

Endoscopic Drainage of Pancreatic Pseudocysts: Clinical Profile and Outcome Analysis

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ABSTRACT

Background: Pancreatic pseudocyst is a complication of acute and chronic pancreatitis. Although surgery considered the gold standard, there is a rapid shift towards endoscopic treatment owing to its therapeutic outcome and minimal invasive involvement. This study aims to present the clinical profile and outcome analysis of the endoscopic drainage of pancreatic pseudocysts in Dhulikhel Hospital.

Methods: This is a retrospective review of all patients who were diagnosed with pancreatic pseudocyst between January 2015 and December 2018 in Dhulikhel Hospital. The retrospective data were on patient characteristics, etiology, location of the cyst, other clinical characteristics.

Results: The study included 51 patients and the average age of the patients in this study was 39 years and among them 62.7% were female. The mean size of pseudocyst was 7.89 cm, and the average days of hospital stay was 13.64. The most common etiology was idiopathic and more than half of the patient's cyst was in head and/or body, 15 and 36 underwent conservative and therapeutic management respectively. The technical success rate was at 94% and reported increased pancreatic pseudocyst in Dhulikhel Hospital from 2015-18.

Conclusions: The study findings highlight the increased trend of pancreatitis pseudocyst as a complication of acute or chronic pancreatitis. Endoscopic drainage of pseudocyst with plastic stent is an established method of managing it. However, pancreatic pseudocyst even larger than 6 cm can undergo spontaneous resolution. Hence, conservative management should be considered first.

Keywords: Endoscopic ultrasound; endoscopic drainage; pancreatitis; pancreatic pseudocyst.

INTRODUCTION

Pancreatic pseudocyst is a localized fluid collection that arises as a complication of acute or chronic pancreatitis.¹ The most common presentation is a single pseudocyst, about 5-20% of the cases show multiple pseudocysts.² Although prevalence of pancreatic pseudocysts accounts for 75-80% or cystic lesions.³⁻⁵ Endoscopic Ultrasound (EUS) has been added to improve diagnostic and therapeutic accuracy and is replacing the conventional method as a standard approach for treatment of pancreatic pseudocysts. In limited resource settings like Nepal, accessibility of the endoscopic drainage is uncommon. However, pancreatic pseudocyst even larger than 6 cm can undergo spontaneous resolution.

Hence, conservative management should be considered first. Thus, the study aims to present the clinical profile and outcome analysis of the endoscopic drainage of pancreatic pseudocysts in Dhulikhel Hospital.

METHODS

This was a retrospective observational study, conducted in gastroenterology division of Dhulikhel Hospital (DH) The study was conducted from January 2015 to December 2018 and reviewed the record of patients of DH who were diagnosed with pancreatic pseudocyst. The study was approved by the institutional review committee of Kathmandu University School of Medical Sciences IRC committee (46/19), to review the medical

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records of the eligible patients throughout the study period. The inclusion criteria of the patients (study participants) were:

1. Radiological-diagnosed pancreatic pseudocyst either with or without symptoms
2. Patients with a follow up period of at least 3 months after first drainage for those who underwent therapeutic intervention. For those who were managed conservatively, 3 months follow up was from their first clinical visit where diagnosis was confirmed. This study included all the eligible patients (n=51) out of 58 patients throughout the study period, excluding the pregnant patients.

Patients were asked to visit an outpatient clinic as a routine follow up 4 weeks after stent placement. Those under conservative care were also asked to follow up at 4 weeks after their first clinical visit. They were asked to visit 1-3 monthly as necessary after the first visit, and the stent was removed if complete resolution had occurred during any of these visits. Progress was monitored through radiological examination.

