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CASE REPORT | ENDOSCOPY

Treatment With Balloon Angioplasty of Chronic Portal Vein Thrombosis

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ABSTRACT

The therapeutic options in portal vein thrombosis cases of young age and low weight, as in this case, are limited. Interventional radiologists also have minimal experience in pediatric patients. There are no reported cases anywhere worldwide, especially in this age group. However, we think that balloon angioplasty can be safely applied in cases in which esophageal variceal bleeding cannot be controlled using traditional treatment.

INTRODUCTION

Portal vein thrombosis may be caused by thrombophilia and is frequently seen in babies undergoing umbilical vein catheterization at birth. Medical and endoscopic procedures and surgery are applied in treatment.[1,2] This case report discusses the achievement of a complete cure using portal vein balloon angioplasty in a case of chronic portal vein thrombosis presenting to our hospital with once-monthly bleeding esophageal varices and in which traditional treatments were insufficient or could not be administered because of young age and low weight.

CASE REPORT

Our patient, born by cesarean delivery at 28 weeks weighing 700 g, was admitted to the intensive care unit for 3 months. During that time, umbilical catheterization was performed, and was then discharged, in a healthy condition. The patient first presented to our clinic at the age of 15 months because of approximately 200 mL of bloody vomiting. The patient weighed 5,500 g (<3p) and was 67 cm (<3p) in height. Echocardiography and the thrombosis panel (homocysteine, protein C, protein S, antithrombin III, and MTHFR gene mutation) were normal. Chronic portal vein thrombosis was determined at portal Doppler USG, whereas upper gastrointestinal (GI) system endoscopy revealed one grade 1 and one grade 2 esophageal varices and portal hypertensive gastropathy findings. During the follow-up after treatment, bleeding was brought under control by the discontinuation of oral feeding and intravenous proton pump inhibitor and somatostatin infusion. The patient was started on propranolol (1 mg/kg) and sucralfate and placed under observation. However, owing to the patient's age and low weight, the pediatric surgery reported that shunt surgery would not be beneficial and entails a high complication rate. Medical treatment was maintained, and the patient received a high-calorie diet for weight gain. At the follow-up, the patient presented to our clinic because of esophageal variceal bleeding approximately once every month. Endoscopic band ligation was not possible because of the unavailability of a band ligator for children. Sclerotherapy was performed under general anesthesia at monthly intervals for esophageal bleeding, but endoscopy showed that this treatment was ineffective. Owing to the lack of any alternative, portal vein balloon angioplasty was planned.

Occlusion in the main portal vein, cavernous transformation, and gastroesophageal varices were observed at angiography (Figure 1). Once a 5 F Bern catheter had been passed through the occlusion in the main portal vein with the help of a guidewire, dilation was

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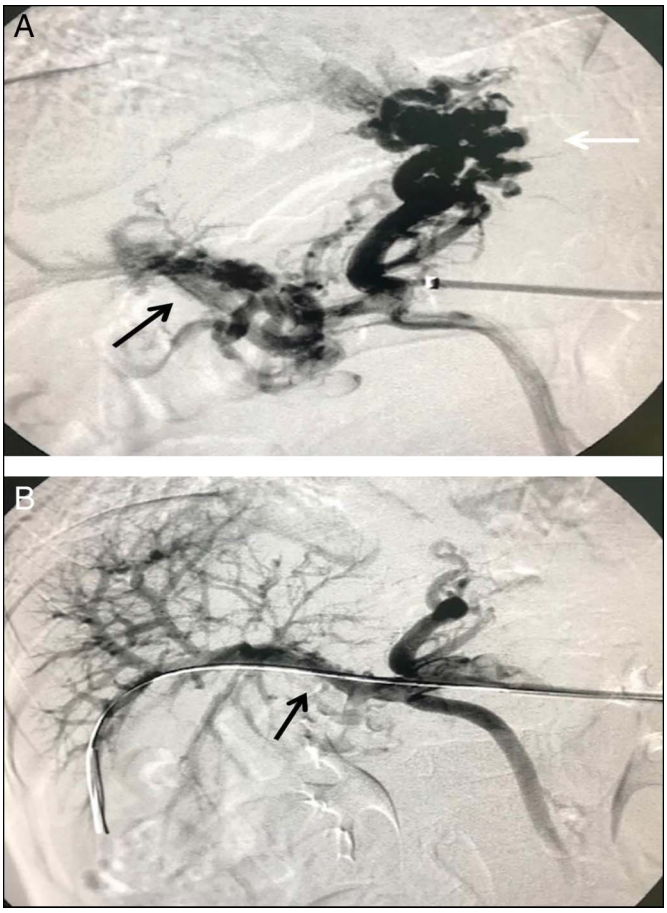

