

# Pancreatic Pseudocyst Rupture: Cause of Acute Abdomen

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**How to cite this paper:** Cruz-González, J.I., Olmo, M.Á.M.-D., García-Ramón, B.A., Hernández-García, B., Guzmán-Priego, C.G. and Jiménez-Sastré, A. (2023) Pancreatic Pseudocyst Rupture: Cause of Acute Abdomen. *Case Reports in Clinical Medicine*, 12, 324-331.

<https://doi.org/10.4236/crcm.2023.128045>

**Received:** July 6, 2023

**Accepted:** August 22, 2023

**Published:** August 25, 2023

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## Abstract

Case report of a 23-year-old male patient with a pancreatic pseudocyst, initially was treated by the Interventional Radiology service by placing percutaneous drainage with poor evolution, abruptly presented abdominal pain, Systemic Inflammatory Response Syndrome and peritoneal irritation, so an urgent exploratory laparotomy was performed with a finding of rupture of the pancreatic pseudocyst into the abdominal cavity. He presented septic shock and died in the immediate postoperative period. Computerized Axial Tomography represents the ideal diagnostic method. Spontaneous rupture is extremely rare and requires urgent surgical intervention.

## Keywords

Rupture, Pancreatic Pseudocyst, Acute Abdomen

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## 1. Introduction

The incidence of pancreatic pseudocyst in the world is relatively low, occurring in 1.6% - 4.5% per 100,000 adults per year. The prevalence is described as 10% to 26% in acute pancreatitis and 20% to 40% in chronic pancreatitis [1]. It represents a late complication; it develops between 3 - 6 weeks after the pancreatitis [2] symptoms. The pancreatic pseudocyst is a characterized entity due to the chronic accumulation of pancreatic fluid, surrounded by a non-epithelialized wall of granulation tissue and fibrosis. The content consists of plasma, electrolytes and pancreatic enzymes [3]. 50% of pancreatic pseudocysts resolve spontaneously (without undergoing a surgical therapeutic procedure or non-surgical); its persistence develops when it has communication with the main pancreatic duct that prevents

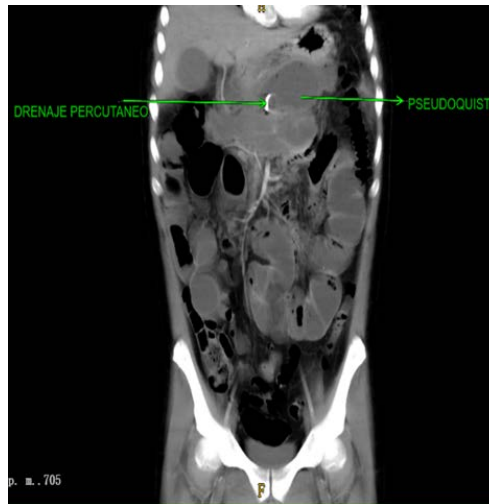
involution [4]. The diagnosis is established with computerized axial tomography (CT), which has a sensitivity of 90% - 100% and specificity of 98% - 100% [3]. CT allows to evaluate the size, thickness of the wall, septations, contiguity with organs and neighboring tissues and thus defines surgical treatment, with cystogastrostomy, cystoduodenostomy and cystojejunostomy as options, the latter being the procedure of choice. And it can be performed open or laparoscopic [1]. Spontaneous rupture of the pseudocyst occurs in less than 3% of cases [5] which it conditions a severe picture of acute abdomen, with the characteristic symptoms of peritonitis, systemic inflammatory response syndrome (SIRS) and progresses to sepsis, septic shock and death [6]. This clinical entity requires an urgent surgical approach, through exploratory laparotomy and damage control focused on the findings [7]. The objective is to demonstrate the importance of timely diagnosis and surgical approach of pancreatic pseudocyst and to identify the development of acute abdomen secondary to its perforation and the consequent sepsis and septic shock of intestinal origin.

## 2. Case Report

The patient's family authorized the publication of the case by signing an informed consent. A 23-year-old male patient, with a history of type 2 Diabetes Mellitus for one year of diagnosis on insulin therapy, systemic arterial hypertension on treatment with nifedipine, history of three idiopathic pancreatitis events (two years, one year and two months ago); with no history of alcoholism, ultrasonography and CT excluded gallbladder lithiasis, choledocholithiasis, intra or extra-hepatic bile duct dilation, as well as anatomical alterations or tumors of these structures. Blood lipids were within normal parameters; For this reason, these episodes of recurrent acute pancreatitis were treated by the Internal Medicine service. Three weeks after the resolution of the last episode of acute pancreatitis, a pancreatic pseudocyst was diagnosed, which caused a mass effect on adjacent structures, causing the patient epigastric abdominal pain, postprandial fullness, nausea, vomiting, and food regurgitation, for which he underwent percutaneous drainage in the Interventional Radiology Service (**Figure 1**). A CT scan of the abdomen is performed after the procedure, which reports the presence of a thin-walled pancreatic pseudocyst (**Figure 2**).

