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Case Report

A case report of bleeding from duodenal varices treated with percutaneous transhepatic obliteration

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ABSTRACT

Duodenal varices are ectopic in nature and account for 40% of all ectopic bleeding cases. Ectopic variceal bleeding is rare (1%–5% of all variceal bleeding cases). The three principle approaches used to treat duodenal varices are endoscopic procedures, interventional radiological methods, and surgical interventions. A 59-year-old male with alcoholic liver cirrhosis and chronic hepatitis B infection visited our gastroenterology department with melena. Gastroduodenoscopy and computed tomography identified varices in the second part of the duodenum. We performed percutaneous transhepatic obliteration using glue and coil embolization, which obliterated the varices and resulted in immediate hemostasis. However, 3 months later, he re-visited presenting with newly developed duodenal varices and underwent endoscopic injection sclerotherapy.

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Keywords: Duodenal varices; Ectopic varices; Endoscopic injection sclerotherapy; Percutaneous transhepatic obliteration

Introduction

Ectopic varices are dilated, portosystemic collateral vein located in sites other than the gastroesophageal region.¹ They can develop in the duodenum, small bowel, colon, rectum, and retroperitoneal areas. The prevalence of ectopic variceal bleeding is 1% to 5% in patients with liver cirrhosis.^{2,3} Duodenal varices are associated with high mortality and a poor prognosis because of massive bleeding from the portal vein and technical difficulties associated with hemostatic procedures.⁴ The treatment options are endoscopic, radiological, and surgical interventions. Because there are no standard treatment guidelines to duodenal varices due to low incidence, the management depends on the anatomy of the varices, the severity of the patient's condition, and availability of the technology.⁵ Surgical treatments included variceal ligation, duodenectomy, and shunt surgery. Endoscopic treatment can be applied initially but is not always practicable or successful if the varices are large and located in inaccessible regions.^{3,6} In patients with duodenal varices located beyond endoscopic visual field or difficult to access, interventional radiological procedure may be in-

dicated. Such procedures include transjugular portosystemic shunt (TIPS), balloon-occluded retrograde transvenous obliteration (BRTO) and percutaneous transhepatic obliteration (PTO).⁷ We present a case of duodenal variceal bleeding treated immediately by PTO.

Case Report

A 59-year-old male with alcoholic liver cirrhosis and chronic hepatitis B infection was admitted to our department because of melena. He was taking diuretics and tenofovir 300 mg daily to treat ascites and the hepatitis B virus infection. Gastroduodenoscopy revealed non-bleeding esophageal varices. Neither the antrum nor duodenum could be evaluated because of a large amount of food material present. He was not currently bleeding. On admission, his blood pressure was 116/45 mmHg and pulse rate was 70 bpm. The laboratory findings were hemoglobin level of 7.2 g/dL, leukocyte count of 7,660/mm³, platelet count of 56,000/mm³, aspartate aminotransferase/alanine aminotransferase levels of 65/49 IU/mL, total bilirubin level of 3.72 mg/dL, prothrombin time (international normalized ratio) of 1.31, and

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albumin level of 2.2 g/dL.

Repeat gastroduodenoscopy was performed one day later due to persistent melena. No esophageal varix bleeding was noted, but bulging duodenal varices with blood clots were found along the wall of duodenal second duodenal region. Their surfaces featured

Fig. 1. Gastroduodenoscopy revealed varices in the second region of the duodenum beyond the ampulla, but no active bleeding.

erosive lesions without bleeding (Fig. 1). The bleeding appeared to originate from the ectopic varices in the duodenal second region. Abdominopelvic computed tomography (CT) angiography was performed to evaluate the duodenal varices. Aggravated varices were evident in the distal portion of duodenal second region, and a shunt along jejunal branch of superior mesenteric vein, the portal vein, inferior vena cava (IVC) was noted on CT angiography (Fig. 2).

We assumed that the varices of the second duodenal region were the source of the bleeding and decided to perform transhepatic portography with embolization of duodenal varices. Before the procedure, ascites drainage catheter was inserted for better approach. One day later, percutaneous transhepatic puncture of the right posterior portal vein was performed. Using a transhepatic approach, we defined the portal vein and duodenal varices angiographically. The posterior portal vein was punctured using 21-gauge needle, and 5-F vascular sheath (Terumo, Tokyo, Japan) was inserted to portal system. After vascular sheath placement, jejunal branch of superior mesenteric vein, efferent vein of duodenal varix, was selected. Following shunt venogram showed duodenal varix with active contrast extravasation into duodenum, which was demonstrated on pre-procedural CT scan. Then, 2.2-F microcatheter (Progreat; Terumo) was more advanced into duodenal varix with 0.016-inch microwire (ASAHI Meister; Asahi Intecc, Seto, Japan). Using five 0.018-inch detachable coils; 4 ea of 8 mm × 20 cm, 1 ea of 6 mm × 20 cm (Interlock; Boston Scientific, Marlborough, MA, USA) and glue-lipiodol mixture, duodenal varix was successfully embolized. After angiographic confirmation of complete stasis of blood flow into duodenal varix, the vas-

Fig. 2. Computed tomography/angiography findings. (A) In the second region of the duodenum, dilated varices are evident in the axial view. (B) Dilated duodenal varices are apparent in the coronal view.

