Section: General Surgery

Original Research Article

# SURGICAL TREATMENT FOR PANCREATITIS AND ITS COMPLCATIONS

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## ABSTRACT

Pancreatitis is characterized by inflammation of the pancreas. With surgical treatment, the mortality rate for patients with infected pancreatic necrosis could be decreased in various specialized centers. Hence, we aimed to evaluate the surgical treatment for pancreatitis and complications. This is a retrospective study conducted with total of 85 patients with history of pancreatitis admitted in the wards of Department of General Surgery at our tertiary care centre. All the patients were subjected to assessment for development of complications such as (i) Pancreatic pseudocyst, (ii) Pancreatic abscess, (iii) Pancreatic necrosis, (iv) Pancreatic ascites, (v) Pleural effusion, and (vi) Fistula. The mean age of patients was 48.83 years with majority being distributed in the age group of 41-50 years (41.2%). Male predominance (70.6%) was observed as compared to females (29.4%). Majority of the patients underwent cystogastrostomy (31%) followed by Roux-en-Y cystojejunostomy & cystoduodenostomy (27% each), and necrosectomy (15%). The top three ranked complications associated with pancreatitis were found to be pancreatic pseudocyst (52.9%), pancreatic abscess (15.3%), and pancreatic necrosis (11.8%). The mean hospital stay of patients treated with surgical method for pancreatitis was 22 days and 3 patients (6.7%) required repeated surgery for the successful treatment of pancreatitis. In conclusion, pancreatitis is more prevalent among males in the age group of 41-50 years. Thus, the current study emphasizes the importance of early assessment of surgical intervention for the management of patients with complications of pancreatitis.

## INTRODUCTION

Pancreatitis is an inflammatory disorder of the pancreas that may evolve in certain individuals from an acute form (sudden onset) to recurrent acute pancreatitis (more than one episode) and eventually to chronic pancreatitis. The clinical manifestations and disease progression show considerable interindividual variability.[1] Acute pancreatitis represents an immediate inflammatory response to pancreatic injury, whereas chronic pancreatitis leads to irreversible structural damage with impairment of both endocrine and exocrine pancreatic functions.[2]

Over the past decade, substantial advances have been made in understanding the natural history and pathophysiology of acute pancreatitis. Its clinical spectrum ranges from a mild, self-limiting condition to a severe necrotizing form. Approximately 80% of cases are mild and resolve spontaneously within 3–5 days.[3-5] Patients with mild disease generally respond well to conservative management, requiring intravenous fluid therapy and analgesia. In contrast, severe acute pancreatitis, which occurs in about 15–20% of cases, is characterized by organ failure and/or local complications such as necrosis, abscess formation, or pseudocyst development. The early phase of severe disease typically occurs within the first two weeks and is marked by systemic inflammatory response syndrome with associated pulmonary, cardiovascular, and renal dysfunction.[6]

Most patients presenting with severe early organ failure demonstrate pancreatic necrosis on computed tomographic (CT) imaging. Infection of pancreatic necrosis develops in approximately 40–70% of individuals with necrotizing pancreatitis.[7] The late phase of the disease, usually arising during the


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second or third week after admission, is predominantly related to infection of necrotic tissue. In recent years, management strategies for severe acute pancreatitis have shifted from early surgical intervention toward aggressive intensive care management. While treatment in the initial phase is primarily conservative, surgical intervention may become necessary during the later phase.[8]

A major improvement in the clinical outcomes of acute pancreatitis over the past decade has been the reduction in overall mortality to around 5%, with mortality in severe cases declining to 10–20%. Despite this progress, early mortality rates in severe pancreatitis vary widely among centers, ranging from less than 10% to as high as 85%.[9] The initial management of acute pancreatitis focuses on two key objectives: providing supportive care and managing specific complications, and limiting the extent of pancreatic inflammation, necrosis, and the systemic inflammatory response by interrupting disease pathogenesis. Prompt and adequate fluid resuscitation along with supplemental oxygen constitutes the cornerstone of supportive therapy. Infection in pancreatitis is considered a secondary event, and the use of prophylactic antibiotics in severe cases aims to prevent infection of pancreatic necrosis, reduce septic complications, and lower mortality, as supported by several randomized controlled trials.[10,11]

However, endoscopic retrograde cholangiopancreatography (ERCP) with endoscopic sphincterotomy (ES) is indicated in cases of gallstone pancreatitis complicated by an impacted stone, biliary sepsis, or obstructive jaundice.[12,13] Accurate differentiation between sterile and infected pancreatic necrosis is crucial for appropriate management and requires radiological evidence of retroperitoneal gas on computed tomography or bacteriological confirmation obtained through CT- or ultrasound-guided fine-needle aspiration of pancreatic or peripancreatic necrosis.[14,15]

