Strategies in Treating Pancreatic Pseudocyst

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Abstract

Aims: The goal of this study is to look into the inpatient outcomes of various treatment approaches for Pancreatic Pseudocyst (PP) and to assess the efficacy and complications of various treatment regimens.

Patients and methods: This research reports on a retrospective review of 125 patients with Pancreatic Pseudocyst who underwent treatment, whether medical or surgical, and their outcomes in a gastroenterology and hepatology teaching hospital / medical city / Baghdad-Iraq, between (2017 – 2021).

Results: The mean and standard deviation are used to represent the effects. The student t test was used to compare categorical variables. SPSS was used for all statistical research, and a p value of 0.05 was deemed statistically important. In our sample, 30.4 percent of cases received supportive care, while the remaining 69.6 percent received surgical intervention. In our sample, the most common surgical procedure was Cystogastrostomy (significant p=0.05). Cystojejunostomy was the surgical procedure conducted that had the fewest complications, as opposed to external drainage, which had a higher value (significant at p 0.05). The recurrence rate was strongly dependent on the treatment chosen for the underlying disorder. The resection surgery had the lowest recurrence rate, followed by Cystojejunostomy, while percutaneous drainage had the highest recurrence rate, followed by external drainage, with a p value of 0.05. There were no statistically significant variations in mortality rates between surgical interventions (p=0.284).

Conclusions: Asymptomatic pancreatic pseudocyst is treated conservatively, while infected or ruptured pancreatic pseudocyst necessitates external drainage. In the majority of cases, anastomosis of the pancreatic pseudocyst to the surrounding bowels, either CG or CJ, is performed with reasonable success.

Keywords: Strategies; Treating; treated conservatively; Pancreatic Pseudocyst.

Introduction

The pancreas is an abdominal organ that secretes several digestive enzymes (substances that enable and speed up chemical reactions in the body) into the pancreatic ductal system, which empties into the small bowel, it also contains the Islets of Langerhans, which secrete several hormones, including insulin (that helps to regulate blood sugar).(1) Pancreatic pseudocyst (PP) are inflammatory fluid collections associated with pancreatitis and account approximately 80% of

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pancreatic cystic lesions, they predominantly develop in adult men as a complication of alcoholic, biliary, or traumatic cause of acute pancreatitis[2,3,4].

The fluid-filled cavity of pancreatic pseudocyst after acute episodes of pancreatitis that result in tissue necrosis or disruption of a pancreatic duct, according to the Revised Atlanta classification, as a pseudocyst should be characterized every acute pancreatic fluid collection that develops an enhancing capsule earlier than four week after onset of acute pancreatitis[5,6]. The communication with the pancreatic ductal system is initially always present and may further remain or seal off spontaneously during the clinical course[7]. Most pseudocysts present minor symptoms and are uncomplicated, the vast majority of pseudocysts (less than 6 cm) have thin wall and usually resolve spontaneously, while large pseudocysts are often in continuity with the pancreas, and thick-walled rarely communicate with the pancreatic ductal system[4,7]. Most large pancreatic pseudocysts are likely to remain requiring intervention only in the presence of complications (bleeding, infection, splenic vein thrombosis etc.), and obstructive symptoms of duodenum, bile duct, or stomach[8]. PP may result from an episode of acute pancreatitis, chronic pancreatitis, pancreatic trauma or extrinsic obstruction of the pancreatic duct[9,10,11].The cyst can be filled with pancreatic juice containing amylase, lipase and zymogens or, if no communication with the pancreatic ducts exists, with protease-free serous fluid[12,13]. Pan et al 2015, proposed a new classification as in table (1) was devised based on the size, anatomical location, and clinical manifestations of the pancreatic pseudocyst along with the anatomical relationship between the pseudocyst and the pancreatic duct and the components of the classification[10].

Table 1: New Classification Scheme of Pancreatic Pseudocysts

Type	Description of Pancreatic Pseudocyst
I	<5 cm and without complications, symptom, and neoplasia
II	Suspected cystic neoplasia
III	The Location of pancreatic pseudocyst is uncinate
IIIa	Pseudocyst communication with the pancreatic duct
IIIb	Without communication between pseudocyst and pancreatic duct
IV	Location of pancreatic pseudocyst is head, neck,and body
IVa	Exist communication between pseudocyst and pancreatic duct (1)
IVb	Distance from the cyst to the gastrointestinal wall is <1 cm (2)
IVc	Neither 1 nor 2
V	Location of pancreatic pseudocyst is tail
Va	Splenic vein involvement or upper gastrointestinal bleeding
Vb	Distance from the cyst to the gastrointestinal wall is <1 cm, without splenic vein involvement or upper gastrointestinal bleeding.

