

CASE REPORT

비장 경유 색전술을 이용한 출혈성 십이지장 정맥류의 성공적인 치료

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Successful Treatment of Bleeding Duodenal Varix by Percutaneous Transsplenic Embolization

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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. Treatments including endoscopic sclerotherapy, endoscopic ligations, endoscopic clipping and transjugular intrahepatic portosystemic shunt have been tried, with only moderate and variable success. A percutaneous transsplenic approach offers another way of accessing the PV. Here we report a case of successfully treated duodenal variceal bleeding by percutaneous transsplenic embolization. (*Korean J Gastroenterol* 2015;66:286-290)

Key Words: Duodenum; Varicose vein; Embolization

INTRODUCTION

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 possi-

ble 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

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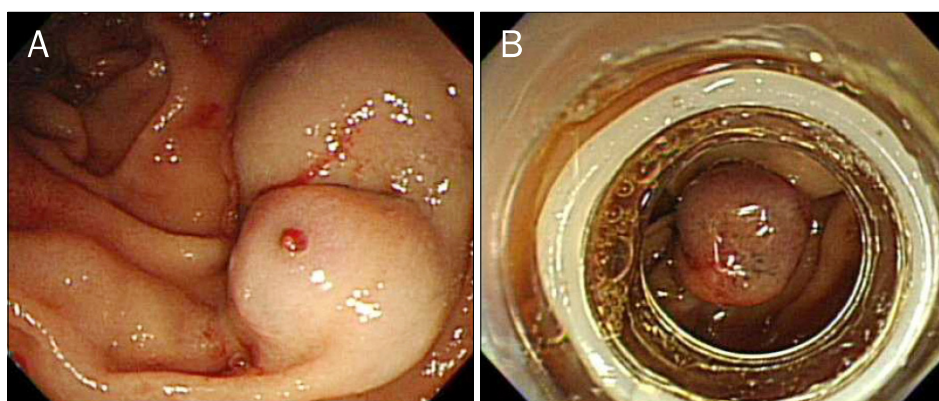


Fig. 1. (A) Upper gastroduodenoscopy shows a varix in the second portion of duodenum, with red spot. (B) Endoscopic photograph shows the successfully band-ligated duodenal varix.

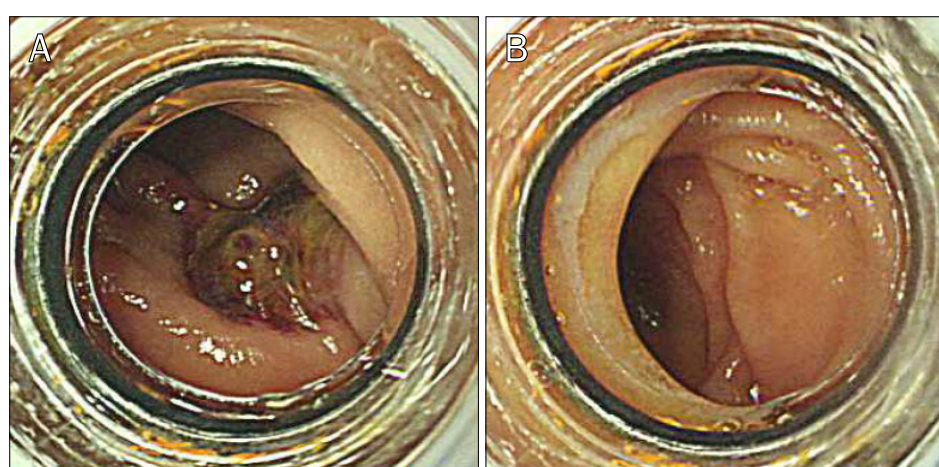


Fig. 2. (A) On later endoscopy, post ligation ulceration was observed without bleeding sign. (B) There was no blood clot or trace of bleeding in other part of duodenum.