In specialized centers, surgical management of infected pancreatic necrosis has reduced mortality rates to approximately 20%.[16,17] Recently, less invasive alternatives to conventional open surgery have been explored, challenging the notion that surgery is invariably mandatory in all cases of infected necrosis. Patients with severe necrotizing pancreatitis may deteriorate rapidly within hours to days following symptom onset, making the optimal timing of necrosectomy a subject of ongoing debate. In the only prospective randomized trial comparing early pancreatic debridement (within 72 hours of symptom onset) with delayed intervention (after 12 days), mortality rates were reported as 56% and 27%, respectively.[18]

Currently, there is broad consensus that surgical intervention in severe pancreatitis should be deferred whenever possible. The third to fourth week after symptom onset is considered the most favorable period for surgery, as necrotic tissue is better demarcated, thereby reducing intraoperative bleeding, preserving viable tissue, and minimizing subsequent endocrine and exocrine pancreatic insufficiency. Early surgical intervention is reserved for uncommon but life-threatening complications such as bowel perforation or massive hemorrhage.[8] In light of these considerations, the present study was undertaken to evaluate the role of surgical management in pancreatitis and its associated complications.

## MATERIALS AND METHODS

**Study design and patients:** This is a retrospective study conducted with total of 85 patients with history of pancreatitis admitted in the wards of Department of General Surgery at Chigateri district government hospital attached to J. J. M. Medical College (JJMMC), Davangere, Karnataka. A written informed consent was taken from all the patients participating in the study.

**Inclusion criteria**

1. Age: ≥18 years

**Exclusion criteria**

1. Pregnant women
2. Traumatic pancreatitis
3. Post Endoscopic Retrograde Cholangiopancreatography (ERCP) in cases of gallstone pancreatitis
4. Malignancy

**Assessment parameters :** All the patients were subjected to assessment for development of local complications such as (i) Pancreatic pseudocyst, (ii) Pancreatic abscess, (iii) Pancreatic necrosis, (iv) Pancreatic ascites, (v) Pleural effusion, and (vi) Fistula. Additionally, post-operative outcomes including hospital stay, need for repeated surgery, and mortality were assessed.

**Statistical analysis:** Data were entered in Microsoft Excel 2021 and statistical analysis was done using IBM Statistical Software for Social Sciences (SPSS) version 22. Categorical variables were represented in the form of frequency, and percentage. Continuous variables were presented as descriptive statistics (Mean and Standard deviation). $p<0.05$ was considered statistically significant.

## RESULTS

The mean age of patients was 48.83 years with majority being distributed in the age group of 41-50 years (41.2%). Male predominance (70.6%) was observed as compared to females (29.4%). 49.4%, 34.1%, and 16.5% of the patients were having history of comorbidities such as diabetes mellitus, hypertension, and obesity respectively [Table 1].

Majority of the patients i.e., 31% underwent cystogastrostomy followed by Roux-en-Y cystojejunostomy & cystoduodenostomy (27% each), and 15% of the patients underwent necrosectomy [Figure 1].


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**Table 1: Demographic characteristics**

| Variables | N (%) |
|---|---|
| Age (Years) | |
| 18-20 | 4 (4.7) |
| 21-30 | 5 (5.9) |
| 31-40 | 11 (12.9) |
| 41-50 | 35 (41.2) |
| 51-60 | 21 (24.7) |
| 61-70 | 7 (8.2) |
| 71-80 | 2 (2.4) |
| Mean ± SD | 48.83 ± 15.56 |
| Gender | |
| Male | 60 (70.6) |
| Female | 25 (29.4) |
| Comorbidities | |
| Diabetes mellitus | 42 (49.4) |
| Hypertension | 29 (34.1) |
| Obesity | 11 (16.5) |

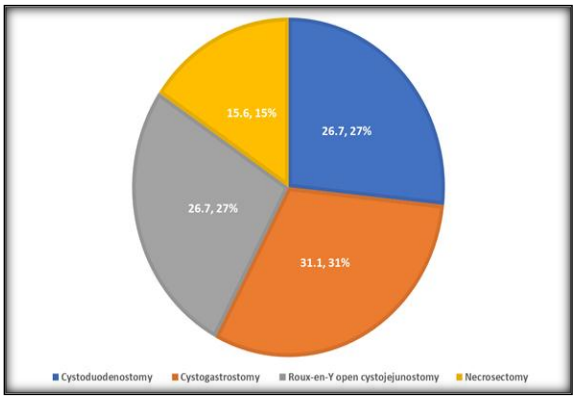


**Figure 1: Distribution of patients based on surgeries**

The results on distribution of patients based on complications were represented in Table 2. The top three ranked complications associated with pancreatitis were found to be pancreatic pseudocyst (52.9%), pancreatic abscess (15.3%), and pancreatic necrosis (11.8%).

The mean hospital stay of patients treated with surgical method for pancreatitis was 22 days and 3 patients (6.7%) required repeated surgery for the successful treatment of pancreatitis. There were no mortalities or DAMA recorded among the pancreatic patients treated with surgical methods [Table 3].

