3. Sparano J, Chang J (1987) Treatment of the Budd-Chiari syndrome with percutaneous transluminal angioplasty. Am J Med 82:821–828
4. Yang XL, Cheng TO, Chen CR (1994) Successful treatment by percutaneous balloon transluminal angioplasty of Budd-Chiari syndrome caused by membranous obstruction of the inferior vena cava: 8-year follow-up study. J Am Coll Cardiol 28:1120–1124
5. Irving JD, Dondelinger RF, Reidy JF, Schild H, Dick R, Adam A, Maynar M, Zollikofer CL (1992) Gianturco self-expanding stents: Clinical experience in the vena cava and large veins. Cardiovasc Intervent Radiol 15:328–333
6. Roy S, Baijal SS, Rastogi H (1994) Ilio-caval reconstruction with metallic stents. Cathet Cardiovasc Diagn 32:367–371
7. Venbrux AC, Mitchell SE, Savader SJ, Lund GB, Trerotola SO, Newman JS, Klein AS, Mitchell MC, Rösch J, Uchida BT, Osterman FA (1994) Long-term results with the use of metallic stents in the inferior vena cava for treatment of Budd-Chiari syndrome. J Vasc Interv Radiol 5:411–416

8. Kohli V, Pande GK, Dev V, Reddy KS, Kaul U, Nundy S (1993) Management of hepatic venous outflow obstruction. Lancet 342:718–722
9. Fischman DL, Savage MP, Leon MB, Schatz RA, Ellis G, Cleman MW, Hirshfeld JW, Teirstein P, Bailey S, Walker CM, Goldberg S (1993) Fate of lesion-related side branches after coronary artery stenting. J Am Coll Cardiol 22:1641–1646
10. Mazur W, Grincstead WL, Hakim AH, Dabaghi SF, Abukhalid JM, Ali NM, Joseph J, French BA, Raizner AI (1994) Fate of side branches after intracoronary implantation of the Gianturco-Roubin flex-stent for acute or threatened closure after percutaneous transluminal coronary angioplasty. Am J Cardiol 74:1207–1210
11. Kaul U, Agarwal R, Jain P, Sharma S, Sharma S, Wasir HS (1996) Management of idiopathic obstruction of the hepatic and suprahepatic inferior vena cava with a self-expanding metallic stent. Cathet Cardiovasc Diagn 39:252–257

Stomal Varices: Treatment by Percutaneous Transhepatic Coil Embolization

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Abstract

Bleeding from stomal varices in a patient with portal hypertension, uncontrolled by surgical ligation and sclerotherapy, was well controlled by percutaneous transhepatic embolization with platinum and stainless-steel coils.

Key words: Stomal varices—Hemorrhage—Interventional procedures, percutaneous transhepatic embolization—Hypertension, portal

Peristomal varices form occasionally in patients with portal hypertension who have a surgically created intestinal anastomosis or a stoma [1]. Percutaneous transhepatic embolization can be used as a means of treating bleeding stomal varices.

Case Report

A 56-year-old woman with hepatic cirrhosis and marked splenomegaly was transferred to our institution after ineffective surgical ligation and sclerotherapy of bleeding varices around a sigmoid colostomy. She had undergone eight prior operations for gastric ulcer and ileus. The most recent operation was a sigmoid colostomy 2 years prior to admission; 1 year later intermittent stomal bleeding occurred twice with an episode of hemorrhagic shock.

On admission she had a hemoglobin of 11.0 g/dl and platelets of 32,000/mm^3 despite multiple blood transfusions. An upper gastrointestinal (GI) series and endoscopy showed no evidence of gastroesophageal varices. Enhanced computed tomography (CT) demonstrated anomalous vascular structures in the abdominal wall surrounding the stoma (Fig. 1). A celiac arteriogram showed splenomegaly and patent splenic and portal veins with no evidence of gastroesophageal varices. The venous phases of superior and inferior mesenteric arteriograms revealed flow reversal into many dilated

and tortuous veins around the stoma draining into the left iliac vein. The superior mesenteric arteriogram also showed dilated vessels in the abdominal wall, probably due to postoperative adhesions.