Fig. 3. Percutaneous transhepatic obliteration was performed successfully. (A) Under fluoroscopic guidance, we took a transhepatic approach to the portal vein and duodenal varix. (B) Contrast extravasation and active duodenal variceal bleeding were found during intervention (arrow). (C) Complete obliteration of duodenal varices using glue and coils; blood flow ceased.

Fig. 4. Computed tomography scan obtained after percutaneous transhepatic obliteration. (A) The embolized duodenal varices are apparent in the axial view. (B) In the coronal view, new collection of highly attenuating fluid is evident in the right side of liver, and glue is seen in the right peritoneum.

cular sheath and catheters were removed with tract embolization using glue-lipiodol mixture.

We thus successfully treated the duodenal varices by transhepatic embolization (Fig. 3). On the day after PTO, abdomen CT revealed embolization of the varices (Fig. 4). The patient was discharged 10 days after PTO without further bleeding.

Three months later, duodenal variceal bleeding re-occurred. CT angiography revealed newly developed duodenal varices. A second radiologic intervention was difficult; thus, we performed endoscopic treatment. The duodenal varices were ligated and glued via endoscopic cyanoacrylate injection. No bleeding was observed during the 6 month follow-up period.

Discussion

Duodenal varices account for 40% of all ectopic variceal bleeding events. Such varices are rare and located in serosa and submucosa, making it difficult for even an experienced endoscopist to detect them during an endoscopic procedure.^{6,8} Therefore, it is important to keep in mind that variceal bleeding foci may be ectopic. If it is difficult to locate the bleeding focus endoscopically, modalities such as CT angiography should be considered.⁹ In our present case, CT angiography suggested that the duodenal varices might be source of bleeding.

No randomized control trials of treatments for duodenal varices have been reported because such varices are rare. Therefore, there are no definitive treatments. Endoscopic ligation or injection sclerotherapy has been used to manage duodenal variceal bleeding and is suggested to be effective. However, the risks include perforation, embolism, and tissue injury.¹⁰ Also, the limited visual field is a disadvantage associated with endoscopic treatments. Interventional radiological procedures include TIPS, BRTO and PTO. Duodenal varices bleed at lower portosystemic pressure gradients than do esophageal or gastric varices, and therefore, TIPS alone may not adequately treat duodenal varices.¹¹ In earlier reports, patients who had already undergone TIPS required definitive treatment (intravascular obliteration of varices via glue injection or embolization) due to persistent variceal bleeding.¹² Other possible TIPS complications include hepatic encephalopathy, aggravated liver dysfunction, and cerebral embolization.^{13,14} BRTO is a feasible therapeutic modality for gastric varices but may aggravate esophageal varices.¹⁵ BRTO has been successfully used to treat duodenal variceal bleeding, but BRTO is not often employed because of poor availability and certain technical difficulties.^{1,16}

In our case, we did not apply initial endoscopic treatment because visual field was inadequate, and the focus of duodenal

variceal bleeding remained uncertain after endoscopy. On abdominopelvic CT angiography, however, large dilated duodenal varices were evident; we judged that the risk of re-bleeding was high. Therefore, we performed an interventional radiological procedure. Liver function was poor, and the tortuous vascular structures were not amenable to TIPS or BRTO. In this case, it was very difficult to advance the balloon to the efferent vein because the diameter of IVC was large and the angle of IVC and efferent vein was acute, so we decided to sclerose the vessels responsible for the duodenal variceal bleeding. PTO has been used to treat duodenal varices without any complication (no hepatic encephalopathy and no increase in liver dysfunction).^{17,18} PTO may be associated with re-bleeding but targets the bleeding vessels to immediately control hemorrhage. We used PTO to immediately control the duodenal varix bleeding and decoyed coils within the targeted vessels without any complications.

The patient did not exhibit additional bleeding soon after the procedure. However, at a duodenal site that differed from that of the previously treated varices, newly dilated varices and bleeding developed after 3 months.

PTO may effectively and directly control duodenal variceal bleeding, especially in patients with poor liver function and vascular structures that contraindicate the use of TIPS or BRTO. However, any long-term decrease in the re-bleeding risk remains unclear. A transhepatic approach affords rapid access to the portal system but does not decompress the portal venous system, resulting in high 1-year re-bleeding rates.¹⁹ Therefore, more intensive treatment of portal hypertension may be required after PTO treatment for patients with duodenal varices.

Ectopic varices are rare, and no standard treatment method is yet available. We performed PTO via transhepatic approach to treat duodenal variceal bleeding. PTO afforded immediate control of the ectopic varices but did not prevent the development of new varices and re-bleeding. More studies are needed to establish and optimal treatment strategy and appropriate secondary prophylaxis for patients with duodenal varices.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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