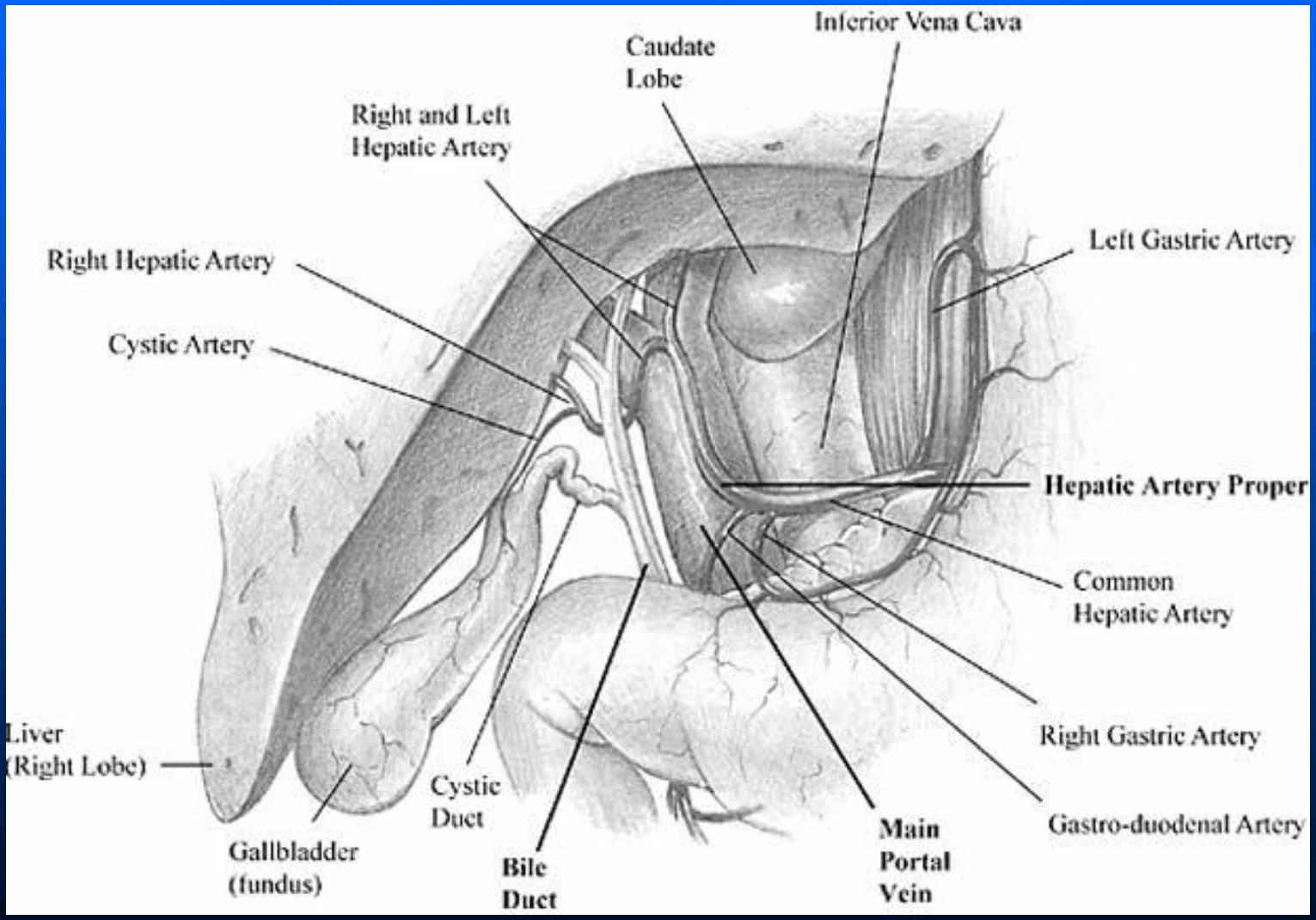
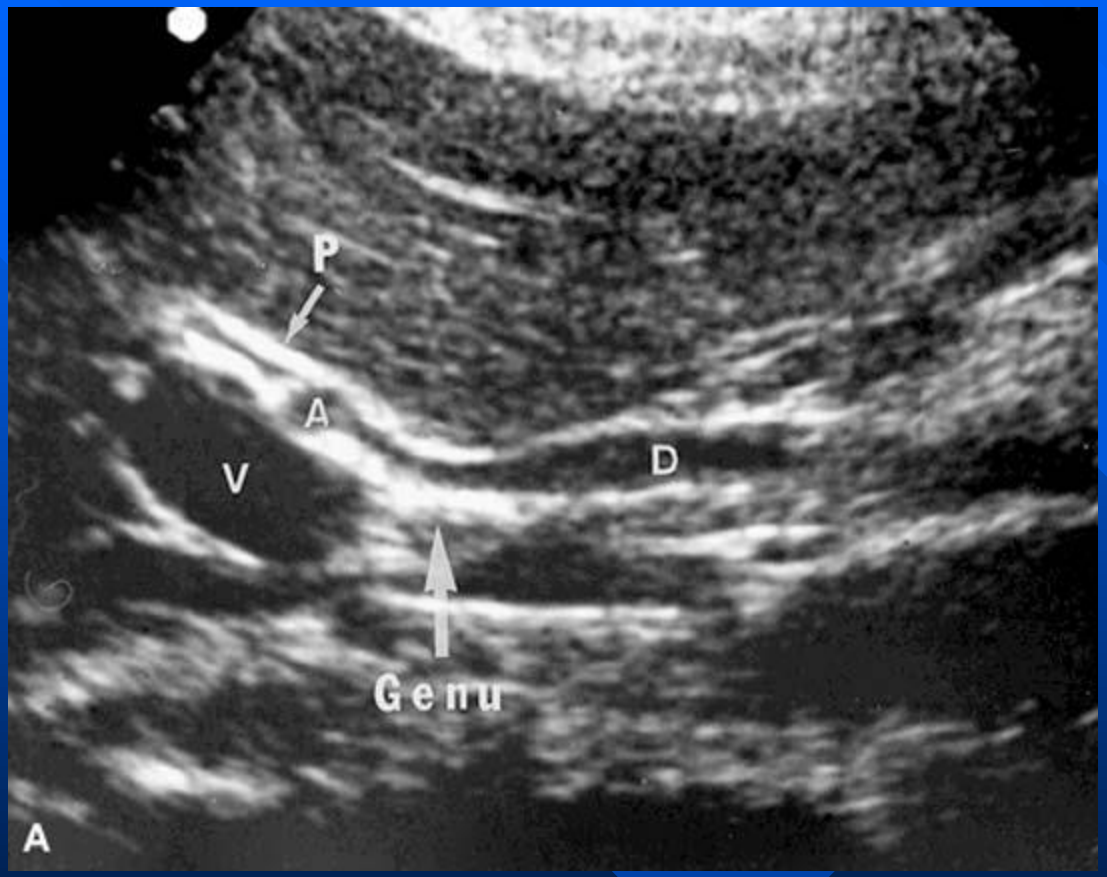
Anatomy

