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**Case Report**

# Laparoendoscopic Cystogastric Bypass of a Pancreatic Necrosis: Case Report and Surgical Technique

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**Abstract:** The incidence of acute pancreatitis (AP) is increasing, up to 0.7 hospitalizations per 1,000 inhabitants in the U.S. In 80% of patients, AP is mild and self-limited, but up to 20% of patients may have a severe necrotizing course, responsible for substantial morbidity and a mortality rate of up to 27%. The main cause of death is necrosis infection, which is associated with a poor prognosis with a mortality of 15% to 39%. Until very recently, the gold standard for treating infected necrosis used to be surgical necrosectomy by laparotomy. This procedure provides wide access to infected necrosis but is highly invasive and is associated with morbidity rates of 34% to 95% and mortality rates of 11% to 39%. Alternative methods primarily involve debridement using retroperitoneal, laparoscopic, endoscopic, or combinations of these. They share the common goal of avoiding laparotomy and together are known as "minimally invasive necrosectomy." These techniques continue to evolve and undergo refinement. To date there is no evidence or randomized trials comparing these techniques with traditional "open" necrosectomy or, equally important, comparing different minimally invasive necrosectomy techniques with each other. This presents a problem for surgeons dealing with patients with pancreatic necrosis as they need to consult the available evidence to guide the selection of their treatment. This case provides a concise but general description of a minimally invasive approach to a pancreatic pseudocyst in a man with a history of alcoholic pancreatitis, with special reference to the surgical technique, the postoperative result and, above all, to point out the benefits of this type of approach.

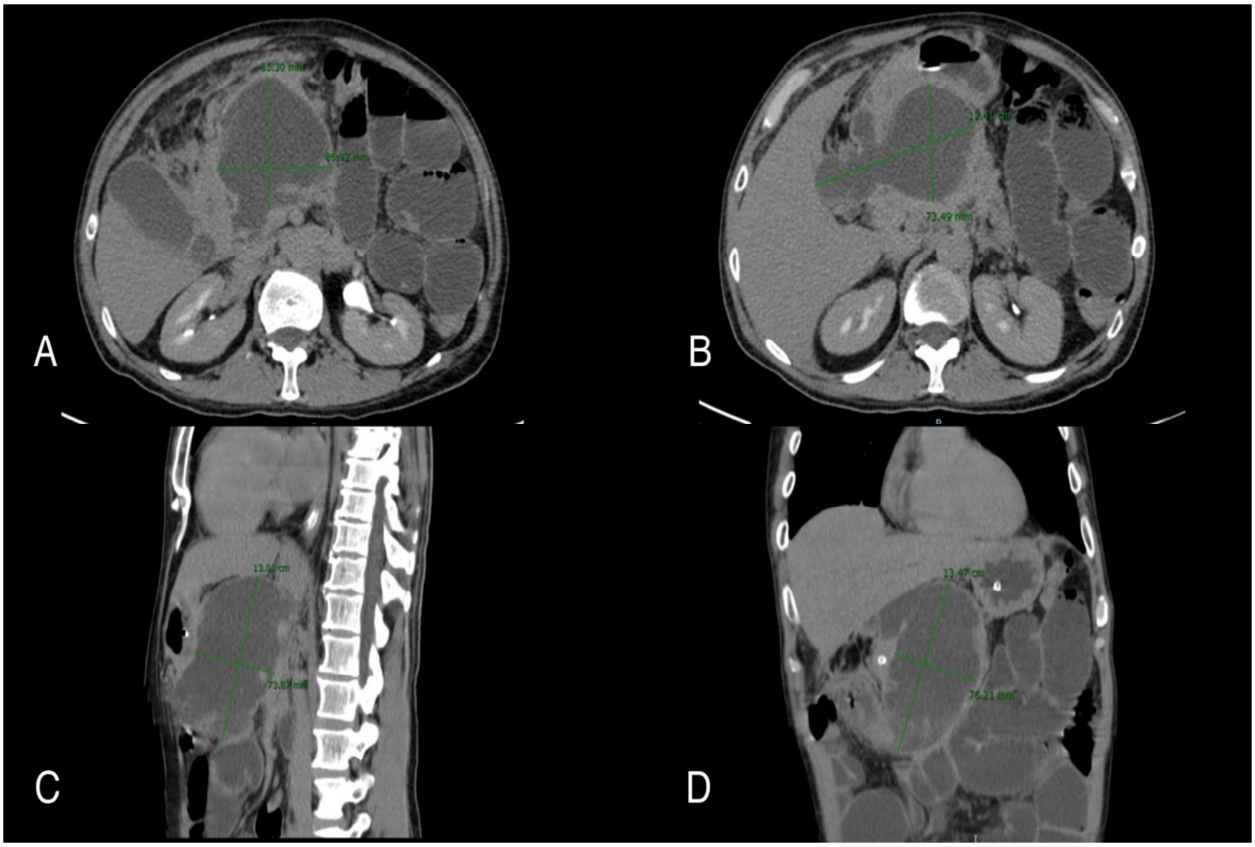
**Keywords:** Pancreatitis, Cystogastric Bypass, Minimally Invasive

