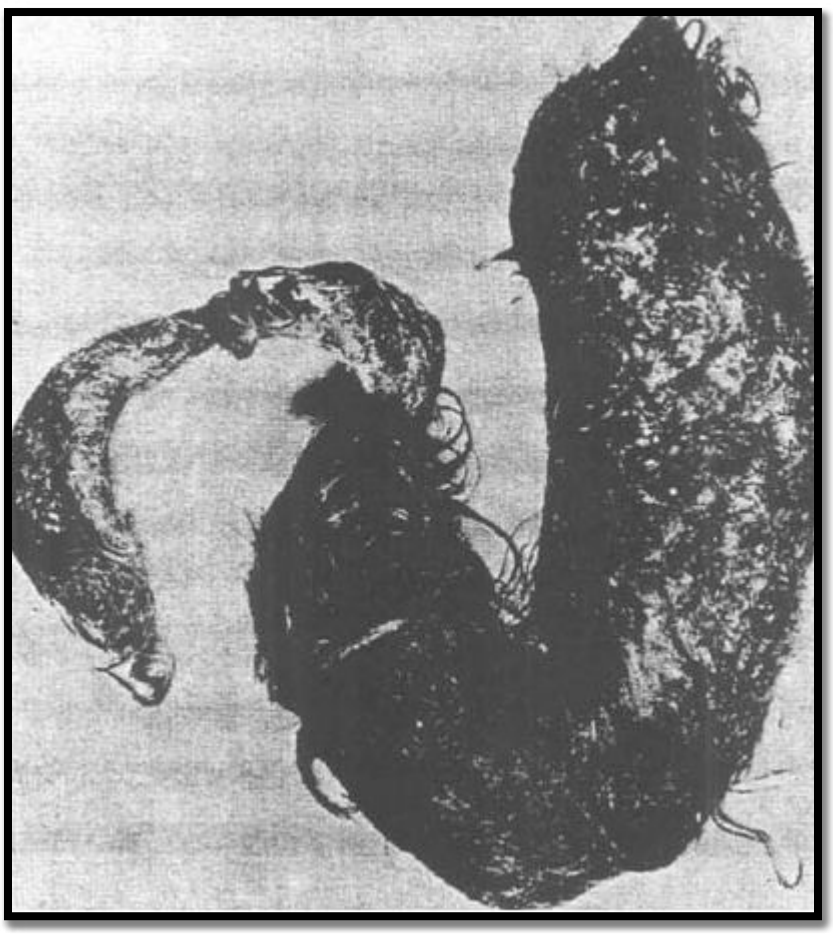
Gastric Trichobezoar
Gastric Lymphoma
Liver: Anatomy & Investigations

Gastric Trichobezoar

- Bezoars are concretions of undigestible matter that accumulate in the stomach.
- Trichobezoars, (hairballs) composed of hair, occur most commonly in young women who swallow their hair
- Phytobezoars are composed of vegetable matter
- Most commonly, bezoars produce obstructive symptoms, but they may cause ulceration and bleeding.
- Diagnosis is suggested by upper GI series and confirmed by endoscopy.
- Treatment options include enzyme therapy (papain, cellulase, or acetylcysteine), endoscopic disruption and removal, or surgical removal



Trichobezoar forming cast of stomach and duodenum removed from a young female

Gastric Lymphoma

- Gastric lymphomas generally account for about 4% of gastric malignancies.
- Over half of patients with non-Hodgkin's lymphoma have involvement of the GI tract.
- Stomach is the most common site of primary GI lymphoma, and over 95% are non-Hodgkin's type.
- Most are B-cell type, thought to arise in mucosa-associated lymphoid tissue (MALT).
- In populations with a high incidence of gastric lymphoma, there is a high incidence of *H. pylori* infection; patients with gastric lymphoma also usually have *H. pylori* infection.

- Low-grade MALT lymphoma, essentially a monoclonal proliferation of B cells, arises from a background of chronic gastritis associated with *H. pylori*.
- These relatively innocuous tumors then undergo degeneration to high-grade lymphoma.
- Remarkably, when the *H. pylori* is eradicated and the gastritis improves, the low-grade MALT lymphoma often disappears.
- Thus low-grade MALT lymphoma is not a surgical lesion.
- Careful follow-up is necessary.

