



## MANAGEMENT AND OUTCOMES OF PSEUDOCYST OF PANCREAS: A TERTIARY CARE CENTRE STUDY

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### Abstract:

**Background:** Pancreatic pseudocysts may arise as a complication of either acute or chronic pancreatitis. The evolving landscape of pseudocyst comprehension can be attributed to the progress in radiology and the advent of novel treatment approaches. This research aimed to evaluate the clinical characteristics, etiology, and diverse management strategies employed for pseudocysts within a tertiary care hospital setting.

**Methods:** This is a prospective study involving 80 adult patients conducted over a span of one year.

**Results:** Pseudocysts exhibit a higher prevalence in males, with alcohol identified as the most common associated etiology. Initial radiological assessments consisted of ultrasound, followed by contrast-enhanced computed tomography (CECT) of the abdomen for all patients. Complications linked to pseudocysts included gastric outlet obstruction and ascites. Internal drainage emerged as the predominant intervention. Post-drainage complications, notably infections, were addressed through antibiotic therapy, with endoscopic drainage implemented in cases of recurrence. Pain emerged as a significant post-operative issue. The preference for endoscopic drainage is growing, given its less invasive nature, higher long-term success rate, shorter hospital stay, and enhanced patient comfort.

**Conclusion:** Pancreatic pseudocysts predominantly afflict males, often associated with alcoholism. The clinical presentation varies, with abdominal pain being the most prevalent grievance, followed by nausea and vomiting. Initial intervention involves supportive care, but persistent symptoms and complications may necessitate surgical drainage, the most frequently employed management approach. Emerging treatment modalities, such as endoscopic interventions, offer distinct advantages, including reduced pain, shorter hospital stays, and lower recurrence rates.

**Keywords:** intervention, endoscopic, pseudocyst.

## Introduction

Acute pancreatitis is the inflammation of the pancreatic parenchyma. Most of the cases of acute pancreatitis are mild and self-limiting but some patients may develop severe life-threatening inflammation of the pancreas which requires hospitalisation. Acute pancreatitis may develop complications like acute fluid collection, walled of necrosis, pseudocyst, pancreatic necrosis and abscess.

Pancreatic pseudocysts are localized fluid collection surrounded by a non-epithelialized layer composed of fibrous and granulation tissue. They are called “pseudocysts” because true cysts are lined by an epithelial lining. The majority, approximately 70%, of pancreatic pseudocysts are intricately linked to chronic pancreatitis induced by alcohol consumption, underlining the significance of this etiological factor. However, the spectrum of triggers for pseudocyst formation is broad, encompassing acute pancreatitis, traumatic incidents, and various surgical interventions. According to the revised Atlanta classification, pancreatic pseudocysts typically manifest with a temporal delay of at least 4 weeks following the initiating event. They exhibit distinctive characteristics, including a well-defined inflammatory wall and a homogeneous fluid content without necrosis.<sup>1</sup> They are filled with amylase rich fluid due to extravasation of the pancreatic enzymes after the pancreatic inflammation. Location wise, 1/3<sup>rd</sup> are present near head and remaining 2/3<sup>rd</sup> in body and tail region. Pancreatic pseudocysts, emerging as a consequential outcome of either acute or chronic pancreatitis present with upper abdominal swelling, gastric outlet obstruction and pain in abdomen if size of the cyst is too large, are routinely identified through diagnostic modalities such as abdominal ultrasound (USG) and contrast-enhanced computed tomography (CECT) of the abdomen.<sup>2</sup> In most instances these pseudocysts exhibit a tendency to resolve spontaneously when managed with supportive care, the prognosis becomes intricately linked to their dimensions and the duration of their presence. Larger cysts, in particular, carry a heightened risk of complications, necessitating vigilant monitoring and tailored management strategies.

