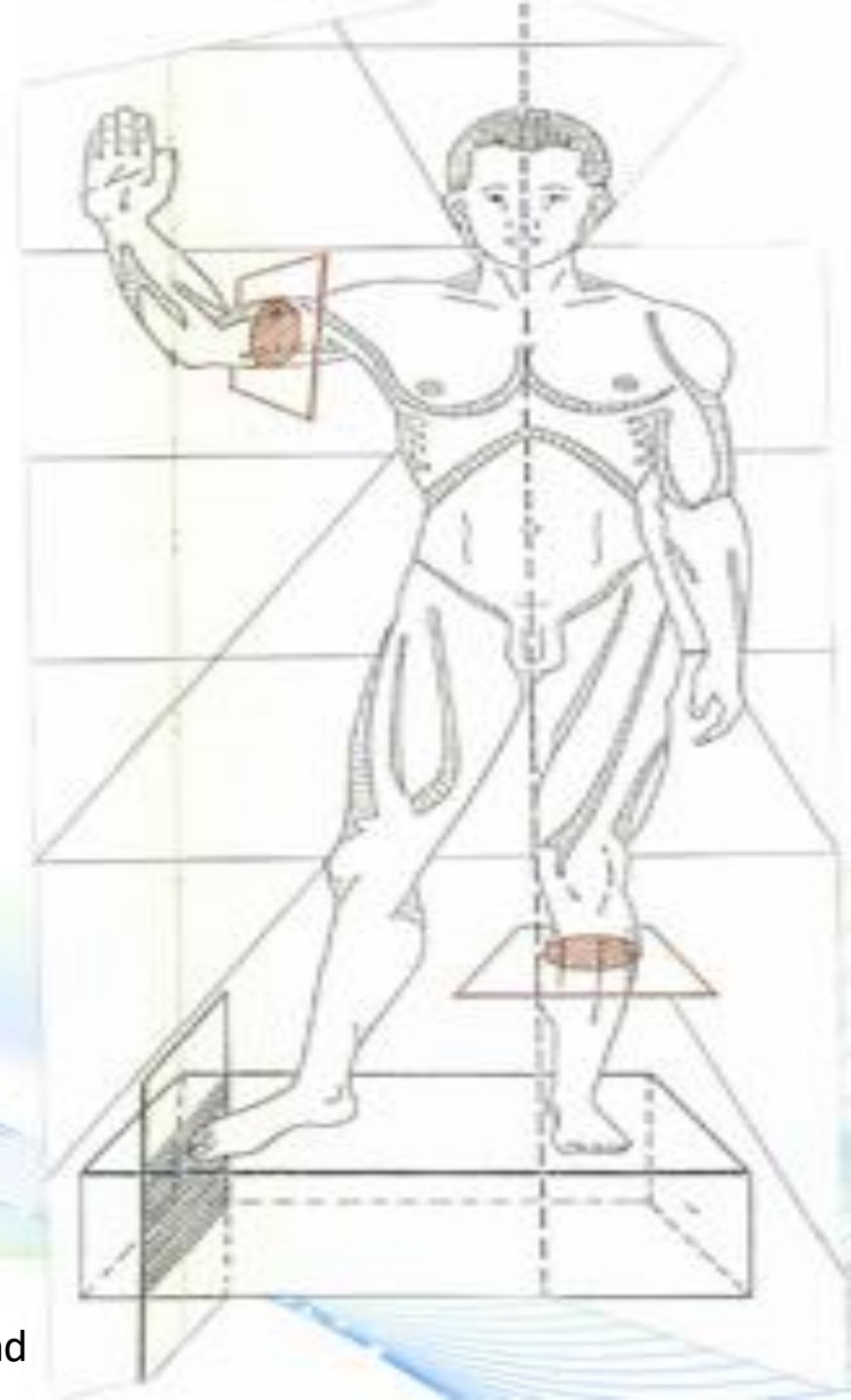
PANCREAS



Pr M. D. EL AMRANI Dr BENTALEB Oussama Dr WAKRIM Hind

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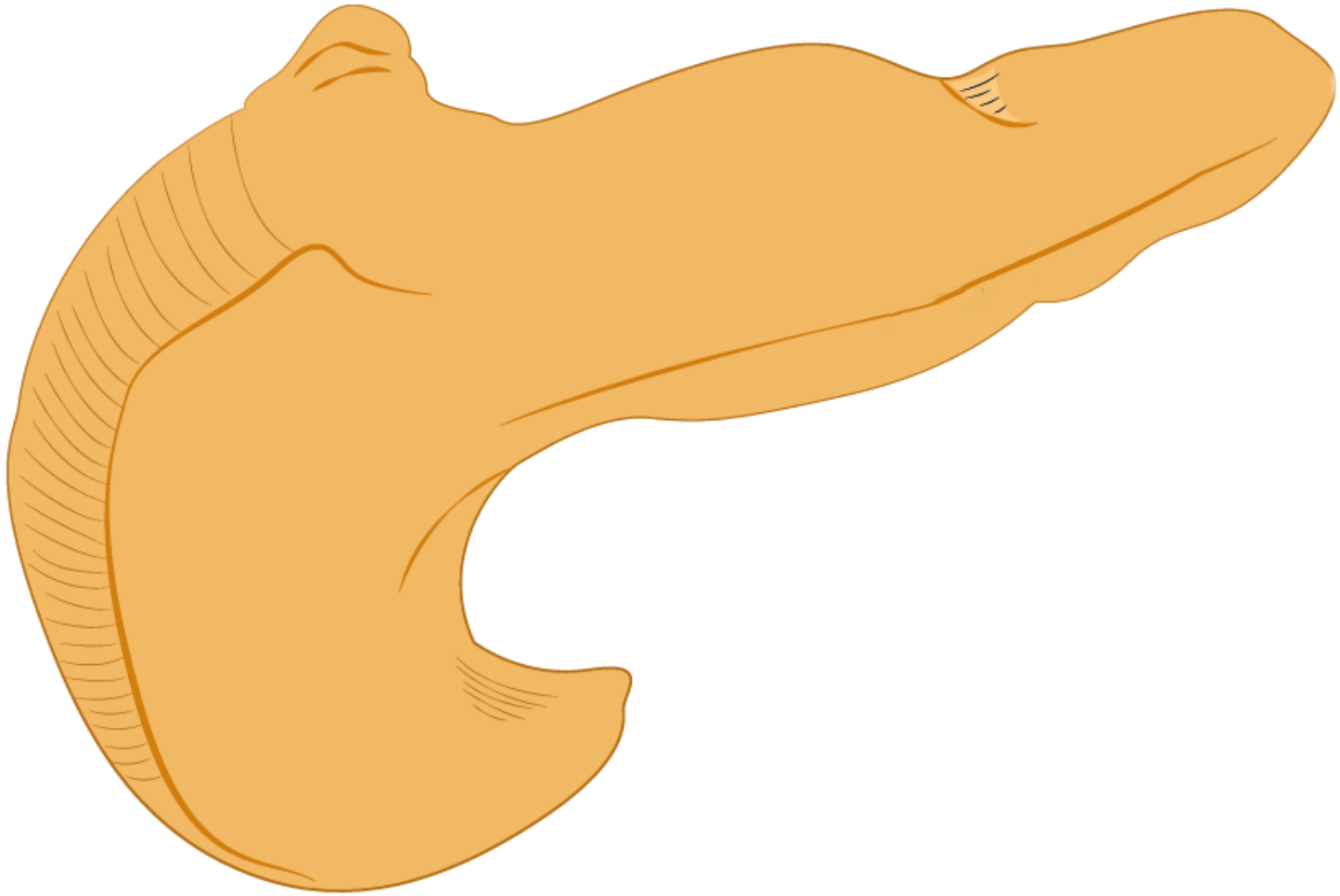
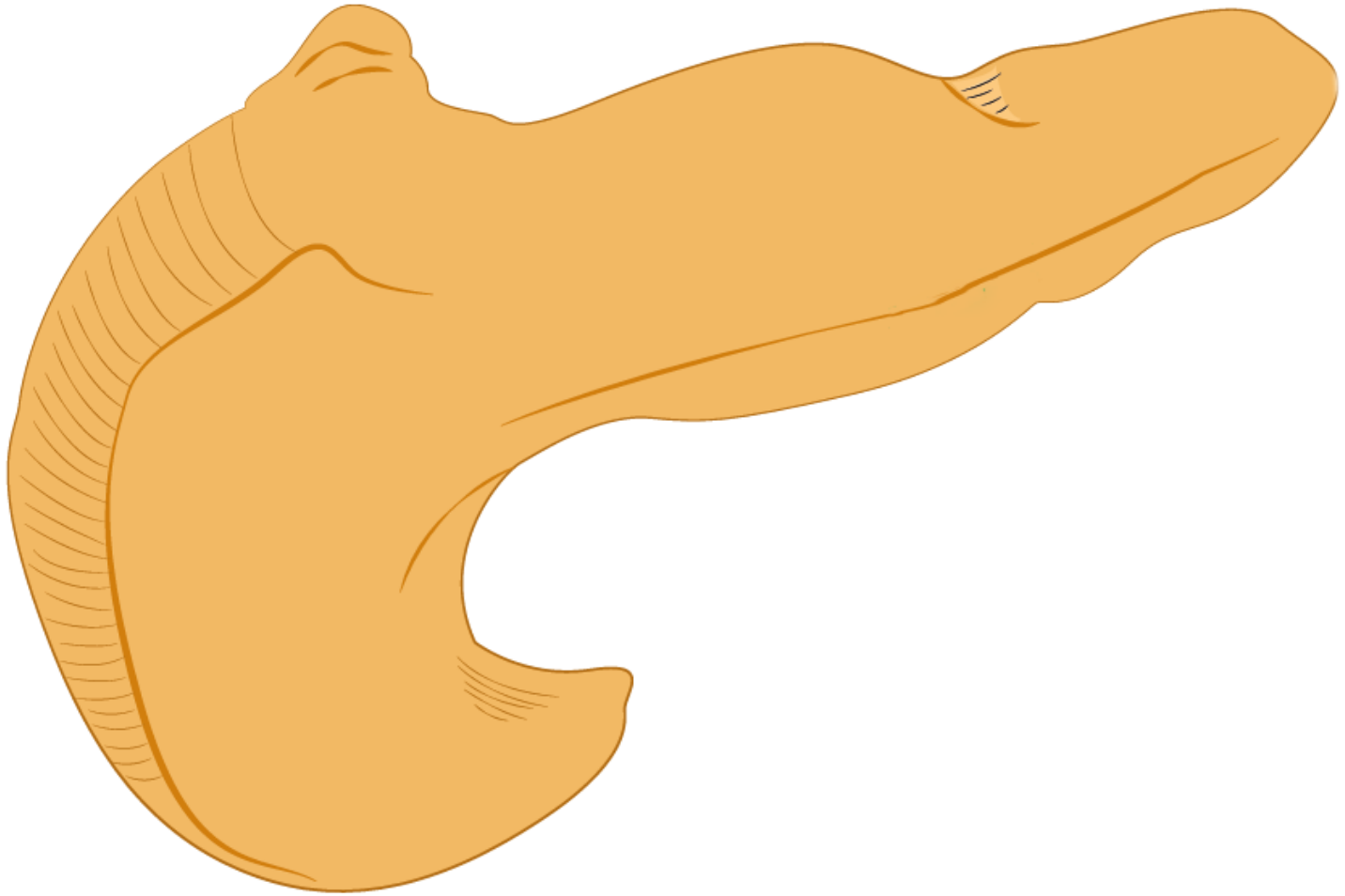


I. INTRODUCTION

- Annexed gland of the gastrointestinal tract
- Composite gland
- **Exocrine function:**
  - -Exocrine acini discharge their secretions into the duodenum to assist in digestion
- **Endocrine function:**
  - -Endocrine islets of Langerhans, whose special role is in carbohydrate metabolism



