Arterial reconstruction by anastomosis of left gastric artery and superior mesenteric artery for locally advanced pancreatic carcinoma

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ABSTRACT

We report the case of a 61-year-old man with pancreatectomy with arterial resection and reconstruction and extended lymph node dissection because of locally advanced pancreatic cancer. Surgery revealed the tumor invading the root part of the superior mesenteric artery, so we cut off and reconstructed the artery root through end-to-end anastomosis of the left gastric artery and superior mesenteric artery. The left gastric artery is a reasonable choice to reconstruct the superior mesenteric artery, and to the best of our knowledge, only a few reports describe locally advanced pancreatic cancer as an indication for our surgical procedure. (J Vasc Surg Cases and Innovative Techniques 2019;5:4-6.)

Locally advanced pancreatic cancer often involves adjacent vessels. Whether the tumor needs to be resected and when and how the resection should be done remain controversial.1 Here, we report a case that received superior mesenteric artery resection and reconstruction by anastomosis of the left gastric artery and superior mesenteric artery for locally advanced pancreatic carcinoma.

The patient authorized the disclosure of his case details and images.

CASE REPORT

A 61-year-old man was admitted to the hospital because of pancreatic duct dilation for 6 months and yellowing of the skin and sclera for 1 week. The patient had a history of diabetes mellitus for 6 months, and his blood glucose level could be controlled with subcutaneous hypoglycemic drugs. Positive laboratory test results included the following: blood hemoglobin, 107 g/L; alanine transaminase, 316 U/L; aspartate transaminase, 83 U/L; total bilirubin, 140.9 μmol/L; and direct bilirubin, 102.4 μmol/L. Computed tomography (CT) imaging showed a 4.0-cm tumor located in the head and neck of the pancreas and that the pancreatic duct in the tail of the pancreas was greatly dilated. A spleen vein approximately 1.5 cm long was obviously expanded. The root part of the superior mesenteric artery was possibly involved. The patient was scheduled to undergo pancreaticoduodenectomy. The tumor invaded the splenic veins, but no preoperative splenic congestion was observed, and routine blood test results were within normal range; therefore, the surgical plan did not involve reconstruction of the splenic veins after resection. During surgery, the upper posterior part of the tumor was found to invade the superior mesenteric artery. After pancreaticoduodenectomy, the invaded part of the superior mesenteric artery was removed and the left gastric artery was obliquely cut off to increase its lumen diameter. The distal segment of the left gastric artery was ligated, and end-to-end anastomosis of the proximal left gastric artery and the superior mesenteric artery was performed. Vessels were sutured continuously with 7-0 Prolene sutures (Fig 1).

Lymph nodes from groups 5, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, and 18 were dissected and removed.

The operation time was 9 hours, and intraoperative blood loss volume was 800 mL. Because of successful anesthesia and surgery, the patient was returned to the ward without intensive care unit transition. Postoperative pathologic results showed that the patient had poorly differentiated pancreatic cancer without involvement of the incisal margin. The dissected superior mesenteric artery, fibrous tissue around the arteries in the duodenal wall, and colon were invaded. Pancreatic cancer metastatic to dissected lymph nodes was not observed (0/27). On day 1 after surgery, there was approximately 350 mL of abdominal drainage fluid. Starting from day 1 after surgery, the patient received a subcutaneous injection of low-molecular-weight heparin sodium, but it was terminated on day 2 because of darkening ascitic fluid. The abdominal drainage volume was up to 750 mL on day 3 after surgery and then gradually decreased thereafter. On day 19 after surgery, the peritoneal drainage catheter was pulled out. On day 20 after surgery, CT angiography was performed, and the reconstructed arteries were patent (Figs 2 and 3). On day 21 after surgery, the patient was discharged, and hepatic function and routine blood test indices were normal. At 4 months after surgery, Doppler B-mode ultrasound examination of the reconstructed arteries
showed that the blood flow velocity of the reconstructed superior mesenteric artery was 75.9 cm/s and the resistance index was 0.64, which met the requirement of the blood supply of the small intestine (Fig 4). The patient was followed up for 13 months, and tumor recurrence was not found on B-mode ultrasound or CT examinations; however, pancreatic tumor recurred 14 months after surgery, and the patient died soon because of a hospital’s denying treatment.

**DISCUSSION**

Some scholars have performed pancreatectomy combined with arterial resection and reconstruction for pancreatic cancer. Evidence indicates that although the operation time is long and there are many postoperative complications, the median survival time can be up to 12 months; in some cases, it can be up to 21 months, which is equivalent to that for patients who undergo radical surgery without artery dissection for pancreatic cancer. Similarly, it was also reported that among 13 patients who underwent arterial resection, regional lymph node metastasis was found during postoperative pathologic examination in only two patients, and patients without lymph node metastasis had good curative effect and survived >2 years. Therefore, in the case...
of no identified conclusion regarding the role of arterial resection and reconstruction in radical therapy for pancreatic cancer, surgical resection can be actively performed for some patients.

The anastomosis of splenic artery and superior mesenteric artery could be used to ensure continuous blood flow to the small intestine. However, the blood supply to the spleen has to be considered because blood insufficiency to the spleen leads to severe complications, such as infarction, infection, and abscess formation. In this study, splenic artery occlusion resulted in spleen infarction and abscess formation. Ligation of the left gastric artery cannot lead to poor blood supply to the stomach. Therefore, the left gastric artery is a convenient and reasonable choice to reconstruct the superior mesenteric artery to ensure perfusion to the small intestine.

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