Most extrapancreatic pseudocysts are located in the body and tail region, whereas most intrapancreatic pseudocysts are in the head of the pancreas[14,15]. Pancreatic pseudocysts are most often retrogastric[16]. Blood-sustained ascites and abdominal fat necrosis have been explained by fluid escaping via the foramen of Winslow into the greater sac, and blockage of the foramen may cause the fluid to become "encysted"in the lesser sac[17,18].

Patients and Methods

This study will report the results of a retrospective analysis of 125 patients diagnosed with pancreatic pseudocysts who underwent treatment, whether medical or surgical, and their outcomes in GIT and Hepatobiliary Teaching Hospital, Medical City, Baghdad, IRAQ between January 2017 and January 2021.

The demographic data were obtained (age and gender), with comparison between male and female according to the presence of pseudo pancreatic cyst

and it's correlation with age of the patients. The common etiological and risk factors associated with formation of pancreatic pseudocyst secondary to acute and chronic pancreatitis also obtained in our study. The main clinical presentation including symptoms and signs associated with pancreatic pseudocyst also the laboratory data and imaging modalities were performed in our study for diagnosing pseudo pancreatic cyst and the complication of pancreatic pseudocyst were noticed in these patients group. The treatment options for pancreatic pseudocyst were performed whether conservative or interventional treatment and the postoperative complications were noticed during interventional treatment of pancreatic pseudocyst. All of the pancreatic pseudocysts in our sample with a disease course of >4 weeks had the mature cyst wall identified by computed tomography or transabdominal ultrasonography. Conservative management with supportive care and active definitive care with any type of surgical intervention were the two major aspects of management. Traditional surgical drainage (SD), percutaneous and endoscopic drainage (END), as well as the well-established watchful follow-up management, have all been assessed. Our study included supportive care with spontaneous resolution of pseudocysts, particularly for those who presented after an episode of acute pancreatitis, small pseudocyst size, intrapancreatic pseudocyst, pseudocyst of the head of the pancreas, persistence 6 weeks, and thin pseudocyst wall, and the majority of small pancreatic pseudocysts resolved spontaneously over time. The supportive treatment used in patients included tolerated oral intake, enteral low fat diet, as well as the addition of analgesics and antiemetic, however, the presence of symptoms such as pain, discomfort, vomiting, or frequent admissions for intravenous fluid resuscitation, as well as the development of complications such as infection, bleeding, or rupture in adjacent organs, was indicated for the implementation of interventional techniques. Rupture of adjacent organs, pseudocyst-related pain, biliary obstruction, gastric or duodenal obstruction, increasing size on follow-up, and pseudocyst bleeding were the most common reasons for pancreatic pseudocyst drainage. Percutaneous drainage (PD), endoscopic drainage (END), surgical internal drainage (SD), and excision are interventional techniques used in our hospital. Intervention was postponed for up to 6 weeks after the pancreatitis episode in the absence of life-threatening events to allow the pseudocyst wall to mature and thicken, facilitating any type of drainage.

Percutaneous drainage (PD) was accomplished by inserting a drainage catheter into the pancreatic pseudocyst under ultrasound or CT guidance.

Endoscopic drainage (END) are another interventional method used in the treatment of pancreatic pseudocysts. They rely on a single space delineated between normal anatomic structures such as the stomach, duodenum, and transverse mesocolon, and since they were used in just a few cases in our research, they were not included in our results. The aim of endoscopic treatment was to attach the pseudocyst cavity to the gastrointestinal lumen, which was achieved using either a transpapillary or a transmural method, with the latter requiring access via the stomach (cystogastrostomy) or the duodenum (cystoduodenostomy).**Surgical internal drainage** SD was included in our study by suturing the posterior wall of the stomach to a pancreatic pseudocyst (pseudocystogastrostomy), while the other types of anastomosis have been rarely introduced, including pseudocystoduodenostomy and the pseudocystojejunostomy. The classical method entails a midline or subcostal incision, exposure of the lesser sac, biopsy of the pseudocyst wall, aspiration of pseudocyst fluid, breakdown of any multilocules, and finally anastomosis of the pseudocyst with the stomach, duodenum, or jejunum, depending on the surgeon's choice and anatomical condition at that time. When the pseudocyst was extended well into the transverse mesocolon to the most dependent portion of the pseudocyst, Roux-en-Y cystojejunostomy was used.

