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Experience with alternate sources of venous inflow in the meso-Rex bypass operation: the coronary and splenic veins

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Abstract The meso-Rex bypass procedure has been used to treat patients with portal hypertension from extrahepatic portal vein obstruction. This report describes modifications of this procedure in 5 patients. Either the splenic or coronary vein was used as the venous inflow point, and the bypass was performed either directly through transposition of the vein or with the use of a venous conduit.

Patients with extrahepatic portal vein obstruction (EHPVO) present with symptoms of portal hypertension. Acute bleeding from esophageal and gastric varices is temporarily treated with sclerotherapy or variceal banding [1-4]. Children who experience continued bleeding despite medical management or who experience clinically significant hypersplenism have been referred for surgery. Surgical options have historically included gastric devascularization procedures [5,6], mesocaval shunts [7], and distal or proximal splenorenal shunts [8,9]. The meso-Rex bypass procedure, which was originally described to treat post–liver transplant patients with portal vein thrombosis, has also been applied successfully to nontransplant patients [10-12]. The internal jugular vein was used as a conduit to bypass the obstructed extrahepatic portal circulation and bring blood from the superior mesenteric vein (SMV) to the patent intrahepatic left portal vein. This report describes 3 variations of this procedure: (1) transposition of the splenic vein postsplenectomy to the left portal vein, (2) transposition of the coronary vein to the left portal vein, and (3) interposition of venous conduits from the coronary vein to the left portal vein (3 patients). Approval from the institutional review board of both institutions (Children's Memorial Hospital, Chicago, Ill, and University of Iowa Hospitals, Iowa City, IA) was obtained.

1. Case 1: transposition of the splenic vein

A 7-year-old boy who had choledochal cyst excision, choledochoduodenostomy, and splenectomy for hypersplenism was referred for continued bleeding from esophageal and gastric varices. Preoperative imaging showed a small SMV and a splenic vein that communicated with a large number of varices in the left flank at the site of the splenic bed (Fig. 1A). At surgery, the SMV was too damaged from recanalization to be used. However, the splenic vein was found to have a normal caliber. The splenic vein was then fully mobilized, divided in the left flank, and swung up behind the neck of the pancreas to the left portal vein within the Rex recessus.

Postoperative magnetic resonance venogram (Fig. 1B) and venous duplex (Fig. 1C) demonstrated excellent flow in the transposed splenic vein to the liver. At 1-year follow-up, the shunt remained patent, and the patient showed no signs of portal hypertension.

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2. Case 2: transposition of the coronary vein

An 18-year-old man was referred for continuing bleeding from varices and portal gastropathy from EHPVO. He previously underwent 2 failed mesocaval shunt operations and a splenectomy. One of his internal jugular veins was used during the first mesocaval shunt operation. Preoperative imaging suggested that the SMV was small and damaged in part because of the previous shunts. Intraoperatively, the SMV was thrombosed. His mesenteric blood flow appeared to reconstitute as a nest of peripancreatic collaterals and flow toward the gastroesophageal junction through a series of large varices. These varices included the coronary vein that contained a fresh thrombus. The coronary vein was thrombectomized, and adequate flow was obtained in a hepatopetal direction. This vein was mobilized and transposed to the intrahepatic portal vein. (Fig. 2) Excellent flow was obtained intraoperatively, and the portal hypertension symptoms have since resolved. The bypass has remained patent at 1-year follow-up as confirmed by magnetic resonance venogram and venous duplex.

