

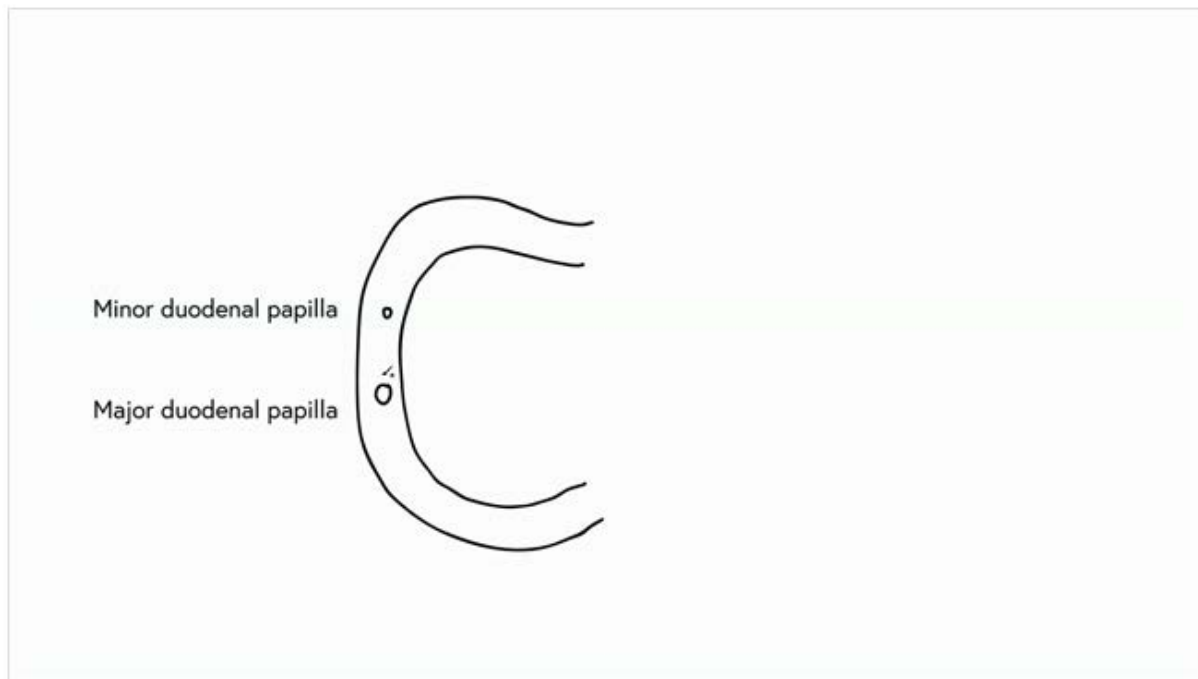
Exploring anatomy: the human abdomen

An advanced look at the biliary system

Welcome to this video for exploring anatomy, the human abdomen. This video is going to outline the biliary system.

So first of all, let's start by drawing out the duodenum. Now, the duodenum is going to receive both the pancreatic juice and also the bile that flow through this system. So here, we've got the C-shaped duodenum.

Importantly, on the internal surface of the duodenum, which is what we're looking at the moment, then we have a couple of openings. We have a minor and a major duodenal papilli. So here, we have the minor duodenal papilla and here we have the major duodenal papilla. These are important as they allow the bile and the pancreatic juice to pass through the wall of the duodenum.



So now, let's have a look at some of the ducts that form this system. Let's start by looking at the gallbladder located on the visceral surface of the liver. So here, we have the gallbladder, important for storing and concentrating the bile.

And passing away from the gallbladder, we have the cystic duct. So here, we have the cystic duct. The cystic duct is going to unite with the common hepatic duct. And the common hepatic duct is formed by the union of two hepatic ducts.

We have the right hepatic duct. And we have the left hepatic duct. These two hepatic ducts drain the bile from the two functional lobes of the liver, the left and right functional lobes.

As they unite, they form the common hepatic duct. The common hepatic duct and the cystic duct both pass out through the porta hepatis of the liver, where they unit. The cystic duct merges with the common hepatic duct on its righthand side.

And from here, we then have what's known as the bile duct. So the bile duct is formed by the union of the common hepatic duct and the cystic duct. The bile duct forms part of the portal triad. It runs alongside the hepatic portal vein and also the hepatic artery.

It then descends posterior to the duodenum-- we can see via these dotted lines-- posterior to the duodenum, where it then joins with the main pancreatic ducts. And let's start drawing the main pancreatic ducts.

