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CASE REPORT | LIVER

Rapidly Progressive Portal Cavernoma Cholangiopathy in a Patient With Infeasible Decompressive Shunt Surgery

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ABSTRACT

We present a 27-year-old man with a 2-year history of extrahepatic portal vein obstruction and selective immunoglobulin A deficiency, referred for acute cholangitis from portal cavernoma cholangiopathy (PCC). Because recurrent cholangitis rapidly led to liver failure, orthotopic liver transplantation (OLT) was successfully performed. To date, this is one of the few cases of patients with symptomatic PCC who required OLT and the first case who had a successful 6-year follow-up. Thus, OLT can be used for symptomatic PCC associated with nonshuntable anatomy, ineffective biliary drainage, and progressive liver damage. Selective immunoglobulin A deficiency may play a role in recurrent cholangitis.

INTRODUCTION

Portal cavernoma cholangiopathy (PCC) refers to abnormalities in the biliary tract in patients with portal cavernoma caused by extrahepatic portal vein obstruction (EHPVO). The prevalence of biliary changes in patients with portal cavernoma ranges from 70% to 100% according to the diagnostic tool.[1] However, the prevalence of symptomatic PCC is 5%–38% and tends to occur in older patients with a longer duration of EHPVO, dilated segments of bile ducts, and the presence of gallstones.[2,3] We report the case of a 27-year-old patient with a 2-year history of EHPVO, recurrent cholangitis from PCC, and rapidly worsening liver function successfully treated by orthotopic liver transplantation (OLT).

CASE REPORT

A 27-year-old White man with a 2-year history of idiopathic EHPVO and nonshuntable anatomy was admitted to our hospital for fever, jaundice, pruritus, and right upper quadrant abdominal pain in December 2014. As a child, he was diagnosed with mild asthma, intermittent diarrhea, and selective immunoglobulin A deficiency (SIgAD). In 2012, moderate thrombocytopenia and an increase in alkaline phosphatase were revealed. The other liver function tests remained unchanged, and esophagogastroduodenoscopy detected small esophageal and gastric varices. Contrast-enhanced computed tomography revealed splenomegaly, dilation of the splenic vein, recanalization of the paraumbilical vein, and portal cavernoma (Figure 1). The patient had no history of thrombophilia, myeloproliferative neoplasms, abdominal inflammation, surgery, and trauma. A workup for underlying chronic liver disease and coeliac disease was also negative. The transient elastography result was 7.2 KPa. Thus, the patient was diagnosed with idiopathic EHPVO. The creation of a portal-systemic shunt was unfeasible because of the poor quality of splanchnic veins.

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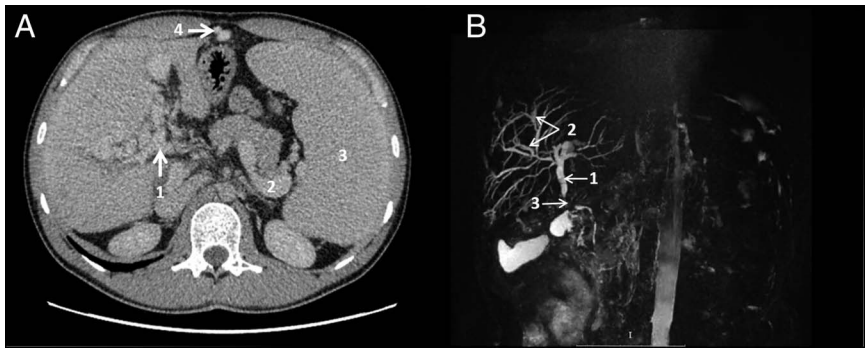

Figure 1. Liver imaging. (A) Contrast-enhanced computed tomography (October 2012) shows (1) portal cavernoma, (2) splenic vein extension, (3) splenomegaly, and (4) recanalization of the paraumbilical vein. (B) Magnetic resonance cholangiopancreatography (December 2014) shows the dilatation of the (1) extrahepatic and (2) intrahepatic bile ducts and (3) the common bile duct stricture in the middle third.

