

Presentation And Management Of Pseudocyst Of The Pancreas in The Gastroenterology And Hepatology Teaching Hospital

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ABSTRACT

Background: Pancreatic pseudocysts are one of the most common complications of acute and chronic pancreatitis and can also occur following trauma to the pancreas. They comprise about 80% of cystic lesions of the pancreas. **Patients And Method:** This is a retrospective and prospective study, which included 48 patients with pancreatic pseudocysts who were admitted to the gastroenterology and hepatology teaching hospital between 1\1\2009 to 31\12\2011, data were collected both and demographically and clinically. **Aim of the Study:** This study aims to review the management of patients who presented to our hospital with pancreatic pseudocysts, focusing on their presentation, preoperative investigations, treatment given and complications of pseudocysts and treatment. **results:** 48 patients with pancreatic pseudocysts were collected; males comprise 26 (54.17%) patients, while females comprise 22 (45.83%). Patients were between 4 years and 92 years of age (median: 42.69 years). Abdominal pain was the most common presentation and was present in 43 patients. The majority of cases (46) were due to pancreatitis, 32 had acute pancreatitis, and 14 chronic pancreatitis, and only 2 patients had blunt pancreatic trauma. Most of the pseudocysts were located in the head and body of pancreas (in 19 patients), while the pseudocysts were found in the body in 15 patients. Most of the patients (23) were treated conservatively, while external drainage was done in 10 patients. Surgery was the treatment modality in 13 patients. Endoscopic drainage of pseudocysts was done in 2 patients. Complications followed pseudocysts occur in 17 patients. Surgical treatment of pseudocysts had morbidity occurred in 2 patients. External drainage was associated with complications in 3 patients. **Conclusions:** Because more than half of the pseudocysts will regress spontaneously in a few weeks, conservative treatment should be undertaken first. Different treatment options are available for dealing with pseudocysts, including external drainage, endoscopic drainage, and open surgical drainage. **Key word:** pseudocyst pancreas.

Introduction:

A pseudocyst is a collection of amylase-rich fluid enclosed in a wall of fibrous or granulation tissue.⁽¹⁾ Altogether, pancreatic pseudocysts represent more than 75% of cystic lesions of the pancreas. Pseudocysts may be broadly divided into acute pseudocysts, which evolve from post pancreatitis acute fluid collections, and chronic pseudocysts, which develop in the setting of chronic pancreatitis. Traumatic pseudocysts arising from pancreatic duct disruption account for 3% to 8% of pseudocyst presentations and behave similarly to acute pseudocysts.⁽²⁾ The identification and treatment of pseudocysts requires definition of the various forms of pancreatic fluid collections that occur.⁽³⁾

* Peripancreatic fluid collection:

A collection of enzyme-rich pancreatic juice that occurs early in the course of acute pancreatitis or that forms after a pancreatic duct leak; located in or near the pancreas; it lacks a well-organized wall of granulation or fibrous tissue.

***Early pancreatic (sterile) necrosis:** A focal or diffuse area of nonviable pancreatic parenchyma, typically occupying >30% of the gland and containing liquefied debris and fluid.

*** Late pancreatic (sterile) necrosis:** An organized collection of sterile necrotic debris and fluid with a well-defined margin or wall within the normal domain of the pancreas.

***Acute pseudocyst:** A collection of pancreatic juice enclosed within a perimeter of early granulation tissue, usually as a consequence of acute pancreatitis that has occurred within the preceding 34 weeks.

*** Chronic pseudocyst:** A collection of pancreatic fluid surrounded by a wall of normal granulation and fibrous tissue, usually persisting for >6 weeks.

*** Pancreatic abscess:** Any of the above in which gross purulence (pus) is present, with bacterial or fungal organisms documented to be present.

