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Case report

Ligation of superior mesenteric vein and portal to splenic vein anastomosis after superior mesenteric-portal vein confluence resection during pancreaticoduodenectomy – Case report

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ABSTRACT

62 year old Caucasian female with pancreatic head mass abutting the superior mesenteric vein (SMV) presented with fine needle aspiration biopsy confirmed diagnosis of ductal adenocarcinoma. CT scan showed near complete obstruction of portal vein and large SMV collateral development. After 3 months of neoadjuvant therapy, her portal vein flow improved significantly, SMV collateral circulation was diminished. Pancreaticoduodenectomy (PD) and superior mesenteric portal vein (SMPV) confluence resection were performed; A saphenous vein interposition graft thrombosed immediately. The splenic vein remnant was distended and adjacent to the stump of the portal vein. Harvesting an internal jugular vein graft required extra time and using a synthetic graft posed a risk of graft thrombosis or infection. As a result, we chose to perform a direct anastomosis of the portal and splenic vein in a desperate situation. The anastomosis decompressed the mesenteric venous system, so we then ligated the SMV. The patient had an uneventful postoperative course, except transient ascites. She redeveloped ascites more than one year later. At that time a PET scan showed bilateral lung and right femur metastatic disease. She expired 15 months after PD.

Conclusion: The lessons we learned are (1) Before SMPV confluence resection, internal jugular vein graft should be ready for reconstruction. (2) Synthetic graft is an alternative for internal jugular vein graft. (3) Direct portal vein to SMV anastomosis can be achieved by mobilizing liver. (4) It is possible that venous collaterals secondary to SMV tumor obstruction may have allowed this patient's post-operative survival.

1. Introduction

Superior mesenteric vein (SMV) or superior mesenteric-portal vein confluence (SMPV) tumor involvement without arterial involvement is not a sign of unresectable disease [1]. A comparison of a group of patients who underwent pancreaticoduodenectomy (PD) with SMV or SMPV confluence resection and a group of patients who underwent standard PD found no difference in perioperative mortality (0 deaths in both groups), rate of positive resection margin (13 vs. 16%, $P = 0.72$), number of positive lymph nodes (42 vs. 52%, $P = 0.38$), median length of hospital stay (16 vs. 15 days, $P = 0.39$) and median survival (22 vs. 20 months, $P = 0.25$) [2]. Thus, venous resection and reconstruction during PD is currently the standard of care in centers where surgeons have the experience for SMV or SMPV confluence resection and reconstruction [1,3]. The following methods for SMPV reconstruction have been reported: (1) patch angioplasty; (2) ligation of the splenic vein and primary portal vein and SMV anastomosis; (3) ligation of the splenic vein, and internal jugular vein interposition between the portal vein and the SMV; (4) primary portal vein and SMV anastomosis without division of the splenic vein; (5) internal jugular vein interposition between the portal vein and SMV without division of the splenic vein [1].

The use of SMV ligation and primary anastomosis of the portal vein and splenic veins has not yet been reported for PD performed for pancreatic cancer. However, the trauma literature has documented patient survival is possible following ligation

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of the SMV due to the establishment of collateral circulation [4,5].

Here we report a case of ligation of the SMV, and primary portal vein and splenic vein anastomosis during PD.

2. Presentation

A 62 year old Caucasian female presented with a three week history of jaundice, 7 pound unintended weight loss and mild epigastric abdominal pain. An endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic ultrasound were performed and the ERCP showed a high-grade distal common bile duct stricture with proximal dilation. Stenting of the common bile duct was then performed. Endoscopic ultrasound showed a 33.6 × 24.9 mm mass in the head of the pancreas. The mass was abutting the portal vein and multiple vascular collaterals were noted raising the possibility of invasion of the vein. A fine needle aspiration was also consistent with a moderately differentiated ductal adenocarcinoma.

A triphasic CT scan also confirmed a 3 cm × 2.5 cm low attenuation mass located in the head of the pancreas with dilation of the main pancreatic duct. Adenopathy was also present around the celiac artery. However, the fatty tissue plane around the celiac axis and SMA was present. There were near complete obstruction of portal vein flow and significant venous collateral circulation development (Fig. 1).