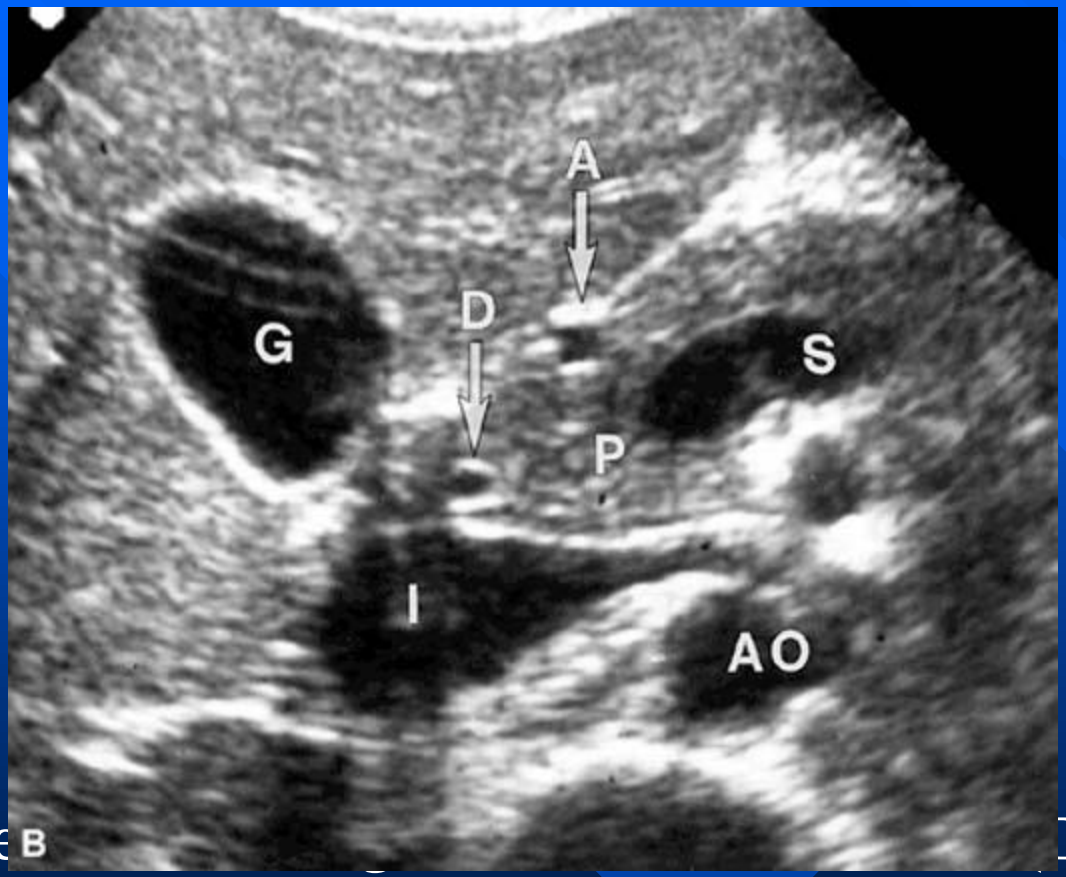

Inferior Vena Cava
Caudate Lobe
Right and Left Hepatic Artery
Left Gastric Artery
Right Hepatic Artery
Cystic Artery
Hepatic Artery Proper
Common Hepatic Artery
Right Gastric Artery
Liver (Right Lobe)
Cystic Duct
Gastro-duodenal Artery
Main Portal Vein
Gallbladder (fundus)
Bile Duct

Anatomy



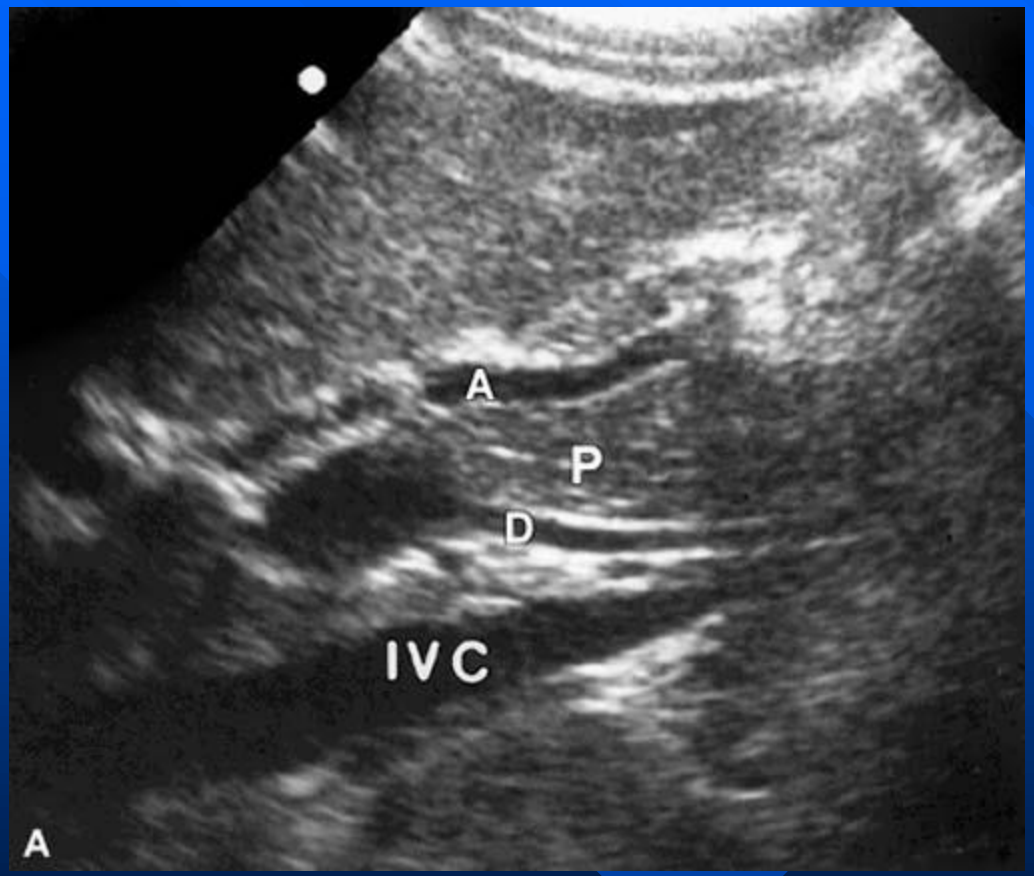
Longitudinal views. The proximal segment (P) of the common duct is seen parallel to the main portal vein (V). Dorsal angle (Genu) is seen between the proximal (P) and distal (D) segments of the common duct. A, Right hepatic artery