Acute pseudocysts may resolve spontaneously in up to 50% of cases, over a course of 6 weeks or longer.⁽⁴⁾ Pseudocysts >6 cm resolve less frequently than smaller ones but may regress over a period of weeks to months. Pseudocysts are multiple in 17% of patients,⁽⁵⁾ or may be multilobulated. They may occur intrapancreatically or extend beyond the region of the pancreas into other cavities or compartments. Pseudocysts may become secondarily infected, in which case they become abscesses. Occasionally, a cystic neoplasm may be confused with a chronic pseudocyst. Distinguishing of pseudocyst from a cystic neoplasm depend first on history and appearance on CT and ultrasound.

EUS and aspiration of the cyst fluid is very useful in such a situation. The fluid should be sent for measurement of carcinoembryonic antigen (CEA) levels, amylase levels and cytology. Fluid from a pseudocyst typically has a low CEA level, and levels above 400 ng ml⁻¹ are suggestive of a mucinous neoplasm. Pseudocyst fluid usually has a high amylase level, but that is not diagnostic, as a tumour that communicates with the duct system may yield similar findings. Cytology typically reveals inflammatory cells in pseudocyst fluid. If there is no access to EUS, then percutaneous FNA is acceptable (just aspiration, *not* percutaneous insertion of a drain).⁽¹⁾

Complications:⁽¹⁾

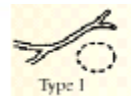
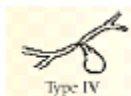
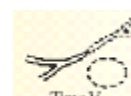
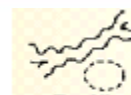
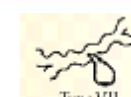
Infection:	Abscess, Systemic sepsis
Rupture:	
Into the gut	Gastrointestinal bleeding, Internal fistula
Into the peritoneum	Peritonitis
Enlargement:	
Pressure effects	Obstructive jaundice from biliary compression, Bowel obstruction
Pain	
Erosion into a vessel (pseudoaneurism)	Haemorrhage into the cyst, Haemoperitoneum

Classification:

In an attempt to help decide the timing and choice of surgical intervention, several classifications have been proposed. According to the Atlanta classification⁽⁶⁾, an **acute pseudocyst** is a collection of pancreatic juice enclosed by a wall of fibrous or granulation tissue, arising as a consequence of acute pancreatitis or pancreatic trauma, whereas a **chronic pseudocyst** is a collection of pancreatic juice enclosed by a wall of fibrous or granulation tissue,

Arising as a consequence of chronic pancreatitis and lacking of an antecedent episode of acute pancreatitis. But in clinic, some pseudocysts are usually associated with chronic pancreatitis and may develop after an episode of acute pancreatitis. There is also a classification based entirely on pancreatic duct anatomy proposed by Nealon *et al.*⁽⁷⁾ . This system defines the categories of ductal abnormalities seen in patients with pseudocyst and relates the authors' experience with different types of treatment.

Nealon's Classification: Endoscopic Retrograde Cholangiopancreatography

Type	Description	Depiction
I	Normal duct/ no communication	
II	Normal duct/ with communication	
III	Normal duct with stricture/ no communication	
IV	Normal duct with stricture/ with communication	
V	Normal duct/ complete obstruction	
VI	Chronic pancreatitis/ no communication	
VII	Chronic pancreatitis/ with communication	

The classification of pseudocysts proposed by D' Egidio *et al.*⁽⁸⁾ takes into account all the aspects mentioned above. They identified three distinct types of pseudocysts: **Type I or acute "post-necrotic" pseudocysts** that occur after an episode of acute pancreatitis and are associated with normal duct anatomy and rarely communicate with the pancreatic duct, **Type II, or post-necrotic pseudocysts** which occur after an episode of acute or chronic pancreatitis (the pancreatic duct is diseased but not strictured, and there is often a duct-pseudocyst communication) **and Type III, defined as "retention" pseudocysts**, which occur in chronic pancreatitis and are uniformly associated with duct stricture and pseudocyst-duct communication. Pseudocysts usually cause symptoms of pain, fullness, or early satiety. Asymptomatic pseudocysts can be managed expectantly and may resolve spontaneously or persist without complication.⁽⁹⁾ Symptomatic or enlarging pseudocysts require treatment, and any presumed pseudocyst without a documented antecedent episode of acute pancreatitis requires investigation to determine the etiology of the lesion.⁽¹⁰⁾