A percutaneous transhepatic portogram (PTP) 6 days after admission confirmed the findings of indirect mesenteric venography (Fig. 2). To control variceal bleeding, variceal feeder branches were embolized with a total of 15 coils [11 fibered platinum microcoils (Vortex; Cook, Bloomington, IN, USA), 3 platinum coils (0.35 Pt-Max; Cook), and a stainless steel coil] of appropriate size, selected by measuring the caliber of feeder branches on venography. The main trunk was then embolized with 13 stainless-steel coils. The total number of coils used was 28.
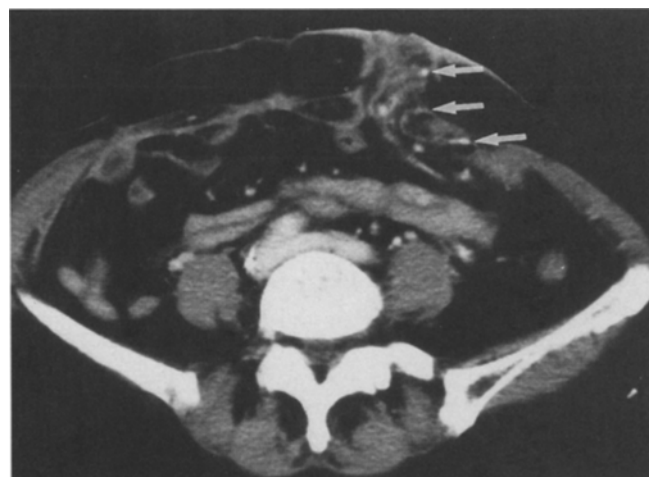

Fig. 1. Contrast-enhanced CT scan demonstrates anomalous vascular structures around the stoma (arrows) in the abdominal wall.
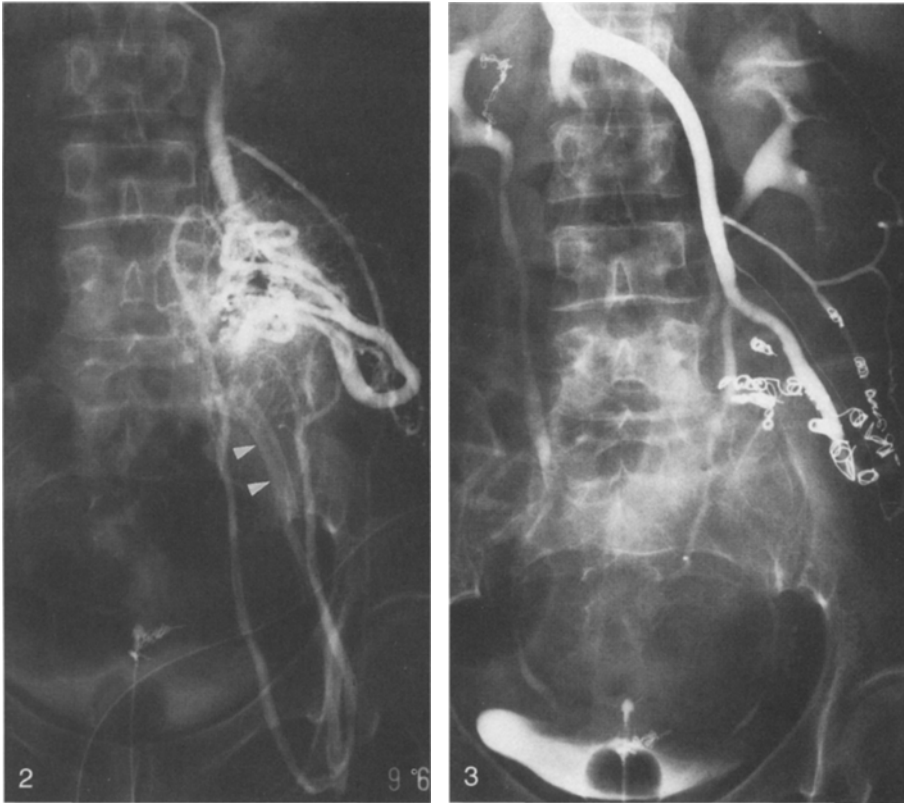
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Fig. 2. Percutaneous transhepatic inferior mesenteric venogram showing stomal varices. The blood flow of the inferior mesenteric vein is reversed toward the colostomy stoma and the left iliac vein (arrowheads).