With the revised Atlanta Classification the distinction between various pancreatic fluid collections (PFCs) was made with clear-cut criteria. The classification was meant as a way forward for radiologists and clinicians to diagnose and plan therapeutic measures with precision. However, as Adler and Siddiqui point out in their study, the definitive line of distinction becomes blurred quite often in clinical practice. In this study, at least 2 of the participants showed no evidence of solid components in collection arising out of necrotic pancreatitis. Given the definition in revised Atlanta Classification that necrotic pancreatitis gives rise to Acute Necrotic Collection (ANC), which is likely to develop into Walled Off Necrosis (and not pseudocyst) after 4 weeks. In some cases, the collection was diagnosed as pseudocyst in CT examination, but was found to contain solid components during EUS-guided drainage in our setting, after which the diagnosis had to be changed in reports. Owing to this inconsistency in following the guideline to naming pancreatic fluid collections as advised by the revised Atlanta Classification, this study decided to include all mature fluid collections (either with or without solid components) into assessment. It was also a consensus among the authors that the aim of this paper is to look for general clinical profiles, incidence, and outcome of pancreatic pseudocyst in a cohort, the decision to include all pseudo cystic pancreatic fluid collection regardless of their content was agreed upon. From here

on, pseudocyst refers to a mature cyst either with or without solid component, with distinction made where deemed necessary.

Technical success was defined by successful deployment of at least one stent across the newly formed transmural tract. Successful treatment was defined as complete resolution on radiological examination at three months outpatient follow-up evaluation.

The data of the eligible patients was extracted from the hospital electronic database and medical records of the endoscopy unit of the Gastroenterology department at Dhulikhel Hospital. The data was entered and further cleaned in Microsoft Excel program and was exported to the SPSS version 22 software for the data analysis. The information that was included in the study were socio-demographics, clinical, laboratory investigations, procedures, imaging, and others.

The study presented the descriptive statistics and summarized the mean, median, standard deviation, quartiles of the continuous variable and tabulated frequency table for the categorical variables.

RESULTS

The table 1 summarizes the demographic and the clinical features of the 51 eligible patients with endoscopic drainage of pancreatic pseudocysts at Dhulikhel Hospital. The average age of the patients in this study was 39 (SD \pm 13.55) years and among them 62.7% were male and 37.3% were female.

The mean size of pseudocyst was 7.89 cm (SD \pm 2.5-18cm) among which 18 cases had solid components present in varying degrees. The average days of hospital stay was 13.64 (\pm 14.42). The most common etiology of pancreatitis was idiopathic (60.8%) followed by biliary (23.5%), alcoholic (11.8%) and trauma (3.9%). The CT and/or USG were used as the initial diagnostic test in all the cases and indications for drainage were abdominal pain and infection along with biliary obstruction. More than half of the patient's cyst was in head and/or body and few were in tail (29%) and extra pancreatic (22%). The study also demonstrated that more than half (54.5%) of the causes of pseudocyst were of acute origin and about 44.5% were of chronic origin. Three of them had stent migration, one passed in stool spontaneously. In one case of stent migration, two out of three had migrated and one was in-situ. The highest number of stents used was two (n=14) and then one (n=12), three (n=6), four (n=1) and one was an unknown number while

for two of the patients, the procedure was abandoned.

Stent migration did not significantly impact treatment rate in patients. It did, however, seem to affect the length of hospital stay. Length of hospital stay was also increased for those who had infection post endoscopic drainage. However, patients with cyst in head and/or body required therapeutic intervention more than those with cyst in either tail or extra pancreatic location.

In among 37 patients who underwent drainage with EUS-guided stenting, drainage was accomplished without EUS guidance in among nine patients and nine had to undergo repeated procedure. Neither location and size nor multiple cyst presentation was associated with repeated intervention. Only infected presentations seemed to warrant a need for repeated intervention.

Among 51 patients, 15 underwent conservative management owing to absence of any local complications and discomfort to patients, and 36 required different therapeutic intervention among which 32, 3 and 1 underwent trans gastric, trans duodenal and trans papillary therapeutic interventions respectively. Diameter of the cyst seemed to affect treatment of choice, cysts with larger diameter requiring therapeutic intervention as compared to smaller sized cysts. The study demonstrated 5 cases among the 15 that had conservative management, whose cyst diameter was greater than 6cm. In those cases, cyst size seemed to be decreasing with every monthly follow up as evidenced by USG examination, so no intervention was opted. Indication for drainage was thought to be infection in 15/36 of the cases. Complication rate between drainage of infected (2/15) and non-infected (7/21) cyst was less different. Infected presentations also did not have much influence in the number of hospital stay days and successful treatment rate.

