Interventional Radiology

Variceal bleeding in the small intestine successfully treated with balloon-occluded retrograde transvenous obliteration using N-butyl-2-cyanoacrylate: A case report

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ARTICLE INFO

Article history:
Received 30 October 2017
Accepted 15 January 2018
Available online 6 February 2018

Keywords:
Small intestinal varices
Balloon-occluded retrograde transvenous obliteration
N-butyl-2-cyanoacrylate

ABSTRACT

Rupture of small intestinal varices associated with portal hypertension can be a serious condition that is difficult to diagnose early and to manage. Moreover, optimal guidelines for the treatment of small intestinal varices have not yet been established. We herein report a case of a 73-year-old man with small intestinal varices. The man presented with bleeding from a stoma in the small intestine, which subsequently led to hemorrhagic shock. We successfully treated the patient with balloon-occluded retrograde transvenous obliteration via the right inferior epigastric vein using N-butyl-2-cyanoacrylate.

Introduction

Ectopic varices, caused by portal hypertension, are defined as portosystemic collaterals located outside the gastroesophageal region [1]. Ectopic varices can cause gastrointestinal bleeding and can be life threatening. However, ectopic varices are difficult to diagnose, manage, and treat because there are no optimal guidelines for the treatment of small intestinal varices currently.

Balloon-occluded retrograde transvenous obliteration (B-RTO) is an angiographic technique that has been accepted as a treatment option for small intestinal varices [2]. B-RTO using N-butyl-2-cyanoacrylate (NBCA; Histoacryl; B. Braun, Melsungen, Germany), a liquid embolic material that works rapidly and permanently [3], has been reported to be useful for the treatment of bleeding duodenal varices [4].

We herein report a case regarding the successful treatment of ruptured small intestinal varices successfully treated by B-RTO via the right inferior epigastric vein using NBCA.
Case report

Case

A 73-year-old man presented to our hospital with bleeding from an ileostomy. The man had suffered from liver cirrhosis caused by nonalcoholic steatohepatitis and had undergone hemicolectomy and ileostomy because of ascending colon cancer 18 months previously. The patient’s initial laboratory data were as follows: red blood cell count, 2.60 × 10^6/L; hemoglobin, 8.8 mg/dL (anemia); platelet count, 107 × 10^3/μL; total bilirubin, 0.8 mg/dL; albumin, 3.0 g/dL; fibrinogen, 199 mg/dL; and international normalized ratio of prothrombin time, 1.45. Six months previously, an upper gastrointestinal endoscopy was performed, and only scarring from esophageal varices was detected.

Emergency endoscopy from the ileostomy could not reveal the bleeding point. Moreover, a gradual drop in blood pressure was observed (systolic blood pressure, 60 mm Hg). To determine the source of bleeding, urgent contrast-enhanced computed tomography (CT) was performed. The CT showed small intestinal varices with extravasation and a small amount of ascites (Fig. 1).

Therefore, emergency angiography was performed. The right common femoral vein was punctured under local anesthesia, and a 6-Fr sheath introducer was inserted. Subsequently, a 4-Fr cobra-shaped catheter was inserted into the right inferior epigastric vein. Using coaxial technique, a 2.7-Fr microballoon catheter (Attendant:Terumo Clinical Supply, Gifu, Japan) was advanced into the proximal portion of the small intestinal varices. Balloon-occluded retrograde transvenous venography via the right inferior epigastric vein revealed small intestinal varices (arrow) with no extravasation (Fig. 2).

Complete variceal embolization was achieved using a 0.5 mL NBCA : lipiodol mixture (1:1) (Fig. 3). The duration from the injection of the NBCA : lipiodol mixture until balloon deflation was approximately 20 seconds. After embolization, the patient had no additional bleeding and was discharged 20 days after B-RTO.

Discussion

Varices of the esophagus and the stomach are common portosystemic collaterals in patients with portal hypertension; however, ectopic varices are uncommon. Approximately 17% of ectopic varices are found in the jejunum and the ileum, 17% are found in the duodenum, 14% in the colon, 8% in the...

Fig. 1 – (A) Contrast-enhanced computed tomography scan reveals small intestinal varices and extravasation (arrow). (B) Three-dimensional computed tomography scan waving toward the right anterior oblique position reveals small intestinal varices (arrowhead), as well as the branch vessel of the superior mesenteric vein (arrow) and the right inferior epigastric vein (open arrow).

Fig. 2 – The right inferior epigastric vein was the main draining vein. Balloon-occluded retrograde transvenous venography via the right inferior epigastric vein shows small intestinal varices (arrow) with no extravasation.
and efferent veins. Given that small intestinal varices connecting to the right inferior epigastric vein, the main efferent vein could be identified through contrast-enhanced CT, we selected B-RTO for the treatment.

