

Evaluation of Short-term Outcomes of Elective Pancreatic Surgeries: A Cross-Sectional Study

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Abstract:

Aim: To evaluate the short-term outcomes of elective pancreatic surgeries

Study design: A cross-sectional study

Place and Duration: This study was conducted at Suleman Roshan Medical College Tando Adam Pakistan from June 2020 to June 2021.

Methodology: A total of 50 patients were enrolled. The information was entered into a pre-designed proforma to determine the need for elective pancreatic surgery, describe the pathological basis and types of pancreatic operations performed, and evaluate the short-term outcomes of multiple pancreatic surgeries in terms of side effects, death rates, and Complications.

Results: The study examined 50 patients who received a hospital-based elective pancreatic surgery for various reasons. According to histology, most of the tumors (47.6 %, n=10) were pancreatic head carcinomas. The most common complication was delayed stomach emptying (DGE) (33%, n=7), which was followed by post-pancreatic haemorrhage (PPH) (23%, n=5), postoperative pancreatic fistula (POPF) (19%, n=4) surgical site infection (14% n=3), and intra-abdominal abscess (IAA) (9.5%, n=2).

Conclusion: The most common indication for pancreatic resections was pancreatic head carcinoma. The most frequent and severe consequences were delayed stomach emptying, post-pancreatic hemorrhage, postoperative pancreatic fistula, and surgical site infection

Keywords: Complication, Intra-abdominal abscess, Post-operative pancreatic fistula, Post-pancreatectomy hemorrhage, surgical site infection

Introduction:

Pancreatic surgery (PS) has long been regarded as one of the most challenging, dangerous procedures in abdominal surgery and considered as the most difficult tasks for surgeons because of its anatomical position in the retroperitoneum, the involvement of neighboring organs in the disease process, and life-threatening consequences that are difficult to control. ^[1] It is a high-risk procedure with post-operative morbidity rates exceeding 40% and fatality rates ranging from 0% to 15%. ^[2] Over the last few decades, the post-operative result of pancreatic surgery has steadily improved. ^[1, 3] The use of enhanced recovery after surgery protocols in patients undergoing Pancreatic Surgery in certain non-randomized studies and a recent randomized controlled trial to promote early recovery without affecting surgical outcomes.

In recent decades, the indications for pancreatic surgery have grown, owing to three factors. First, where resection was previously contraindicated, pancreatic malignancies are now surgically removed. Second, tumors that were less commonly diagnosed, such as intraductal papillary mucinous neoplasms now with recent advancement of imaging can be picked up earlier. Third, older patients, particularly those above the age of 90 years, are subjected to surgery. ^[4, 5] Whipple procedure, Pylorus preserving pancreaticoduodenectomy, and distal pancreatectomy are the most prevalent pancreatic cancer resection procedures. While open resections are the most common, laparoscopic resections are becoming more common. ^[6]

Furthermore, the risk of complications still seems significant and reported between 22-47 % in other literature. ^[7] Pancreatic fistula (PF), delayed gastric emptying (DGE), Post-Pancreatectomy Haemorrhage (PPH), surgical site infection (SSI), Intra-Abdominal Abscess (IAA), pancreatitis, and some of the serious complication. Even so, in recent years, these complications have become less common. ^[5] Improvements in pancreatic anastomoses, such as the duct-to-mucosa technique, external drainage of the pancreatic duct with an indwelling stent, and the use of fibrin biological glue, are just a few of the surgical methods that have been promising to reduce the incidence of postoperative pancreatic complications.

Several researchers have looked into the factors that lead to severe complications after pancreatic surgery with the hopes of improving surgical standards and reducing avoidable hospital costs associated with readmission. However, after the Medicare Act was enacted, most research was published in Western countries, particularly the United States. Recovery's impact on postoperative hospital stay and readmission after pancreatic Surgery has only been studied in a few Asian institutes. Although there were no differences in mortality rate or

pancreas-specific complication, recent and comprehensive research of German and Dutch audits revealed that hospital stay and readmission were varied between the two nations.^[8]

The primary goal of this research was to assess the causes for elective pancreatic surgery and track and evaluate the surgical operation. The focus was on the procedure's safety as well as consequences, morbidity, and mortality.

