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Original Research Article

Spectrum of elective pancreatic surgeries with short term outcomes at a tertiary hospital in North India

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ABSTRACT

Background: Pancreatic surgeries have undergone substantial changes over the last few decades and are now being attempted by many surgeons not limited to specialised centres. The study has attempted to document the indications for elective pancreatic surgeries and its outcomes in terms of morbidity and mortality.
Methods: This observational study included 42 patients over a period of 12 months. The data were recorded in a predesigned proforma to assess the indication for elective pancreatic surgery, to describe the number and kind of pancreatic operation undertaken and to evaluate the short-term outcome of various pancreatic surgeries in terms of complications, morbidity and mortality.
Results: Authors studied 42 patients, who underwent the elective pancreatic surgeries for various indications in hospital. Histopathological studies revealed that the majority (50%) were carcinoma of the head of pancreas. Pancreaticoduodenectomy (PD) was done in all the sixteen cases. The most important complications of PD were delayed gastric emptying (DGE) (50%), surgical site infection (SSI) (43.7%), post pancreatic haemorrhage (PPH) (31%), post-operative pancreatic fistula (POPF) (25%) and intra-abdominal abscess (IAA) (12.5%). Of the 26 patients operated for benign conditions of pancreas, 19 (73%) had pancreatic pseudocyst, in majority of cases as a sequela of alcohol induced pancreatitis. Partington Rochelle procedure was the commonest surgical procedure in chronic pancreatitis.
Conclusions: Carcinoma of head of pancreas was the most common periampullary malignancy necessitating major pancreatic resections. DGE, POPF and PPH were the most common and significant post-operative complications.

Keywords: Delayed gastric emptying, Intra-abdominal abscess, Pancreaticoduodenectomy, Post-pancreatectomy haemorrhage, Post-operative pancreatic fistula, Surgical site infection

INTRODUCTION

Pancreatic surgery is one of the most challenging endeavours for the surgeons due to its anatomical position in the retroperitoneum, involvement of adjacent organs in the disease process and life-threatening complications which are extremely challenging to manage. The mortality and morbidity rates for major pancreatic resections are reported to be 2% and 30-60 %.[1] The improved safety with which pancreatic resections are now performed has led to several changes in the practice of pancreatic cancer surgery i.e. inclusion of broader range of indications e.g. borderline resectable tumours, intraductal papillary mucinous neoplasms, and with fewer complications and improved survival.[2]

The various benign conditions necessitating elective surgical intervention are pseudo cyst of pancreas and chronic pancreatitis. There are a wide variety of surgical procedures performed for all these conditions. For pseudocyst of pancreas, surgical procedures done are cystogastrostomy, cystojejunostomy and cystoduodeno-

stomy. These procedures are currently more frequently being done through laparoscopic approach. The surgical procedures offered for chronic pancreatitis might be of resection or decompression type or drainage procedures. Drainage procedures are reserved for those having ductal strictures, stones and pseudocysts, whereas resection procedures benefit those having inflammatory masses in head. Nevertheless, many patients need a combination of these two methods. Laterolateral pancreaticojejunostomy (Partington Rochelle procedure) and Puestow procedure are commonly employed drainage procedures. PPPD and DPPHR are common resection procedures. Frey's procedure and Beger's procedures employ combination of both.

Most common resection procedures for pancreatic malignancies are Whipple procedure, Pylorus preserving pancreaticodudodenectomy and distal pancreatectomy. Though open approach is most widely practiced, laparoscopic resections are becoming more frequent.[3] Though the operative mortality following major pancreatic resections is less than 2%, the morbidity is still significant (22-47%).[4] Important complications are pancreatic fistula (PF), delayed gastric emptying (DGE), post-pancreatectomy haemorrhage (PPH), surgical site infection (SSI), intra-abdominal abscess (IAA), pancreatitis, etc. But these complications have become less frequent in recent years.

The aim of this study is to assess the indications of elective pancreatic surgery and to observe and evaluate the operative procedure undertaken. The focus is on the safety of these surgeries, complications, morbidity and mortality.

METHODS

This was an observational study conducted at Himalayan Institute Medical Sciences, Swami Rama Nagar, Dehradun, India, over a period of 12 months from December of 2017 to December of 2018. Inclusion criteria were all adult patients undergoing elective pancreatic surgeries in institute. Exclusion criteria were emergency pancreatic surgeries for trauma. Indications for surgery were grouped according to the benign or malignant pathologies. The surgical procedure and intraoperative events were recorded. The complications of major resections were defined and stratified according to the guidelines of ISGPS (International Study Group of Pancreatic Surgery). All perioperative and early (≤4 weeks) post-operative complications, morbidities and mortality (none in this study) were tabulated and the final data was analysed by SPSS. The results were expressed in simple statistical methods as percentage, mean, mode, median and standard deviation.