The diagnosis of some type of pancreatic fluid collection should be suspected in every patient with acute pancreatitis who is not significantly better within 1 week of supportive treatment. The diagnosis should also be suspected in patients with chronic pancreatitis and a change in symptoms. CT is the preferred initial diagnostic study as it is able to supply information regarding the common duct, the pancreatic duct, and the presence or absence of pancreatic necrosis. Once a diagnosis has been made by CT, abdominal ultrasound is a suitable radiographic modality for follow-up assessment of interval changes in size, and MRCP is increasingly valuable in demonstrating cyst-duct relationships and communications.⁽²⁾

If infection is suspected, the pseudocyst should be aspirated (not drained) by CT- or US-guided FNA, and the contents examined for organisms by Gram's stain and culture.⁽¹¹⁾ If infection is present, and the contents resemble pus, external drainage is employed, using either surgical or percutaneous techniques. If the pseudocyst has failed to resolve with conservative therapy, and symptoms persist, internal drainage is usually preferred external drainage,

to avoid the complication of a pancreaticocutaneous fistula. Pseudocysts communicate with the pancreatic ductal system in up to 80% of cases,⁽¹²⁾ so external drainage creates a pathway for pancreatic duct leakage to and through the catheter exit site. Internal drainage may be performed with either percutaneous catheter-based methods (transgastric puncture and stent placement to create a cystogastrostomy), endoscopic methods (transgastric or transduodenal puncture and multiple stent placements, with or without a nasocystic irrigation catheter), or surgical methods (a true cystoenterostomy, biopsy of cyst wall, and evacuation of all debris and contents). Surgical options include a cystogastrostomy, a Roux-en-Y cystojejunostomy, or a cystoduodenostomy. Cystojejunostomy is the most versatile method, and it can be applied to pseudocysts that penetrate into the transverse mesocolon, the paracolic gutters, or the lesser sac. Cystogastrostomy can be performed endoscopically⁽¹³⁾, laparoscopically,⁽¹⁴⁾ or by a combined laparoscopic-endoscopic method.⁽¹⁵⁾

Because pseudocysts often communicate with the pancreatic ductal system, two newer approaches to pseudocyst management are based on main duct drainage, rather than pseudocyst drainage per se. Transpapillary stents inserted at the time of ERCP may be directed into a pseudocyst through the ductal communication itself, or can be left across the area of suspected duct leakage to facilitate decompression and cyst drainage, analogous to the use of common bile duct stents in the setting of a cystic duct leak.⁽³⁾ Resection of a pseudocyst is sometimes indicated for cysts located in the pancreatic tail, or when a midpancreatic duct disruption has resulted in a distally located pseudocyst. Distal pancreatectomy for removal of a pseudocyst, with or without splenectomy, can be a challenging procedure in the setting of prior pancreatitis. An internal drainage procedure of the communicating duct or of the pseudocyst itself should be considered when distal resection is being contemplated.⁽³⁾

Patients And Method:

This is a retrospective and prospective study, which included 48 patients with pancreatic pseudocysts who were admitted to the gastroenterology and hepatology teaching hospital between 1\1\2009 to 31\12\2011, they were analyzed regarding their, age, gender, history and physical examination, cause of pseudocysts (acute or chronic pancreatitis or trauma) and cause of pancreatitis (biliary, alcohol intake or other causes), investigations, imaging techniques (for determination of the size and site of pseudo cysts), detail of management, which include conservative or operative management, and follow up for development of complications, and mortality.

The initial evaluation and assessment of all patients admitted with pseudocysts of the pancreas started with history and physical examination, and then full blood tests were done. Plain abdominal x-rays were not routinely performed except for diagnosis of pancreatitis. Abdominal ultrasound examination was the initial imaging technique for all patients, followed by abdominal CT scan or abdominal MRI in most cases. Endoscopic ultrasound (EUS) was performed in selected cases especially to help differentiate pseudocysts from cystic tumors of the pancreas.