Methodology:

The current cross-sectional study was conducted in Department of General Surgery, Suleman Roshan Medical College Tando Adam Pakistan hospital from June 2020 to June 2021 after taking Permission from the ethical review committee of the institute. The study comprised all individuals (n=50) who underwent elective pancreatic surgery at the institute. Exclusion criteria included emergency pancreatic operations due to trauma. Demographic information, surgical details, post-operative information, and pathologic characteristics were all documented. Data were analyzed for indications classified as benign or malignant pathologies and perioperative complications. The mean and standard deviation were used to present continuous data. The Student t-test or the Mann–Whitney test evaluated the continuous variables. Data were analyzed by using SPSS. Version 21.

Results:

The study included n=50 individuals with benign and malignant pancreatic diseases, with an average age of 65.38 years \pm 08.67 (95% CI: 61.3–65.47). The youngest patient was 34 years, while the oldest was 82 years old. Males comprised 54 % (n=27) of the patients, while females comprised 46% (n=23) (As shown in Table 1) Out of n=50, 21 (42%) of the patients had pancreatic cancer, 9 (18%) had chronic pancreatitis, and 20 (40%) had pseudocysts of the pancreas. The most prevalent etiology of malignant pancreatic disorders was cancer of the head of the pancreas, and the most common benign pancreatic disease was pseudocyst of the pancreas. In malignant disorder, the majority (47.6%) were carcinomas of the head of the pancreas, according to histopathological examinations. Carcinoma of the ampulla of Vater accounted for 28.5% (n=6) of all cases, 14 % (n=3) with duodenal adenocarcinoma, and Cholangiocarcinoma accounting for the remaining 9.5% (n=2) (As shown in Table 2)

The most prevalent complication reported among n=21 patients operated for malignant diseases was DGE n=7 (33%) followed by PPH n=5 (23%), PF n=4 (19%), SSI n=3 (14%), and intra-abdominal abscess n=2 (9.5%), as shown in **Table 3**.

Five patients had postoperative bleeding, which was the most prevalent reason for re-exploration, and four patients acquired pancreatic fistulas in this investigation. According to the International Study Group for Pancreatic Surgery (ISGPS) grading system, 2 pancreatic fistulas received grade A, 1 received a B, and 1 received a C.

There were 20 (%) cases of pancreatic pseudocysts. Only two patients (%) had pseudocyst associated with chronic pancreatitis, and all were acquired acute pancreatitis. Nine (%) patients with chronic pancreatitis had surgery. Death was substantially linked with the existence of postoperative complications, the requirement for reoperation, and age greater than 70 years (P=.005, P.0001, and P=.007, respectively). Only the necessity for reoperation remained significant after multivariate analysis (OR: 24.29, 95 percent CI: 2.36–228.58).

Table 1. Demographic characteristics of the study participants.

Variable	Total n=50	P-value
Mean age (years)	65.38 ± 08.67	0.48
Gender		
Male	27 (54%)	0.024
Female	23 (46%)	

The data is presented in a mean, standard deviation, or a number (percent).

Table 2: Etiology of Pancreatic surgery (n=50).

Disease		Numbers (%)	Total n=50 (100%)
Pancreatic cancer	Ca head of the pancreas	10 (47.6)	21 (42)
	Ca ampulla of Vater	6 (28.5)	
	Cholangiocarcinoma	2 (9.5)	
	Duodenal adenocarcinoma	3 (14)	
Chronic pancreatitis	Alcohol abuse		9 (18)
Pseudocysts of the pancreas	Sequelae to gallstone induced acute pancreatitis	12 (60)	20 (40)
	Sequelae to alcohol-induced acute pancreatitis	6 (30)	
	Sequelae to chronic pancreatitis	2 (10)	

Table 3: Complications after surgery (n=21).

Complications	Number (%)
Haemorrhage	5 (23)
Delayed gastric emptying	7 (33)
Pancreatic fistula	4 (19)
Intra-abdominal abscess	2 (9.5)
Surgical site infection	3 (14)

Discussion:-

This study evaluated the causes for elective pancreatic surgery and tracked and assessed the complications after the surgery. The result showed that a higher number of patients with pancreatic cancer and the head of the pancreas were involved in most cases. Delayed gastric emptying followed by hemorrhage is the most common complication after the surgery.

