

Review of Management Options for Pancreatic Pseudocysts: An Observational Study

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Abstract: Background and Objectives: *Pseudocyst of Pancreas is a common complication of pancreatitis. This study aims to identify various etiological factors, assess the relative frequency of occurrence concerning age and sex, establish accurate diagnosis using various investigations and explore different management modes, including conservative and surgical management. The study will examine and observe the different modes and their efficacy. This is necessary to know the better treatment of choice. It is a prospective study of 40 adult patients admitted in Kempegowda Institute of Medical sciences and Research Centre, Bangalore. All the patients underwent definitive treatment. Data related to the objectives of the study was collected.*

Keywords: Pancreatic pseudocyst, pancreatitis management, conservative treatment, surgical intervention, endoscopic drainage.

1. Introduction

Pseudocyst of pancreas is the most common complication of pancreatitis, characterised by collection of peripancreatic fluid collection (PPF), surrounded by an unepithelialized wall of granulation tissue and fibrosis over a period exceeding six weeks. It accounts for 75% of all pancreatic masses. Pseudocysts occur in up to 10 percent of patients with acute pancreatitis, and in 20 to 38 percent of patients with chronic pancreatitis.

Pseudocysts usually presents with symptoms such as abdominal pain, epigastric fullness or early satiety, nausea and vomiting. Abdominal pain is the most common symptom, accounting for 70 to 94% of the cases.

Acute pseudocysts with a diameter of <6 cm often monitored with regular imaging and clinical follow - up, and have a higher likelihood of spontaneous resolution in up to 50% of cases over a course of 6 weeks. Whereas pseudocysts with diameter of ≥6 cm or which persists beyond 6 weeks and causes symptoms such as pain, obstruction, or secondarily infection, compression over adjacent structures, superior mesenteric, portal or splenic vein thrombosis and intra - cystic haemorrhage or pseudoaneurysms may be considered for surgical intervention

Diagnostic modalities include demonstration of elevated amylase and lipase with reduced CEA in cystic fluid, Ultrasonography, Computerized tomography, magnetic resonance imaging, ERCP and endoscopic ultrasound.

Pancreatic pseudocyst, a common complication of pancreatitis, presents significant medical challenges.

This prospective study conducted at Kempegowda Institute of Medical Sciences, Bengaluru, examines various etiological

factors, diagnostic methods and treatment modalities for pancreatic pseudocyst in 40 patients. The study compares conservative and surgical management outcomes, providing insight into optimal treatment approaches to enhance patient recovery. Treatment includes conservative management and minimally invasive procedure such as percutaneous drainage, endoscopic drainage and surgical drainage procedure documented in this study.

2. Aim and Objectives

Aim

The aim of the study is to systematically evaluate and compare the efficacy, safety, and outcomes of different treatment modalities in the management of pseudocysts of pancreas.

Objective:

- 1) To analyse factors Influencing Treatment selection.
- 2) To Assess the Effectiveness of different treatment modalities.
- 3) To Assess Quality of Life and Functional Outcomes with a follow up of 2 months to 18 months.

Protocol of the Procedure:

Inclusion and exclusion criteria were applied to all patients presenting with pancreatitis to the surgery department of our hospital. Patients were educated about the study and only those patients consenting to participate in the study were included.

Database collection included documentation of medical history, age, sex, prehospital interval, vital signs, abdominal signs, and drug history

3. Material and Methods

It is a prospective study of 40 adult patients admitted in kempegowda institute of medical sciences and research centre, Bangalore, Karnataka, India from march 2022 to august 2023. All the patients underwent definitive treatment. Data related to the objectives of the study was collected. After admission, data for study was collected by history, clinical findings, relevant diagnostic investigations performed over patient. After discharge, patients were followed up regularly at the outpatient clinic. Patients were followed one week after discharge, then every 3 months for the first year and then every 6 months for 18 months and later on patient's demand.

Follow - up visit included detailed history taking, clinical examination, detailed laboratory evaluation, and abdominal ultrasound. If any complication was suspected, further workup was performed for further management including CECT abdominal and Pelvis or MRCP or endoscopic evaluation.

The primary outcome of the study is the incidence of recurrence of pancreatic pseudocyst after different surgical intervention. Secondary outcomes included the overall incidence of postoperative complications and pancreas - specific complications.

Inclusion Criteria:

- All patients diagnosed with pseudocyst of Pancreas.
- Patients above age of 18 years and giving valid informed consent.