ANTERIOR VIEW OF PANCREAS

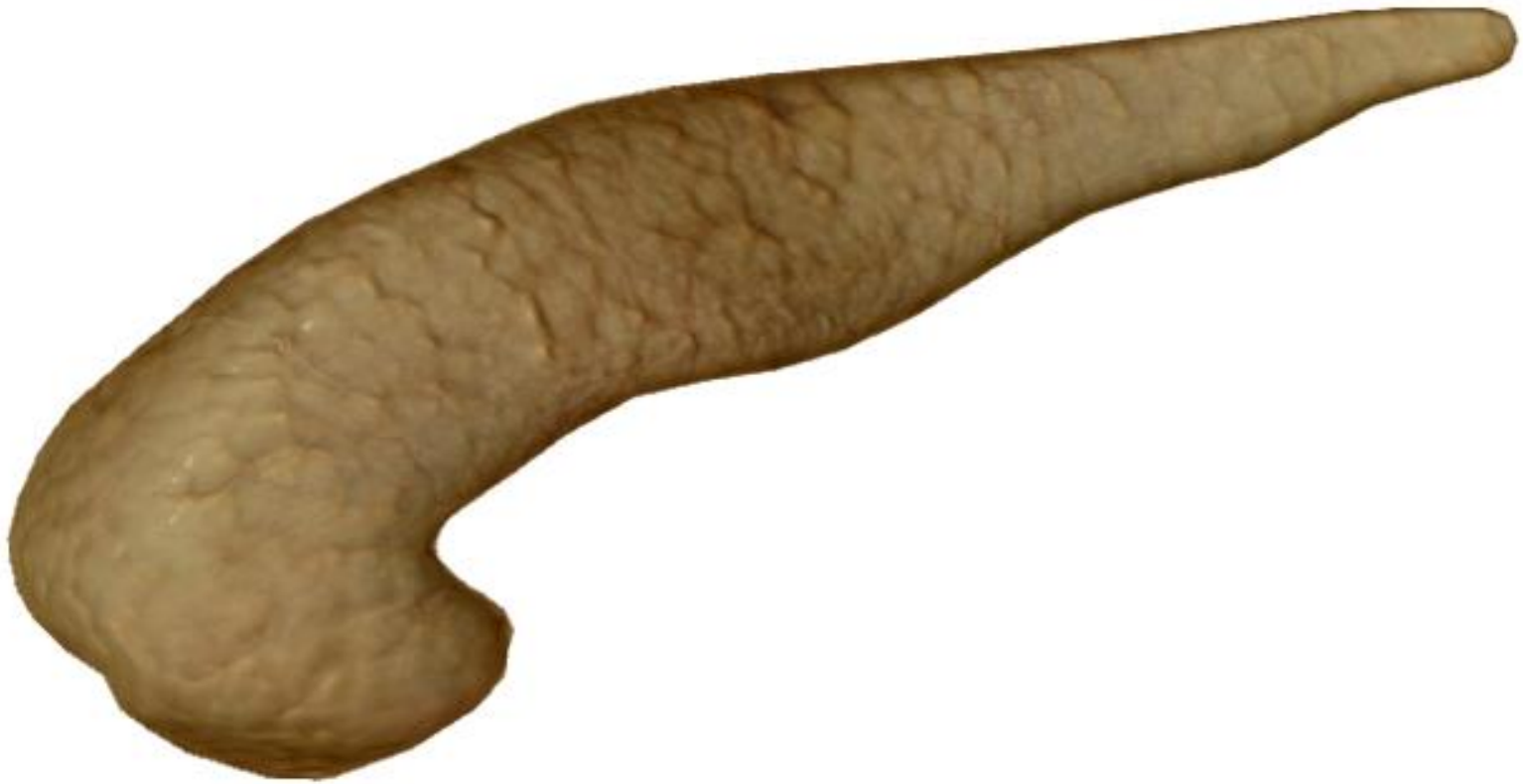
II. DESCRIPTIVE ANATOMY

A. SITUATION

- Lies transversally a in front of the first lumbar vertebra between the second portion of duodenum to the right and the spleen to the left
- Lies immediately behind the peritoneum of the posterior abdominal wall
- The transverse mesocolon is attached to its anterior surface just above the inferior border; thus most of the gland lies in the supracolic compartment in the lesser sac forming part of the stomach bed
- Deep in the epigastric region of the abdomen

B. SHAPE

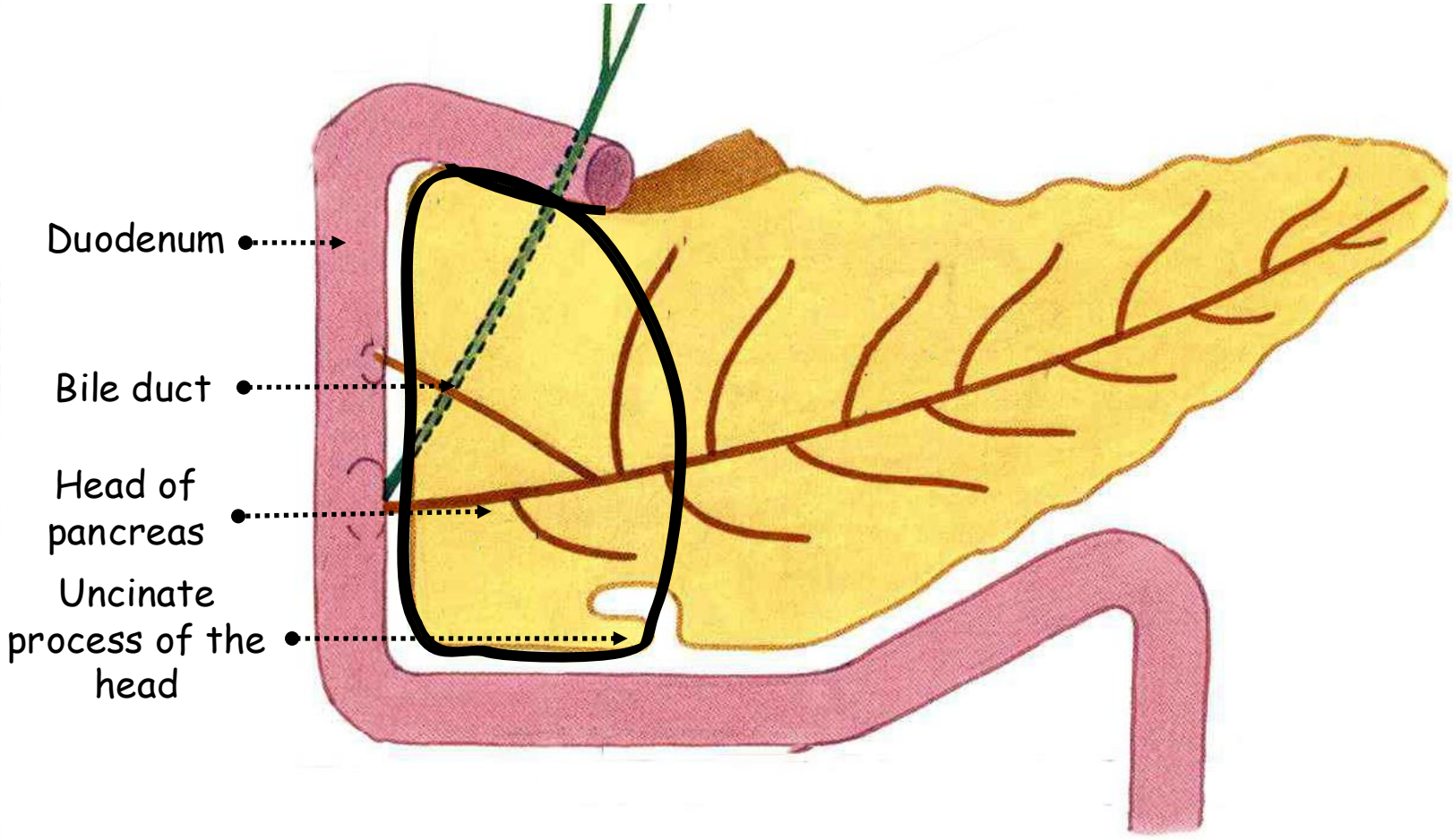
- In shape the gland resembles the upper end of a thick walking-stick or hook, lying sideways with the handle or hook on the right and turned downwards
- Retort-shaped, tapering and sloping upwards from a big head to a narrow tail
- Firm consistency
- Finely lobulated surface
- Grayish-pink coloured
- Consists of head, neck, body and tail
- The head and tail incline towards the paravertebral gutters, while the neck and body are curved boldly forward



ANTERIOR VIEW OF THE PANCREAS SHOWING ITS SHAPE

1. Head:

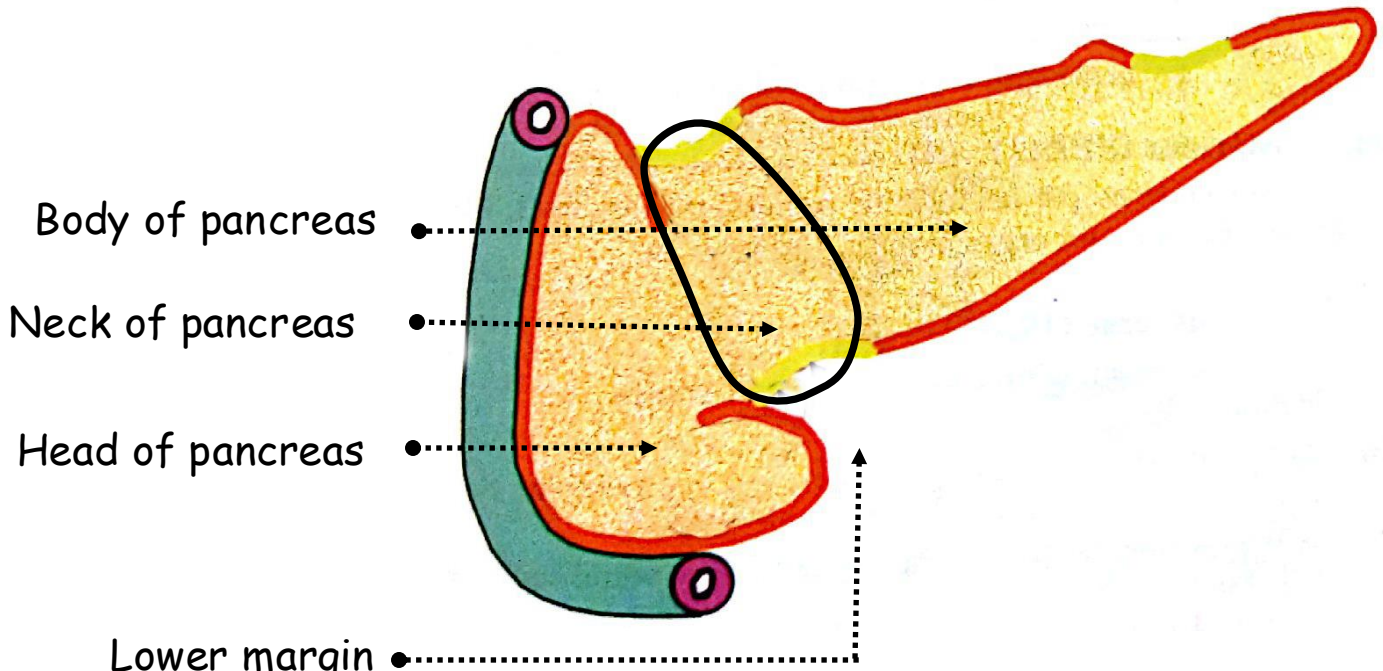
- Broadest part
- Flattened anteroposteriorly and moulded to the C-shaped concavity of the duodenum
- **Posterior surface:** deeply indented and sometimes tunnelled by the terminal part of the bile duct
- Lower part of the posterior surface is prolonged, wedge-shaped to the left, behind the superior mesenteric vein and artery, in front of the aorta; the uncinate process of the head
- **Anterior surface:** lies in both supracolic and infracolic compartments
- Some of this surface is bare, for the leaves of the greater omentum and of the transverse mesocolon are here wide apart at their attachments



