

## A Retrospective Evaluation of the Outcome of Surgical Management of Local Complications of Acute Pancreatitis: An Observational Study

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### Abstract

**Aim:** This study aims to evaluate the indication and outcome of different surgical management modalities in local complications of acute pancreatitis.

**Methods:** A hospital-based retrospective study was conducted in the Department of Surgery, Nalanda Medical College and Hospital, Patna, Bihar, India for one year. A purposive sampling method was utilized to recruit the patients. 400 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 were included in the study.

**Results:** Out of 50 patients, 60% were males. 50% had ethanol etiology and 36% had pseudocyst pancreatic fluid collection. According to the location, 66% were at body or tail. According to Clavien-Dindo classification, 34% were in grade 2 followed by grade 1 (22%) and grade 4 (22%).

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

**Keywords:** Acute Pancreatitis, Local Complications, Surgical Management.

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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. It is rare in childhood but may occur at any age (according to recent publications [1,2], median age, 55-58 yr). Acute biliary pancreatitis is more common in women, and alcoholic pancreatitis is more common in middle-aged men. [2] 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. [3] Severe acute pancreatitis (SAP) requires prolonged hospitalization, frequently including a stay in the intensive care unit (ICU) because of organ dysfunction. [4]

Most of the fluid collection noted during acute pancreatitis are sterile and resolve spontaneously. If

the fluid collection is infected within four weeks or remains symptomatic beyond four weeks of onset, intervention is indicated. [5] Timing and modality of intervention for these local complications strongly impact the morbidity and mortality of acute pancreatitis. [6] Less invasive options such as percutaneous drainage or endoscopic drainage techniques will be adequate for managing most cases of local complications. However, minimally invasive (video-assisted or laparoscopic) or open surgical drainage is indicated when these modalities are unavailable or fail to drain the collection adequately. [5-7]

Initial treatment of SAP is primarily medical, and these patients require intensive organ support. [8,9] Surgery for SAP is a morbid procedure associated with complications in 34% to 95% of patients, and mortality in 11% to 39%. [10,11] Surgery may lead to long-term pancreatic insufficiency. [11,12] The high mortality rate encountered with surgery reflects the hazards of operating on critically ill septic patients, often with multiorgan failure. [13]

This study aims to evaluate the indication and outcome of different surgical management modalities in local complications of acute pancreatitis.

### Materials and Methods

A hospital-based retrospective study was conducted in the Department of Surgery, Nalanda Medical College and Hospital, Patna, Bihar, India for one year. A purposive sampling method was utilized to recruit the patients. 400 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 were included in the study. All patients were managed using the step-up approach, starting with conservative management and minimally invasive intervention when warranted.

### Inclusion and exclusion criteria

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 for the period of one year. Exclusion criteria for the study were patients who had associated vascular and bowel-related complications.

### Procedure

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 by the surgical team experienced in pancreatic surgery. The local complications of acute pancreatitis were based on the revised Atlanta classification 2012. All complications were graded according to the Clavien-Dindo classification. Data were analyzed using the statistical package for the social sciences (SPSS) version 20.

### Results

**Table 1: The demographic and clinical characteristics of patients**

Variables	N	%
<b>Gender</b>		
Male	30	60
Female	20	40
<b>Clinical characteristics</b>		
<b>Etiology</b>		
Biliary	21	42
Ethanol	25	50
Others	4	8
<b>Category of pancreatic fluid collection (PFC)/complications</b>		
PPC	8	16
ANC	16	32
WON	8	16
Pseudocyst	18	36
<b>Location of the cavity</b>		
Head	17	34
Body or tail	33	66

Out of 50 patients, 60% were males. 50% had ethanol etiology and 36% had pseudocyst pancreatic fluid collection. According to the location, 66% were at body or tail.

**Table 2: Clavien-Dindo classification of the complication following surgical intervention**

Clavien-Dindo classification	N	%
Grade 0	9	18
Grade 1	11	22
Grade 2	17	34
Grade 3	2	4
Grade 4	11	22

According to Clavien-Dindo classification, 34% were in grade 2 followed by grade 1 (22%) and grade 4 (22%).

### Discussion

The primary goal of treatment for acute necrotic collection is to drain the content and remove all infected pancreatic tissues. [6] The available

treatment options include open and laparoscopic transperitoneal drainage, image-guided retroperitoneal drainage, and endoscopic transgastric approaches. [7] 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. In 2010 the results of the trial demonstrated several benefits from the step-up approach over laparotomy. [8]

Out of 50 patients, 60% were males. 50% had ethanol etiology and 36% had pseudocyst pancreatic fluid collection. According to the location, 66% were at body or tail. According to Clavien-Dindo classification, 34% were in grade 2 followed by grade 1 (22%) and grade 4 (22%). 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. [14] However, if the WON is infected, intervention is warranted in the form of endoscopic drainage or open necrosectomy. [7] 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. [15] These include transpapillary pancreatic duct stenting, transmural drainage, or a combination of both. [16,17] Transpapillary stent placement and endoscopic ultrasound (EUS)-guided transmural drainage (EUS-TM) for PPC drainage report a wide range of clinical success. [18-20] However, when these modalities are not suitable for the patient surgical management is an acceptable modality for managing pancreatic pseudocyst. [21]

There is no single surgical procedure that is appropriate for all pseudocysts. The most important factor dictating the mode of treatment is local expertise. [22] 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. [23] 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. [24,25]

## 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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