HBP Practical Clinics II

How to Reconstruct Following Resection of SMV-SV-PV Confluence in Pancreatoduodenectomy?

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Pancreatic carcinoma is the fifth-leading cause of cancer death in Korea and fourth-leading cause of cancer death in United States. Surgical resection is the only curative treatment, so far. However, only 20% of whole pancreas cancer patient can be candidate for surgical resection. In other words, remaining 80% of patients are inoperable at time of diagnosis for locally advanced or metastatic disease. Although there is no place of surgery for metastatic disease, some trials have been made for curative resection for locally advanced disease which is defined as the cases with arterial and/or venous invasion. However, the management of vascular encasement is still challenging procedure during Whipple's procedure. Therefore, when pancreatic surgeons sometimes encounter vascular encasement during pancreaticoduodenectomy for pancreas head adenocarcinoma, they can choose one management strategy among three options : (1) leave tumors attached to the vessel, resulting in a grossly positive margin of resection, (2) try to separate the tumor from the vessel, with a considerable hemorrhage risk, (3) perform a partial or segmental resection of the portion of invaded vessel with reconstruction. For arterial invasion, many authors still regarded this as contraindication to surgery, because of high morbidity and mortality rates associated with arterial resection and reconstruction. Also, periarterial neural plexus invasion frequently prohibits a pathologically curative resection for advanced pancreas carcinoma which invaded SMA of celiac axis. However, superior mesenteric vein or portal vein invasion, which is once considered a contraindication to surgery, is not in itself a criterion of unresectability, nowadays. First portal vein resection during pancreaticoduodenectomy was reported by Moore et al. in 1951 and Asada S et al. reported this procedure in an attempt to improve survival duration by performing en bloc resection of pancreas and surrounding structures in 1963. This concept was supported by Fortner form Unites States, who proposed "regional pancreatectomy" which involved the systemic resection of major peripancreatic vascular structures together with wide soft tissue clearance. Contrary to the beliefs of Fortner, radical or extended PD has not been demonstrated to confer a survival benefit.

However, vascular resection for isolated invasion of SMV, PV, or superior mesenteric-portal vein (SMPV) confluence has been reported for more than 10 years as the procedure to improve survival rate without significant complication since Fuhrman's report in 1996 from M.D. Anderson Cancer Center. They insisted that infiltration of portal vein/SMV was not a function of the biological aggressiveness of the tumor but of the proximity of the tumor to the pancreatic head. Since this report, several articles to confirm this theory were followed and showed that the outcome of pancreaticoduodenectomy is unaffected by portal vein resection. Also, we did not detect the prognostic significance of portal vein/SMV resection for 219 pancreas head cancer patients who underwent pancreaticedudentomy. With regard to reconstruction method, small opening due to limited tumor adhesion can be repaired using patch graft from great saphenous vein. In most of cases, end-to-end anastomosis can be a useful reconstruction method after portal vein/SMV resection. Complete mobilization of mesenteric root can facilitate a tension free anastomosis. Only rarely, vascular graft using autologous vein or artificial synthetic materials is necessary to prevent tension.

References

1. Moore GE, Sako Y, Thomas LB. Radical pancreaticoduodenctomy with resection and anastomsis of the superior mesenteric vein. Surgery 1951;30:550.
2. Asada S, itaya H, Nakamura K, et al. Radical pancreatectomy and portal vein resection. Arch Surg 1963;87:609.
3. Fortner JG. Regional resection of cancer of the pancreas: A new surgical approach. Surgery 1973;73:307.
4. Fuhrman GM, Leach SD, Staley CA, et al. Rationale for en bloc vein resection in the treatment of pancreatic adenocarcinoma adherent to the superior mesenteric-portal vein confluence. Ann Surg 1996;223:154.
5. Tseng JF, Raut CP, Lee FE, et al. Pancreaticoduodenctomy with vascular resection: Margin status and survival duration. J Gastrointest Surg 2004;8:935.
6. Michalski CW, Weitz J and Buchler MW. Surgery insight: Surgical management of pancreatic cancer. Nature Oncology 2007;4:526.
7. You DD, Lee HG, Heo JS, Choi SH, Choi DW. Prognostic factors ana adjuvant chemoradiation therapy after pancreaticoduodenctomy for pancreatic adenocarcinoma. J Gastrointest Surg 2009;13:1699.
8. Buchs NC, Chilcott M, Poletti PA and Morel P. Vascular invasion in pancreatic cancer: Imaging modalities, preoperative diagnosis and surgical management. World J Gastroenterol 2010;16:818.
9. Christian KK, Lal A, Pappas S, Quebbeman E, Evans DB. Poral vein resection. Surg Clin N Am 2010;90:309.
10. Thomas RM and Ahmad SA. Current concept in the surgical management of pancreatic cancer. Surg Oncol Clin N Am 2010;19:335.