Original Research Article

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Audit of 62 cases of pancreatic resections for pancreatic cancer

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ABSTRACT

Background: Varieties of pancreatic pathologies, needs resection of pancreatic tissue. Adenocarcinoma of the pancreatic duct is the most common malignancy presenting with early metastasis and seen as resistant to alternative treatment regimens currently available. Management and handling of such tumors is a complex and challenging task for a surgeon. Surgical resection offers an improved prognosis, with a median survival after resection of 14-20 months and up to 25% 5-year survival rates. Present study is aimed at presenting data of 62 pancreatic resections for various malignant pancreatic lesions.

Methods: This is an ongoing longitudinal study which started in 2009 at teaching institute in central India. Though we had 109 patients for pancreatic resection, only 62 patients were considered suitable for the study. All patients after admission were thoroughly investigated and then considered for surgery. 48 patients were male and 14 patients were female. Age group was ranging from 33 to 65 years with mean age between 45 to 55 years. Spectrum of various malignancies and different types of pancreatic resections were done and results are presented here.

Results: Pancreatic adenocarcinoma is an aggressive malignancy responds to surgical treatment better than other alternative modalities. In the present series out of 62 patients 27 patients with pancreatic head cancer, 22 patients with periampullary cancer, 2 patients with duodenal cancer, 6 patients with distal cholangio carcinoma, 1 patient with mucinous cystadenocarcinoma. 4 patients with body and tail of pancreas cancer. Average age 38 to 65 years, 47 males and 15 females. Commonest procedure was Whipple's operation, and distal pancreatectomy. Survival in present series was 18 -24 months and 5-year survival was 12 % that is seen mainly with Periampullary cancer.

Conclusions: Surgery is the only chance of cure or long-term survival in pancreatic cancer. Chemo radiation as a primary therapy is ineffective. But some reports suggest the improved quality of life with palliative chemotherapy. Biology of the disease is the king and dictates the survival, the type of surgical procedure had no impact on survival, nor on morbidity and mortality.

Keywords: Complications, Outcomes, Pancreatic cancer, Pancreatic resections

INTRODUCTION

A variety of pancreatic pathologies, malignant and benign, may need to remove the pancreatic tissue to varying extent. Resection of head includes standard pancreaticoduodenectomy or but less extensive resections can also be performed in the form of central pancreatectomy or distal pancreatic resection. Pancreatic ductal carcinoma is the most common malignancy of

pancreas, presents with early metastasis which is resistant to alternative treatment regimens available currently. Handling of such a disease is a complex and challenging task for operating surgeon or his conservative medicine team. ¹⁻³ Surgical resection offers significantly improved prognosis with a median survival 14-20 months and 5 year survival rates 8%. ^{4.5} When surgical resection was compared with radio chemotherapy for resectable pancreatic cancer, patients in operative group done fairly

well with median survival of 17 months versus 11 months chemoradiation group.^{6,7} Few studies report improvements especially with regard to quality of life, are primarily due to use of gemcitabine as first line chemotherapy.8 Standardized surgical treatment for head pancreas cancer, duodenal cancer. distal cholangiocarcinoma, periampullary cancer was Whipple's or it's pylorus preserving modification. While for tumors of body and tail of pancreas needs distal pancreatectomy. Many studies report the role of adjuvant chemotherapy is advantageous in prolonging the overall survival, while the neo adjuvant chemotherapy is still in the phase of infancy.9 With this in mind we aimed our study to present the data of 62 cases of various pancreatic resections for cancer of pancreas.

METHODS

This is an ongoing longitudinal study which started in 2009 at teaching institute in central India. Though we had 109 patients of pancreatic cancer only 62 patients were considered suitable for the study. As other 47 patients had pancreatic cancer with metastasis, so excluded from our study. 48 patients were male and 14 patients were female. Age group was 33 to 65 years with mean age between 45 to 55 years.



Figure 1a and 1b: Specimen of periampullary cancer (pancreaticoduodenectomy).

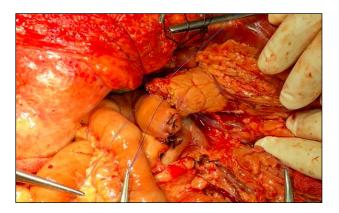


Figure 2: Duct to mucosa pancreatic jejunostomy.