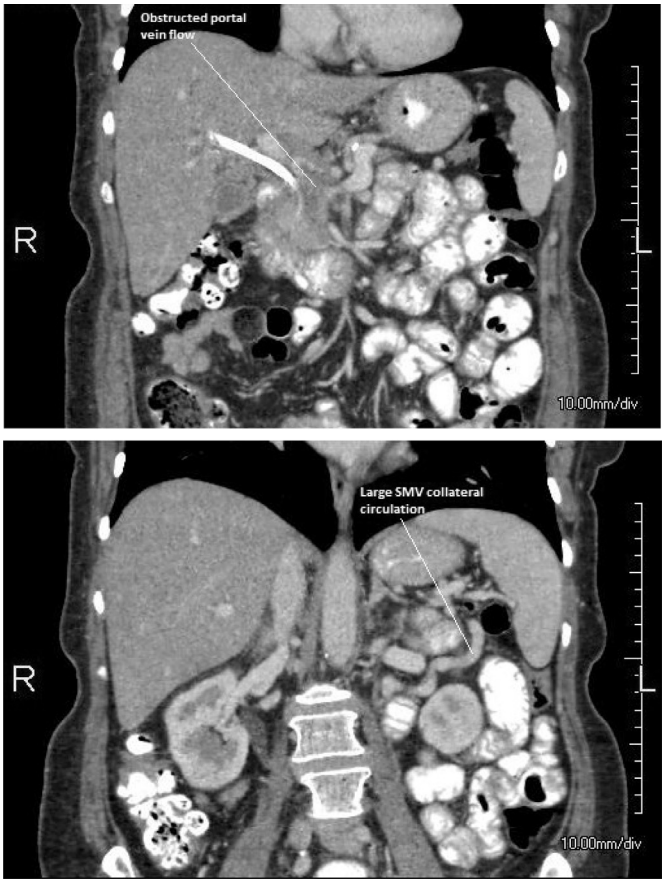

Fig. 1. Pre-neoadjuvant therapy triphasic CT scan: 3.2 cm × 2.5 cm head of pancreatic mass caused SMV/portal vein obstruction and superior mesenteric vein collateral circulation development.

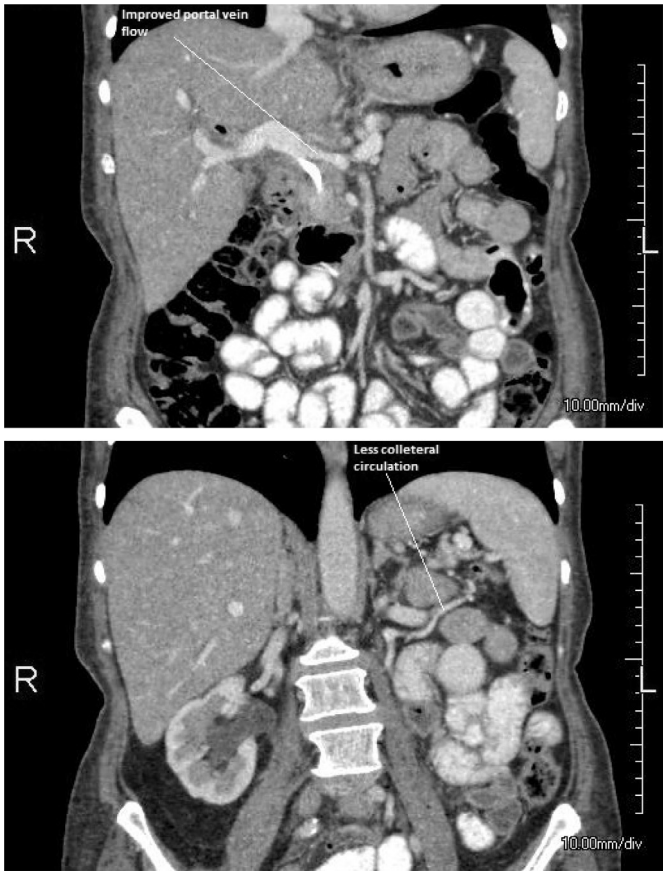

Fig. 2. Post-neoadjuvant therapy triphasic CT scan: Significant improvement of portal vein flow and diminished SMV collateral circulation.

3. Therapeutic intervention

Neoadjuvant chemoradiation therapy was performed with FOLFIRINOX protocol for three months.

A post neoadjuvant therapy CT scan showed a significant reduction of the size of the pancreatic mass from 3 cm × 2.5 cm to 2.3 cm × 2 cm, and the fatty tissues plane around the superior mesenteric and celiac arteries still remained. There were

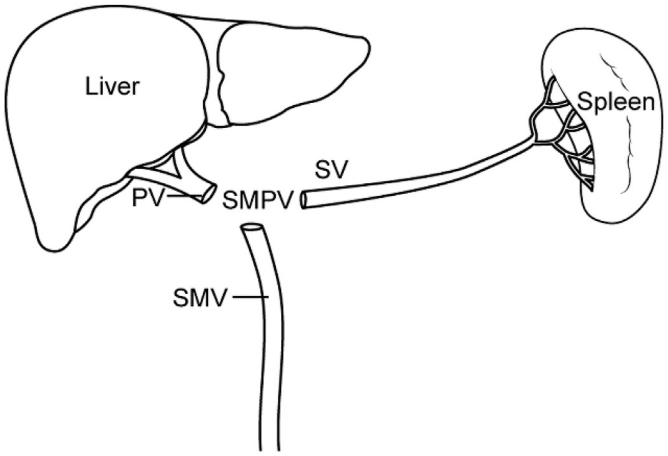

Fig. 3. Illustration of SMV and SMPV resection. (SMV: superior mesenteric vein; SMPV: superior mesenteric portal vein confluence; SV: splenic vein; PV: portal vein).