

Exploring anatomy: the human abdomen

An advanced look at the blood supply to the pancreas and duodenum

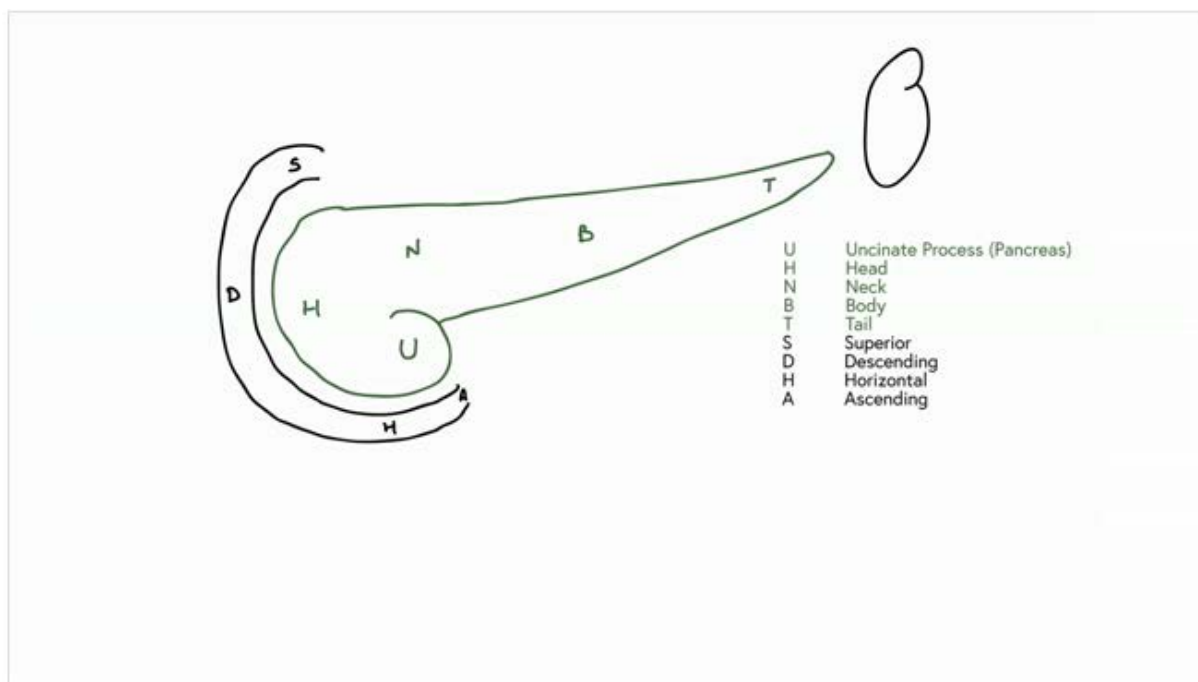
Welcome to this video for exploring anatomy, the human abdomen. This video is going to outline the blood supply to the pancreas and duodenum.

So first of all, let's draw out parts of the duodenum. Here we can see we've got a bit of the superior part, the descending and horizontal portion of the duodenum. And then we can draw out the head and the uncinate process of the pancreas that is filling this concavity of the duodenum. And then the neck, body, and tail of the pancreas extends over towards the spleen. And we can just quickly add in, just for some added detail, the spleen.

Obviously, these organs aren't to their anatomical size. It's just so you have an idea of their location and the arteries that supply them.

So just to recap, we can see we've got the uncinate process of the pancreas. We've got the head. We've got the neck, body, and the tail.

And here, in black, we can see we've got the duodenum. We've got a portion of the superior part. We've got the descending part, horizontal part, and a small little part of the ascending portion here.