PV is in picture.



Figure 3: CT scan pancreatic head cancer.



Figure 4: septate lesion in the pancreatic body and tail.



Figure 5: mucinous cystadenocarcinoma of body and tail of pancreas.

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 > 22 mg%) and then considered for surgery. We did not have the facility of endoscopic ultrasound. All patients were subjected for

preoperative laparoscopy to assess the operability. Preoperative preparation was done as for any major case, all patients who had major pancreatic resections were closely observed in surgical ICU for 48 to 72 hours. 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). Spectrum of various malignancies and pancreatic resections done, results are presented here, relevant differences in morbidity and mortality of the surgery, i.e Whipple's over pylorus preserving pancreatico duodenectomy (PPPD) and survival between two procedures.

Technical considerations

Pancreaticoduodenectomy has evolved since Kausch, who performed first successful operation in 1912 but it was associated with lot of morbidity and mortality. Pancreaticoduodenectomy consists of three steps, exploration, resection and reconstruction of the gastrointestinal continuity. As of now because of the modification in the technology the procedural morbidity has come down considerably. Classical Whipple's operation consists of removal of head of pancreas with duodenum with pylorus with 1st few centimeters of jejunum resulting into various complications like gastric dumping. In present series 27 patients with diagnosis of head cancer, 22 patients with periampullary cancer, 6 patients with distal cholangiocarcinoma, 2 patients with duodenal cancer underwent Whipple's operation or its (Pylorus modification. preserving Pancreaticoduodenectomy). 5 patients with body and tail tumors had distal pancreatectomy with or without splenectomy. In all patients, R-0 resection was achieved. Standard anastomosis between pancreas and jejunum (duct to mucosa pancreatico jejunostomy, pacreatico jejunostomy by dunk in method, on antimesenteric boarder, followed by biliary enteric anastomosis and then gastrojejunal anastomosis. The distances between all these anastomoses were almost 8 cm from each other. Gastrojejunostomy was almost 25 cm from PJ (Pancreatico Jejunostomy) of jejunum, in two layers by absorbable 4-0 PDS sutures the method of anastomosis depends on whether the pancreas is soft or fibrosed. Wherever it is soft pancreas dunk in method is followed, otherwise it was duct to mucosa anastomosis.

RESULTS

Out of 62 patients 48 (77.41%) males, 14 patients (22.59%) females. Age group was 33 to 65 years with mean age between 45 to 55 years. Present study group was consisting of 62 patients. Of 62 patients, 27 (43.54%) with pancreatic head cancer, 22 patients (35.48 %) with periampullary cancer, 2 patients (4.22 %) with duodenal cancer, 6 patients (9.6%) with distal cholangio carcinoma, 1 patient (1.61%) with mucinous cystadenocarcinoma involving body and tail. 4 patients (6.45%) with body and tail of pancreas cancer (Table 1).

55 patients (88.70%) presented with jaundice. 2 patients (3.22%) presented with signs of gastric outlet obstruction. On upper GI endoscopy followed by histopathology, confirmed the diagnosis of adenocarcinoma of duodenum. Pain in abdomen with or without mass and vague abdominal symptoms was the presentation in patients with body and tail of pancreas cancer in 5 patients (6.45%).

Pancretic resection for No. of patients Operation performed 3-5 year survival Cancer head of pancreas 27 Classical whipple's Pylorus preserving Pancreato duodenectomy 4 Patients (18%) Periampullary cancer 22 Duodenal cancer 2 Classical whipple's No patient surviving Distal Cholangiocarcinoma Classical whipple's No patient surviving 6 Cancer body and tail of pancreas 4 Distal pancreatectomy No patient surviving Mucinous cystadenocarcinoma Distal pancreatectomy 1 patient surviving

Table 1: Location of pancreatic cancer, number of patients, operation performed, survival.

