Stomal Varices Treated by Two Different Interventional Approaches

We report two patients with colon cancer suffering from stomal variceal bleeding who were treated by two different interventional approaches. In case 1, a retrograde approach was applied to perform sclerotherapy of stomal varices, due to liver metastases. After access to the superficial epigastric vein as one of the efferent veins by the percutaneous approach, stomal varices were embolized using a sclerosant under compression of the efferent veins by hand, rolled gauze packs, and balloon occlusion. In case 2, two vascular plugs were placed in the two afferent veins by the antegrade transhepatic approach. Case 1 suffered from massive ascites after the procedure. No recurrent stomal variceal bleeding occurred until the patients’ death in both cases. Blood flow reduction to the stoma may be sufficient for patients with a short prognosis.

Key words: stomal varices, bleeding, embolization, sclerotherapy, vascular plug

Introduction

Stomal varices develop when the hepatofugal flow from the high pressure portal venous system decompresses into the low pressure systemic veins of the abdominal wall via the mucocutaneous venous network surrounding the stoma site [1]. This phenomenon can occur in up to 50% of patients with enterostomies/colostomies with concurrent portal hypertension [2, 3]. The risk of stomal bleeding in this setting has been estimated to be approximately 27% [4]. Various modes of treatment for stomal varices have been described previously: local compression, suture ligation, stoma revision, liver transplantation, transjugular intrahepatic portosystemic shunt (TIPS), and embolization or sclerotherapy by the antegrade or retrograde approach or by the direct percutaneous approach. Local compression and suture ligation are effective for urgent bleeding but their efficacy is temporary and recurrent bleeding often occurs [5]. An optimal treatment modality has not yet been established. We report two patients with colon cancer suffering from stomal variceal bleeding treated by two different interventional approaches.

The procedures described in this article were approved by the institutional review board of our institution, and written informed consents were obtained.

Case Reports

Case 1

A 39-year-old woman was diagnosed with transverse colon cancer with multiple liver metastases, and stoma for the ileus was created in the right upper quadrant of the abdomen. Systemic chemotherapy including XELOX regimen (capecitabine plus oxaliplatin) and XELOX plus bevacizumab regimen had been performed after surgery for greater than four months. Stomal bleeding occurred the next year.
and multiple superficial epigastric veins as well as inferior branches from the superior mesenteric vein as an afferent vein, access the portal vein by the transhepatic or transjugular approach.

She was referred to our department for interventional treatment. Chemotherapy could not be continued because of repeated episodes of stomal variceal bleeding. She was readmitted for further treatment. Chemotherapy could not be continued because of repeated episodes of stomal variceal bleeding. She was referred to our department for interventional treatment. Chemotherapy could not be continued because of repeated episodes of stomal variceal bleeding. She was referred to our department for interventional treatment.

Contrast enhanced computed tomography (CT) revealed no ascites, but multiple liver metastases made it difficult to access the portal vein by the transhepatic or transjugular approaches. CT also demonstrated stomal varices, a colonic branch from the superior mesenteric vein as an afferent vein, and multiple superficial epigastric veins as well as inferior epigastric veins as efferent veins. The efferent veins could be visualized clearly by ultrasound sonography (US), and most of them could be compressed easily by the ultrasound transducer. One superficial epigastric vein was dilated well enough to be punctured. Pre-procedural angiogram from the superior mesenteric artery and splenic artery demonstrated hepatofugal flow to stomal varices via the colonic branch on the portal phase (Figure 1a). A direct puncture to the stomal varices from the mucosal side was technically possible but was considered unfavorable from the viewpoint of cleanliness (Figure 2). We chose a retrograde approach from the dilated superficial epigastric vein.

A puncture was done using an 18-gauge needle to the dilated superficial epigastric vein under US guidance, and a 4-French (F) introducer sheath was inserted. The stomal varices could not be visualized by retrograde venogram under balloon occlusion using a 4 mm diameter microballoon catheter (Attendant delta, Terumo Clinical Supply, Gifu, Japan) (Figure 1b). Two rolled gauze packs were placed over the small superficial epigastric veins on the cranial side of the stoma and fixed with elastic tape (Figure 3a). Additionally, the other dilated superficial epigastric vein on the caudal side of the stoma was compressed manually (Figure 3b). Under these conditions, balloon occluded retrograde venogram enabled visualization of the stomal varices and afferent vein (Figure 1c). A total of 10 mL of 50% dextrose was injected intermittently. Subsequently, a 5% ethanolamine oleate (Oldamin, Asuka Pharmaceutical, Tokyo, Japan) mixture diluted with the same amount of 300 mg/mL contrast agent (Iopamiron, Bayel, Tokyo, Japan) was injected at