# 1. Introduction

In the advent of minimally invasive surgical procedures, the least impact on the patient has been sought, with these methods being the treatment of choice in various pathologies, as in this case of drainage of pancreatic collections [1]. Historically, various terms have been used to describe fluid accumulations around and within the pancreas, depending on their chronicity and characteristics, dividing them into 4 groups: acute peripancreatic fluid collections, necrotic fluid collections, pancreatic pseudocyst, and walled off necrosis (WON). Pancreatic necrosis with collection formation is susceptible to infection, being a challenge due to the morbidity that is added when draining them openly. Recently, the percutaneous and endoscopic approaches have gained great popularity due to their minimally invasive nature [2-4], however, the laparoscopic technique has shown good therapeutic results and greater benefits to the patient, such as shorter hospital stay and shorter recovery time [5-8]. This case provides a concise but general description of a minimally invasive approach to a pancreatic pseudocyst with special reference to the surgical technique, the postoperative result and, above all, to point out the benefits of this type of approach.

# 2. Case Presentation

A 48-year-old male patient with a history of smoking (smoking rate = 23), heavy alcoholism, marijuana use, hepatitis C, and a history of 2 events of mild acute pancreatitis of alcoholic origin resolved without apparent complications. Two and a half months later, he went to the emergency room of the Centenario Hospital Miguel Hidalgo in Aguascalientes, Mexico due to abdominal pain, hyporexia, nausea and vomiting of two days of evolution, finding on physical examination pain and increased volume on palpation at the epigastric level located in deep planes, without data of peritoneal irritation, the diagnostic protocol is completed, documenting moderately severe acute alcoholic pancreatitis. Computerized axial tomography (CT scan) with evidence of hypodense and irregular image of 13.47 x 12.41 x 8.53 cm, defined wall and heterogeneous content corresponding to a pancreatic pseudocyst of 746 ml volume (Figure 1). It begins with support management until remission of acute pancreatitis, later, laparoendoscopic cystogastric bypass is performed (Figure 2), with findings of a pancreatic pseudocyst with septate necrotic content, which displaces the stomach, obtaining a total of 700 ml of cloudy fluid and debris. (Figure 3). A triple-lumen nasojejunal tube was placed for immediate enteral feeding and gastric decompression. The patient was discharged from our service in 2 days, with a nasojejunal tube and outpatient control, retiring 3 weeks after the surgical event, adequately tolerating the oral route.




A and B: axial section. C: sagittal section. D: coronal section.

