BILIARY TRACT AND GALLBLADDER

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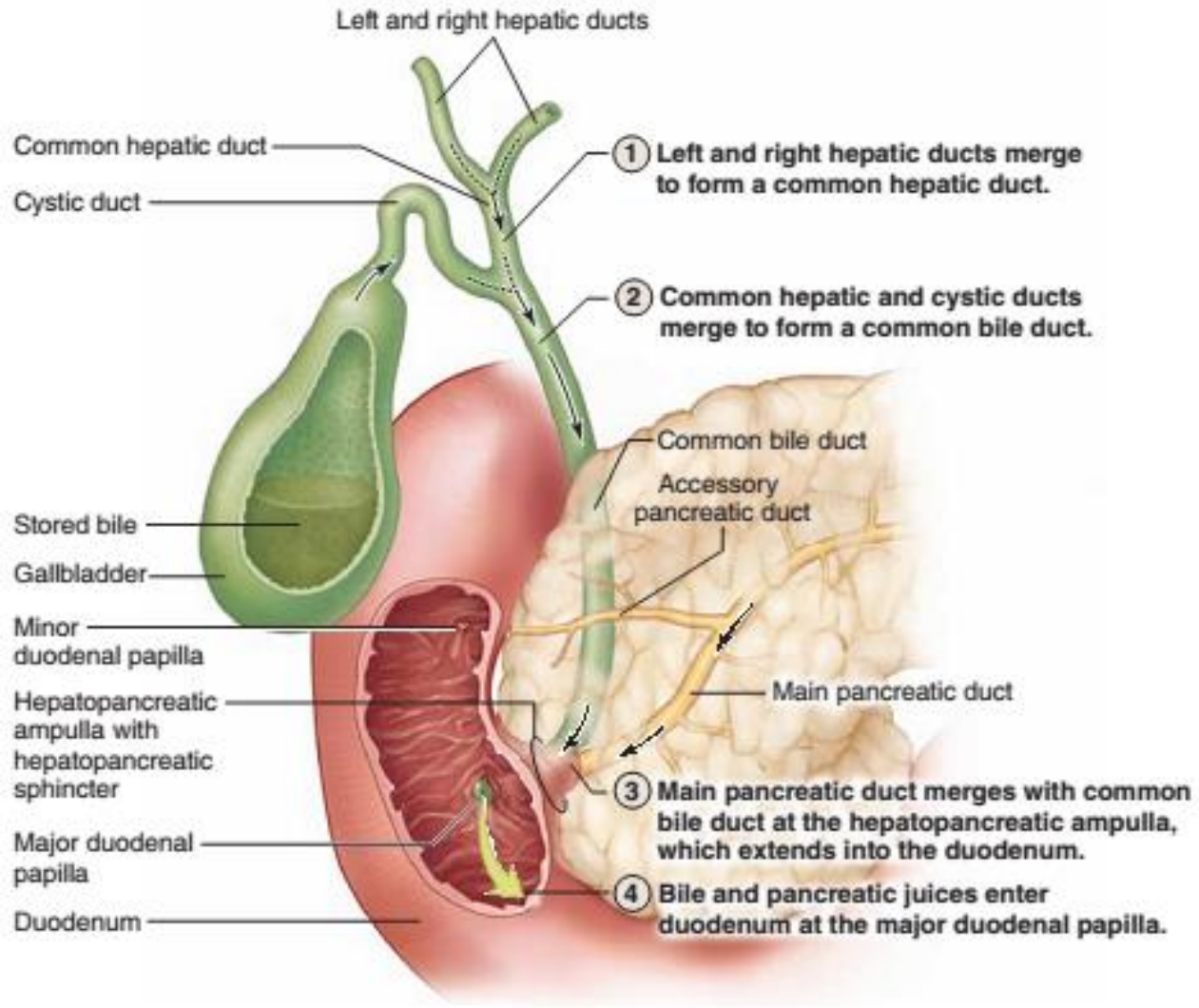
AP ANATOMY DEPT