Elective pancreatic resections can be performed with a low morbidity and mortality rate of less than 5%, despite being technically challenging^[9] This is due to improved perioperative anesthesiological care and interventional radiologic complication treatment surgical skill^[10]. In high-volume centers, Gooiker et al. have convincingly established that there is a clear

reduction in death rate and a survival benefit. It's also worth noting that the centralization of major pancreatic surgeries and technical and technological developments have helped improve results ^[11].

In our study, 21 patients with periampullary malignancies were operated on, with 47% having carcinoma head of the pancreas and 28.5% having carcinoma ampulla of Vater. Our results are close to the study done by Westgaard et al. in 2013 reported that 34 percent and 29 percent incidence were head of pancreas and cancer of the ampulla of Vater, respectively ^[12]. By the current study's findings, another study performed by Riall et al. found a wide range of periampullary tumors, with 63 percent of patients having pancreatic carcinoma head and only 16 percent having Vater's carcinoma ampulla ^[13].

Delayed gastric emptying, hemorrhage, PF, SSI and intraabdominal abscess are the most common consequences of this study. Our findings show a higher rate of problems than previously reported in the literature. Malik et al. reveal that 6.5 % of patients in Pakistan get SSI following elective surgery. The most prevalent organism that causes the infection is *Staphylococcus aureus* ^[14]. The incidence of severe hemorrhage was 3.1 % in Rajarathinam's prospective research. Another considerable research by Yekebas et al. found that 5.7 % of the 1524 patients receiving PD had severe PPH. They also found that the development of POPF has a substantial impact on the outcome of PPH. ^[15] According to Chawla et al., in another study, 44 patients met the inclusion criteria, 27 of them were male ^[16]. There was no post-operative pancreatic fistula in any of the patients, although 31% of them suffered morbidities, such as 4.9% have delayed stomach emptying, 9.1% had wound infection, 6.8% had hemorrhage. He reported that 11.9% of patients died after the surgery. Furthermore, 2456 individuals with pancreatic cancer resections were evaluated by R. Halloran et al. The most prevalent complications reported by him was POPF, and it was observed in 10.4% cases followed by DGE, PPH, wound infection, and IAA reported in 9.9%, 4.8%, 4.8% and 3.9% cases respectively ^[17]. In our study, five patients (23%) had PPH, three of whom were re-examined, and the other two were handled conservatively. In our research, there was a higher rate of postoperative bleeding. PPH has also been identified as the most common marker of re-examination and substantial morbidity. According to Bassi et al., POPF affects 10-29 percent of people ^[18].

POPF was found in four patients (19%) in our investigation. Only two POPF patients needed to be re-examined. With conservative treatment, the other patients improved. Similar to our study, Bhatti et al. demonstrated acceptable long-term results and shed light on the specific epidemiology of patients undergoing PS in Pakistan for various diseases. Five patients (3.2%) had a grade B pancreatic fistula, whereas six had a grade C fistula (3.8 percent). The mortality rate in the hospital was around 5%. ^[19] In this study, alcohol misuse was the primary cause of chronic pancreatitis in all cases that were operated on. Savalia et al. observed significant pain alleviation in 85-96 percent of chronic pancreatitis patients. In addition, nearly 65 percent of the patients were alcoholics, according to Rana et al. ^[17]. Moreover, nine individuals with chronic pancreatitis were operated on; all of them had a history of persistent alcoholism.

The small sample size is the major limitation of the current study. Another limitation was being a single-center study; Multicenter studies should be conducted with large sample size.

Conclusion: The most common periampullary malignancy was pancreatic head carcinoma. Post-operative complications including DGE, PPH, and POPF resulted in unplanned interventions and a more extended hospital stay. PPH was the prime determinant for re-exploration. The most common causes of acute pancreatitis and pseudocysts were gallstones and alcohol.

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Conflict of interest

None

Permission

Permission was taken from the ethical review committee of the institute

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