ANTERIOR VIEW OF THE PANCREAS

2. Neck:

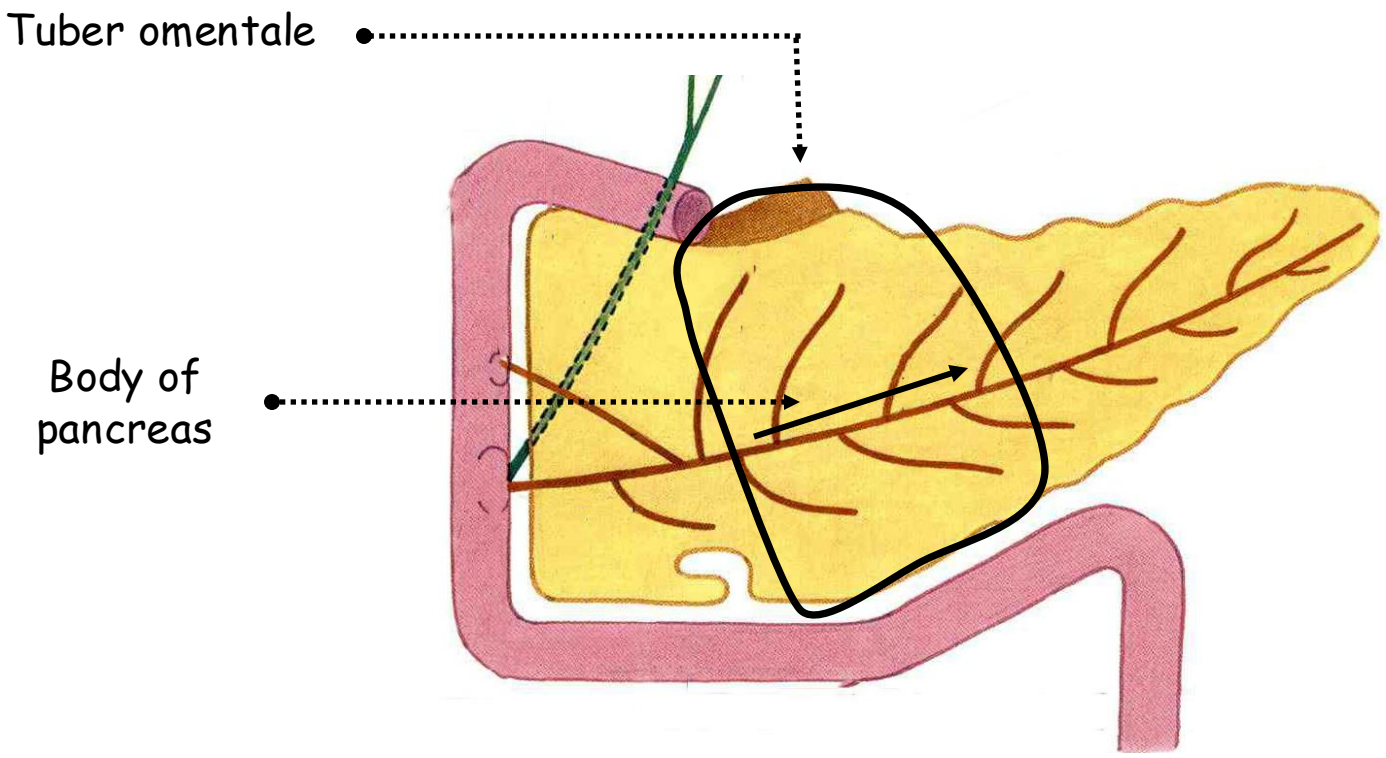
- Narrow band of pancreatic tissue that lies in front of the superior mesenteric and portal veins
- Continuous to the right with the head and to the left with the body
- **Lower margin:** the superior mesenteric vein is embraced between the neck and the uncinate process of the head
- **Lower border:** the transverse mesocolon is attached and constitutes the stomach bed of lesser sac
- **Upper border:** the splenic vein runs into the left side of the vertical superior mesenteric-portal channel



ANTERIOR VIEW OF THE PANCREAS

3. Body:

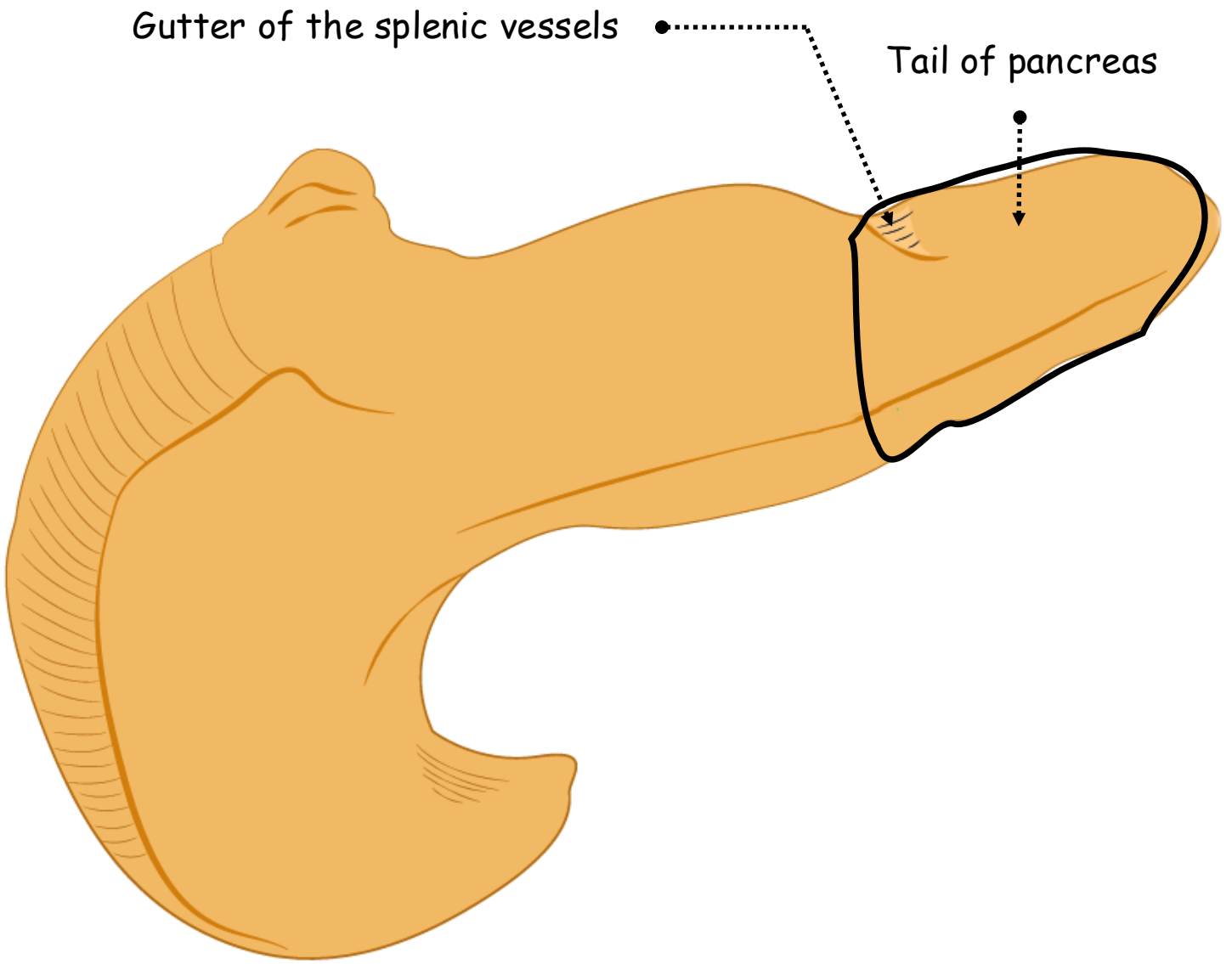
- Sloping gently upwards
- **Upper border:** the splenic artery passes to the left with the crests of its waves showing above the pancreas and the troughs out of sight behind it
- **Lower border:** crosses the origin of the superior mesenteric artery
- **Anterior surface:** slight convexity towards the right, the tuber omentale, touches the left lobe of the liver above the lesser curvature of the stomach through the lesser omentum; the transverse mesocolon is attached towards the lower part and constitutes the stomach bed of lesser sac
- **Posterior surface:** the inferior mesenteric vein joins the splenic vein



ANTERIOR VIEW OF THE PANCREAS

4. Tail:

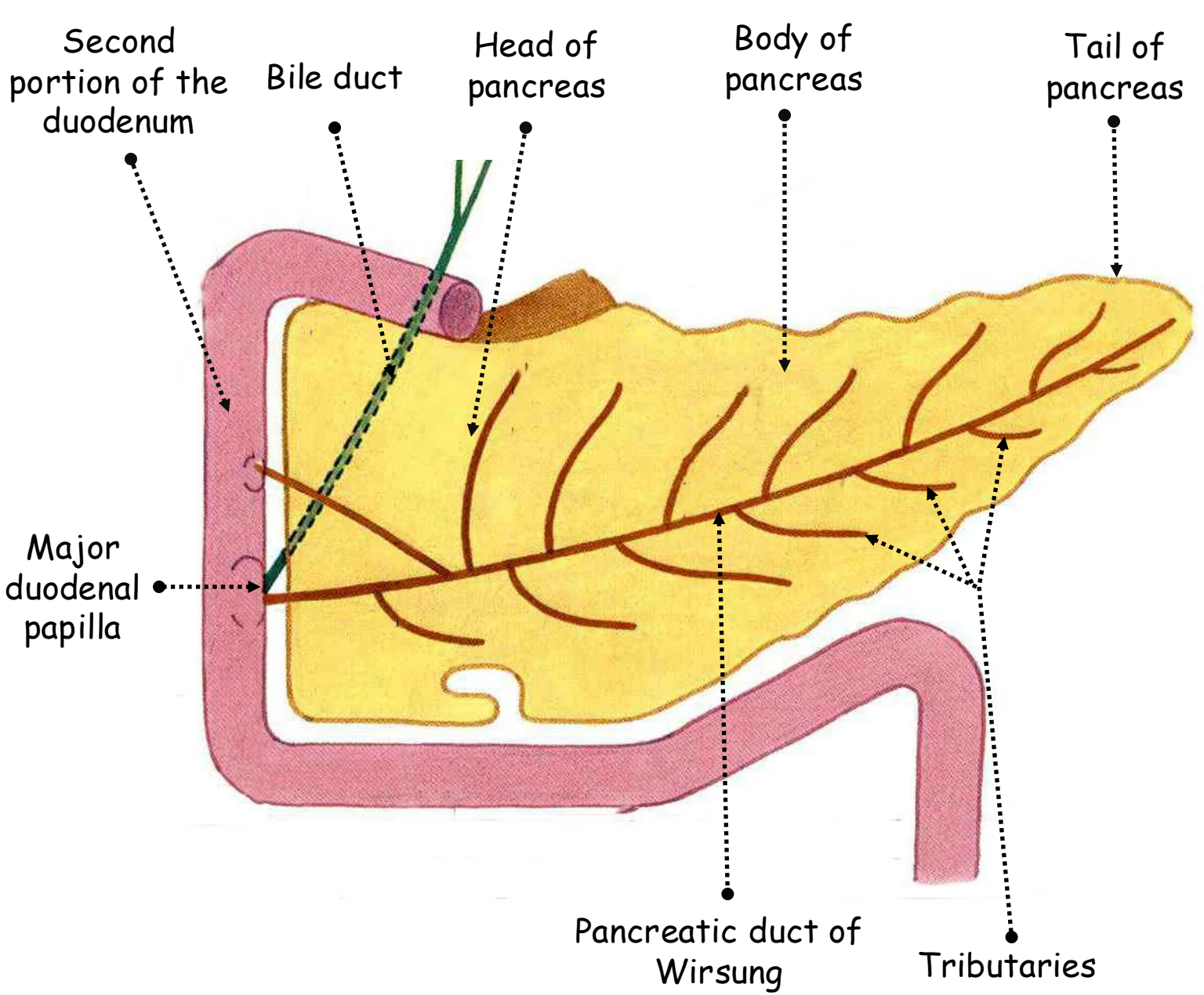
- Gutter of the splenic artery, vein and lymphatics
- Lies within the two layers of the lienorenal ligament
- Touches the hilum of the spleen