Initial USG followed by CT Scan complementing the diagnosis along with ERCP/MRCP, in properly selected patients. We did not do endoscopic ultrasound and guided biopsy, because of financial constraints, MRI for lymph node mapping was not done in the present study. CT scan was basically aimed to assess extent of disease around the major vascular structures. We did not favor major vascular resections in our series. Of 62 patients 57 (92%) underwent Whipple's Pancreatico duodenectomy. Of 57 patients 35 (61) had classical whipple's and 22 patients (39%) had PPPD operation. 5 patients (8%) underwent distal pancreatectomy with 4 patients had splenectomy

because of close proximity of the tumor to splenic hilum. Average operating time 180 to 270 minutes in Whipples, time required for distal pancreatectomy was between 180 to 220 minutes. Average blood loss was 150 ml to 200 ml. Not a single patient had blood transfusion intraoperatively. All patients had histopathological diagnosis of adenocarcinoma, 1 had mucinous cystadenocarcinoma. Morbidity and hospital mortality was calculated and survival was estimated by the Kaplan-Meier method using the date of operation as the starting point and death as the end point. In the present series we had pancreatic leak in Whipples in 4 (7%) patients. All 4

patients had hospital mortality (7%). All pancreatic leaks were demonstrated by wound discharge and subsequent wound dehiscence with presence of high levels of amylase in drain fluid done from 3rd and 7th post-operative day. Pancreatic leak was demonstrated on day 4 to day 6. One patient (1.75%) with bile leak from hepaticojejunostomy, was treated conservatively stopped after 2 weeks.

All remaining patients were followed up and average survival in patients with head cancer was 16 to 20 months. With no patients survived for five years but we noted 3 years survival in head cancer group. Not a single patient with cholangio carcinoma survived more than 12 to 16 months. While Periampullary cancers were surviving from 24 to 40 months. It is this group where we had 5-year survival after surgery in 4 patients (18%). Patients with distal pancreatic resection for body and tail of pancreas, mucinous cystadenocarcinoma the patient is still surviving after 5 years. Average survival for adenocarcinoma of body and tail of pancreas in the present series was 12 to 18 months. No patients survived after 18 months. 2 patients with duodenal cancer also died within 18 months.

DISCUSSION

Pancreatic resections are described for various pancreatic and peripancreatic tumors since the era of Kausch and whipple. Pancreatic ductal adenocarcinoma is found to be one of the commonest pathology, followed by ampullary or periampullary cancer, distal cholangio carcinoma, needs Whipple's procedure. Tumors of body and tail are treated by distal pancreatectomy. 1-3 Surgical resection offers significantly improved prognosis with a median survival 14-20 months and 5 year survival rates less than 7-10% Table 1.1,4,5 Current scenario in such a tricky situation is a difficult proposition as outcome with other alternative therapies are not acceptable in terms of survival and quality of life.⁶⁻⁸ Some recent reports show improved survival with Gemcitabine as a first line of therapy.9 In the present series males are the sufferers of pancreatic cancer, out of 62 patients, 48 (77.41%) males, 14 patients (22.59%) females, age group was 33 to 65 years with mean age between 45 to 55 years. Of 62 patients, 27 (43.54%) with pancreatic head cancer, 22 patients (35.48 %) with periampullary cancer, 2 patients (4.22 %) with duodenal cancer, 6 patients (9.6%) with distal cholangio carcinoma, 1 patient (1.61%) with mucinous cystadenocarcinoma involving body and tail. 4 patients (6.45%) with body and tail of pancreas cancer. As per available literature incidence of pancreatic head cancer is between 0.3 to 13.7/100000.9 Duodenal cancer is a relatively uncommon neoplasm, which accounts for approximately 6% of periampullary malignancies with an incidence estimated at 2.9 cases for million population and accounts for approximately 0.2% of gastrointestinal tract carcinomas. SWS 50% done for duodenal adenocarcinoma had overall 5 year survival varies widely according to the series published, but is generally reported to be >50% in case of curative resection. 10,11 Distal cholangio carcinoma (DCC), in a study of 56 DCC, mean age was 65±15 years. The median overall survival (OS) was 36.9 months, recurrence occurred in 35 patients (67%) mostly in the liver (37%) median DFS was 14.6 months Table 2.12,13

Table 2: Survival data of pancreatic resection for pancreatic cancer patients.