**Table 2: Distribution of patients based on complications**

| Complications | N (%) |
|---|---|
| Pancreatic pseudocyst | 45 (52.9) |
| Pancreatic abscess | 13 (15.3) |
| Pancreatic necrosis | 10 (11.8) |
| Pancreatic ascites | 8 (9.4) |
| Pleural effusion | 6 (7.1) |
| Fistula | 3 (3.5) |

**Table 3: Post-operative outcomes**

| Outcomes | Value |
|---|---|
| Hospital stays in days (Mean ± SD) | 22.48 ± 2.68 |
| Need for repeated surgery, n (%) | 3 (6.7) |
| Mortality or DAMA | Nil |

DAMA, Discharge against medical advice.

## DISCUSSION

Despite significant advances in medical care, pancreatitis remains associated with considerable morbidity and mortality. In this prospective study, we evaluated the role of surgical management in pancreatitis and its related complications at our tertiary care centre. The mean age of patients in the present study was 48.83 years, which is comparable to findings reported in the literature. Bakkour et al., in a prospective study involving 63 patients with acute pancreatitis, reported a mean age of 53.2 years, with the highest proportion of patients belonging to the 40–49-year age group. These observations are consistent with our findings, where most patients were in the 41–50-year age range.[19]

A prospective study by Khurana et al., examining the clinical presentation, investigations, complications, and management of acute pancreatitis, reported a marked male predominance (84%) compared to females (16%).[20] Similarly, Bakkour et al., also documented male predominance (55.6%) in their cohort.[19] In line with these reports, our study likewise demonstrated a higher prevalence of pancreatitis among male patients.

In the present study, the majority of patients underwent cystogastrostomy, followed by Roux-en-Y cystojejunostomy, cystoduodenostomy, and necrosectomy. Correspondingly, existing literature indicates that open internal drainage remains the conventional surgical approach for pancreatic pseudocysts and is indicated in a substantial


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proportion of cases.[21-23] Cystoduodenostomy is typically chosen when the pseudocyst is situated in the pancreatic head and is closely adherent to the duodenum. However, this technique is contraindicated in the presence of a thick intervening pancreatic tissue layer between the pseudocyst and the duodenum. Concerns have been raised regarding the safety of this procedure due to the latero-lateral anastomosis, particularly when the pseudocyst is not firmly attached to the duodenal wall or is located near vital structures such as the terminal bile duct and pancreatic duct. Consequently, cystoduodenostomy is regarded as technically challenging and is associated with relatively higher morbidity and mortality rates.[24]

Pearson et al., reported a series of seven patients who underwent Roux-en-Y cystojejunostomy, with no recurrence of pancreatitis or evidence of exocrine insufficiency; however, approximately half of the patients required antidiabetic therapy due to endocrine insufficiency. This outcome is likely attributable to pancreatic tissue necrosis in severe acute pancreatitis, leading to long-term impairment of both endocrine and exocrine pancreatic functions.[23] Cystojejunostomy is therefore considered the preferred procedure for very large pseudocysts extending into the umbilical, hypochondriac, or lumbar regions, as it allows for dependent drainage and is generally regarded as the procedure of choice for giant pseudocysts. Additionally, it represents a more physiological drainage option, since pancreatic secretions, which are alkaline in nature, drain into the similarly alkaline environment of the jejunum.[24]

In our study, the most frequently observed complications of pancreatitis included pancreatic pseudocyst, pancreatic abscess, and pancreatic necrosis. In consistent with our study findings, published literature suggests that pseudocyst formation is among the most common complications of chronic pancreatitis.[25] Pseudocysts occur more frequently in alcohol-induced chronic pancreatitis.[26] The clinical manifestations of pseudocysts in chronic pancreatitis are variable, with pain being the most common presenting symptom. Pseudocysts may also lead to gastric outlet obstruction, biliary obstruction, or venous thrombosis due to mass effect. Acute complications such as hemorrhage from pseudoaneurysm rupture and infection have also been reported.[27] Although laparoscopic-assisted necrosectomy appears to be a feasible alternative to open necrosectomy, these findings should be interpreted cautiously. The laparoscopic approach carries a significant risk of major injury to intra-abdominal organs or vascular structures. Moreover, published reports indicate a high incidence of serious complications, including fistula formation (20%–60%) and bleeding (approximately 15%), even with careful patient selection.8

## CONCLUSION

Pancreatitis is more prevalent among males in the age group of 41-50 years. Complication of pancreatitis could be effectively managed with cystogastrostomy, Roux-en-Y cystojejunostomy, cystoduodenostomy, and necrosectomy depending on the condition. The most commonly encountered complications are pancreatic pseudocyst, pancreatic abscess, and pancreatic necrosis. Thus, the current study emphasizes the importance of early assessment of severity and surgical intervention for the management of patients with pancreatitis.

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