The landscape of pseudocyst comprehension has undergone dynamic transformations over time, primarily driven by advancements in radiological technologies and the introduction of novel treatment modalities. Treatment strategies for pancreatic pseudocysts are notably varied and lack a standardized approach. Only a handful of clear indications, such as cyst infection or biliary obstruction, provide specific guidance for therapeutic interventions.<sup>3,4</sup> Moreover, the landscape of therapeutic interventions has evolved over the last decade, with endosonographic drainage techniques gaining prominence and progressively supplanting surgical drainage procedures like cystogastrostomy or cystojejunostomy. Despite the emergence of randomized controlled trials comparing endosonographic drainage to conventional techniques, critical questions concerning the selection of patients for treatment and optimal timing remain insufficiently addressed in the current body of literature.<sup>5</sup> In the management of pancreatic pseudocysts, the decision to pursue invasive drainage procedures is typically driven by two main considerations: the persistence of patient symptoms and the presence of complications. Among the available drainage modalities, endoscopic techniques offer less invasive alternatives but these modalities are not available everywhere. Percutaneous catheter drainage represents another viable approach, involving the insertion of a catheter through the skin and into the pseudocyst under imaging guidance, effectively draining fluid and reducing cyst size. Surgical interventions, such as cysto-gastrostomy or Roux-en-Y cystojejunostomy or external drainage procedures, may be considered when endoscopic or percutaneous approaches prove impractical or unsuccessful.<sup>6</sup> The choice of drainage modality is tailored to factors like pseudocyst size, location, patient health, and the expertise available. This decision-making process is collaborative, involving the patient and healthcare team, and is based on individual circumstances and preferences. We planned this study to see the presentation of pseudocyst and outcome of various treatment modalities available in our set up.

## AIMS AND OBJECTIVES

To observe the effectiveness of different management strategies for pancreatic pseudocyst and their outcomes.

## MATERIAL AND METHODS

This is a prospective observational study including 80 adult participants. A meticulous approach was employed to gather detailed clinical and relevant dataset of the patients upon their admission to the medical facility. Detailed history and examination findings and results of investigations conducted were carefully noted for each patient.

Once diagnosis of pseudocyst of pancreas was confirmed by a radiological investigation, patients were included in the study after taking informed consent. Patients below the age of 18 years or those diagnosed with cystic neoplasms of pancreas were excluded from the study. After the diagnosis of pancreatic pseudocyst was confirmed, patients were subjected to conservative management approach primarily focusing on symptomatic treatment. This strategy aimed for careful observation of the patient and assessing the progression or regression of pseudocyst over time by serial radiological investigations like ultrasound and CECT abdomen as indicated. Patients with progression in size and maturation of pancreatic pseudocyst were subjected to proactive intervention.

Decision making process involved selecting most appropriate drainage procedure tailored according to the individual. Various drainage procedures include percutaneous drainage of pancreatic pseudocyst under radiological guidance or surgical drainage procedures like cystogastrostomy or Roux-en-Y cystojejunostomy. Selection of these procedures depend on specific characteristic and requirement of each pancreatic pseudocyst. Post-operatively patients were followed for a spanning period of 6 months to assess the long-term outcomes of these drainage procedures. The data was then compiled to have a comprehensive understanding of efficacy of these management strategies.

## Results

This is a comprehensive study conducted in tertiary care centre including 80 patients diagnosed with pancreatic pseudocyst. The disease is widely distributed among all the age groups however younger age group is more commonly affected. This can be seen the results of our study which shows patients with age group of 21-30 years being most affected (32.5 percent) followed by age group of 31-40 years.

**Age distribution**

| Age (years) | Number of patients | Percentage |
|-------------|--------------------|------------|
| 21-30       | 26                 | 32.5       |
| 31-40       | 20                 | 25         |
| 41-50       | 18                 | 22.5       |
| 51-60       | 8                  | 10         |
| 61-70       | 8                  | 10         |
| Total       | 80                 | 100        |

In our study a notable gender distribution was observed. The study population comprised of 56 males (70%) as compared to 24 females (30%). These results show significant prevalence of disease in a particular gender population with male to female ratio being 7:3. These findings prompt to further exploration of potential role of gender related factors in pathogenesis and manifestation of this disease.

**Gender**

| Gender | Number | Percentage |
|--------|--------|------------|
| Male   | 56     | 70         |
| Female | 24     | 30         |
| Total  | 80     | 100        |

Development of pancreatitis and pancreatic pseudocyst is attributed to a number of factors. In our study various factors for development of pancreatic pseudocyst were investigated and 60 patients (75%) of patients had alcohol as etiological factor for development of the disease. This was followed

by biliary tract disease (20%) and traumatic pancreatitis (2.5%), however no cause could be identified in 2 patients and were labelled to have idiopathic cause.

