Portosystemic Anastomoses

Portosystemic anastomoses occur due to portal hypertension. These result in the expansion of pre-existing vascular channels within the portal and systemic circulation. Expansion of the anastomosis of the left gastric vein and esophageal veins presents as esophageal varices. Expansion of the anastomosis of the paraumbilical veins and the epigastric veins presents as caput medusae. Expansion of the anastomosis of the superior rectal vein and the middle & inferior rectal veins presents as anorectal varices.



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Characteristics

Portal Hypertension
Portal Hiker-BP
Portal hypertension is characterized by increased pressure in the venous portal system. It can occur from vascular obstruction (e.g., Budd-Chiari syndrome, portal vein thrombosis), cirrhosis (the most common etiology in developed countries), and schistosomiasis. Chronic portal hypertension can cause an increase in hydrostatic pressure at pre-existing vascular channels within the portal and systemic circulation (portosystemic collateral veins), leading to dilation. These dilated collateral veins can be seen in the lower esophagus, anterior abdomen, and lower rectum. It can be memorized by the mnemonic "varices of gut, butt, and caput (medusae)."

Anastomoses

Left Gastric Vein - Esophageal Veins
Left Stomach Vine Esophageal-sarcophagus Vine
In chronic portal hypertension, left gastric vein can shunt blood from the portal system to the esophageal veins, resulting in esophageal varices. The Left gastric vein feeds into the portal system, while the Esophageal veins feed into the systemic circulation.

Esophageal Varices
Esophageal-sarcophagus Ferris-wheel
Portal hypertension can cause an increase in hydrostatic pressure in the left gastric vein which anastomoses with the systemic esophageal veins in the lower esophagus, resulting in esophageal varices.

Paraumbilical Veins - Epigastric Veins
Parachute-umbrella Vine and E-pick-gas Vine
In chronic portal hypertension, paraumbilical veins can shunt blood from the portal system to superficial epigastric veins in the abdominal wall, resulting in caput medusae. The paraumbilical veins feed into the portal system, while the superficial and inferior epigastric veins feed into the systemic circulation.

Caput Medusae
Cap Medusa
Caput medusae is a description for the engorged veins in the anterior abdomen ("head of Medusa"). This is due to increased portal pressure in the paraumbilical veins which anastomose with the systemic epigastric veins.

Superior Rectal Vein - Middle & Inferior Rectal Veins
Superior Rectal-rectangle Vine - Middle and Inferior Rectal-rectangle Vine
In chronic portal hypertension, the superior rectal vein can shunt blood from the portal system to middle and inferior rectal veins in the lower rectum, resulting in anorectal varices. The superior rectal vein feeds into the portal system, while the middle and inferior rectal veins feed into the systemic circulation.

Anorectal Varices
Uranus-anus-rectangle Ferris-wheel
Anorectal varices are due to increased portal pressure within the superior rectal vein which anastomoses with the middle and inferior rectal veins.

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