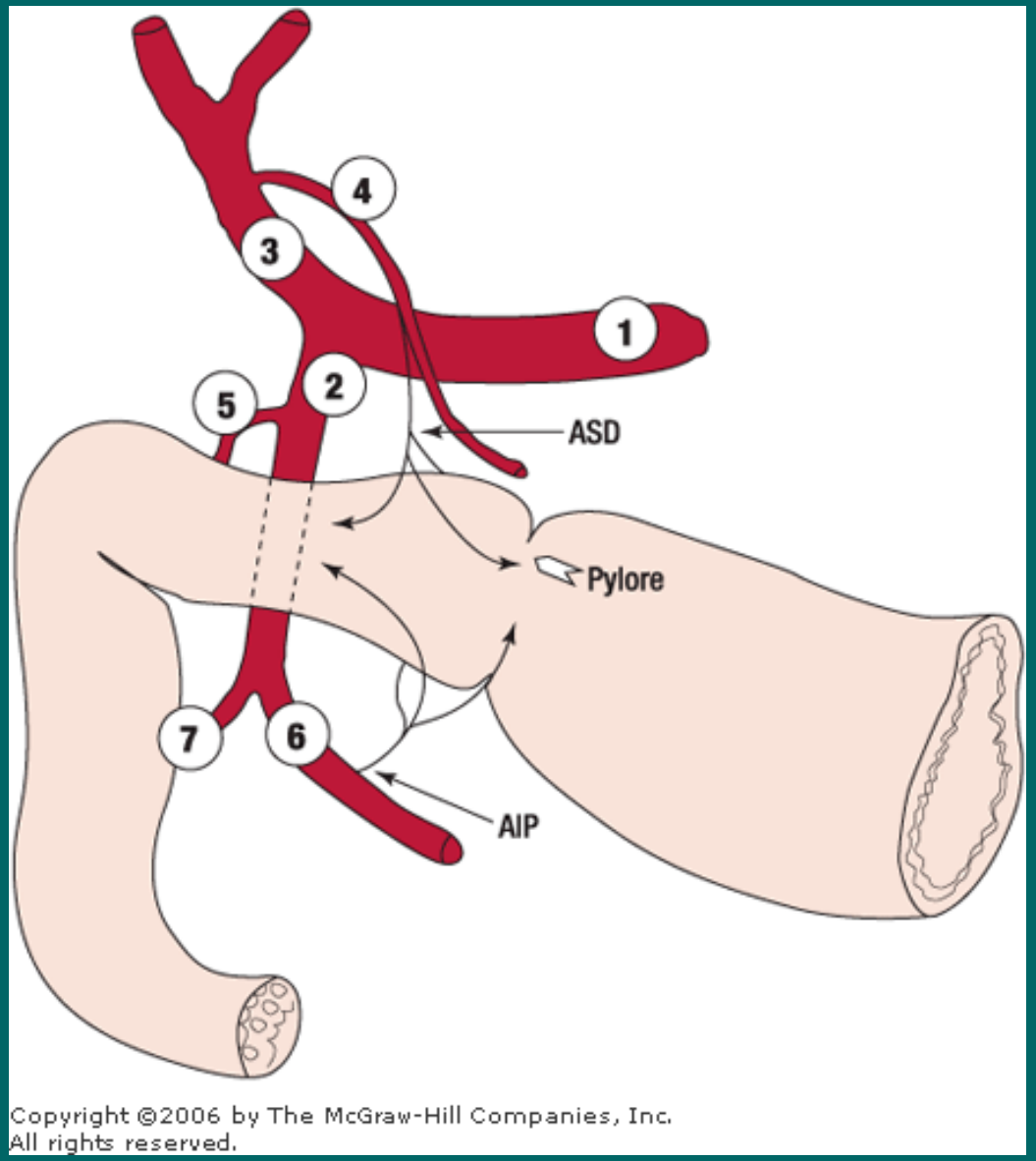
The upper half is supplied by the sup pancreaticoduodenal artery br of gastroduodenal artery. The lower half is supplied by the inf pancreaticoduodenal artery br of SMA

