

## To Study Indications and Outcome of Surgical Management of Local Complications of Acute Pancreatitis

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### Abstract

**Aim:** To study Indications and outcome of surgical management of local complications of acute pancreatitis.

**Material and methods:** This prospective observational study conducted in the Department of General Surgery, Jannayak Karpoori Thakur Medical College and Hospital, Madhepura, Bihar, India, from July 2020 to June 2021, The inclusion criteria for the study were patients who underwent laparoscopic, retroperitoneal or open surgical procedures for the management of local complications of acute pancreatitis.

**Results:** Among them, 50 patients had local complications due to acute pancreatitis. All patients were managed using the step-up approach, starting with conservative management and minimally invasive intervention when warranted. Twenty patients required surgical intervention due to failure of endoscopic or radiological intervention or positions of lesions being inaccessible to these techniques.

**Conclusion:** various endoscopic techniques are now available to manage the pancreatic fluid collection and pancreatic necrosis, surgery remains an essential modality in managing the disease.

**Keywords:** acute pancreatitis, surgery, complications

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### Introduction

Acute pancreatitis (defined as the acute nonbacterial inflammatory condition of the pancreas) is derived from early activation of digestive enzymes inside acinar cells, with varying compromising of the gland itself, nearby tissues, and other organs. It is well known that several situations develop into acute pancreatitis, but the mechanisms and how those mechanisms develop the disease remain unclear. If the early events that generate the

inflammatory process are understood and if pro and anti-inflammatory factors that modulate the severity of the disease are known - treatment can be implemented so the process will not happen or possible associated complications will be minimized. [1] Acute pancreatitis is one of the most common gastrointestinal disorders requiring acute hospitalization worldwide, with a reported annual incidence of 13 to 45 cases per 100000

persons. [2] In the United States, it is the third most common gastrointestinal disorder requiring acute hospitalization. [3] In the United States alone, acute pancreatitis leads to 270000 hospital admissions annually and in-patient costs exceeding 2.5 billion dollars. [4] It is rare in childhood but may occur at any age (according to recent publications [5,6] median age, 55-58 yr). Acute biliary pancreatitis is more common in women, and alcoholic pancreatitis is more common in middle aged men. [6] Although most patients with acute pancreatitis recover without sequelae, between 10% to 20% will have a more complicated clinical course with higher risks of morbidity and mortality. [7] Severe acute pancreatitis (SAP) requires prolonged hospitalization, frequently including a stay in the intensive care unit (ICU) because of organ dysfunction. [8] Severe pancreatitis is associated with a mortality of 15% to 30%, whereas mortality from mild pancreatitis is only 0% to 1%, and organ failure is the most important determinant of mortality in acute pancreatitis. However, in approximately 30% of patients with necrotizing pancreatitis, a secondary necrotic infection occurs, mostly 3 to 4 wk after the onset of necrotizing pancreatitis. [9] If left untreated, mortality of infected necrosis approaches 100%. [3, 10] Initial treatment of SAP is primarily medical, and these patients require intensive organ support. [11, 12] Surgery for SAP is a morbid procedure associated with complications in 34% to 95% of patients, and mortality in 11% to 39%. [13, 14] Surgery may lead to long-term pancreatic insufficiency. [14, 15] The high mortality rate encountered with surgery reflects the hazards of operating on critically ill septic patients, often with multiorgan failure. [16]

### Material and methods

This prospective observational study conducted in the Department of General Surgery,

Jannayak Karpoori Thakur Medical College and Hospital, Madhepura, Bihar, India, India from July 2020 to June 2021

### Inclusion criteria

Patients who underwent laparoscopic, retroperitoneal or open surgical procedures for the management of local complications of acute pancreatitis

### Exclusion criteria

Patients who had associated vascular and bowel-related complications

### Methodology

Clinical, laboratory and imaging findings including, contrast-enhanced CT scan findings of all the cases, were recorded as per the proforma. In addition, the indication of each procedure, perioperative outcome and associated complications were evaluated in all the studied cases. All minimally invasive procedures were performed under general anesthesia using Karl Storz© laparoscopic set by the surgical team experienced in pancreatic surgery. The local complications of acute pancreatitis were based on the revised Atlanta classification 2012. [17] All complications were graded according to the Clavien- Dindo classification. [18]

Data were analyzed using the statistical package for the social sciences (SPSS) version

25.0.