ANTERIOR VIEW OF THE PANCREAS

5. Pancreatic duct of Wirsung:

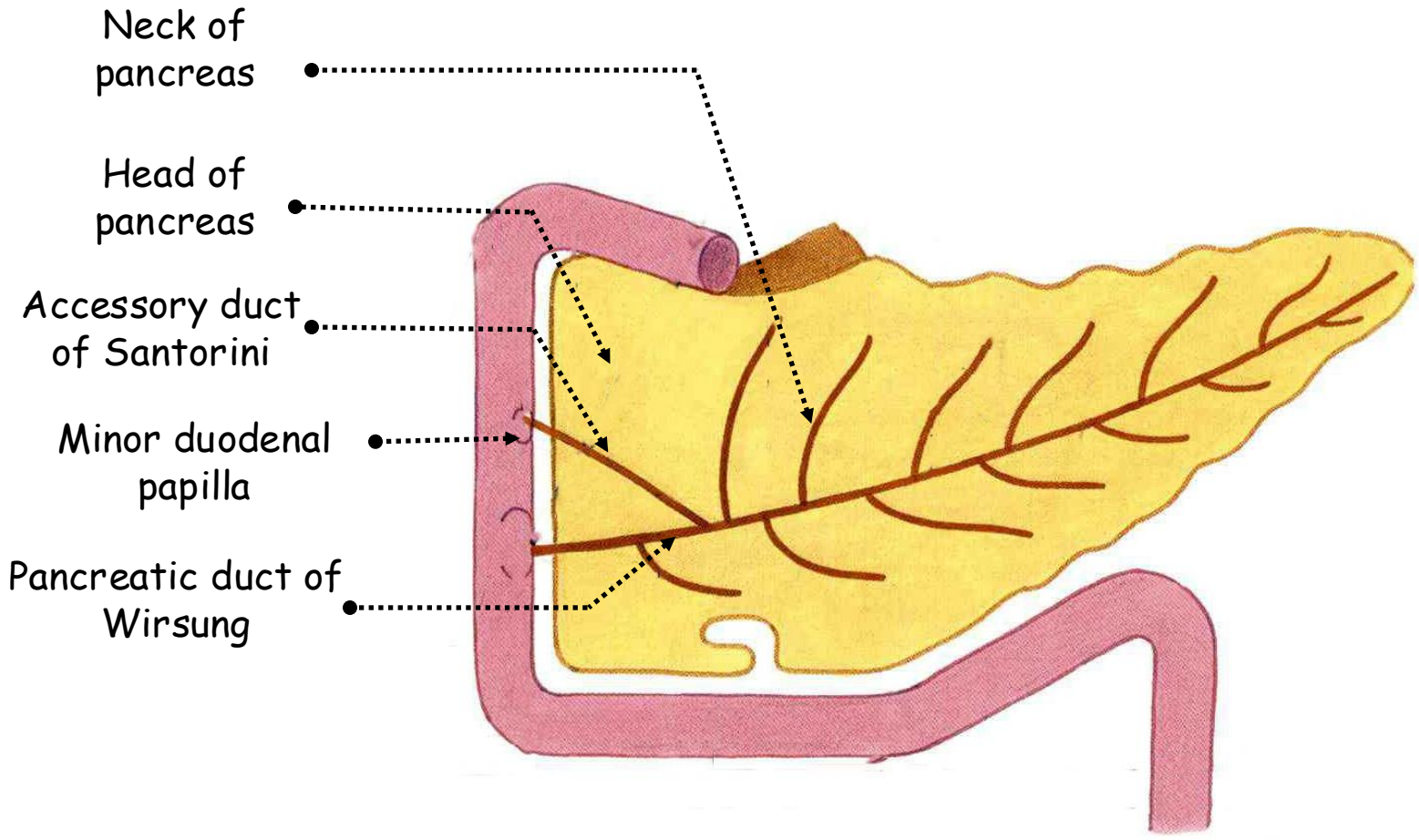
- Continuous tube leading from the tail to the head
- Gradually increasing in diameter as it receives delicate tributaries
- At the hepatopancreatic ampulla, it is joined at an angle of about 60° by the bile duct
- Drains most of the pancreas except for the uncinate process and lower part of the head
- Opens into the duodenum at the major duodenal papilla



ANTERIOR VIEW OF THE PANCREAS

6. Accessory pancreatic duct of Santorini:

- Drains the uncinate process and lower part of the head
- Opens into the duodenum at the minor duodenal papilla situated about 2 cm proximal to the major papilla
- The two ducts frequently communicate with one another



ANTERIOR VIEW OF THE PANCREAS

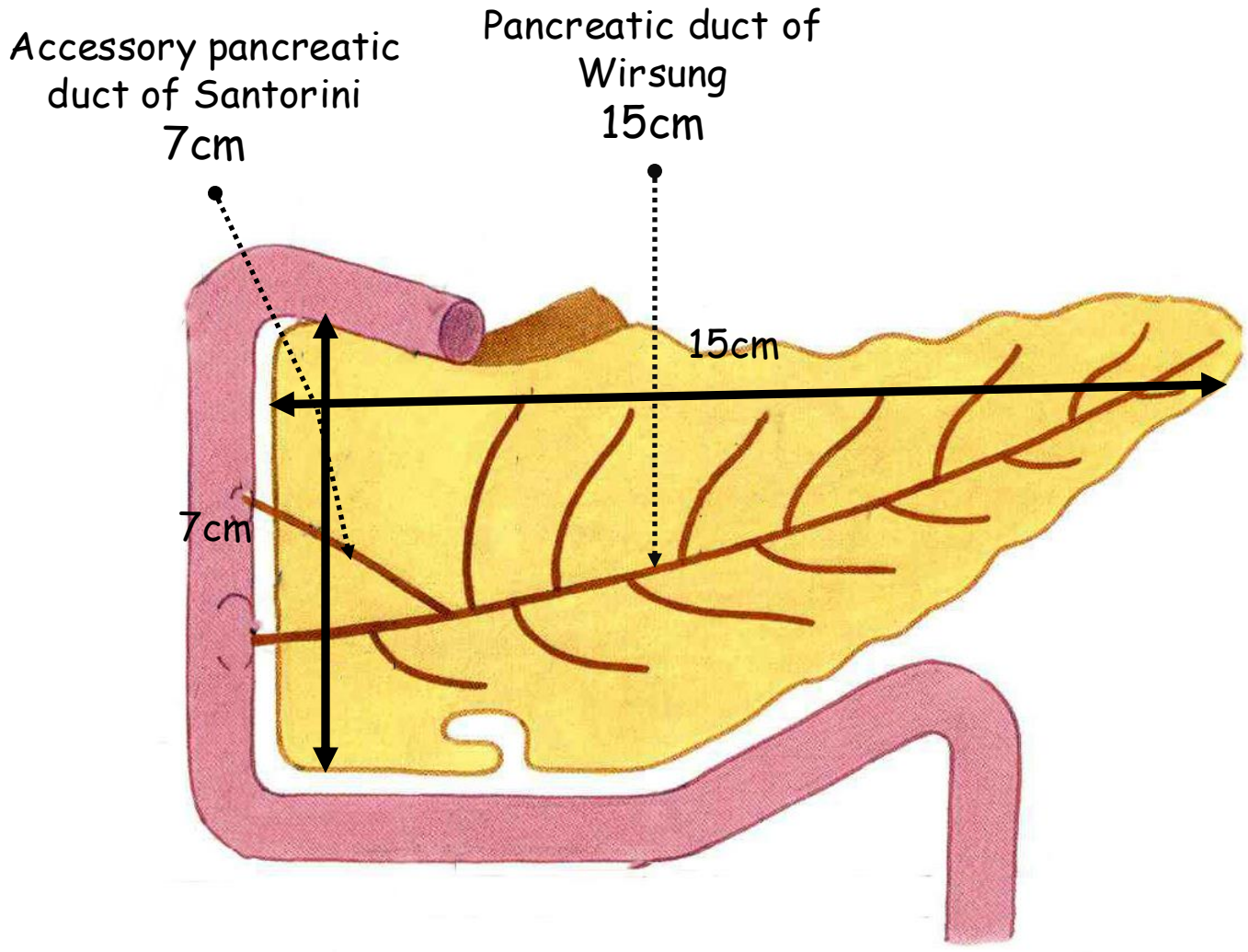
C. DIMENSIONS

- Length: 15 cm
- Heigth: 7 cm
- Thickness: 3 cm
- Weigth: 75 grams
- **Pancreatic duct of Wirsung:**

  -Length: 15 cm

  -Internal diameter: 4 mm
- **Accessory pancreatic duct of Santorini:**

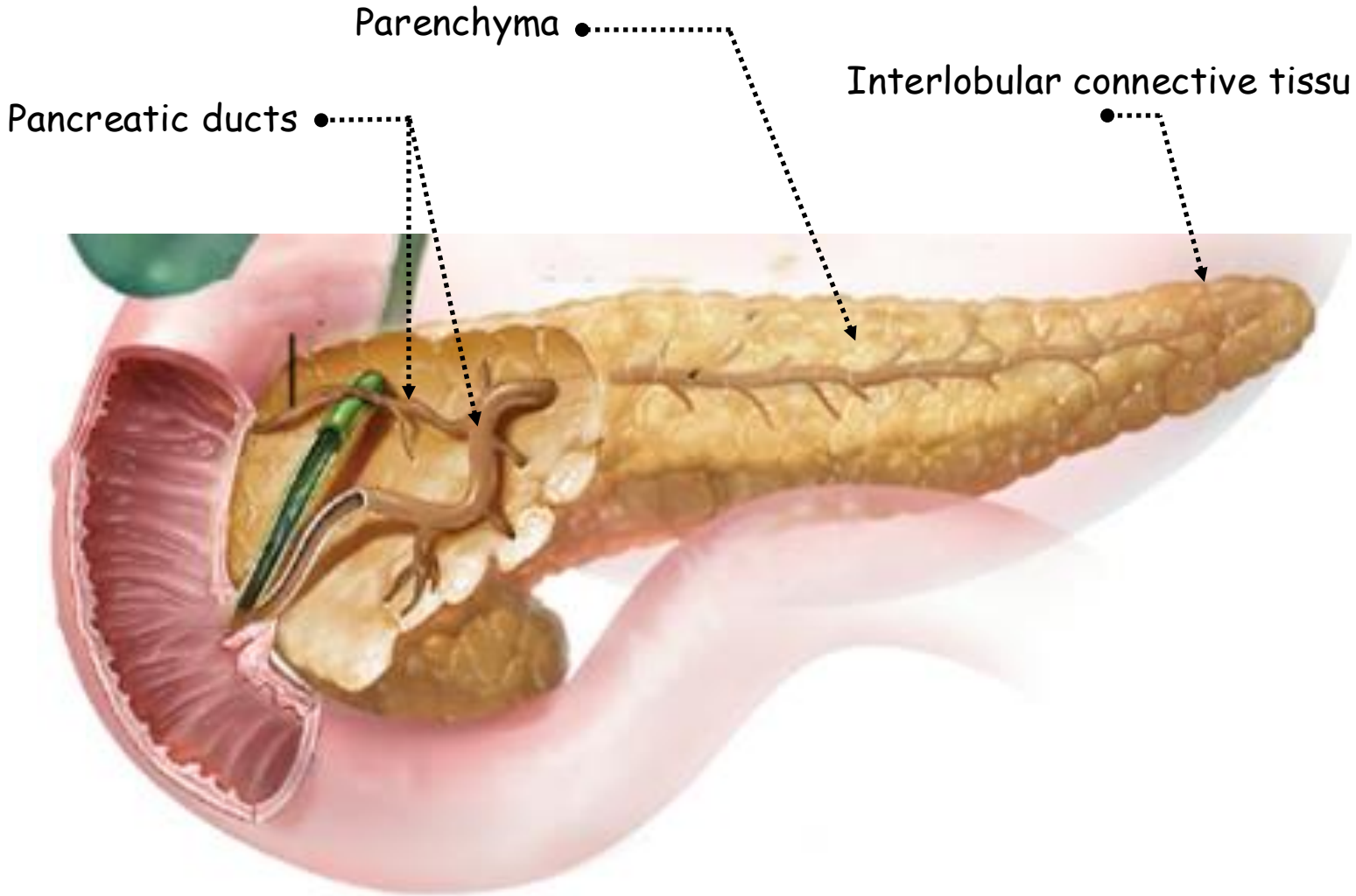
  -Length: 7 cm



ANTERIOR VIEW OF THE PANCREAS

III. STRUCTURE

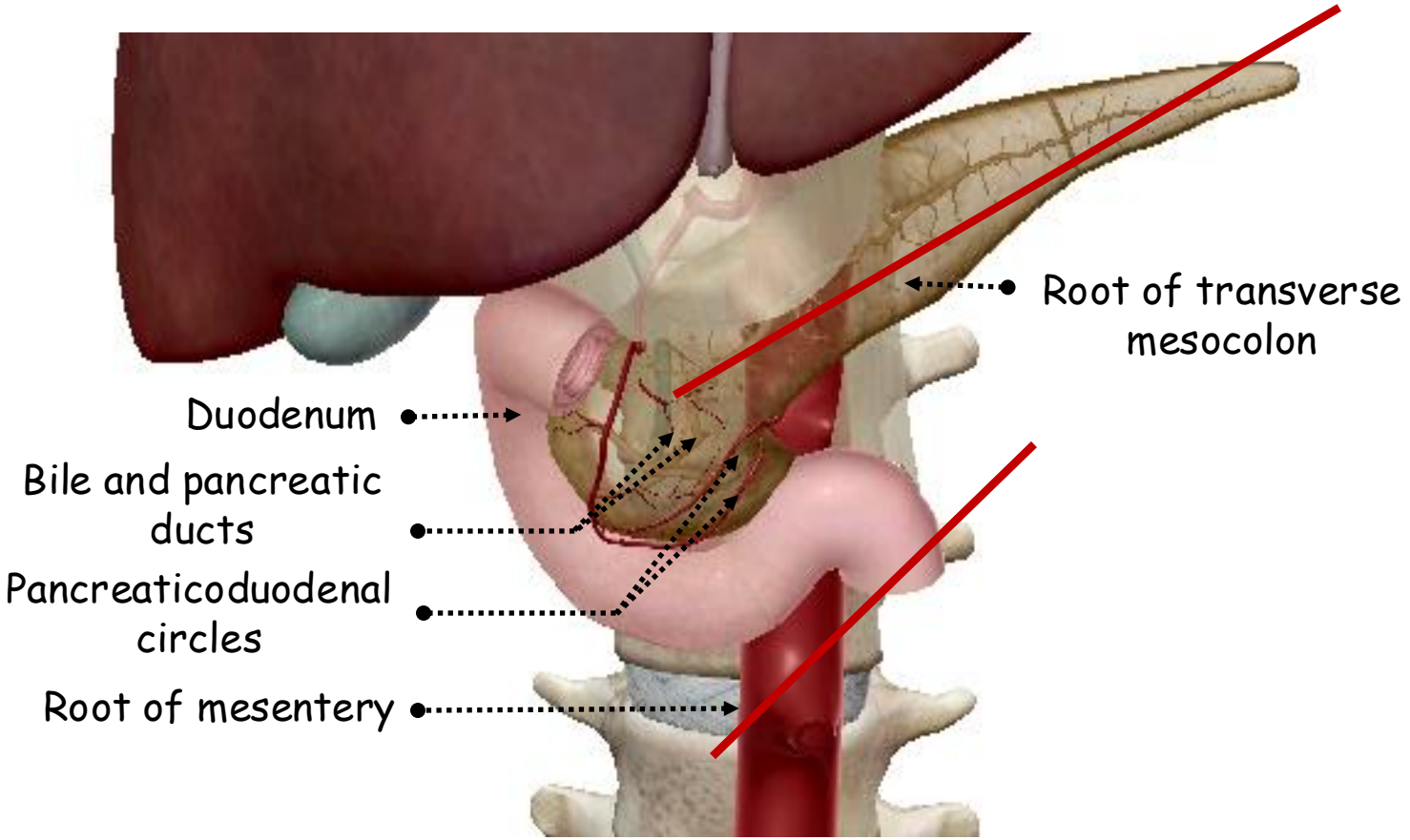
- Lobulated gland
- Characteristic mixture of islets and acini
- **Serous acini:**
  - -Protein-secreting cells
  - -Exocrine secretion
  - -Various digestive enzymes mainly trypsin and lipase
- **Endocrine islets of Langerhans:**
  - -Rounded groups of cells scattered among the acini
  - -α-islet cells: glucagon
  - -β-cells: insulin
  - -δ-cells: somatostatin
- Interlobular connective tissu
- Scanty ducts among the acini