Figure 1. (case 1) a: Portogram via splenic artery showed hepatofugal flow from a colonic branch as an afferent vein (white arrow) to stomal varices (arrowhead), and epigastric veins as efferent veins (black arrow). b: Balloon occluded retrograde venogram using a microballoon catheter (arrowhead) visualized another efferent vein (black arrow) but no stomal varices. c: Stomal varices (white arrowhead) were visualized under additional manual compression of the efferent vein (black arrowhead: position of the microballoon catheter). d: Stomal varices were not visualized on the final portogram (poor image quality due to misregistration).

Figure 2. (case 1): The main afferent vein was clearly visualized on ultrasound (*: center of the stoma). Puncture to the afferent vein (white arrow) close to the center of the stoma could not be done through the skin. Puncture to the other afferent vein (black arrow) was difficult due to its tortuosity.

Figure 3. (case 1) a: Addition of the microballoon catheter (*: center of the stoma) enabled visualization of the stomal varices and afferent vein (white arrow). b: Balloon occluded retrograde venogram enabled visualization of the stomal varices and afferent vein (white arrow). c: Stomal varices were not visualized on the final portogram (poor image quality due to misregistration).
doses of 3-5 mL each from the microballoon catheter. This session was repeated at 5 minute intervals until complete thrombosis of stomal varices was observed on US. The total amount of sclerosant mixture used was 15 mL. On final portogram, stomal varices were not visualized (Figure 1d). We confirmed stasis of contrast agent mixed with the sclerosant in the efferent veins, and no migration into the intrahepatic portal vein on CT immediately after the procedure (Figure 4).

On the day after the procedure, the patient complained of abdominal distension due to ascites, and it worsened day by day. An indwelling catheter into the abdominal cavity was necessary, and ascites was continuously discharged (approximately 1820 mL per day on average). On the 19th day after the procedure, she died due to her cancer, but no recurrent stomal bleeding was found up to the day of death.
Case 2

A 70-year-old woman was diagnosed with descending colon cancer with bilateral ovarian metastases, and a stoma was created in the left upper quadrant of her abdomen. Systemic chemotherapy including XELOX regimen and XELOX plus bevacizumab regimen had been administered for two years after the surgery, but approximately 600 mL of stomal bleeding occurred, and chemotherapy was discontinued. She was referred to our department for interventional treatment.

Contrast enhanced CT demonstrated stomal varices and two dilated colonic branches from the superior mesenteric vein as afferent veins. Stomal varices and the efferent veins could be visualized by US, but they were tortuous and were not sufficiently enlarged to be punctured. The CT images also showed a small amount of ascites and no liver metastasis. Pre-procedural portogram from the superior mesenteric artery and splenic artery demonstrated hepatofugal flow to stomal varices via the colonic branches (Figure 5a-c). We chose antegrade afferent vein embolization by a transhepatic approach.

The portal vein of liver segment 3 (P3) was punctured with an 18-gauge needle under US guidance, and a 5-F guiding sheath (Destination, Terumo, Tokyo, Japan) was inserted into the portal vein over the guidewire (Radifocus, Terumo, Tokyo, Japan). A 4-F seeking catheter (Unite, Asahi Intecc, Aichi, Japan) was advanced near the stomal varices via the one dilated afferent vein, and one, 7 mm in diameter AMPLATZER vascular plug (AVP)-4 (AGA Medical, Golden Valley, Minnesota, USA) was placed in the afferent vein (3.8 mm in vascular diameter). Another, 8 mm in diameter AVP-4 was placed in another afferent vein (4.3 mm). These plugs were implanted after confirming hepatofugal flow using a small amount of contrast agent. The two afferent veins where plugs were implanted were not visualized on the final portogram (Figure 5d). Although slight flow into the stomal varices via the other small afferent vein remained, the procedure was completed after embolizing the transhepatic puncture tract using two microcoils of 3 mm diameter and 6 cm length (Interlock, Boston Scientific, Marlborough, Massachusetts, USA). Post-procedural CT showed remaining afferent venous flow (Figure 6).