- High-grade gastric lymphoma require aggressive oncologic treatment for cure
- Systemic symptoms such as fever, weight loss, and night sweats occur in about 50% of patients
- The tumors may bleed and/or obstruct.
- Lymphadenopathy and/or organomegaly suggest systemic disease.
- Diagnosis is by endoscopy and biopsy.
- Primary lymphoma is usually nodular with enlarged gastric folds.
- Diffusely infiltrative process akin to linitis plastica is more suggestive of secondary gastric involvement by lymphoma.
- EUS; CT scanning of the chest, abdomen, and pelvis; and bone marrow biopsy.
- Treatment is with primary chemotherapy and radiation without surgery

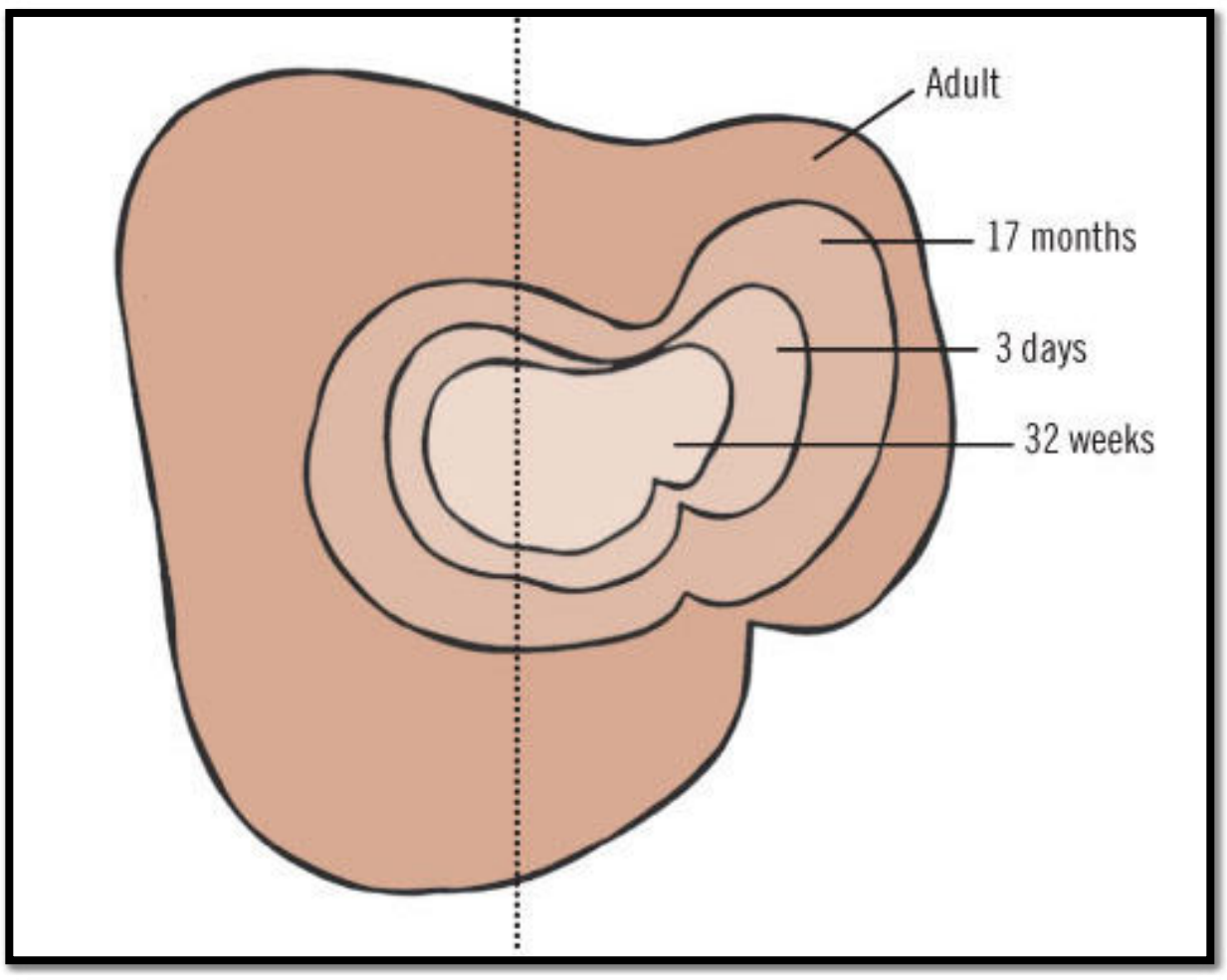
Liver

Anatomy: Embryology

- The earliest appearance of the liver primordium occurs on Day 22 after conception.
- It appears at the superior intestinal portal, caudal and ventral to the heart.
- By Day 24 hepatic diverticulum grows into the transverse septum that contains the vitelline and umbilical veins