Endoscopic Retrograde Cholangiopancreatography (ERCP) was not routinely performed as a diagnostic tool in the workup of a pancreatic pseudocyst, but may have a therapeutic value for the associated pancreatitis.

Conservative treatment was tried first with close observation of the patients both clinically for symptoms or complications of the pseudocysts and radiologically for massive enlargement or persistence of the cysts. For symptomatic or complicated pseudocysts and for those failing to reg

ress or enlarging massively, intervention was done mainly surgery, while percutaneous aspiration under ultrasound guidance are left for infected pseudocysts and for medically unfit patients. Surgery was done by different surgeons in the gastroenterology and hepatology teaching hospital, and the choice of surgical procedure was left to the opinion of the surgeon depending on size and site of the cyst, general condition of the patient, and the expertise of the surgeon. Percutaneous drainage is usually performed under ultrasound guidance in the radiology department by insertion of a Peritoneal Dialysis (PD) catheter in the cyst with continuous wash of the PD catheter in the ward.

Results:

Forty eight patients with pancreatic pseudocysts were analyzed, males were slightly more than females; males comprise 26 (54.17%) patients, while females comprise 22 (45.83%). Patients were between 4 years and 92 years of age (Range: 48 years; and median: 42.69 years). Most patients were in their thirties and forties of age [both comprise 22 (45.83%) of patients]. (Table 1).

(Table 1): Age and gender

Age group	Total [No. (percent)]	Male [No. (percent)]	Female [No. (percent)]
1-9 yr	2 (4.16%)	2 (4.16%)	0
10-19 yr	3 (6.25%)	1 (2.08%)	2 (4.16%)
20-29 yr	6 (12.50%)	2 (4.16%)	4 (8.33%)
30-39 yr	10 (20.83%)	4 (8.33%)	6 (12.50%)
40-49 yr	12 (25%)	10 (20.83%)	2 (4.16%)
50-59 yr	7 (14.58%)	5 (10.42%)	2 (4.16%)
60-69 yr	3 (6.25%)	2 (4.16%)	1 (2.08%)
70-79 yr	2 (4.16%)	0	2 (4.16%)
80-89 yr	2 (4.16%)	0	2 (4.16%)
90-99 yr	1 (2.08%)	0	1 (2.08%)
Total	48 (100%)	26 (54.17%)	22 (45.83%)

Regarding clinical presentation (signs and symptoms), abdominal pain (mainly in the epigastric region and sometimes radiated to the back) was the most common presentation and was present in 43 (89.58%) patients, followed by nausea and/or vomiting which was

present in 35 (72.92%) patients, fever in 15 (31.25%) patients, abdominal mass in 10 (20.83%) patients, and jaundice (from biliary obstruction) in 8 (16.67%) patients. Other presentation (like diarrhea, cough and dyspnea) was found in 4 (8.33%) patients. (Table 2).

Table 2: Symptoms and signs

Presentation	No. (percent)
Abdominal pain	43 (89.58%)
Nausea and/or vomiting	35 (72.92%)
Fever	15 (31.25%)
Abdominal mass	10 (20.83%)
Jaundice	8 (16.67%)
Others	4 (8.33%)

Regarding the cause of pseudocysts, majority of cases were due to pancreatitis, and only 2 (4.16%) patients were due to blunt pancreatic trauma to the epigastric region. Of the 46 patients with pancreatitis, 32 (69.57%) patients were due to acute pancreatitis; of these, 23 (47.92%) patients were due to biliary cause (common bile duct stones), 5

(10.42%) patients were due to alcohol consumption, and 4 (8.33%) patients were of unknown cause. Chronic pancreatitis were the cause of pseudocyst in 14 (29.17%) patients;

of these 10 (20.83%) patients were due to biliary cause, 3 (6.25%) patients were due to alcohol consumption, and 1 (2.08%) patient was due to unknown cause. (Table 3).