BILIARY TRACT & GALLBLADDER

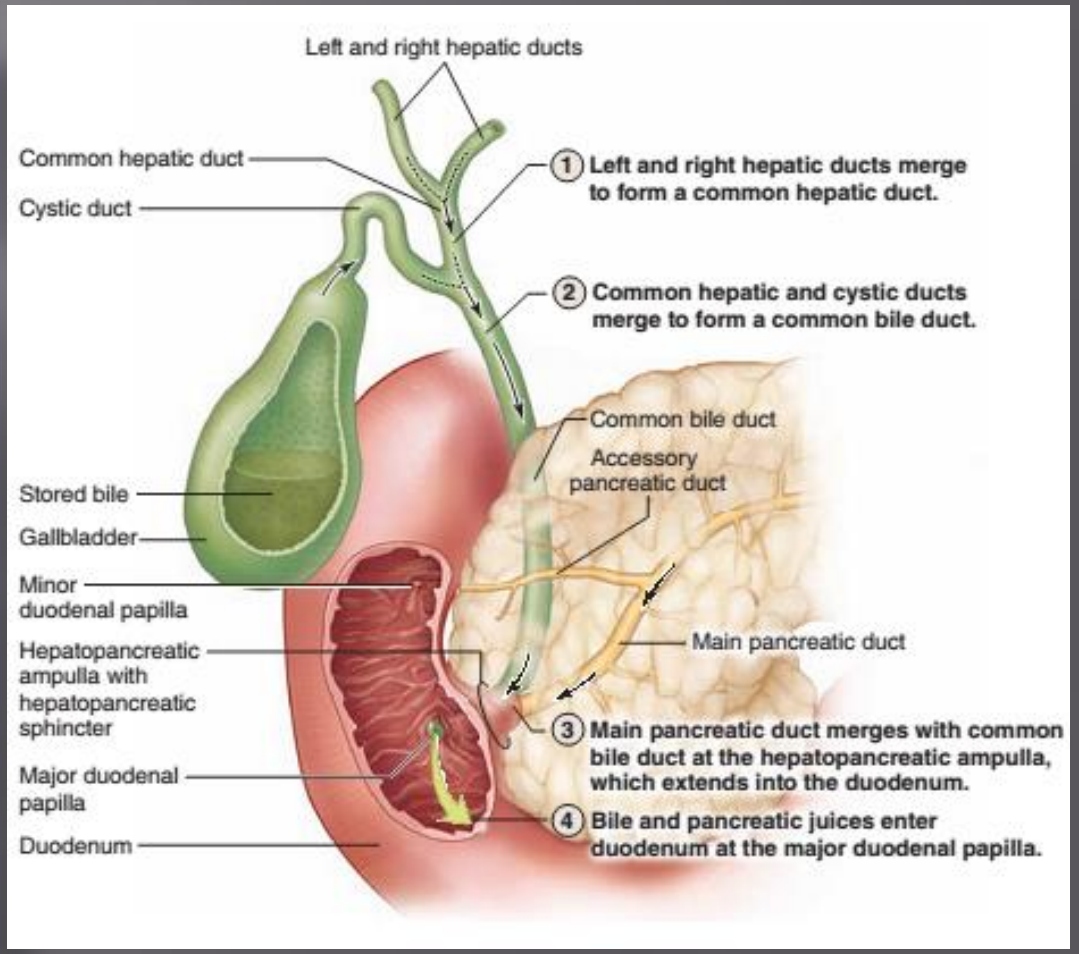


Bile leaves the liver in the left and right hepatic ducts, which merge to form the common hepatic duct, which connects to the cystic duct serving the gallbladder. The latter two ducts merge to form a common bile duct. All these ducts carrying bile are lined by cuboidal or low columnar cells called **cholangiocytes**, similar to those of the small bile ductules in the liver.

The main pancreatic duct merges with the common bile duct at the hepatopancreatic ampulla, which enters the wall of the duodenum at a major papilla (of Vater); the accessory pancreatic duct enters the duodenum at a minor papilla. Bile and pancreatic juices are mixed before release into the duodenal lumen.

BILIARY TRACT & GALLBLADDER

- The bile produced by the hepatocytes flows through the bile canaliculi, bile ductules, and bile ducts.
- These structures gradually merge, forming a converging network that ultimately forms the common hepatic duct that joins the cystic duct from the gallbladder and continues to the duodenum as the common bile duct
- The gallbladder is a hollow, pear-shaped organ attached to the lower surface of the liver, capable of storing 30-50 mL of bile that is concentrated during storage



BILIARY TRACT EPITHELIUM

- The hepatic, cystic, and common bile ducts are lined with a mucous membrane having a simple columnar epithelium of cholangiocytes.
- The lamina propria and submucosa are relatively thin
- with mucous glands in some areas of the cystic duct, and surrounded by a thin muscularis.
- The muscle layer becomes thicker near the duodenum and finally, in the duodenal papilla, forms a sphincter that regulates bile flow into the small bowel

