THE HEPATIC PORTAL SYSTEM

LEARNING OBJECTIVES

- At the end of the lecture, students should be able to:
- Know about the hepatic portal system.
- Know about the hepatic portal circulation.
- Understand the anatomy of hepatic vein.
- Know about the portacaval anastomosis.
- Know the clinical correlation of hepatic portal system.

PORTAL VENOUS SYSTEM

- A portal venous system occurs when a capillary bed drains into another capillary bed through veins.
- Both capillary beds and the blood vessels that connect them are considered part of the portal venous system.
- Portal venous systems are considered venous because the blood vessels that join the two capillary beds are either veins or venules.
- Examples of such systems include the hepatic portal system and the hypophyseal portal system.
- "Portal venous system" often refers to the hepatic portal system.
- For this reason, "portal vein" most commonly refers to the hepatic portal vein.
HEPATIC PORTAL SYSTEM

- It is the system of veins comprised of the hepatic portal vein and its tributaries. It is also called the portal venous system.

- Blood from the entire digestive area including the intestines, stomach, pancreas, and gall bladder passes through the liver for cleansing and storing of nutrients.

- This function is often overlooked as critical to the overall circulatory system.

THE PORTAL CIRCULATION

- It is the circulation of blood through larger vessels from the capillaries of one organ to those of another; applied to the passage of blood from the gastrointestinal tract and spleen through the portal vein to the liver.

- Circulation of blood to the liver from the small intestine via the portal vein, the pathway of blood flow from the GI tract and spleen to the liver via the portal vein and its tributaries.

- Also called HEPATIC PORTAL SYSTEM.
HEPATIC PORTAL VEIN

- It is a vein in the abdominal cavity that drains blood from the gastrointestinal tract and spleen.
- It is formed by the confluence of the superior mesenteric and splenic veins, and also receives blood from the inferior mesenteric, gastric, and cystic veins.
- The hepatic portal vein is a major component of the hepatic portal system, one of the main portal venous systems in the body.
- Conditions involving the hepatic portal vein cause considerable illness and death.
- An important example of such a condition is elevated blood pressure in the hepatic portal vein, called portal hypertension.

HEPATIC PORTAL VEIN

- Approximately 8 cm (3 in) in adults.
- It is located in the right upper quadrant of the abdomen, originating behind the neck of the pancreas.
- It is formed by the union of the superior mesenteric vein and the splenic vein.
- Occasionally, the hepatic portal vein also directly communicates with the
inferior mesenteric vein, although this is highly variable.

- Other tributaries of the hepatic portal vein include the cystic and gastric veins.

**HEPATIC PORTAL VEIN**

- It ramifies further, forming smaller venous branches and ultimately portal venules.

- Each portal venule courses alongside a hepatic arteriole and the two vessels form the vascular components of the portal triad.

- These vessels ultimately empty into the hepatic sinusoids to supply blood to the liver.
Portal Venous System

- It is responsible for directing blood from parts of the gastrointestinal tract to the liver.
- Substances absorbed in the small intestine travel first to the liver for processing before continuing to the heart.
- Not all of the gastrointestinal tract is part of this system.
- The system extends from about the lower portion of the esophagus to the upper part of the anal canal.
- It also includes venous drainage from the spleen and pancreas.
PORTAL VENOUS SYSTEM

- Large veins that are considered part of the portal venous system are the:
  - Hepatic portal vein
  - Splenic vein
- Roughly, the portal venous system corresponds to areas supplied by the celiac trunk, the superior mesenteric artery, and the inferior mesenteric artery.

PORTACAVAL ANASTOMOSIS

- The portal venous system has several anastomosis with the systemic venous system.
- In cases of portal hypertension these anastomosis may become engorged, dilated, or varicosed and subsequently rupture.
Clinical Correlation
Portal Hypertension

- Portal hypertension is a condition in which the blood pressure of the portal venous system is too high.
- It is often the result of cirrhosis of the liver.
- It is a major complication of liver disease.
- When scarring and fibrosis from cirrhosis obstruct the portal vein in the liver, pressure rises in the portal vein and its tributaries, producing portal hypertension.
PYLEPHLEBITIS

- Pylephlebitis is infection of the hepatic portal vein, usually arising from an infectious intraabdominal process such as diverticulosis.

PORTOSYSTEMIC SHUNTS

- A common method for reducing portal hypertension is to divert blood from the portal venous system to the systemic venous system by creating a communication between the portal vein and the IVC.
- This portacaval anastomosis or portosystemic shunt may be done where these vessels lie close to each other posterior to the liver.
- Another way of reducing portal pressure is to join the splenic vein to the left renal vein, after splenectomy (splenorenal anastomosis or shunt.)