Exclusion Criteria:

- Patients below age of 18 years.
- Patients with pancreatic cystic lesions confirmed to be malignant.
- Patients who have undergone previous treatment for pancreatic pseudocyst.

Descriptive and inferential statistical analysis was carried out on the data collected using SPSS17.

Indications of treatment modalities in my study were as follows:

- Observation and Conservative management: Asymptomatic or minimally symptomatic pseudocysts with size <6cm with thickness of <9mm without evidence of any complications. This could include observation, conservative management (e. g. fluid management, control of pain and sepsis, nutritional support and control of organ damage).
- Endoscopic Drainage: Pseudocysts located near the stomach or duodenum, accessible via endoscopic ultrasound (EUS).
- Percutaneous Drainage: Large or inaccessible pseudocysts, or when endoscopic drainage is not feasible.
- Cystoduodenostomy: Pancreatic pseudocyst located in the head of the pancreas that are in close contact with the duodenum are treated with a cystoduodenostomy.
- Cystogastrostomy: Pancreatic pseudocysts closely attached to the stomach should be treated with a cystogastrostomy.

- Roux - en - Y cystojejunostomy: Some pseudocysts are not in contact with the stomach or duodenum hence the surgical treatment for these patients is a Roux - en - Y Cystojejunostomy.
- Laparoscopic Cystogastrostomy: If endoscopic or percutaneous drainage of the pseudocyst are unsuccessful due to anatomical factors, laparoscopic cystogastrostomy may be considered and the cyst should be adjacent to the posterior gastric wall to facilitate creation of communication between the pseudocyst and the stomach.

Post OP outcomes noted were:

S. no	Condition
1.	Resolved
2.	Gastrointestinal infections
3.	Pancreatocutaneous Fistula
4.	Bowel obstruction
5.	Pancreatic Leakage (rupture into GI tract) with peritonitis
6.	Spontaneous GI bleeding
7.	Death

4. Results

Among the 40 cases, 30 patients presented with chronic pancreatitis, and 10 presented with acute pancreatitis

1) Age

Age of patients in this study ranged from 18 to 60 years. Pseudocysts were common in patients aged 31 to 40 years accounting for 60 percent of the cases. This was probably due to alcohol consumption in this age group.

Age in Years	No of Patients	Percentage
18 - 20	0	0
21 - 30	8	20
31 - 40	24	60
41 - 50	6	15
51 - 60	2	5

2) Sex

In our study of 40 patients, there were 28 (70%) male patients and 12 (30%) female patients. indicating that the disease is more common in males with ration of male to female is 2.33: 1. This again was due to higher alcohol consumption in men.

Sex	Number of Patients	Percentage
Male	28	70
Female	12	30

3) Etiology

The commonest etiology associated with pseudocyst was alcohol which was seen in 60% of patients followed by biliary tract disease seen in 32.5% of patients

Etiology	Number of Patients	Percentage
Alcohol	24	60
Biliary Tract Disease	13	32.5
Hyperlipidemia	1	2.5
Traumatic	1	2.5
Idiopathic	1	2.5

4) Symptoms and Signs

The commonest symptom was upper abdominal pain which was present in 17 (42.5%) patients. The commonest sign was epigastric tenderness present in 16 (40%) patients followed by epigastric fullness present in 10 (25%) patients.

Signs & Symptoms	No. of Patients	Percentage
Abdominal Pain	17	42.5
Nausea & Vomiting	3	7.5
Weight Loss	4	10
Fever	4	10
Epigastric Tenderness	16	40
Epigastric Fullness	10	25
Jaundice	2	5

5) Management

Among 40 cases of Pseudocysts of the Pancreas in my study 13 (32%) cases were managed conservatively and intervention was done in 27 cases (67%).

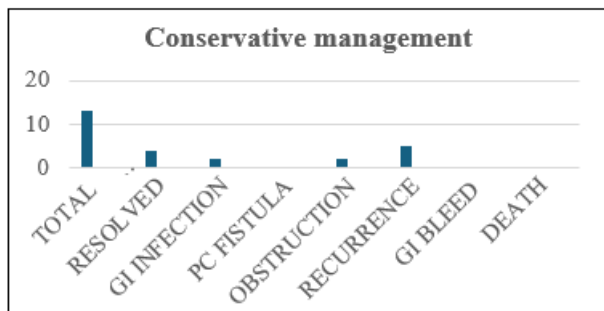
Management	No. of Cases	Percentage
Conservative	13	32
Intervention	27	67

