

Jejunal varix bleeding with extrahepatic portal vein obstruction after pylorus-preserving pancreatoduodenectomy: report of two cases

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We present 2 patients showing afferent jejunal varix bleeding around hepaticojejunostomy caused by extrahepatic portal vein obstruction after pylorus-preserving pancreatoduodenectomy (PPPD). The case 1 was a 58-year-old woman who had recurrent anemia and hematochezia 3 years after undergoing PPPD. On the portography, the main portal vein was obliterated and collaterals around hepaticojejunostomy were developed. After percutaneous transhepatic balloon dilatation and stent placement through the obliterated portal vein, jejunal varices had disappeared and thereafter no bleeding occurred for 32 months. The case 2 was a 71-year-old man who had frequent melena 7 years after PPPD. Portal stent insertion was first tried, but failed due to severe stenosis of the main portal vein. Therefore, meso-caval shunt operation was attempted in order to reduce the variceal flow. Although an episode of a small amount of melena occurred one month after the shunt operation, there was no occurrence of bleeding for the next 8 months. For the treatment of jejunal varices, a less invasive approach, such as the angiographic intervention of stent insertion, balloon dilatation, or embolization is recommended first. Surgical operations, such as a shunt or resection of the jejunal rim, could be considered when noninvasive approaches have failed. ([Korean J Hepatobiliary Pancreat Surg 2012;16:37-42](#))

Key Words: Jejunal varices; Hepaticojejunostomy; Portal vein stenosis; Percutaneous transhepatic angioplasty; Portocaval shunt

INTRODUCTION

Extrahepatic portal vein obstruction is one of causes of portal hypertension.¹ Varices at sites other than the esophago-gastric region have been reported more frequently in patients with portal hypertension associated with portal vein obstruction than in those with cirrhosis.² Especially in patients who have performed the hepaticojejunostomy, extrahepatic portal vein obstruction leads to the afferent loop varices around anastomosis site.³ Extrahepatic portal vein obstruction after pylorus-preserving pancreatoduodenectomy (PPPD) has been explained by the following: postoperative portal vein thrombosis; adhesion and inflammation around the portal vein due to lymph node dissection or anastomosis leakage; and tumor recurrences around the portal vein.⁴ Afferent loop varices may cause recurrent and massive gastrointestinal bleeding, but the

early detection of the bleeding focus is difficult.⁵ The treatments of varices in this area include surgical, endoscopic or angiographic therapies.^{4,6}

We report 2 cases of afferent loop jejunal varix bleeding at the hepaticojejunostomy site after PPPD. One patient was effectively treated by interventional portal vein dilatation and stenting. The second patient underwent a meso-caval shunt operation after the failure of portal vein stenting.

CASE

Case 1

A 58-year-old woman visited our hospital complaining of recurrent anemia and hematochezia. She had undergone PPPD due to stage T1N0 bile duct cancer arising as a choledochal cyst 3 years prior. Postoperative adjunctive

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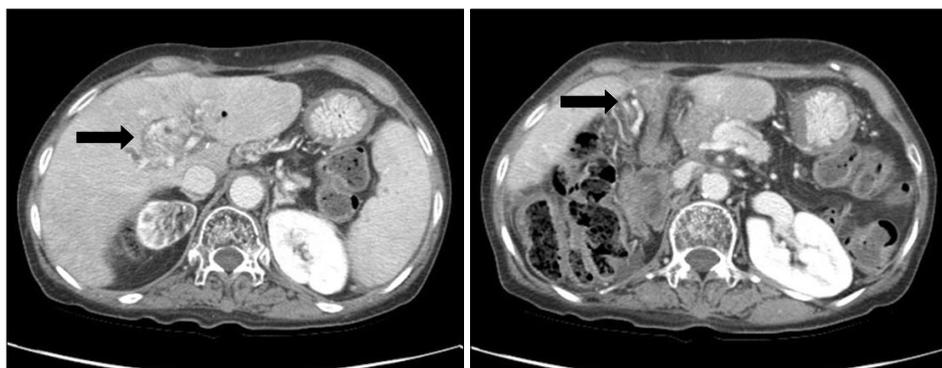


Fig. 1. The portal phase of contrast-enhanced CT shows the jejunal varices at the afferent loop (arrow).

