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Portal vein reconstruction during Whipples pancreaticoduodenectomy for suspected malignant cyst of the pancreas.

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Abstract :

This case report illustrates the feasibility and good surgical outcome with portal vein reconstruction using prosthetic conduit along with pancreaticoduodenectomy for suspected malignant cyst of the pancreas.

Keyword :malignancy, portal vein reconstruction, pancreaticoduodenectomy, PTFE conduit

Introduction:

Carcinoma head of pancreas remains a debilitating illness, despite advances in chemotherapy and surgery. Portal vein resection has been attempted in order to increase the resectability of the lesion. The literature regarding increased survival rates after resection of involved portal vein along with a standard pancreaticoduodenectomy (PD) as compared to palliative chemotherapy remains debatable. The details of a patient who underwent successful PD for suspected malignanct cyst of pancreas alongwith portal vein reconstruction with

prosthetic graft is presented here. **Case details:**

Mr. K, a 40 year old male from Tamil Nadu presented with complaints of recurrent episodes of abdominal pain and distension. Physical examination revealed a large retroperitoneal mass in the epigastrium and right hypochondrium. Contrast-enhanced computed tomography showed a large cystic lesion involving the head of pancreas, suspected to be a cystadenoma. It was involving the portal vein/superior mesenteric vein (SMV) confluence. Superior mesenteric artery was not involved and there was no ascites or liver or lung metastases. The surgical gastroenterology team planned for Whipple's pancreaticoduodenectomy in collaboration with Vascular Surgery team for portal vein resection and reconstruction. Under general anaesthesia, through a midline longitudinal laparotomy, first the surgical gastroenterology team resected the lesion along with PD. The involved ends of the portal vein were clamped and resected causing a deficit of portal vein and SMV. Intravenous heparin 5000 units was

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administered. The SMV was mobilised. The cut end of inferior mesenteric vein (IMV) was mobilised. Reconstruction was done using a 8mm PTFE graft. Proximally it was anastomosed to the cut end of the portal vein end-to-end with 5/0 continuous polypropylene sutures. Distally, the graft was anastomosed to the cut end of SMV end-to-end with continuous 6/0 polypropylene sutures. A longitudinal graftotomy was made over the lateral aspect of the graft and the cut end of the IMV was anastomosed to the graft end-to-side with 6/0 continuous polypropylene sutures. Post-procedure, the bowel colour improved from dusky congestion to pink and the portal vein was filling well. Heparin was not reversed after completion of the procedure. The patient was monitored for haemodynamic instability in the post-anaesthesia care unit and extubated on the third day. Thereafter, he made an uneventful recovery and jejunostomy feeds were started. Postoperative duplex done on day 7 revealed flow in the reconstructed portal vein graft. He was continued on antiplatelet therapy. At follow up after 6 months, he was doing well and duplex showed that the PTFE graft was patent.

Discussion:

The management of cystic lesions of the pancreas has evolved along with our understanding of their natural history as well as improved diagnostic imaging and procedures. The International Association of Pancreatology came out with guidelines and recommendations for resection these cystic neoplasms of the pancreas. Whether these lesions deserve the same intensity of aggressiveness with respect to achieving a R0 resection as adenocarcinoma of pancreas is still controversial. On the other hand, pancreaticoduodenectomy (PD) is well accepted as the treatment of carcinoma of head of pancreas . The portal/SMV confluence is in close anatomical proximity to the head of pancreas and its involvement is usually considered locally advanced disease. However, even these patients have been shown to be

benefitted by combining an en bloc resection and repair of the portal vein. The current literature suggests that the addition of a venous resection does not cause an increase in morbidity and mortality over a standard PD. Importantly, results show that portal vein resection can lead to similar survival outcomes in samestage tumours. Advances in crosssectional imaging now allow precise examination of the pancreatic venous interface, but the extent of the disease can be underestimated even with the combination of multidetector computed tomography(CT), endoscopic ultrasound (EUS) and magnetic resonance imaging. The CT scan findings such as portal vein(PV) or SMV narrowing, PV wall irregularity, or circumferential involvement of the PV >90 degrees raise the suspicion of tumour involvement. An EUS scan can help identify PV involvement. Findings of irregular venous walls, loss of interface, and proximity of the tumour mass can also raise the suspicion of PV involvement. Various methods are currently used for portal vein reconstruction. Adequate mobilisation of the liver and small bowel can allow a 3-cm seqment to be bridged and an end-toend direct repair performed. Various conduits for reconstruction can also be used including, bovine pericardium, autologous saphenous, internal jugular or left renal vein. Currently, there are no randomised control trials (RCT) or metaanalysis assessing the potential benefit of the addition of venous resection to PD. Therefore, we have to rely on data from numerous large case series and a systematic review. Performing a RCT of venous resection

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may be difficult since most fit patients with a borderline resectable tumour will undergo a trial of dissection and the extent of disease is only fully determined intraoperatively. Yekebas et al recently reported on 585 patients operated between 1994 and 2005 and compared patients undergoing venous resection with those undergoing a standard PD on an intention to- treat analysis. They showed comparable median survival rates (15 months versus 16 months; P = 0.086)

with no difference in peri-operative morbidity and mortality and concluded that venous resection at the time of PD can be offered with similar morbidity and mortality and offers these patients longer survival times than palliative chemotherapy. Similarly Riediger et al analyzed 165 patients undergoing PD and reported similar postoperative morbidity (23% versus 35%) and mortality (3.5% versus 4.1%) rates for patients undergoing PD without and with the need for venous resection. Long-term survival was not influenced by the need for portal or SMV reconstruction in any of the tumour groups. Tseng et al reported similar long-term survival in 141 patients who underwent PD with portal venous reconstruction from the MD Anderson Cancer Center. SMV-portal vein resections included tangential resection with vein patch (n = 36), segmental resection with primary anastomosis (n = 35), and segmental resection with autologous interposition graft (n = 55). Median survival was 23.4 months in the group which required venous reconstruction and 26.5 months in the group which underwent standard PD(P = 0.177). They concluded that properly selected patients who require venous reconstruction have a similar survival to those undergoing standard PD and better survival by comparison to historical data reporting survival of patients treated non-operatively. However despite these encouraging results, evidence in favour of arterial resection

is scanty and confined to small, mostly retrospective series. The majority of published series conclude that arterial involvement is a contra-indication to resection due to the high rate of operative morbidity, a high R1 resection rate and doubtful survival benefit. There are very valid concerns such as increased operating times, higher blood loss and greater transfusion requirements associated with pancreatic resections including venous resection compared to standard resections.

Conclusion:

The general consensus now appears to be that pancreatic resection with portal venous resection has evolved into a safe procedure with zero operative mortality especially in high-volume centres. There remain, however, on-going concerns including a high R1 resection rate and positive lymph node status, and limited survival benefit.

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Figures: Figure 1 A Reconstruction using vein patch. B Reconstruction using a femoral vein interposition graft. Courtesy Lee et al. JVasc 2010



Fig.3 Proximal anastomosis of the portal vein to the graft being performed



Fig. 4 After completion of portal vein repair to end of SMV, and IMV as an end-toside anastomosis onto the graft



Fig.2 Resected pancreatcoduodenectomy specimen



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