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

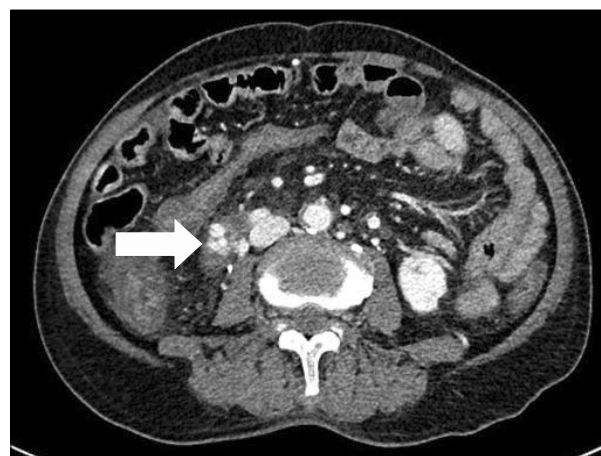


Fig. 3. In the third portion of the duodenum, multiple dilated varices (arrow) were detected on contrast enhanced CT angiography.

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



Fig. 4. (A) Under ultrasonographic and fluoroscopic guidance, transsplenic approach to the portal vein and duodenal varix (arrow) was done. (B) Selective and complete embolization of duodenal varix with glue was done using microcatheter.

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 Accu-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.³ 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 transvenous obliteration and embolization.^{6,7}

For the embolization procedure, transjugular intrahepatic or percutaneous transhepatic access to the portal venous system is required. This is a commonly used technique for access to the PV.⁸ However, percutaneous transhepatic 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

1. Norton ID, Andrews JC, Kamath PS. Management of ectopic varices. *Hepatology* 1998;28:1154-1158.
2. Perera MT, Shimoda M, Kato M, et al. Life-threatening bleeding from duodenal varices due to pancreatic arterio-venous malformation: role of emergency pancreatoduodenectomy. *Hepatogastroenterology* 2008;55:1553-1556.
3. Khouqeer F, Morrow C, Jordan P. Duodenal varices as a cause of massive upper gastrointestinal bleeding. *Surgery* 1987;102:548-552.
4. Helmy A, Al Kahtani K, Al Fadda M. Updates in the pathogenesis, diagnosis and management of ectopic varices. *Hepatol Int* 2008;2:322-334.
5. Sato T, Akaike J, Toyota J, Karino Y, Ohmura T. Clinicopathological features and treatment of ectopic varices with portal hypertension. *Int J Hepatol* 2011. doi: 10.4061/2011/960720.
6. Hotta M, Yoshida H, Mamada Y, et al. Successful management of duodenal varices by balloon-occluded retrograde transvenous obliteration. *J Nippon Med Sch* 2008;75:36-40.
7. Vidal V, Joly L, Perreault P, Bouchard L, Lafortune M, Pomier-Layrargues G. Usefulness of transjugular intrahepatic portosystemic shunt in the management of bleeding ectopic varices in cirrhotic patients. *Cardiovasc Intervent Radiol* 2006;29:216-219.
8. Luo J, Yan Z, Wang J, Liu Q, Qu X. Endovascular treatment for non-acute symptomatic portal venous thrombosis through intrahepatic portosystemic shunt approach. *J Vasc Interv Radiol* 2011;22:61-69.
9. Silva MA, Hegab B, Hyde C, Guo B, Buckels JA, Mirza DF. Needle track seeding following biopsy of liver lesions in the diagnosis of hepatocellular cancer: a systematic review and meta-analysis. *Gut* 2008;57:1592-1596.
10. Tung WC, Huang YJ, Leung SW, et al. Incidence of needle tract seeding and responses of soft tissue metastasis by hepatocellular carcinoma postradiotherapy. *Liver Int* 2007;27:192-200.
11. Brazzini A, Hunter DW, Darcy MD, et al. Safe splenoportography. *Radiology* 1987;162:607-609.
12. Probst P, Rysavy JA, Amplatz K. Improved safety of splenoportog-

- raphy by plugging of the needle tract. AJR Am J Roentgenol 1978;131:445-449.
13. Tuite DJ, Rehman J, Davies MH, Patel JV, Nicholson AA, Kessel DO. Percutaneous transsplenic access in the management of bleeding varices from chronic portal vein thrombosis. J Vasc Interv Radiol 2007;18:1571-1575.
 14. Chu HH, Kim HC, Jae HJ, et al. Percutaneous transsplenic access to the portal vein for management of vascular complication in patients with chronic liver disease. Cardiovasc Intervent Radiol 2012;35:1388-1395.
 15. Lee JY, Song SY, Kim J, et al. Percutaneous transsplenic embolization of jejunal varices in a patient with liver cirrhosis: a case report. Abdom Imaging 2013;38:52-55.