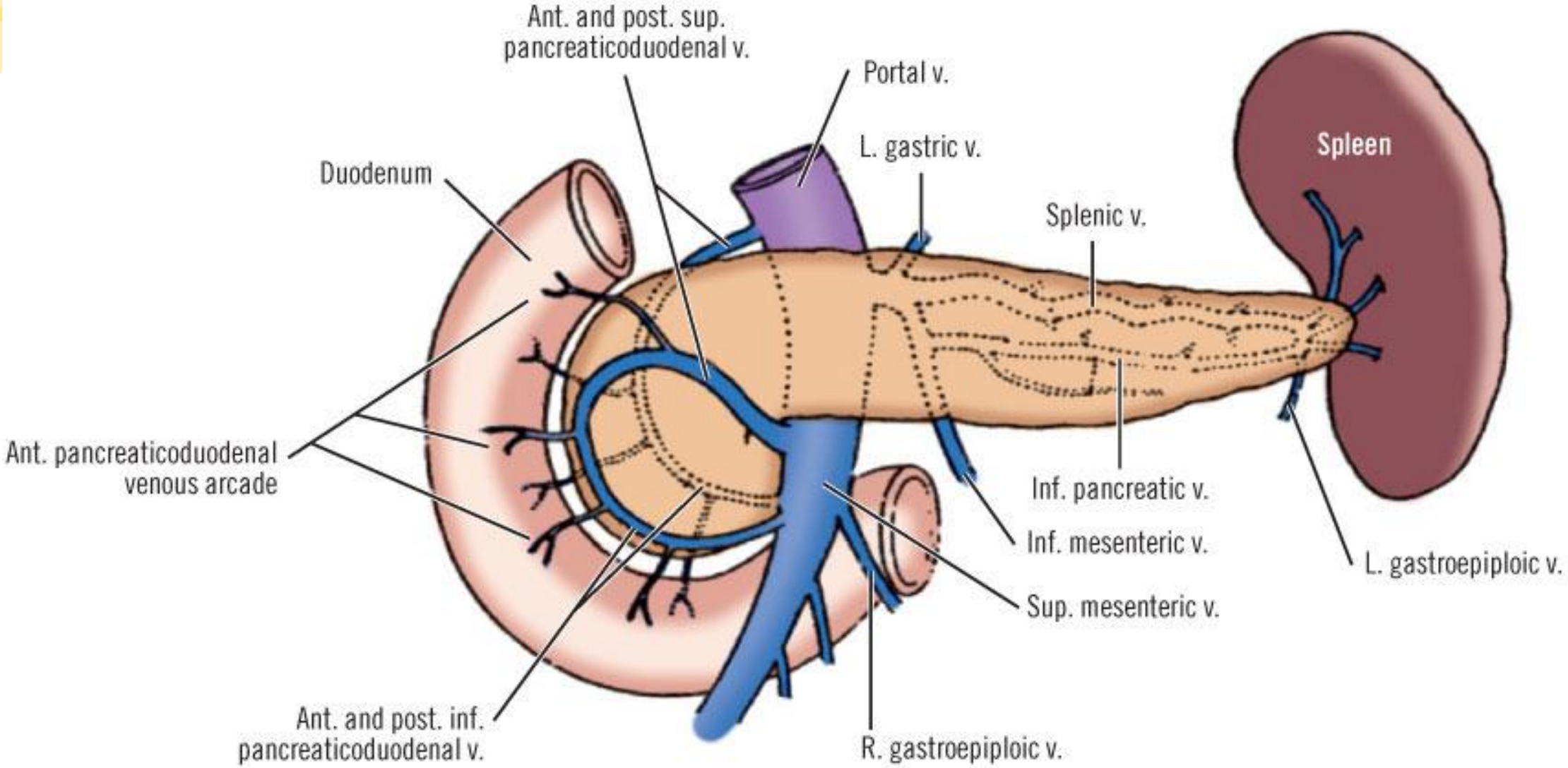
Veins

Sup pancreaticoduodenal artery into portal & inf pancreaticoduodenal drains into SMA