Anatomy



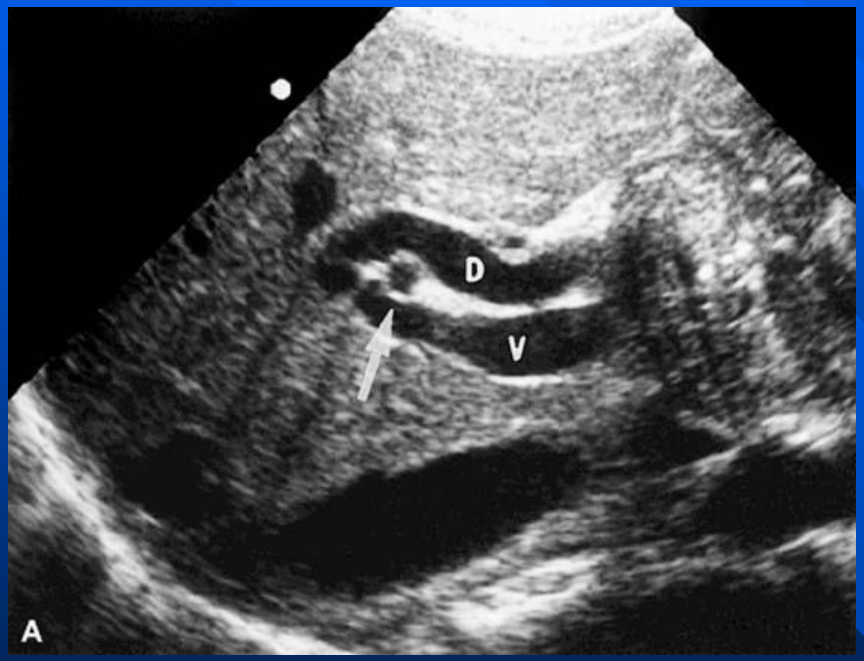
Transverse B D) along the posterior and lateral margin of the head of the pancreas (P). Gastroduodenal artery (A) is seen anterior to the head of the pancreas. I, inferior vena cava; G, gallbladder; S, splenic vein; AO,

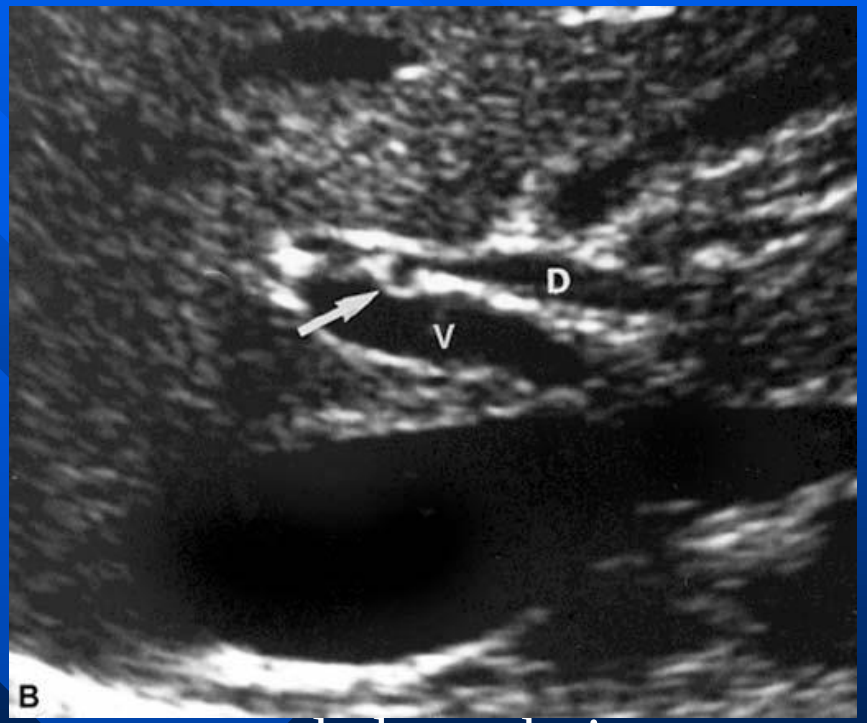
Anatomy



Normal distal common duct: pancreatic portion. Longitudinal view showing distal common duct (D) posterior to the head of the pancreas (P). A, gastroduodenal artery; IVC, inferior vena cava.

