



# Paradigm in the Management of Recurrent Pancreatic Pseudocyst in Infant: A Case Report and Literature Review

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## Abstract

**Introduction:** The most common causes of pancreatic pseudocysts are gallstones and binge alcohol consumption in adult. This disorder of the pancreas is however exceedingly uncommon in children. The purpose of this case was to evaluate the outcome of pediatric patient after unsuccessful conventional drainage techniques: endoscopic, pseudocystojejunostomy and multiples percutaneous drainage with a recurrent pancreatic pseudocyst.

**Cases:** A 15-year-old young female patient with chronic abdominal pain, postprandial distension and weight loss was referred at our department for treatment. Her physical examination revealed epigastric pain and abdominal mass in the left abdominal region. We performed open cysto gastrostomy under general anesthesia. The duration of the procedure was 185 minutes and none complications of the procedure were observed.

**Conclusion:** The paradigm in this case is when the pseudocyst is localized in both head and tail of the pancreas and it is recurrent; the correct decision is to perform an open cysto gastrostomy.

**Keywords:** Pancreatitis- Pediatric

## OPEN ACCESS

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**Received Date:** 15 Jan 2018

**Accepted Date:** 05 Feb 2018

**Published Date:** 09 Feb 2018

### Citation:

Aurelus PJ, Carrion RRZ, Solis EAM, De La Cruz Rodriguez L, De La Cruz Yanez H. Paradigm in the Management of Recurrent Pancreatic Pseudocyst in Infant: A Case Report and Literature Review. *Ann Pediatr Res.* 2018; 2(1): 1006.

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## Introduction

The most common causes of pancreatic pseudocysts are gallstones and binge alcohol consumption in adult. However in children, it is a complication of injury to the pancreatic parenchyma or pancreatic duct [1,2]. There has been an increase in the incidence of pseudocyst due to pancreatitis complication. In fact, the sequela of Wilson ductal disruption is the formation of a collection with or without solid debris between pancreas that known like pancreatic pseudocyst. This disorder of the pancreas is however exceedingly uncommon in children [2]. The first report of pancreatic pseudocyst was attributed to Morgagni in 1761 and the first surgical drainage was performed by Friedrich Wilhelm Wandesleben in November 1841 [3]. Pancreatic pseudocyst may be acute or chronic, depending on whether the process that led the pseudocyst was acute or chronic pancreatitis, respectively. Acute pseudocysts require at least 4 weeks to occur, and devoid of significant solid debris. The incidence of Pseudocyst after acute pancreatitis is reported to be between 5 to 16% and 20 to 40% after chronic pancreatic [1-3]. Particularly small pseudocyst is difficult to differentiate from cystic tumors of the pancreas, according to the revised Atlanta classification [4]. Symptoms are diverse in the Pancreatic Pseudocyst (P.P) and heavily depend on localization and size of the pseudocyst, generally abdominal pain is the most frequent symptom. The formers standards of therapy are endosonographic drainage techniques, surgical drainage like pseudocystojejunostomy and pseudocystogastrostomy [3,4]. The laparoscopic and endoscopic approaches to internal drainage of pancreatic pseudocyst are the current minimally invasive management option [5]. On the other hand, in certain situation is still controversial the decision for the open procedure, what was the aim of this work. The purpose of this case was to evaluate the outcome of pediatric patient after unsuccessful conventional drainage techniques: endoscopic, pseudocystojejunostomy and multiples percutaneous drainage with a recurrent pancreatic pseudocyst; in our Pediatric center [Hospital of Pediatrics "Dr. Silvestre Frenk Freund "National Medical Center Siglo XXI: IMSS (Mexican Institute of Social Security) Mexico].



Figure 1: Ultrasound aspect of P.P.



Figure 2: Head or Tail of P. Pseudocyst.



Figure 3: P.P with mature wall.

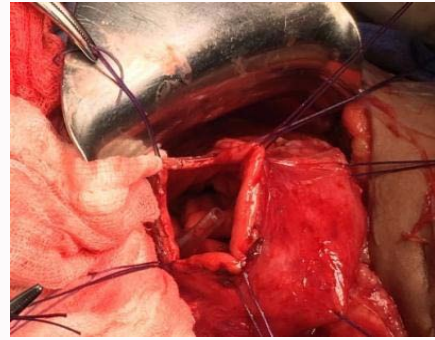


Figure 4: Gastrostomy anterior wall.