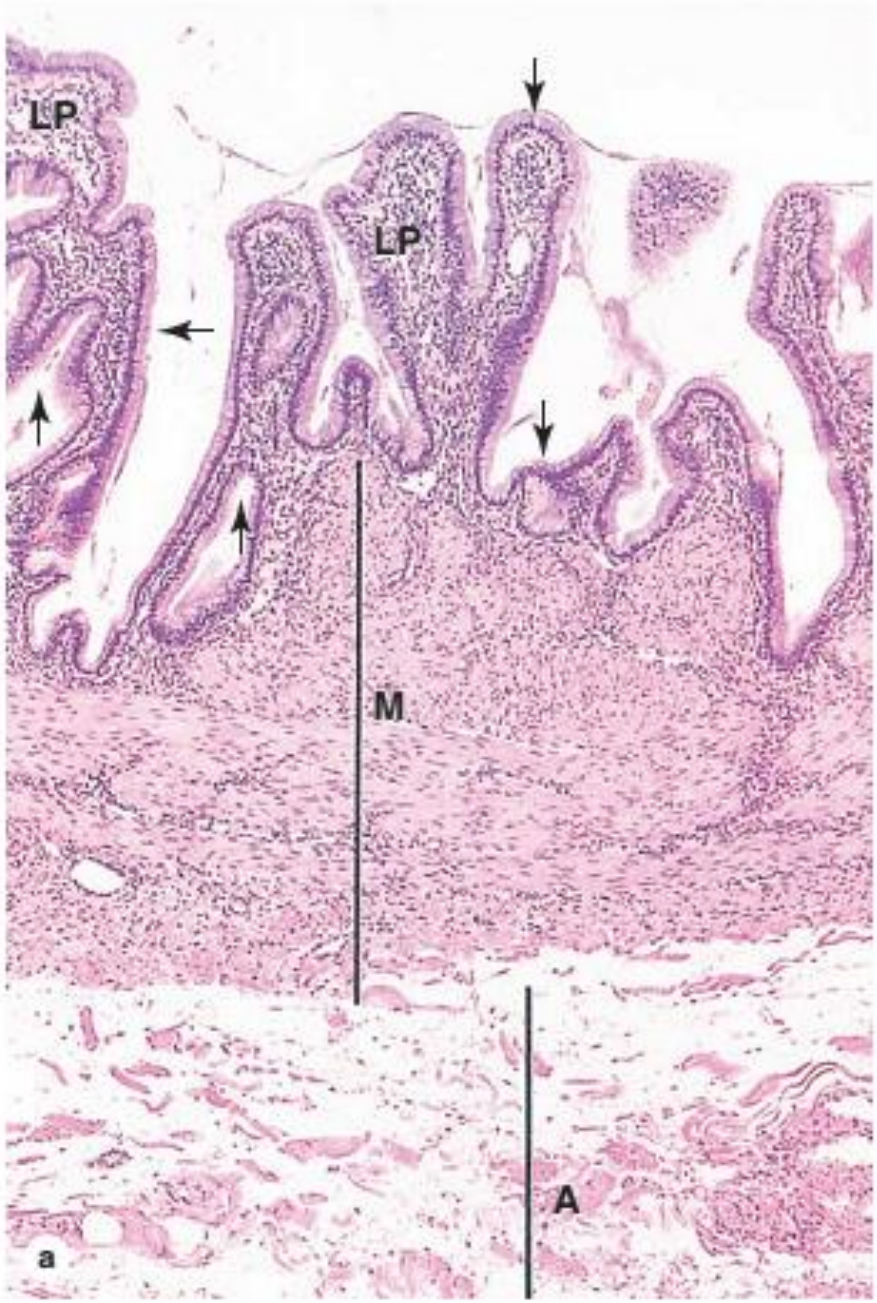
Gallbladder

- The wall of the gallbladder consists of a mucosa composed of simple columnar epithelium and lamina propria, a thin muscularis with bundles of muscle fiers oriented in several directions

- The wall of the gallbladder does not contain a muscularis mucosae or submucosa.

- And an external adventitia at place liver attach or remaining portion is serosa .

- The mucosa has numerous folds that are particularly evident when the gallbladder is empty



- The lining epithelial cells of the gallbladder have prominent mitochondria, microvilli
- And large intercellular spaces, all indicative of cells actively transporting water, in this case for concentrating bile
- The mechanism for this includes activity of Na+ pumps in the basolateral membranes, followed by passive movement of water from the bile.
- To move stored bile into the duodenum, contraction of the gallbladder

Gallbladder Contraction

- Muscularis is induced by cholecystokinin (CCK) released from enteroendocrine cells of the small intestine.
- Release of CCK is, in turn, stimulated by the presence of ingested fats in the small intestine.
- Gallbladder removal due to obstruction or chronic infammation leads to the direct flow of bile from liver to gut, with few major consequences on digestion.

