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Outcome assessment of surgical management of local complications of acute pancreatitis: An observational study

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Abstract

Aim: To evaluate the indication and outcome of different surgical management modalities in local complications of acute pancreatitis.

Methodology: A hospital-based observational study was conducted in the department of surgery Shri Shankaracharya Institute of medical sciences, Bhilai, India after approval from the institutional ethical committee. A purposive sampling method was utilized to recruit the patients. Patients who underwent laparoscopic or open surgical procedures transperitoneal or retroperitoneal for the management of local complications of acute pancreatitis for the period of 1 year were included. 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.

Results: Total 496 patients were admitted to the surgery department with the diagnosis of acute pancreatitis or with complications of acute pancreatitis. Among them, 80 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. 24 patients required surgical intervention due to failure of endoscopic or radiological intervention or positions of lesions being inaccessible to these techniques. Among the 24 patients in the study, 4 patients had PPC, all of whom were managed with external drainage due to persistent symptoms. 6 patients who had ANC were initially subjected to conservative management. In addition, WON was noted in 4 patients and 10 patients had pseudocyst. Due to clinical deterioration and high suspicion of infected necrosis in patients with WON, FNAC was performed in all patients, revealing growth in culture.

Conclusion: Patients who have local complications of pancreatitis respond best to treatment at a tertiary care centre that is staffed with pancreatic surgeons. Surgery is still the primary treatment option for pancreatic necrosis and pancreatic fluid collection, despite the proliferation of endoscopic procedures designed to treat these conditions.

Keywords: Pancreatitis, necrosis, pseudocyst, endoscope

Introduction

Acute pancreatitis (AP) is defined as an acute inflammatory attack of the pancreas with a sudden onset of symptoms, which, in the absence of post necrotic damage to the gland, results in complete resolution of histology, physiology, and symptoms and, provided the initiating cause is removed, there will be no further attacks^[1]. Acute pancreatitis is characterized by a rapid onset of symptoms and an acute inflammatory attack of the pancreas. It is caused by the premature activation of digesting enzymes inside the acinar cells of the gland, which can result in varied degrees of damage to the gland itself, the tissues surrounding, and other organs. It is common knowledge that a number of conditions may lead to acute pancreatitis, but the mechanisms that cause the disease and the manner in which those processes is not well understood^[2].

With a reported yearly prevalence of 13 to 45 cases per 100000 individuals^[3] acute pancreatitis is one of the most prevalent gastrointestinal illnesses that requires immediate hospitalisation globally. It is the third most prevalent gastrointestinal illness that results in the need for immediate hospitalisation in the United States^[4]. Acute pancreatitis is responsible for 270000 hospital admissions yearly and in-patient expenses that surpass 2.5 billion dollars^[5].

This statistic is only relevant for the United States. The most prevalent causes of AP are gallstones (40-65%) and alcohol (25-40%), while the remaining 10-30% are related to a range of reasons including autoimmune and genetic risk factors [6]. Gallstones account for the majority of cases of AP. Although the majority of individuals who suffer from acute pancreatitis make a full recovery without experiencing any complications, between 10 and 20 percent of those affected will have a more difficult clinical course with increased risks of morbidity and death [7]. Because of organ failure, patients with severe acute pancreatitis (SAP) need to remain hospitalised for an extended period of time, which commonly includes a stay in the intensive care unit (ICU) [8].

The mortality rate associated with severe pancreatitis ranges from 15% to 30%, but the mortality rate associated with mild pancreatitis is just 0% to 1%. Organ failure is the most significant factor that determines death in acute pancreatitis. However, a subsequent necrotic infection can emerge in roughly thirty percent of individuals who have necrotizing pancreatitis [9]. This usually takes place three to four weeks after the initial beginning of necrotizing pancreatitis.

Complications can arise both locally and across the body when someone has acute pancreatitis. The updated Atlanta classification from 2012 is the source for the terminology that is used to describe the local consequences of acute pancreatitis [10]. Early and late pancreatitis are the two stages of acute pancreatitis. During the early period (less than four weeks), the local complications are broken down into two categories: acute peri-pancreatic collection (often abbreviated as PPC) and acute necrotic collection (ANC). In the late phase of the infection, which lasts for more than four weeks, walled-off necrosis (WON) and pseudocyst are detected [10, 11]. Both the early and the late phases are associated with the development of vascular problems [12]. Intervention is recommended if the fluid collection becomes contaminated during the first four weeks or if symptoms persist for more than four weeks from the beginning of the condition [13].

The timing of intervention and the treatment mechanism chosen for these local consequences have a significant influence on the morbidity and mortality associated with acute pancreatitis [14]. Less invasive alternatives such as percutaneous drainage or endoscopic drainage procedures will be suitable for addressing most occurrences of local problems. However, minimally invasive (video-assisted or laparoscopic) or open surgical drainage is needed when these modalities cannot drain the collection effectively. This is because minimally invasive drainage is less intrusive than open surgical drainage. The purpose of this study is to examine the indications for various surgical management methods and the outcomes of those treatments in the treatment of local complications of acute pancreatitis.