#### **Etiology**

| Etiology              | Number of patients | Percentage |
|-----------------------|--------------------|------------|
| Alcohol               | 60                 | 75         |
| Biliary tract disease | 16                 | 20         |
| Trauma                | 2                  | 2.5        |
| Idiopathic            | 2                  | 2.5        |
| Total                 | 80                 | 100        |

Underlying pancreatic conditions associated with pseudocyst formation are acute pancreatitis, chronic pancreatitis and acute on chronic pancreatitis in 41.25% (n= 33), 33.75% (n= 27), and 25% (n=20) of patients respectively.

#### **Underlying pancreatic conditions associated with pseudocyst**

| Type of Pancreatitis          | Number of patients | Percentage |
|-------------------------------|--------------------|------------|
| Acute Pancreatitis            | 33                 | 41.25      |
| Chronic pancreatitis          | 27                 | 33.75      |
| Acute on chronic pancreatitis | 20                 | 25.00      |

Patients suffering from pancreatic pseudocyst may present with a wide spectrum of symptoms. Pain abdomen was the most common presenting complaint of the patients in our study (72.5%) followed by lump in abdomen, nausea and vomiting. Complications associated with pancreatic pseudocysts were gastric outlet obstruction affecting 10% of the patients. This was followed closely by the occurrence of ascites and infection, documented in 7.5% and 5% of patients, respectively.

#### **Symptomatology**

| Symptoms            | Number of patients | Percentage |
|---------------------|--------------------|------------|
| Pain abdomen        | 58                 | 72.5       |
| Lump in abdomen     | 45                 | 56.25      |
| Early satiety       | 34                 | 42.5       |
| Nausea and vomiting | 44                 | 55         |

Patients were initially given trial for conservative management with careful observation of clinical condition of the patients and monitoring of the cyst by serial radiological investigations. 26 patients (32.5%) showed improvement with conservative management approach. Two patients in the study required percutaneous drainage of cyst. Out of these, one patient was rendered unfit for general anaesthesia due to poor chest condition and one patient had infected pancreatic pseudocyst. Majority of patients in our study required cystogastrostomy (57.5%) whereas 7.5% required Roux en Y cystojejunostomy. The decision for the nature of intervention was taken based on location of cyst and feasibility of cystoenterostomy.

#### **Management of pseudocyst**

| Management            | Number of patients | Percentage |
|-----------------------|--------------------|------------|
| Conservative          | 26                 | 32.5       |
| Percutaneous drainage | 2                  | 2.5        |
| Cystogastrostomy      | 46                 | 57.5       |
| Cystojejunostomy      | 6                  | 7.5        |
| Total                 | 80                 | 100        |

Complications like haemorrhage, perforation, fistula formation and recurrence were noted in post-operative period. Two patients developed haemorrhage after cystogastrostomy of which one patient was managed conservatively with cold saline lavage through nasogastric tube whereas other patient needed re-exploration due to recurrent bleeding episodes. Patients managed with percutaneous drainage developed pancreatic fistula formation from percutaneous drainage site which was managed conservatively and one patient managed with percutaneous drainage developed recurrence of pseudocyst after removal of drain.

#### Complications after drainage procedure

| Complication      | Number of patients | Percentage |
|-------------------|--------------------|------------|
| Haemorrhage       | 2                  | 2.5        |
| Perforation       | -                  | -          |
| Fistula formation | 1                  | 1.25       |
| Recurrence        | 1                  | 1.25       |

## DISCUSSION

In this comprehensive study involving 80 patients, a thorough analysis of demographic and clinical data revealed significant patterns related to age, gender, and associated risk factors. The majority of patients, accounting for 32.5%, fell within the 21-30 years age group, with a subsequent proportion in the 31-40 years age range. The mean age of  $39 \pm 13$  years indicated that pancreatic pseudocysts are more prevalent in the younger and middle-aged population, potentially attributed to increased alcohol consumption within this age cohort.<sup>7</sup> Further examination of gender distribution demonstrated a noteworthy predominance in males, constituting 70% of the study population, reaffirming the association between male gender and a higher incidence of pancreatic pseudocysts. Martinez-Ordaz et al also noticed similar observations in their study.<sup>8</sup> This correlation is likely influenced by the elevated rates of alcohol consumption observed among males in the study, with 75% of patients reporting a history of alcohol intake. Notably, the study also identified biliary tract disease as a contributing factor in 15% of cases. Symptomatology analysis revealed that 72.5% of patients presented with abdominal pain, making it the most common presenting complaint. A significant portion, 56.25 % exhibited a lump in the abdomen, while 55% reported symptoms of nausea and vomiting. These findings underscore the prominence of abdominal pain and gastrointestinal symptoms as primary reasons for seeking medical attention.<sup>9</sup> The study's multifaceted insights contribute to a nuanced understanding of the demographic and clinical landscape of pancreatic pseudocysts, emphasizing the interplay of age, gender, and lifestyle factors in the manifestation of this condition.