MEDICAL APPLICATION

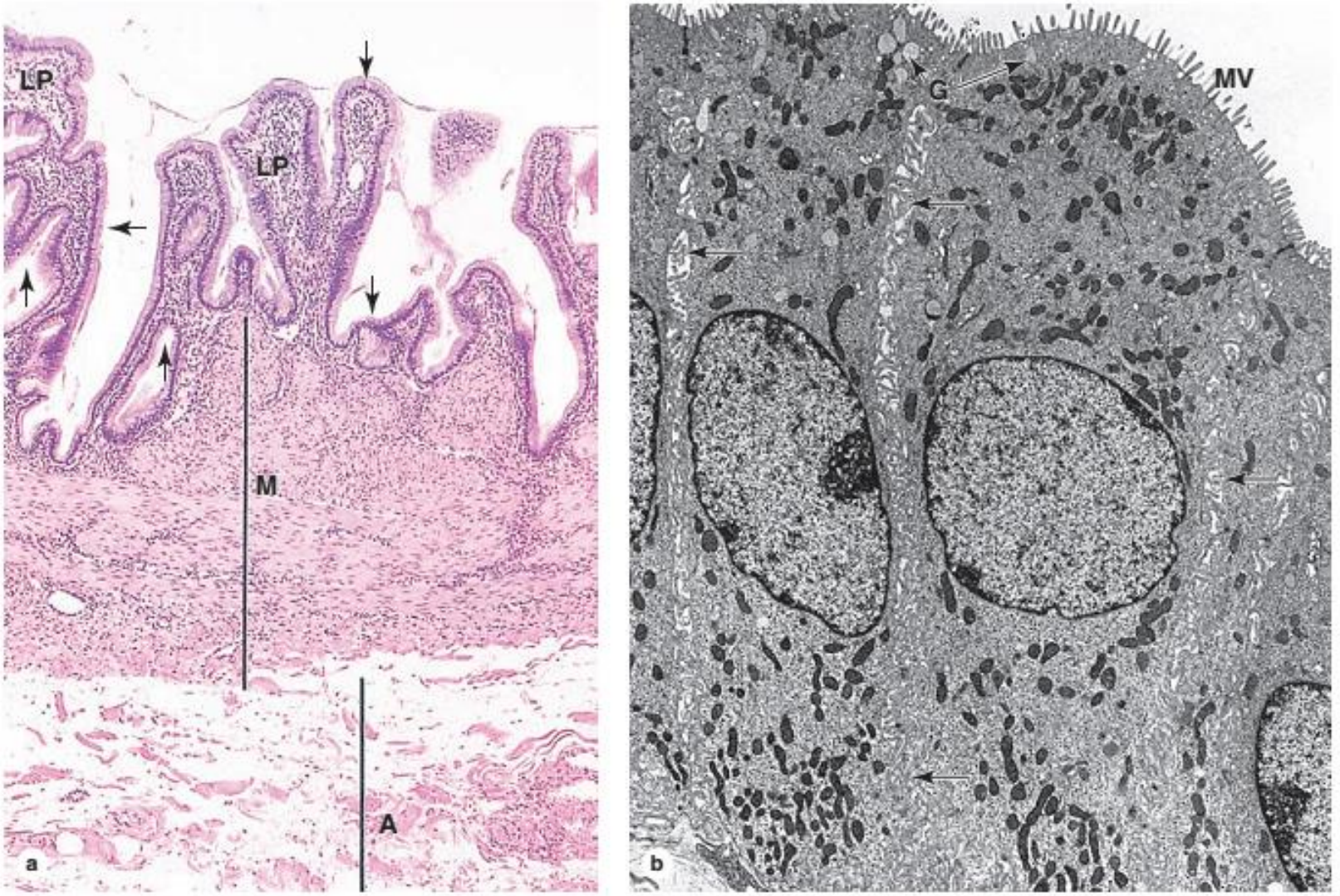
- Reabsorption of water from bile in the gallbladder is involved in the formation of gallstones in the lumen of the gallbladder or biliary ducts, a condition called cholelithiasis .

- This disorder usually originates with bile that already contains excessive amounts of normal bile components.

- Supersaturation of cholesterol in bile can lead to the formation of cholesterol stones, the most common form.

