



Surgery

PYLORUS PRESERVING PANCREATODUODENECTOMY (PPPD) FOR PERIAMPULLARY CARCINOMA - OUR EXPERIENCE OF 6 CASES

Km Garg

Professor, Hod , Department of Surgery, Jaipur National University Institute of Medical Sciences and Research Center (JNUIMSRC), Jagatpura, Jaipur, India.

Reetesh Kumar Pathak*

Asisstant Professor, Department of Surgery, Jaipur National University Institute of Medical Sciences and Research Center (JNUIMSRC), Jagatpura, Jaipur, India.
*Corresponding Author

ABSTRACT Pancreaticoduodenectomy (PD) is the standard surgical treatment for resectable periampullary tumors. It can be performed with or without pylorus preservation. Here in we present our experience of 6 cases of pylorus preserving P D (PPPD) for periampullary carcinoma, and our results show that PPPD is atleast as good as classic PD, if not better in some aspects.

KEYWORDS : Pancreaticoduodenectomy, Periampullary carcinoma, Pylorus preserving

INTRODUCTION:

Pancreatic carcinoma is the fourth common malignancy and is associated with an extremely poor prognosis, reflected by a median survival of <6 months and a 5 year survival of <5%^{1,2}. Currently, surgical resection provides the only hope of a cure for periampullary and pancreatic carcinoma, whereas high rates of post operative complications remain significant causes of mortality and markedly prolonged hospitalizations³. Traverso and Longmire in 1980, published their experience in PPPD for malignant lesions which included 18 patients with periampullary, duodenal, and pancreatic carcinomas with encouraging results of normal gastric emptying and acidity⁴. Since, PPPD has been applied widely to patients with peri-ampullary lesions, benign, or malignant. In spite of the reported good outcomes of PPPD, many surgeons still question the benefit of this procedure especially the reported high incidence of delayed gastric emptying and, more importantly, the negative impact that pylorus preservation has on tumor clearance, recurrence, and long-term survival. Herein we present our experience of PPPD in six cases of periampullary carcinoma.

Methods:

This is an ongoing longitudinal study which started in 2016 at teaching institute JNUIMSRC, Jaipur, India. Though we had many patients of pancreatic cancer only 6 patients were considered suitable for the study. 5 patients were male and 1 patient was female. Age range was 36 to 72 years; with mean age 50 years.

Detail history was obtained from all patients and all necessary investigations were done with emphasis on liver function, kidney function, coagulation profile, CA 19-9, USG abdomen, upper GI endoscopy and biopsy whenever indicated. CT scan of abdomen to see the extent of disease and involvement of vascular structures around pancreas. Patients in which the tumor is fixed to portal vein or SMV and patients with liver metastasis, ascitis, peritoneal metastasis were excluded from study.

Wherever necessary MRCP/ ERCP with biliary stenting was done (bilirubin levels have gone >22mg%) and then considered for surgery. We did not have the facility of endoscopic ultrasound. Preoperative preparation was done as for any surgery in a obstructive jaundice case.

All patients were operated by right subcostal skin incision which was extended to left side (roof top).

Technical considerations:

In both the classic PD and PPPD, the head of pancreas, duodenum, and distal bile duct are resected. The main difference is that in classic PD, the gastric antrum and pylorus are resected with the creation of a gastro-jejunosomy while in PPPD, the gastric antrum and pylorus are preserved and the line of resection is through the first part of duodenum and a duodeno-jejunosomy is performed.

In present series 6 patients with diagnosis of periampullary cancer underwent Pylorus preserving Pancreaticoduodenectomy. In all patients, R-0 resection was achieved. Standard anastomosis between pancreas and jejunum (pancreatico jejunostomy (PJ) by dunk-in method, on an antimesenteric border, followed by biliary enteric anastomosis- single

layer end to side Hepatico-jejunosomy (HJ) almost 8cm from PJ, and then duodeno-jejunal anastomosis- two layer, on same jejunal loop about 25cm from HJ.

