

Anatomy lab - 6

the phrenic nerve:

it arises in the neck from the 3rd, 4th, and 5th cervical nerves of the cervical plexus.

It enters the thorax by passing in front of the subclavian artery.

The phrenic nerve is close to the internal thoracic artery, and is easily injured when unintentionally ligated with this artery.

phrenic nerve injury and paralysis of the diaphragm:

the phrenic nerve is the only motor nerve supply to the diaphragm. if one phrenic nerve is injured, then one of the two domes of the diaphragm will be paralyzed. During inspiration (inhaling), the paralyzed dome will remain in its relaxed position, and is then pushed up the thorax by the positive abdominal pressure, created by the movement of the other dome. this is known as the paradoxical movement of the diaphragm.

The abdomen: organs, omenta, and arterial supply

1- the greater sac and lesser sac of the peritoneal cavity are continuous through an opening; the epiploic foramen.

2- Structures anterior to the foramen are: portal vein, hepatic artery proper, the bile duct.

3- structures posterior to the foramen: the inferior vena cava.

The lesser omentum: it extends from the lesser curvature of the stomach to the inferior surface of the liver.

ligaments of the liver:

- the falciform ligament: its free margin contains the ligamentum teres, which is the remains of the left umbilical vein.

The ligamentum venosum, that is the remains of the ductus venosus, is attached to the left branch of the portal vein and ascends to be attached above to the inferior vena cava.

Duct system for bile:

the right and left hepatic ducts combine to form the common hepatic duct. Then, this duct is joined by the cystic duct of gallbladder to form the bile duct.

The bile duct is to the right of the hepatic artery proper, and to the right and anterior to the portal vein, in the free margin of the lesser omentum. It then descends to become posterior to the first part of duodenum, and then lies in a groove on the posterior surface of the head of the pancreas. to then drain in the second part of the duodenum.

The portal circulation:

The portal vein is formed by the union of the splenic vein and the superior mesenteric vein, posterior to the neck of the pancreas. when it approaches the liver it divides into right and left branches. The portal vein lies in the free margin of the lesser omentum; anterior and to its left is the hepatic artery proper. Anterior and to its right is the bile duct.

The stomach bed: what's posterior to the stomach:

- the splenic artery: a branch of the celiac trunk, that supplies the foregut. It's tortuous, and runs along the superior surface of the pancreas.

- the splenic vein: it runs posterior to the pancreas.

- the pancreas.

clinical application:

1- Obstructive jaundice: occurs in case of pancreatic carcinoma or gallstones that lead to the obstruction of the bile duct.

2- portosystemic anastomosis: the hepatic portal circulation drains blood from the abdominal organs to the liver in normal individuals. However in patients with portal hypertension (e.g. cirrhosis), portosystemic anastomosis decrease the blood flow to the liver, and allows more blood to enter the systemic circulation.

clinical manifestations:

- encephalopathy; the blood flow decreases to the liver, decreasing by that the blood's detoxification.

- ascites: accumulation of fluid in the abdominal cavity.

note: right side heart failure can also lead to ascites, with enlargement of both the spleen and liver.