Table 3: Cause of pseudocyst

Cause	No. (percent)
Acute pancreatitis	Biliary
	23 (47.92%)
	Alcohol
Chronic pancreatitis	5 (10.42%)
	Other
	4 (8.33%)
Trauma	Biliary
	10 (20.83%)
	Alcohol
Total	3 (6.25%)
	Other
	1 (2.08%)
Trauma	2 (4.16%)
Total	48 (100%)

Most of the pseudocysts were located in the head and body of pancreas, 19 (39.58%) patients had their pseudocysts located in the pancreatic head and neck, while the pseudocysts were found in the body in 15 (31.25%)

patients. Other sites include 7 (14.58%) patients with pseudocysts in the tail of pancreas, and in 7 (14.58%) patients, the pseudocysts were found in a site unrelated to the pancreas, mainly in the epigastric region. (Table 4).

Table 4: Site of pseudocyst

Site	No. (percent)
Pancreatic head and neck	19 (39.58%)
Pancreatic body	15 (31.25%)
Pancreatic tail	7 (14.58%)
Other	7 (14.58%)
Total	48 (100%)

Most of the patients [23 (47.92%)] were treated conservatively, while external drainage was done in 10 (20.83%) patients. (Table 5).

Table 5: Treatment

Treatment modality	No. (percent)
Conservative	23 (47.92%)
External drainage	10 (20.83%)
Surgery	13 (27.08%)
Endoscopic treatment	2 (4.16%)
Total	48 (100%)

Surgery was the treatment modality in 13 (27.08%) patients; of these, 10 (76.92%) patients had anastomosis done between the pseudocyst and the posterior wall of the stomach (cystogastrostomy) with evacuation of the contents of the cyst and taking of biopsy from the pseudocyst wall for exclusion of

cystic tumour of pancreas, 2 (15.38%) patients had anastomosis between the jejunum (cystojejunostomy); one patient with a loop and the other with a Roux limb, also with a biopsy taken from the pseudocyst wall and cyst evacuation; and 1 (7.69%) patient had external drainage done because of sepsis. (Table 6).

Table 6: Types of surgical management

Type of surgery	No. (percent)
Cystogastrostomy	10 (76.92%)
Cystojejunostomy	2 (15.38%)
External drainage	1 (7.69%)

Other treatment option was done by our medical colleagues in 2 (4.16%) patients, and this was endoscopic drainage of pseudocysts by insertion of tubes between the pseudocyst and the stomach wall under endoscopic ultrasound (EUS) guidance.

Regarding morbidity, complications occur following either the pseudocyst itself during the conservative treatment, or followed treatment. Complications followed pseudocysts occur in 17 (35.42%) patients and include first infection of the pseudocyst which occur in 7 (14.58%) patients, followed by jaundice from common bile duct obstruction in 5

(10.42%) patients, and repeated vomiting from gastric outlet obstruction in 5 (10.42%) patients. Surgical treatment of pseudocysts had morbidity occurred in 2 (15.38%) patients, one patient had wound infection and the other had upper gastrointestinal tract bleeding from the suture line and both treated successfully by conservative and supportive management. External drainage was associated with complications in 3 (30%) patients, and this included recurrence of the cyst in two patients and bleeding into the drain in one patient. All these complications were treated conservatively successfully. (Table 7).

Table 7: Complications of pseudocysts and treatment

Complications		No. (percent)
Of pseudocysts	Infection	7 (14.58%)
	CBD obstruction	5 (10.42%)
	Duodenal obstruction	5 (10.42%)
Of external drainage	Recurrence	2 (20%)
	Bleeding	1 (10%)
Of surgery	Infection	1 (7.69%)
	Bleeding	1 (7.69%)

One patient died during the conservative treatment of acute pseudocyst because of recurrent attack of severe acute pancreatitis with associated medical co-morbidities.

Discussion:

In our study, males were slightly more than females; males comprise 26 (54.17%) patients, while females comprise 22 (45.83%). Patients were between 4 years and 92 years of age (Range: 48 years; and median: 42.69 years). In most studies, males were higher than females but with different percentages, e.g.; Von Heerden et al⁽¹⁶⁾

study had 46 males and 25 were females, and the respective average ages were 47.4 and 44.0 years. In our collection, epigastric pain was the most common presentation and was present in about 90% of patients, followed by nausea and/or vomiting which was present in 73% of patients, and fever in about 32% of patients.