Fig. 3. After coil embolization the varices are obliterated.

Absorbable gelatin sponge was not used. A PTP after coil embolization demonstrated complete obliteration of the varices (Fig. 3). The preprocedure portal pressure of 40 mmH$_2$O did not change significantly thereafter (41 mmH$_2$O). The initially bluish discolored skin around the stoma improved markedly within the 24 hr following the procedure. At 1 year follow-up, the patient has remained well without further episodes of stomal bleeding.

Discussion

Varicosity associated with portal hypertension is usually seen in the esophagus, rectum, and umbilicus. However, some patients have varices in other sites, particularly those who have had previous surgery [2]. Bluish discoloration of the skin at the site of a stoma is a valuable clue to the presence of stomal varices.

Resnik et al. [3] described three patients with hemorrhages from an ileostoma and portal hypertension. The ileostomy varices arose from postsurgical anastomoses between the high-pressure portal system and the low-pressure systemic veins of the abdominal wall. On the parietal surface of the gut, small venous communications connect mesenteric venous to systemic venous channels in the retroperitoneum and in the abdominal wall. Edwards [4] demonstrated by postmortem venography that these preexisting networks arise in the embryo due to the juxtaposition of the developing systemic and visceral venous plexuses.

Several authors have reported bleeding from stomal varices in cirrhotic patients [1, 5–7]. Eade et al. [7] described variceal hemorrhage from ileostomy in five patients with coexisting inflammatory bowel disease. There is a high mortality rate (approximately 30%–40%) associated with bleeding from esophageal varices, whereas death from acute stomal hemorrhage has been estimated at 3%–4% [1, 8]. Therapeutic measures for recurrent stomal bleeding have ranged from locally administered therapy to stomal revision and portosystemic shunt surgery. Local measures such as manual compression, direct

variceal ligation, and sclerotherapy appear to control bleeding only temporarily and often require multiple transfusions [6–9]. Portosystemic shunt surgery is effective in preventing recurrent bleeding [10], but it is associated with significant mortality, ranging from 5% to 15% [11]. Portosystemic shunt surgery may be technically difficult in patients with previous abdominal surgery because of adhesions.

Transjugular intrahepatic portosystemic shunt (TIPS) placement is an effective therapeutic alternative for bleeding stomal varices [12, 13]. Weinberg et al. [13] reported two pediatric cases in which bleeding stomal varices were successfully managed with TIPS placement. TIPS placement may prevent the development of esophageal varices by decompressing portal venous pressures. In young patients in whom the potential for liver transplantation exists, TIPS placement may be an effective bridge to liver transplantation because the shunt is intrahepatic. But in the presence of decompensated liver function, TIPS would result in secondary hepatic encephalopathy or liver failure [12].

As other treatment choices, balloon-occluded retrograde transvenous obliteration (BRTO) and double balloon-occluded embolotherapy (DBOE) were considered. BRTO obliterates the outlet veins of the varices by retrograde injection of 5% ethanolamine oleate (EOI) [14]. DBOE closes both the variceal inflow and outflow by filling the closed spaces between the occlusion balloons with 5% EOI [15]. The major complication is EOI-induced renal failure. Successful treatment was reported for duodenal varices by BRTO [15] and rectal varices by DBOE [14]; however, these procedures were not established for the treatment of stomal varices.