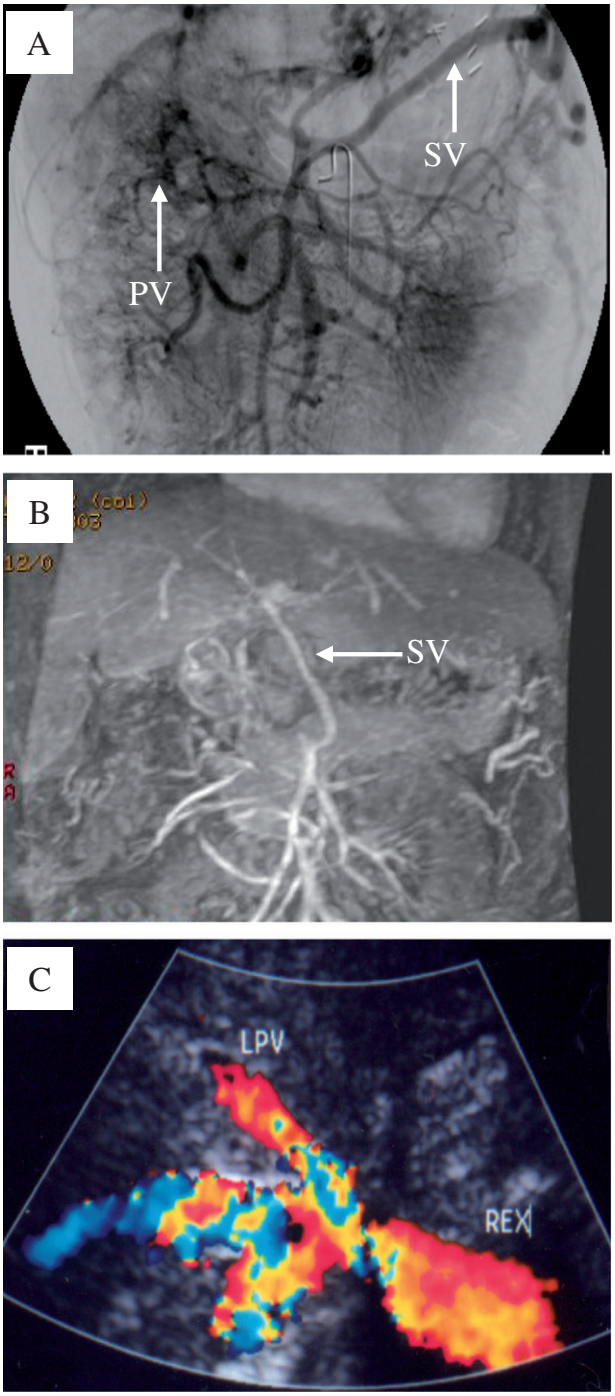

Fig. 1 A, Preoperative venogram demonstrating the patent splenic vein and absence of the spleen. The extrahepatic portal vein thrombosis and the extensive collaterals are also shown. B, Postoperative magnetic resonance venogram demonstrating transposition of the splenic vein to the left portal vein. C, Duplex of the spleno–left portal shunt showing flow in the bypass. LPV indicates left portal vein; PV, portal vein; REX, Rex shunt; SV, splenic vein.

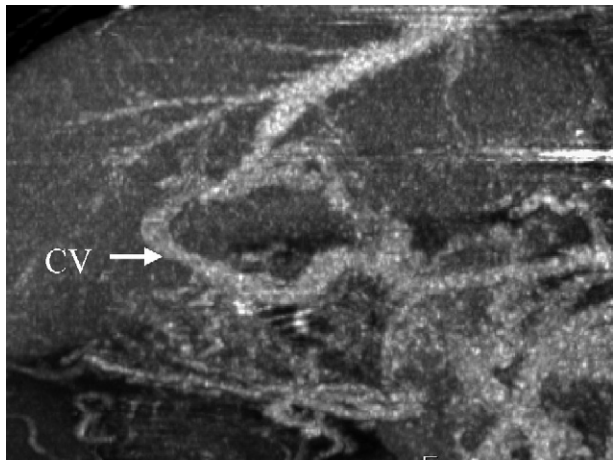

Fig. 2 Postoperative magnetic resonance venogram demonstrating transposition of the coronary vein to the left portal vein. CV indicates coronary vein.

3. Cases 3 to 5: interposition graft from the coronary vein to the left portal vein

Patient 3 had a history of Burkitt lymphoma. He was referred at 12 years of age for recurrent bleeding from esophageal varices because of EHPVO. His preoperative imaging showed a significantly narrowed SMV but a large coronary vein providing the main outflow tract for the mesenteric venous return. At surgery, an anastomosis was performed between the coronary vein and the intrahepatic left portal vein using the internal jugular vein as a conduit. (Fig. 3A) The shunt was patent with excellent flow after 1 year, without signs of portal hypertension. (Fig. 3B)

Patient 4 had imperforate anus, colostomy, vesicostomy, coloanal pull-through, takedown of colourethral fistula, and a right nephrectomy. He was referred at