6) Types of Surgeries Performed

Surgeries performed	No. of patients
Cystogastrostomy	9
Cystoduodenostomy	6
Roux - en - Y cystojejunostomy	4
EUS drainage	3
Percutaneous drainage	2
Laparoscopic cystogastrostomy	3

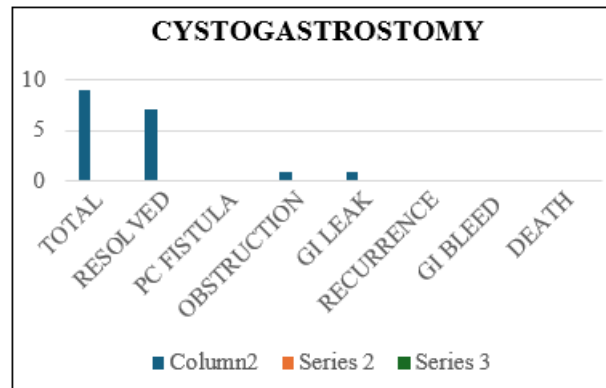
a) Conservative management

Total of 13 patient with chronic pancreatitis had pseudocyst with diameter of <6cm with wall thickness of <9mm and with no complications were managed conservatively. 4 (30.7%) resolved, 2 (15.3%) developed GI infection, 5 (38.4%) of 13 presented with recurrence.



b) Cystogastrostomy:

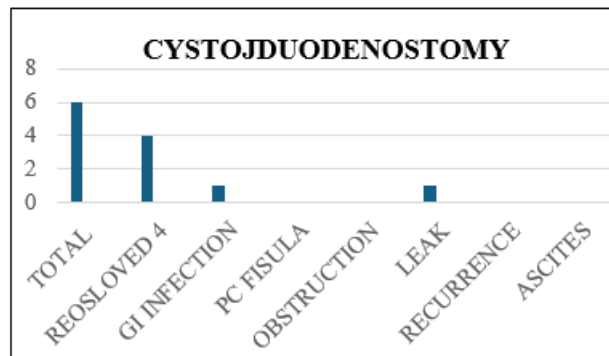
Most common surgical management that patient underwent in my study was Cystogastrostomy, 9 (33.3%) Patients with pseudocyst of diameter >6cm and with thickness of >10mm pseudocyst closely being attached to the stomach underwent cystogastrostomy. Out of 9 patients, 7 (77%) of patient showed resolution of the pseudocyst with 1 (11%) presented with acute intestinal obstruction and 1 (11%) presented with GI leak on regular follow up.



c) Cystoduodenostomy

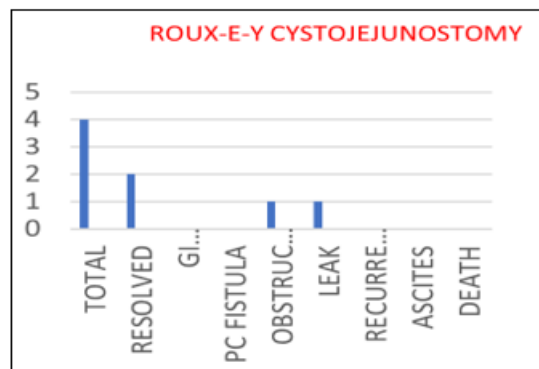
Pancreatic pseudocyst located in the head of the pancreas with diameter of >6cm and with thickness of >10mm in close contact with the duodenum are treated with a cystoduodenostomy.

Total of 6 (22%) patients underwent Cystoduodenostomy out of which 4 (66.6%) showed resolution of the pseudocyst whereas 1 (16%) patient showed GI infection, 1 (16.6%) presented with GI leak on follow up.



d) Roux - en - Ycystojejunostomy

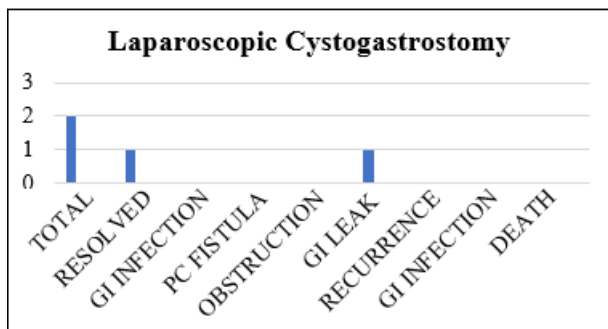
Pseudocysts which are not in contact with the stomach or duodenum underwent Roux - en - Y cystojejunostomy. Total of 4 (14.8%) patient underwent Roux - e - y cystogastrostomy. 2 (50%) of patient showed resolution of pseudocyst, 1 (25%) presented with features of obstruction, 1 (25%) presented with GI anastomotic leak of them showed post op complication.



