•ANATOMY OF THE SMALL INTESTINE

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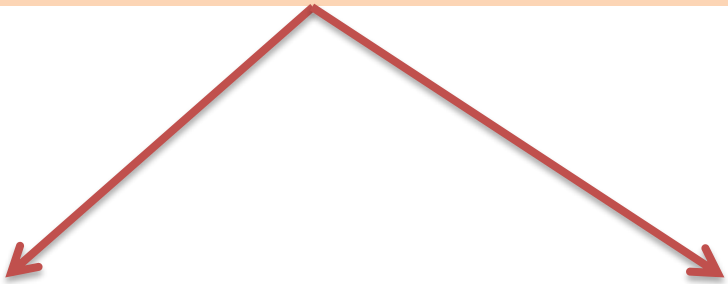
OBJECTIVES

At the end of the lecture, students should:

- List the different **parts** of small intestine.
- Describe the anatomy of **duodenum, jejunum & ileum** regarding: *the shape, length, site of beginning & termination, peritoneal covering, arterial supply & lymphatic drainage.*
- Differentiate between each part of duodenum regarding *the length, level & relations.*
- Differentiate between the **jejunum & ileum** regarding *the characteristic anatomical features of each of them.*

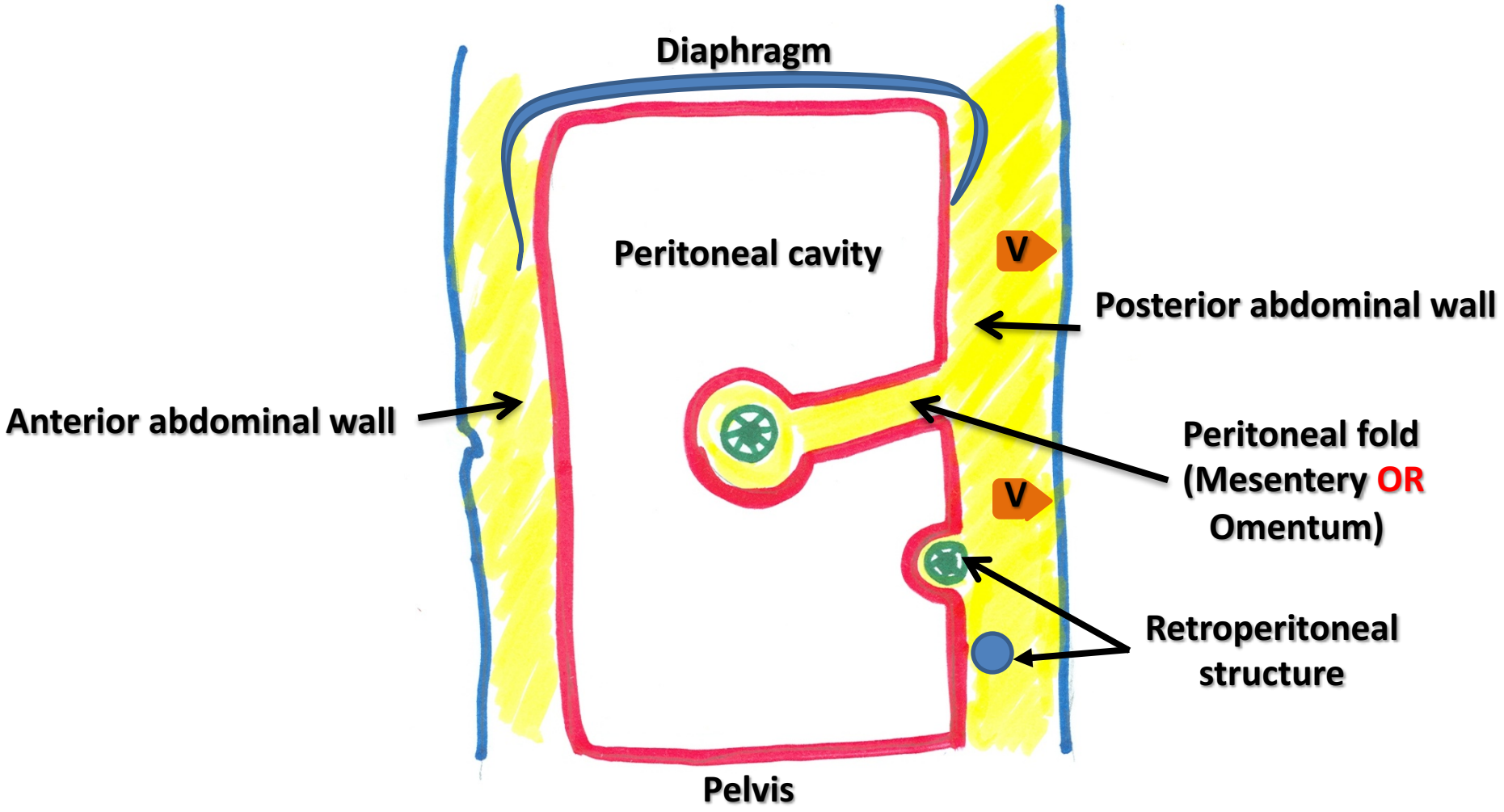
SMALL INTESTINE



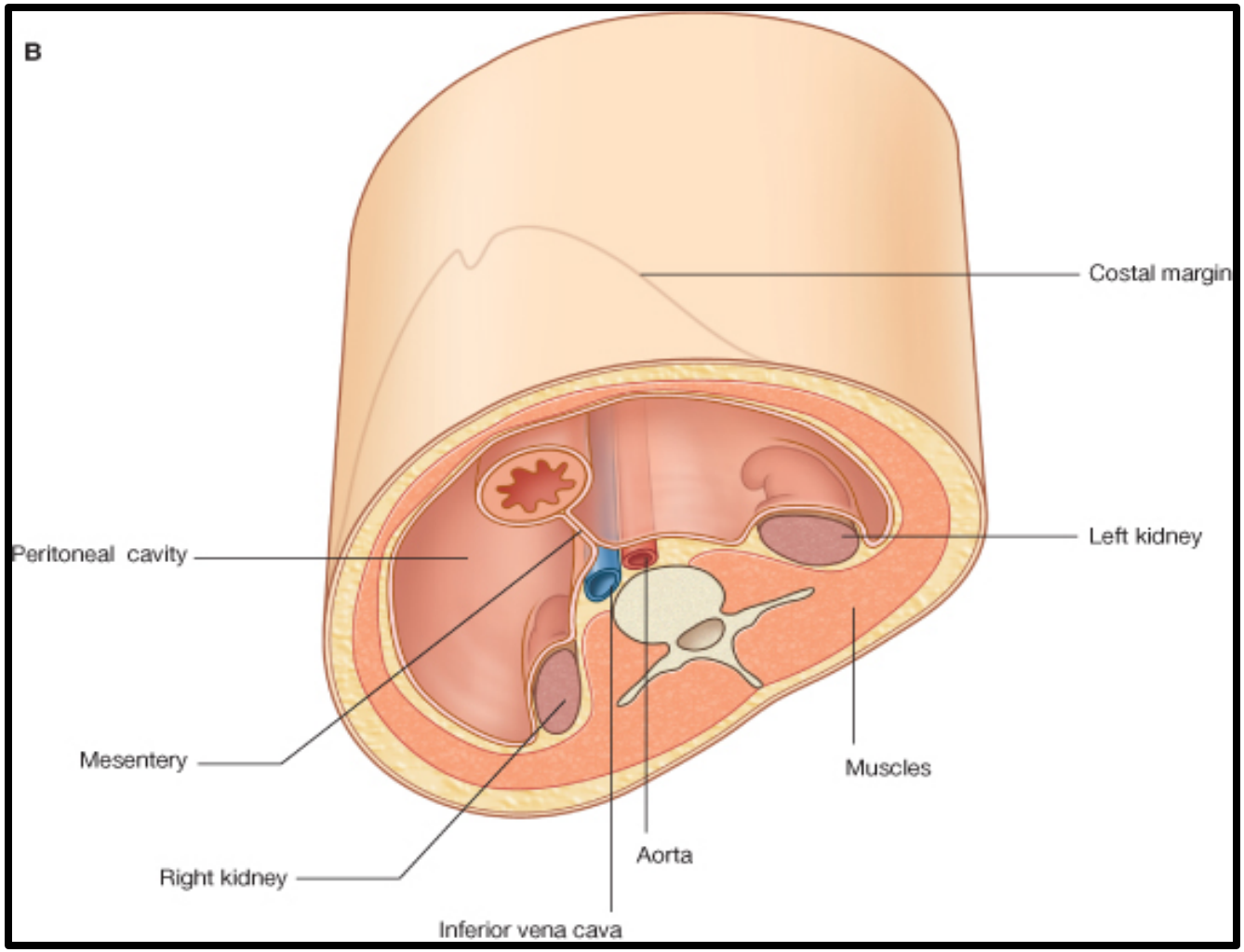
FIXED PART
(NO MESENTERY)
DUODENUM

FREE (MOVABLE) PART
(WITH MESENTERY)
JEJUNUM & ILEUM

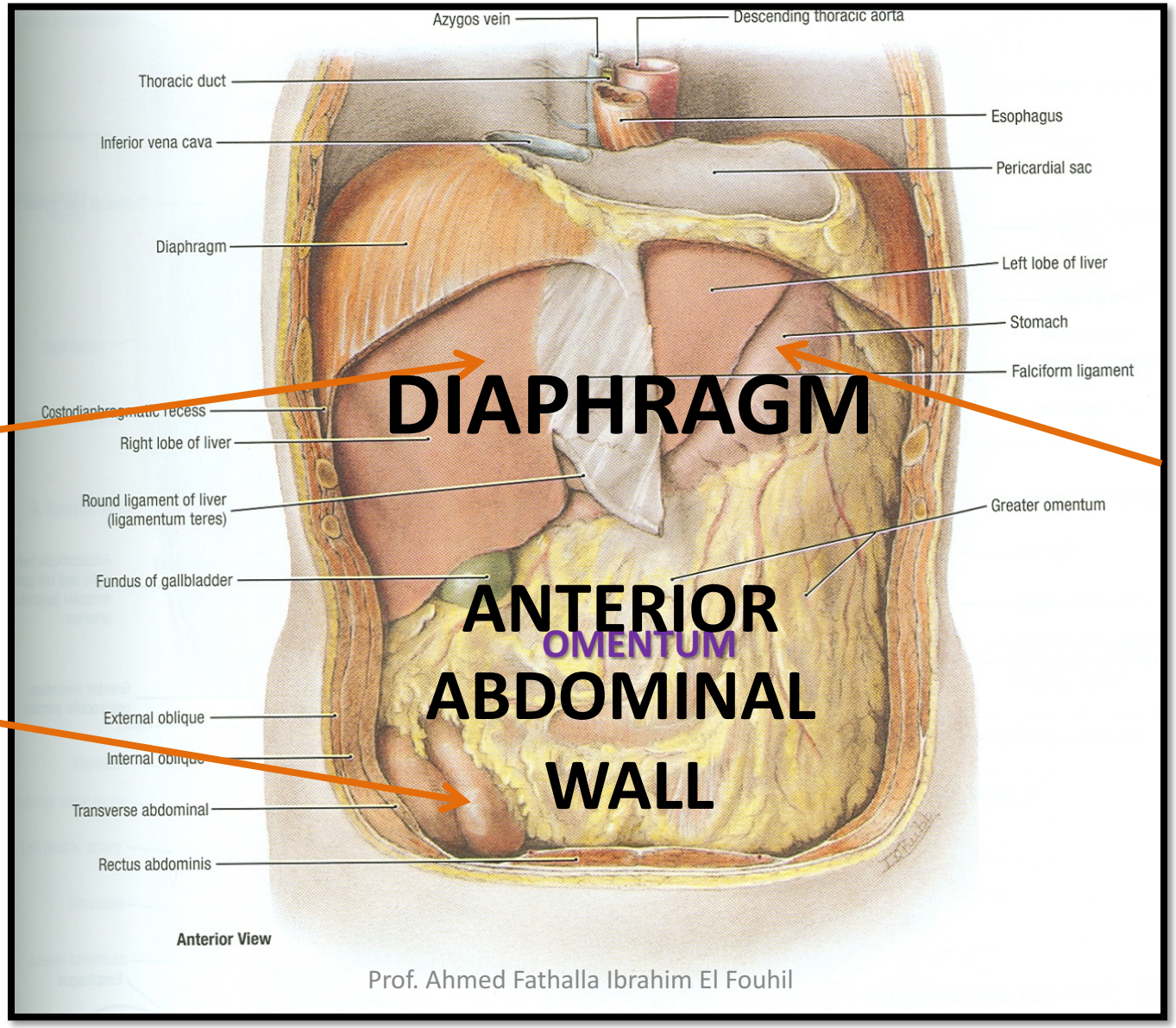
ABDOMEN


Diaphragm
Peritoneal cavity
V
Posterior abdominal wall
Anterior abdominal wall
Peritoneal fold
(Mesentery OR
Omentum)
V
Retroperitoneal
structure
Pelvis

ABDOMEN


B
Costal margin
Peritoneal cavity
Left kidney
Mesentery
Muscles
Aorta
Right kidney
Inferior vena cava