Materials and Methods

A hospital-based observational study was conducted in the department of surgery Shri Shankaracharya Institute of medical sciences, Bhilai, India after approval from the institutional ethical committee.

Inclusion criteria

Patients who underwent laparoscopic, or open surgical procedures for the management of local complications of acute pancreatitis from September 2019 to March 2021

Exclusion criteria

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 [10]. All complications were graded according to the Clavien-Dindo classification [15].

Results

Total 496 patients were admitted to the surgery department with the diagnosis of acute pancreatitis or with complications of acute pancreatitis. Among them, 80 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. 24 patients required surgical intervention due to failure of endoscopic or radiological intervention or positions of lesions being inaccessible to these techniques.

Table 1: The demographic and clinical characteristics of patients

Variables	N	%
Total number (n)	24	100
Male patients	13	54.17
Female	11	45.83
Median age (years)	47.5+12.42	
Clinical characteristics		
Etiology		
Biliary	10	41.67
Ethanol	13	54.17
Others	1	4.16
Category of pancreatic fluid collection (PFC)/complications		
PPC	4	16.67
ANC	6	25.00
WON	4	16.67
Pseudocyst	10	41.66
Location of the cavity		
Head	9	37.50
Body or tail	15	62.50

Among the 24 patients in the study, 4 patients had PPC, all of whom were managed with external drainage due to persistent symptoms. 6 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, 4 patients were treated with VARD, and 1 patient was treated with open necrosectomy and closed drainage between days 15 to day 21 following the onset of the disease. Due to incomplete drainage in 1 patient who underwent VARD, laparoscopic transgastric necrosectomy was performed on day 21 as CECT revealed a matured wall. In addition, WON was noted in 4 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 2: Clavien-Dindo classification of the complication following surgical intervention

Variables	N	%
Grade 0	3	12.5
Grade 1	6	25.0
Grade 2	9	37.5
Grade 3	1	4.2
Grade 4	5	20.8

All patients underwent laparoscopic or open cystogastrostomy. Among the 10 patients with a pseudocyst, all patients had the size of the cyst more than 6 cm and were symptomatic. 2 patients underwent laparoscopic internal drainage, while 8 others underwent open cystoenterostomy. There was no mortality in this series; 4 patients developed hospital-acquired pneumonia requiring external continuous positive airway pressure ventilation, and 3 patients developed surgical site infections. 1 patient who underwent open necrosectomy had to be re-explored on postoperative day 2 for bleeding. Blood transfusion was required in 9 patients. The mean hospital stay was 14.5 days.

Discussion

Surgery and its timing are the focus of contention when treating SAP. Decades ago, some experts used laparotomy in the early phase of SAP to debride and drain the retroperitoneal infected necrosis [16]. However, studies have shown that “early” surgery is often accompanied by higher mortality [17], and several studies also have shown that there is success with some SAP patients with retroperitoneal infected necrosis, conservatively managed without high-risk surgical intervention; therefore, many experts advocated delayed surgery [17, 18]. In recent decades, higher mortality rates during early surgery resulted from those SAP cases that underwent traditional laparotomy (which may cause severe trauma) to debride and drain the retroperitoneal infected necrosis [19].

Faced with high morbidity and mortality rates of operative necrosectomy, minimally invasive strategies are being increasingly explored by gastrointestinal surgeons, radiologists, and gastroenterologists [20]. As technical ability and endoscopic tools have gradually become more precise, the mortality rates of patients with severe pancreatitis have improved, and there are fewer complications compared to those having open debridement treatment [21]. Percutaneous catheter drainage (PCD), endoscopic transgastric procedures, and a minimally invasive approaches all have been proposed as alternatives to open necrosectomy [22]. When minimal invasive management is unsuccessful or necrosis has spread to locations not accessible by endoscopy, open abdominal surgery is recommended [21].

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 [23].

The primary goal of treatment for acute necrotic collection is to drain the content and remove all infected pancreatic tissues [24]. The available treatment options include open and laparoscopic

transperitoneal drainage, image-guided retroperitoneal drainage, and endoscopic transgastric approaches [25]. 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 [26]. In 2010 the results of the trial demonstrated several benefits from the step-up approach over laparotomy [26]. 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 [27].

Conclusion

Pancreatitis patients who develop local problems should be treated at a tertiary care centre staffed by expert pancreatic surgeons. Surgical intervention is still a crucial part of pancreatic necrosis and pancreatic fluid collection management, despite the availability of endoscopic procedures.