e) Laparoscopic cystogastrostomy

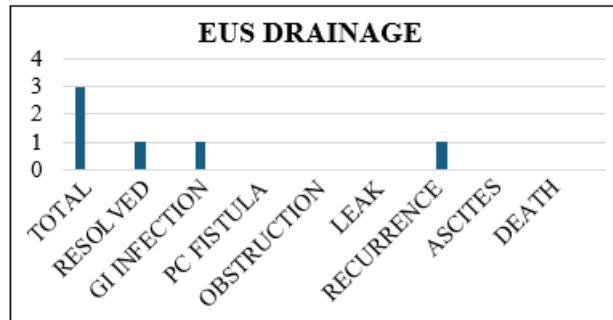
If endoscopic or percutaneous drainage of the pseudocyst have failed and the cyst adjacent to the posterior gastric wall to facilitate creation of communication between the

pseudocyst and the stomach underwent Laparoscopic cystogastrostomy. Out of 2, 1 (50%) of the patients showed resolution of the pseudocyst and only 1 (50) presented with GI leak on regular follow up.



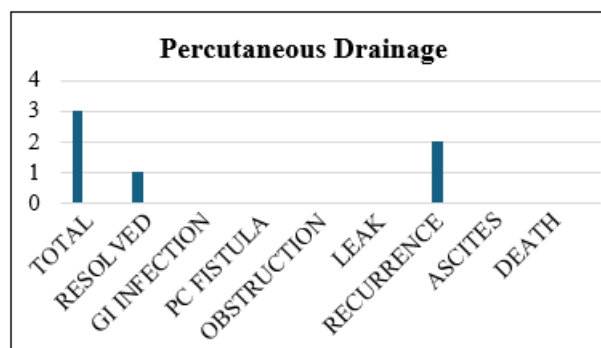
f) Endoscopic Drainage:

Pseudocysts located near the stomach or duodenum, with size of <6cm in diameter with no complications and which were accessible via endoscopic ultrasound (EUS) were selected for this procedure. Total of 3 patients underwent this procedure. Out of which 1 (33%) patient showed resolution, with 2 (66.6%) showed complications on follow up.



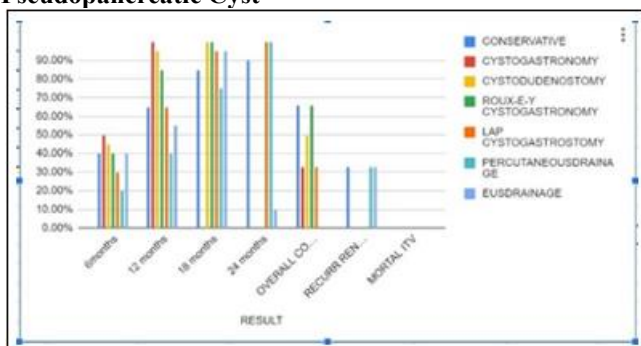
g) Percutaneous Drainage:

Pseudocyst which were large (>6cm in diameter) with rapid growth in size, with thin wall and higher chances of rupture with inaccessibility and when endoscopic drainage is not feasible were selected for percutaneous drainage. Total of 3 patient underwent Percutaneous Drainage. 1 (33.3%) showed resolution whereas 2 (66.6%) showed recurrence on follow up.



Result	Conservative	Cystogastrostomy	Cystodudenostomy	ROUX - E - Y Cystogastrostomy	LAP. Cystogastrostomy	Percutaneous Drainage	EUS Drainage
6 months	20%	50%	50%	30%	40%	40%	40%
12 months	45%	100%	100%	75%	85%	65%	55%
18 months	85%	-	-	100%	100%	85	95
24 months	100%	-	-	-	100%	100%	100
Overall Compliactions	66%	33%	50%	66%	33%	100%	66%
Reocc	33%	0	0	0	0	50	33
Mortality	0	0	0	-	0	0	0