In among six participants who encountered procedure related adverse events, two of them had infection, two had bleeding peri-procedure, one had pseudoaneurysm and other one had perforation. Technical failure was seen in 2 cases where procedure had to be abandoned without completing stent deployment. In one, failure was associated with inaccessible cyst cavity. There was persistent bleeding (about 200 ml) peri-procedure, which required 2 hemostatic clips and the procedure had to be abandoned without stenting. Another case, which also had excessive bleeding during procedure, had to be admitted to ICU without stent placement. All stents had a diameter ranging from 7Fr to 10Fr. The average resolution time after drainage was 10 weeks. This study showed technical success rate at 94%, complete resolution for 91%,

Table 1. The demographic and clinical characteristics of the pancreatic pseudocysts at Dhulikhel Hospital (n=51).

Variable	n (n=51)	%
Age (in years) [mean (SD)]	39.60 (±13.55)	
Gender		
Male	19	37.3
Female	32	62.7
Pseudocyst size (in cms) [mean (SD)]	7.80 (±2.5-18)	
Hospital stays (in days) [mean (SD)]	13.64 (±14.42)	
Etiology		
Idiopathic	31	60.8
Biliary	12	23.5
Alcoholic	6	11.8
Trauma	2	3.9
Location		
Head and/or body	27	52.9
Tail	15	29.4
Extra pancreatic	11	21.6
Pseudocyst origin		
Acute origin	28	54.5
Chronic origin	23	44.5
Post Stent		
Stent migration***	3	5.9
Passed in stool	1	2.0
Mortality	1	2.0

*** One stent was in situ

Table 2. Approach, adverse effect, and outcome assessment of pancreatic pseudocyst.

Variable	n (n=51)	%
Approach		
Conservative	15	29.4
Therapeutic		
Trans gastric	32	62.7
Trans duodenal	3	5.9
Trans papillary	1	2.0
Adverse events		
Infection	2	3.9
Pseudoaneurysm	1	2.0
Perforation	1	2.0

Bleeding peri procedure	2	3.9
Outcome assessment of pancreatic pseudocyst drainage at 3 months (in%)		
Technical success	48	94.4
Complete resolution	46	90.9
75% resolution	5	9.1
Adverse events	9	17.6
Number of stents used		
0 (failed/procedure abandoned)	2	3.9
1	12	23.5
2	14	27.5
3	6	11.8
4	1	2.0
Unknown	1	2.0

Figure 1 demonstrates the increasing incidence of pancreatic pseudocyst in Dhulikhel Hospital from 2015 to 2018. The number of cases were 6, 5, 11 and 29 in 2015, 2016, 2017 and 2018 respectively.

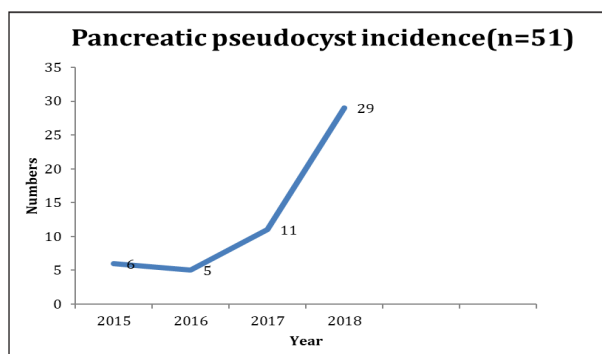


Figure 1. Pancreatic pseudocyst incidence (n=51).

DISCUSSION

This study highlighted increasing trend of pancreatitis cases and its complications as fluid collections requiring interventions. This study also reports the EUS guided pancreatic pseudocyst intervention in this volume from a resource limited country like Nepal. However, some hospital-based studies reflected that acute pancreatitis prevalence of 45-85 cases per annum in the tertiary care setting.⁶⁻⁸ The authors attributed this high incidence to widespread availability, and improvement in diagnostic technologies.⁹ EUS making its way into Nepali healthcare settings, the diagnostic as well as curative capabilities in various pancreato-biliary interventions have increased in recent years.