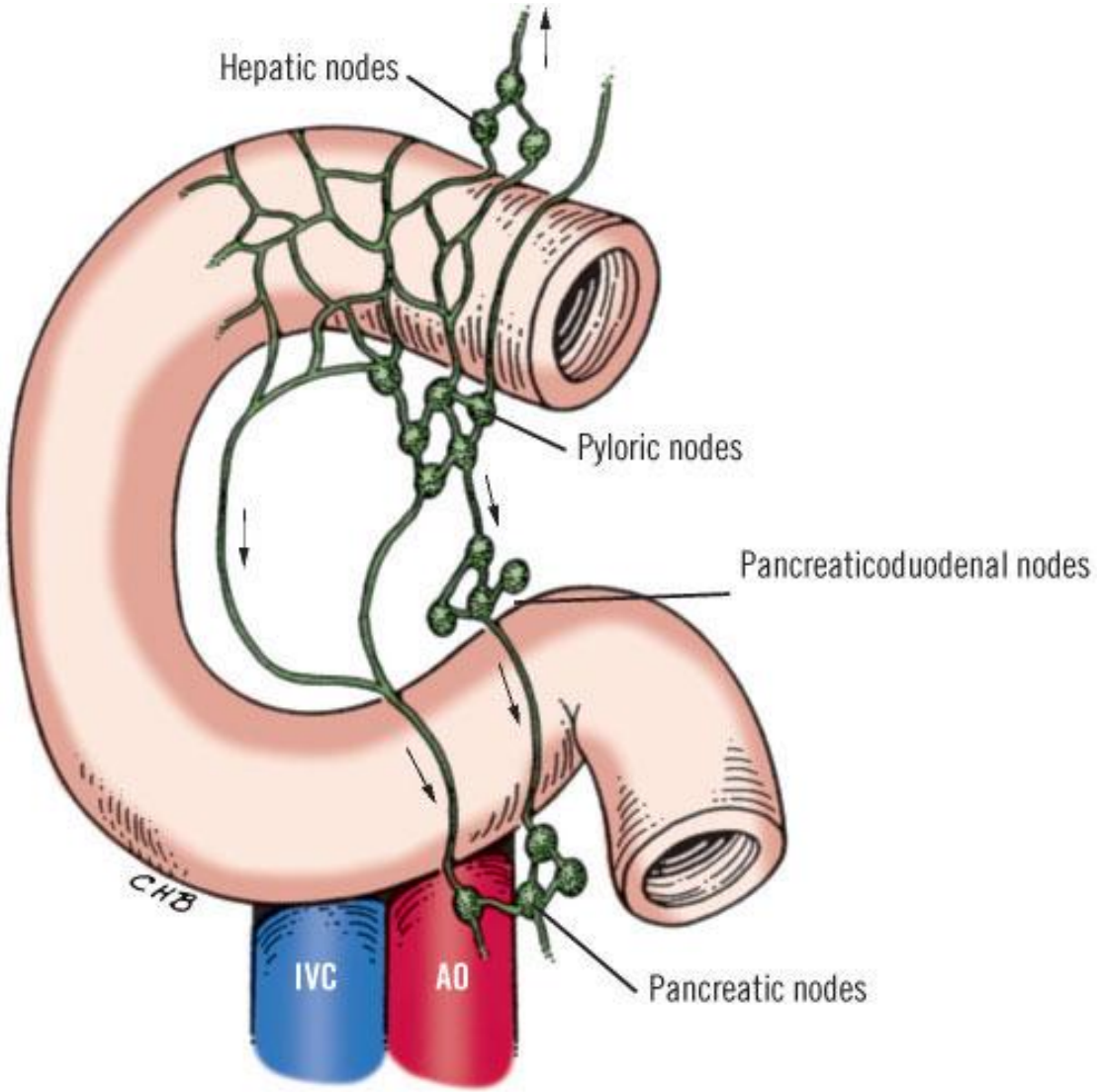






Nerve Supply

Sympathetic & parasympathetic (vagus) nerves
from celiac & superior mesenteric plexuses



Clinical Notes

Trauma to the duodenum

In severe injury to ant abdominal wall, the 3rd part
May be severely crushed against the L3

Duodenal Ulcer

An ant ulcer of the 1st inch of 1st part may perforate into greater sac and the fluid my go to the right iliac fossa. In this case the differential diagnoses b/w a perforated duodenal ulcer & perforated appendix may be difficult

