

PORTAL HYPERTENSION: CAUSES, CLINICAL MANIFESTATIONS, AND SURGICAL TREATMENT METHODS

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Abstract

Portal hypertension is a severe pathological condition frequently encountered in diseases of the liver and the portal venous system, characterized by an increase in pressure within the portal vein (portal venous) system. This article describes the anatomical structure of the portal vein, the types of portal hypertension, the main etiological factors, clinical signs, as well as conservative and surgical treatment methods. A clinical analysis was conducted on 462 patients diagnosed and treated for portal hypertension in the surgical department of R.Sh.T.Yo.I.T.M.S.F. during 2021–2025. The results of the study demonstrated that liver cirrhosis is the primary cause of portal hypertension and that splenorenal anastomosis is one of the most effective surgical treatment methods.

Keywords

portal hypertension, portal vein, liver cirrhosis, varicose veins, splenorenal anastomosis, portocaval shunt.

INTRODUCTION

Portal hypertension is considered one of the most significant and life-threatening complications among diseases of the liver and the portal venous system. This condition develops as a result of impaired blood flow within the portal vein system and most often occurs in the setting of liver cirrhosis, chronic hepatitis, and other severe pathologies.

In healthy individuals, pressure in the portal venous system ranges from 50 to 115 mm of water column, whereas in portal hypertension this value may reach 600 mm of water column or higher. As a consequence of portal hypertension, severe clinical manifestations arise, including varicose dilation of the esophageal, gastric, hemorrhoidal, and abdominal wall veins, ascites, splenomegaly, and hepatic encephalopathy.

The relevance of this article lies in the fact that bleeding associated with portal hypertension is one of the leading causes of mortality in affected patients.

Therefore, early diagnosis of the disease and the application of effective treatment methods are of great importance.

AIM OF THE STUDY

To study the formation and anatomical characteristics of the portal vein, the types and causes of portal hypertension, as well as the conservative and surgical methods used in the treatment of portal hypertension, and to analyze the results of clinical practice.

MATERIALS AND METHODS

The study was conducted between 2021 and 2025 in the surgical department of R.Sh.T.Yo.I.T.M.S.F. A total of 462 patients who presented with a diagnosis of portal hypertension were analyzed. The patients underwent clinical, laboratory, and instrumental examinations (ultrasound, endoscopy, computed tomography, and laboratory biochemical analyses).

The mechanisms, etiological factors, and complications of portal hypertension were identified, and the effectiveness of the conservative and surgical treatment methods applied was evaluated.

ANATOMICAL CHARACTERISTICS OF THE PORTAL VEIN

Impairment of blood outflow in the portal venous system usually leads to portal hypertension (sometimes reaching 600 mm of water column or even higher). In healthy individuals, pressure in the portal venous system ranges from 50 to 115 mm of water column. The portal vein is a major blood vessel that collects venous blood from the unpaired organs of the abdominal cavity and transports it to the liver. It is mainly formed by the confluence of three, and sometimes four, large venous vessels:

1. Splenic vein
2. Superior mesenteric vein
3. Inferior mesenteric vein

Anatomical location:

At the level of the 12th thoracic and 3rd lumbar vertebrae

Located within the hepatoduodenal ligament

Dimensions:

Diameter: 1.5–1.8 cm

Length: 2.8–12 cm

After entering the liver, the portal vein branches and ensures blood flow through the sinusoids.

TYPES OF PORTAL HYPERTENSION

According to the location and nature of the pathological process, portal hypertension is divided into four types:

- Suprahepatic portal hypertension
- Intrahepatic portal hypertension
- Extrahepatic portal hypertension
- Mixed portal hypertension

According to the results of the study, intrahepatic portal hypertension was identified in 86% of patients.

MAIN CAUSES OF PORTAL HYPERTENSION

The main causes of intrahepatic portal hypertension include the following:

- Liver cirrhosis – in 90% of cases
- Portal cirrhosis
- Postnecrotic cirrhosis
- Mixed forms
- Chronic active hepatitis
- Granulomatous diseases (tuberculosis, sarcoidosis)
- Schistosomiasis
- Liver tumors

In liver cirrhosis, the progressively increasing connective tissue compresses the intrahepatic venous vessels, leading to an elevation of portal pressure.