No post-procedural complication, including worsening ascites, was found, and the patient was discharged 10 days after the procedure. She died of cancer on the 50th day after...
the procedure, although systemic chemotherapy was re-
started. Until her death, there was no recurrent stomal bleed-
ing.

Discussion

We performed two different interventional approaches for
bleeding stomal varices. They were effective to prevent re-
bleeding from stomal varices until the patients’ death. Case
1, however, suffered from progressing abdominal distention
due to massive ascites. This was considered to be due to
acutely exacerbated portal hypertension after thrombosis of
the stomal varices and main efferent veins. No definite evi-
dence of total portal vein thrombosis was found on CT im-
mediately after the procedure. In case 2, we intentionally in-
completely embolized the afferent veins by using only vas-
cular plugs to prevent acute exacerbation of portal hyperten-
sion, avoiding complete thrombosis of the stomal varices
and parastomal vessels by using a sclerosant. In fact, we
confirmed incomplete embolization on the final portogram
showing remaining flow to stomal varices via the other
small afferent vein. Case 2 suffered from neither recurrent
stomal bleeding nor worsening ascites. From the viewpoint
of patients’ quality of life, particularly in patients with short
prognosis experiencing repeated stomal variceal bleeding,
complete thrombosis of stomal varices with a risk of refrac-
tory ascites may not always be necessary. A decrease in the
bleeding frequency may be sufficient to treat these patients.

According to the literature, TIPS seems to be a preferred
treatment modality in most patients in need of portal decom-
pression. In case 1, however, multiple liver metastases pre-
vented the use of TIPS or transhepatic antegrade emboliza-
tion, and tortuosity of efferent veins prevented the retrograde
approach to the afferent veins. For this reason, we opted for
sclerotherapy by the retrograde approach under compression
with a combination of hand and rolled gauze packs and oc-
cclusion with a microballoon catheter. Saad et al. previously
reported a similar technique with external abdominal wall
compression using an ultrasound transducer [6]. In the sys-
tematic review by Spier et al. [7], sclerotherapy was re-
ported to carry a risk of stomal damage. On the other hand,
Minami et al. and Takano et al. reported successful balloon-
occluded retrograde transvenous obliteration for stomal
varices [8, 9].

To date, reports on the direct percutaneous approach are
afferent veins with metallic coils after inserting the catheter
to the vessel through the punctured stomal varices. Kwok et
al. [12] used a combination of metallic coils and histoacryl
glomer with the same approach. In these reports, whether di-
rect puncture to the stoma may be problematic from the
viewpoint of cleanliness is not described; these direct punc-

Figure 6. (case 2) a: Sagittal image of pre-procedural contrast enhanced CT shows afferent veins (arrow) connected to the stoma. b: Post-procedural CT shows remaining flow of afferent veins (arrow) after embolization with AMPLATZER vascular plug-4 devices (arrowhead).
tures may be performed through the skin, but it is unclear in the published articles.

The two patients in this report had continued systemic chemotherapy, including oxaliplatin. Since the first report by Rubbia-Brandt et al. [13], it is now widely known that portal hypertension can be induced as an adverse side-effects of systemic chemotherapy for colorectal cancer, particularly with the use of oxaliplatin. Oxaliplatin is considered to induce parenchymal damage of the liver, primarily involving the sinusoids, defined as sinusoidal obstruction syndrome [14]. Although portal hypertensive symptoms improve in some cases after administration of oxaliplatin is discontinued, these symptoms may progress in other cases, such as ours [15].

Management of stomal varices by afferent vein embolization with metallic coils has been previously reported. However, a metallic coil has the potential problem of migration. Arulaj et al. [11] reported a case in which the coil placed in the branch of the superior mesenteric vein migrated to the main portal vein (eventually removed with a snare). The use of AVP would enable exact positioning with a decreased risk of migration compared with metallic coils.

In conclusion, retrograde sclerotherapy under external compression and occlusion of efferent veins may be efficient to control bleeding stomal varices, but simply decreasing the flow to the stoma by mild occlusion of afferent veins may be sufficient to treat patients with a short life expectancy, considering potential complications of acutely exacerbating portal hypertension. Further studies in a larger patient cohort are necessary to validate our hypothesis.

Conflict of interest: The authors declare that they have no conflicts of interest to report.

References