Other presentations were abdominal mass in 21% patients, and jaundice in 17% patients. In Kiviluoto et al⁽¹⁷⁾ series, more than half (68%) of the patients had upper epigastric abdominal pains that often radiated to the back. A palpable intra-abdominal mass and loss of weight (>5 kg) were other common signs (32% and 27%, respectively). Permanent or intermittent obstructive jaundice (18%) was a sign that suggested compression of the common bile duct by a pancreatic mass. Vomiting (8%) was often evoked by compression of the pyloric outlet or duodenum.

The occurrence of a pseudocyst parallels that of pancreatitis and the etiology of pseudocysts resembles the causes of pancreatitis closely. In our collection, biliary pancreatitis was the most common cause of acute and chronic pseudocysts (48% for acute and 21% for chronic pseudocysts). Alcohol-related pancreatitis appears to be the major cause in studies from countries where consumption of strong beverages is relatively high and accounts for 59-78% of all pseudocysts (Pitchumoni CS, Agarwal N).

⁽¹⁸⁾ Walt et al.⁽¹⁹⁾ reported data collected from Wayne State University Hospital, Detroit. The causative factors in the 357 admissions for pancreatic pseudocysts included alcoholism in 251 cases (70%), biliary tract disease in 28 (8%), blunt trauma in 17 (5%), penetrating trauma in 4 (1%), operative trauma in 1 (0.3%), and idiopathic in 56 (16%). The proportion of acute and chronic pseudocysts was not indicated in this study.

In a prospective study from France, chronic pseudocysts were associated with alcoholic pancreatitis in 94% of cases. The leading cause of acute pseudocysts was gallstones accounting for 45% of all acute cases. The other causes were trauma (10%), ERCP (7%), alcohol, pancreas divisum, surgery (4% each) and idiopathic (28%), (Bourliere M, Sarles H).⁽²⁰⁾

In recent prospective British study, patients with chronic pancreatic pseudocysts had established chronic pancreatitis as a result of alcoholism in 71% of cases. Other causes encountered were recurrent attacks of acute pancreatitis (5%), cholelithiasis (4%) or unknown causes (20%). (Usatoff V, Brancatisano R, Williamson RC).⁽²¹⁾

Pseudocysts may also develop in the aftermath of pancreatic trauma, and are then a direct sign of a rupture or at least a breach in the pancreatic duct. Although adult series of pseudocysts report trauma as the etiological factor in only 3-8% of patients[(O'Malley VP, Cannon JP, Postier RG)⁽²²⁾, (Frey CF)⁽²³⁾ (Shan YS, Sy ED, Tsai HM, Liou CS, Lin PW)⁽²⁴⁾], most pancreatic pseudocysts in children are post-traumatic[(Northrup WF 3rd, Simmons RL),⁽²⁵⁾ (Vane DW, Grosfeld JL, West KW, Rescorla FJ)⁽²⁶⁾].

In our series, 2 cases were due to pancreatic trauma, one of them was 9 years old boy. Knowledge of the anatomy of the pancreas and the pathogenesis of pancreatic fluid collections is essential for choosing the right treatment method. In the study by Bourliere and Sarles⁽²⁷⁾, most pseudocysts were located in or near the tail of the pancreas. In another study (Kloppel G, Maillet B.)⁽²⁸⁾, most extrapancreatic pseudocysts were related to the body and tail, whereas most intrapancreatic pseudocysts were in the head of the pancreas. Pancreatic pseudocysts are most often retrogastric (Maule WF, Reber HA.)⁽²⁹⁾.