ABDOMEN - LAYER 1



REST OF LAYER 1
JEJUNUM & ILEUM + TRANSVERSE COLON

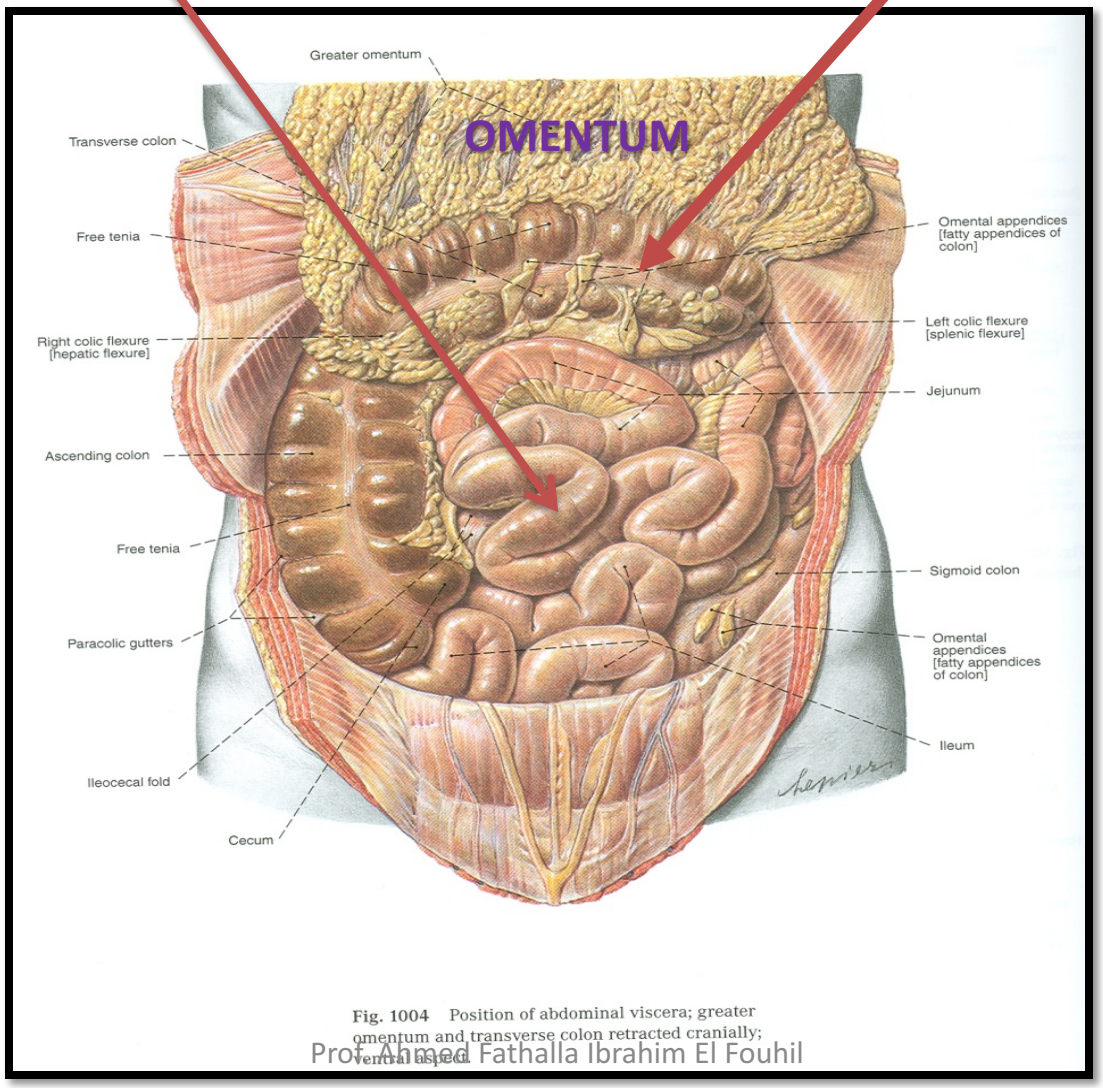
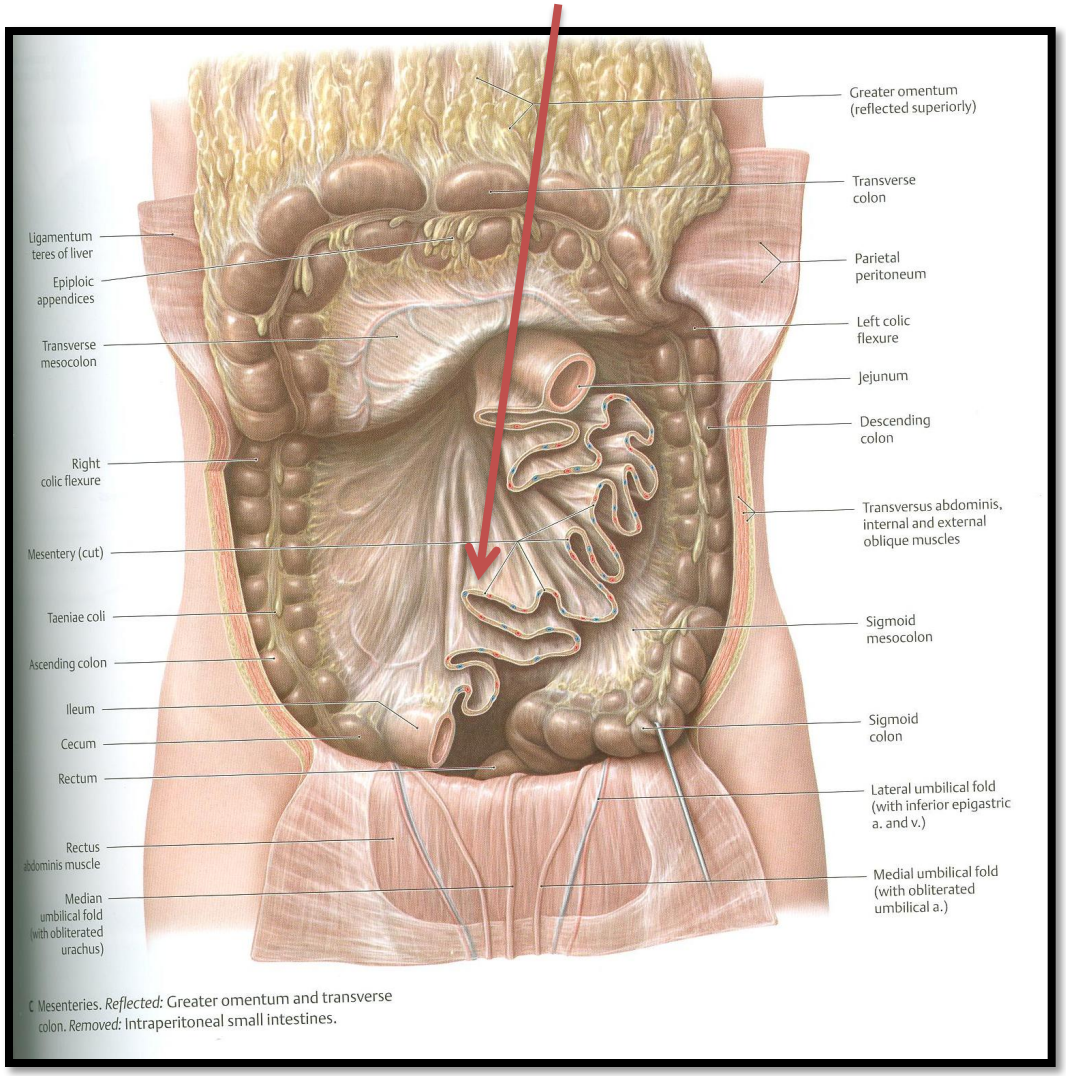