RESULTS

There were 42 (n=42) patients with benign and malignant pancreatic diseases who underwent elective pancreatic surgery. Among these 42 subjects, 16 were operated for pancreatic malignancies (all had periampullary carcinoma), 7 for chronic pancreatitis and 19 for pseudocyst of pancreas. The underlying aetiology for the pancreatic operations is shown in Table 1.

Among aetiologies of malignant pancreatic diseases, the most common malignant condition was carcinoma of head of pancreas and among benign pancreatic diseases most common disease was pseudocyst of pancreas (Figure 1).

Histopathological studies revealed that the majority (50%) were carcinoma of the head of pancreas. Carcinoma of the ampulla of Vater comprised 31% of all patients followed by duodenal adenocarcinoma (12%) and carcinoma of the distal CBD (6%).

The most commonly surgery done for periampullary carcinoma was PPPD (Table 2). PJ was the most common method of reconstruction, yet PG was employed more frequently in PPPD. Among 16 patients operated for malignant diseases the most common complication encountered was DGE (50%) followed by SSI (43.7%), PPH (31%) PF (25%) and intra- abdominal abscess (12.5%) depicted in (Table 3).

Table 1: Etiology for various elective pancreatic operations (n=42).

Disease		Numbers	Total	Type of anastomosis	
				PJ	PG
Pancreatic malignancies	Ca head of pancreas	8	16	5	3
	Ca ampulla of Vater	5		4	1
	Cholangiocarcinoma	1		1	
	Duodenal adenocarcinoma	2		1	1
Chronic pancreatitis	Alcohol abuse		7		
Pseudocyst pancreas	Sequelae to gallstone induced acute pancreatitis	10	19	Cystogastrostomy- 15	
	Sequelae to alcohol induced acute pancreatitis	8			
	Sequelae to chronic pancreatitis	1		Cystojejunostomy- 3	

PJ-Pancreaticojejunostomy PG-Pancreaticogastrostomy.

Table 2: Operations done for periampullary carcinoma (n=16).

Operation	Numbers	Pancreatic reconstruction	Feeding jejunostomy
Classical pancreaticoduodenectomy	6	PJ 5 PG 1	6
Pylorus preserving pancreaticoduodenectomy	10	PJ 6 PG 4	10
Total	16	PJ 11 PG 5	16

PJ-Pancreaticojejunostomy PG-Pancreaticogastrostomy

Post-operative haemorrhage was noticed in 5 patients and was the most common indication for re-exploration Three of these patients were re-explored in immediate post op period, while the other two were managed conservatively and haemorrhage resolved. In this study, 6 patients developed pancreatic fistula. According to ISGPS grading score, 4 had grade A, 1 had grade B and 1 had grade C pancreatic fistula (Table 4).

Table 3: Complications seen after PD (n=16).

S. no.	Complications	No. of cases
1	Hemorrhage	5
2	Delayed gastric emptying	8
3	Pancreatic fistula	4
4	Biliary leak	3
5	Anastomotic leak	2
6	Obstruction	0
7	Intra-abdominal abscess	4
8	Surgical site infection	7
9	Wound dehiscence	2

Table 4: ISGPS classification grades of postoperative pancreatic fistula (n=6).

POD	Presentation	Management	Grade
3	Continuous drainage of amylase rich fluid from drain site	Urostomy bag was placed	A
3	Excessive fluid discharge from drain site	Regular dressing	A
3	Biliopurulent discharge from suture site	Regular dressing and urostomy bag applied	B
3	Excessive fluid discharge from drain site	Urostomy bag applied	A
3	Pain abdomen, persistent tachycardia	Re-exploration done on POD3	C
3	Excessive fluid discharge from drain site	Regular dressing	A

There were 19 cases with pseudocyst of pancreas. All were subsequent to acute pancreatitis and only 1 patient had pseudocyst associated with chronic pancreatitis.

The most common surgery done for pseudocyst of pancreas were CG (78.9%), followed by CJ (15.7%) and there was one case in which external drainage was done (Table 5).

Seven patients were operated for chronic pancreatitis. The different operations done are outlined in Table 6. All patients operated for chronic pancreatitis had good symptomatic relief with morbidity rate of 8%.

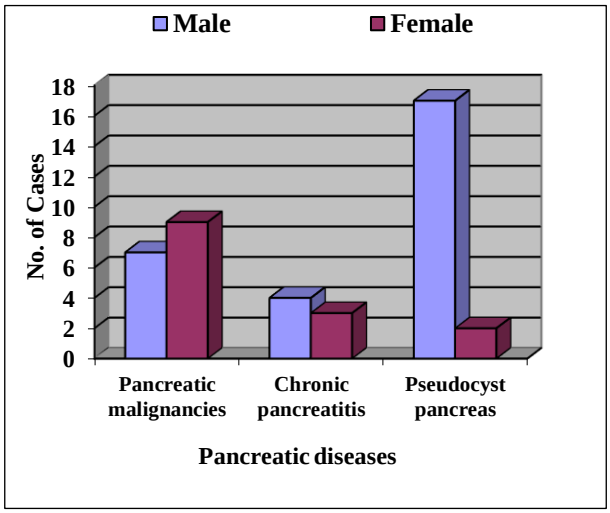

Figure 1: Gender distribution of benign and malignant pancreatic diseases (n=42).