ANTERIOR VIEW OF THE DUODENUM AND PANCREAS

IV. SUPPORTS

- Duodenum
- Bile and pancreatic ducts
- Pancreaticoduodenal circles
- Treitz fascia to the right and left Toldt's fascia to the left
- Root of the transverse mesocolon and the mesentery



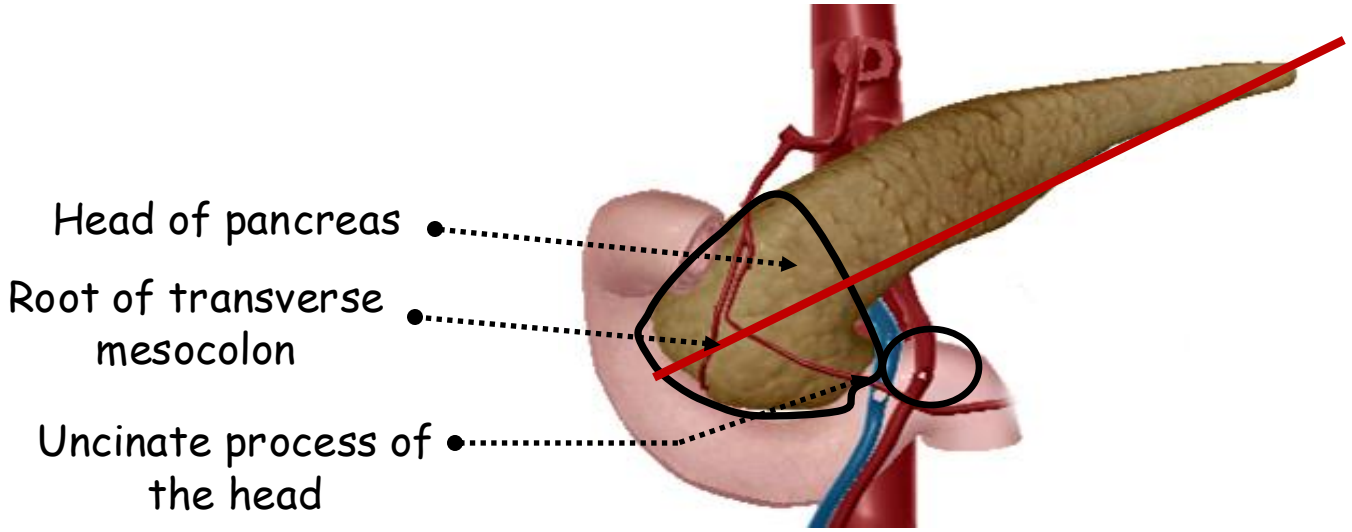
ANTERIOR VIEW OF THE DUODENUM AND PANCREAS

V. ANATOMICAL RELATIONS

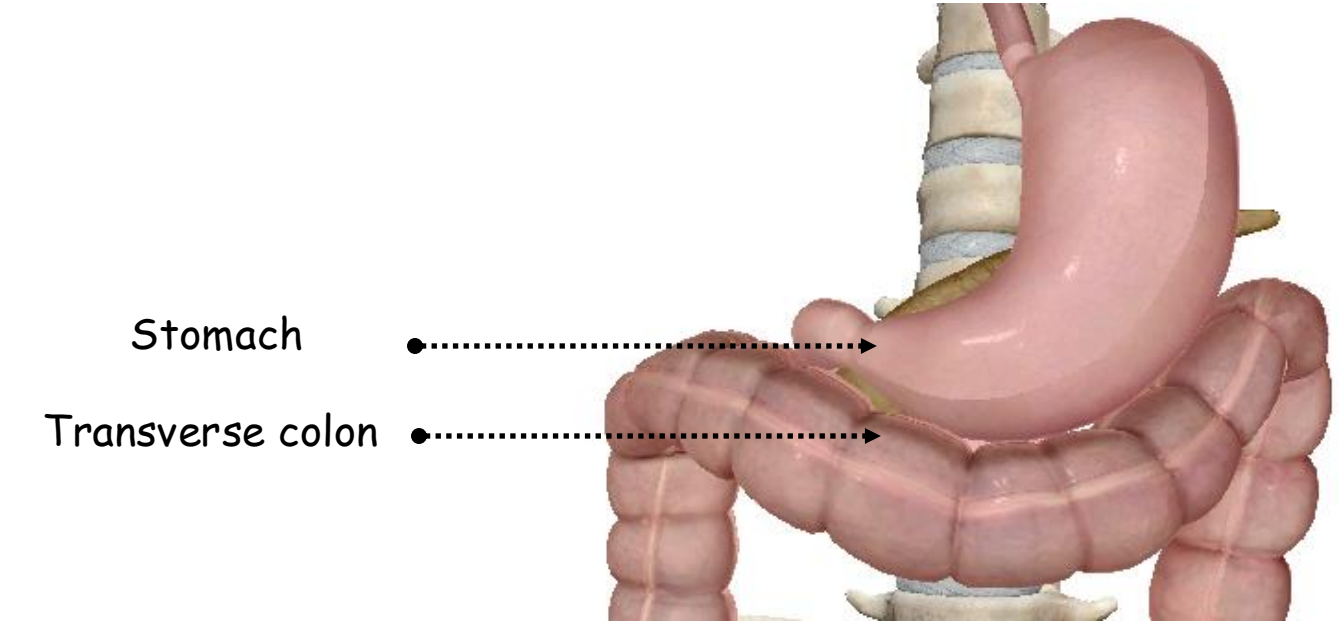
A. HEAD

1. Anterior surface:

- Root of the transverse mesocolon
- Transverse colon
- Greater omentum
- Lesser sac
- Stomach



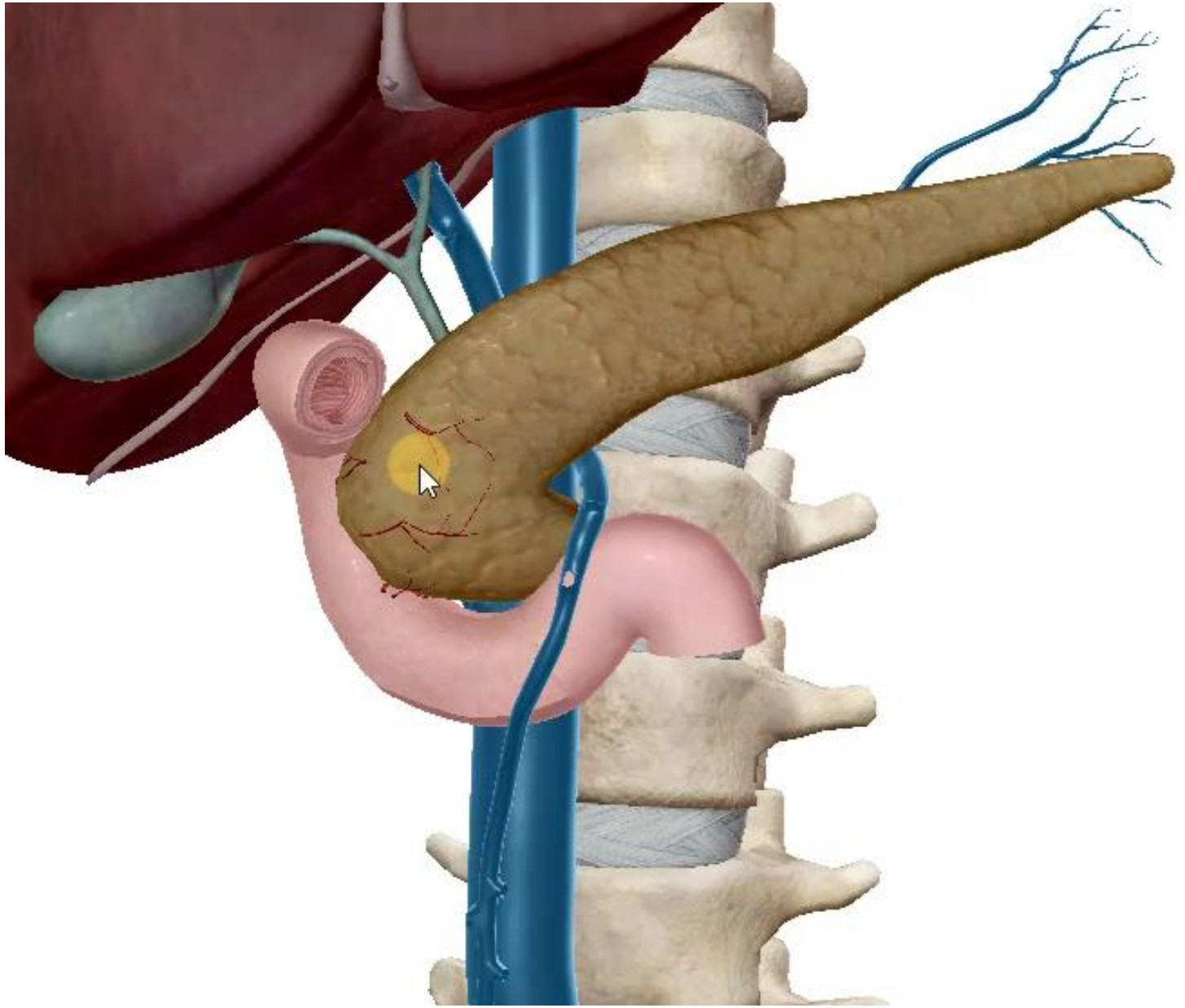
ANTERIOR VIEW OF THE DUODENUM AND PANCREAS



ANTERIOR VIEW OF THE SUPRACOLIC COMPARTMENT

2. Posterior surface:

- From the front to the back
- Terminal part of the bile duct
- Superior mesenteric vein and artery in front of the uncinate process
- Right and left renal veins
- Inferior vena cava
- Aorta