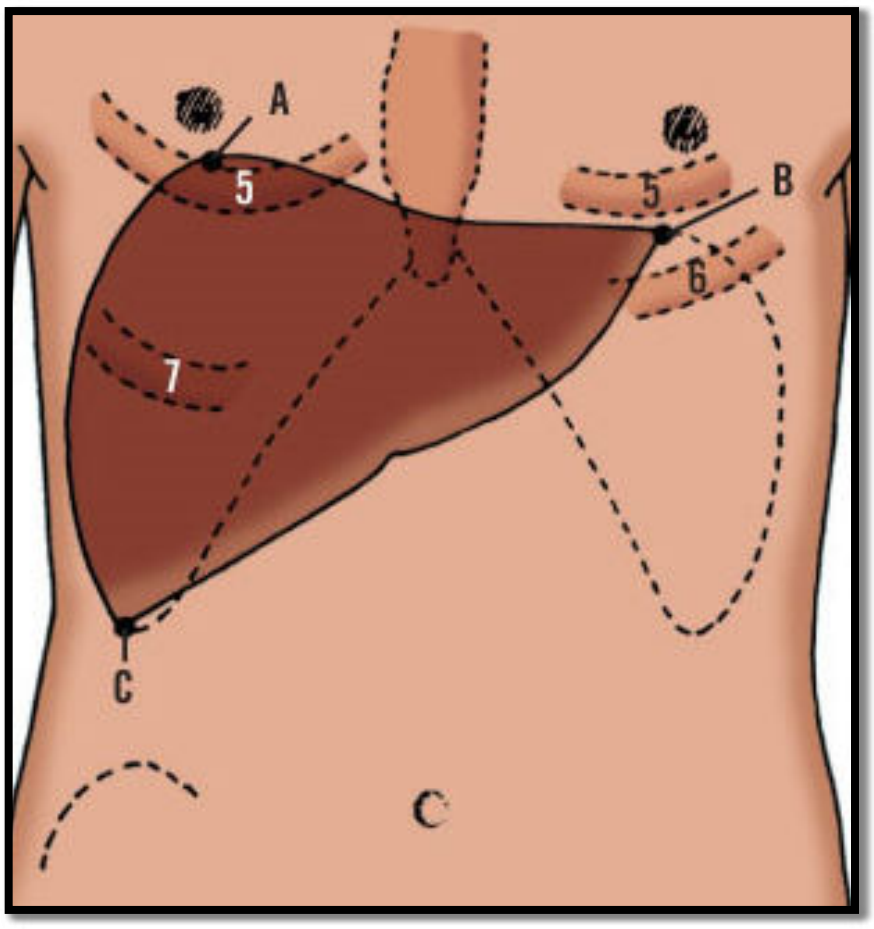
- By Day 51, the intrahepatic veins attain the normal adult distribution and segmentation

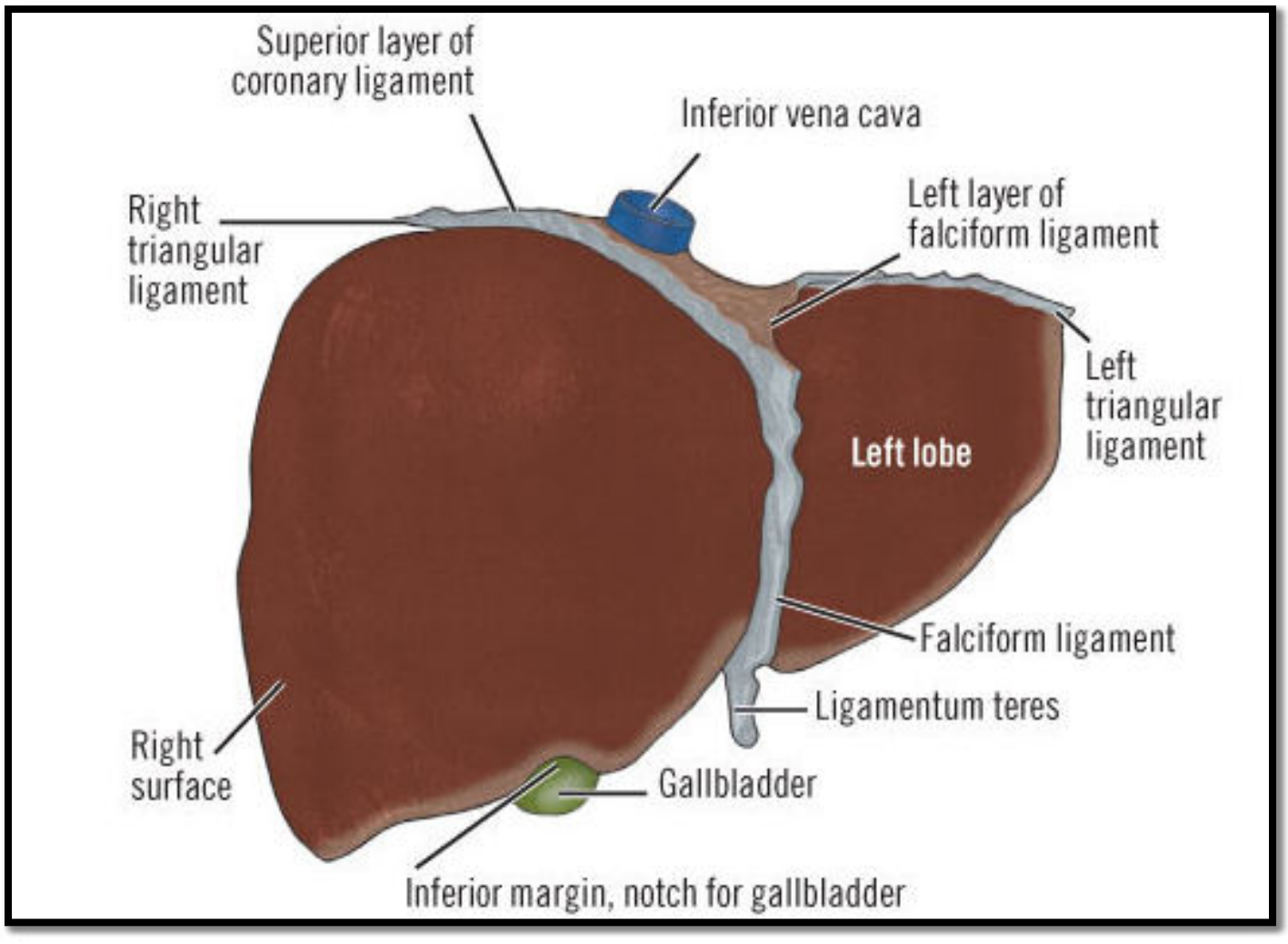
- By the ninth week, the liver embraces as much as 10% of body volume