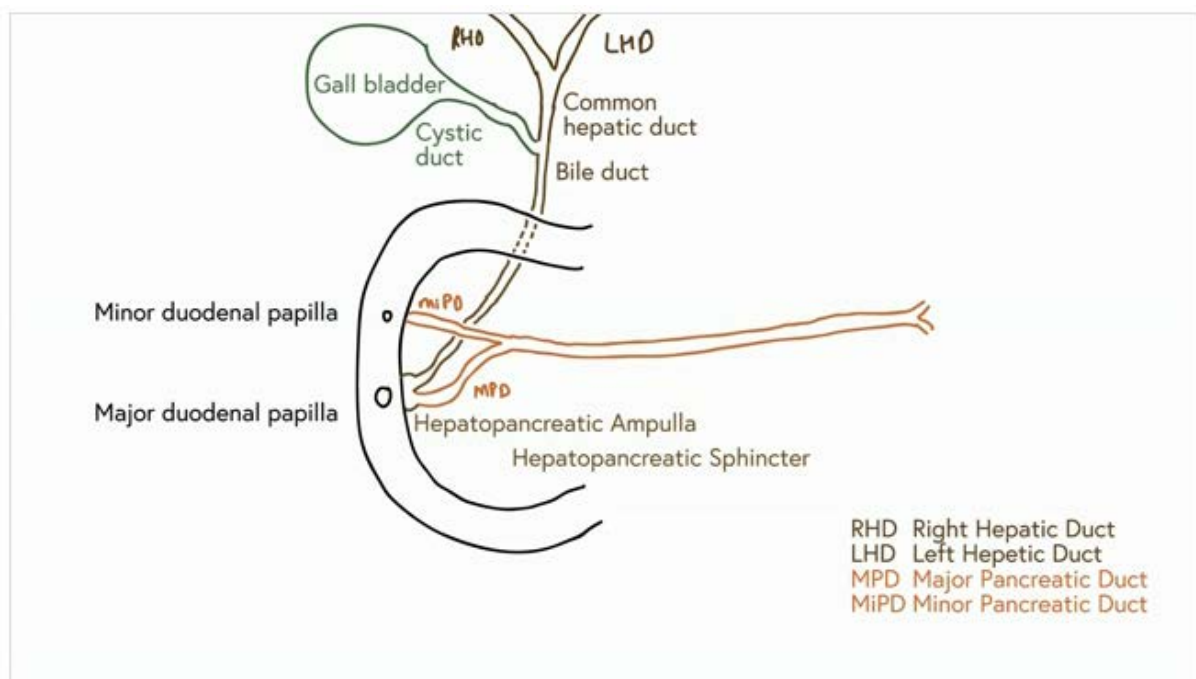
So running throughout the whole length of the pancreas-- which I won't draw here as it overcomplicates the diagram-- running from the tail of the pancreas, through the body, through the neck, and into the head, and then descending down through the head towards the major duodenal papilla is the main pancreatic duct.

It's going to be receiving various ductules along its course. But it passes along from the tail, body, neck of the pancreas. The major pancreatic duct passes towards the major duodenal papilla. And there's also a minor pancreatic duct, or an accessory pancreatic duct, that passes towards the minor duodenal papilla.

If we then just concentrate on the major pancreatic duct-- so here's the major pancreatic duct and here's the minor pancreatic duct-- then the major pancreatic duct is going to unite with the bile duct. The bile duct running on the posterior surface of the head of the pancreas is going to blend with the main pancreatic duct.

And as these two ducts unite, they form the ampulla, the hepatopancreatic ampulla. We can see the bile duct has passed posterior to the minor pancreatic duct. And it's running along the posterior surface of the head.

And these two ducts, the bile duct and the major pancreatic duct, form the hepatopancreatic ampulla. This ampulla is a dilation found on the medial surface of the descending duodenum. Surrounding the hepatopancreatic ampulla is the hepatopancreatic sphincter. And this sphincter is regulated by the autonomic nervous system.



So now we can see that with parasympathetic innervation, this sphincter is going to dilate and both bile and pancreatic juice are going to pass through the major duodenal papilla into the duodenum.

We've reduced parasympathetic innervation or increased sympathetic innervation. This sphincter is going to constrict and it's going to prevent the passage of bile passing into the duodenum.

As the bile will still be produced by the hepatocytes in the liver, the bile will continue to follow down this path. As it's blocked, it will then back up and empty into the gallbladder, where it will be stored and concentrated.

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