Central Asian Journal of Medicine

INTERVENTIONAL CORRECTION OF EXTRAHEPATIC PORTAL HYPERTENSION IN PATIENT AFTER LIVER TRANSPLANT. THE FIRST CASE REPORT IN UZBEKISTAN

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ABSTRACT

Liver transplantation is a multi-component and complex type of operative treatment. Patients undergoing such a treatment sometimes are getting various complications. One of these complications is a portal hypertension associated with portal vein stenosis.

Materials and methods. In 8 months after the right lobe transplantation from living donor in an adult patient the signs of portal hypertension were observed. Stenosis of the portal vein was revealed. Due to this fact percutaneous transhepatic correction of portal vein stenosis was per formed.

Results. As a result of the correction of portal blood flow no more portal vein stenosis obtained. According to the laboratory and instrumental methods of examination the graft had a normal function, portal blood flow was adequate. In order to control the anastomosis patency Doppler ultrasound was performed in the 5-days and 21-days period. Due to these examinations the no stenosis was obtained, the rate of blood flow in the portal vein due to Doppler data has reached 60-70 cm/sec, and a decrease of the spleen size was noted.

Key words: portal hypertension, liver transplantation, portal vein stenosis, balloon angioplasty.

INTRODUCTION

Liver transplantation, to date, is the standard and the only one treatment for patients with end-stage diffuse and focal liver diseases [1]. In the Republic of Uzbekistan only living donor liver transplant (LDLT) is currently performed. This type of transplant care has a number of advantages over transplantation from a deceased donor: good graft quality, the ability to perform the surgery in the required time frame, and better tissue compatibility with the donor.

LDLT is a multicomponent, difficult method of surgical treatment. Patients undergoing this type of medical care may have various complications. One of these complications is a violation of blood flow in the portal vein as a result of the development of portal vein stenosis (PVS) [2,6,9-11]. Various disorders of the portal blood supply of the liver graft are formidable complications associated with a high incidence of its dysfunction and possible graft loss [3]. The progression of portal stenosis after liver transplantation inevitably leads to aggravation of the clinical manifestations of portal hypertension syndrome (splenomegaly, ascites, esophageal varicose veins, cytopenia) [6].

Doppler ultrasound is the main method for diagnosing post-transplant vascular complications, including portal vein stenosis [5]. Another informative method is computed tomography (CT) with intravenous contrast administration, which makes it possible to determine the severity and extent of PVS [4,22].

There are palliative and radical treatments for portal hypertension due to portal vein stenosis. Palliative methods include shunt operations on the portal system. The disadvantage of this method is the reduction in the volume of blood flow in the portal vein system, which can subsequently lead to aggravation of stenosis, in addition, encephalopathy as a traditional complication of bypass surgery. Radical methods include restoring the blood flow of the portal vein by its reconstructing by using artificial grafts or autografts, as well as endovascular

methods of treatment. The disadvantage of surgical reconstruction of the portal vein is the need for traumatic repeated surgical intervention in the area of the graft gate, access to which is difficult due to adhesions, as well as the risk of restenosis, so the expediency of the operation is determined to a greater extent by portal vein thrombosis with the impossibility of its correction by another method [20,21].

According to literature, endovascular correction techniques are the most preferable. One of the most effective and minimally invasive methods of treatment is endovascular angioplasty, including percutaneous transhepatic balloon angioplasty or stenting of the PVS [3,6-8,12,16-22].

After reviewing the Uzbekistan scientific literature, we did not find any works on the topic of interventional correction of portal vein stenoses in patients after liver transplantation. In view of this, we decided to demonstrate a clinical case of X-ray endovascular treatment of a patient with portal vein stenosis that occurred in the long-term period after liver transplantation.

Materials and methods.

Patient A., 48 years old, observed in the V. Vakhidov Republican Specialized Scientific and Practical Medical Center of Surgery since January 2022 with hepatitis C liver cirrhosis (MELD 22 points, Child-Pugh class C), portal hypertension (3rd degree esophageal varicose veins, splenomegaly, polyserositis, hypersplenism syndrome). Due to severe splenomegaly and severe pancytopenia, the patient underwent selective embolization of the splenic artery before liver transplantation. Also, patient had recurrent hydratoraxes, so pleural drainage was also carried out.

In May 2022, the patient underwent LDLT. The right lobe from her son was transplanted. The patient was discharged without complications in 21 days after surgery with good graft function. The immunosuppressive protocol was standard for our clinic: a two-component scheme using tacrolimus and methylprednisolone.