Due to presenting a favorable evolution after this procedure; tolerating oral feeding, evacuating, and voiding normally, with no clinical data of abdominal involvement, he was discharged 72 hours later with drainage at his home. 48 hours after being discharged from the hospital, he went to the Emergency Department for presenting abdominal pain with a focus in the epigastrium of mild intensity, gastrobiliary vomiting and generalized abdominal distension, for which an evaluation by the General Surgery service was requested. Weight 78 kg, height 183 cm, blood pressure 118/78, heart rate 78 beats per minute, respiratory rate 17 breaths per minute, poorly hydrated mucous membranes, normal patient, with a globose abdomen, presence of percutaneous drainage with low serum blood output, is documented. Decreased peristalsis, hyperresonance to percus-

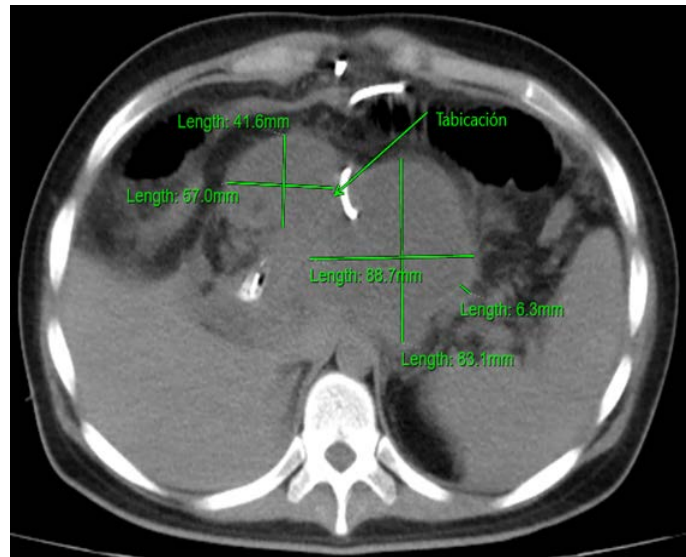
sion, and pain on palpation in the epigastrium, without peritoneal irritation, did not present acute abdominal symptoms. Laboratories reported hemoglobin of 13.4 mg/dL, hematocrit 44%, amylase 70 U/L, and lipase 64 U/L. He was admitted to the hospital where a new tomography was performed (**Figure 3** and **Figure 4**), with evidence of a pancreatic pseudocyst on the anterior face of the body of the pancreas, for which reason it was proposed to perform internal bypass surgery (open cystojejunostomy) on the patient, accepting. Since he did not have a surgical emergency at that time, preoperative risk assessments are requested, since he has multiple comorbidities, and he is scheduled for surgery.



**Figure 1.** Contrast-enhanced coronal CT scan of the abdomen defining a pancreatic pseudocyst with dimensions of 62 × 97 × 46 mm, with the presence of percutaneous drainage inside.



**Figure 2.** Contrast-enhanced CT scan of the abdomen in coronal section showing a 2.6-mm wall of the pancreatic pseudocyst, percutaneous catheter inside.

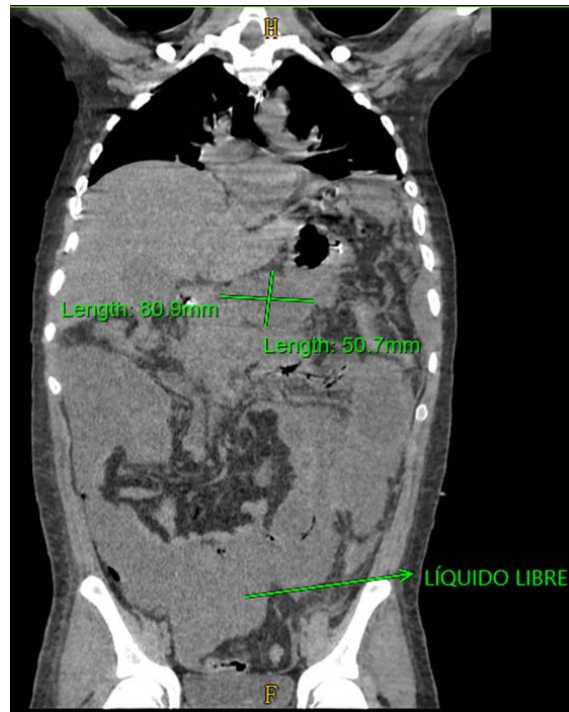


**Figure 3.** Simple coronal cut CT of the abdomen with the presence of a pancreatic pseudocyst, in the body of the pancreas, with dimensions of  $90.4 \times 54.2$  mm, wall of 4.5 mm.



**Figure 4.** Simple axial plane abdominal CT with evidence of a septate pancreatic pseudocyst, thick wall, dimensions  $83.1 \times 88.7$  mm.

12 hours before the scheduled surgery, the patient reported intense diffuse abdominal pain, on physical examination he presented abdominal distension, peritoneal irritation, and a flattened abdomen associated with SIRS. A CT scan of the abdomen was urgently performed with a finding of a pancreatic pseudocyst smaller than a previous tomography, peripancreatic fluid, and free fluid in the abdominal and pelvic cavity (**Figure 5**).