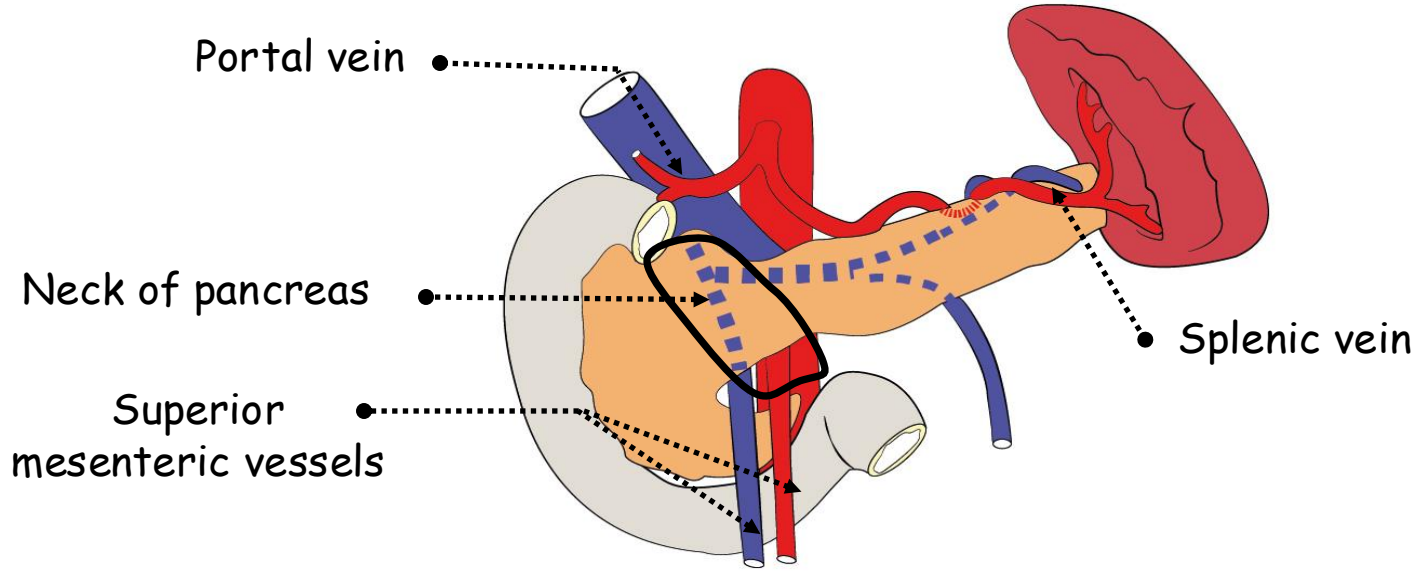
B. NECK

1. Posterior surface:

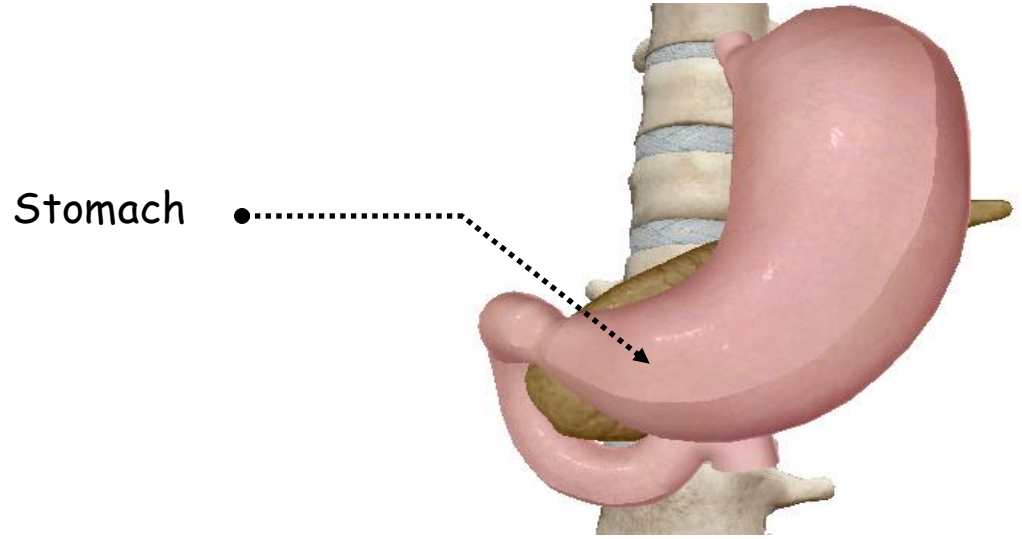
- Superior mesenteric vein
- Splenic vein
- Portal vein

2. Lower border:

- Root of transverse mesocolon
- Stomach bed of lesser sac



ANTERIOR VIEW OF THE DUODENUM AND PANCREAS



ANTERIOR VIEW OF THE SUPRACOLIC COMPARTMENT

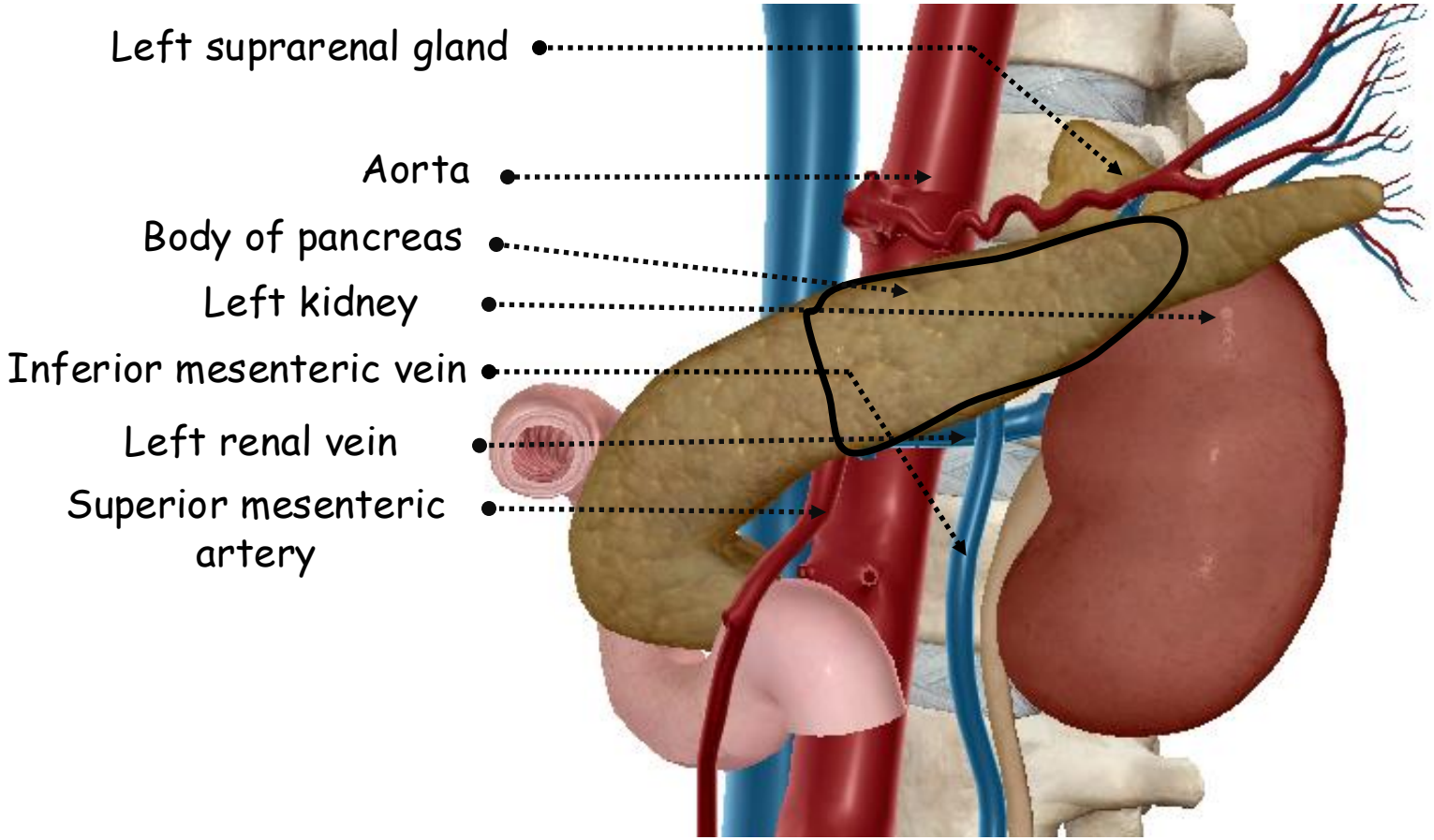
C. BODY

1. Posterior surface:

- From the right to the left
- Left renal vein
- Splenic vein
- Inferior mesenteric vein
- Aorta
- Left crus of the diaphragm
- Left psoas muscle
- Lower pole of the left suprarenal gland
- Hilum of the left kidney

2. Lower border:

- Origin of the superior mesenteric artery



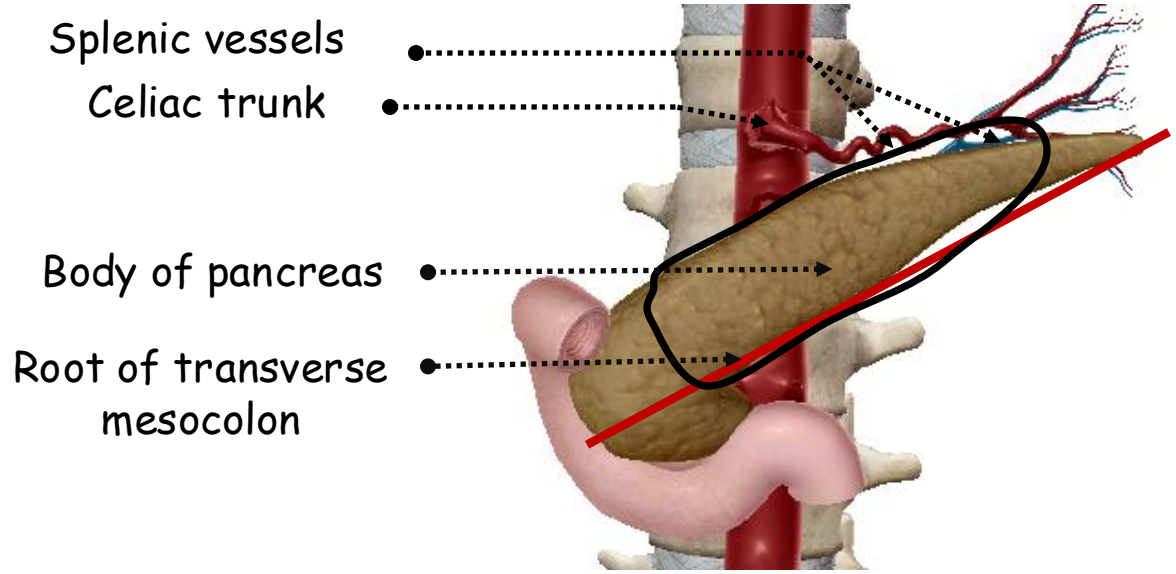
LEFT ANTERIOR LATERAL VIEW OF THE DUODENUM AND PANCREAS

3. Upper border:

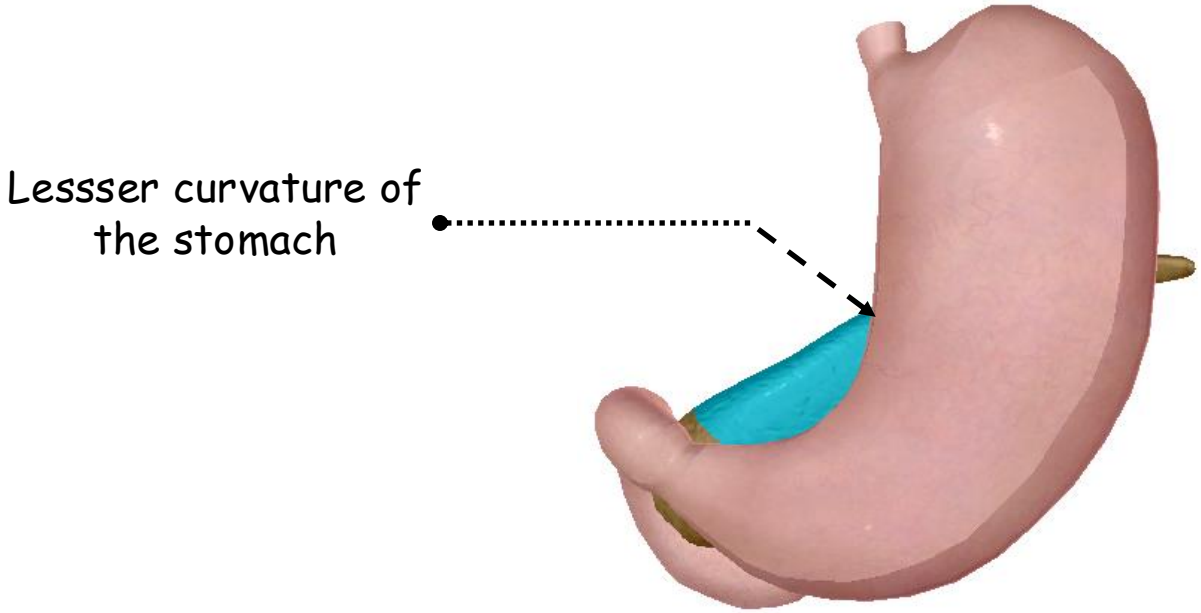
- Celiac trunk
- Splenic artery

4. Anterior surface:

- Lesser curvature of the stomach
- Lesser omentum
- Left lobe of the liver
- Root of transverse mesocolon
- Lesser sac



