

ORIGINAL RESEARCH

To investigate the indications and outcomes of surgical intervention for local complications arising from acute pancreatitis

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ABSTRACT

Aim: To investigate the indications and outcomes of surgical intervention for local complications arising from acute pancreatitis. **Material and methods:** This prospective observational research was undertaken at the Department of General Surgery, with the permission of the protocol review committee and institutional ethics committee. The study's inclusion criteria were individuals who received laparoscopic, retroperitoneal, or open surgical treatments to address the local complications of acute pancreatitis. **Results:** Out of the total, 50 individuals had local problems as a result of acute pancreatitis. The step-up method was used to handle all patients, beginning with conservative therapy and implementing minimally invasive intervention when necessary. Twenty individuals need surgical surgery as a result of the ineffectiveness of endoscopic or radiological intervention, or owing to the inaccessibility of lesions to these procedures. **Conclusion:** Several endoscopic procedures are now accessible for the treatment of pancreatic fluid accumulation and pancreatic necrosis. However, surgery continues to be a crucial approach in controlling the condition.

Keywords: Acute pancreatitis, Indications, CT scan

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INTRODUCTION

Acute pancreatitis, which refers to the sudden nonbacterial inflammation of the pancreas, occurs when digestive enzymes are prematurely activated inside acinar cells, leading to damage to the gland, surrounding tissues, and other organs. The etiology of acute pancreatitis is well recognized, however, the precise processes behind its development and progression remain elusive. Understanding the first events that trigger inflammation and identifying the proand anti-inflammatory elements that influence the intensity of the illness might enable the implementation of therapeutic strategies to prevent the occurrence of the process or reduce the likelihood of related problems.¹ Acute pancreatitis is a prevalent gastrointestinal condition that necessitates immediate hospitalization on a global scale. It has been estimated to occur at a rate of 13 to 45 cases per 100,000

individuals annually.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 research was undertaken at the Department of General Surgery, with the permission of the protocol review committee and institutional ethics committee. The study's inclusion criteria were patients who received laparoscopic, retroperitoneal, or open surgical treatments to address the local problems arising from acute pancreatitis. The research excluded participants who had concurrent vascular and bowel-related problems.

METHODOLOGY

The clinical, laboratory, and imaging data, including the contrast-enhanced CT scan results, were documented according to the proforma. Furthermore, all the examined patients were assessed for the indication of each surgery, perioperative outcome, and any related complications. The surgical team, skilled in pancreatic surgery, completed all minimally

invasive operations utilizing the Karl Storz® laparoscopic equipment while the patient was under general anesthesia. The local complications of acute pancreatitis were determined according to the updated Atlanta classification of 2012. Seventeen The Clavien-Dindo classification was used to grade all problems. Eighteen

The data were analyzed using the statistical software program for the social sciences (SPSS) version 25.0.

RESULTS

A total of 450 individuals were brought to the surgical department with either a diagnosis of acute pancreatitis or complications arising from acute pancreatitis. Out of the total, 50 individuals had local problems as a result of acute pancreatitis. The step-up method was used to handle all patients, beginning with conservative therapy and implementing minimally invasive intervention when necessary. Twenty individuals need surgical surgery as a result of the ineffectiveness of endoscopic or radiological intervention, or owing to the inaccessibility of lesions to these procedures. The patients' demographic and clinical features are shown in (Table 1). Out of the 20 patients included in the trial, three individuals had PPC. All three patients were treated with external drainage as a result of ongoing symptoms. Initially, conservative care was applied to seven patients who had ANC. Nevertheless, as a result of ongoing high body temperature and worsening medical condition, a second contrast-enhanced CT scan was performed, which showed indications of infected tissue death. According to the results of the Contrast-Enhanced Computed Tomography (CECT), five patients received treatment with VARD, while one patient had open necrosectomy and closed drainage between days 15 and 21 after the illness started.

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±2.65	

Table 2: The clinical characteristics of patients.

Clinical characteristics	Number	Percentage
Etiology		
Biliary	9	45
Ethanol	10	50
Others	1	5