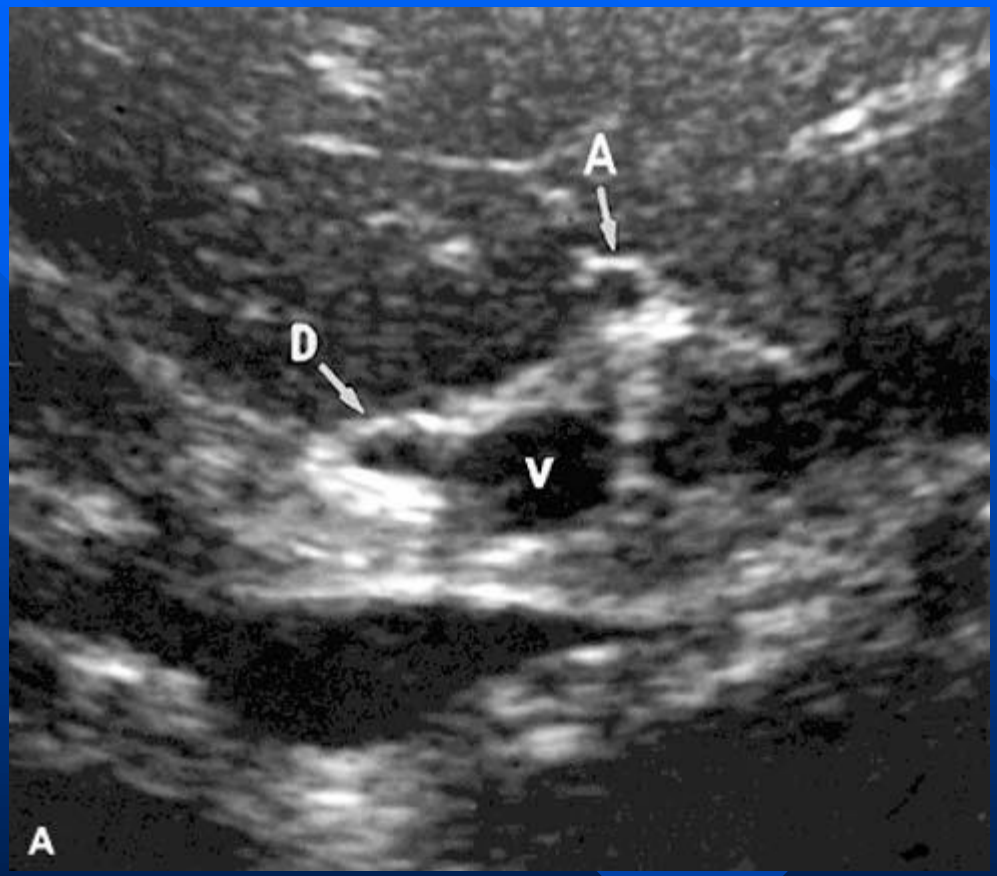
Relation of the right hepatic artery to the common duct on longitudinal views





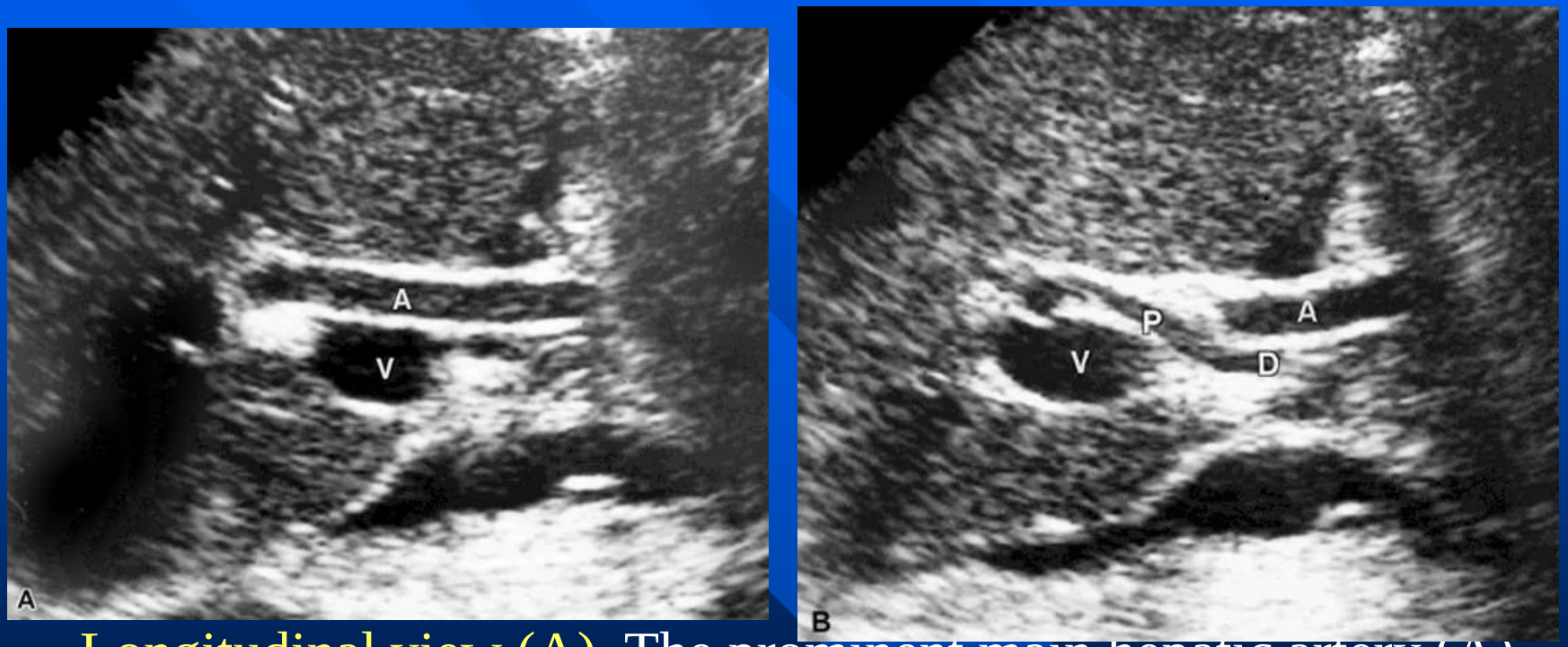
Right hepatic artery (arrow) is seen as a rounded anechoic structure posterior to the common duct (D), between the common duct and the main portal vein (V). The common duct is slightly dilated in (A) and is of normal size in (B)

Mickey Mouse (Transverse)



