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CASE REPORT

Managing Unsuspected Tumour Invasion of the Superior Mesenteric-Portal Vein during Surgery for Pancreatic Head Cancer. A Case Report

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ABSTRACT

Context In some cases, synchronous superior mesenteric-portal vein resection can be performed during pancreatic resection for cancer. The reconstruction technique is usually primary anastomosis; in only a few cases is an autologous vein graft needed. **Case report** We report a case of reconstruction of the superior mesenteric-portal vein with a splenic vein autograft in a patient affected by pancreatic head adenocarcinoma who underwent a total pancreatectomy. **Conclusions** The reconstruction of the superior mesenteric-portal vein with a splenic vein autograft should be performed in selected cases. It allows a reduction of operating time, it is a less invasive approach than reconstruction using an internal jugular vein autograft and it can be an oncologically correct approach.

INTRODUCTION

Synchronous portal-superior mesenteric vein resection is performed in about 26% (range: 2-77%) of cases during pancreatic resection for cancer [1]. The type of synchronous portal-superior mesenteric vein resection is usually circumferential (72.8%); a lateral wedge resection is rarely performed (10.9%). The most common venous reconstruction after circumferential resection is primary anastomosis (88.6%), followed by autologous vein graft (9.7%) and synthetic vein graft (1.7%) [1]. In cases in which a primary end-to-end anastomosis is not possible, an internal jugular vein autologous graft [2] is utilized in the reconstruction of the superior mesenteric-portal vein. We herein report a case of synchronous portal-superior mesenteric vein resection followed by reconstruction using an autologous graft of the splenic vein in a patient affected by pancreatic cancer.

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Key words Mesenteric Veins; Pancreatectomy; Pancreatic Neoplasms; Portal Vein; Reconstructive Surgical Procedures

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CASE REPORT

A 68-year-old man, whose father had died from pancreatic cancer, was admitted to our institute for obstructive jaundice, hyperchromic urine and hypocholic stools. His past medical history was characterized by arterial hypertension and prostatic hypertrophy. Laboratory tests showed the following levels: total bilirubin 16.57 mg/dL (reference range: 0.20-1.10 mg/dL), direct bilirubin 13.02 mg/dL (reference range: 0-0.30), GGT 792 U/L (reference range: 8-61 U/L), alkaline phosphatase 876 U/L (reference range: 98-280 U/L), AST 102 U/L (reference range: 0-38 U/L), ALT 214 U/L (reference range: 0-41 U/L) and CA 19-9 5,821 U/L (reference range: 0-37 U/L).

Ultrasonography (US) showed a hypoechoic mass of the pancreatic head, 3 cm in diameter, and dilatation of the intrahepatic bile ducts, common bile duct and Wirsung duct. A spiral, multislice computed tomography (CT) scan of the abdomen confirmed the presence of the hypodense mass in the head of the pancreas with dilatation of the choledochus and Wirsung duct, and showed grade 1 involvement [3] of the superior mesenteric-portal vein (Figure 1). A US-guided core biopsy was subsequently performed and a diagnosis of adenocarcinoma was reached. A biliary stent was positioned during endoscopic retrograde cholangiopancreatography (ERCP). On the basis of these findings, the patient underwent surgery. At laparotomy, neither ascites nor hepatic metastases were

Figure 1. CT scan of the abdomen: hypodense mass in the head of the pancreas with dilatation of the choledochus and Wirsung duct and grade 1 involvement of the superior mesenteric-portal vein (arrow).

found and a mass in the pancreatic head, 4 cm in diameter, was detected. All mobilization maneuvers for a pancreaticoduodenectomy were performed. At the end of these maneuvers, involvement of the superior mesenteric-portal vein was more extensive than what had been suspected preoperatively; US revealed a more than 180° vein infiltration of the superior mesenteric-portal vein about 3 cm in length. Moreover, the section of the isthmus of the pancreas showed resection margins positive for PanIN-3 (pancreatic intraepithelial neoplasia). As a result of these findings, a pylorus-preserving total pancreatectomy with superior mesenteric-portal vein resection was performed. The superior mesenteric-portal vein resection was circumferential, extending about 4 cm in length; reconstruction of the superior mesenteric-portal vein was carried out utilizing an autograft of the splenic vein (Figure 2). The resected specimen was brought to the back table and the splenic vein graft was archived by sectioning the vessel at 3 cm from the portomesenteric confluence. Histological examination of the margin of the splenic vein was tumour-free. Portal vein occlusion time was 30 minutes. Blood loss was 1,650 mL and operating time was 465 minutes.