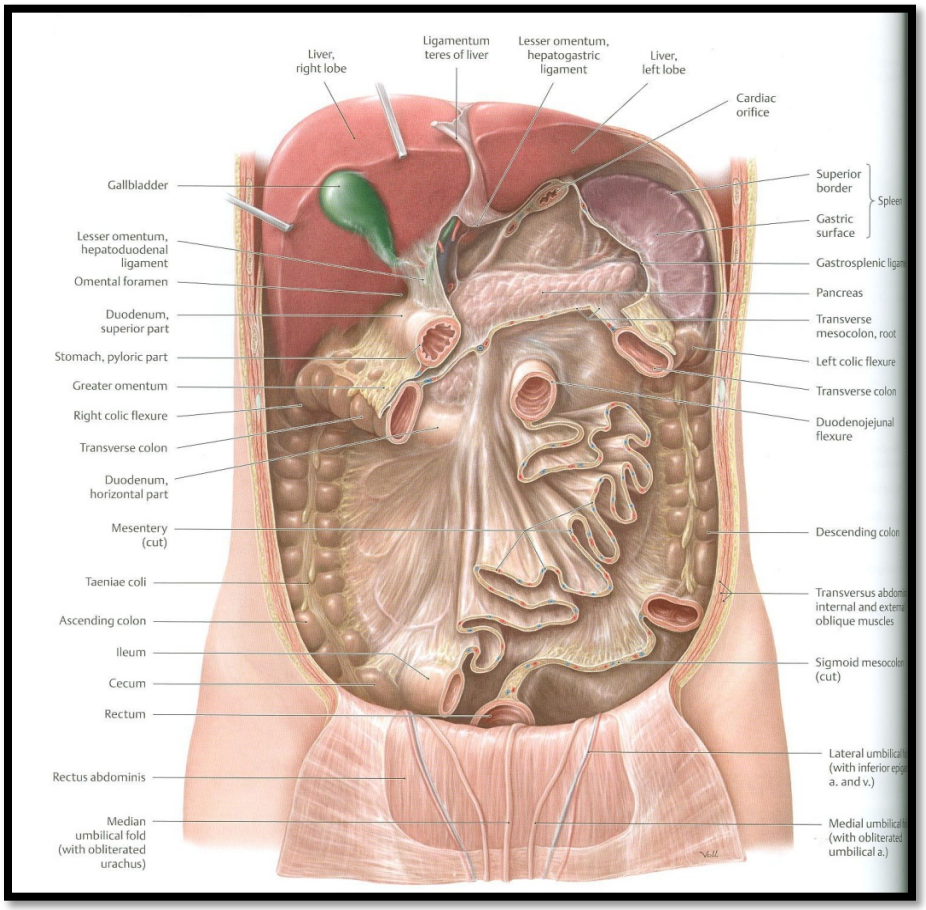
Fig. 1004 Position of abdominal viscera; greater omentum and transverse colon retracted cranially; ventral aspect.

MESENTERY OF SMALL INTESTINE

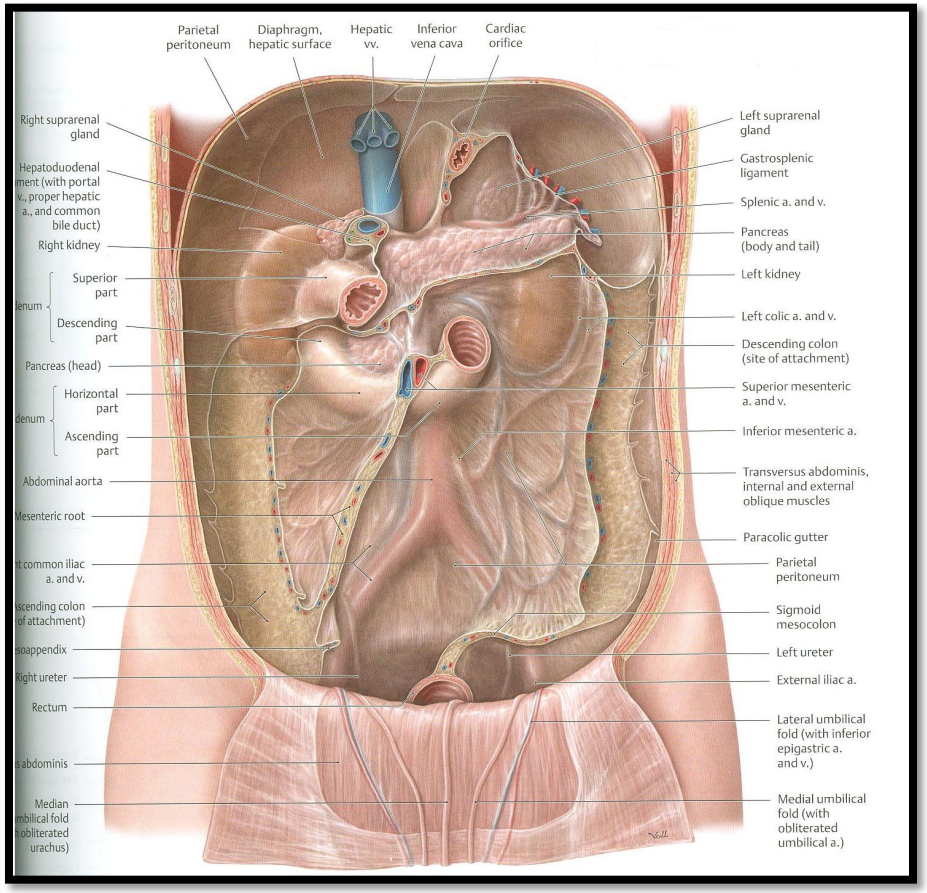


C Mesenteries. *Reflected:* Greater omentum and transverse colon. *Removed:* Intraperitoneal small intestines.

1


Liver, right lobe
Ligamentum teres of liver
Lesser omentum, hepatogastric ligament
Liver, left lobe
Cardiac orifice
Gallbladder
Lesser omentum, hepatoduodenal ligament
Omental foramen
Duodenum, superior part
Stomach, pyloric part
Greater omentum
Right colic flexure
Transverse colon
Duodenum, horizontal part
Mesentery (cut)
Taeniae coli
Ascending colon
Ileum
Cecum
Rectum
Rectus abdominis
Median umbilical fold (with obliterated urachus)
Superior border
Gastric surface
Spleen
Gastrosplenic ligament
Pancreas
Transverse mesocolon, root
Left colic flexure
Transverse colon
Duodenojejunal flexure
Descending colon
Transversus abdominis, internal and external oblique muscles
Sigmoid mesocolon (cut)
Lateral umbilical fold (with inferior epigastric a. and v.)
Medial umbilical fold (with obliterated umbilical a.)

2


Parietal peritoneum
Diaphragm, hepatic surface
Hepatic vv.
Inferior vena cava
Cardiac orifice
Right suprarenal gland
Hepatoduodenal ligament (with portal v., proper hepatic a., and common bile duct)
Right kidney
Superior part
Descending part
Pancreas (head)
Horizontal part
Ascending part
Abdominal aorta
Mesenteric root
Right ureter
Rectum
Median umbilical fold (with obliterated urachus)
Left suprarenal gland
Gastrosplenic ligament
Splenic a. and v.
Pancreas (body and tail)
Left kidney
Left colic a. and v.
Descending colon (site of attachment)
Superior mesenteric a. and v.
Inferior mesenteric a.
Transversus abdominis, internal and external oblique muscles
Paracolic gutter
Parietal peritoneum
Sigmoid mesocolon
Left ureter
External iliac a.
Lateral umbilical fold (with inferior epigastric a. and v.)
Medial umbilical fold (with obliterated umbilical a.)

