비장 경유 색전술을 이용한 출혈성 십이지장 정맥류의 성공적인 치료
강동훈, 박지원, 전의용1, 김성은, 김종혁, 권영석, 박승아, 박충기
한림대학교성심병원 내과, 영상의학과 1

Successful Treatment of Bleeding Duodenal Varix by Percutaneous Transsplenic Embolization
Dong Hun Kang, Ji Won Park, Eui Yong Jeon1, Sung Eun Kim, Jong Hyeok Kim, Young Seok Kwon, Seung Ah Park, and Choong Kee Park
Departments of Internal Medicine and Radiology1, Hallym University Sacred Heart Hospital, Anyang, Korea

Variceal bleeding occurs primarily in the esophagus or stomach in patients with liver cirrhosis, but can also occur rarely in the duodenum. Duodenal variceal bleeding has a high mortality and poor prognosis due to heavy blood flow originating from the portal vein (PV) and the technical difficulty of hemostatic procedures.1,2 Several approaches are available for PV catheterization. Percutaneous transhepatic or transjugular intrahepatic approach is a conventional route to access the PV system. However, this method may be impossible in patients with large amount of ascites, hematoma around liver, total occlusion of the main PV or hepatocellular carcinoma.

Transsplenic varix embolization is considered primarily as an alternative when transhepatic embolization is not possible because of anatomical variations from liver cancer or surgery.

In this case, we treated bleeding duodenal varices successfully through transsplenic embolization in a cirrhotic patient without liver cancer or anatomical abnormality. We report that a transsplenic approach offers a good alternative, comparable to the transhepatic approach for a varix embolization, and review the literature.

CASE REPORT
A 70-year-old man was admitted to our hospital because of recurrent hematochezia. He was diagnosed with alcoholic
liver cirrhosis and recurrent esophageal varix bleeding five years ago. At the time of admission, the patient’s blood pressure was 130/80 mmHg and pulse rate was 78 beats/min. Laboratory findings were as follows: hemoglobin concentration, 8.6 g/dL; hematocrit, 24%; leukocytes, 11,600/mm³; platelets, 69,000/mm³; AST/ALT, 43/48 IU/L; bilirubin total/direct, 1.75/0.5 mg/dL; PT, 19.2 seconds; albumin, 3.6 g/dL.

An emergency gastroendoscopy was performed upon admission. With gastroendoscopy, no bleeding esophageal varices were seen. However, there was a tortuous duodenal varix along the wall of duodenal second portion and a red spot on the surface of this varix. This was considered a bleeding focus, and endoscopic band ligation was successfully done (Fig. 1). The next day, however, although the patient received two packed red blood cell transfusions after admission, the hemoglobin level was lower and hematochezia continued. The patient complained of dizziness. These findings suggested ongoing bleeding. An endoscopy was performed, only post ligation ulceration was observed and there was no blood clot or trace of bleeding in stomach and duodenum (Fig. 2). Because a bleeding focus was not found on gastroduodenoscopy, a colonoscopy was performed on the same day. Bright red blood was found from rectum to cecum, without mucosal lesion. This suggested small bowel bleeding beyond
the second part of duodenum, so we performed three dimensional CT angiography for confirming the bleeding focus. In the third portion of the duodenum, multiple dilated varices were detected on contrast enhanced CT angiography (Fig. 3). At this site, however, the contrast leakage was obscure even in the face of massive bleeding, and CT angiography did not show the site of variceal bleeding.

We judged the varix in the third portions of the duodenum to be a possible bleeding source, so we performed embolization. Because the splenic vein was not tortuous, the transsplenic approach was selected as the straightest pathway for entry of duodenal varix. Percutaneous transsplenic puncture of the splenic vein was performed using a 20-gauge Chiba needle (Cook, Bloomington, IN, USA) under ultrasonographic guidance. A 0.18-inch guide wire was then advanced through the 20-gauge needle within the splenic vein. A 6F Accuitrol introducer catheter (Sungwon Medical, Seoul, Korea) was advanced over the guide wire. Splenic and superior mesenteric venography was obtained; the large duodenal varix flowed into inferior vena cava. The duodenal varix was selected using microcatheter and wire. Glue and lipiodol mixture (1:3 ratio) were used as embolization material for variceal embolization. The duodenal varix was completely embolized; no flow into the varix was observed (Fig. 4). As a final step, the splenic puncture site was occluded with glue.