Seven months before the presentation, in May 2014, the patient experienced variceal bleeding and successfully underwent endoscopic band ligation. In December 2014, at the time of admission, the patient was febrile with tenderness in the right upper quadrant. Laboratory analysis revealed albumin 36 g/L, international normalized ratio 1.1, total bilirubin 3.2 mg/dL, direct bilirubin 2.1 mg/dL, aspartate transaminase 145 U/L, alanine transaminase 162 U/L, gamma-glutamyl transpeptidase 126 U/L, and total alkaline phosphatase 780 U/L. Thrombocytopenia and leukopenia became worse (white blood cell count 2,700 cells/mm^3, platelets 56,000 cells/mm^3). Magnetic resonance cholangiopancreatography showed dilatation of the biliary tree and bile duct stricture in the midportion of the common duct; no signs of cirrhosis were observed (Figure 1). Endoscopic retrograde cholangiopancreatography plus biliary sphincterotomy and stenting were performed, followed by a short-term improvement.

Three months later, in March 2015, the patient developed new-onset pruritus and cholangitis, and nasobiliary drainage was performed. The patient developed a total of 8 episodes of cholangitis and underwent 3 unsuccessful attempts of metal stent deployment. Each attempt to insert a guidewire was complicated by hemobilia, which did not allow stent insertion. The biliary bleeding stopped spontaneously. The patient had low albumin 33.5 g/L and altered international normalized ratio 1.38. Large esophageal and gastric varices were first noted. Over the next 2 months, he had a weight loss of 10 kg and developed protein-energy malnutrition. Owing to rapidly progressive liver failure with a Model for End Stage Liver Disease (MELD) of 15, eight episodes of cholangitis, and nonshuntable anatomy, cadaveric OLT was performed in August 2015. At the time of OLT, laboratory analysis revealed albumin 30 g/L, international normalized ratio 1.45, total bilirubin 3.6 mg/dL, direct bilirubin 1.6 mg/dL, aspartate transaminase 110 U/L, alanine transaminase 116 U/L, gamma glutamyl transpeptidase 272 U/L, total alkaline phosphatase 1,360 U/L, white blood cell count 2,800 cells/mm^3, and platelets 47,000 cells/mm^3. Histological examination showed signs of recurrent pyogenic cholangitis, obliterative portal venopathy, and occasional portal-to-portal bridging (Figure 2).

After OLT, the patient recovered quickly; jaundice, purities, and abdominal pain disappeared; and laboratory results normalized within 3 months: aspartate transaminase 19 U/L, alanine transaminase 11 U/L, glutamyl transpeptidase 12 U/L, alkaline phosphatase 131 U/L, total bilirubin 1.3 mg/dL, direct bilirubin 0.5 mg/dL, and albumin 41 g/L. At the time of this writing, the follow-up period after OLT was 6 years. The patient is free of symptoms and continues taking tacrolimus.