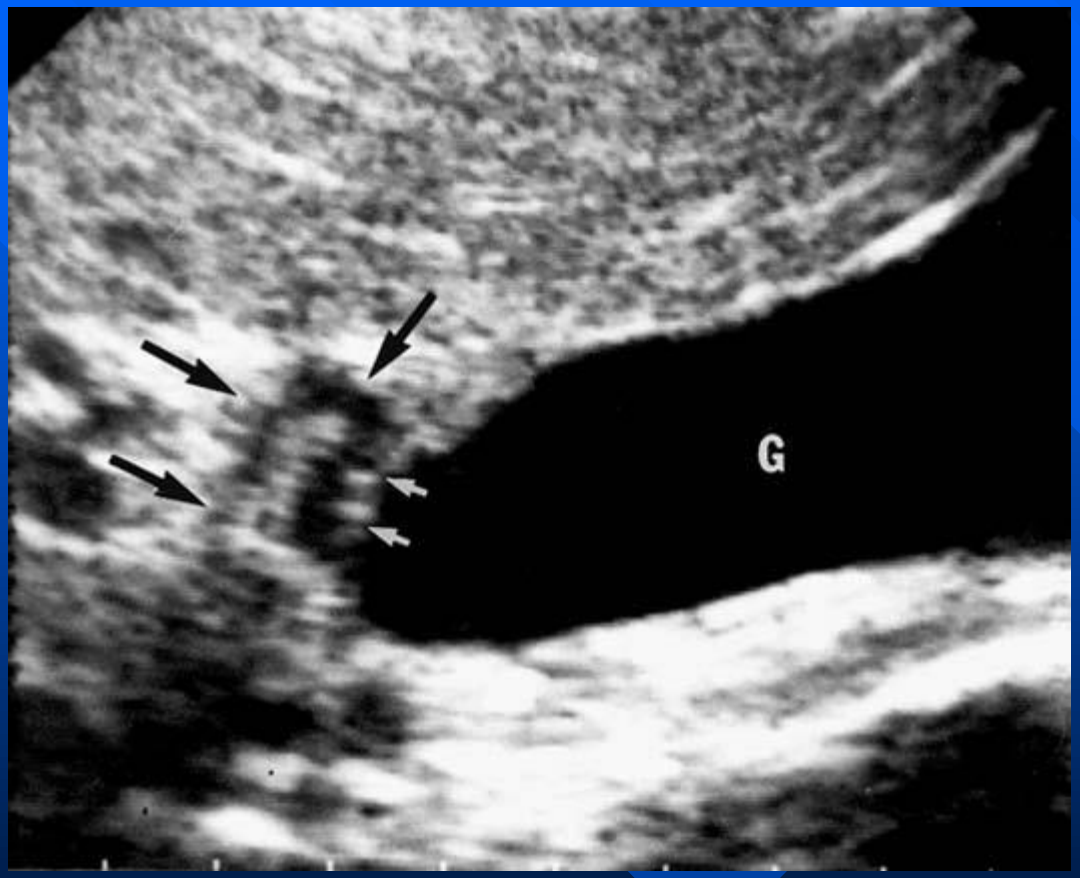
Porta hepatis: (A and B) The main hepatic artery (A) is located anterior and medial to the main portal vein (V). The common duct (D) is located anterior and lateral to the main portal vein (V).

Pitfall



Longitudinal view (A). The prominent main hepatic artery (A) mimics dilated common duct anterior to the portal vein (V) B: oblique view shows the normal proximal common duct (P) anterior to the portal vein (V)

Gallbladder neck and proximal cystic duct



Longitudinal view demonstrating neck and slightly dilated proximal cystic duct (arrows). The serrated appearance of the walls of the cystic duct is secondary to valves of Heister.

