



THE PORTAL VEIN OF THE LIVER AND ITS FUNCTIONS

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Abstract: *The portal vein plays a critical role in liver physiology by transporting nutrient-rich blood from the gastrointestinal tract and spleen to the liver. This review highlights the anatomy, development, and major functions of the portal vein, emphasizing its importance in metabolic processes and homeostasis. Understanding the portal vein is essential for diagnosing and treating hepatic and systemic diseases.*

Keywords: *Liver, portal vein, physiology.*

Introduction

The liver is a vital organ with a dual blood supply: the hepatic artery and the portal vein. Unlike the hepatic artery, which delivers oxygenated blood, the portal vein carries deoxygenated, nutrient-rich blood from the gastrointestinal tract, pancreas, gallbladder, and spleen. Approximately 75% of the liver's blood supply comes from the portal vein, making it a central component of hepatic function.

Anatomy of the Portal Vein

The portal vein is typically formed by the confluence of the **superior mesenteric vein** and **splenic vein**, posterior to the neck of the pancreas. It ascends towards the liver and enters through the porta hepatis, where it divides into right and left branches, supplying corresponding hepatic lobes.

The key tributaries of the portal vein include:

- **Inferior mesenteric vein**
- **Left and right gastric veins**



- **Cystic vein**
- **Paraumbilical veins**

Functions of the Portal Vein

1. **Nutrient Transport:** After digestion, absorbed nutrients such as glucose, amino acids, and lipids are delivered via the portal vein to the liver for metabolism or storage.
2. **Detoxification:** The liver removes toxins and drugs from the portal blood before they can enter systemic circulation.
3. **Immune Surveillance:** The liver acts as an immune organ, filtering pathogens and antigens from the portal circulation through Kupffer cells.
4. **Hormone Clearance:** The portal vein also carries hormones such as insulin and glucagon, which are metabolized in the liver.

Clinical Relevance

Disorders of the portal vein, such as **portal hypertension**, **portal vein thrombosis**, and **congenital anomalies**, can severely impact hepatic and systemic health. Understanding the portal venous system is crucial in hepatology and gastroenterology.

Conclusion

The portal vein is a vital structure for maintaining metabolic balance, detoxification, and immune defense. Its strategic role in directing blood from the digestive organs to the liver underscores its significance in both health and disease.

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