

# Laparoscopic treatment of intrasplenic pancreatic pseudocyst

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**Abstract.** – **INTRODUCTION:** Pseudocyst formation commonly follows pancreatitis, but erosion into the spleen is rare and potentially life threatening. We report a case of an intrasplenic pancreatic pseudocyst treated laparoscopically with distal pancreatectomy and splenectomy.

**METHODS:** A 50 year old male with a history of chronic alcoholic pancreatitis, presented with abdominal pain for 3 months, worsening over the past several days. A CT scan showed a broad 9 cm subcapsular fluid collection suspicious for an intra-splenic pseudocyst. The patient underwent laparoscopic distal pancreatectomy and splenectomy.

**RESULTS:** There were no intraoperative complications and the patient was discharged on day 8. The final pathology revealed a benign cystic lesion measuring 9 x 6 x 3 cm that was not communicating with the pancreatic duct, and 2 smaller pseudocysts in the pancreatic body and tail. A previous scan did not reveal any abnormalities in the spleen, and showed the other pancreatic pseudocysts. At 8 month follow up the patients was symptom free, with no new pseudocysts.

**CONCLUSIONS:** Splenic parenchyma involvement is an unusual complication of pancreatic pseudocyst. The optimal treatment is controversial. Percutaneous drainage carries a high recurrence rate and risk of hemorrhage. Open surgery is effective, but associated with significant morbidity. Laparoscopy offers an effective method of treatment without the potential complication of a large abdominal incision.

*Key Words:*

Pancreatic pseudocysts (PC), Spleen.

ondary to acute pancreatitis, and 41.8% after chronic pancreatitis<sup>1</sup>. The location can be throughout the pancreas, with the majority involving the head and body, but 20% of them are extrapancreatic (pleura, mediastinum, pelvis and spleen). The location of a pseudocyst in the liver is an exceptional event. In fact, only thirty-three cases are reported in the literature<sup>2</sup>. Similarly, most of the splenic cystic lesions are true cysts and only rarely pseudocysts<sup>3</sup>. We describe here the rare case of a pancreatic pseudocyst located within the splenic capsule treated by laparoscopic resection.

## Case Report

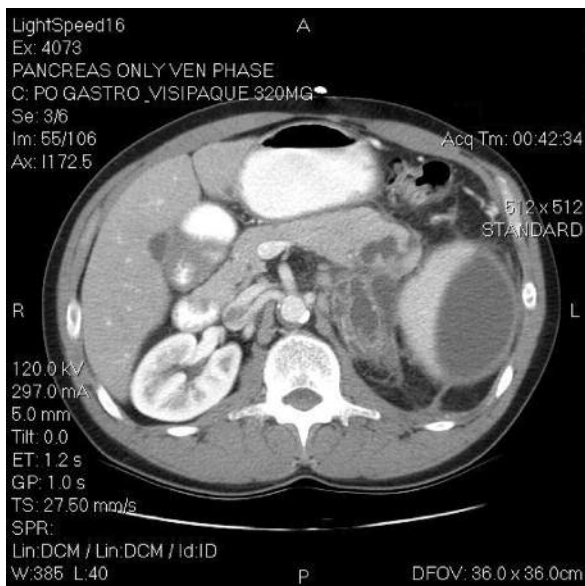
A 50 year old African American male with a past medical history significant for chronic alcohol induced pancreatitis presented to the Emergency Department with a 3 month history complaint of abdominal pain that has been worsening over the past several days. The patient's history is significant for multiple episodes of hospitalizations for acute pancreatitis as well as a known history of a 2.2 cm splenic pseudoaneurysm, which remained unchanged in size over the past year.

On physical exam he presented with some tenderness and fullness of the left upper quadrant. Laboratory findings from a satellite clinic, 3 days prior to admission demonstrated an elevated amylase (495 U/L) and lipase (583 U/L) level. The patient was afebrile, but tolerant of regular diet, and denied any episodes of emesis. However, he complained of a chronic left sided abdominal pain radiating to his back lasting for hours at a time.

