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A Case of Duodenal Varices Treated by Balloon-occluded Retrograde Transvenous Obliteration

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Duodenal varices are a rare and fatal condition. Treatment options for duodenal varices have been more variety in recent years. A 46-year-old man with liver cirrhosis was admitted because of severe anemia. Laboratory findings showed extremely low values for hematocrit (8.9%) and hemoglobin (2.3 g/dl). Upon endoscopic examination and contrast-enhanced computed tomography, duodenal varices were evident on the third portion of the duodenum. On the 4th day, he was successfully treated by balloon-occluded retrograde transvenous obliteration (BRTO). Contrast-enhanced computed tomography, magnetic resonance imaging and endoscopy on the 4th week showed that the varices had diminished. In cases of duodenal varices when hemostasis, we support the use of BRTO.

Key words: duodenal varices, balloon-occluded retrograde transvenous obliteration, liver cirrhosis, duodenal bleeding

Introduction

Duodenal varices are a rare and fatal condition, and almost all cases are associated with liver cirrhosis or portal hypertension[1)~6)]. Treatment options have become more varied in recent years[1)~6)]. We experienced a case of duodenal varices with liver cirrhosis that was successfully treated by balloon-occluded retrograde transvenous obliteration (BRTO) alone.

Case

A 46-year-old man was referred from a clinic because of severe anemia. He had general fatigue and had noticed tarry stool over a period of a week, but no hematemesis. He was a heavy drinker, but had not been diagnosed as having liver cirrhosis. On admission, he was alert and was severely pale. Systolic blood pressure was 100 mmHg, and pulse rate was 120 /min. His abdomen was soft and flat, and there was neither tenderness nor a palpable mass. Laboratory findings showed extremely low values for hematocrit (8.9%) and hemoglobin (2.3 g/dl). Platelet count was 65,000 /μl, AST was 42 IU/*l*, and ALT was 32 IU/*l*. After fluid restoration and blood transfusion, the anemia had improved, and no bleeding was observed. Hepatitis B antigen and antibody and hepatitis C antibody were negative.

Contrast-enhanced computed tomography revealed markedly tortuous vessels around the third portion of the duodenal wall and an enlarged gonadal vein, slight liver cirrhosis, but no ascites or splenomegaly (Fig. 1). Magnetic resonance imaging also showed abnormal collateral vessels (Fig. 2). Upon endoscopic examination, duodenal varices on the third portion of the duodenum were evident but not esophageal varices (Fig. 3). There was no active bleeding on the duodenum, and a clipping was taken for marking.

On the 4th day, angiography was performed. Portography via the superior mesenteric artery demonstrated a tortuous vein next to the duodenum

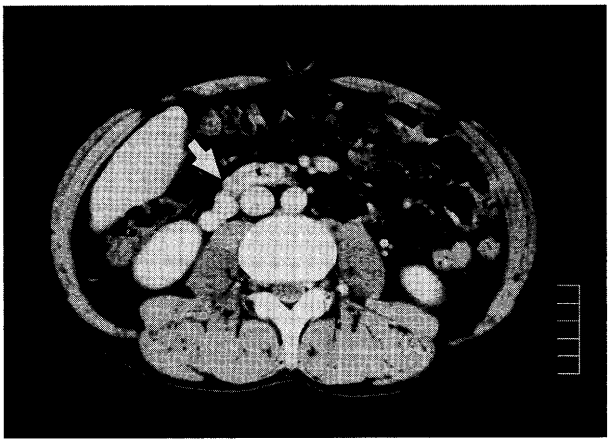

Fig. 1 Contrast-enhanced CT showed markedly tortuous vessels around the third portion of duodenal wall and enlarged gonadal vein, slight liver cirrhosis, but no ascites nor splenomegaly.

Fig. 2 MRI showed markedly tortuous vessels around the duodenal wall.

Fig. 3 Endoscopic examination showed duodenal varices on the third portion of the duodenum.