ABDOMEN – LAYER 3 (IN BLACK) + PART OF LAYER 2 (IN BLUE)

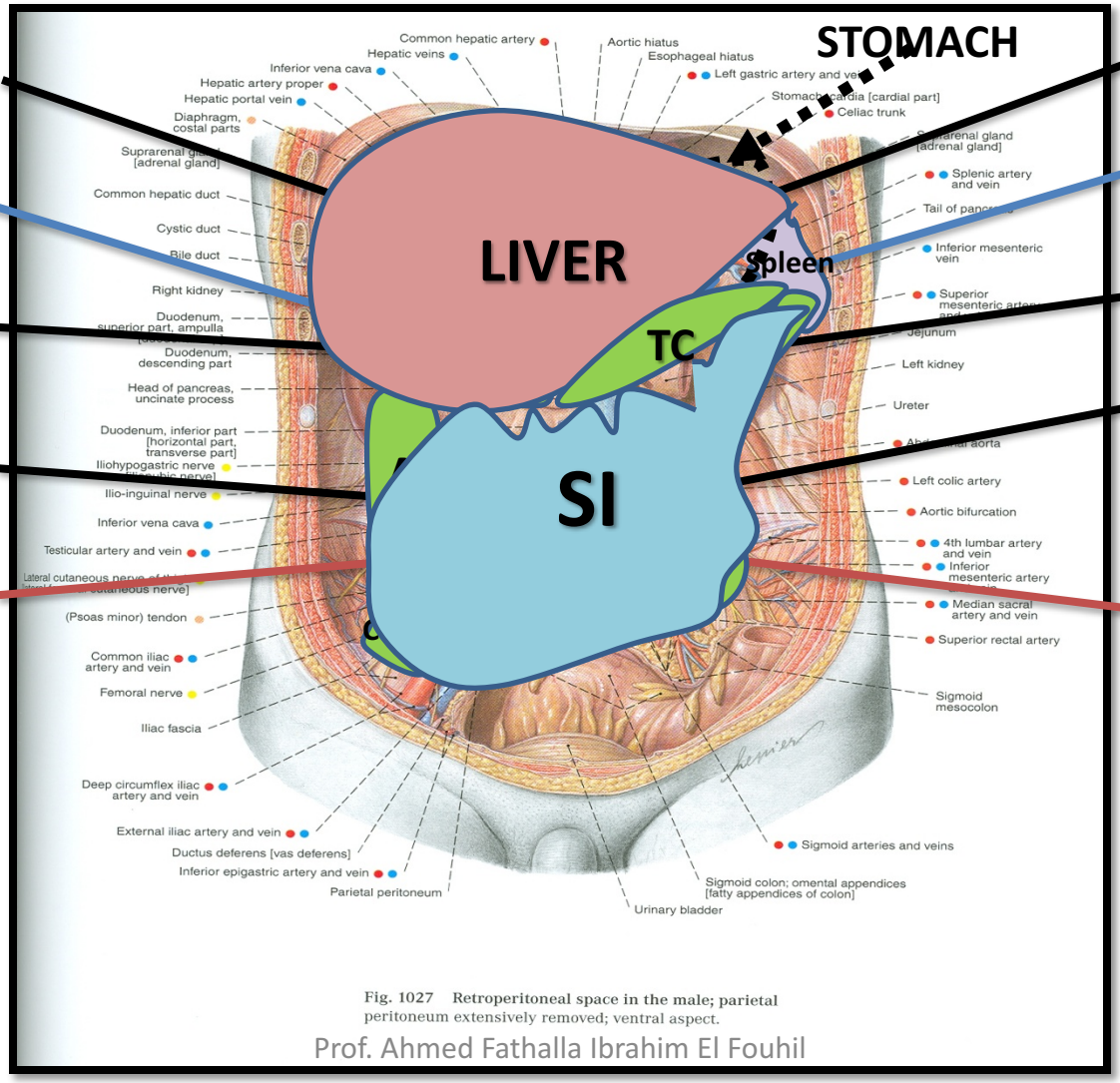


Fig. 1027 Retroperitoneal space in the male; parietal peritoneum extensively removed; ventral aspect.

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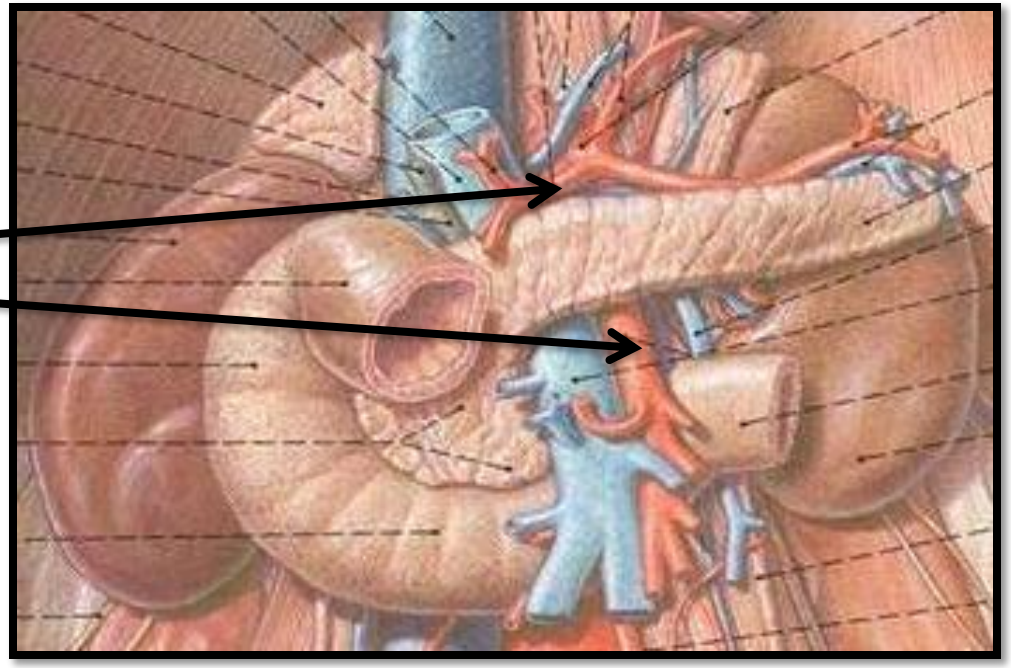
RELATION BETWEEN EMBRYOLOGICAL ORIGIN & ARTERIAL SUPPLY

DUODENUM:

- Origin: Foregut & Midgut
- Arterial supply:

1. Coeliac trunk (artery of foregut)
2. Superior mesenteric: (artery of midgut)



JEJUNUM & ILEUM:

- Origin: Midgut
- Arterial supply:

Superior mesenteric: (artery of midgut)