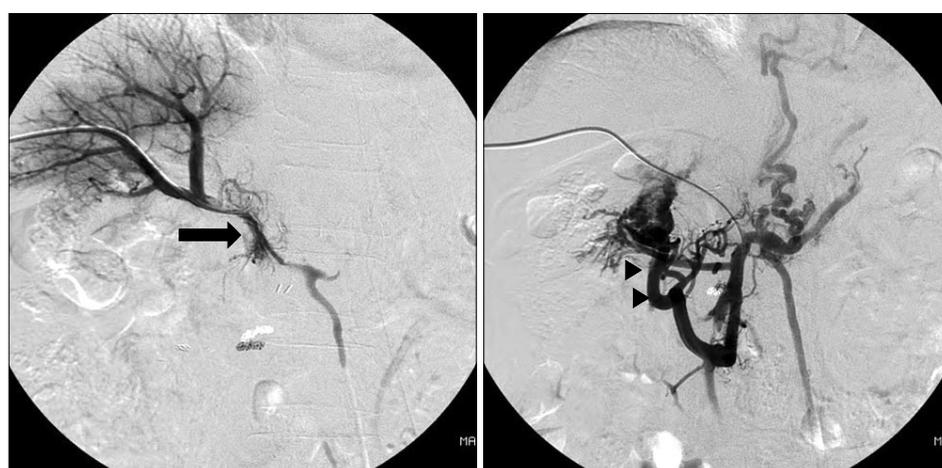


Fig. 2. Percutaneous transhepatic portography shows the extrahepatic portal vein obstruction (arrow) and hepatopetal collaterals (arrowheads) around the hepaticojejunostomy site.

chemo-radiation therapy was not performed. To detect the bleeding focus, gastroscopy, colonoscopy, and red blood cell (RBC)-bleeding scan were performed, but no active bleeding was found. However, computed tomography (CT) showed the progressive enlargement of the afferent loop of the jejunal varices around the hepaticojejunostomy with a portal vein total obstruction from one year prior (Fig. 1). Furthermore, the superior mesenteric arterial portography showed an extrahepatic portal vein obstruction and marked cavernous transformation around the hepaticojejunostomy. With these examinations, a bleeding of the jejunal varix at the afferent loop was strongly suspected. Therefore, percutaneous transhepatic portography was attempted for the diagnosis and treatment of the portal vein obstruction. A fine network of hepatopetal collaterals was observed. The passing of a guidewire through the main portal vein was performed successfully (Fig. 2). Next, a 6 mm-sized balloon dilatation by a metallic stent insertion (10 mm in diameter and 6 cm in length) were performed to recanalize the obstructed extrahepatic portal

vein (Fig. 3). After the procedure, the pressure gradient between the proximal and distal parts of the stent was checked with 0 mmHg. Jejunal varices after the stent insertion showed a remarkable decrease pressure; no further bleeding occurred for 32 months so far (Fig. 4).

Case 2

A 71-year-old man presented at our hospital complaining of dizziness and melena. The patient had undergone a PPPD due to a stage T3N0 bile duct cancer 7 years before. Postoperative concurrent chemoradiation therapy had been performed for treatment of his condition at that time. When he came to our emergency room, his hemoglobin level was 4.4 g/dl. He has been followed suffering from recurrent bleeding at the jejunal varices around hepatojejunostomy for the 4 years prior to this visit. He had been managed conservatively with ferrous sulfate and intermittent transfusions. Extrahepatic portal vein obstruction and collaterals were detected by CT and transhepatic portography (Fig. 5). Therefore, a portal vein stent



Fig. 3. Percutaneous transhepatic stent insertion (arrow) and the stenosis of the portal vein were relieved.

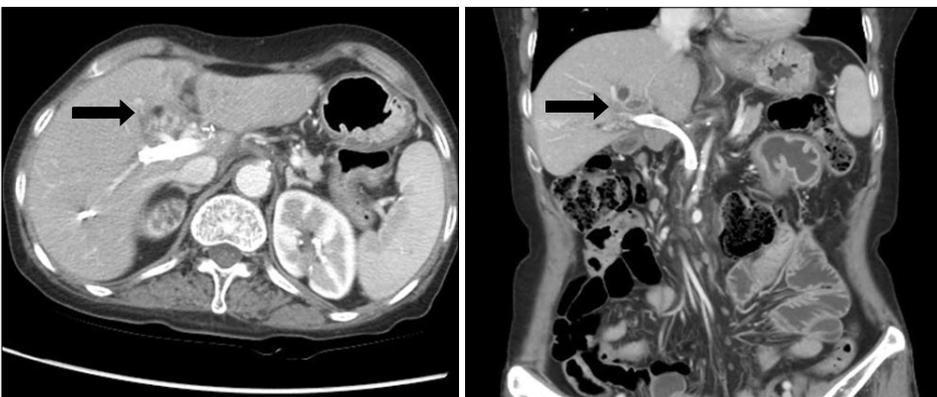


Fig. 4. After insertion of the stent, CT shows decreased jejunal varices (arrow) and intact extrahepatic portal flow.