In our collection, most of the pseudocysts were located in the head and neck, followed by body and less in the pancreatic tail. The old teaching that the presence of cysts of more than 6 cm in diameter for 6 wk should be drained is no longer true (Cooperman AM.)⁽³⁰⁾. The outcome of pseudocysts, which either spontaneously resolve or require operation, and the rate of complications and recurrence, are similar regardless of the size (be it less than 6 cm in diameter or larger) and the course of disease [(Soliani P et al),⁽³¹⁾ (Pitchumoni CS, Agarwal N.),⁽³²⁾ (Cheruvu CV, Clarke MG, Prentice M, Eyre-Brook IA.)⁽³³⁾, (Vitas GJ, Sarr MG.)⁽³⁴⁾]

for the etiology of pancreatitis is a more important determinant of the outcome rather than the size of pseudocyst or course of disease. The natural history of pancreatic pseudocyst suggests that cysts existing beyond a seven-week period are prone to major complications whose mortality greatly exceeds that of elective surgery (Bradley EL III, Clements JL, Gonzalez AC).⁽³⁵⁾

A six-week observation period is the one most frequently used in other series. In our series, no surgery was done before at least six weeks close observation of the patients.

No agreement exists on the best way to electively

treat pseudocysts, although the literature supports internal drainage whenever possible (Anderson MC).⁽³⁶⁾ While some favor cystogastrostomy (Von Heerden et al)⁽¹⁶⁾ and others cystojejunostomy, [(Ravelo HR, Aldrete JS),⁽³⁷⁾ (Sandy JT, Taylor RH, Christensen RM, et al)⁽³⁸⁾] we believe that treatment should be individualized and the operation chosen according to the particular anatomy and condition of the patient. One must be careful to avoid internal drainage of infected pseudocysts (Von Heerden et al).⁽¹⁶⁾

In our series, cystogastrostomy was the procedure of choice in most cases. Regarding the complications of pseudocysts itself and of different modes of treatment in our series, sepsis was the most common complication of pseudocyst and occur in 14% of patients followed by duodenal and biliary obstruction with a 10% for both. A review of the literature also reveals that up to 40% of patients with untreated pseudocysts develop complications (Andrew LW, Carlos FC, David WR).⁽³⁹⁾ On the other hand, Bradley et al⁽³⁵⁾ had a complication rate of only 20%. Yin et al⁽⁴⁰⁾ had a 50% (11/22) complicated cases and although there was no mortality, they were often associated with severe morbidity.

In our collection, external drainage had recurrence in two cases and bleeding in one patient. Yin et al⁽⁴⁰⁾ used percutaneous drainage in a patient with a large infected pseudocyst with systemic toxemia. But it was complicated with leakage around the catheter with diffuse peritonitis. One symptomatic patient with an immature cyst wall had a recurrence after external drainage and severe pulmonary effusion due to pancreaticopulmonary fistula after percutaneous drainage. In our collection, surgery (internal drainage) resulted in complications in two cases, one had pancreatic infection and the other had bleeding. Yin et al⁽⁴⁰⁾ had two cases with sustained pancreatic infections, and a third patient had severe hemodynamic changes and a pancreatic abscess following internal drainage due to sudden massive fluid loss and poor drainage, respectively. In our series, morbidity and recurrence was higher in external percutaneous drainage group than in surgical internal drainage group. In Yin et al⁽⁴⁰⁾ series, external drainage was associated with higher morbidity than internal drainage (n=6, 60% vs n=4, 40%). This was significantly higher than the 23% reported by Balfour⁽⁴¹⁾ and quite similar to 72.7% and 61% noted in Brian et al⁽⁴²⁾ and Shatney's⁽⁴³⁾ series respectively.

Conclusions:

1. It is important to rule out cystic tumors of the pancreas (which are less common than pancreatic pseudocysts), because of the disastrous consequences of draining cystic tumors.
2. Because more than half of the pseudocysts will regress spontaneously in a few weeks, conservative treatment should be undertaken first and leaving intervention for symptomatic or complicated pseudocysts and for enlarging pseudocysts.
3. Different surgical options are available for dealing with pseudocysts depending on site and size of pseudocyst, presence of infection within the cyst, general condition of the patient and experience of the surgeon.
4. External drainage is still a viable option for the treatment, especially for infected pseudocysts and toxic patients and those with medical comorbidities.

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