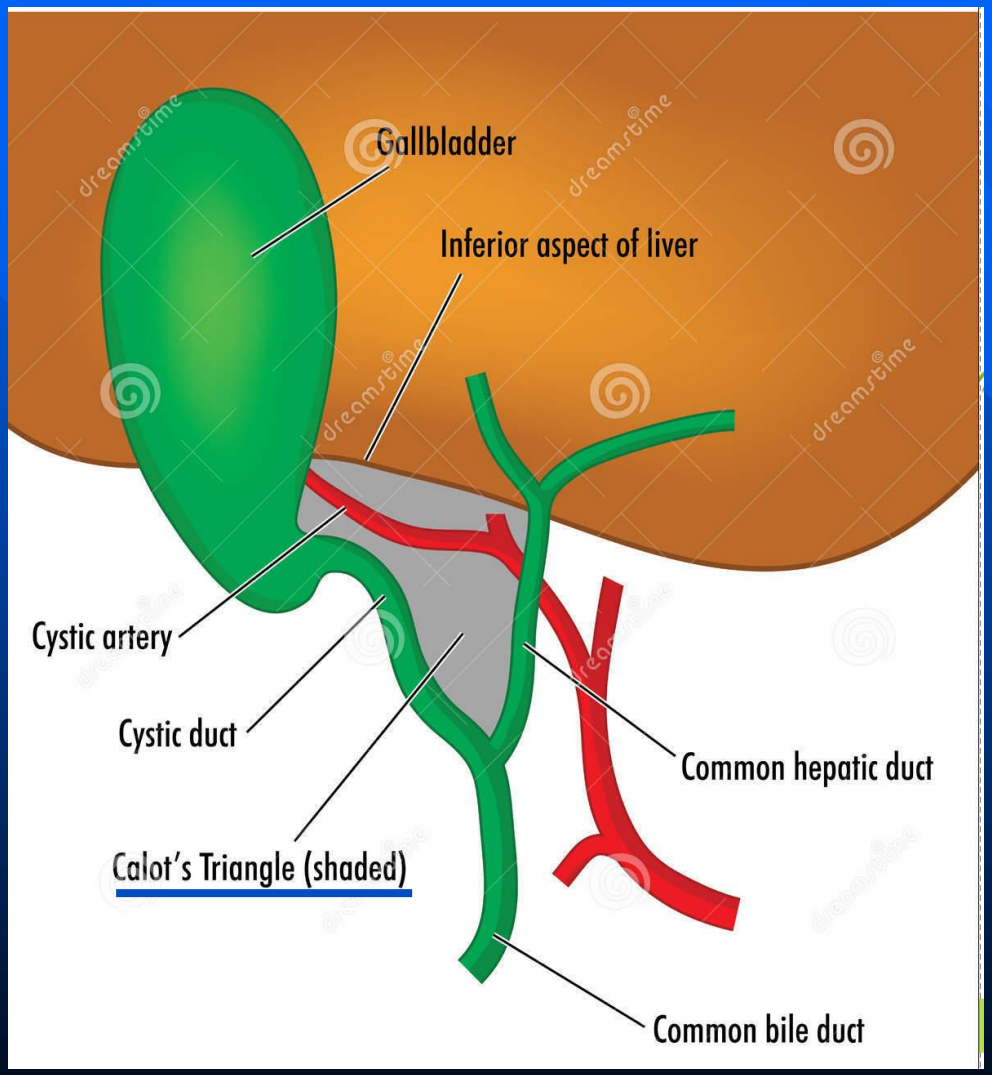
Anatomy

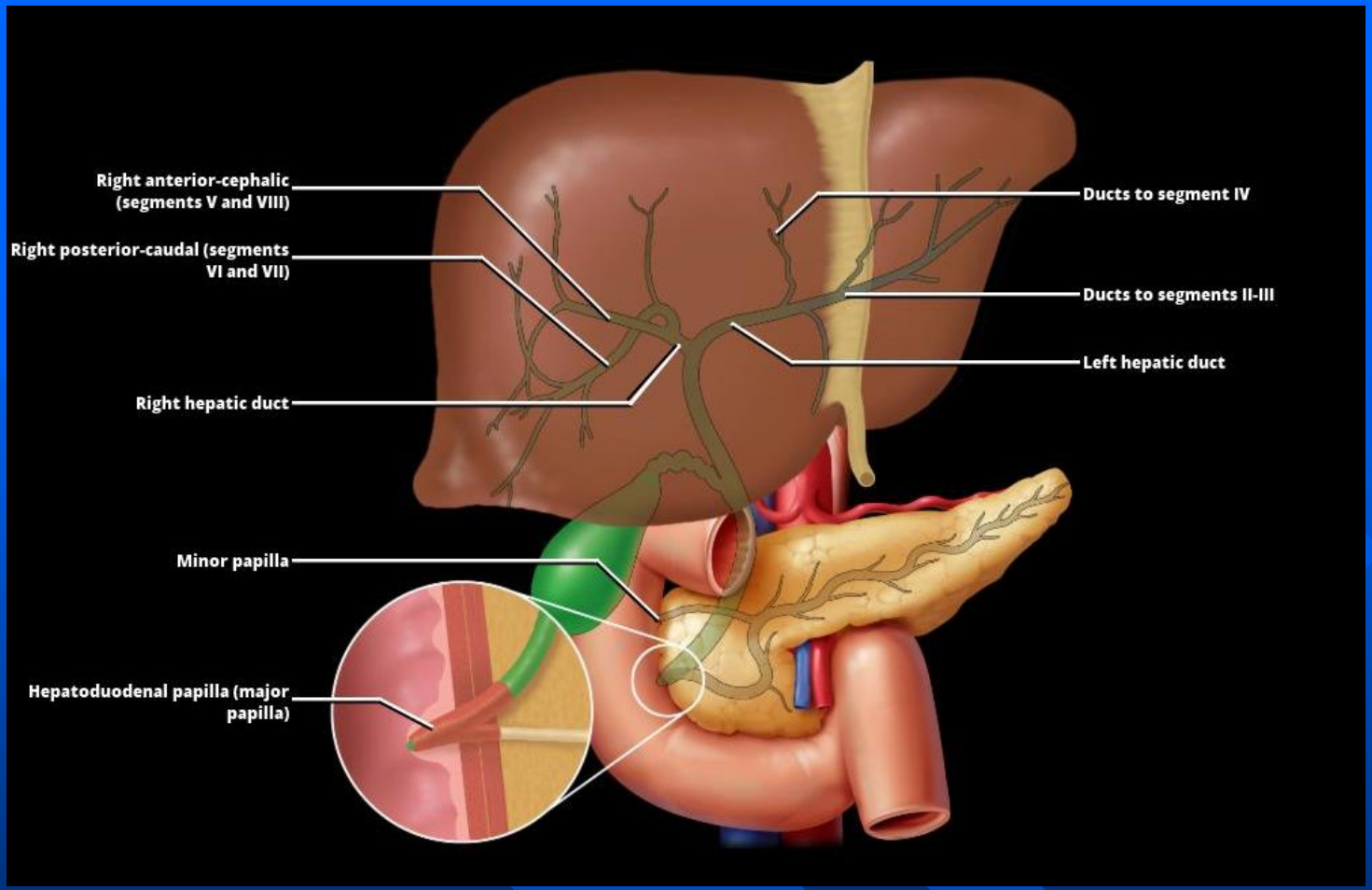
- Direct venous drainage of GB into liver bypasses portal venous system, often results in **sparing of** adjacent liver from generalized **steatosis** (fatty liver)
- **Nodal metastasis from GB carcinoma** to peripancreatic nodes may simulate primary pancreatic tumor
- **Sonography**: Optimal means of evaluating GB for stones and inflammation (**acute cholecystitis**); best done in fasting state (distends GB)