Comparison of Results of Different Surgeries done on Pseudopancreatic Cyst



5. Result

Patients who are diagnosed with pseudocyst of pancreas over a period 24 months that was 40 cases were admitted and treated. Among 40 cases, 30 (75%) patients presented with chronic pancreatitis and 10 (25%) presented with acute

pancreatitis. 16 patients (40%) presented with epigastric pain and 24 (60%) were alcoholic and presented between 31 - 40 years of age group. These cases were analyzed according to age distribution, sex, etiological factors, mode of presentation, size, location and different surgeries and their outcome. Patients were followed up for 2 months to 18 months. These results are compared and studied. Ultrasound abdomen and CECT abdomen was the prime diagnostic tool to know the situation and size of the pseudocyst, pancreatic duct dilatation, and its complications on post op follow up. MRCP was done in the patients with pseudocyst to see the communication with pancreatic duct. Resolution of pseudocyst of Pancreas were monitored by ultrasound abdomen on regular follow up. 13 out of 40 cases (32%) were managed conservatively with size less than 6 cm, with thickness <9mm and with no complications and 27 out of 40 patients (67%) with size of the cyst more than 6 cm and diameter >9mm were considered for surgical intervention.

9 out of 27 cases underwent Cystogastrostomy (37%), 6 out of 27 underwent Cystoduodenostomy (22%), 4 out of 27 underwent Roux - en - y cystojejunostomy (14.8%), 2 out of 27 underwent laparoscopic cystogastrostomy (7.4%), 2 out of 27 underwent Endoscopic drainage (7.4%), 3 (11%) out of 27 underwent Percutaneous drainage (11.1%).

Out of 9 patients undergoing Cystogastrostomy, 1 developed obstruction (11%) and 1 developed intraabdominal leak (11%) and 7 (77%) patients showed complete resolution within 6 months post surgery. s

Out of 6 patients undergoing Cystoduodenostomy 1 developed (16%) GI infection and 1 developed GI leak (16%) and 4 (66%) patients resolved within 12 months of surgery.

Out of 4 patients underwent Roux - en - y cystojejunostomy 1 presented with obstruction and 1 developed anastomotic leak and, 2 patients showed complete resolution within 18 months.

Out of 2 patients undergoing laparoscopic cystogastrostomy, and 1 (25%) developed Pancreatocutaneous fist and 1 (25%) patients resolved showed complete resolution after 18 months.

Out of 3 patients undergoing Endoscopic drainage of pseudocyst, 1 (33.3%) patient developed GI infection and 1 (33%) resolved 1 (33%) developed recurrence after 18 months of follow up.

Out of 3 patient undergoing Percutaneous drainage, 1 (33%) resolved and 1 developed recurrence and 1 (33%) developed pancreaticocutaneous fistula after 18 months

6. Discussion

Pancreatic pseudocyst refers specifically to a fluid collection in the peripancreatic tissue, which usually is rich of pancreatic juice surrounded by a non - epithelialized wall made up of fibrous and granulation tissue granulation tissue usually after 4 weeks. Pancreatic pseudocysts are a known complication of acute or chronic pancreatitis and post traumatic but more common after acute exacerbations of chronic pancreatitis than acute pancreatitis. The incidence of is extremely low ranging from 1.6–4.5% per 100, 000 adults per year and prevalence ranges from 10% to 26% in acute pancreatitis and 20–40% in chronic pancreatitis with male predominance with ratio of 4: 1 (male: female). Overall incidence is common in males of upto 80% with maximum incidence age group of 41 to 50 years. Pancreatic pseudocysts most commonly in patients in alcoholic chronic pancreatitis (70% to 78%). The diagnosis of pseudocyst is usually established by imaging studies and biochemical parameters have limited role in diagnosis. Surgery is the traditional modality for treating pancreatic pseudocysts, with high success rates and low morbidity and mortality.

Treatment modalities of pseudo pancreatic cyst comprises two aspects that is conservative management or surgical drainage. Management of pseudocyst can vary with range of complications mainly based on its size, location and duration. However the indications for open surgical procedure of

internal drainage (open cystogastrostomy, open cystoduodenostomy and Roux - en - y open cystojejunostomy.

Cystogastrostomy is preferred in Symptomatic or very large pseudocysts of the pancreas adherent to the posterior wall of the stomach. Cystoduodenostomy Is limited to the pseudocyst in the pancreatic head or uncinate process that lie within 1cm of duodenal lumen

7. Conclusion

The treatment of pancreatic pseudocysts requires a tailored approach based on individual patient's factors. This study highlights the varied outcomes of different treatment modalities for pancreatic pseudocyst.

While conservative management may be suitable for smaller, uncomplicated cysts, surgical and minimally invasive procedures offer effective solution for a larger, symptomatic cases. Continuous advancements in treatment techniques promise better patient outcomes, undergoing the need for personalized treatment plans based on individual plans. Regular follow - up and addressing underlying causes are crucial to prevent recurrence and ensure optimal patient outcomes.

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