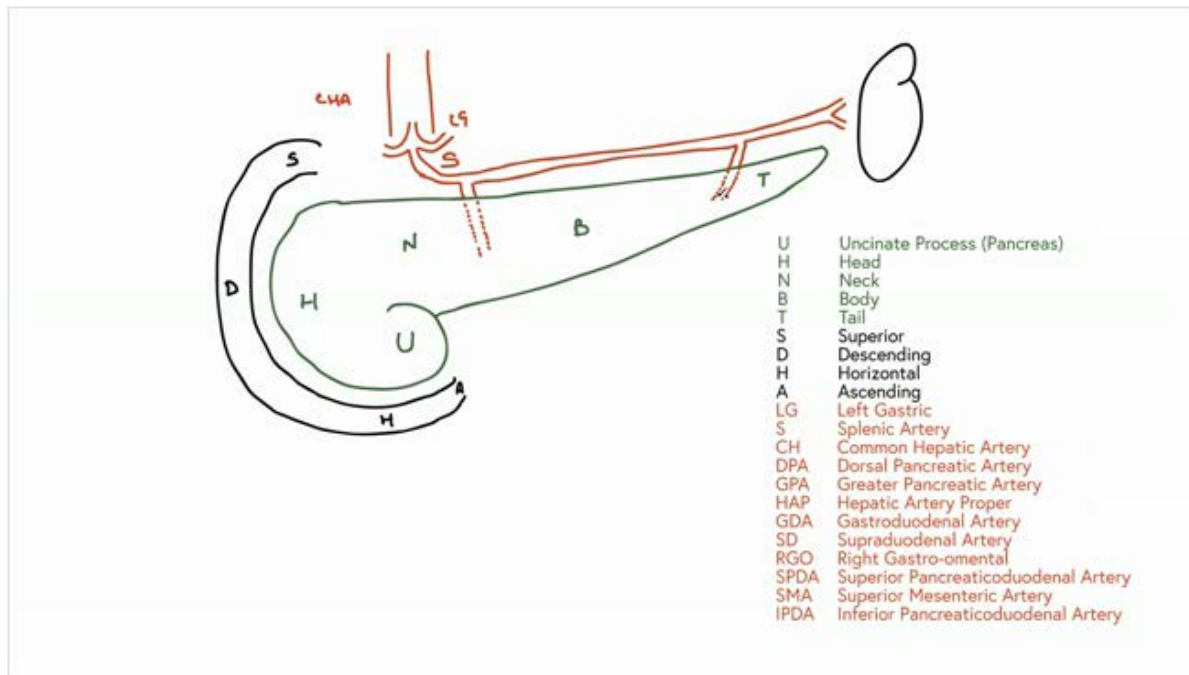


So now, let's look at the blood supply to these two organs, the duodenum and the pancreas. So you should be aware that these organs are going to be supplied by either the coeliac trunk or the superior mesenteric artery.

Let's start with the coeliac trunk, which comes off the abdominal aorta at the level of the lower border of the T12 vertebra. And the coeliac trunk splits into the three branches. It splits into the left gastric, which we can see here. It splits into the splenic and it splits into the common hepatic artery. And we'll come back to this one in a moment. But let's just focus on the splenic artery.

The splenic artery, as its name suggests, heads towards the spleen. And this is why I've added the spleen here, just to add that piece of detail. But as the spleen runs along the upper border of the pancreas, heading towards the spleen, it gives rise to a couple of arteries that supply the body and the tail of the pancreas.

These approach the pancreas from its posterior aspect. So we'll draw them with these dotted lines. And this is the dorsal pancreatic artery and the greater pancreatic artery.



Now, I won't draw in all of their individual branches. But these two arteries are going to supply the body and the tail of the pancreas. And they may well join and give off various branches. So coming off the splenic, we've got the dorsal pancreatic artery and we've got the greater pancreatic artery.

So now, let's turn to the common hepatic artery. The common hepatic artery extends up towards the liver. And as it passes towards the liver, it bifurcates into two.