References	Time period	Additional treatment	Number of patients	Median survival in months	5-year survival
Capussotti et al ²⁰	1988-1998	No adjuvant	100	-	8.4%
Carpelan-Holmatorm et al	1990-1996	Not documented	10	-	0.25%
Mosca et al ²¹		No adjuvant treatment	69	16.9	11%
Neoptolemos et al ⁹	2000	Chemoradiation	73	13.9	7%
Present study	2009-	No adjuvant therapy	62	12-18	6% periampullary
	2017				group.

In the present study group of 62 patients, 57 (92%) underwent Whipple's pancreaticoduodenectomy. Of 57 patients 35 (61%) had SWS and 22 patients (39%) had PPPD operation. 5 patients (8%) underwent distal pancreatectomy with 4 patients had splenectomy because of tumor reaching splenic hilum. A 2014 Cochrane review examined six randomized controlled trials (RCTs) comparing classic Whipple pancreaticoduodenectomy with PPPD in a total of 465 patients with periampullary or pancreatic carcinoma. ¹⁴ The authors found no relevant differences in mortality, morbidity, or survival between the two operations. This review was updated in 2016 to include eight RCTs with a total of 512 participants.

Again, the investigators found no evidence of any relevant differences in mortality, morbidity, and survival between the two operations, though some perioperative outcome measures favored PPPD to a significant degree. Postoperative pancreatic fistula (POPF) is the main cause of fatal complications after whipple's operation (Table 3.) There is still no universally accepted technique for Pancreaticoenterostomy, especially in patients with soft pancreas. Modified Blumgarts method is safe and simple and improves postoperative outcomes. In the present series average operating time 180 to 270 minutes in whipples, median duration of the SWS was 265 (range 203-475) minutes with median

blood loss was 570 (50-850) ml. Time required for distal pancreatectomy was between 180 to 220 minutes. Average blood loss is between 150 ml to 200 ml. In the present series, not a single patient had blood transfusion

intraoperatively. Average hospital stay after SWS was, 17.5 to 19.7 days, with about 27 patients discharged with normal 12 days' time. Study published in 2013 reports hospital stay (19.7±7.7) days.

Table 3: Mortality and morbidity after pancreatic resections for pancreatic cancer.

References	Time period	Number of patients	Mortality	Morbidity
Buchler et al ⁵	1993-2001	468 SW/PPPD	1.3%	36%
Capussotti et al ²⁰	1988-1998	149 whipple's SW	5.4% (60 days)	37.5 %
Richter et al ⁶		PPPD		34.4%
Fahy BN, Frey CF ²²	1997-2002	51 patients distal pancreatic resection	0-4%	47%
Present study	2009	62 patients SW, PPPD, DPR	8%	36%

Post OP complications occurred in 62.5% (95/152 and mortality was 3.29% (5/152) delayed discharge is associated with postoperative complications age, BMI, surgical procedure, blood transfusion, fluid input. 16,17 In the patients who had PPPD, median operating time was 232 (165-270) minutes and median blood loss was 100-1300 cc. Pancreatic leak 5.5% delayed gastric emptying was observed more frequently with PPPD 6/14 than after SWS none of 19 patients (p<0.05). There is no significant difference between the SWS and PPPD in terms survival and 5-year survival rate. Recent reports suggest median survival was 16 months and 5-year survival was 9.4% in 36 patients. Blood loss during the operation influenced the prognosis. 18-21

All patients had histopathological diagnosis of adenocarcinoma; 1 had mucinous cystic adenocarcinoma. Distal pancreatectomy was first performed by Billroth in 1884, accounts for approximately 25 percent of all pancreatic resections. Distal pancreatic resections can be performed with low rate of mortality, though incidence is pancreatic leak is a common cause of morbidity. The method of pancreatic stump closure may influence postoperative morbidity. ²²

CONCLUSION

Pancreatic resections are performed with some morbidity and mortality, technical differences in managing both the resection and reconstructive parts of operation depend on surgeon's preference rather than actual guidelines. In current scenario, pancreatic resection for pancreatic cancer seems to be the best possible option in terms of quality of life and survival.

Earlier diagnosis as a result of more sophisticated investigations, improved neo adjuvant or adjuvant chemotherapy together with targeted therapies are likely to improve the dismal prognosis with pancreatic cancer patients in near future. However, all these surgical resections and newer treatment modalities have to be evaluated in controlled clinical trials with optimal statistical analysis.

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Ethical approval: The study was approved by the

institutional ethics committee

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