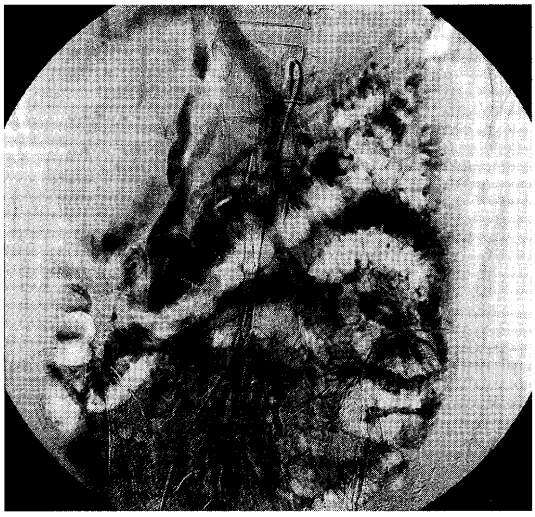

Fig. 4 Portography via the superior mesenteric artery demonstrated a tortuous vein next to the duodenum, and porto-systemic shunt.

and a porto-systemic shunt (Fig. 4). The portal vein was normal in size. Balloon-occluded retrograde gonadal venography via the vena cava inferior demonstrated varicose veins arising from the splenic vein and draining into the dilated right gonadal vein (Fig. 5). BRTO was performed from the draining vein into the gonadal vein using 7 ml of 5% ethanolamine oleate with iopamidol, 11 metallic coils, and 20 ml of 50% glucose solution to obliterate the varicose vein. Just before this procedure, systemic infusion of 4,000 units of haptoglobin was begun to avoid hemoglobinuria.

Endoscopic examination three days after BRTO showed that the varices had decreased. The patient's clinical course was uneventful. On the 17th day, a liver biopsy was done and microscopic examination revealed liver cirrhosis. Contrast-enhanced computed tomography, magnetic resonance imaging and endoscopy on the 4th week showed that the varices had diminished and the right gonadal vein was of normal size (Fig. 6). Esophageal varices did not occur after this therapy. He was discharged on the 34th hospital day.

Discussion

The occurrence of duodenal varices is rare, and the condition is often fatal[1)~6)]. Blood flow within duodenal varices is so rapid that bleeding often becomes severe[2)~6)]. Prognosis is poor, with a mortality rate as high as 40%[2)~6)]. More than 90% of duodenal varices are associated with liver cirrhosis or portal

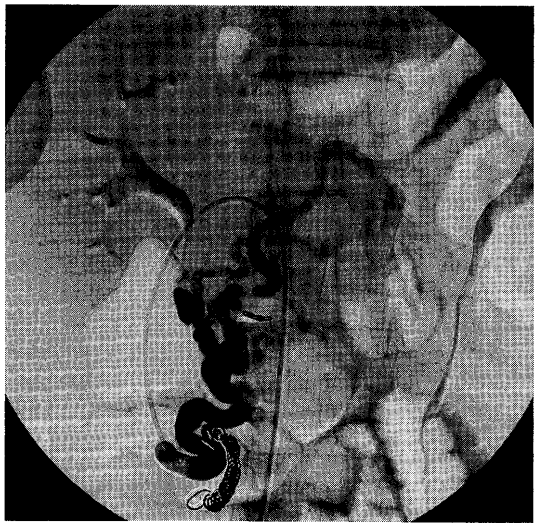

Fig. 5 The balloon-occluded retrograde transvenous obliteration (BRTO) was performed to obliterate the varicose vein.

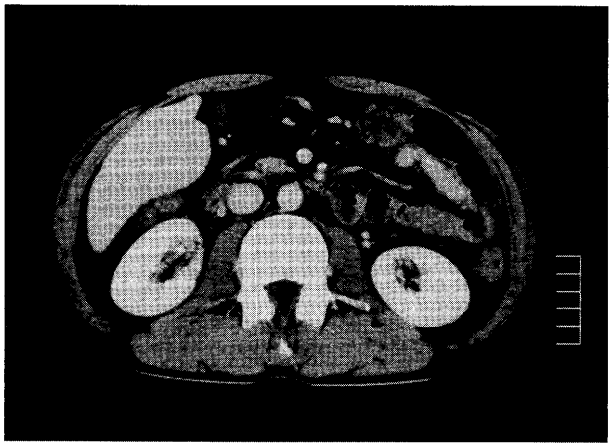

Fig. 6 Contrast-enhanced computed tomography on the fourth week showed that the varices had diminished.

hypertension[7]. This case had slight liver cirrhosis with mild thrombocytopenia, but no splenomegaly nor ascites. A liver biopsy revealed the presence of liver cirrhosis.