**Figure 5.** Simple coronal cut CT scan of the abdomen with evidence of a pancreatic pseudocyst measuring 80.99 mm × 50.7 mm with free fluid in the abdominal and pelvic cavity.

Due to the evident picture of acute abdomen and imaging findings, he underwent emergency exploratory laparotomy with findings of three-liter free intestinal and pancreatic fluid, ruptured pancreatic pseudocyst on the root of the mesentery, a percutaneous catheter placed inside, with walls strongly adhered to structures, adhesion to the ileum that causes perforation and necrosis of 15 cm, it is not possible to perform internal diversion or resection of the pseudocyst, so we proceed to place a Saratoga drain in the bed of the pseudocyst, resection of 40 cm of affected ileum, ileostomy of Brooke, washing and drying cavity. Secondary to presenting intestinal loops with severe edema, we opted for management with an open abdomen using a Bogotá bag and scheduling a second surgical procedure. A patient in critical condition with clear signs of septic shock is accepted and transferred from the operating room to the Intensive Care Unit with vasopressor support and an invasive mechanical ventilation regimen. He presented multiple organ failure and died 24 hours after surgery.

### 3. Discussion

Idiopathic acute pancreatitis, like the one described in the clinical case, is characterized by not finding a cause that conditions the pancreatic inflammation after a basic initial study; clinical, laboratory and imaging [7]. Pancreatic pseudocyst as a complication of this occurs more frequently in men in their fourth or fifth decade of life, [1] but as seen in the case presented, it can occur in younger people. To classify it, the D'Egidio classification was used, proposed in 1991 [8],

which is described according to the context in which it appears as a complication of an episode of acute or chronic pancreatitis, the integrity of the main pancreatic duct and its communication with the pseudocyst. Currently, there are numerous treatment options, however, the presence of symptoms must be individualized and evaluated, which are related to the mass effect on neighboring organs and include nausea, vomiting, postprandial fullness or cholestasis [9] [10]; and even compression of mediastinal structures [11]; symptoms present in the patient presented and that are criteria for percutaneous drainage, even shortly after the diagnosis of pseudocyst, as in the clinical case, in which it was performed [3] weeks after the diagnosis was established. The development of complications of the pseudocyst itself is severe, bleeding, infection, fistula, thrombosis of the adjacent vasculature may occur secondary to “digestion” of the vascular wall by pancreatic enzymes [12] and even its rupture into a blood vessel with the consequent passage of enzymes to the systemic circulation causing a picture of arthralgia and subcutaneous purpura [13]. The reports in the medical literature of the rupture are scarce and it is a catastrophic and lethal condition, so it is necessary to report this situation to avoid it, identify it and treat it immediately. There are not risk factors described to predict it.

The rupture of the pancreatic pseudocyst into the abdominal cavity presents an abrupt picture of acute abdomen in which the cardinal symptom is abdominal pain, associated with SIRS [5] [14], a clinical picture documented in the case Agalianos *et al.* [15] wrote a review article in which they described the classification, diagnostic and treatment tools of the pancreatic pseudocyst. After searching the most recent medical literature on the subject, they describe observation as the first step of treatment, and if there is no spontaneous involution of the pseudocyst or symptoms that affect quality of life present, the patient is a candidate for interventional techniques. such as ultrasound or CT-guided percutaneous drainage, concluding that it is an excellent option in elderly patients, with multiple comorbidities, infected pseudocyst and patients who cannot tolerate open surgery or endoscopic procedure, in addition to those presenting immature pseudocyst with wall thickness < 4 mm confirmed by CT; that contraindicate internal shunting [15] [16], conditions that were present in the patient in the case reported (comorbidities, symptoms associated with the mass effect of the pseudocyst and wall of <4 mm), for which percutaneous drainage was the first treatment step.

#### **4. Conclusion**

Current treatment options for pancreatic pseudocyst are diverse. These must be always individualized in the context of the status of each patient, the symptoms, imaging assessment of the pseudocyst: size, wall thickness, septations, contiguity with organs and tissues, and choosing the ideal moment to perform surgical treatment. In the case reported, it was documented that the diagnostic and therapeutic approach was carried out in accordance with the recommendations of

the most up-to-date medical literature. Percutaneous drainage was performed early (3 weeks after diagnosis), due to symptoms caused by the mass effect of the pseudocyst, however the resolution of the pseudocyst was not achieved and the symptoms increased, at the same time it was documented by CT with a thick enough wall > 4 mm to perform internal bypass. It was decided to schedule surgery, however, unexpectedly and unusually, spontaneous rupture into the abdominal cavity occurred, causing a catastrophic clinical picture of acute abdomen and septic shock that culminated in the death of the patient despite performing emergency laparotomy.

## Acknowledgements

We thank the Social Security Institute of the State of Tabasco for the facilities granted to carry out this study.

## Conflicts of Interest

There is no conflict of interest to carry out this study.

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