Relative size of the left and right lobes of the liver in the foetus

- largest solid organ of the body
- Weight: adult male ranges from 1.4 kg to 1.8 kg
  adult female from 1.2 kg to 1.4 kg
- wedge-shaped





Diaphragmatic aspect of the liver

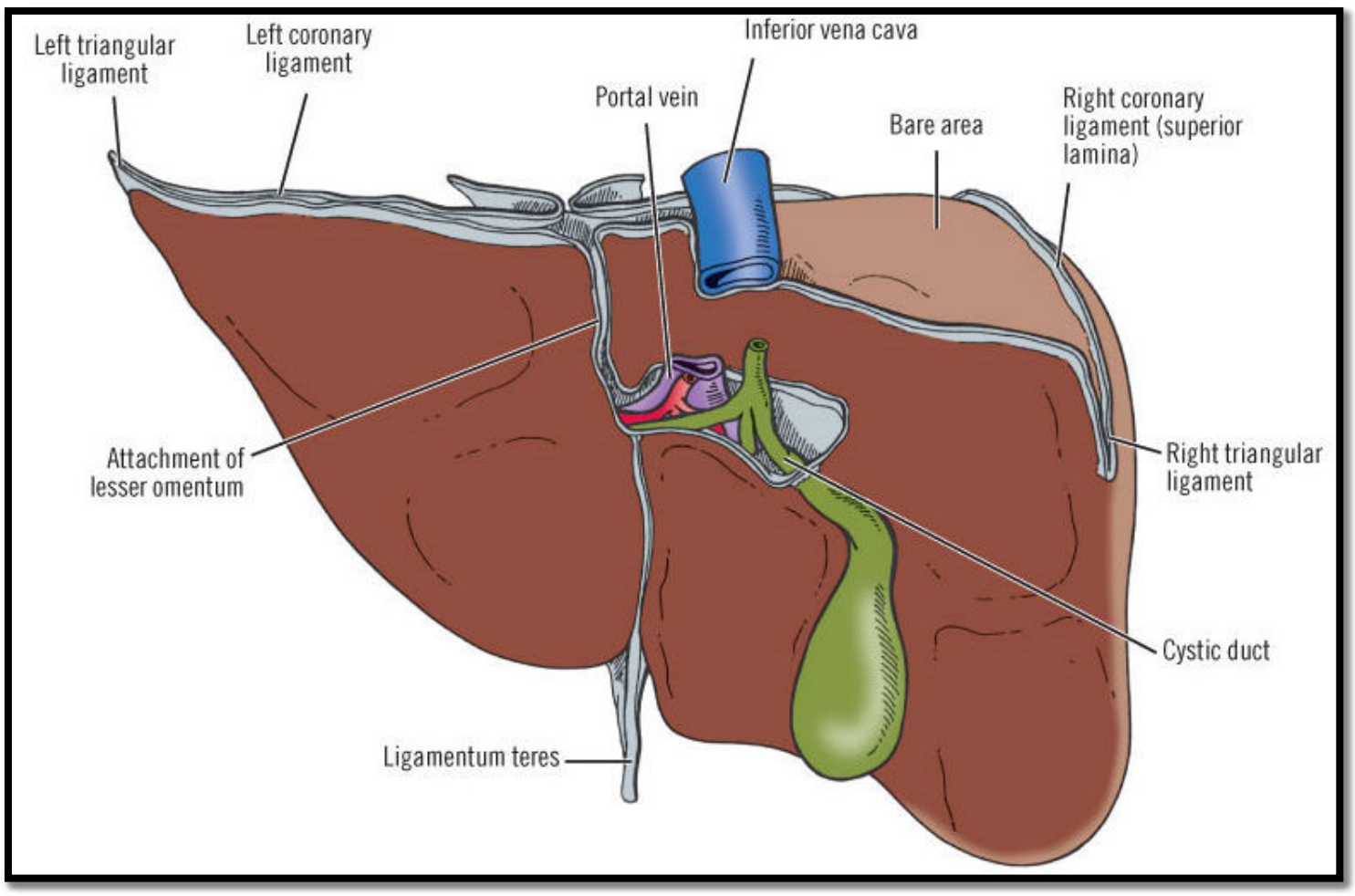


Diagram of the posterior aspect of the liver

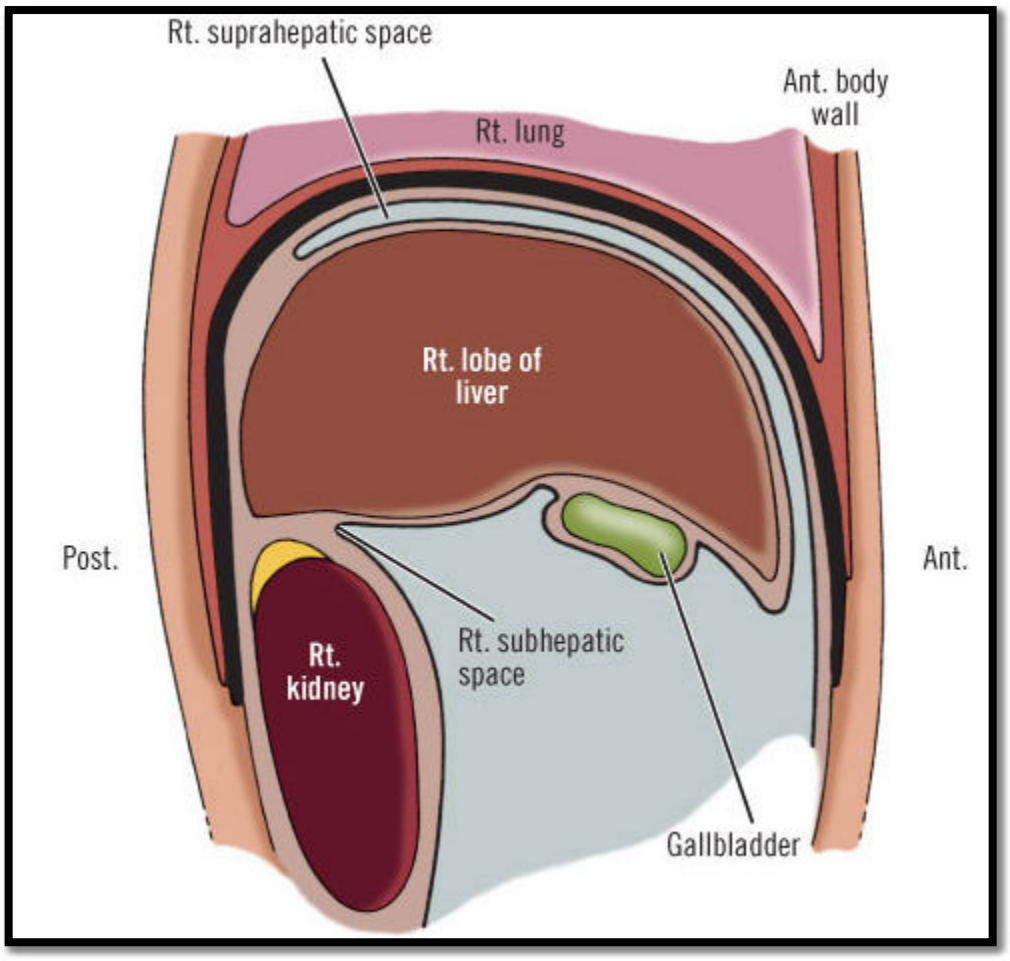
- Anatomic & nonanatomic factors responsible for the fixation of the liver at the right upper quadrant of the abdomen:

Anatomic

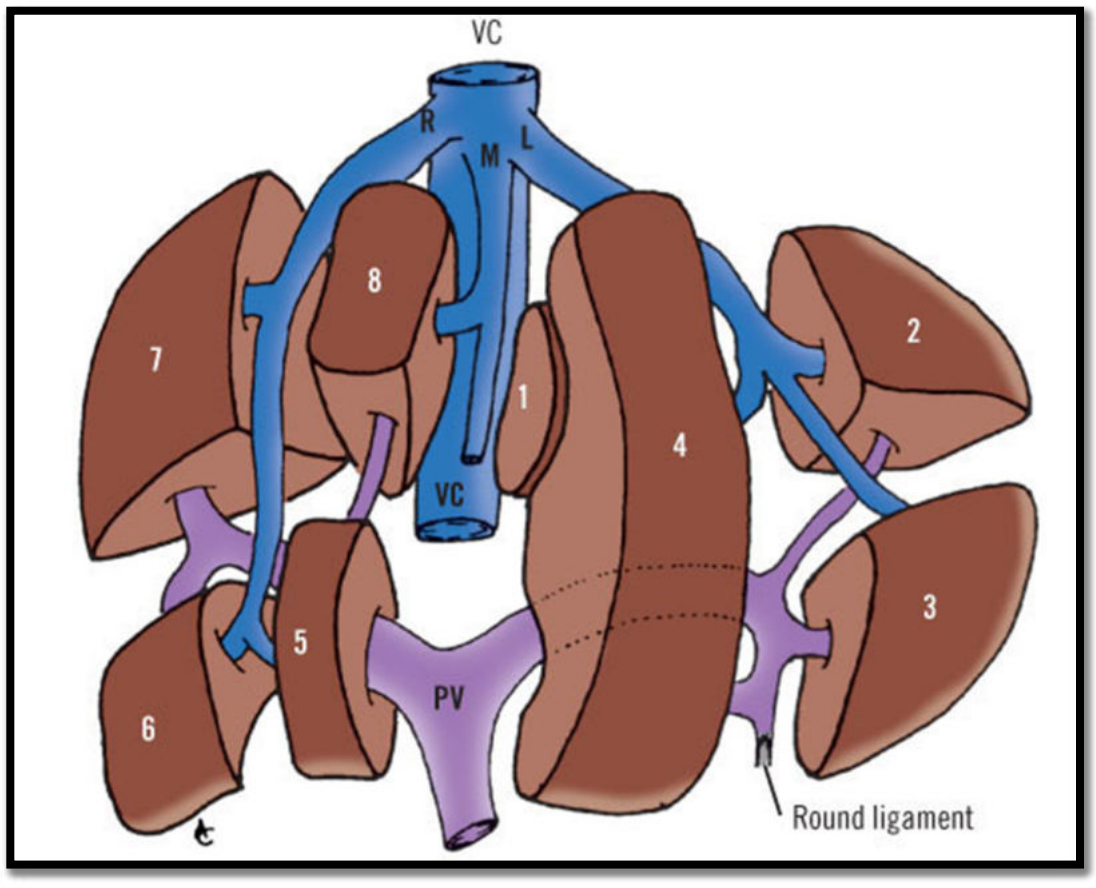
- Inferior vena cava
- Suprahepatic veins
- Several ligaments such as the round ligament and coronary ligament
- Peritoneal folds

Nonanatomic

- Positive intraabdominal pressure



Parasagittal section through the upper abdomen showing the potential right suprahepatic and sub hepatic spaces



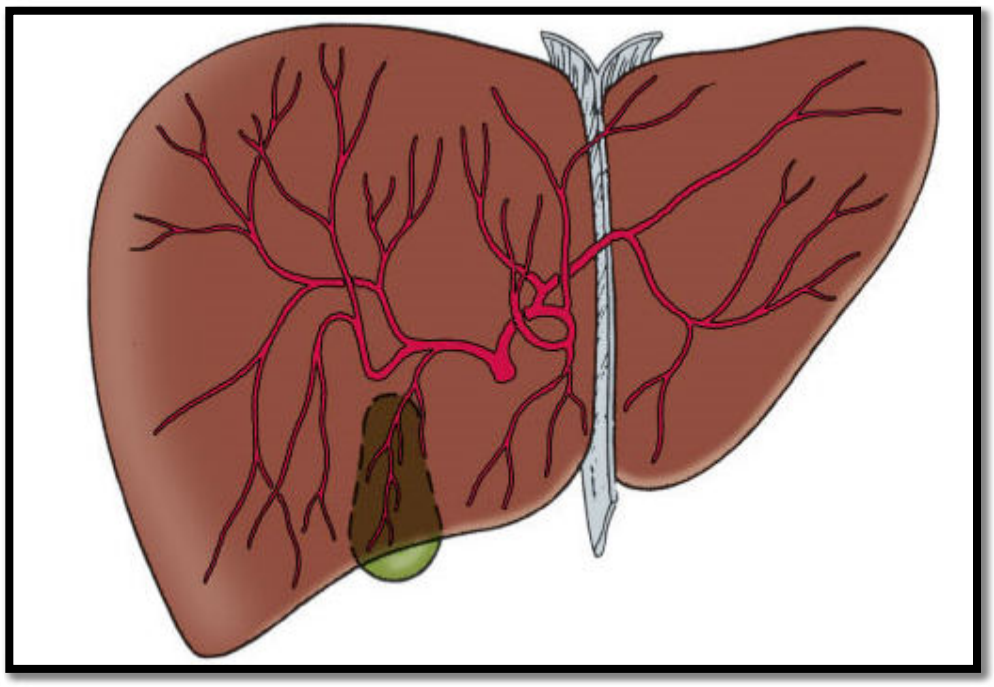
The umbilical fissure separates the anatomic left lobe (segments 2 and 3) from the right lobe (segments 4-8)

The middle hepatic vein runs within the main portal fissure (Cantlie's line), which separates the left liver (segments 2 to 4) from the right liver (segments 5 to 8)

