Management of superior mesenteric arteriovenous fistula after small bowel resection 20 years previously: Endovascular treatment

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A 59-year-old man was admitted to the West China Hospital (Sichuan, China) with recurrent abdominal pain and diarrhea. The patient had undergone a resection of the small bowel due to small intestinal bleeding caused by an ulcer 20 years previously and had no history of trauma. Physical examination revealed stable vital signs, but there was tenderness in the area of the epigastrium radiating to the back without muscle tension and rebound pain. Laboratory tests revealed hemoglobin, white blood cell, total bilirubin, prothrombin time, albumin and creatinine levels of 97 g/L, 18.65×10⁹/L, 53 umol/L, 12.0 s, 34.1 g/L, 112 μmol/L, respectively. Computed tomography (CT) angiography of the abdomen and pelvis revealed marked enhancement of the superior mesenteric vein (3.1 cm in diameter) in the arterial phase, the fistula of the neck between the superior mesenteric artery and the superior mesenteric vein (0.9 cm in diameter), the engorgement of the intestinal walls and mesentery, and abdominal ascites (Figure 1). Endovascular treatment was implemented in the hybrid operating room. If unsuccessful, open surgery would immediately follow. Superior mesenteric angiography demonstrated a superior mesenteric arteriovenous fistula (SMAVF) in accord with CT (Figure 2). Embolization of the fistula was performed with multiple 8 mm, 10 mm and 12 mm coils deployed at the neck of the SMAVF, respectively. An additional angiogram showed no opacification of the SMAVF (Figure 3). After the procedure, the patient was monitored carefully for any evidence of bowel ischemia. During the next several days, the patient’s abdominal pain disappeared and the initial watery diarrhea gradually resolved. Confirmation of these findings was obtained by ultrasound with no evidence of portal hypertension. At the three-month follow-up, the patient was in satisfactory condition and had no symptoms of bowel ischemia.

Figure 1) Computed tomography angiography. A Axial view showing the superior mesenteric vein with marked enhancement in the arterial phase and aneurismal dilation. B Volume-rendered computed tomography showing the fistula between the superior mesenteric artery and the superior mesenteric vein.

Figure 2) Superior mesenteric angiogram showing the distal superior mesenteric artery with direct shunting of contrast into the superior mesenteric vein, which is in accord with the volume-rendered computed tomography shown in Figure 1B.

Figure 3) Postembolization angiogram. The fistula from the distal superior mesenteric artery to the superior mesenteric vein has been occluded with multiple 8 mm, 10 mm and 12 mm coils. An additional angiography shows no further opacification of the superior mesenteric arteriovenous fistula.

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DISCUSSION
The first arteriovenous fistula was reported in 1947, but documented SMAVs are extremely rare (1,2). The formation of SMAVs is usually due to trauma or iatrogenic injury, such as penetrating trauma, ileal resection, appendectomy, hemicolectomy and sigmoidectomy (1). In the present case, it was most likely the result of iatrogenic vascular injury during resection of the small bowel 20 years previously. The clinical manifestations of SMAVF may vary from the asymptomatic carrier state to a delayed presentation of abdominal pain, anorexia, diarrhea, gastrointestinal hemorrhage, signs of portal hypertension and even congestive heart failure (3). Treatment options for SMAVF include surgical intervention (4), and endovascular management such as coil embolization (5) and covered stents (6). Before treatment, CT angiography can evaluate the position and the size of fistula, the severity of portal hypertension and intestinal ischemia. In our case, coil embolization was used to avoid greater risks in open surgery. Endovascular treatment for SMAVF may be an effective and safe therapeutic option.

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