ANTERIOR VIEW OF THE DUODENUM AND PANCREAS



ANTERIOR VIEW OF THE SUPRACOLIC COMPARTMENT

D. TAIL

1. Posterior surface:

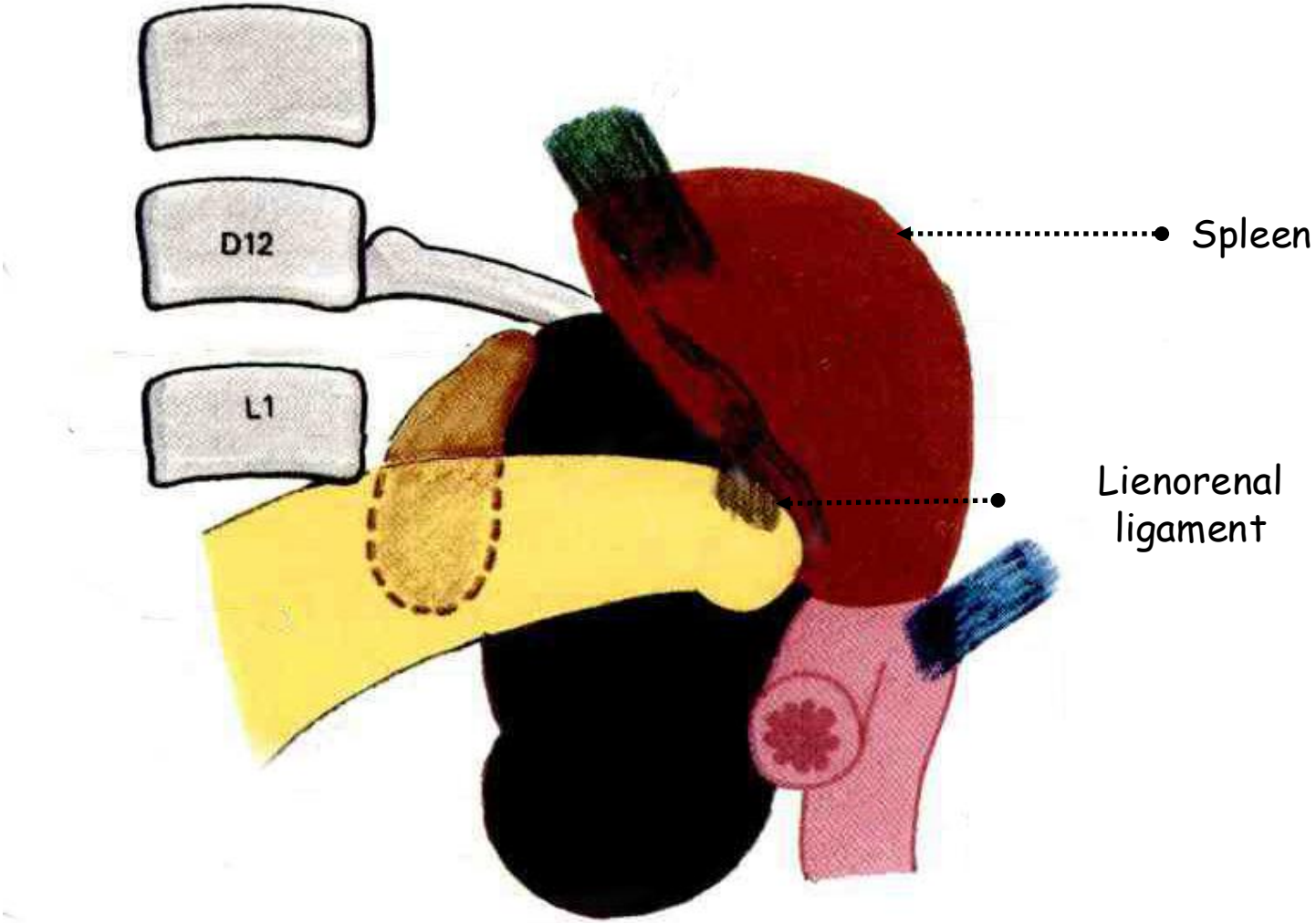
- Left kidney at the level of the hilum

2. Upper border:

- Splenic vessels and lymphatics

3. Anterior surface:

- Lienorenal ligament
- Hilum of the spleen



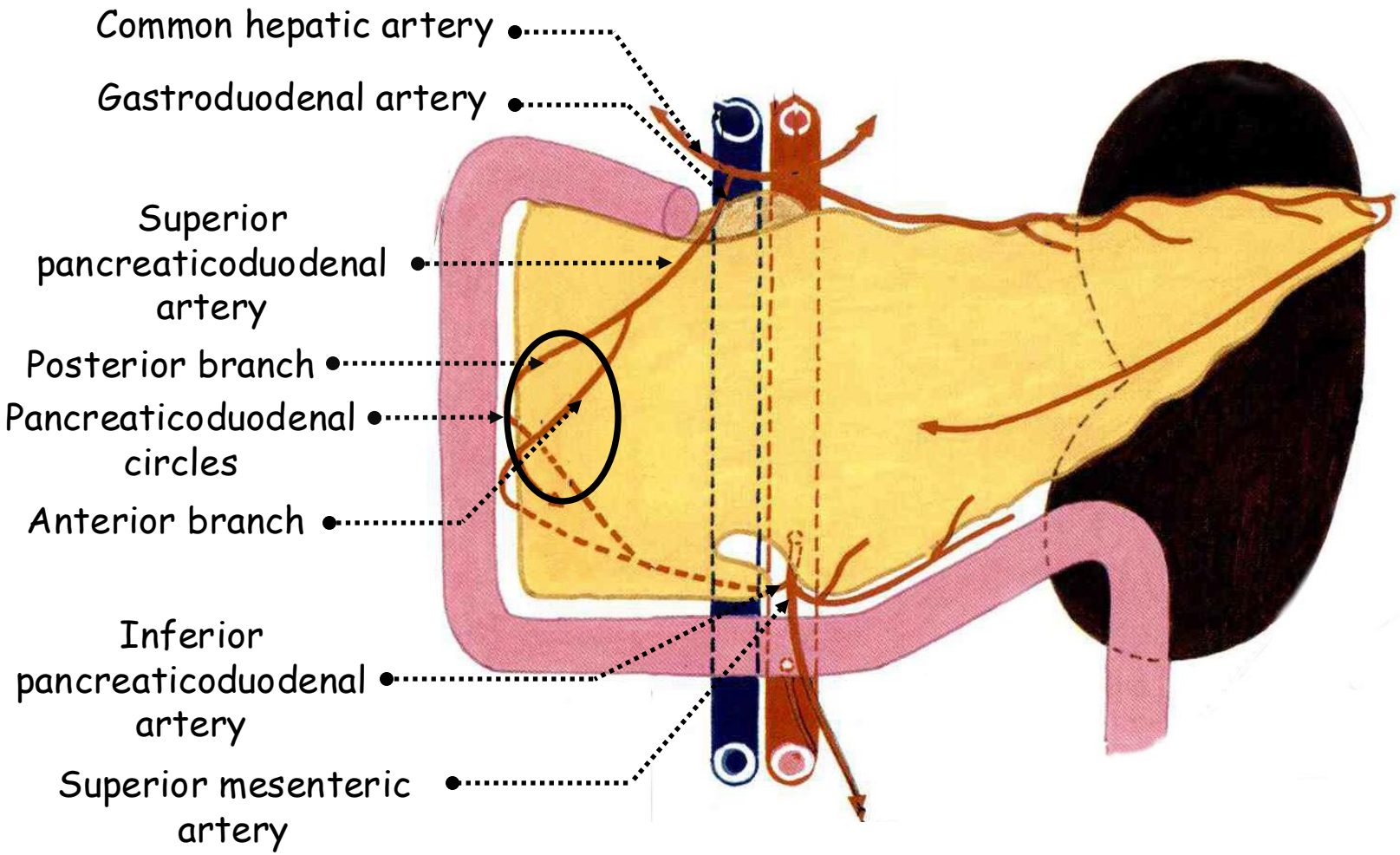
ANTERIOR VIEW SHOWING THE ANATOMICAL RELATIONS OF THE PANCREAS

VI. BLOOD SUPPLY; LYMPH DRAINAGE AND NERVE SUPPLY

A. ARTERIES

1. Pancreaticoduodenal arteries:

- **Superior:**
  -Branch of the gastroduodenal artery
  -Two terminal branches: anterior and posterior
- **Inferior:**
  -Branch of the superior mesenteric artery
  -Two terminal branches: anterior and posterior
- **Pancreaticoduodenal circles:**
  -Anterior and posterior
  -Homonymous branches of the superior and inferior pancreaticodudodenal arteries
- Head of pancreas



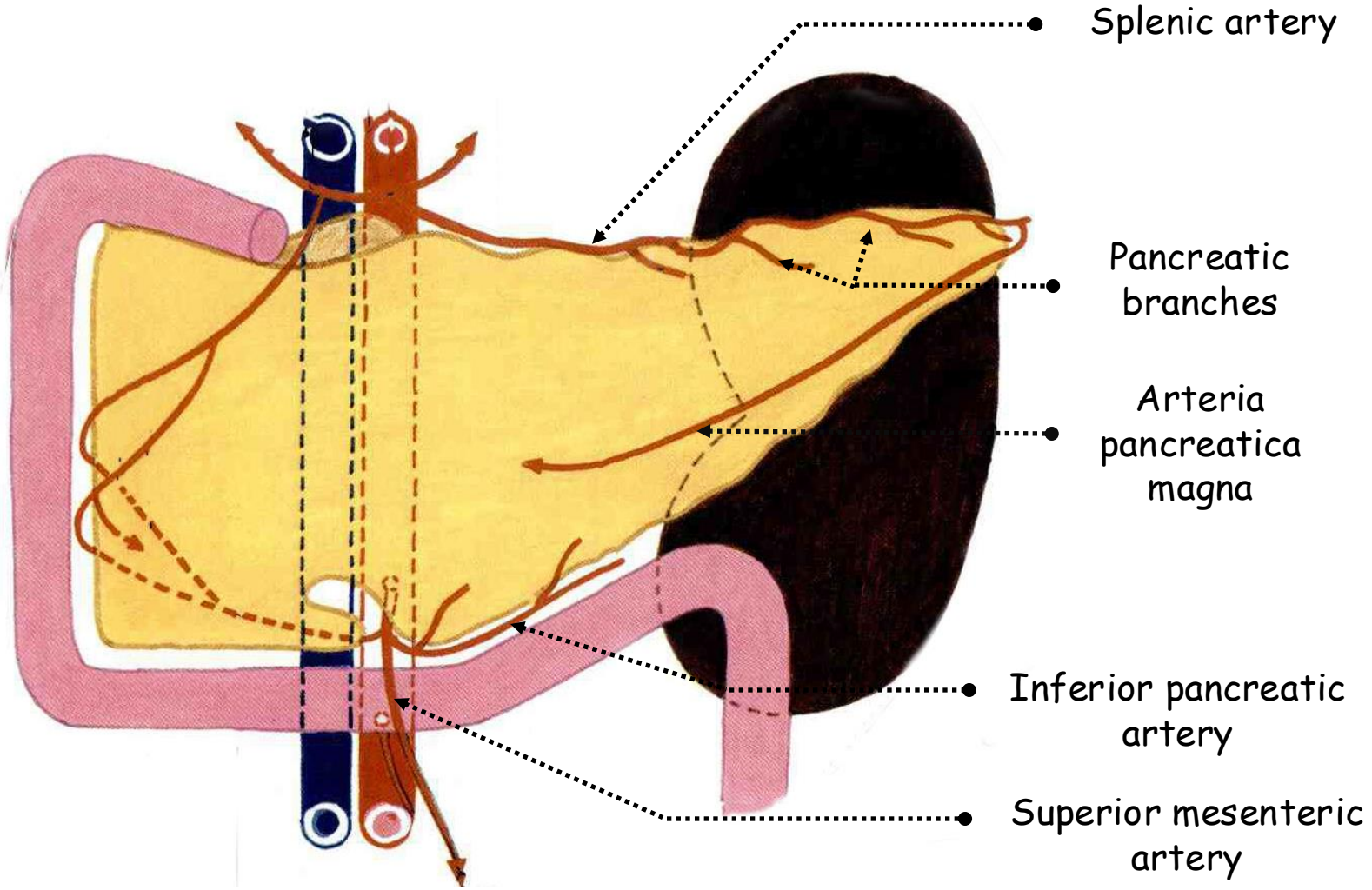
ANTERIOR VIEW OF THE DUODENUM AND PANCREAS