Table 5: Operations for pseudocyst (n=19).

Operations	No.	Complications
Cystogastrostomy	15	Haemorrhage 1 SSI 1
Cystojejunostomy (Roux -en -Y)	3	SSI 2
External drainage	1	Nil

DISCUSSION

It has been proposed that the definition of a "high volume centre" for pancreatic surgery is 19 or more pancreatic

resections per institution per year.[5] Individual surgeon volume also has bearing on outcomes and the required number of surgery per surgeon per year has been cited as 10-12 cases to meet the definition. In light of these benchmarks, centre can be termed as a medium volume centre.

Gooiker et al have clearly demonstrated that there is a clear-cut reduction in mortality rate and a survival benefit in high volume centres when compared to medium to low volume centres. It has also been observed that centralization of major pancreatic surgeries and technical advances has contributed to improved outcomes.[6]

Westgaard et al in 2013 reported the incidence of head of pancreas and carcinoma of ampulla of Vater to be 34% and 29% respectively.[7] A study by Riall et al, reports a different distribution of periampullary tumours with 63% patient having carcinoma head of pancreas and only 16% patients with carcinoma ampulla of Vater.[8] In our study 16 patients were operated for periampullary malignancies, of which 50% had carcinoma head of pancreas and 31% had carcinoma ampulla of Vater.

Halloran et al reviewed pancreatic cancer resections in 2456 patients. The important post-operative complications were POPF (10.4%), DGE (9.9%), PPH (4.8%), wound infection (4.8%) and IAA (3.9%).[5] In this study the most important complications are DGE (50%), SSI (43.7%), haemorrhage (31%) PF (25%) and intra-abdominal abscess (12.5%). Our study reveals higher rate of complications than is reported in world literature.

In a prospective study by Rajarathinam the incidence of severe PPH was 3.1%. Another large review by Yekebas et al, reported high percentage of severe PPH 5.7% of total 1524 patient undergoing PD. They also observed that the outcome of PPH depends significantly on development of POPF.[10] In our study, there were 5 patients (31%) having PPH of which 3 were re-explored and other two were managed conservatively. This implies a higher incidence of post op hemorrhage in our study. PPH is also revealed as the most common indication of re exploration and significant morbidity.

Bassi et al reported the incidence of POPF to be 10-29%.[11] In our study four patients (25%) had POPF. Only one patient of POPF had to be re- explored. The other patients improved with conservative management.

Waliye et al reported higher incidence of morbidity (7.4%) with FJ.[12] This group also recommended abandoning FJ placement in cases of PD in favour of perioperative nutritional support and early commencement of oral intake.

Padusiss et al reported significantly higher overall morbidity (43.3%) with FJ compared to 34.6% without FJ. An increase in complications such as SSI, pneumonia, sepsis and acute renal failure was specifically noted in presence of FJ.[13] In our study all patients undergoing PD had feeding jejunostomy and there was no significant morbidity attributed to FJ.

Martinez et al reported CJ in 86% and CG in 14% of 111 patients with pseudocyst, Newell et al, reported CJ in 67% patients and CG in 33% patients in a series of operations done for pseudocyst.[14,15] In this study CG (83%) was more commonly done than CJ (17%). No significant morbidity or mortality was reported except minor SSI.

Darwin et al who reported alcohol to be the most common aetiology (46%) followed by idiopathic aetiology (24%).[16] In this study alcohol abuse is the main causative factor in all operated case of chronic pancreatitis.

Savalia et al reported substantial pain relief in 85-96% patient of chronic pancreatitis after LPJ. Their study also showed alcohol abuse in approximately 65% of all patients.[17] In this study 7 patients were operated for chronic pancreatitis and all had history of chronic alcoholism. Most common presenting symptoms were abdominal pain. The most common complication was SSI (43%) and all patients had good symptomatic relief.

This study revealed no mortality, yet a significant higher rate of complications leading to morbidity in patients with major pancreatic resections.

CONCLUSION

Carcinoma of head of pancreas was the most common periampullary malignancy necessitating major pancreatic resections. DGE, POPF and PPH were the most common and significant post-operative complications leading to unplanned interventions and prolonged hospital stay. The major indication for re-exploration was PPH. Gall stones and alcohol were the most common etiology for acute pancreatitis and pseudocyst. Alcohol abuse was most important causative factor for chronic pancreatitis.

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