Figure 1. (A) Splenic venography showing occlusion in the main portal vein, cavernous transformation (black arrow), and gastroesophageal varices (white arrow). (B) Venography after balloon angiography showing patency in the main portal vein (black arrow) and improved flow toward the liver.

applied to the main and right portal veins with 5-, 6-, and 7-mm balloons. Angiography revealed full patency in the main portal vein, the disappearance of the cavernous transformation, and a marked decrease in a flow toward the gastroesophageal varices (Figure 1).

On the same day, the patient was started on 2000 U subcutaneous enoxaparin. No postoperative complications developed. The portal vein was fully patent at the second portal Doppler USG session performed after 15 days. Physical examination revealed that the spleen previously extending to the inguinal had contracted to 4 cm in the midclavicular line. Endoscopy performed 20 days subsequently revealed only 1 linear varices, and the portal hypertensive gastropathy findings had resolved. However, the patient returned to our emergency department because of renewed upper GI bleeding 2 months after that procedure. Upper GI endoscopy revealed two grade 2 esophageal varices with red spots and the findings of portal hypertensive gastroenteropathy. History revealed that the family had discontinued the enoxaparin therapy in the past month. Five months after the first procedure, the patient was taken for repeat endovascular treatment. However, severe focal narrowing was present in the proximal main portal vein, and blood flow was predominantly in the direction of the gastroesophageal varices. An 8-mm balloon was inserted into the portal vein, and no residual narrowing was detected. Enoxaparin therapy was again initiated after the procedure. The patient has had a follow-up for 18 months without problems (Figure 2).

DISCUSSION

Neonatal portal vein thrombosis is rare, being seen in an estimated 1/100,000 live births, but in 36/1,000 cases admitted to neonatal intensive care.[1] In the neonatal period, it most frequently develops because of umbilical catheter installation, rarely produces symptoms and findings, and resolves in the neonatal period approximately 60%–70% of the time.[3]

There are various therapeutic options in cases of portal hypertension with portal vein thrombosis. Propranolol therapy can be administered for portal hypertension, and proton pump inhibitors can be given for gastric protection.[4] At the same time, endoscopic variceal ligation and sclerotherapy can be performed for varices. However, these are supported, not radical therapies. Treatments in portal vein thrombosis are those that regulate portal hypertension. Splenorenal and Rex shunts are methods frequently applied in pediatric cases.[5]

The endovascular treatment of symptomatic chronic portal vein thrombosis is still controversial. Other therapeutic options include thrombectomy, balloon angioplasty, and stent insertion, but these are rarely used in chronic portal vein thrombosis in children. Balloon angioplasty has more commonly been performed after liver transplantation in the literature, and successful results have been reported.[6] Portal vein stent insertion and angioplasty in portal vein stenosis in pediatric liver transplantation cases exhibit similar long-term outcomes.[7]

The therapeutic options in portal vein thrombosis cases of young age and low weight, as in this case, are limited. Endeavors to maintain life in cases of recurrent variceal bleeding are made using support therapies only. Balloon angioplasty for chronic portal vein thrombosis is very rarely used in adults. Interventional radiologists also have minimal experience in pediatric cases. However, we think that balloon angioplasty can be safely applied in cases in which esophageal variceal bleeding cannot be controlled using the traditional treatment. Success was achieved after the first procedure in our case, and the patient was followed up without problems under enoxaparin therapy. However, thrombosis reoccurred within 1 month after drug discontinuation, and a second balloon angioplasty procedure was performed. Enoxaparin therapy was maintained after the