The patient was admitted to the hospital and underwent a CT scan which revealed replacement of the spleen by a very large subcapsular fluid collection suspicious for an intra-splenic pseudocyst (Figure 1). The patient was optimized

## Introduction

Pancreatic pseudocysts (PC) are reported in the literature with an incidence of 14.6% when sec-



**Figure 1.** CT scan with large cystic lesion within the spleen and smaller pseudocysts at the tail of the pancreas.

for definitive surgical management via laparoscopic splenectomy and distal pancreatectomy.

After placement in a modified right lateral decubitus position, the abdomen was accessed using an open Hasson technique. Accessory 12 and 5 mm ports were placed along the left subcostal area. Upon laparoscopic exploration of the abdominal cavity, it was noted that the cyst was severely adhered to the surrounding structures including the stomach. During dissection of the pseudocyst a cystotomy was made and over a liter of fluid was aspirated and sent for culture. It became evident at this time that there were two capsules involved in the process, the outer presumably the splenic capsule and the inner pseudocyst capsule. Samples of these specimens were sent for frozen section and found to be negative for malignancy. Once the spleen was completely mobilized from its attachments, the distal pancreatectomy was performed using a 60 mm load of the linear stapler. In order to separate the specimen from the stomach, a gastrotomy was made. An intraoperative upper endoscopy then was performed to evaluate the gastorrhaphy. Finally a closed suction drain was placed in the operative field.

The final pathology revealed a benign cystic lesion measuring 9 x 6 x 3 cm in size which was not in communication with the pancreatic duct, and two smaller pseudocysts in the pancreatic body and tail (Figure 2). Its internal surface re-

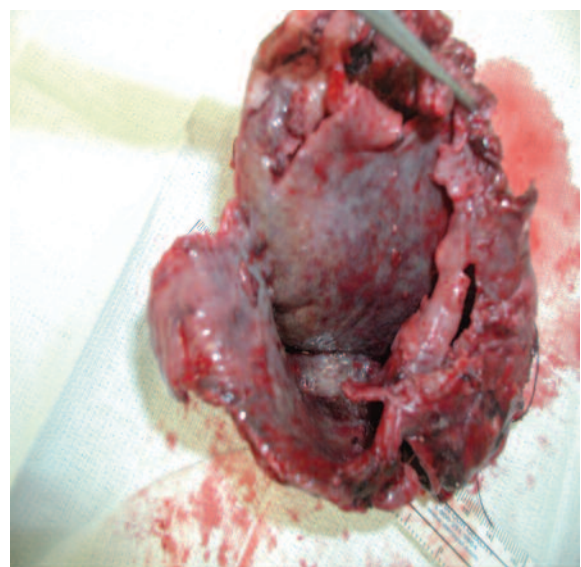
vealed a fibrotic wall lacking epithelium but lined by granulation tissue with fibrinous exudates. The gastric wall was negative for malignancy but had evidence of mild chronic inflammation. The remaining specimen revealed areas of chronic pancreatitis and splenic atrophy.

There were no intraoperative complications. The patient was initially admitted to the intensive care unit for delirium tremens and then discharged on post-operative day 8 with the drain in place secondary to an elevated amylase in the drainage output (Figure 3). The drain was removed in clinic two weeks later and post-splenectomy vaccinations were given.

At 8 month follow up the patients was symptom free, with no new pseudocysts.

## Discussion

A pseudocyst can be defined as a chronic collection of pancreatic fluid surrounded by a non-epithelialized wall of granulation tissue and fibrosis<sup>4</sup>. The etiology in the majority of the cases is related to acute and chronic pancreatitis, mostly from gallstone disease and alcoholism. They can present as an epigastric mass with pain, mild fever, leukocytosis, persistent serum amylase elevation, and a pancreatic cyst demonstrated by ultrasound or CT scan. Their pathogenesis involves extravasation of pancreatic juices and glandular necrosis of sterile pockets that form as inflamma-



**Figure 2.** Pseudocyst within the capsule of the spleen.



**Figure 3.** Trocar site with specimen extraction site.

tion subsides. A pancreatic abscess ensues when these type of collections become infected. Prompt management is warranted in this event.