### Results

432 patients were admitted to the surgery department with the diagnosis of acute pancreatitis or with complications of acute pancreatitis. Among them, 50 patients had local complications due to acute pancreatitis. All patients were managed using the stepup approach, starting with conservative management and minimally invasive intervention when warranted. Twenty patients required surgical intervention due to failure of endoscopic or radiological intervention or positions of

lesions being inaccessible to these techniques. The demographic and clinical characteristics of the patients are listed in (Table 1). Among the 20 patients in the study, three patients had PPC, all of whom were managed with external drainage due to persistent symptoms. Seven patients who had ANC were initially subjected to conservative management. However, due

to persistent fever and clinical deterioration, contrast-enhanced CT was repeated, revealing features of infected necrosis. Based on CECT findings, five patients were treated with VARD, and one patient was treated with open necrosectomy and closed drainage between days 15 to day 21 following the onset of the disease.

**Table 1: The demographic distribution of patients**

Variables	N	%
Total number (n)	20	100
Male patients	11	55%
Female patients	9	45%
Median age (years)	48.5 years	

**Table 2: The Etiology**

Etiology	N	%
Biliary	9	45%
Ethanol	10	50%
Others	1	5%

**Table 3: The PFC and cavity location**

Category of pancreatic fluid collection (PFC)/complications	N	%
PPC	3	15%
ANC	7	35%
WON	3	15%
Pseudocyst	7	35%
Location of the cavity		
Head	6	30%
Body or tail	14	70%

Due to incomplete drainage in one patient who underwent VARD, laparoscopic transgastric necrosectomy was performed on day 21 as CECT revealed a matured wall. In addition,

WON was noted in three patients. Due to clinical deterioration and high suspicion of infected necrosis in patients with WON, FNAC was performed in all patients, revealing growth in culture.

**Table 4: Clavien-Dindo classification of the complication following surgical intervention**

Grade	Number of patients
Grade 1	10
Grade 2	28
Grade 3	4
Grade 4	8

All patients underwent laparoscopic or open cystogastrostomy. Among the eight patients with a pseudocyst, all patients had the size of the cyst more than 6 cm and were symptomatic. One patient underwent laparoscopic internal drainage, while seven others underwent open cystoenterostomy. There was no mortality in this series; three patients developed hospital-acquired pneumonia requiring external continuous positive airway pressure ventilation, and four patients developed surgical site infections. One patient who underwent open necrosectomy had to be re-explored on postoperative day 2 for bleeding. Blood transfusion was required in seven patients. The mean hospital stay was 15.4 days. The grade of complication noted following surgery in these patients is shown in table 4.

## Discussion

The primary goal of treatment for acute necrotic collection is to drain the content and remove all infected pancreatic tissues. [19] The available treatment options include open and laparoscopic transperitoneal drainage, image-guided retroperitoneal drainage, and endoscopic transgastric approaches. [20] The current recommendation for the treatment of acute necrotic collection is the “step-up” approach. The term „step-up“ was coined by the Dutch PANTER trial and is used commonly across disciplines when referring to minimally invasive procedures that have the potential to be re-employed with escalation towards more invasive procedures for the drainage of infected pancreatic necrosis. [21] In 2010 the results of the trial demonstrated several benefits from the step-up approach over laparotomy. [21] In our series, the “step-up” approach was the primary modality of treatment in ANC.

Management strategy of walled-off necrosis has evolved over the years. Some WON resolve with time and can be conservatively managed if there are no

symptoms or secondary complications like infection of the walled-off necrotic collection. [22] However, if the WON is infected, intervention is warranted in the form of endoscopic drainage or open necrosectomy. [20] In our series, all patients with WON underwent open transperitoneal necrosectomy due to the positions of WON being unamenable to endoscopic approaches. Several endoscopic drainage modalities exist for managing symptomatic pancreatic pseudocysts. [23] These include transpapillary pancreatic duct stenting, transmural drainage, or a combination of both. [24, 25] Transpapillary stent placement and endoscopic ultrasound (EUS)-guided transmural drainage (EUS-TM) for PPC drainage report a wide range of clinical success. [26,27,28] However, when these modalities are not suitable for the patient surgical management is an acceptable modality for managing pancreatic pseudocyst. [29]

There is no single surgical procedure that is appropriate for all pseudocysts. The most important factor dictating the mode of treatment is local expertise. [30] Despite the various endoscopic and minimally invasive options, the most effective and reliable method of draining a pseudocyst is internal drainage by an open surgical approach. [31] For the management of pancreatic pseudocyst in our series, cystogastrostomy was the commonest internal drainage procedure performed, followed by Roux-en-Y cystojejunostomy. This technique consists of an anterior gastrostomy followed by a posterior gastrostomy centred on the cyst, which avoids dissection through inflamed tissues. [32, 33]

## Conclusion

Management of patients with local complications of pancreatitis is most effective at a specialized tertiary care centre with pancreatic surgeons who have expertise in managing these cases.

Although various endoscopic techniques are now available to manage the pancreatic fluid collection and pancreatic necrosis, surgery remains an essential modality in managing the disease.

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