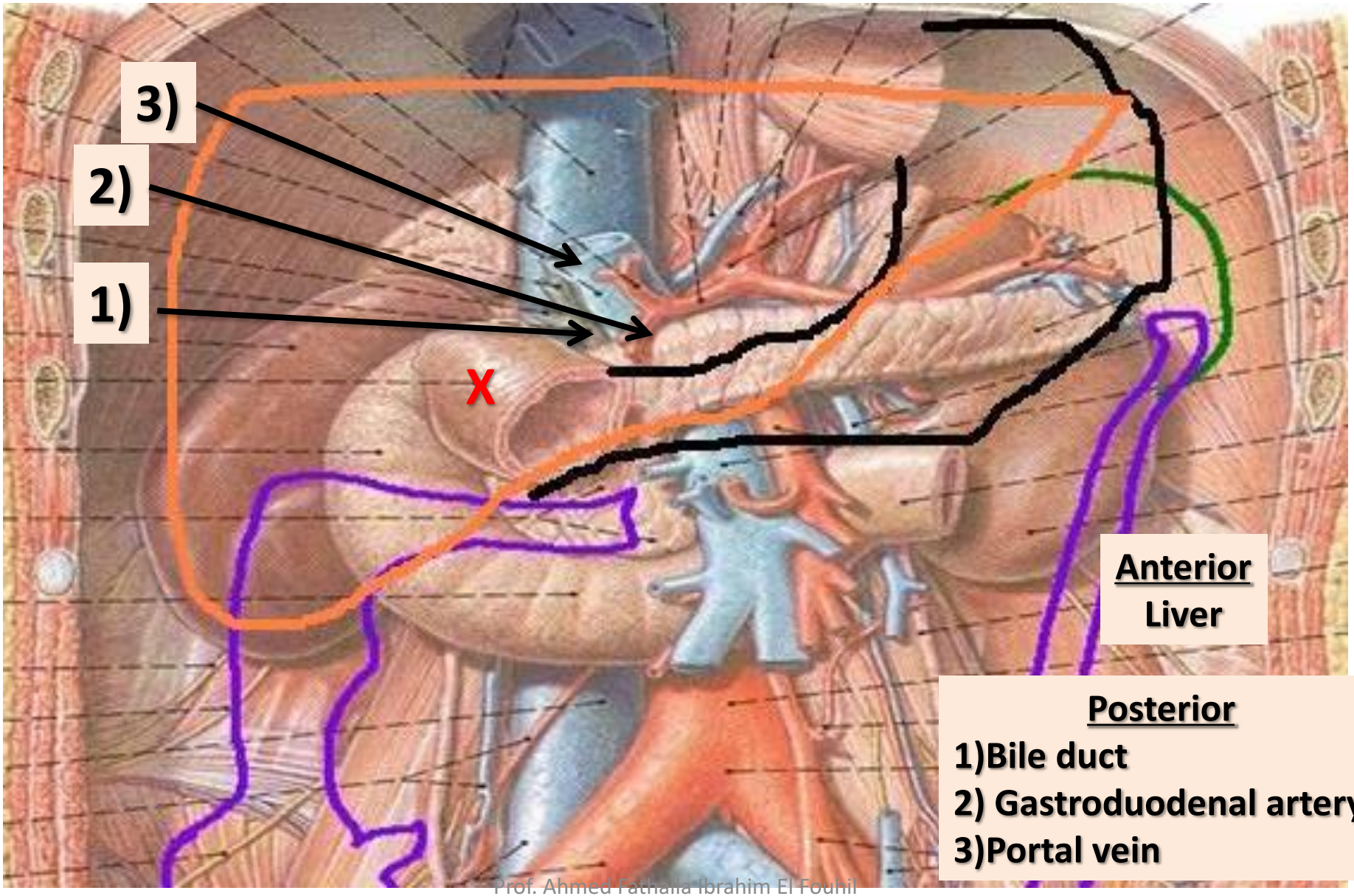
DUODENUM

- **SHAPE:** C-shaped loop
- **LENGTH:** 10 inches
- **BEGINNING:** at pyloro-duodenal junction
- **TERMINATION:** at duodeno-jejunal flexure
- **PERITONEAL COVERING:** retroperitoneal
- **DIVISIONS:** 4 parts
- **EMBRYOLOGICAL ORIGIN:** foregut & midgut
- **ARTERIAL SUPPLY:** coeliac & superior mesenteric
- **LYMPHATIC DRAINAGE:** coeliac & superior mesenteric