Vascular Distribution

- Hepatic artery
- Portal vein

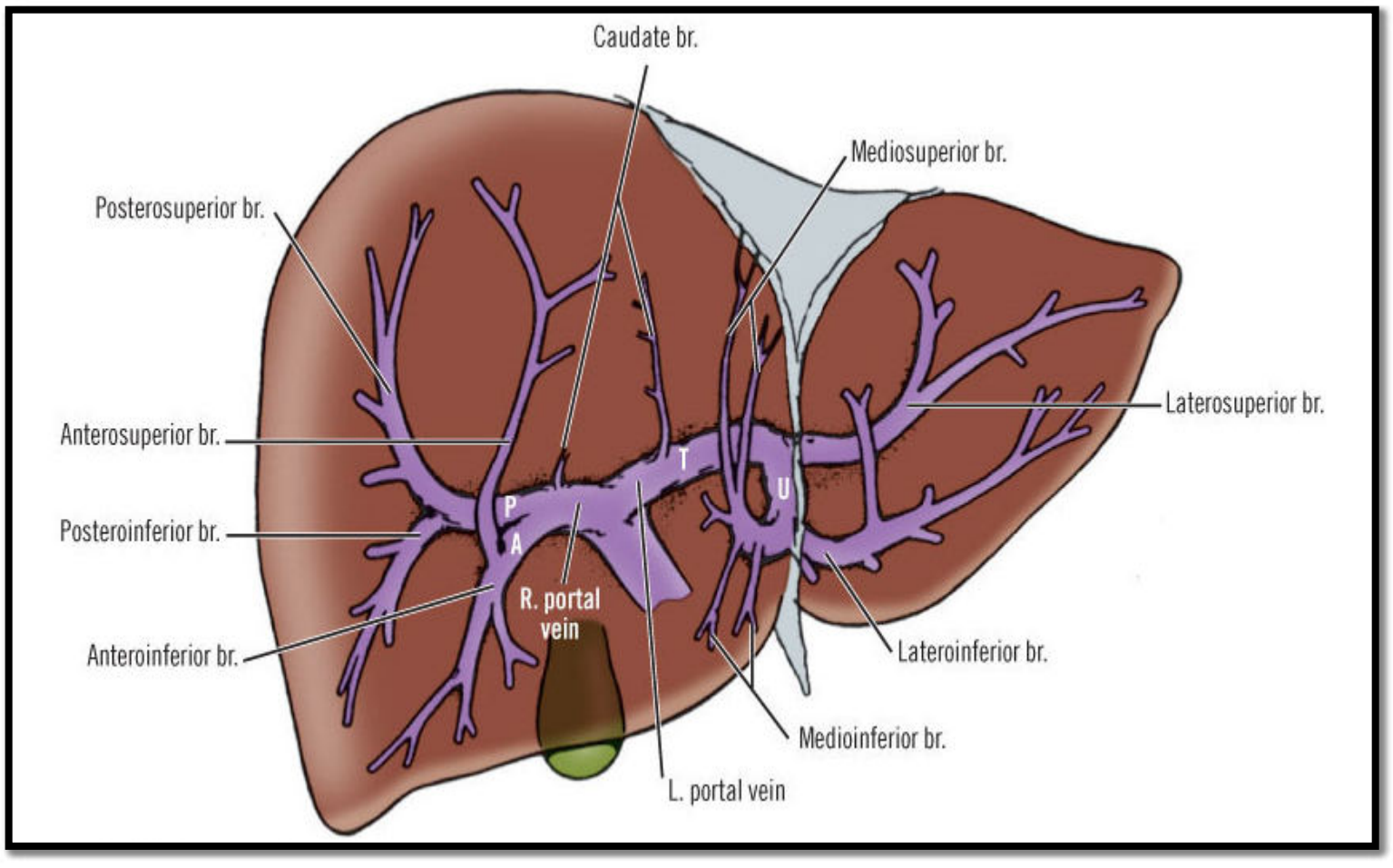
- About one-fourth of the blood and one-half the oxygen come by way of the hepatic artery.
- Remainder is carried by the portal vein
- Blood from these two sources mingles in the blood sinusoids of the liver parenchyma and is drained by tributaries of the hepatic veins
- These veins open into the inferior vena cava