After discharge the observation performed on an outpatient basis, every 30 days laboratory control and ultrasound control of the graft were performed. Four months after transplant the patient complained of jaundice and itching. A comprehensive examination was performed, any data for the stricture of the biliary anastomosis was not obtained, signs of graft rejection were revealed (ALT 800 U/l AST 640 U/l, serum bilirubin 305 umol/l). The rejection crisis was stopped by pulse therapy with glucocorticosteroids (methylprednisolone 20 mg/kg of body weight), the immunosuppressive protocol was also corrected - mycophenolic acid was added. The patient was discharged with satisfactory graft function and normal blood tests.

The next appeal was in October 2022 with complaints of an increase in the size of the abdomen, tachycardia, feet, ankles and hips edema. The patient underwent a comprehensive examination. According to the ultrasound data, there was splenomegaly (Fig. 1), ascites, as well as an expansion of the intrahepatic portal vein branches up to 20 mm (Fig. 2). Due to the difficult visualization of the hepatoduodenal ligament during ultrasound examination, the patient underwent CT procedure with intravenous contrast admitting. Significant PVS in the area of the portal anastomosis was revealed (Fig. 3).

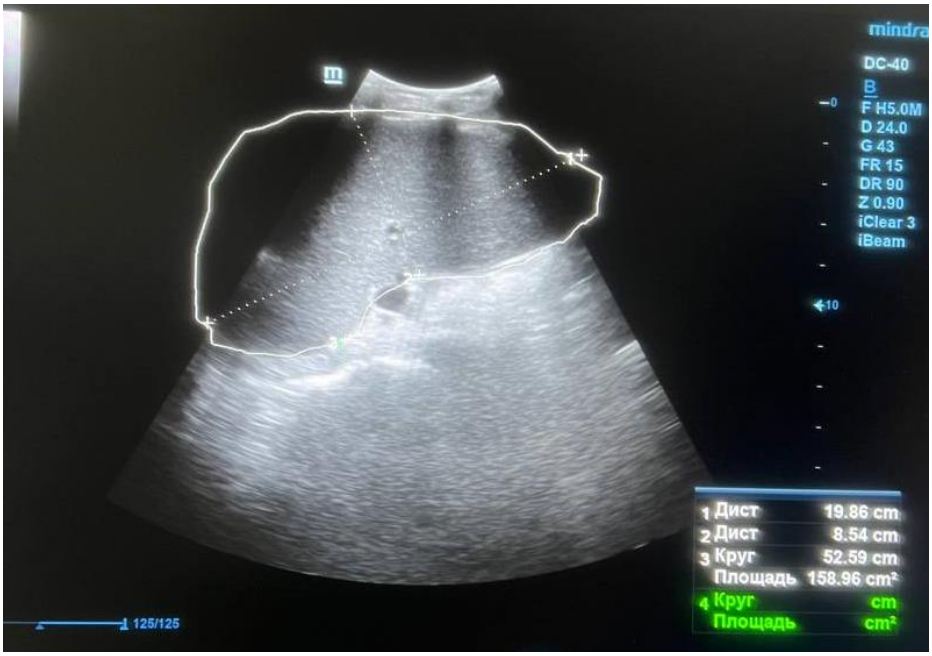

Figure 1. Ultrasound examination. Spleen size increased up to 159 sm^2.