The diagnosis of duodenal varices is supported by endoscopy, but it is often difficult because the examination is performed at the time of bleeding and varices exist at the second or third portion of the duodenum[1)~6)]. As in other reports[1)~6)], computed tomography and magnetic resonance imaging revealed markedly tortuous vessels around the duodenal wall in our patient. The afferent vessels usually originate in the portal vein trunk or superior mesenteric vein. The efferent vessels are usually draining into the inferior vena cava or the ovarian vein.

Treatment of bleeding duodenal varices is difficult[1)~6)]. Recently, many procedures have been reported, including surgery[8)], endoscopical approaches[9)10)], and interventional radiology. Endoscopic procedures, including endoscopical injection sclerotherapy[9)] and endoscopic variceal ligation[10)], are temporary, and long-term hemostasis is difficult to achieve because varicose vessels remain. In interventional approaches, transjugular intrahepatic portosystemic shunt also has been reported[11)], but this procedure is associated with severe complications including encephalopathy and cerebral embolization. Percutaneous transcather embolization of the portal vein[12)] is more invasive than BRTO.

BRTO is among the most frequently administered therapies for gastric varices in Japan[2)5)], and it has been applied for duodenal varices[1)~6)]. BRTO is a safe and successful procedure, and it can totally occlude varices. In most reported cases, BRTO and endoscopic procedures are used in combination because of bleeding[1)~6)]. In our case, since the bleeding had already stopped upon admission, we did not need endoscopic procedures. Complete hemostasis was achieved by BRTO alone.

BRTO is usually performed for the treatment of gastric varices. The feeding vessels of gastric varices come from splenic vein due to portal hypertension and the draining vessel is mainly dilated left inferior phrenic vein. Usually balloon catheter is inserted from right femoral vein or right internal jugular vein to the dilated left inferior phrenic vein. Balloon dilation stops the spleno-renal shunt and during the dilatation, left inferior phrenic venography is performed to evaluate the gastric varices, and the extent of the collateral drainers.

The ethanolamine oleate and X-ray contrast material are mixed with the volume ratio of 1: 1. This mixture is injected to the left inferior phrenic vein till the gastric varices are filled with this mixture. This mixture injures endothelium and urges the varices to be embolized. In our case, feeding vessels came from splenic vein as usual, though major

draining vessels were retroperitoneal collateral veins communicated with right gonadal vein and inferior vena cava. We successfully found and catheterized to the collateral veins through right gonadal vein by right femoral vein approach. After the coil embolization of collaterals which directly communicated with inferior vena cava, BRTO was performed to the retroperitoneal collateral veins.

In cases of duodenal varices when emergent hemostasis is not necessary, we support the use of BRTO without endoscopic procedures. Further experiences are required to confirm the efficacy of this strategy for treatment of duodenal varices.

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バルーン下逆行性経静脈的塞栓術で治療した十二指腸静脈瘤の1例

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十二指腸静脈瘤はまれであるが，致死的な出血を来す．近年，種々の治療法が行われている．肝硬変を有する46歳の男性が，重症の貧血のため入院した．血液検査ではヘマトクリット8.9%，血色素量2.3g/dlであった．内視鏡および造影CT検査により十二指腸水平脚に静脈瘤を認めた．第4病日に，バルーン下逆行性経静脈的塞栓術を行い，治療に成功した．第4週の造影CT，MRIと内視鏡検査で十二指腸静脈瘤は消失していた．止血している十二指腸静脈瘤では，バルーン下逆行性経静脈的塞栓術が有効であると考えられた．