All patients during postoperative period were closely observed in surgical ICU for 48 to 72 hours

On 4th post operative day onwards patients were kept on enteral feeding through jejunostomy. Drain amylase was done on 3rd, 5th and 10th postoperative day, to see any pancreatic leak. Chest physiotherapy started immediately on 2nd postoperative day. All patients were given DVT (Deep Venous Thrombosis) prophylaxis by LMH (Low Molecular Weight Heparin).

Results:

Overall 6 patients underwent PPPD, 5 were males and one was female. Age range was from 36 to 72 years with mean age as 50 years.

All patients presented with jaundice and pain in abdomen. Two patients underwent prior ERC and stenting of biliary tree. Contrast enhanced CT abdomen was done in all cases with aim to assess extent of disease around the major vascular structures. Average operating time was 240 to 270 minutes. All patients had histopathological diagnosis of adenocarcinoma periampullary region.

In present series, pancreatic leak was noted in one male patient, demonstrated by wound discharge and subsequent wound dehiscence with presence of high levels of amylase in drain fluid from 3rd post operative day.

Delayed gastric emptying was not a matter of concern in our cases, however the patient who developed pancreatic leak did complain of vomiting but it subsided during subsequent 6 week time.

Mortality was not reported within 40 days of surgery, however one patient after 8 months of surgery developed metastases and succumbed. Out of 5 surviving patients, 2 have lived for 3 years and rest 3 varying from 6 months to 18 months.

Comments

Pancreaticoduodenectomy (PD) is the primary surgical treatment for patients with periampullary and pancreatic carcinoma. The standard PD operation involves removing the pancreatic head, duodenum, common bile duct, gall bladder with (or without), the distal portion of the stomach associated with the adjacent lymph nodes⁵. Pylorus-preserving PD (PPPD) is similar with the exception that the pylorus and first portion of the duodenum are preserved and continuity is restored through duodeno-jejunosomy.

Age:

Although age is a risk factor, current studies suggest that PD is an acceptable option for elderly patients⁶. In a review of outcomes of PD completed on 385 patients, 23 patients who were 80 years or older were assessed from 1998 to 2011. When comparing younger patients versus those >80 years of age, the study demonstrated that complication rate (40% vs 43%),

mortality rate (4% vs 0%), and overall median survival for pancreatic cancer patients were not statistically different between the groups⁶. In present series also a male patient of 72 years, had an uneventful post operative period, though he developed metastases and died after 8 months of surgery.

Hence, age and chronic illnesses are no longer a contraindication to surgical treatment. Life expectancy and quality of life at a later age have improved, making older patients more likely to receive pancreatic surgery, thereby also putting emphasis on operative patient selection to minimize complications.

Rather than chronologic age, it is more important to consider patient's performance status and comorbidities and base the decision to operate on a careful and individual risk-benefit analysis.

Operating time:

Many researchers have reported shorter operating time in PPPD as compared to PD, this observation has been further supported by a meta-analysis that PPPD was, 72 minutes shorter⁷, and 41.3 minutes shorter⁸. This shorter operating time is beneficial in overall outcome.

Blood loss and need for blood transfusion:

Several reports have indicated no significant difference in intra-operative blood loss and blood transfusion between PPPD and PD. In a meta-analysis, however, although there has been no significant difference in blood loss, rather more patients in the PD group have required blood transfusions⁸, that could be partly due to the fact that there is less dissection in PPPD.

Operative mortality:

Perioperative mortality was none in present series.

Two meta-analysis studies have shown a trend toward lower perioperative mortality in the PPPD Group^{7,8}. However, in a randomized controlled trial comparing 13 patients with CPD to 14 patients with PPPD has shown no significant difference in mortality (15.4% and 28.6%, respectively, P-value 0.65) but these are very high mortality rates for any pancreaticoduodenectomy in comparison to the widely reported 3% in most studies⁹.

Postoperative complications:

Delayed gastric emptying (DGE): DGE is probably the most studied complication following any type of pancreaticoduodenectomy and has been reported to occur in 1~6% of patients³. Although postoperative DGE is not life threatening, it results in decreased quality of life and impaired oral intake. There has always been the thought that pylorus preservation would increase the chance of DGE. However, no significant difference in DGE was found in PD and PPPD groups.