References

- Whitcomb DC. Pancreatitis: TIGAR-O version 2 risk/etiology checklist with topic reviews, updates, and use primers. *Clin Transl Gastroenterol.* 2019;10(6):e00027.
- Cruz-Santamaría DM, Taxonera C, Giner M. Update on pathogenesis and clinical management of acute pancreatitis. *World J Gastrointest Pathophysiol.* 2012;3:60-70.
- Yadav D, Lowenfels AB. The epidemiology of pancreatitis and pancreatic cancer. *Gastroenterology.* 2013;144:1252-1261.
- Gooszen HG, Besselink MG, van Santvoort HC, Bollen TL. Surgical treatment of acute pancreatitis. *Langenbecks Arch Surg.* 2013;398:799-806.
- Peery AF, Dellon ES, Lund J, Crockett SD, McGowan CE, Bulsiewicz WJ, *et al.* Burden of gastrointestinal disease in the United States: 2012 update. *Gastroenterology.* 2012;143:1179-1187.e1-3.
- Yadav D, Lowenfels AB. The epidemiology of pancreatitis and pancreatic cancer. *Gastroenterology.* 2013;144(6):1252-1261.
- Wu BU, Johannes RS, Sun X, Tabak Y, Conwell DL, Banks PA. The early prediction of mortality in acute pancreatitis: a large population-based study. *Gut.* 2008;57:1698-1703.
- Beger HG, Rau BM. Severe acute pancreatitis: Clinical course and management. *World J Gastroenterol.* 2007;13:5043-5051.
- Besselink MG, Van Santvoort HC, Boermeester MA, Nieuwenhuijs VB, Van Goor H, Dejong CH, *et al.* Timing and impact of infections in acute pancreatitis. *Br J Surg.* 2009;96:267-273.
- Banks PA, Bollen TL, Dervenis C. Classification of acute pancreatitis - 2012: Revision of the Atlanta classification and definitions by international consensus. *Gut.* 2013;62(1):102-11.
- Colvin SD, Smith EN, Morgan DE, Porter KK. Acute pancreatitis: an update on the revised Atlanta classification. *Abdom Radiol (NY).* 2020;45(5):1222-31.
- Gluszek S, Nawacki Ł, Matykiewicz J, Kot M, Kuchinka J.

- Severe vascular complications of acute pancreatitis. *Pol Prz Chir Polish J Surg.* 2015;87(10):485-90.
13. IAP/APA evidence-based guidelines for the management of acute pancreatitis. *Pancreatology.* 2013;13(2):48-53.
 14. Lancaster A, Zwijacz M. Acute pancreatitis and fluid-filled collections: etiology and endoscopic management. *Gastroenterol Nurs.* 2019;42(5):417-9.
 15. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. *Ann Surg.* 2004;240(2):205-13.
 16. Autio V, Juusela E, Lauslahti K, Markkula H, Pessi T. Resection of the pancreas for acute hemorrhagic and necrotizing pancreatitis. *World J Surg.* 1979;3:631-639.
 17. Mier J, León EL, Castillo A, Robledo F, Blanco R. Early versus late necrosectomy in severe necrotizing pancreatitis. *Am J Surg.* 1997;173:71-75.
 18. Sarr MG, Nagorney DM, Mucha P, Farnell MB, Johnson CD. Acute necrotizing pancreatitis: management by planned, staged pancreatic necrosectomy/debridement and delayed primary wound closure over drains. *Br J Surg.* 1991;78:576-581.
 19. Tu Y, Jiao H, Tan X, Sun L, Zhang W. Laparotomy versus retroperitoneal laparoscopy in debridement and drainage of retroperitoneal infected necrosis in severe acute pancreatitis. *Surg Endosc.* 2013;27:4217-4223.
 20. Werner J, Feuerbach S, Uhl W, Büchler MW. Management of acute pancreatitis: from surgery to interventional intensive care. *Gut.* 2005;54:426-436.
 21. Chen J, Fukami N, Li Z. Endoscopic approach to pancreatic pseudocyst, abscess and necrosis: review on recent progress. *Dig Endosc.* 2012;24:299-308.
 22. Babu RY, Gupta R, Kang M, Bhasin DK, Rana SS, Singh R. Predictors of surgery in patients with severe acute pancreatitis managed by the step-up approach. *Ann Surg.* 2013;257:737-750.
 23. Lankisch PG, Apte M, Banks PA. Acute pancreatitis. *Lancet.* 2015;386:85-96.
 24. Lancaster A, Zwijacz M. Acute pancreatitis and fluid-filled collections: etiology and endoscopic management. *Gastroenterol Nurs.* 2019;42(5):417-9.
 25. Baron TH, Di Maio CJ, Wang AY, Morgan KA. American gastroenterological association clinical practice update: Management of Pancreatic Necrosis. *Gastroenterol.* 2020;158(1):67-75.
 26. Hollemans RA, Bakker OJ, Boermeester MA, *et al.* Superiority of Step-up Approach vs Open Necrosectomy in Long-term Follow-up of Patients With Necrotizing Pancreatitis. *Gastroenterology.* 2019;156(4):1016-26.
 27. Dalsania R, Willingham FF. Treatment of walled-off pancreatic necrosis. *Curr Opin Gastroenterol.* 2019;35(5):478-82.