Resection of Pseudocyst was used as an alternative procedure to internal drainage for chronic pseudocysts. Resection was performed in our hospital by different operation methods including partial left-sided pancreatectomy, or by Whipple's procedure with pylorus-preserving pancreatoduodenectomy.

laparoscopic techniques with pseudocystogastrostomy resulted in adequate internal drainage and minimal morbidity, it was only performed on a small number of patients.

External drainage (EXD) was used for immature cysts with infected contents and for ruptured cysts and during emergency laparotomy.

Postoperative management of pancreatic pseudocyst: Patients that had treated of a pseudocyst surgically is generally straightforward and follows standard treatment. Hospitalization as short as 1 to 2 days for endoscopic or laparoscopic procedures are performed in the elective setting or length of stay duration approximately 7-10 days following a complex, combined resection and drainag

Data analysis : The result was presented as the mean and standard deviation. The student t test was used to compare categorical variables. SPSS was used for all statistical research, and a p value of 0.05 was deemed statistically important.

Results

Males 68% and women 32% with a median age of 40 years (range 10-65). there were significant differences in regarding sex and age distribution at $p \leq 0.05$. The etiology was secondary to alcoholic pancreatitis in 47.2 percent of patients, blunt trauma in 12.8 percent, idiopathic in 4%, and biliary diseases in 36% of patients which was significant at $p \leq 0.05$. In our study 64 patients was presented with chronic pancreatitis (51.2%), while 61 patients was presented with acute form (48.8%) which is not significant at (p=0.25). The main symptoms of PP was abdominal pain in 95.2%, weight loss in 11.2%, postprandial fullness or early satiety in 44.8%, nausea and vomiting 77.6%, anorexia 22.4%, fever present in 13.6%, abdominal distension 72% and jaundice 4.8%. The predominant sign on physical examination was abdominal tenderness 96.8%, abdominal mass in the epigastrium in 90.4% and ascites 9.6%. The most obvious and significant symptoms and signs is abdominal pain and abdominal tenderness at $p \leq 0.05$. Regarding complications of the pseudocyst itself like infection was present in 32%, ascites 8%, intestinal obstruction 5.6%, rupture 9.6%, hemorrhage 0.8%, the most significant complication was infection compared with other types of complication at $p \leq 0.05$ followed by rupture, ascites and intestinal obstruction. The investigations revealed hyperamylasaemia in 50% and increase ascetic amylase in 74%.

Radiological finding like computed tomography scans (CT) in all patients with sensitivity of CT in diagnosing pseudocysts ranges from 90–100% and abdominal ultrasound were performed on all patients with sensitivity in the detection of pancreatic pseudocysts was 84%. On the other hand MRI was done in 34.4% with sensitivity and specificity of 100% which provide more information in diagnosis and prediction of possible drainage. However the sensitivity of magnetic resonance cholangiopancreatography (MRCP) in our study varies, while endoscopic ultrasound (EUS) used less often and only as a diagnostic complement. Regarding postoperative surgical complications includes 12.6% developed a pancreatic fistula, 29.8% with wound infection, 3.4% with postoperative hemorrhage, 31% pain and 4% was non surgical complications, of which 4 were pneumonia, one cardiac arrhythmia and one pulmonary thromboembolism. Pain and wound infection were the most common postoperative complications, with pancreatic fistula coming in second at $p \leq 0.05$. The average size of a pancreatic pseudocyst was 18 cm (range 7-29 cm), and the most common position was the body and tail of the pancreas in 85 cases (68%) compared to the head and extrapancreatic (significant at $p \leq 0.05$).

The treatment selected for our study was supportive care in 30.4% of cases, while others 69.6% of cases was surgical intervention. The pseudocyst was resolved in 57.8% of patients treated with a non-operative procedure, with a satisfactory radiographic follow-up. In our study surgical intervention was performed in several ways. table (2) and figure (1).