Samaraweera et al. [1] reported four patients who underwent transhepatic mesenteric vein catheterization with successful embolization of stomal varices for intractable bleeding. These authors used Gianturco coils with or without an absorbable gelatin sponge plug for embolization. In our patient, the use of platinum and

metallic coils was sufficient to obliterate the stomal varices. Gelatin sponge and other solutions were not used to prevent undesirable systemic and portal vein embolization.

The potential complications of transhepatic variceal embolization include bleeding, bile leak, liver trauma, and portal thrombosis [5]. We used Gelfoam pieces to occlude the parenchymal track when we removed the transhepatic sheath.

References

1. Samaraweera RN, Feldman L, Widrich WC, Waltman A, Steinburg F, Greenfield A, Srinivasan M, Robbins AH, Johnson W (1989) Percutaneous transhepatic embolization. Radiology 170:779–782
2. Hamlyn AN, Lunzer MR, Morris JS, Puritz H (1974) Portal hypertension with varices in unusual sites. Lancet 2:1531–1534
3. Resnik RH, Ishihara A, Chalmers TC, Schimmel EM (1968) A controlled trial of colon bypass in chronic hepatic encephalopathy. Gastroenterology 54:1057–1069
4. Edward EA (1951) Functional anatomy of the porto-systemic communications. Arch Intern Med 88:137–154
5. Toumeh KK, Girardot JD, Choo IW, Andrews JC, Cho KJ (1995) Percutaneous transhepatic embolization as treatment for bleeding ileostomy varices. Cardiovasc Intervent Radiol 18:179–182
6. Graeber GM, Ratner MH, Ackerman NB (1976) Massive hemorrhage from ileostomy and colostomy stomas due to mucocutaneous varices in patients with coexisting cirrhosis. Surgery 79:107–110
7. Eade MN, Williams JA, Cooke WT (1969) Bleeding from an ileostomy caput medusae. Lancet 2:1166–1168
8. Ackerman NB, Graeber GM, Fey J (1980) Enterostomal varices secondary to portal hypertension. Arch Surg 115:1454–1455
9. Broniatowski SG, Fazio V (1983) Conservative treatment of bleeding stomal varices. Arch Surg 115:981–985
10. Moncure AC, Waltman AC, Vandersalm TJ, Linton RR, Levine FH, Abbott WM (1975) Gastrointestinal hemorrhage from adhesion-related mesenteric varices. Ann Surg 183:24–29
11. Warren WD, Millikan WJ Jr, Henderson JM, Wright L, Kutner M, Smith RB 3d, Fulenwider JT, Salam AA, Galambos JH (1982) Ten years portal hypertension surgery at Emory: Results and new perspectives. Ann Surg 195:530–542
12. Haskal ZJ, Scott M, Rubin RA, Cope C (1994) Intestinal varices: Treatment with the transjugular intrahepatic portosystemic shunt. Radiology 191:183–187
13. Weinberg GD, Matalon TA, Brunner MC, Patel SK, Sandler R (1995) Bleeding stomal varices: Treatment with a transjugular intrahepatic portosystemic shunt in two pediatric patients. J Vasc Interv Radiol 6:233–236
14. Haruta I, Isobe Y, Ueno E, Toda J, Mitsunaga A, Noguchi S, Yamaguchi K, Hayashi N (1996) Balloon-occluded retrograde transvenous obliteration (BRTO), a promising nonsurgical therapy for ectopic varices: A case report of successful treatment of duodenal varices by BRTO. Am J Gastroenterol 91:2594–2597
15. Kimura T, Haruta I, Isobe Y, Ueno E, Toda J, Nemoto Y, Ishikawa K, Miyazono Y, Shimizu K, Yamaguchi K, Hayashi N (1997) Novel therapeutic approach for rectal varices treated with double balloon-occluded embolotherapy. Am J Gastroenterol 92:883–886