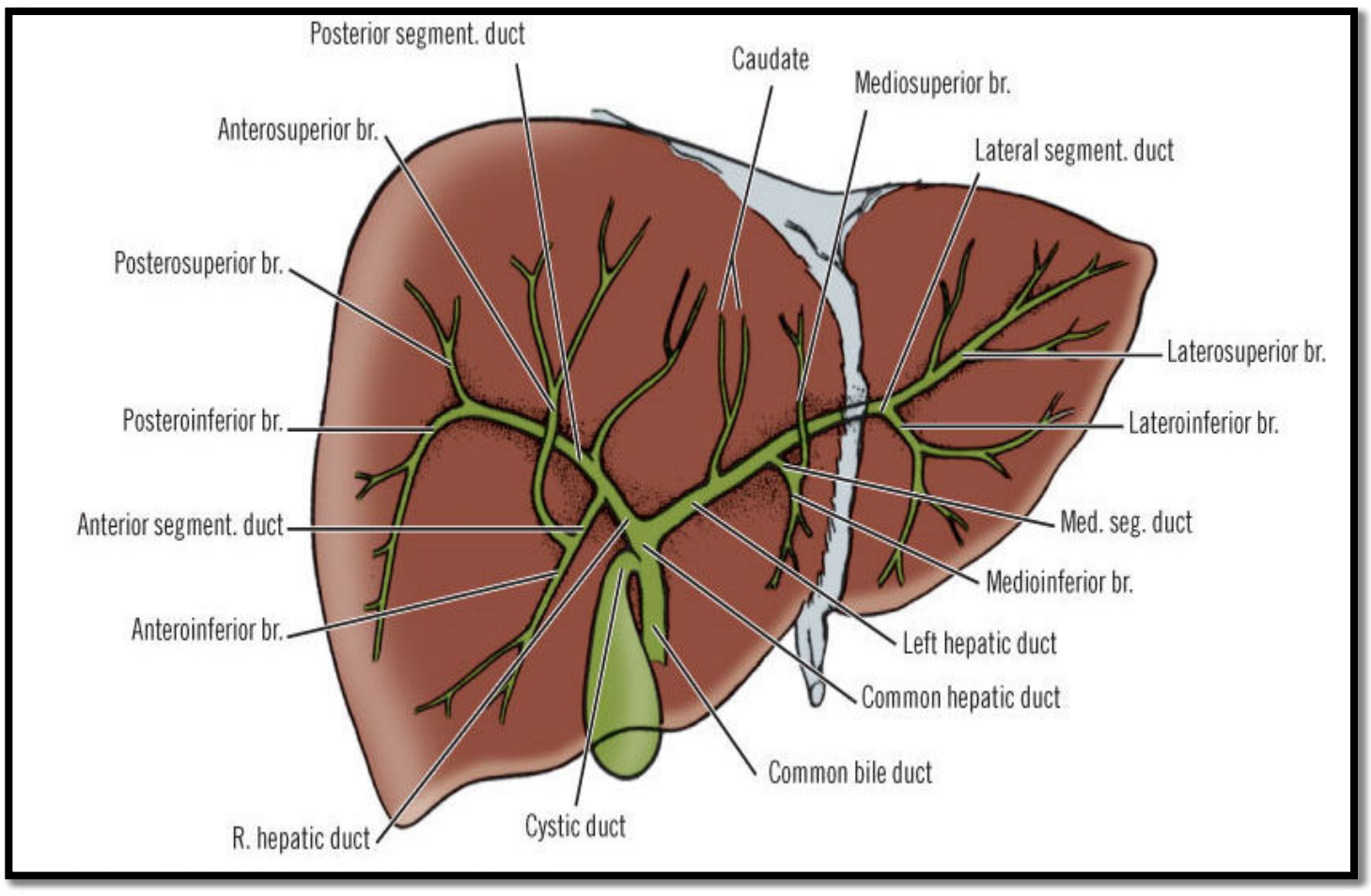
Intrahepatic distribution of the hepatic artery

Survival of a liver segment following arterial ligation is the result of all the following:

- Increased extraction of oxygen from portal venous blood
- Extrahepatic collateral circulation
- Intrahepatic collateral circulation formed in response to the ligation



Intrahepatic distribution of the hepatic portal vein



Intrahepatic distribution of the bile ducts

Lymphatics

- The liver sinusoids have an endothelial lining composed of flattened squamous cells and stellate macrophages (Kupffer cells)
- This endothelial layer is separated from the surrounding hepatocytes by a narrow perivascular space (of Disse) partially filled by microvilli of the hepatocytes
- The perivascular space of Disse is the source of lymph produced by the liver
- The lymphatics of the liver are usually divided into superficial or sub capsular and deep or portal systems

Nerve Supply

- The sympathetic fibres arise from thoracic spinal cord segments 7 to 10
- The parasympathetic efferent fibres arise from the hepatic division of the anterior and posterior vagal trunks

The phrenic nerve supply via its C3, 4, 5 roots is probably the basis of shoulder pain in biliary colic

Investigations

- Serum Liver Tests

Parenchymal (hepatocytes)	AST, ALT
Canalicular (biliary)	ALP, 5'NT, GGT, bilirubin
Synthetic function and metabolism	INR, factors V and VII, bilirubin, albumin

- Radiologic Evaluation of the Liver
  - Ultrasound
  - Computed Tomography Scan
  - Magnetic Resonance Imaging
  - Positron Emission Tomography
  - Angiography
- Percutaneous Biopsy
- Diagnostic Laparoscopy