Table 2: Interventional treatment, preoperative and postoperative characteristics in 87 patients with pancreatic pseudocyst

Interventional Treatment	Size in cm (range)	Postoperative complications	Recurrence	Mortality
Percutaneous drainage *(n=4) / 4.6%*	9	1 (25%)	2 (50%)	1
Surgical Internal Drainage Cystojejunoanastomosis (n = 19) / 21.8%	16	2 (10.5%)	1 (5.2%)	0
Cystogastroanastomosis (n = 48) / 55.1%	21	10 (20.8%)	4 (8.3%)	0
Cystoduodenoanastomosis (n = 4) / 4.6%	15	1 (25%)	1 (25%)	0
External drainage *(n = 7) / 8%*	19	4 (57.1%)	3 (42.8%)	1
Laparoscopic drainage *(n= 2) / 2.3 %*	13	0 (0%)	1 (50%)	0
Resection *(n = 3) / 3.4%*	17	1 (33.3%)	0 (0%)	1
Total *(n= 87) / 69.6%*		(n=19) 21.8%	(n=12) 13.7%	(n=3) 3.4%

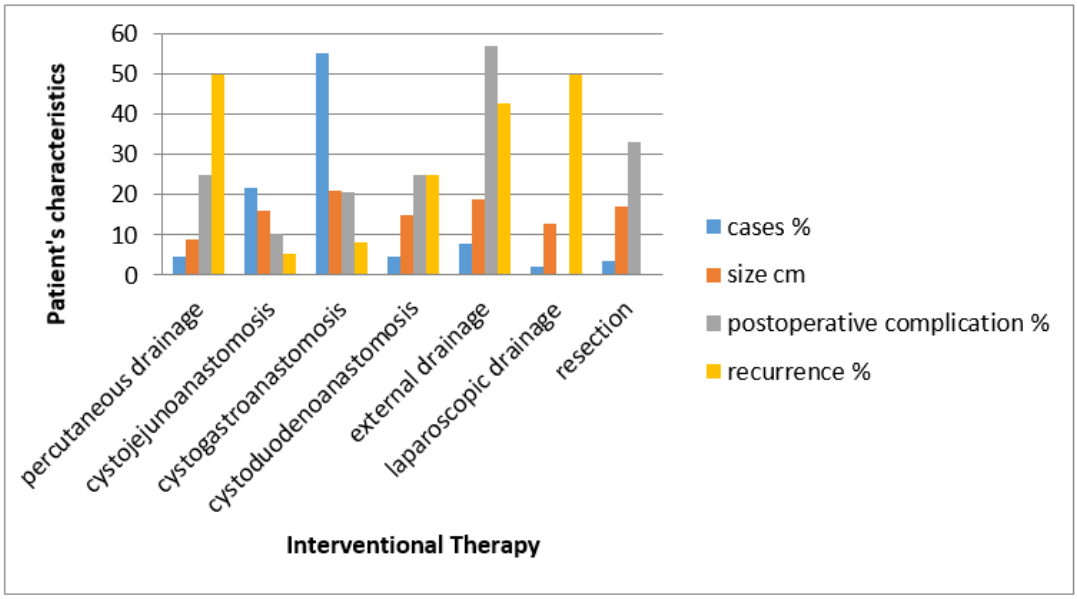

Figure 1: interventional treatment, preoperative and postoperative characteristics in 87 patients with pancreatic pseudocyst.

Cystojejnoanastomosis was performed in 21.8% of the cases, cystogastroanastomosis in 55,1% of the cases, and cystodeudenoanastomosis in 4.6% of the cases. Seven patients (8%) had external surgical drainage and 3.4% had resection, while 4.6% had percutaneous drainage and 2.3% had laparoscopic drainage. Cystogastroanastomosis was the most common surgical procedure in our study (significant at p 0.05). As compared to external drainage, which had a higher complication rate, cystojejunoanastomosis was the surgical technique with the fewest complications (significant at p 0.05). The recurrence rate was strongly dependent on the underlying condition's treatment. The lowest recurrence rate was resection surgery, followed by cystojejunoanastomosis, while the highest recurrence rate was percutaneous drainage, followed by external drainage, with a p value of 0.05. The mortality rates for all forms of surgical operation were not statistically relevant (p=0.284).