CLINICAL MANIFESTATIONS

Portal hypertension presents with the following clinical signs:

1. Splenomegaly (the spleen may enlarge up to 1000 g)
2. Varicose dilation of the esophageal and gastric veins
3. Dilatation of hemorrhoidal veins
4. Venous collaterals on the lower abdominal wall
5. Ascites
6. General weakness
7. Pain in the epigastric region
8. Loss of appetite
9. Nausea and abdominal bloating
10. Constipation
11. Hepatic encephalopathy

The most dangerous complication is bleeding from varicose veins, which often results in death.

TREATMENT METHODS

Two main approaches are used in the treatment of portal hypertension:

1. Conservative treatment

Medications aimed at controlling bleeding from varicose veins are administered, including:

- Octreotide
- Vasopressin
- Terlipressin

These drugs temporarily reduce portal pressure and decrease bleeding.

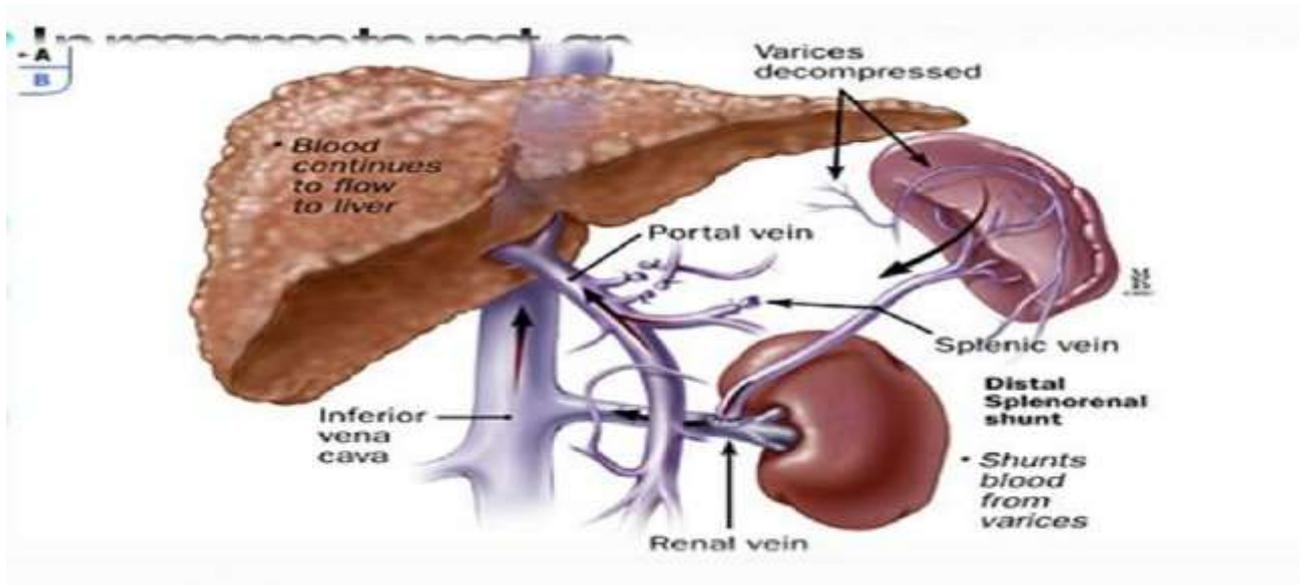
2. Surgical treatment

As the main treatment strategy, vascular anastomosis techniques aimed at reducing portal hypertension are employed.

The following shunting procedures exist between the portal and caval venous systems:

1. Total (portocaval) anastomosis
2. Partial anastomoses:
 - Mesentericocaval
 - Splenorenal anastomosis

In clinical practice, the most frequently used and effective method was splenorenal anastomosis.



RESULTS OF THE STUDY

Among the 462 patients observed during 2021–2025:

Intrahepatic portal hypertension was diagnosed in 397 patients (90%).

Liver cirrhosis was identified in 357 patients (86%).

As a result of surgical shunting procedures and conservative treatment, the incidence of bleeding from varicose veins was significantly reduced, and patient survival was prolonged.

CONCLUSION

Portal hypertension is mainly associated with liver cirrhosis and is accompanied by severe clinical complications.

Bleeding from the esophageal and gastric veins is the leading cause of mortality in patients.

Although conservative treatment provides temporary benefits, surgical shunting remains the main method of treatment.

Splenorenal anastomosis is one of the most effective and safe methods for reducing portal pressure.

Timely diagnosis and comprehensive treatment make it possible to save patients' lives and prolong survival.

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