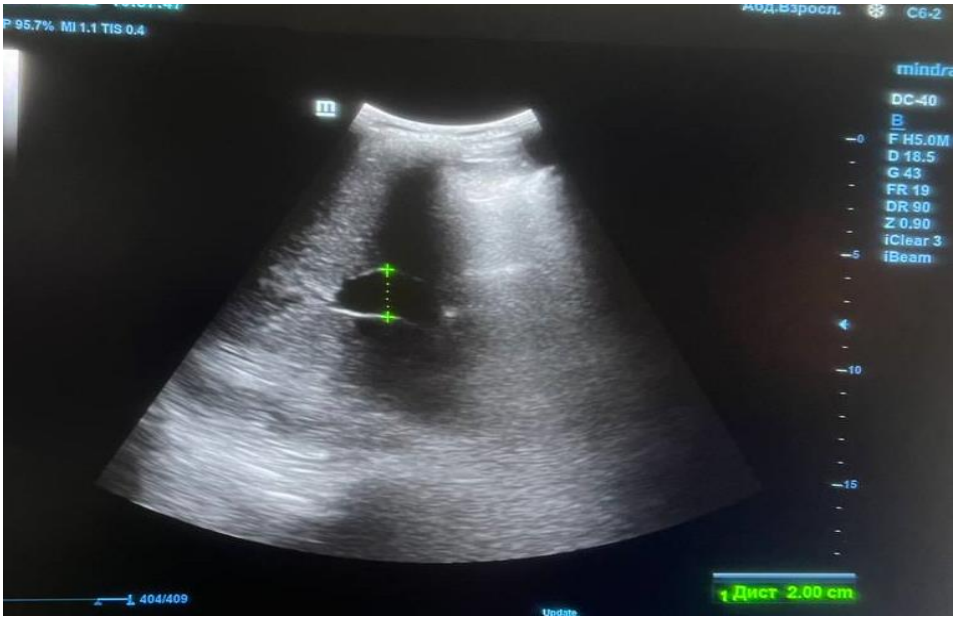

Figure 2. Ultrasound examination. Expansion of the intrahepatic portal vein branches up to 20 mm.

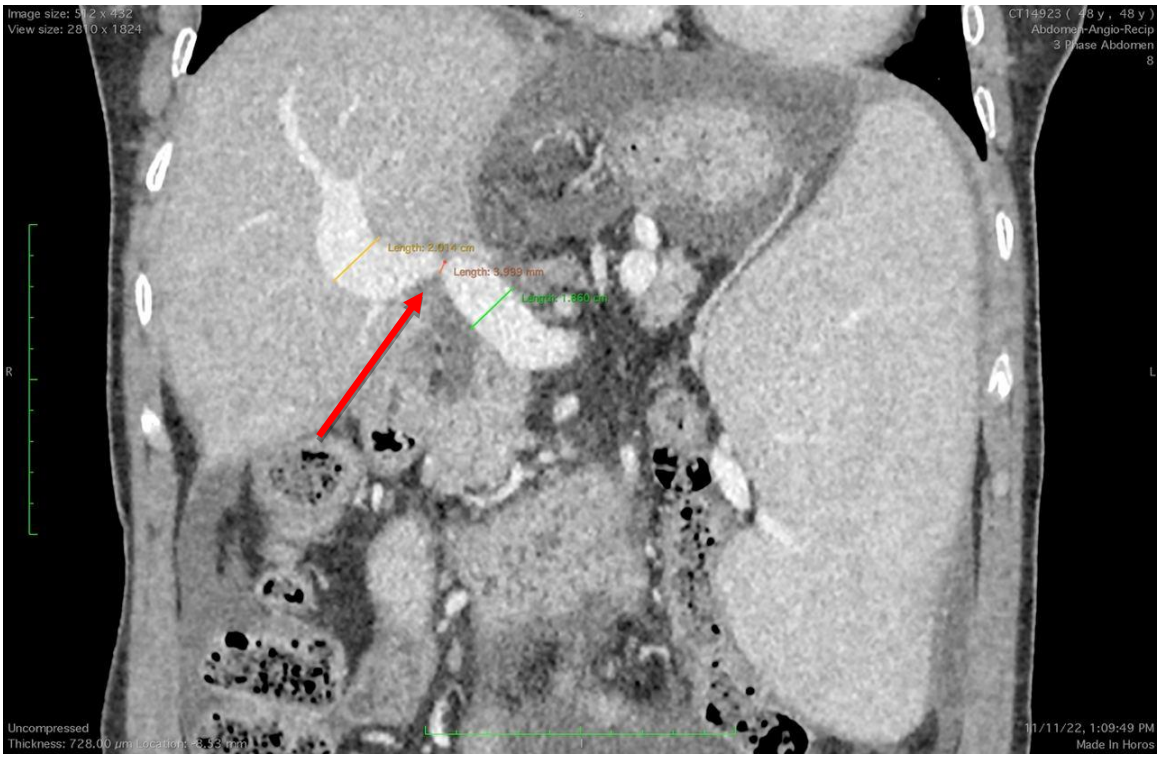

Figure 3. CT-angiography. The arrow indicates the site of portal vein stenosis. PVS diameter was 3.9 mm.

Considering the developed stenosis of the portal vein and the long period passed after liver transplantation, the traditional surgery of re-anastomosis is associated with huge surgical risks. Also, knowing the international experience of interventional correction of such complications [2,6,16-21], we decided to perform percutaneous-transhepatic balloon angioplasty of the PVS.

Surgery.

After local anesthesia with 1% lidocaine solution, using ultrasonic navigation, transhepatic puncture of a branch of the portal vein was performed using Chiba 20G needle. Plain angiography of the portal vein system was performed. A coronary guiding was passed through the puncture needle and installed into the splenic vein. An introducer installed using the guiding. An angulated EndoFlex-4 catheter was inserted into the splenic vein system. Angiography was performed and the site of portal vein stenosis was identified (Figure 4).