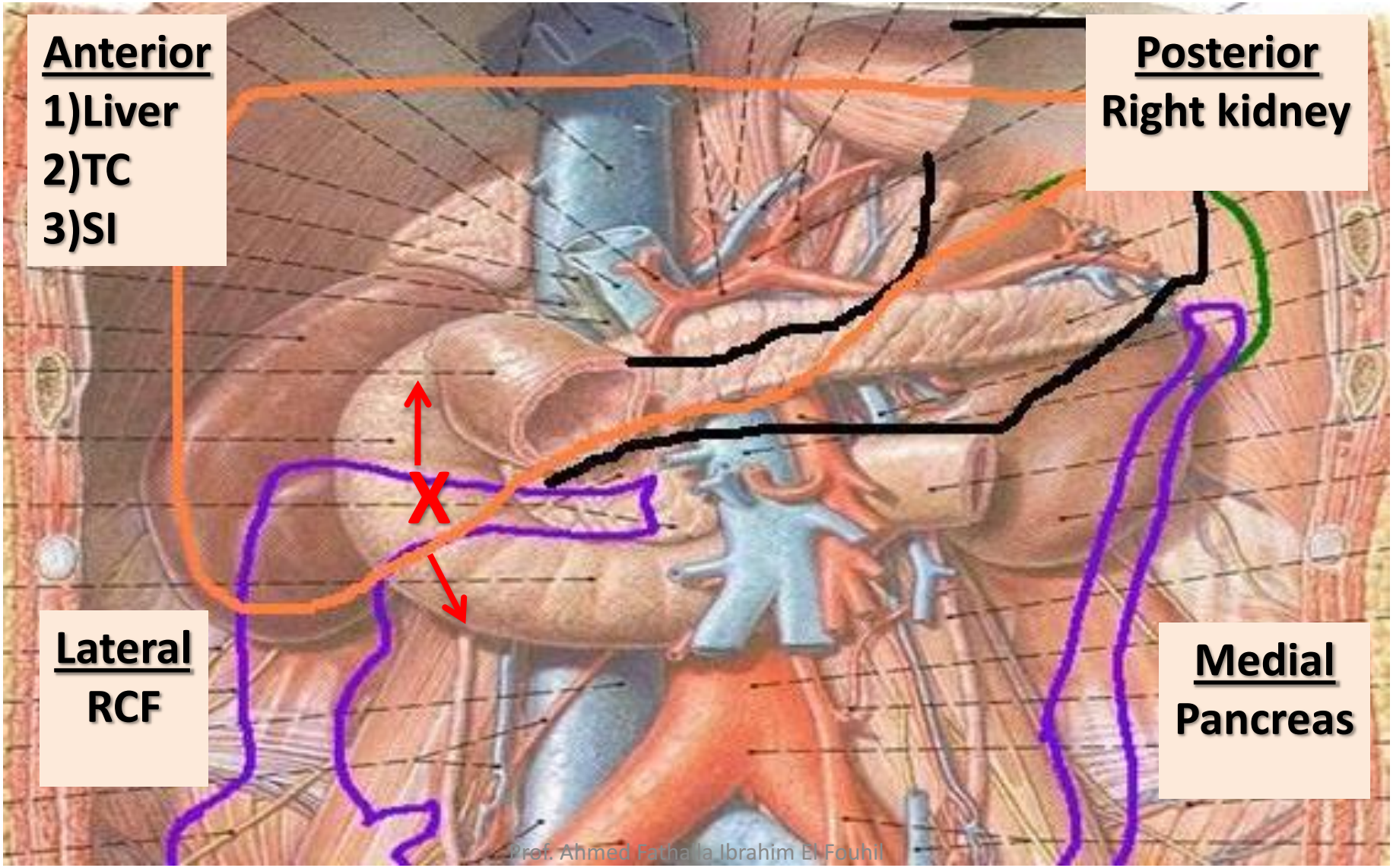
DUODENUM
LENGTH – SURFACE ANATOMY

PART	LENGTH	LEVEL
FIRST PART (HORIZONTAL)	2 INCHES	L1 (TRANSPYLORIC PLANE)
SECOND PART (DESCENDING)	3 INCHES	DESCENDS FROM L1 TO L3
THIRD PART (HORIZONTAL)	4 INCHES	L3 (SUBCOTAL PLANE)
FOURTH PART (ASCENDING)	1 INCHES	ASCENDS FROM L3 TO L2

RELATIONS OF FIRST PART

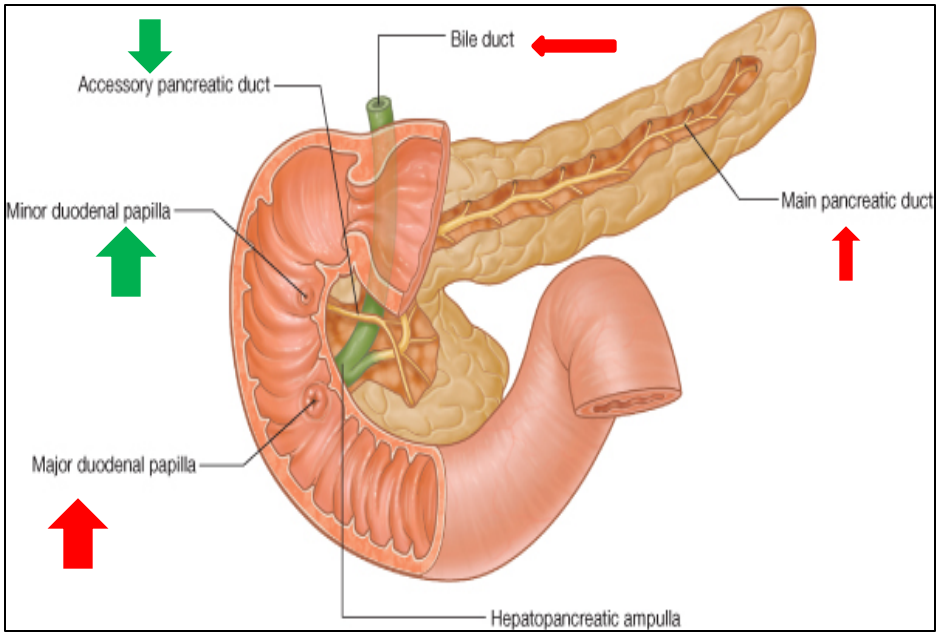


RELATIONS OF SECOND PART



OPENINGS IN SECOND PART OF DUODENUM

1. **Common opening of bile duct & main pancreatic duct:** on summit of major duodenal papilla.
2. **Opening of accessory pancreatic duct** (one inch higher): on summit of minor duodenal papilla.



RELATIONS OF THIRD PART

- **Anterior:**
  - a)Small intestine
  - b) Superior mesenteric vessels
- **Posterior:**
  - 1) Right psoas major
  - 2) Inferior vena cava
  - 3) Abdominal aorta
  - 4) Inferior mesenteric vessels

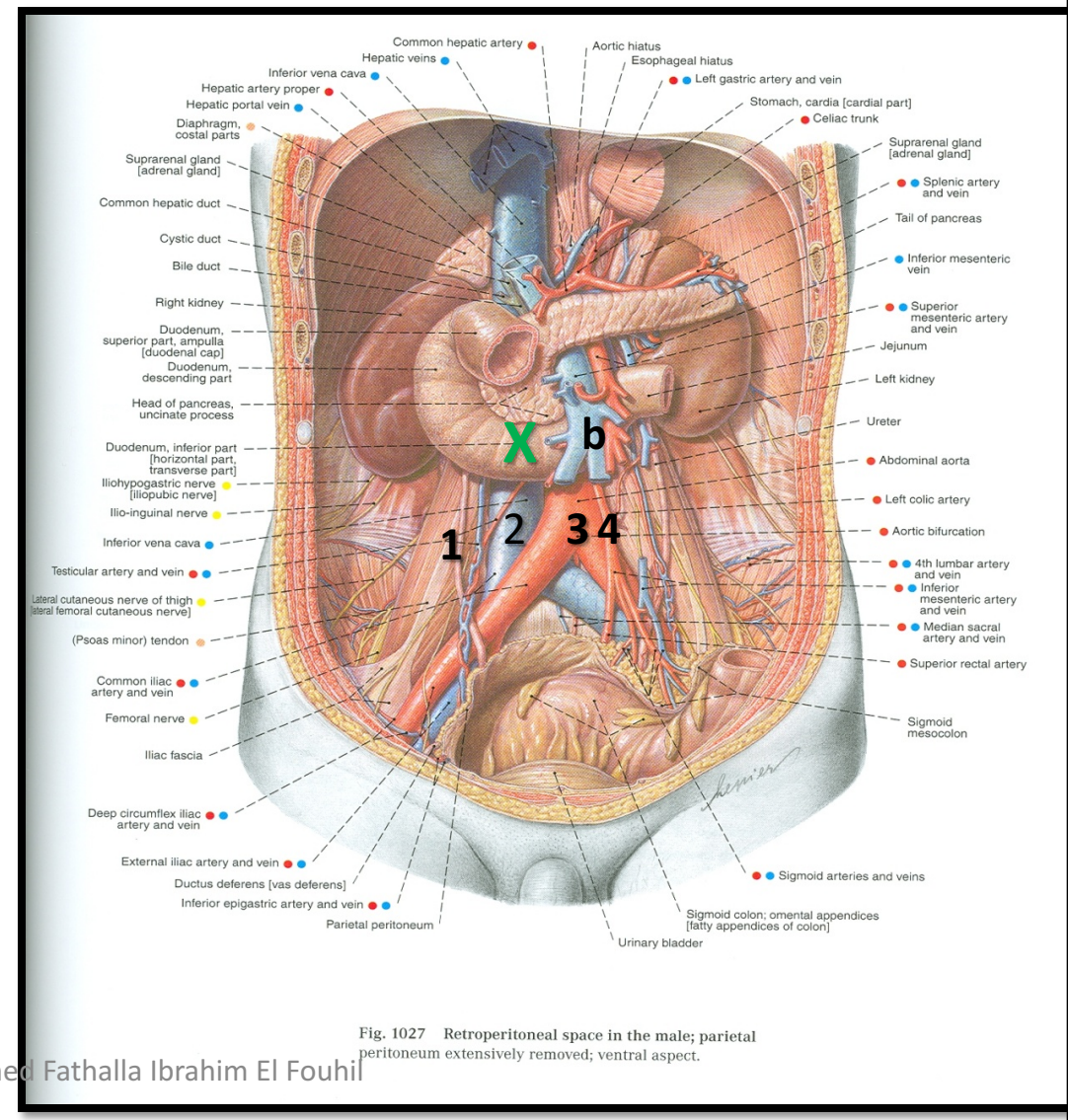


Fig. 1027 Retroperitoneal space in the male; parietal peritoneum extensively removed; ventral aspect.

