Original Research Article

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Indications and outcome of surgical management of local complications of acute pancreatitis: a single-centre experience

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ABSTRACT

Background: Acute pancreatitis is a common and challenging disease that can develop both local and systemic complications. According to the Atlanta classification, local complications include peri-pancreatic collection, acute necrotic collection, pseudocyst and walled-off necrosis.

Methods: A hospital-based retrospective study was conducted in the department of surgery at Kathmandu medical college teaching hospital. Patients were recruited using purposive sampling method and those who underwent laparoscopic, retroperitoneal or open surgical procedures for the management of local complications of acute pancreatitis from June 2017 to July 2021. The indication, perioperative outcome and associated complications were evaluated in all the cases.

Results: Between June 2017 to July 2021, 432patients were admitted to the surgery department with acute pancreatitis or with complications of acute pancreatitis. Twenty-one patients required surgical intervention in the form of external drainage, cysto-enterostomy, VARD or open necrosectomy due to failure of endoscopic or radiological intervention or due to positions of lesions being inaccessible to these techniques. All patients had clinical improvement following surgery with an acceptable complication rate given the severity of the disease.

Conclusions: 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

INTRODUCTION

Acute pancreatitis has local and systemic complications. Terminologies used for local complications of acute pancreatitis are based on the revised Atlanta classification 2012. Acute pancreatitis has two phases, early and late. During the early phase (<4 weeks), the local complications are categorized as Acute peri-pancreatic collection (PPC) and acute necrotic collection (ANC). During the late phase (>4 weeks), walled-off necrosis (WON)and pseudocyst areobserved. Vascular complications are encountered in both the early and late phases.

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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. Timing and modality of intervention for these local complications strongly impact the morbidity and mortality of acute pancreatitis. 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. 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 at Kathmandu medical college teaching hospital (KMCTH), Kathmandu, Nepal, after approval from the institutional ethical committee. A purposive sampling method was utilized to recruit the patients.

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 from 1 June 2017 to 30 July 2021. 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 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 2012.¹ All complications were graded according to the Clavien-Dindo classification.⁷ Data were analyzed using the statistical package for the social sciences (SPSS) version 20.

RESULTS

Between 1st June 2017 and 30th July 2021, 432 patients were admitted to the surgery department with the diagnosis of acute pancreatitis or with complications of acute pancreatitis. Among them, 64 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-one 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 21 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.

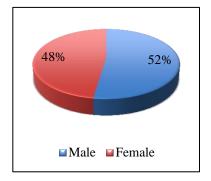


Figure 1: Male to female ratio.

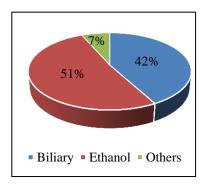


Figure 2: Etiology of acute pancreatitis.

Table1: The demographic and clinical characteristics of patients.

Variables	N	%
Total number (n)	21	100
Male patients	11	52.38
Median age (years)	47.5	
Clinical characteristics		
Etiology		
Biliary	9	42.86
Ethanol	11	52.38
Others	1	4.7
Category of pancreatic fluid collection		
(PFC)/complications		
PPC	3	14.29
ANC	7	33.33
WON	3	14.29
Pseudocyst	8	38.09
Location of the cavity		
Head	7	33.33
Body or tail	14	66.67

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.

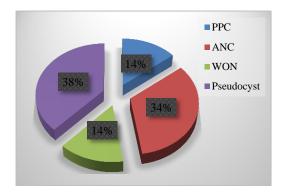


Figure 3: Local complications of acute pancreatitis.

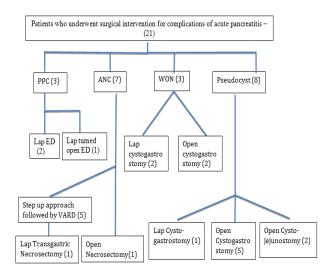


Figure 4: Flowchart of patients with complications of acute pancreatitis undergoing different surgical procedures; lap (laparoscopic); ED (external drainage); VARD (video-assisted retroperitoneal drainage).

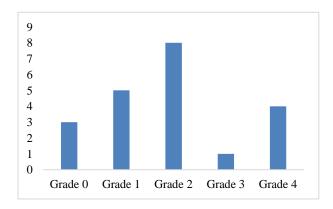


Figure 5: Clavien-Dindo classification of the complication following surgical intervention.

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 cysto-enterostomy (Figure 4). 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 (Figure 5).

DISCUSSION

In this study, ANC and pseudocyst were the commonest peripancreatic fluid collection requiring surgical intervention. WON and pseudocyst were managed using minimally invasive techniques in more than 80% of the cases. While most cases of ANC were managed using VARD, patients with PPC were managed by laparoscopic and open external drainage techniques. The etiology of the majority of the cases in this study was either biliary or ethanol. In addition, one patient had developed pancreatitis secondary to hypertriglyceridemia. In our study, biliary pancreatitis was common among females, whereas alcoholic pancreatitis was more common among males, as noted with global trends.⁸

The primary goal of treatment for acute necrotic collection is to drain the content and remove all infected pancreatic tissues.⁵ The available treatment options include open and laparoscopic transperitoneal drainage, image-guided retroperitoneal drainage, and endoscopic transgastric approaches.⁶ 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. 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. However, if the WON is infected, intervention is warranted in the form of endoscopic drainage or open necrosectomy. 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. These include transpapillary pancreatic duct stenting, transmural drainage, or a combination of both. Transpapillary stent placement and endoscopic ultrasound (EUS)-guided transmural drainage (EUS-TM) for PPC drainage report a wide range of clinical success. However, when these modalities are not suitable for the patient surgical management is an acceptable modality for managing pancreatic pseudocyst. Transpapillary surgical management is an acceptable modality for managing pancreatic pseudocyst.

There is no single surgical procedure that is appropriate for all pseudocysts. The most important factor dictating the mode of treatment is localexpertise. Bespite 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. 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. Despite the various and procedure performed, followed by a posterior gastrostomy centred on the cyst, which avoids dissection through inflamed tissues.

Limitations

The main limitation of this study is its small sample size. In addition, these surgical procedures have not been directly compared to other techniques such as endoscopic and interventional radiological procedures.

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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Ethical approval: The study was approved by the

Institutional Ethics Committee

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