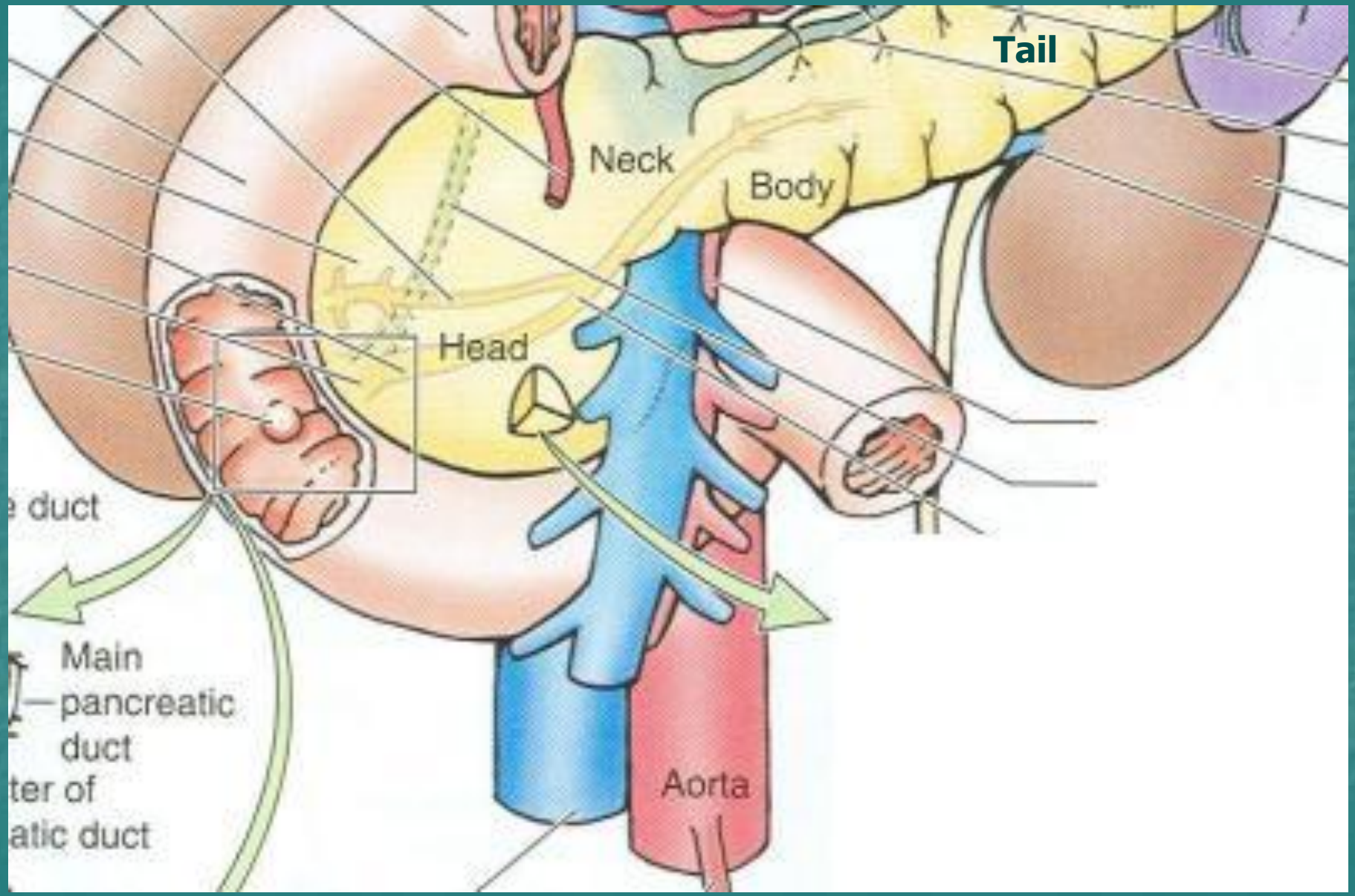
Duodenal Recesses

Close to the duodenojejunal junction, there may be four small pocketlike pouches of peritoneum called the superior duodenal,

inferior duodenal, paraduodenal and retroduodenal recesses

Important Duodenal Relation

Gallstone may ulcerate the duodenum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Body
Head
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Main
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