The catheter has been removed. The guiding was replaced with a more rigid one. A 12mm x 40mm Mustang-type balloon was inserted through the conductor, and balloon angioplasty of the stenosis was performed under a pressure of 16 ATM. Next, a similar plastic was performed with a 20x40 mm balloon under a pressure of 3 ATM. Control angiography showed a significant angiographic effect, there was no data for portal vein stenosis (Figure 5).

Guidewires and introducer removed. Control ultrasound showed no graft hematomas and signs of bleeding. The blood flow through the portal vein was adequate (linear blood flow 55 cm/sec).

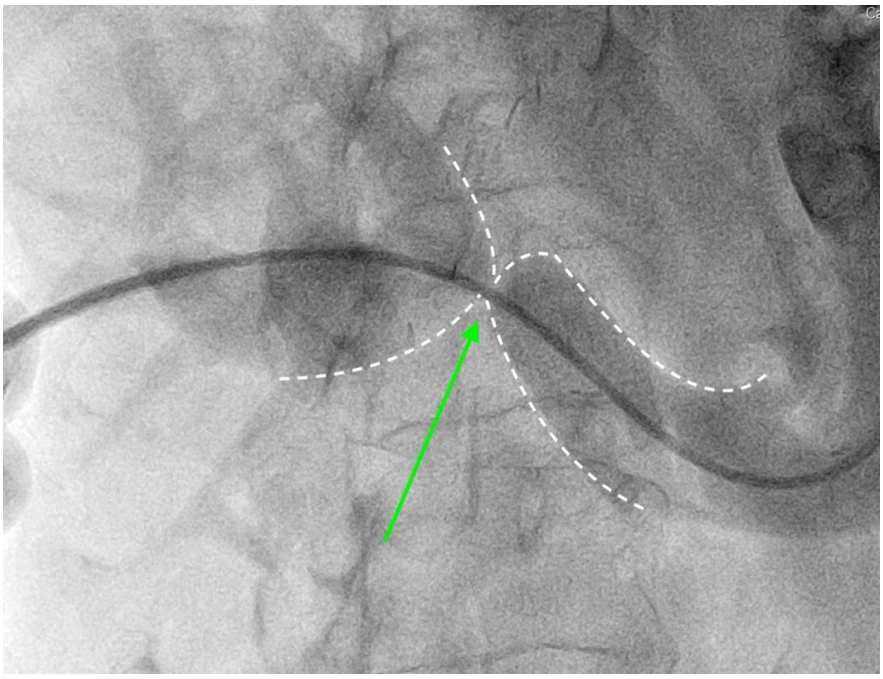

Figure 4. Percutaneous-transhepatic portography. The arrow indicates the site of portal vein stenosis.

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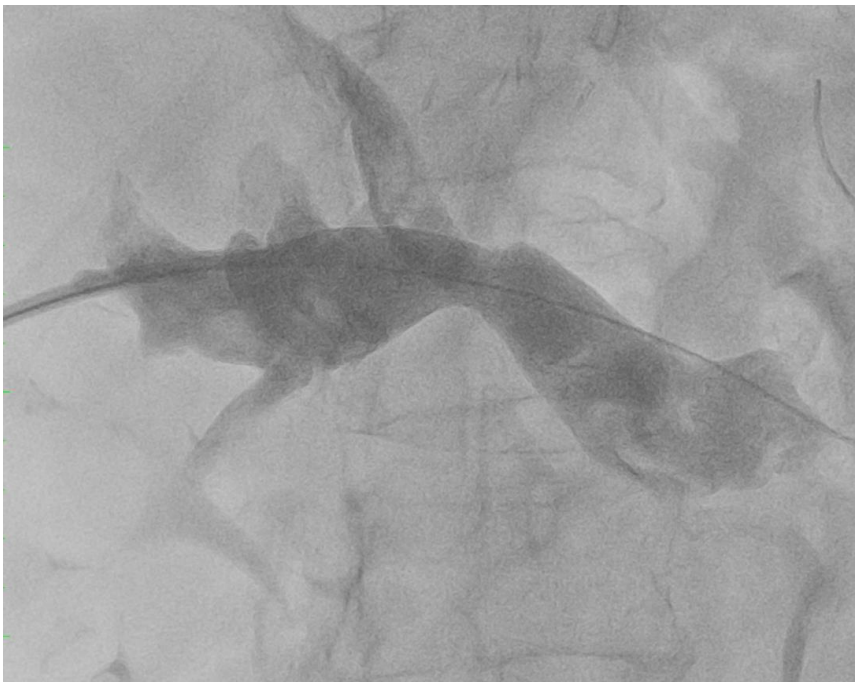

Figure 5. Percutaneous-transhepatic portography. Effect after PVS balloon angioplasty.