The diversity in these symptoms underscores the multifaceted nature of pseudocysts, a complexity intricately woven by factors such as their size, location, and duration. Radiological imaging conducted in our study provided a revealing glimpse into the underlying pancreatic conditions, identifying acute pancreatitis in 41.25% of patients and chronic pancreatitis in a substantial 33.75% of the cohort. These findings differs with the observations of Rosso et al., who reported pseudocysts arising in 10-20% of cases in acute pancreatitis and 20-40% in chronic pancreatitis.<sup>10</sup> This concurrence further solidifies the understanding of the interplay between pseudocysts and different stages of pancreatic inflammation. The study's comprehensive insights contribute significantly to the evolving understanding of this complex medical condition, shedding light on varied presentation and management strategies and paving the way for enhanced clinical practices in the future.

While our study provided valuable insights into the general trends surrounding complications, we identified specific risk factors associated with drainage procedures.<sup>11</sup> Notably, pseudocysts situated in the pancreatic head were found to be more susceptible to treatment-related complications, including hemorrhage, perforation, and the formation of fistulae. By shedding light on risk factors, we aim to advance the understanding of the complexities involved in managing these challenging cases, ultimately fostering improved clinical practices. The conclusion drawn from various studies suggests that the ultimate choice of management for pancreatic pseudocysts is contingent upon the availability

of resources and local expertise. In the present study, 32.5% of the patients were managed conservatively, while 2.5% of the patients rendered unfit for surgical intervention, were managed with percutaneous drainage. The selection of surgical procedure for drainage of the pseudocyst was chosen on the basis of location and size of the pseudocyst as well as feasibility of the anastomosis. 57.5 % of the patients having pseudocyst in relation of pancreatic head and stomach were managed with cystogastrostomy whereas 7.5 % of cysts present in relation of body and tail of the pancreas managed with cystojejunostomy. Martinez-Ordaz et al reported cystojejunostomy as predominant interventional modality for the management of pancreatic pseudocyst whereas Sheheta et al also reported that 81% of the patients were managed with cystogastrostomy.<sup>9,12</sup> This discrepancy may be attributed to the varying clinical presentations and complexities of pseudocysts, prompting a tailored approach based on individual patient characteristics and the resources at hand. All patients, regardless of the chosen management strategy, were diligently followed up for a duration spanning from 6 months to 1½ years post-discharge. Those who underwent conservative management experienced complete resolution of the cyst by the conclusion of the study period. This favourable outcome underscores the effectiveness of conservative approaches, emphasizing the importance of vigilant monitoring and appropriate intervention based on the evolving clinical course.<sup>13</sup> Regular ultrasound examinations of the abdomen should be conducted every month to monitor the progress and assess the resolution of the pseudocyst.<sup>14</sup> In summary, the diverse management strategies observed in the study reflect the nuanced decision-making process influenced by available resources and local expertise. The meticulous follow-up protocols employed for both conservative and surgical approaches contribute to a comprehensive understanding of the trajectory of pseudocyst resolution, further refining the knowledge base for optimal management strategies in varied clinical scenarios.

## CONCLUSION

The study's findings offer a comprehensive overview of pancreatic pseudocysts, aligning with the statistical data collected. Notably, pseudocysts exhibit a higher prevalence in males than females, with a concentration in the age group of 21-30 years. The primary etiological factors identified are alcohol consumption, followed by biliary tract disease. Clinical presentations predominantly involve pain abdomen, followed by the occurrence of a mass in the abdomen. Radiologically, ultrasound served as the foundational investigation for all patients, supplemented by contrast-enhanced computerized tomography (CECT) abdomen when ultrasound alone was insufficient for diagnosis. The study advocates an initial conservative approach, reserving interventions for cases where necessary. However, when intervention is deemed essential, surgical drainage emerges as the preferred option in limited resource set ups. These comprehensive findings contribute to the evolving understanding of pancreatic pseudocysts, emphasizing the importance of tailored management strategies based on a thorough assessment of patient demographics, clinical presentations, and available resources.

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