

Portal Vein

Portal vein - tributaries, portocaval (portosystemic) anastomosis

Introduction

The portal venous system is responsible for transporting nutrient-rich venous blood from various abdominal organs to the liver for processing. The primary vessel of this system is the portal vein, which acts as a convergence point for venous drainage from the spleen, pancreas, gallbladder, and the abdominal section of the gastrointestinal tract.

Formation of the portal vein occurs posterior to the neck of the pancreas at the level of L2, where the splenic vein and the superior mesenteric vein join together. As the portal vein ascends towards the liver, it passes behind the superior part of the duodenum and the bile duct. Upon nearing the liver, the portal vein divides into left and right branches, each entering the liver separately to distribute blood throughout its parenchyma.

Tributaries of the portal vein

Tributaries contributing to the portal vein include not only the splenic vein and superior mesenteric vein but also additional vessels such as the right and left gastric veins (from the stomach), cystic veins (from the gallbladder), and paraumbilical veins (from the umbilical region of the skin).

Splenic vein

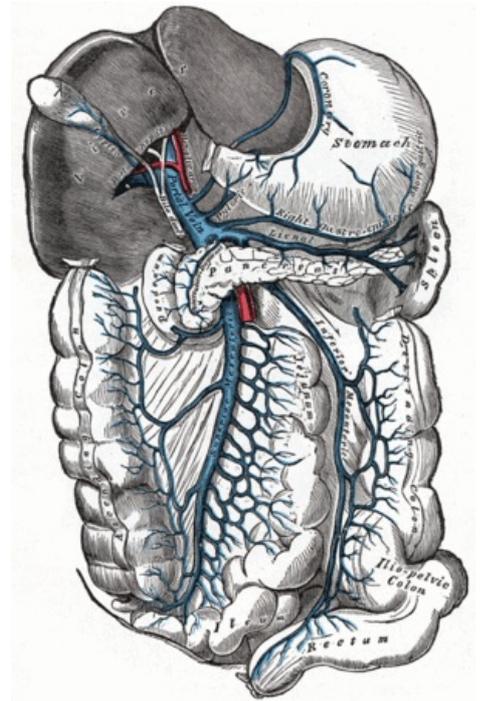
Tributaries

- 1.) Short gastric vein (drains the fundus of the stomach)
- 2.) Left gastro-omental vein (drains the greater curvature of the stomach)
- 3.) Pancreatic veins (drains the pancreas)
- 4.) Inferior mesenteric vein (drains the colon)

Superior mesenteric vein

Tributaries

- 1.) Right gastro-omental vein (drains the greater curvature of the stomach)
- 2.) Anterior and posterior inferior pancreaticoduodenal veins (drain the pancreas and duodenum)
- 3.) Jejunal vein (drains the jejunum)
- 4.) Ileal vein (drains the ileum)
- 5.) Ileocolic vein (drains the ileum, colon and cecum)
- 6.) Right colic vein (drains the ascending colon)
- 7.) Middle colic vein (drains the transverse colon)



tributaries of portal vein

Porto-Caval Anastomosis

Moreover, the portal venous system features porto-caval anastomoses, which serve as collateral connections between the portal and systemic venous systems. These anastomoses act as alternative pathways for blood circulation in cases of portal system blockage, ensuring that venous blood from the gastrointestinal tract can still reach the heart via the inferior vena cava without passing through the liver.

The major sites of these anastomoses include

- **Oesophageal** - Between the oesophageal branch of the left gastric vein and the oesophageal tributaries to the azygous system

- **Rectal** – Between the superior rectal vein and the inferior rectal veins
- **Retroperitoneal** – Between the portal tributaries of the mesenteric veins and the retroperitoneal veins
- **Paraumbilical** – Between the portal veins of the liver and the veins of the anterior abdominal wall

Clinical significance

If a large volume of blood passes through these anastomosis/connections, the veins become dilated resulting in:

- Oesophageal varices – oesophageal
- Haemorrhoids/piles – rectal
- Caput medusae – paraumbilical

References

- HUDÁK, Radovan – KACHLÍK, David. *Memorix anatomie*. 2. edition. Triton, 2013. ISBN 978-80-7387-712-5.