Discussion

One of the most common complications that can arise after a pancreatitis episode is a pancreatic pseudocyst. In most cases, the pathophysiology is caused by a lesion or a change in the normal anatomy of the pancreatic duct[19,20]. The cause of pancreatitis is directly linked to the etiology of pancreatic pseudocyst; in 47.2% of cases, alcohol ingestion is the cause, followed by biliary disease in 36%. Abhishek and Karan 2019 and Sebastian et al 2017[21,22] agree with our findings, which stated that the commonest etiological factor was alcohol which was present in 53.3% of the cases followed by biliary disease in 32%[1], whereas Gang et al 2015[10] found that pseudocysts were mostly caused by biliary pancreatitis in 75.4% of cases followed by alcoholic cause, which contradicts our findings. Because of advancements in imaging techniques, the current prevalence of pancreatic pseudocyst is 48.8% in patients with acute pancreatitis and 51.2% in patients with chronic pancreatitis, Jose Luis et al 2015 [23] agree with our study that the incidence was 55.2% associated with chronic pancreatitis and 44.8% linked with acute pancreatitis. According to [24] Yantting et al 2019 the prevalence of pseudocysts is higher in males between the fourth and fifth decades of life which agree with our study.

A diagnosis was made based on clinical, biochemical, and radiological findings[25]. The clinical presentation varies, ranging from asymptomatic patients to those experiencing abdominal emergency symptoms as a result of complications. The most common symptoms recorded in this study were abdominal pain, early satiety, nausea, vomiting, weight loss, jaundice, and fever. There are currently no specific laboratory tests to diagnose pancreatic pseudocyst; however, up to 50% of patients in our study had persistently elevated amylase and lipase levels, which agrees with[19] Udeshika et al 2018, while [26] Carolyn et al 2013 stated that an elevated amylase level is less specific because it can occur in a variety of other conditions. Mild leukocytosis and changes in liver function tests were also discovered. Despite the fact that most of our patients had elevated serum levels of the above-mentioned pancreatic enzymes, measuring them is a vital part of the diagnostic process and is thus recommended in our study, the other biochemical findings were non-specific. In terms of radiological studies, Christos et al 2018[4] stated that transabdominal ultrasound is one of the most commonly used diagnostic tools in evaluating a pseudocyst due to its portability and ease of access, but it is operator dependent with non-reproducible results and imaging limitations such as overlying bowel gas, which we used to make the diagnosis[27]. We also discovered that MRI and MRCP are the most accurate and sensitive diagnostic tools for evaluating the anatomy of the pancreatic duct. The most common sites of PP in our study were the pancreas' body and tail, which agrees with Bouriliere and Sarles' findings that most pseudocysts were found in or near the pancreas' tail[14], Management strategies have evolved over time and will continue to do so[28]. An asymptomatic pancreatic pseudocyst, regardless of size, position, or extension to neighboring structures, may be treated conservatively, according to the American College of Gastroenterology's 2013 guidelines for the management of pancreatitis. This is in contrast to previous reports, which suggested that the lesion should be drained if it was larger than 6 cm[29]. According to these guidelines, invasive management of pancreatic pseudocysts should be used only if the lesion is causing symptoms or if it has spread to neighboring structures and is jeopardizing normal gastrointestinal physiology (infected

pseudocyst, bleeding, biliary obstruction or delayed gastric emptying) [30]. Currently, management options include percutaneous, endoscopic, or surgical drainage, each with its own set of benefits and drawbacks. It's difficult to say which therapeutic drainage method is better than the others; however, the management option chosen will be based on the clinical features of the patient and, preferably, the anatomy of the pancreatic duct[31].

Nealon and Walser defined a classification that took into account the existence of pancreatic duct stenosis or obstruction, as well as the communication of the pseudocyst to it. According to Park and Heniford[32], patient selection, the underlying cause of pancreatitis, the location of the pseudocyst, and the presence or absence of obstruction of the pancreatic duct are all important factors that will influence the drainage method's success. Surgery was the treatment of choice in our study; it is still considered the gold standard and is divided into three types: internal, external, and resection. Internal drainage may take place through contact between the pseudocyst and the stomach (cystogastroanastomosis), the jejunum (cystojejunoanastomosis), or the duodenum (cystoduodenoanastomosis) [33].The surgeon's preference, as well as the location of the pseudocyst and adjacent structures, will determine which of these techniques is used. If resection is chosen, the treatment will be determined by the position of the pseudocyst and can involve a distal pancreatectomy or even a pancreaticoduodenectomy, depending on the location of the pseudocyst.

Conclusion

Asymptomatic pancreatic pseudocyst is treated conservatively, while infected or ruptured pancreatic pseudocyst necessitates external drainage. In the majority of cases, anastomosis of the pancreatic pseudocyst to the surrounding bowels, either CG or CJ, is performed with reasonable success.

Conflict of interest: None

Source of findings: None

Ethical clearance: None

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