Clinical Importance

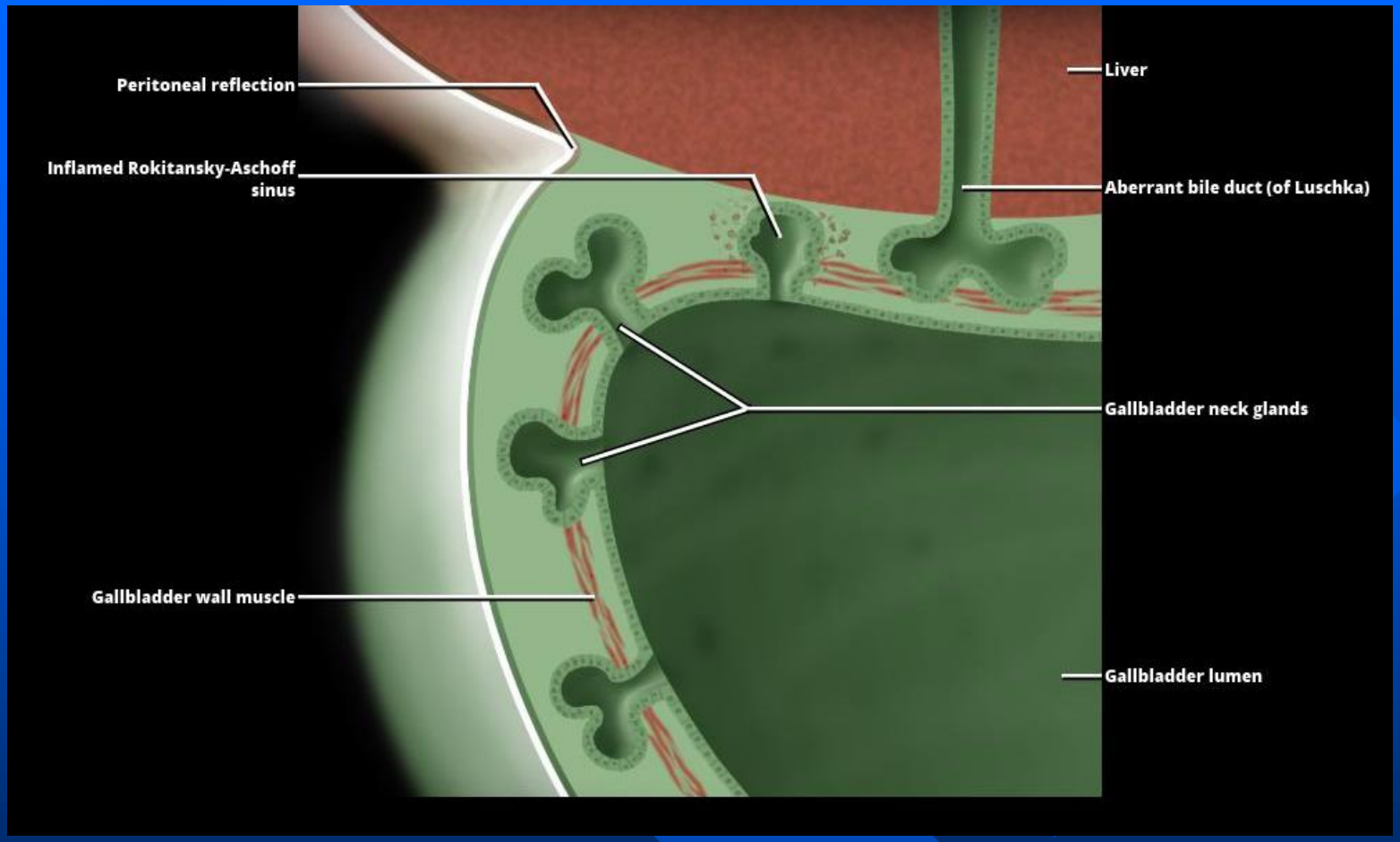
- **Many common variations of biliary arterial** and **ductal anatomy** result in challenges to avoid injury at surgery
  - **Calot triangle** is bounded by CHD, cystic duct, and inferior liver surface
  - Replaced right hepatic artery and aberrant right anterior or posterior ducts run in Calot triangle and can be mistaken for cystic duct during cholecystectomy
- Close apposition of GB to duodenum can result in fistulous communication due to chronic cholecystitis or erosion of gallstones into duodenum
- **Obstruction of CBD** is common due to CBD stones, pancreatic or CBD malignancies, etc.
  - Result is **jaundice** due to backup of bile salts into bloodstream
- Cystic artery is end artery, placing GB at higher risk of ischemia and necrosis