Cysts of the spleen can be parasitic or non-parasitic in origin. Non-parasitic cysts (NPC) include pseudocysts, dermoid, epidermoid, and endothelial types. NPC are thought to be of congenital origin, and not from trauma as once thought<sup>5</sup>. These patients can be asymptomatic or can present with left upper quadrant discomfort or pain, a feeling of fullness, or uncommonly with left shoulder pain. Patients with both NPC and parasitic cysts are typically treated with a total splenectomy; however, splenic salvages are also used to preserve the physiological immune function of the spleen<sup>4</sup>.

Larger size and ectopic locations of pseudocysts require ruling out malignancies. In fact, there are rare tumors of the spleen that can also be considered in the differential diagnosis of splenic lesions. These include lymphoma, sarcoma, hemangioma, and hamartoma. Also, in advanced cancers, the spleen is a common site for metastases (such as lung and breast)<sup>4</sup>. Cyst fluid analysis for tumor markers in the form of CEA, CA125, relative viscosity and cystology can help to differentiate malignant cystic tumors and potentially premalignant mucinous cystic neoplasms from pseudocysts and serous cystadenomas<sup>4</sup>.

Classically the initial treatment of pseudocysts is observation, as they usually resolve spontaneously in 50% of the cases in approximately 6 weeks<sup>5</sup>. If the pseudocysts persists, enlarges, or

becomes symptomatic further therapy should be sought. In addition, up to 80% of the pseudocysts communicate with the pancreatic ducts. Thus external drainage can give rise to a pancreaticocutaneous fistula<sup>6</sup>. Besides the above mentioned complication, percutaneous drainage, the least invasive of the procedures, is associated with a failure rate of more than 30%<sup>7</sup>.

In alternative, internal drainage by endoscopic or surgical methods have been described in the literature. Shyam and et al. recently published the results of a trial where they randomized 40 patients to either endoscopic or surgical cystogastrostomy, and followed them for 24 months<sup>8</sup>. In the study, one patient in the surgical arm presented a pseudocyst recurrence, compared to no recurrences in the endoscopic arm, however this was not statistically different<sup>8</sup>.

The location of the pseudocyst dictates the proposed form of treatment. Unusual locations of pancreatic pseudocyst have been described in the renal parenchyma by Singh et al, and in the left lobe of the liver by Mofredj and et al<sup>9-10</sup>. Intrasplenic pancreatic pseudocysts are extremely rare in the literature and in fact, it has been described 6% of the cases<sup>3</sup>. It is usually due to erosion of pancreatic tail pseudocysts into the splenic hilum. The approach to treatment includes observation, percutaneous drainage or surgical excision. Although spontaneous resolution has been reported, intervention is usually indicated due to the potential for massive hemorrhage. Percutaneous drainage and laparoscopic fenestration have a high incidence of recurrence. Open distal pancreatectomy could lead to up to 25% incidence of complications. Laparoscopic pancreatic resection has been described as a safe alternative to the open approach. In one study Machado et al described no mortalities, however there was a significant morbidity due to pancreatic fistula (28.1%)<sup>11</sup>. However another study concluded that the laparoscopic approach offers advantages over open surgery with lower operative morbidity, higher spleen preservation rate, and shorter hospital stay. The benefits were especially noticed in patients with benign disease and borderline malignancy<sup>12</sup>. Also the safety profile of laparoscopic splenectomy has been widely demonstrated. Marte et al. described a conversion to laparotomy rate of 4.16%, secondarily to uncontrollable bleeding and splenomegaly<sup>13</sup>. In the same study, the postoperative morbidity rate was 8.8% for those with benign disease and 35.7% for those with malignant disease<sup>13,14</sup>.

In our case, we elected to proceed with surgical intervention over conservative methods given the persistence of symptoms, and also the large size of the pseudocyst. Percutaneous drainage could have had a higher risk of hemorrhage and also would have likely resulted in a recurrence. Given the rarity of intrasplenic pseudocyst, performing a prospective study to delineate the best treatment strategy would be challenging, even if beneficial.

### Conclusions

Although pancreatic pseudocysts are relatively frequent, their extension into the supracapsular portion of the spleen is very uncommon. Symptomatic cases should be treated with surgical resection because of the potential for splenic bleeding if other percutaneous or endoscopic methods are employed. The laparoscopic approach seems feasible and safe.

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### Conflict of Interest

The Authors declare that they have no conflict of interests.

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