- Brown or black pigment stones can form when bile contains excessive amounts of unconjugated bilirubin

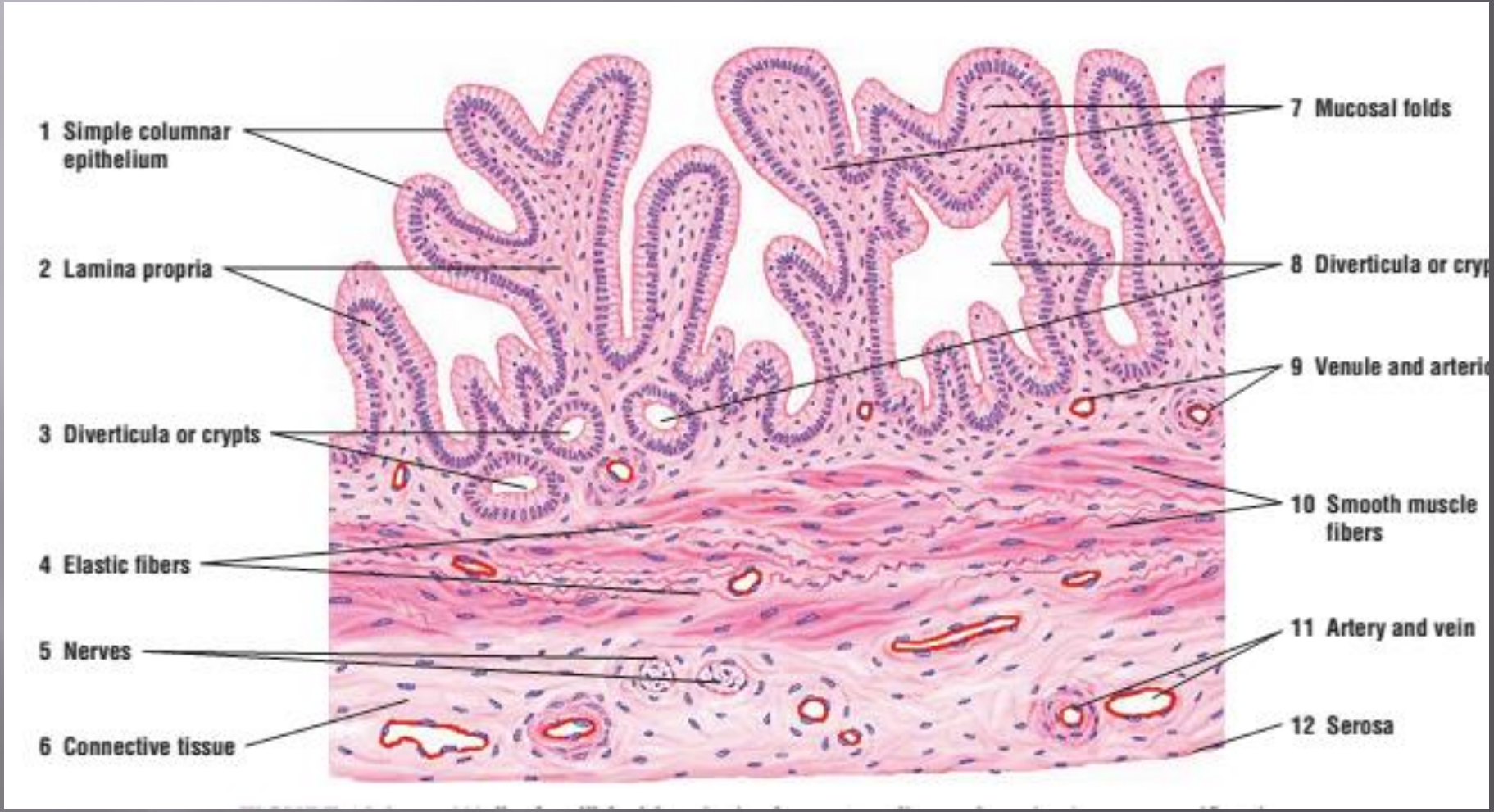
  which can result from chronic hemolysis associated with disorders such as sickle cell anemia. gallstones can lead to biliary obstruction or more commonly to infammation in acute or chronic cholecystitis.



The gallbladder is a saclike structure that stores and concentrates bile, and releases it into the duodenum after a meal. **(a)** Its wall consists largely of a highly folded mucosa, with a simple columnar epithelium (arrows) overlying a typical lamina propria (**LP**); a muscularis (**M**) with bundles of muscle fibers oriented in all directions to facilitate emptying of the organ; and an external adventitia (**A**) where it is against the liver and a serosa where it is exposed. X60. H&E.

(b) TEM of the epithelium shows cells specialized for water uptake across apical microvilli (**MV**) and release into the intercellular spaces (**arrows**) along the folded basolateral cell membranes. From these spaces water is quickly removed by capillaries in the lamina propria. Abundant mitochondria provide the energy for this pumping process. Scattered apical secretory granules (**G**) contain mucus. X5600.

Gallbladder review



THANK YOU