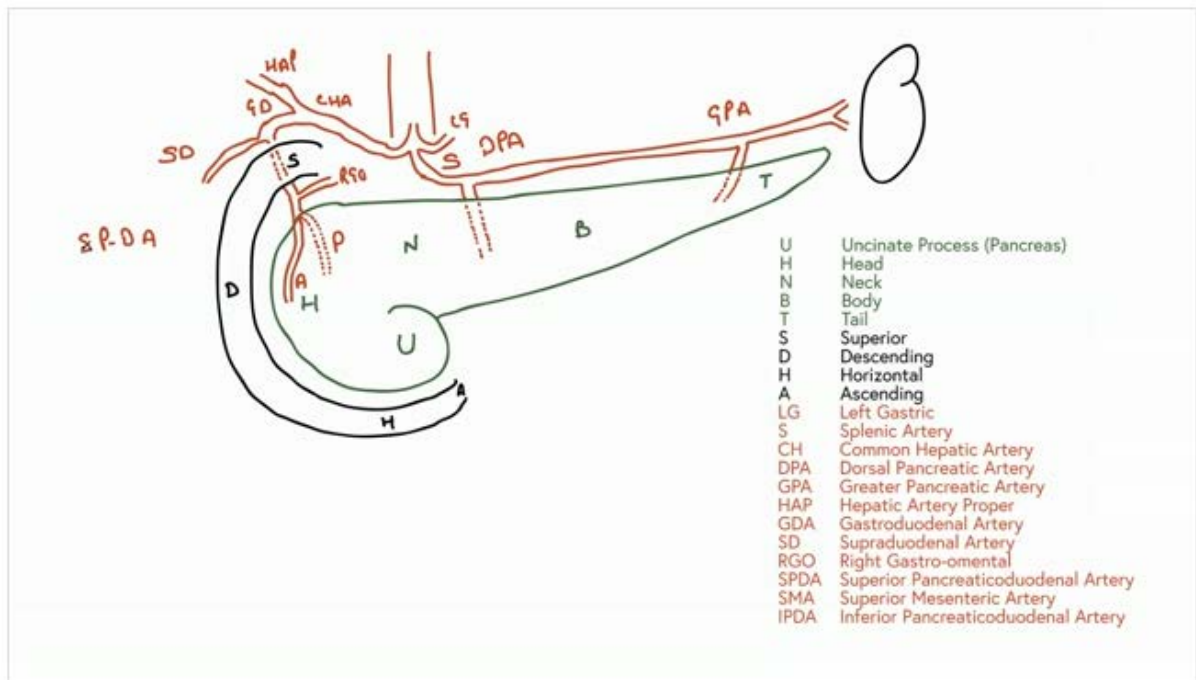
We have the hepatic artery proper, which is going to pass towards the liver-- hepatic artery proper. And we have the gastroduodenal artery. The gastroduodenal artery is going to give various branches, some which supply the stomach. But important, a couple of branches that supply the duodenum and the pancreas.

Initially, we have the supraduodenal artery. So here we can see the supraduodenal artery.

The gastroduodenal artery then descends posterior to the duodenum. So I'll draw again these dotted lines. It runs posterior to the duodenum. It also gives rise to the right gastro-omental artery that supplies the greater curvature of the stomach.

And then it gives rise to an important branch, known as the superior pancreaticoduodenal artery. And this has two important branches. It has an anterior branch that runs along the anterior aspect of the pancreas. And it also has a posterior branch, which again I'll draw in these dotted lines. And this runs along the posterior aspect of the pancreas.

So here we have the anterior branch of the superior pancreaticoduodenal artery. And here we have the posterior branch of the superior pancreaticoduodenal artery. And these are branches coming from the gastroduodenal, once it's giving off the right gastro-omental artery.



So if we have a superior pancreaticoduodenal artery, we're also going to have an inferior pancreaticoduodenal artery. Now to see this, I just need to erase a small portion of the duodenum. Because we're now going to draw in the superior mesenteric artery. And the superior mesenteric artery lies anterior to the uncinate process of the pancreas and also the horizontal portion of the duodenum.

And coming off the superior mesenteric artery here, its first branch, before it goes on to give the jejunal, the ilial, the middle colic arteries, is the inferior pancreaticoduodenal artery-- inferior pancreaticoduodenal artery. And this artery is also going to have anterior and posterior branches. The anterior branches running anterior to the head of the pancreas. And the posterior branches, again by this dotted line, running posterior to the head of the pancreas. But all of these are coming from the inferior pancreaticoduodenal artery.

These anterior and posterior branches anastomose with the anterior and posterior branches of the superior pancreaticoduodenal artery. This means that along the duodenum and at the head of the pancreas, it forms a transition between the coeliac trunk and the superior mesenteric artery, where the coeliac trunk supplies the foregut. The superior mesenteric artery supplies the midgut. And at the level of the second portion of the duodenum and the head of the pancreas, we have this transition.

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