Figure 5: P. Pseudocyst localization.

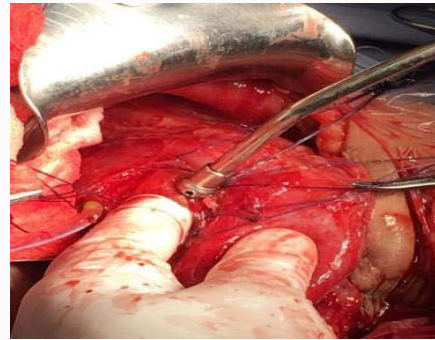


Figure 6: Cysto gastrostomy-window.

## Case Presentation

A 15-year-old young female patient with chronic abdominal pain, postprandial distension and weight loss was referred at our department for treatment. Her physical examination revealed epigastric pain and abdominal mass in the left abdominal region. She had medical history of chronic pancreatitis, multiples unsuccessful treatments and procedures for pancreatic pseudocyst (medical treatment, endoscopic drainage with stent placed, pseudocystojejunostomy drainage, resection part of pancreas and multiples percutaneous drainage). Ultrasound and tomography was performed and demonstrated a little pseudocyst in the pancreas head and a larger pseudocyst of 8.4 cm X 8cm in the pancreas tailed (Figure 1-3). However, she had a large medical history with multiples managements and pain. Owing to the congealed abdominal condition of the patient, the decision was to performed open cysto gastrostomy under general anesthesia. We

created a 5 cm anterior incision of the stomach and a cysto gastrostomy opening approximately 4 cm in size, between the adherent posterior wall of the stomach and anterior capsule of the pseudocyst; with previous introduced a needle in the pseudocyst for its localization. More than 650 ml of fluid contents was aspirated. A nasogastric tube was left in place of the pseudocyst cavity for 6days. We achieved the procedure with Vicryl number 1 to suture and maintained the cysto gastrostomy communication. Finally, the anterior gastrostomy was closed using Vicryl 1 (Figure 4-6).

## Follow-up

The duration of the procedure was 185 minutes. None complications of the procedure were observed such as: bleeding events, blood transfusions and narrowing of the communication between pseudocyst capsule and posterior wall of the stomach. After the operation, the patient was given parenteral nutrition for six days; the nasogastric tube was removed on the 6<sup>th</sup> postoperative day and oral nutrition at seventh day. An ultrasound was performed at day seven from the procedure. She accepted well the oral alimentation



Figure 7: Postoperative U.S.



Figure 9: Duct-communication with stomach.



Figure 8: Drained pseudocyst.

without pain, a tomography was performed and observed well the anastomosis and the conduct; the pseudocyst of the pancreas showed preoperatively was not observed in this study. In fact the postoperative hospital recovery period was ten days with cefotaxime and amikacin as antibiotics treatment. She had pancreatic enzyme; 55 IU/L of lipase and 45 IU/L of amylase at month of the procedure with previous of 800 IU/L of lipase and 7300 IU/L of amylase. The patient was discharged on the 11<sup>th</sup> postoperative day. A repeat CT scan before discharge revealed effective drainage of the pseudocyst. The patient was free of symptoms at 7-month follow-up (Figure 7-9).

### Discussion

The relative proportion of acute and chronic of pseudocyst varies between reports and depends on how pancreatic pseudocysts are defined and by what means they are detected. However, the incidence rates reported in the literature was 20% to 40% in adult; therefore, it is rarely in pediatric population [2,5,6]. Treatment with asparaginase for acute lymphoblastic leukemia can cause pancreatic pseudocyst formation in 1 to 18% of children with acute lymphoblastic leukemia [6,7]. Pancreatic pseudocysts represent common sequelae of acute or chronic pancreatitis and trauma [5-7]. The pathogenesis of pseudocyst formation, as in the Atlanta classification Table 1, has been proposed to understand this complication of pancreatitis [6,7]. Pancreatic