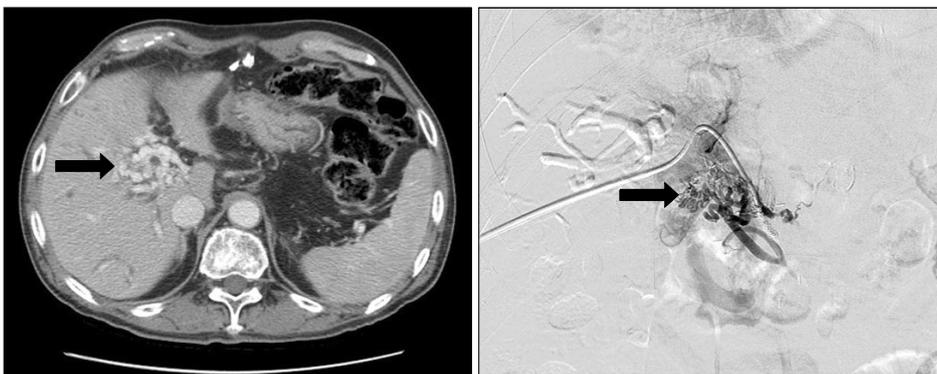


Fig. 5. CT and percutaneous transhepatic portography show the jejunal varices at the afferent loop around hepaticojejunostomy site (arrow).

insertion was attempted, but failed due to severe stenosis of the portal vein. Then, a side-to-side anastomosis of the superior mesenteric vein (SMV) and the inferior vena cava (IVC) was performed to reduce the flow of hepatopetal collaterals. This meso-caval operation was technically difficult because of severe adhesions around the anastomosis site. One month later, the patient came to emergency room complaining of melena. IVC venography and CT revealed that the meso-caval shunt was intact

without obstruction, but the major portion of the portal vein flow was draining through the variceal vein (Fig. 6). Therefore, the patient was started on propranolol for treatment; the patient experienced no bleeding for 8 months so far.

DISCUSSION

It is not uncommon for portal hypertension to induce

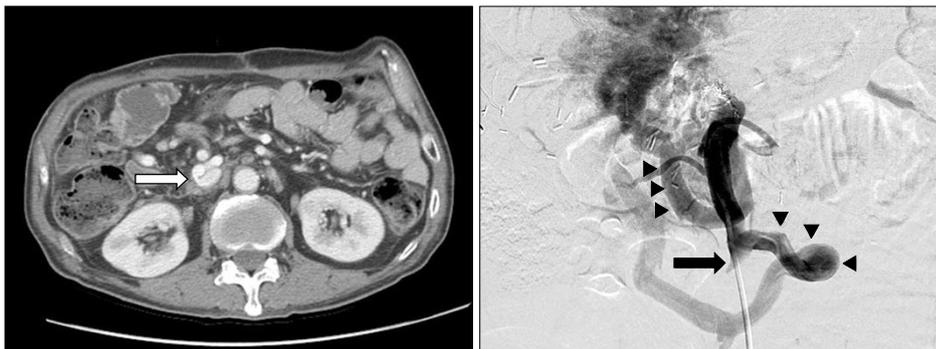


Fig. 6. After the Shunt operation between superior mesenteric vein and inferior vena cava, CT and portography through IVC show the anastomosis site (arrow) and collateral varices (arrowheads).

Table 1. Management and outcomes for jejunal varices bleeding after pancreatoduodenectomy

Authors	Publication year	Case no.	Cause of stenosis	Management	Bleeding time	Rebleeding	Follow-up
Hiraoka et al. ¹⁴	2001	1	IORT	Portal stent	1 yrs	No	6 yrs
Shimizu et al. ⁶	2005	1	IORT	Portal stent	9 mos	No	54 mos
Yamazaki et al. ¹⁹	2005	2	Tumor recurrence	Portal stent	NA	No	14 mos and more
Ota et al. ²⁰	2005	1	Unknown	Portal stent	8 yrs	No	32 mos
Hwang et al. ²¹	2007	1	Tumor recurrence	Portal stent	25 mos	No	14 mos
Chida et al. ²²	2010	1	Unknown	Endoscopic injection	NA	No	NA
Present report	2011	2	Unknown	Portal stent and Shunt operation	3 and 7 yrs	Yes, 1 mo after shunt operation (controlled with propranolol)	32 and 8 mos