Results and follow up.

In the postoperative period the patient received infusion and antiplatelet therapy. Also, immunosuppressive therapy was carried out. In the dynamics during the control ultrasound examination, the ascites regressed completely, the spleen size with a significant decrease. According to laboratory data, no signs of graft dysfunction were observed. The patient was discharged on the 5th day after the procedure for further outpatient monitoring

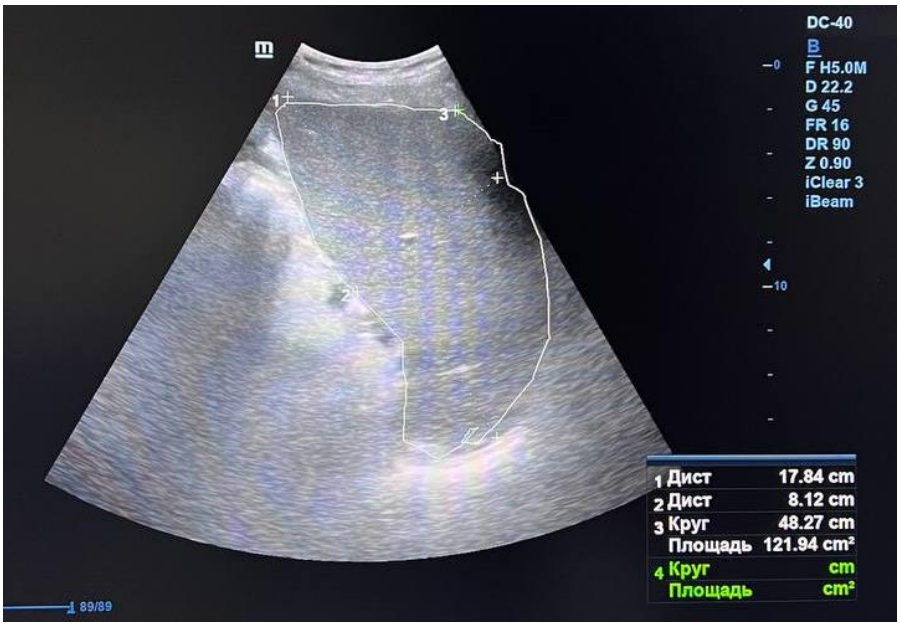

Figure 6. Reduction of the spleen size during dynamic ultrasound observation in 21 days after balloon angioplasty of the PVS.

Outpatient control was carried out 21 days after surgery. According to Doppler ultrasound data, 60-70 cm/sec laminar portal blood flow detected, there was no signs of PVS, splenomegaly with significant regression (Figure 6). According to laboratory data, no cytopenia was observed.

Discussion.

Vascular complications after LDLT require in-time diagnosis and treatment before the graft dysfunction appears [2–6]. In our case, the cause of early recurrent portal hypertension was stenosis of the portal vein in the area of the anastomosis with a partial violation of the outflow from the liver.

In our practice, portal vein stenosis is a rare complication after LDLT. Taking into account the fact that patients with portal vein stenosis have a risk of bleeding due to manifestations of portal hypertension and thrombocytopenia, as well as the presence of a pronounced adhesive process in the abdominal cavity, treatment in such patients should be performed as much as possible in minimally invasive ways. Thus, the percutaneous method has an advantage even over the method of

using a mini surgical access to cannulate a branch of the superior mesenteric or inferior mesenteric veins [6].

This case report demonstrates the high efficiency of percutaneous transhepatic access in the correction of extrahepatic portal hypertension in such patients. It is highly recommended to detect blood flow disorders in the portal vein as early as possible to prevent the development of portal hypertension syndrome in the post-transplant period. This requires regular ultrasound monitoring of liver graft blood flow characteristics [4,5].

Conclusion.

Diagnosis and timely detection of portal vein stenosis in patients after liver transplantation is very important for maintaining the function of the graft and preventing the development of portal hypertension. To do this, recipients need to carry out regular ultrasound control with duplex scanning of the graft blood flow, and in case of detection of signs of blood flow disorders in the portal vein system, CT angiography should be performed.

Percutaneous transhepatic balloon angioplasty of the portal vein stenosis is a minimally invasive and highly effective method for correcting portal hypertension in patients after liver transplantation.

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