In our cases only one patient had DGE, which improved with passage of two month's time.

Anastomotic leak:

Anastomotic leak, especially from pancreaticojejunostomy (PJ), is the main factor for morbidity post-PD. A review of 1066 PPPDs in Japan has revealed a leak rate of 16%¹⁰. In a randomized, controlled trial and two meta-analyses, there has been no difference between CPD and PPPD in terms of PJ leak rate^{7,8,9}.

one of our patient had PJ leak, which led to wound sepsis and later disruption, managed by adhesive bag appliance application and feeding via jejunostomy.

Hospital stay:

Average patients required one week preoperative preparation to normalize their deranged LFT's. 5 of our patients were discharged from hospital between 12-14 post operative day on oral diet. However, one patient who developed PJ leak was discharged from hospital on 38th post operative day.

Usually, the reason for a prolonged hospital stay is anastomotic leak. However researcher failed to indicate that PPPD causes an increase in hospital stay⁸. In fact, one meta-analysis showed a trend toward a shorter hospital stay with PPPD⁷.

CONCLUSION:

In summary, as medicine continues to advance, better early detection programs are implemented, the aging population will increase, and age will no longer be a contraindication for surgery for curative intent. Therefore, meticulous perioperative evaluation, rehabilitation and postoperative care of the patient must continue to play a critical role in improving the survivorship.

Ampullary carcinoma arises from the ampulla or papilla of Vater. Owing to the location of these lesions, the patients present with symptoms earlier at the time of diagnosis, and these lesions have a high rate of being successfully resected. Because there is a lower risk of invasion, these patients should be offered pancreaticoduodenectomy and lymphadenectomy even with positive lymph nodes.

REFERENCES:

1. Topal B, Fieuws S, Aerts R, Weerts J, Feryn T, et al. (2013) Pancreaticojejunostomy versus pancreaticogastrostomy reconstruction after pancreaticoduodenectomy for pancreatic or periampullary tumours: a multicentre randomised trial. *Lancet Oncol* 14:655-662.
2. Siegel RL, Naishadham D, Jemal A (2013) Cancer statistics, 2013. *CA Cancer Clin* 63:11-30.
3. Mezhir JJ (2013) Management of complications following pancreatic resection: an evidence-based approach. *J Surg Oncol* 107:58-66.
4. Traverso LW, Longmire WP., Jr (1980) Preservation of the pylorus in Pancreaticoduodenectomy, a follow-up evaluation. *Ann Surg* 192:306-10.
5. Loos M, Kleeff J, Friess H, Buchler MW (2008) Surgical treatment of pancreatic cancer. *Ann NY Acad Sci* 1138:169-180.
6. Beltrame V, Gruppo M, Pastorelli D, Pedrazzoli S, Merigliano S, Sperti C. (2015) Outcome of pancreaticoduodenectomy in octogenarians: single institution's experience and review of the literature. *J Visc Surg* 152(5):279-284.
7. Karanicolas PJ, Davies E, Kunz R, Briel M, Koka HP, Payne DM, et al. (2007) The pylorus: take it or leave it? Systematic review and meta-analysis of pylorus-preserving versus standard Whipple pancreaticoduodenectomy for pancreatic or periampullary cancer. *Ann Surg Oncol* 14:1825-34.
8. Iqbal N, Lovegrove RE, Tilney HS, Abraham AT, Bhattacharya S, Tekkis PP, et al. (2008) A comparison of pancreaticoduodenectomy with pylorus preserving pancreaticoduodenectomy: meta-analysis of 2822 patients. *Eur J Surg Oncol* 34:1237-45.
9. Srinarmwong C, Luechakietisak P, Prasitvilai W. (2008) Standard Whipple's operation versus pylorus preserving pancreaticoduodenectomy: a randomized controlled trial study. *J Med Assoc Thai* 91:693-7.
10. Yamaguchi K, Tanaka M, Chijiwa K, Nagakawa T, Imamura M, Takada T. (1999) Early and late complications of pylorus-preserving pancreaticoduodenectomy in Japan. *J Hepatobiliary Pancreat Surg* 6:303-11.