Pseudocyst develops when the main pancreatic duct or one of its radicals is disrupted, excreting pancreatic secretions into the retro peritoneum or the peri pancreatic tissue planes [5-8]. Others authors like Nealon and Walser classified pancreatic pseudocysts according to the duct anatomy and their either present or absent communication with pseudocyst cavity [1,4-8]. However, in our patient the pancreatic pseudocyst was secondary of chronic pancreatitis due to tumor and drugs therapy. Pseudocysts may be asymptomatic or may present with variety of symptoms such as pain, satiety, upper gastrointestinal bleeding, nausea and vomiting. Practically, our patient had all of those symptoms except upper gastrointestinal bleeding [4,7-9]. Spontaneous regressions of acute pancreatic pseudocysts may be observed in 30 to 60% of acute pancreatitis patients, our patient had a chronic recurrent pancreatitis [5,9,10]. Internal drainage via cysto gastrostomy and cystojejunostomy has been well established and the permanent resolution of pseudocyst has been reported in 91% to 97% of patients. However, External drainage report a failure of rate of 20 % to 30%, endoscopic drainage has a cyst resolution rate of 60% to 90%, with efficacy comparable to that of surgery [8-11]. Endoscopic drainage is associated with a high rate of technical failure, cyst recurrence, infection, bleeding, stent blockage and inadequate drainage; our patient had stent blockage and inadequate drainage by endoscopic treatment. However, surgery, a near-perfect procedure, is the mainstay in the management of the pancreatic pseudocyst, under this consideration we opted to performed a cysto gastrostomy in this patient [6-12]. The specific management of PPs in children remains controversial and ill defined. Surgical intervention has been the gold's standard of treatment [2]. A large number of patients with pseudocysts need some surgical procedure that depending on location, age, size and persistent of the cyst [4,5,12]. The first pseudocystogastrostomy was performed in 1921[2-4]. Operative internal drainage and drainage of PPs and laparoscopic management of PPs are the treatment of choice for PPs. Some PPs have a spontaneous resolution and this mechanism is unclear. The hypothesis on intra- or extra pancreatic drainage has not been proven [2,3,12,13]. However when pseudocysts are complicated, complications such as infection and the development of gastric varies from splenic vein thrombosis, recurrence of the cyst may represent relative contraindications to endoscopic and

Table 1: Atlanta Classification System.

S. No	Step or Entity	Pseudocyst Pathogenesis
1	Acute fluid collection	Occurring in acute pancreatitis and lacking a wall of granulomatous or fibrous tissue
2	Acute PPs	Formation of a cavity surrounded by fibrous or granulomatous tissue due of an acute pancreatitis or trauma
3	Chronic PPs	Arising in chronic pancreatitis and without a preceding episode of acute pancreatitis
4	Pancreatic abscess	Intra abdominal collection of pus in the proximity of the pancreas with little or no necrosis resulting from acute or chronic pancreatitis or trauma



**Table 2:** Indications for pancreatic pseudocyst (PPs) intervention.

Complicated *PPs	Symptomatic PPs	Asymptomatic PPs
Compression of large vessels	Nausea and vomiting	Pseudocyst >5-6 cm, with any (morphology and size) change for more than six weeks
Mechanic gastro-intestinal compression	Pain	Diameter >4 cm and extra pancreatic complications in patient with chronic alcoholic pancreatitis
Infected pancreatic pseudocysts	Upper gastrointestinal bleeding	Suspected malignancy: median 5-year survival rate after resection
Hemorrhage into pancreatic pseudocyst	Maturity of the cyst wall	
Rupture		
Pancreatic pleural fistulae		
Stenosis of the common bile duct due to compression		

laparoscopic. Similarly, it was equal in our patient furthermore she had cystojejunostomy drainage procedure [6,7,10,12]. However selected pseudocysts can be drained endoscopically through the stomach, duodenum or through a transpapillary approach Table 2. Some authors reported that percutaneous drainage is generally associated with worse outcomes than surgical management [8-11,14]. In our patient the pseudocyst was localized in close contact with the posterior wall of the stomach (Figure 3) even though she had one endoscopic intervention, pancreatic cystojejunostomy derivation and varies unsuccessful percutaneous drainage and two procedures of placed drainage catheter [8,9,14,15]. Many series have reported excellent outcomes with the laparoscopic procedure; therefore our patient was not a good candidate for this procedure due to her medical history [7,8,15].

## Conclusion

The paradigm in this case is when the pseudocyst is localized in both head and tail of the pancreas and it is recurrent; the correct decision is to perform an open cysto gastrostomy like it was in our patient. So, open cysto gastrostomy in recurrence pseudocyst is reported to be feasible, highly effective and safe treatment method.

## Acknowledgement

To IMSS, Patients, Ortega Rodríguez Ma Del Carmen, Yesenia Navarro Sánchez and Jean Family.

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