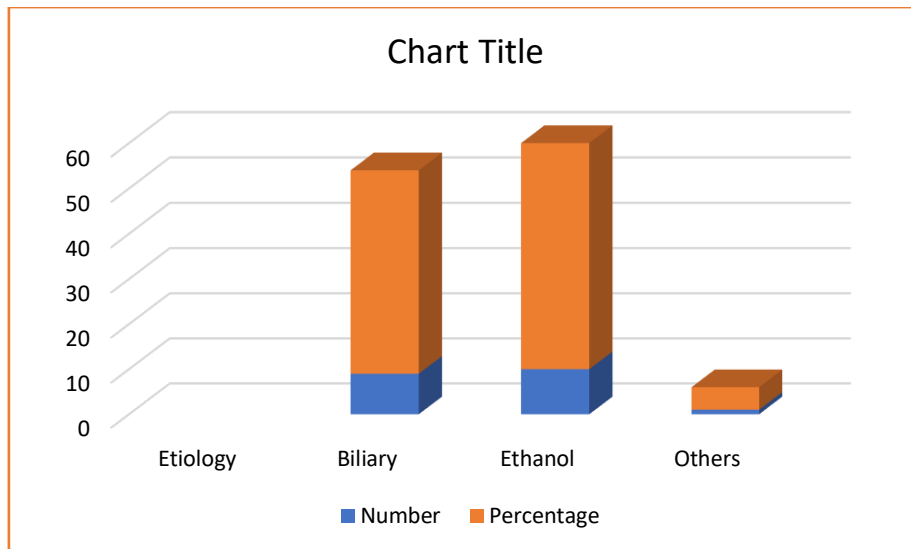


Figure 1: The clinical characteristics of patients

Table 3: The PFC and cavity location

	Number	Percentage
PPC	3	15%
ANC	7	35%
WON	3	15%
Pseudocyst	7	35%
Location of the cavity		
Head	6	30%
Body or tail	14	70%

As a result of inadequate drainage in a patient who had VARD, a laparoscopic transgastricnecrosectomy was carried out on the 21st day, as shown by a CECT scan showing a fully developed wall. Furthermore, WON was seen in three individuals. All patients with WON had FNAC because to clinical worsening and a strong suspicion of infected necrosis. The FNAC results confirmed the presence of 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

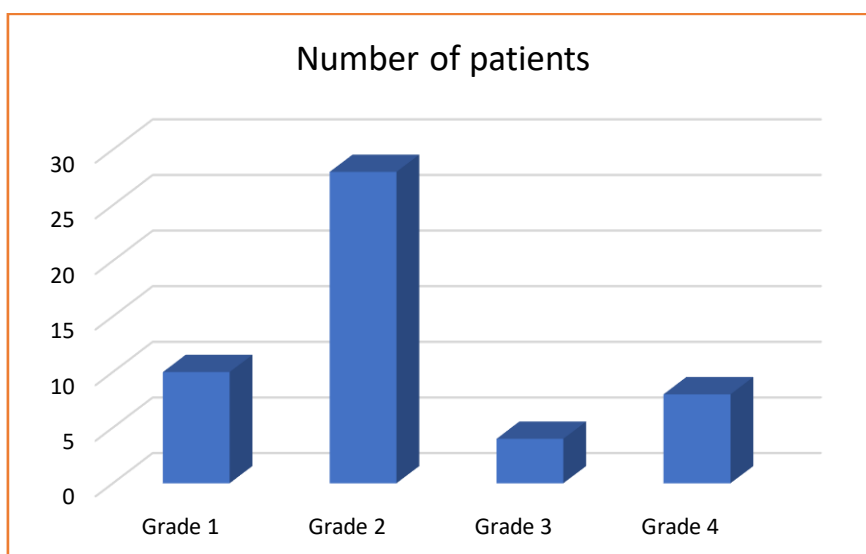


Figure 2. Clavien-Dindo classification of the complication following surgical intervention

Every patient received either laparoscopic or open cysto-gastrostomy. All eight individuals diagnosed with a pseudocyst had cysts larger than 6 cm and were experiencing symptoms. One patient had laparoscopic internal drainage, while seven others got open cysto-enterostomy. No deaths occurred in this group. However, three patients got hospital-acquired pneumonia and required external continuous positive airway pressure support, while four patients had surgical site infections. A single patient who had open necrosectomy required re-exploration on the second day after the surgery due to bleeding. Seven patients needed blood transfusion. The average duration of hospitalization was 15.4 days. The level of complexity seen post-surgery in these individuals is shown in table 4.

DISCUSSION

The main objective of treating acute necrotic collection is to evacuate the contents and excise all diseased pancreatic tissues.¹⁹The therapeutic methods now available include of open and laparoscopic transperitoneal drainage, image-guided retroperitoneal drainage, and endoscopic transgastric techniques.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

localexpertise.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

CONCLUSION

The optimal management of individuals experiencing local complications of pancreatitis is achieved at a specialist tertiary care center with skilled pancreatic surgeons who has competence in handling such situations. Despite the availability of several endoscopic procedures for treating pancreatic fluid accumulation and pancreatic necrosis, surgery continues to be a crucial method for controlling the condition.

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