IORT, Intraoperative radiotherapy; NA, not available

collateral vessels in the distal esophagus and gastric fundus in order to decompress the increased portal pressure.⁷ In rare cases, intestinal varices are developed as new collaterals accompanying portal hypertension with extrahepatic portal obstruction, postoperatively.⁸ In particular, the varices at the afferent loop around the hepaticojejunostomy are induced by the extrahepatic portal obstruction, which is caused by the inflammatory changes due to the leakage of hepaticojejunostomy or lymph node dissection of the hepatic hilum.⁴ Similar to the present cases, radical lymph node dissection around hepatic hilum can be a rare risk factor for extrahepatic portal vein obstruction. The consequences from the afferent loop varices are rupture due to engorged veins and bleeding.⁹ Mild and intermittent bleeding can be observed on close follow-up, however, severe and frequent bleeding should be managed by the intervention or surgery.¹⁰

The diagnosis of ectopic variceal bleeding is difficult, because of its intermittent nature and small amount. Some authors recommended that enteroscopy was a useful meth-

od for detecting varices in the small bowel.⁵ In addition, varices in the gallbladder and the common bile duct were seen as mural filling defects on endoscopic retrograde cholangiopancreatography.¹¹ However, the varix bleeding at the afferent loop is limited for the diagnosis with endoscopy due to angulation of the jejunojejunostomy and hardness of technical handling. Some authors reported that duplex ultrasonography demonstrated the varices with the presence of serpentine vessels and a low-velocity venous signal.¹² To date, the useful methods for detecting ectopic variceal bleeding have been known as CT, RBC scan, and conventional angiography, such as superior mesenteric artery portography and percutaneous transhepatic portography.^{3,4,6,13,14} In the present case, jejunal varices were suspected by the multidetector contrast-enhanced CT angiography, which were confirmed with percutaneous transhepatic portography. After the procedure and surgery, CT was a useful and safe method to evaluate the change in collateral vessels.

The treatment of jejunal varices around the hep-

aticojejunoscopy have not been well established, but stenting has been the preferred treatment modality (Table 1). Traditional treatment has a surgical approach. The resection of jejunum containing the varices was reported.¹⁵ However, the resection was not a good modality, because it caused massive intraoperative varix bleeding and recurrent jejunal varices. The other surgical modality was the shunt operation to decrease the portal pressure. Paquet et al.¹⁶ reported that a meso-caval interposition shunt was successfully performed to treat jejunal varices in the afferent loop after a Billroth-II resection and hepaticoduodenostomy, and no recurrence after 24 months. In the case 2 presented here, we performed the meso-caval shunt operation between the SMV and the IVC, resulting in current control of this patient's varix bleeding. However, this shunt operation has a risk for occlusion, the possibility of encephalopathy, and operative morbidities. Therefore, Chen et al.¹⁷ performed a proximal splenic-left intrahepatic portal shunt operation for extrahepatic portal vein obstruction. This procedure is considered in cases for which the adhesion is not severe and the intrahepatic portal vein and splenic vein are patent.

However, the shunt operation and resection are aggressive, causing more complications than interventional approaches. Therefore, the percutaneous transhepatic balloon dilatation with stent placement for extrahepatic portal vein obstruction has been preferred in the clinical practice since Harville et al.¹⁸ performed this procedure for the treatment of colon varices. This procedure is especially effective because diagnosis and treatment occur at the same time. Although the long-term patency of the stent has not yet been established and the rupture risk during the procedure has existed, it has been preferred because it is far less invasive and has favorable results.^{14,18} In the case 1, the patient was treated with the insertion of a stent and showed no bleeding for 32 months. On the other hand, cholangioscopic sclerotherapy was used to treat the afferent loop varices. However, the recurrence was common and several times additional procedures were required in order to control the bleeding. At last, the transcatheter embolization was considered to occlude the jejunal vein to supply the afferent loop.^{16,18} This procedure had the advantage of selecting the collateral vein and preserving the hepatopetal flow. However, it required a laparotomy and had the chance of relapse.

In conclusion, the variceal bleeding of the afferent loop after PPPD can trigger massive and life-threatening bleeding. After detecting the varix bleeding using CT and conventional angiography, the treatment of varices in this area is recommended with less invasive approach, such as the angiographic interventions of balloon dilatation and stent insertion. Surgical shunt operation can be considered when noninvasive approaches have failed.

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