RELATIONS OF FOURTH PART

- **Anterior:**
  - Small intestine
- **Posterior:**
  - Left psoas major

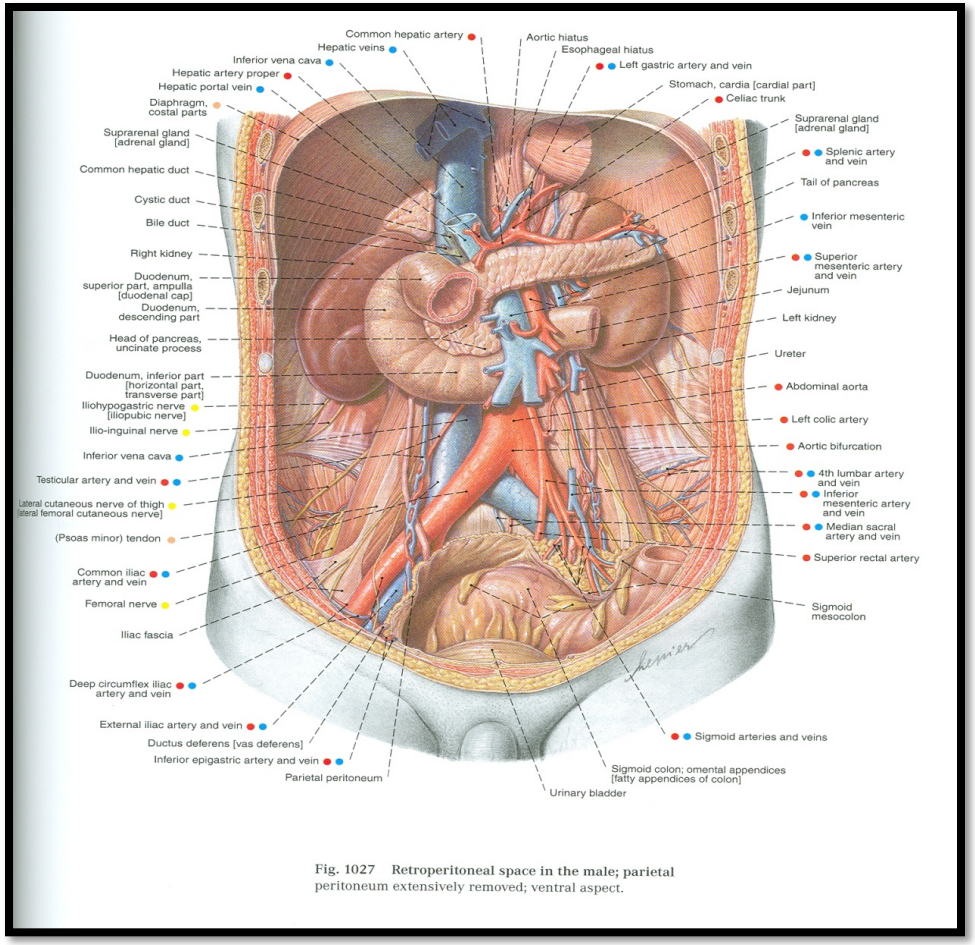
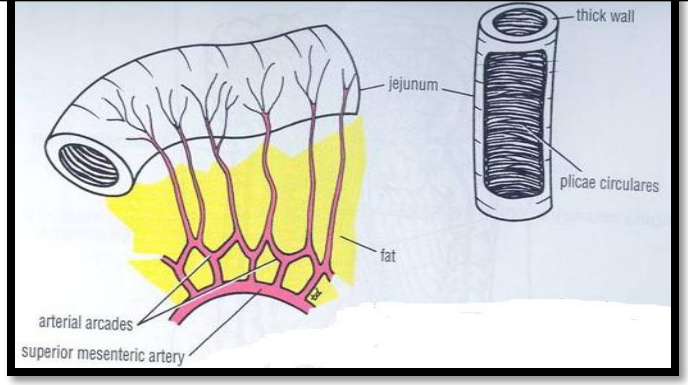
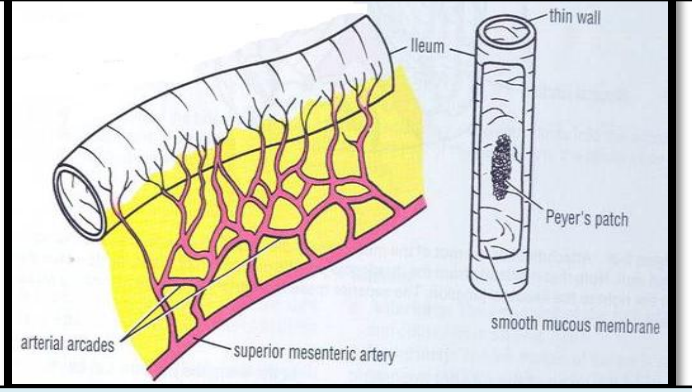


Fig. 1027 Retroperitoneal space in the male; parietal peritoneum extensively removed; ventral aspect.

JEJUNUM & ILEUM

- **SHAPE:** coiled tube
- **LENGTH:** 6 meters (20 feet)
- **BEGINNING:** at duodeno-jejunal flexure
- **TERMINATION:** at ilieo-caecal junction
- **PERITONEAL FOLD:** mesentery of small intestine
- **EMBRYOLOGICAL ORIGIN:** midgut
- **ARTERIAL SUPPLY:** superior mesenteric
- **LYMPHATIC DRAINAGE:** superior mesenteric





	JEJUNUM	ILEUM
LENGTH	Shorter (proximal 2/5)	Longer (distal 3/5)
DIAMETER	Wider	Narrower
WALL	Thicker (more plicae circulares)	Thinner (less plica circulares)
APPEARANCE	Dark red (more vascular)	Light red (less vascular)
VESSELS	Less arcades (long terminal branches)	More arcades (short terminal branches)
MESENTERIC FAT	Small amount near intestinal border	Large amount near intestinal border
LYMPHOID TISSUE	Few aggregations	Numerous aggregations (Peyer's patches)

QUESTION 1

- Which one of the following is anterior to the third part of duodenum?

1. Superior mesenteric vessels 
2. Right kidney
3. Right posas major muscle
4. Abdominal aorta

QUESTION 2

- Which one of the following structures could be injured in case of perforated duodenal ulcer?

1. Right kidney
2. Right colic flexure
3. Gastroduodenal artery 
4. Inferior mesenteric vessels


THANK YOU