If B-RTO had not been suitably performed, we would have been obliged to select the alternative treatments. PTO would have been selected for such a patient because he had a small amount of ascites and mild coagulopathy. Retrograde transvenous obliteration by inserting a needle in an abdominal wall vein after surgical incision would be one of the choices [10]. If the treatment response to PTO or retrograde transvenous obliteration remained poor, TIPS and surgery would have been selected.

A number of liquid or foamy sclerosing agents have been used for B-RTO, including ethanolamine oleate, sodium tetradecol sulfate (Sotradecol; AngioDynamics, Queensbury, NY), polidocanol (Polidocalsklerol; Zeria Pharmaceutical, Tokyo, Japan), and NBCA [11]. However, to obliterate the varices with 5% ethanolamine oleate, the agent must remain within the varices for 4–24 hours [11]. NBCA is an adhesive liquid embolic material that immediately polymerizes and permanently occludes the varices upon exposure to anions in blood [3]. Furthermore, NBCA is not dependent on coagulation. A potential disadvantage for NBCA, however, is the adhesion between the microcatheter and the blood vessel wall. To prevent such an occurrence, the microcatheter needs to be removed at the appropriate time after NBCA administration.

Despite retrograde blood flow and the use of a high-concentration NBCA : lipiodol mixture, no adherence between the microballoon catheter or the microcatheter and the vessel wall was observed. We believe that the NBCA injection pressure corresponded with the blood pressure of the efferent vein during the balloon occlusion, and the timing of balloon deflation was accurate.

In conclusion, small intestinal varices can develop in patients with portal hypertension who have a history of abdominal surgery. Moreover, B-RTO using NBCA can be an effective treatment option for patients who develop hemorrhagic shock due to ruptured varices.

REFERENCES

[1] Norton ID, Andrews JC, Kamath PS. Management of ectopic varices. Hepatology 1998;28(4):1154–8.
[2] Sato T, Yamazaki K, Toyota J, Karino Y, Ohmura T, Akaike J. Ileal varices treated with balloon-occluded retrograde transvenous obliteration. Gastroenterology Res 2009;2(2):122–5.
[3] Pollak JS, White RI Jr. The use of cyanoacrylate adhesives in peripheral embolization. J Vasc Interv Radiol 2001;12(8):907–13.
[4] Hashimoto R, Sufue K, Takeuchi Y, Shibamoto K, Arai Y. Successful balloon-occluded retrograde transvenous obliteration for bleeding duodenal varices using cyanoacrylate. World J Gastroenterol 2013;19(6):951–4.
[5] Lebrec D, Benhamou JP. Ectopic varices in portal hypertension. Clin Gastroenterol 1985;14(1):105–21.
[6] Saad WE, Lippert A, Saad NE, Caldwell S. Ectopic varices: anatomical classification, hemodynamic classification, and hemodynamic-based management. Tech Vasc Interv Radiol 2013;16(2):158–75.

Fig. 3 – Variceal embolization (arrow) using a 0.5 mL of N-butyl-2-cyanoacrylate : lipiodol mixture (1:1) results in complete embolization.
[7] Lopez-Benitez R, Seidensticker P, Richter GM, Stampfl U, Hallscheidt P. Case report: massive lower intestinal bleeding from ileal varices: treatment with transjugular intrahepatic portosystemic shunt (TIPSS). Radiologe 2007;47(5):407–10.

[8] Sato T. Transabdominal color Doppler ultrasonography for the diagnosis of small intestinal and vesical varices in a patient successfully treated with percutaneous transhepatic obliteration. Clin J Gastroenterol 2010;3(4):214–18.

[9] Ota K, Okazaki M, Higashihara H, Kokawa H, Shirai Z, Anan A, et al. Combination of transileocolic vein obliteration and balloon-occluded retrograde transvenous obliteration is effective for ruptured duodenal varices. J Gastroenterol 1999;34(6):694–9.

[10] Ikeda O, Nakasone Y, Yokoyama K, Inoue S, Takamori H, Baba H, et al. Successful treatment of mesenteric varices by retrograde transvenous obliteration by the delivery of N-butyl-2-cyanoacrylate via an abdominal wall vein. Cardiovasc Intervent Radiol 2014;37(2):533–6.

[11] Sabri SS, Saad WE. Balloon-occluded retrograde transvenous obliteration (BRTO): technique and intraprocedural imaging. Semin Intervent Radiol 2011;28(3):303–13.