Calot triangle



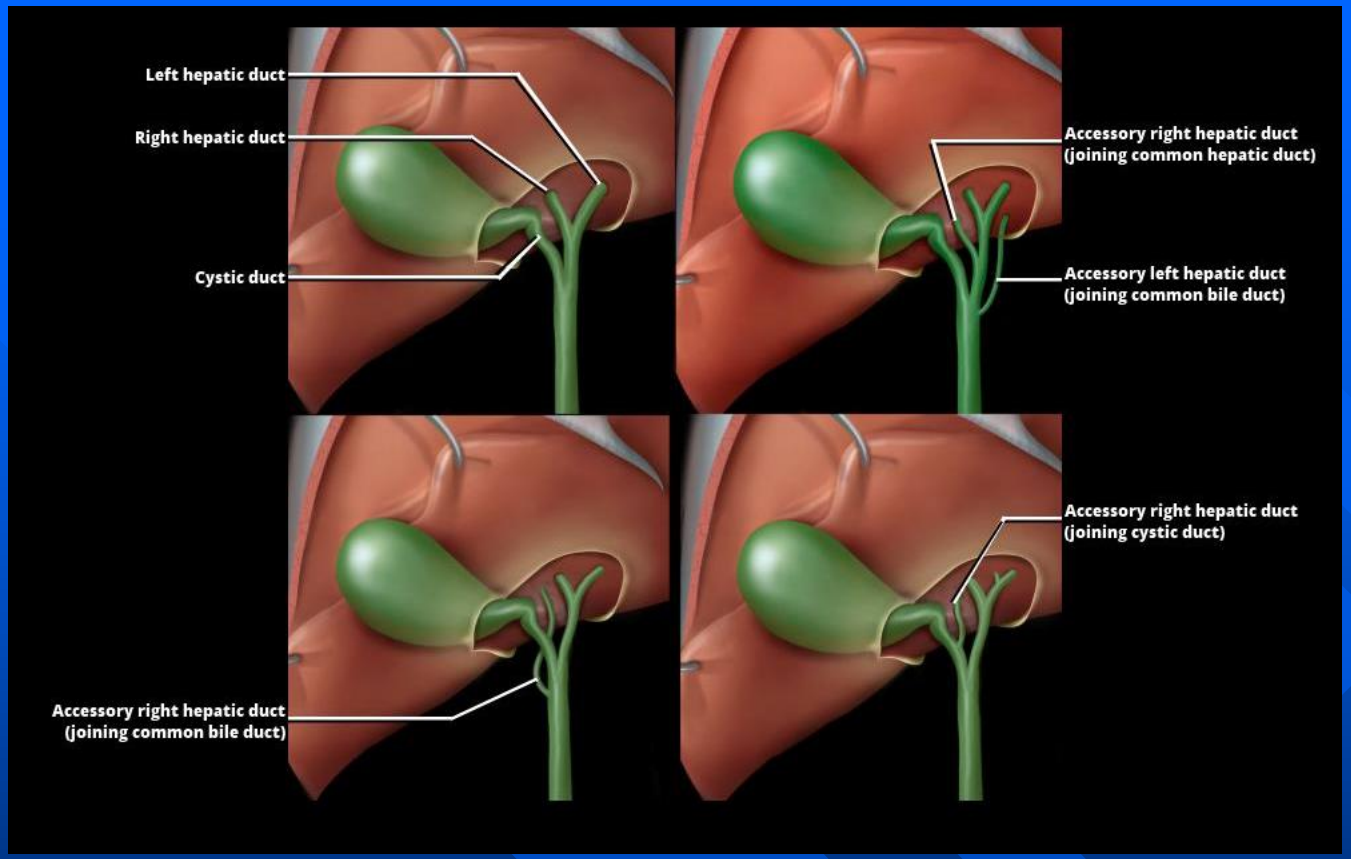


- Note the distribution of the larger intrahepatic bile ducts.
- The common bile duct usually joins with the pancreatic duct in a common channel or ampulla (of Vater) but may enter the major duodenal papilla separately.
- The distal bile duct has a sphincteric coat of smooth muscle, the choledochal sphincter (of Boyden), which regulates bile emptying into the duodenum.
- When contracted, this sphincter causes bile to flow retrograde into the gallbladder for storage.
- The common hepaticopancreatic ampulla may be surrounded by a smooth muscle sphincter (of Oddi).

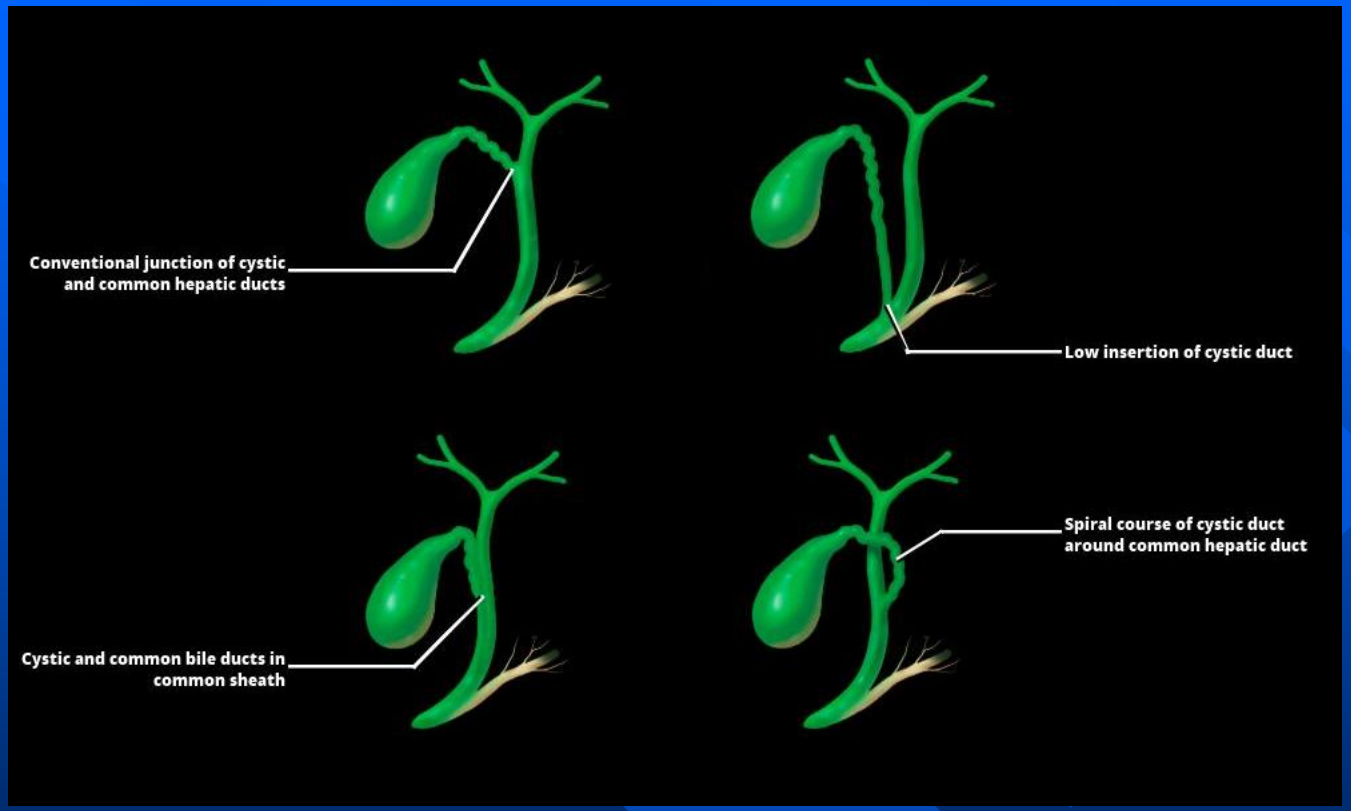


The gallbladder body and neck are adherent to the liver and may be bridged by aberrant bile ducts (of Luschka). Mucous glands are found in the gallbladder neck.

Rokitansky-Aschoff sinuses are pseudodiverticula that extend into the wall and may collect debris, becoming inflamed.



- Variations are common (20% of the population) and may lead to inadvertent ligation or injury at surgery, such as cholecystectomy, in which the cystic duct is clamped and transected.
- Most accessory ducts are on the right side and usually enter the common hepatic duct but may enter the cystic duct or common bile duct.
- Accessory left ducts enter the common bile duct.
- While referred to as "accessory," these ducts are the sole drainage of bile from at least 1 hepatic segment.
- Ligation or laceration can lead to significant hepatic injury or bile peritonitis



The course and insertion of the cystic duct are highly variable, leading to difficulty in isolation and ligation at cholecystectomy. The cystic duct may be mistaken for the common hepatic or common bile duct.