The average of the participants in this study was almost 40 years old with more female participants in the study. The evidence in literature shows that about 50% of pancreatic pseudocysts resolve spontaneously without the need for intervention.¹⁰ Our own finding was below that value, as 70.58% of the cases had to undergo therapeutic intervention. It is overwhelmingly accepted by clinicians and researchers that cysts larger than 6cm and persisting over six weeks are not viable for spontaneous resolution.¹¹ In contrast to this, our study had four cases with cysts larger than 6cm whose average resolution time was 8 weeks. In Sarr and Vitas Study of 68 patients of pancreatic pseudocyst diagnosis treated with non-operative approach and followed over a period of five years, 38% had resolution after more than six months (a total of 57% had successful resolution).¹⁰ Among those, there were also seven patients with cysts larger than 10 cm but did not encounter any serious complications. Other study by Yeo CJ et al and Maringhini A et al have also concluded through their independent studies that cysts larger than 6cm may undergo spontaneous resolution and that size alone is not an indication for drainage.^{11, 12}

Drainage of infected pseudocyst yields conflicting results. A recent prospective study by Sadiq et al concluded that the complication rate is 30% in infected cyst and only 6% in uninfected cyst. Varadarajulu S et al reached a similar conclusion of high complication rate with drainage of infected pseudocyst in their retrospective study of 211 patients.¹³ Our study, in contrast, supports the finding of Varadarajulu S et al that drainage of infected pseudocyst does not significantly affect the rate of complication. It also did not seem to affect the rate of treatment in our study. The technical success rate of endoscopic drainage of pseudocyst is reported at 71-97%¹⁴⁻¹⁶ and treatment success at 72-93%.¹⁷⁻²⁰ Our findings are on par with these studies.

Adverse events have been reported at a wide range of 4.6 to 34% in literature.²¹ A few studies demonstrate that adverse events occur more commonly with the use of plastic stent in comparison to metal stents, and that metal stents generate better clinical outcome.²²⁻²⁴ However, most comparative studies and systematic reviews on different kind of stents do not support this finding.²⁵⁻²⁸ What are agreed upon is that metal stents might shorten the procedural time due to its easy deployment method, hence, driving its use in sicker patients) and Plastic stent is more likely to be routinely indicated given its cheaper price and equal efficacy with metal stent.²⁹ Indeed, which type of stent should be used in each patient is a matter of exploring individual

patient presentation, better outcomes, as well as economic justification all combined. All the patients in our study were managed using plastic stents, which seems the most viable option in Nepal, considering that an average of 15.5% of urban population and 27.4% of rural population in Nepal is still below poverty line.³⁰ There was no record of time spent for each procedure in the database. However, there were also no any cases of adverse events cited that could be remotely related to longer procedural time

The published mortality rate is at 1% or lower.³⁰ In other cases, mortality observed in longer follow-up periods were related to secondary coexisting disease and comorbidities rather than procedure related adverse events. Our study has similar findings with one case of mortality of 64-year-old patient who was a seriously diagnosed case of advanced liver cirrhosis. The patient died of septic shock that developed 1 month following drainage procedure.

This study incorporates several limitations including the design of the study. First, the retrospective nature of the study immediately comes with its inherent limitations, including in our case, lack of records of longer follow-up duration and we have not been able to include all variables that we also want to include for more segregation and information of the study. Second, since we did not analyze the outcomes by differentiating between pseudocyst collection based on presence or absence of solid materials, we are not definitive about whether the presence and amount of necrotic debris affected the procedure and time of successful drainage, presenting complications, and the outcome. Third, there was a lack of comparison group on the types of stents used. Since all the patients had drainage using plastic stents, there is no conclusive evidence on whether the outcomes could have been any different with the use of Self Expandable Metallic Stents (SEMS) or Lumen-Apposing Metal Stents (LAMS) in terms of patient outcome. Lastly, our sample size is small and the study was conducted in a single center, so the finding in this study is bound to be limited in its generalizability. Despite the limitation the major strength of the study is that it has reported the underreported medical condition in the resource limited setting which will be great evidence for future researchers.

CONCLUSIONS

The study findings highlight the increased trend of pancreatitis incidence. Endoscopic drainage is a safe and effective method of managing pancreatic pseudocyst. undergo spontaneous resolution. Hence, conservative management should be sought first, and therapeutic interventions must only be attempted in case of symptomatic or complicated cysts. It is also recommended that larger prospective randomized trials be conducted to further address the unresolved issues associated with present study.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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