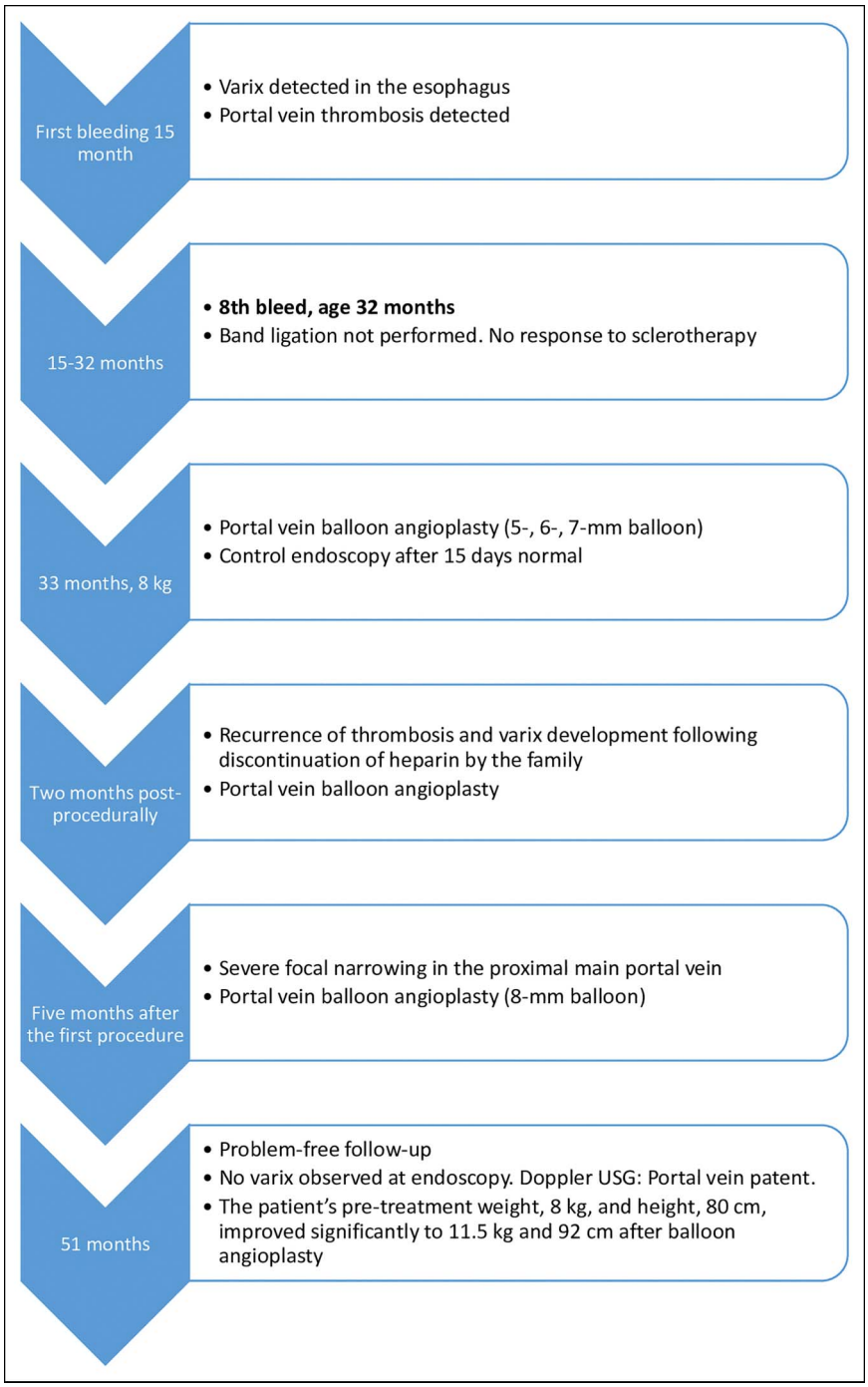

Figure 2. The timeline of events for the patient.

second procedure. The patient is currently in the sixth, complication-free follow-up month.

DISCLOSURES

Author contributions: G. Tumgor and S. Yavuz wrote the article and revised the article for intellectual content. O. Uskudar and U. Ozkan revised the article for intellectual content. All authors approved the final article. G. Tumgor is the article guarantor.

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