Histologic examination of the specimen showed a pT3, well-differentiated adenocarcinoma with diffuse presence of PanIN-1, 2 and 3. The resected portal vein segment was 4 cm long and involvement of the vessel wall reached the intima. The resection margins were negative (R0). There were nodal metastases in 7 (6 peri-choledochic, 1 pancreatico-duodenal) out of 54 nodes (stage III, pT3, N1, M0).

The postoperative course was characterized by the appearance of diabetes and the patient was discharged on the 18th postoperative day. At present, the patient is alive, well and disease free at 8 months after surgery.

DISCUSSION

The first report of superior mesenteric vein resection and reconstruction came from Moore *et al*. at the University of Minnesota in 1951 [4].

Subsequent studies have shown that resection of the superior mesenteric vein, portal vein and superior mesenteric portal vein confluence may be successfully performed to achieve a negative margin resection in selected patients and at selected institutions [5].

In a systematic review of synchronous superior mesenteric-portal vein resection during pancreatic resection for cancer, 1,646 cases from 52 studies were found [1]. Resection and reconstruction of the superior mesenteric-portal vein followed a total pancreatectomy in 321 cases (24.1%); postoperative mortality and morbidity were not increased with respect to those of a total pancreatectomy without vein resection. The most common type of resection of the superior mesenteric-portal vein was circumferential and the most frequent type of reconstruction was primary anastomosis. Reconstruction with an autologous vein graft should be considered in only a few selected cases: when the superior mesenteric-portal vein resection is equal to, or greater than, 3 cm [6], the superior mesenteric-portal vein confluence is involved and when it is not possible to perform a tension-free anastomosis [7]. Usually an autologous vein graft involving the internal jugular vein [2, 8], the long saphenous vein [9, 10] or the superficial femoral vein [11, 12] is used. Operating time for patients undergoing pancreatic cancer resection with synchronous portal-superior mesenteric vein resection was 513 min (range: 168-1,740 min); the median estimated blood loss was 1,750 mL (range: 300-26,000 mL) and the median duration of portal vein occlusion was 20 min (range: 7-302 min) [1].

In the literature, we found only one article by Miyata *et al*. [13] which reported an experience of three cases of portal flow reconstruction with a splenic vein autograft during total pancreatectomy for cancer. The authors examined the cut edge of the graft to exclude the presence of cancer cells. Furthermore, they demonstrated the patency of the graft angiographically. The patients died 2, 4 and 12 months after surgery. Autopsy revealed massive hepatic metastases but no evidence of tumour in the graft wall.

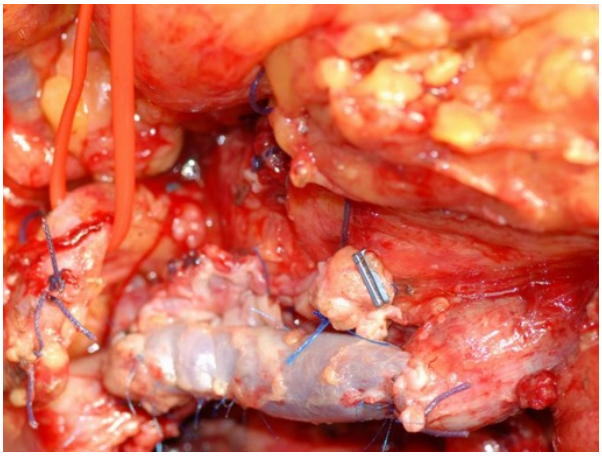

Figure 2. Reconstruction of the superior mesenteric-portal vein using an autograft of splenic vein.

In our case, a pylorus-preserving total pancreatectomy plus reconstruction of the superior mesenteric-portal vein with an autologous splenic vein graft was performed because there was more than 180° vein infiltration, about 3 cm in length, of the superior mesenteric-portal vein and the resection margin was positive for PanIN-3.

The autologous splenic vein graft was easily available and its preparation involved only a few minutes. This technique avoided additional surgical procedures as well as an autologous internal jugular vein graft and it is oncologically correct if the margin of the resection vein is negative. In the literature, no one has reported cases of nodal involvement in splenic artery lymph nodes in pancreatic head cancer [14].

In conclusion, unsuspected tumor invasion of the superior mesenteric-portal vein during surgery for pancreatic head cancer can be managed with an autologous splenic vein graft. This technique is feasible, safe, mini-invasive and oncologically correct.

Conflict of interest The authors have no potential conflicts of interest

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