After embolization, the patient remained hemodynamically stable and had no further bleeding problems. He was discharged one week later with stable hemoglobin level. He has been checked regularly for the last six months without any signs or symptoms of bleeding.

**DISCUSSION**

Varices outside the gastroesophageal region are referred to as ectopic varices. Ectopic varices account for between 1% and 5% of all variceal bleeding cases. Ectopic varices have been reported in the duodenum, ileum, cecum, colon, and gall bladder, although they can occur anywhere in the gastrointestinal tract. The mechanism of duodenal varices formation is unclear but may develop from portal hypertension with liver cirrhosis. Up to 40% of patients with portal hypertension undergoing angiography are diagnosed with duodenal varices.5 Duodenal variceal bleeding has a high mortality and a poor prognosis due to heavy blood flow originating from the PV and the technical difficulty of hemostatic procedures. To detect a bleeding source in a portal hypertensive patient, duodenal varices should be carefully investigated, because duodenal variceal bleeding can be life-threatening and overlooked by endoscopists due to primary inspection of esophageal and gastric varices. It is difficult to visualize a bleeding focus endoscopically if it is located in the distal or lower part of the second part of the duodenum. If the site of bleeding cannot be identified endoscopically, other methods can be considered, such as abdominal CTs, mesenteric angiography and explorative laparotomy.4 Treatments including endoscopic sclerotherapy, endoscopic ligations, endoscopic clipping and transjugular intrahepatic portosystemic shunt (TIPS) or embolization have been tried. Endoscopic management including sclerotherapy, band ligation and clipping should be the first line treatment, if duodenal variceal bleeding has been diagnosed by gastroendoscopy.5

However, if the lesion is beyond the range of endoscopic
observation or endoscopic bleeding control fails, radiological intervention such as embolization is needed. Alternative treatment options include interventional radiologic procedures such as TIPS, balloon-occluded retrograde venous obliteration and embolization.6,7

For the embolization procedure, transjugular intrahepatic or percutaneous transsplenic access to the portal venous system is required. This is a commonly used technique for access to the PV.8 However, percutaneous transsplenic access may be difficult or even impossible in patients with large amount of ascites, hematoma around liver or total occlusion of the main PV. If the patient has a large or diffusely infiltrated malignancy located in the liver, these approaches might increase the risk of tumor seeding.9,10

The percutaneous transsplenic approach is another way to access the portal venous system and has been considered the only alternative route for endovascular management in patients for whom conventional transhepatic or transjugular intrahepatic approaches are difficult or impossible.

Splenoportography was first introduced in 1951, but was soon abandoned because of bleeding risk from the splenic puncture site.11 Probst et al.12 subsequently reported a simple method for preventing bleeding complications by plugging the splenic tract with a compressed absorbable gelatin sponge. However, percutaneous transsplenic access to the PV has not been widely used owing to concern over bleeding, and only a few literature reports supported the safety and effectiveness of this procedure.13 The possible problems of this approach include difficulty in advancing the catheter within a tortuous vein, and bleeding. Hemorrhage from the splenic puncture site and intrasplenic hematomas are considered the principal complications.14

However, the transsplenic approach provides the straightest pathway for entry into branches of the PV and several varices, and is simple to perform. A successful puncture of the intrasplenic vein branch is the key to successful percutaneous transsplenic access. Ultrasound guidance might improve the accuracy of puncturing the intrasplenic vein and avoid puncturing the splenic hilum. In addition, bleeding complications can be prevented by tract embolization using coils, glue, or gelatin sponge particles.15

We performed the procedure under ultrasound guidance and tract embolization with glue and lipiodol mixture. In this case, we treated bleeding duodenal varices successfully through transsplenic embolization in cirrhotic patients without liver cancer or anatomical abnormality. So, in the case of unresolved varix bleeding by endoscopic therapy, the transsplenic approach compares well as an alternative method to a transhepatic approach for varix embolization.

We report a case of a patient with duodenal variceal bleeding successfully treated with percutaneous transsplenic embolization. There is currently no consensus around the best treatment option. The transsplenic embolization offers an effective and alternative method to control endoscopic inaccessible duodenal variceal bleeding.

REFERENCES

12. Probst P, Rysavy JA, Amplatz K. Improved safety of splenoportog-