2. Splenic artery:

- Main vessel
- Arteria pancreatica magna
- Neck, body and tail

3. Inferior pancreatic artery:

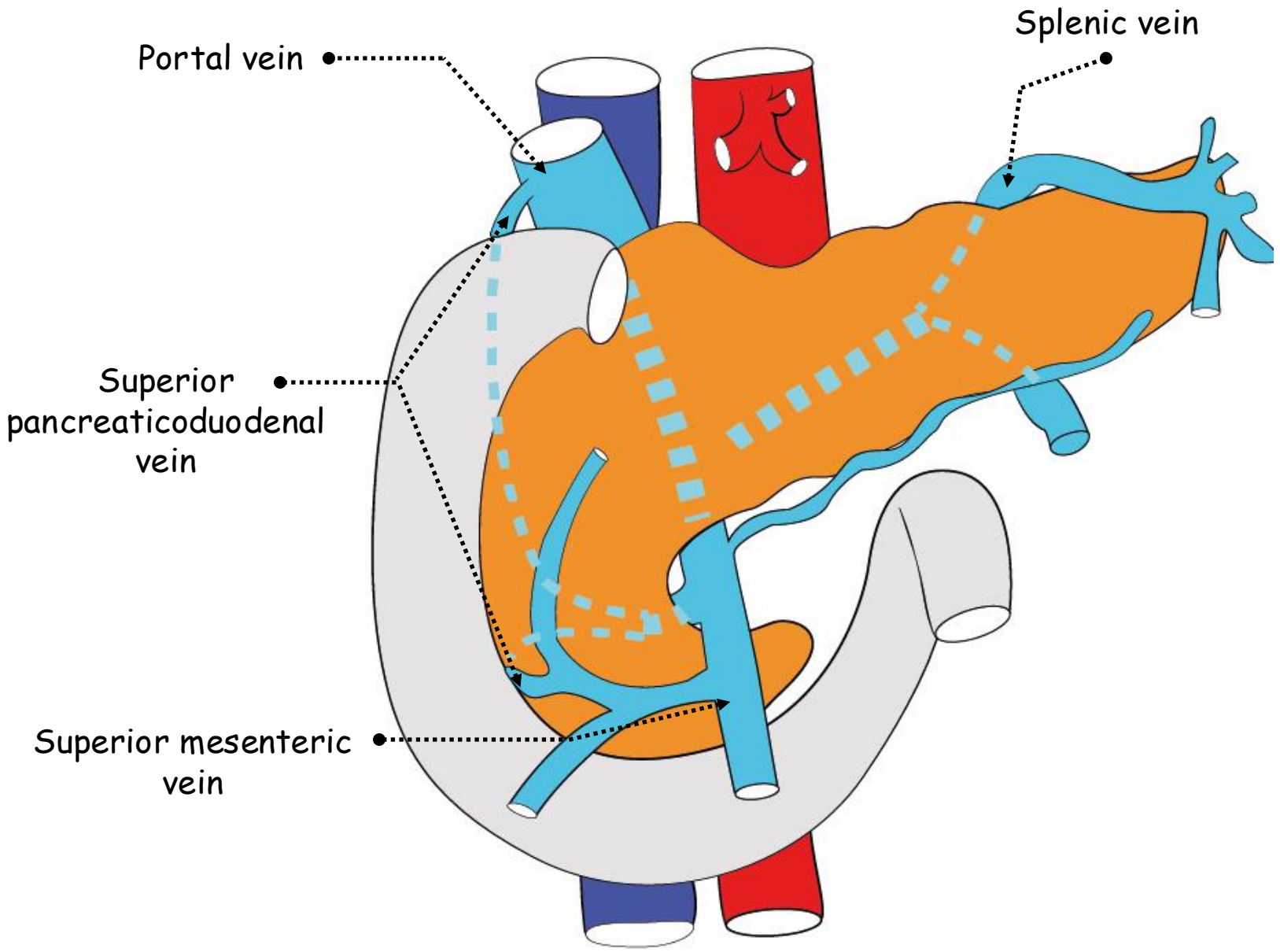
- Branch of the superior mesenteric artery
- Body and tail



ANTERIOR VIEW OF THE DUODENUM AND PANCREAS

B. VEINS

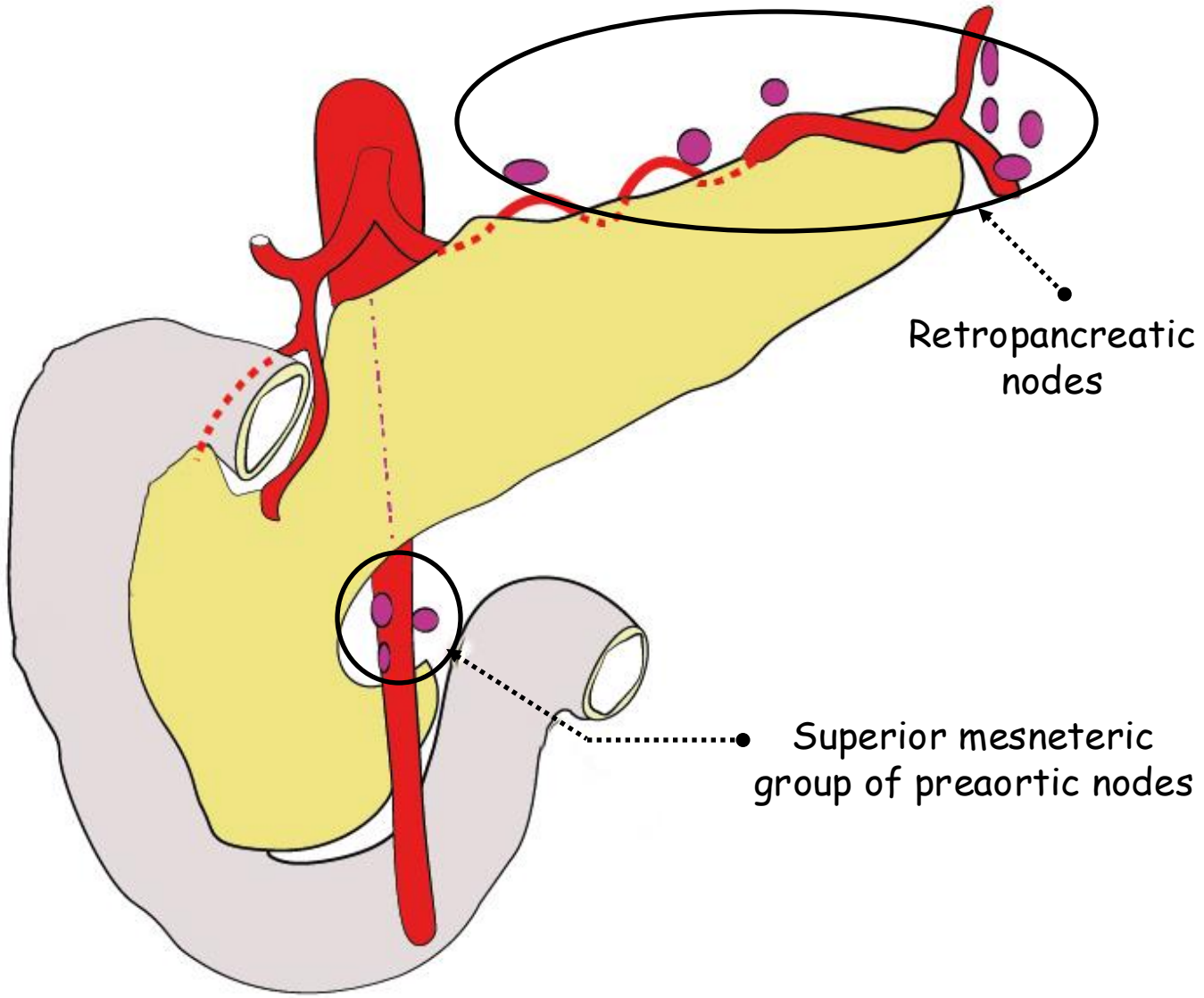
- Correspond to the arteries
- Small veins into the splenic vein
- Superior pancreaticoduodenal vein drains into the portal vein
- Inferior pancreaticoduodenal vein drains into the superior mesenteric vein through the right gastro-epiploic artery



ANTERIOR VIEW OF THE DUODENUM AND PANCREAS

C. LYMPH DRAINAGE

- Follow the course of the arteries
- **Retropancreatic nodes:** to the left of the neck
- **Upper part of the head:** to the celiac group of preaortic nodes
- **Lower part of the head and the uncinate process:** to the superior mesenteric group of preaortic nodes



ANTERIOR VIEW OF THE DUODENUM AND PANCREAS

D. NERVES

- **Parasympathetic:**

  -Posterior vagal trunk and celiac plexus

  -Stimulating exocrine secretion

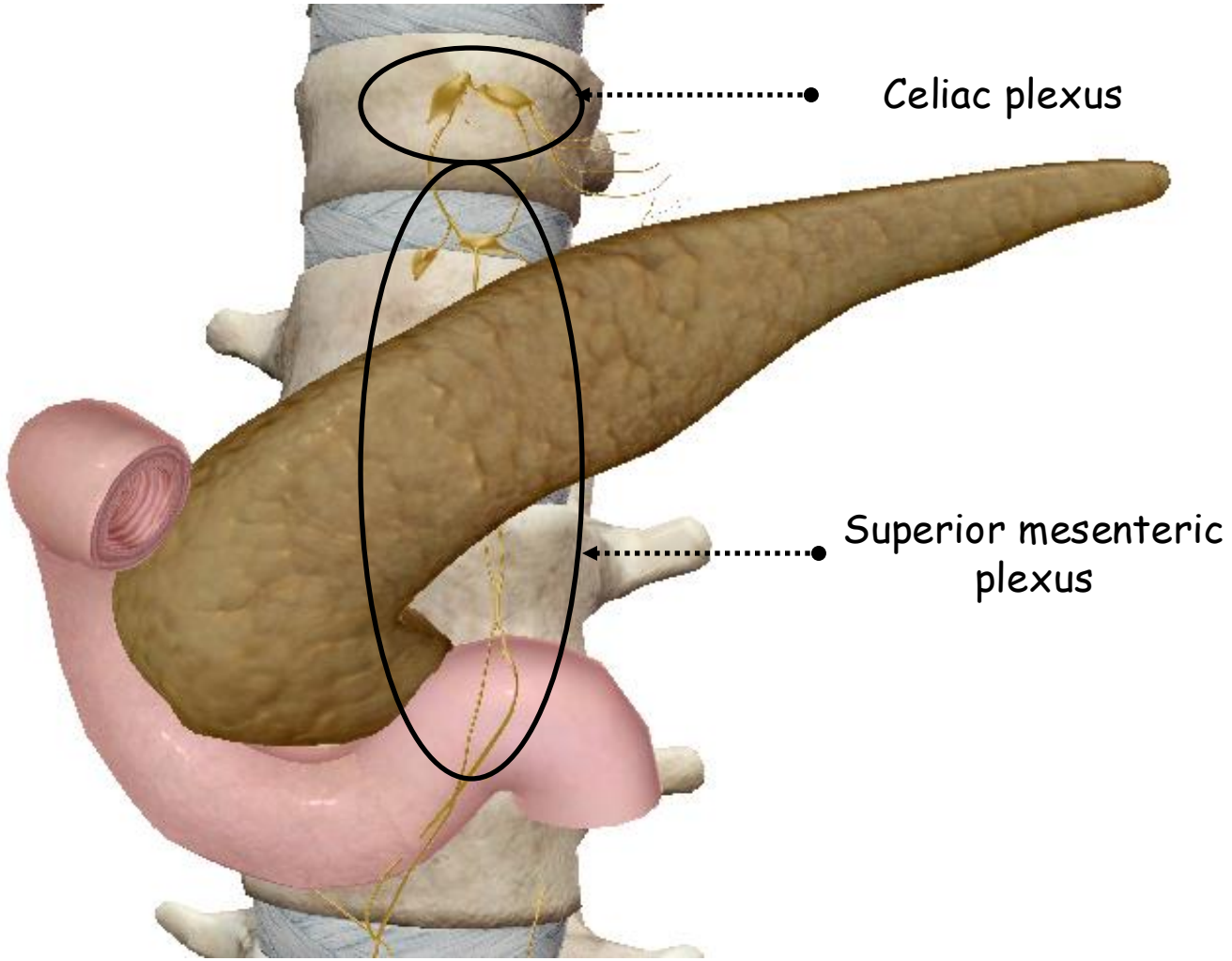
  -Hormonal control is more important

- **Sympathetic:**

  -Spinal cord segments T6-10 via splanchnic nerves and the celiac plexus

  -Vasoconstrictor

  -Pain



ANTERIOR VIEW OF THE DUODENUM AND PANCREAS

VII. SURGICAL APPROACH

- Kocher's manœuvre
- Transection of the stomach
- Resections of the head of the pancreas with the C-shaped duodenal loop
- Pseudocysts of the pancreas

VIII. CONCLUSION

- Major gland of the organism
- Retroperitoneal in front of the great vessels
- Several peritoneal, vascular and visceral relations
- Rich blood supply
- Lymph drainage is ensured mainly by the preaortic nodes
- Neurohormonal mediated secretion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