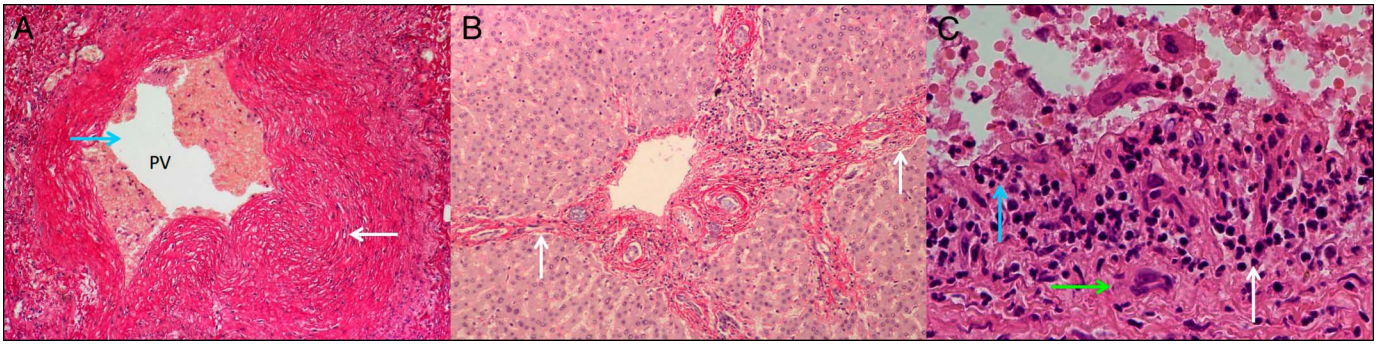

Figure 2. Liver histopathology (August 2015). (A) Phlebosclerosis (white arrow) of the PV with a narrowed venous lumen—obliterative portal venopathy (blue arrow) (picrosirius, 200×). (B) Normal lobular and trabecular architecture of the liver parenchyma. Some portal tracts are extended and have a star-shaped appearance and occasional portal-to-portal bridging (arrows) (picrosirius, 100×). (C) Signs of recurrent pyogenic cholangitis: inflammatory cell infiltration consisted mainly of lymphocytes and plasma cells (white arrow), being mixed with neutrophils (blue arrow); sclerosis of the bile duct wall (green arrow) (hematoxylin and eosin, 400×). PV, portal vein.

DISCUSSION

In the absence of liver cirrhosis and malignancy, the patient with portal hypertension and portal cavernoma was diagnosed with EHPVO.[4,5] No prothrombotic factors such as thrombophilia, myeloproliferative neoplasms, abdominal inflammation, surgery, or trauma were revealed.[4,6]

The worsening of the patient's condition in May 2014 was most likely associated with rethrombosis of the cavernoma veins, which increased portal pressure and led to esophageal variceal bleeding and biliary obstruction. This rapidly progressed to symptomatic PCC.

The initial treatment of PCC included stenting, nasobiliary drainage, and sphincterotomy, which were briefly effective, and the patient relapsed after 2 months.[7,8] Because no shuntable veins were observed in about 5%–30% of patients with PCC, the creation of portal-systemic shunt could not be performed. However, the successful management of PCC using shunting procedures including trans-jugular intrahepatic portosystemic shunt with portal vein recanalization has been reported.[9] A decompressive surgical procedure described for symptomatic PCC in the absence of shuntable veins is repeated plastic stenting, but in our case, stent replacement was unsuccessful and led to recurrent hemobilia.[10] Insertion of a metallic stent provides a longer symptoms-free period when compared with plastic stent.[11] Second-stage biliary surgery such as hepaticojejunostomy or choledochoduodenostomy was not achievable because of the high risk of bleeding from the bile ducts.[2]

The liver failure in patients with PCC is related to secondary biliary cirrhosis.[12] Both portal and biliary obstruction may be associated with recurrent bacterial cholangitis, resulting in cirrhosis. Existing studies have suggested a link between the level of secretory immunoglobulin A in bile and the risk of cholangitis and recurrent biliary infection caused by weakening biliary mucosal immunity.[13–16] Moreover, SIgAD may alter the gut microbiome and contribute to the development of liver disease.[17] We suppose that SIgAD is associated with the development of PCC. In our patient, severe PCC with recurrent cholangitis led to liver failure and malnutrition within 10 months after presentation. The MELD score of 15, young age, hypersplenism, intractable symptoms, and lack of other treatment modalities prompted us to consider OLT.

To date, this is one of the few reports of PCC treated by OLT.[7,15,16,18] Previous cases also reported that recurrent cholangitis resulted in secondary biliary cirrhosis. Two patients developed hemobilia.[7,18] OLT was performed over 11–16 years after diagnosis of EHPVO and 3–10 years after the onset of PCC. Our patient is alive and well 6 years after OLT; we report the longest follow-up period of PCC patients who underwent OLT.

DISCLOSURES

Author contributions: MY Nadinskaia wrote and edited the manuscript, reviewed the literature, and is the article guarantor. VT Ivashkin approved the final manuscript and revised the manuscript for intellectual content. MS Novruzbekov revised the manuscript for intellectual content. LN Zimina and TP Nekrasova provided the images. KB Kodzoeva wrote and edited the manuscript and reviewed the literature. DA Strelkova reviewed the literature and provided the images.

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Informed consent was obtained for this case report.

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