***Figure 1.*** *Computed axial tomography.*

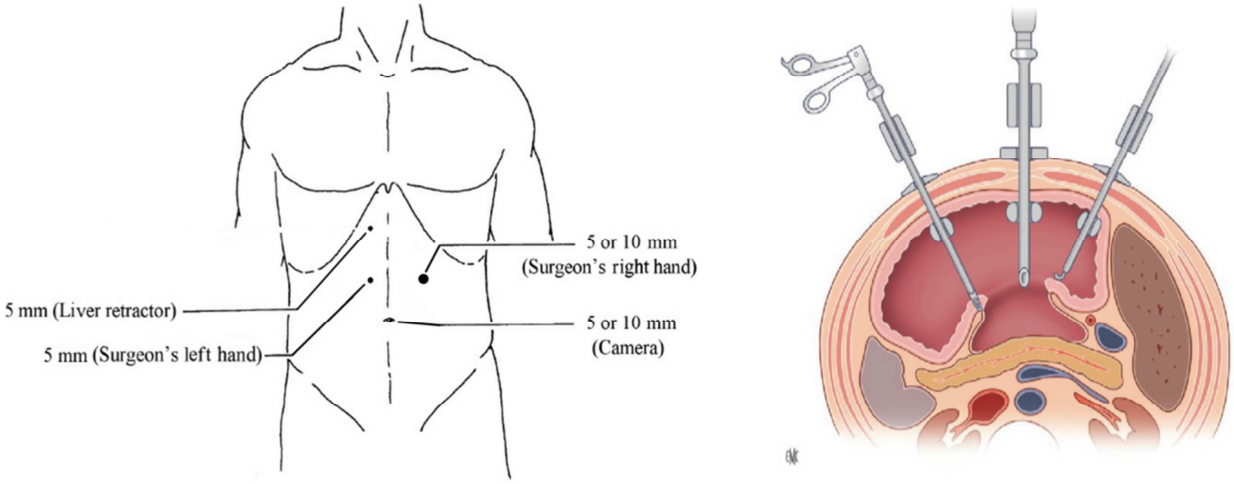



***Figure 2.*** *Schematic showing the location of the ports and the approach to the dissection.*

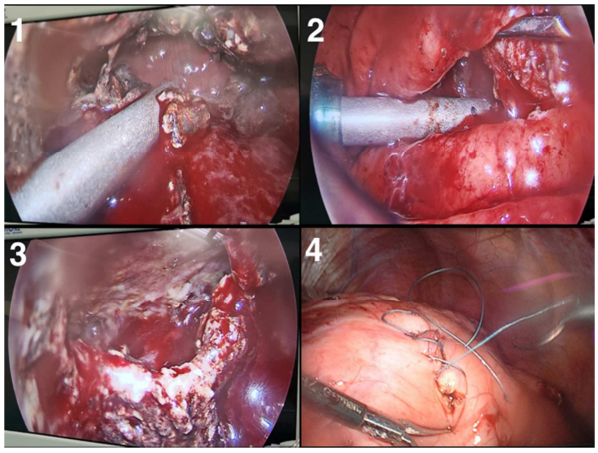



***Figure 3.*** *Drainage sequence.*

1: Opening towards a pseudocyst in the posterior wall of the stomach.
2: Debridement of pancreatic necrosis.
3: Cavity drained.
4: Closure of the stomach wall in 2 planes.

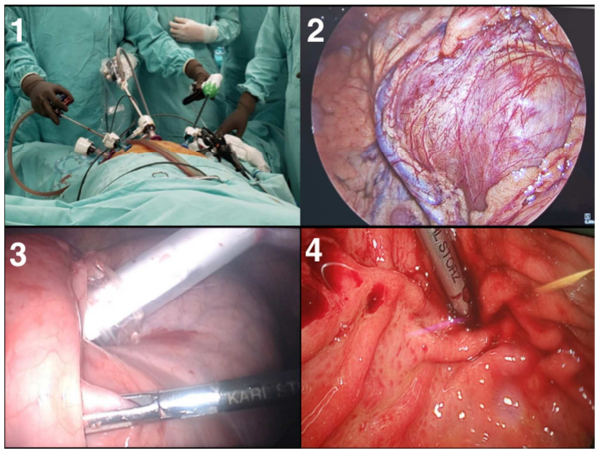



***Figure 4.*** *Initial approach.*

1: Use of 3 trocars of 5 mm and one of 10 mm (optical).
2: Stomach increased in volume due to extrinsic compression of the pseudocyst.
3: Gastrotomy and introduction of trocar to the stomach.
4: Identification of the most turgid area.

## 3. Discussion

The surgical treatment of severe acute pancreatitis has evolved significantly in the last two decades with the advent of minimally invasive surgery [4]. There are several therapeutic options for its resolution: percutaneous drainage, endoscopic management; either transpapillary or transmural, the laparoscopic and open technique [5, 7, 8].

The main indication for drainage is the persistence of symptoms (food intolerance, persistent discomfort, poor quality of life, and/or continuous pain), infection or other complications. In our case, the patient presented intolerance to the oral route as well as symptoms persistent. Given the weight of the literature over the last 3 decades, it is clear that surgery delayed for up to 4 weeks has been shown to be safer and more advantageous with respect to almost all measurable outcomes [9-13].

The standard treatment consists of open necrosectomy to completely remove the affected tissue [10]. However, this "gold standard" approach is associated with significant morbidity, particularly high rates of pancreatic fistulas (40%), enteric fistulas (20%), and incisional hernias (25%), as well as mortality rates that they range between (11 to 39%) coupled with the risk of long-term pancreatic insufficiency [9, 14, 15].

Thus, we are facing the rise of minimally invasive surgery [5]. It has recently been shown that a combination of different approaches could significantly optimize clinical management in critically ill patients affected by complicated necrotizing pancreatitis [13, 14]. Recent literature supports that minimally invasive approaches are associated with better outcomes than early open necrosectomy [13].

Surgical transgastric necrosectomy (STN) is a procedure with limited discussion [12]. The retrospective study by Driedger et al [12] represents the largest experience of SNT within the current literature, in which a series of 178 patients in 3 hospital centers was exposed and it was concluded that STN is an excellent one-step surgical option for sintomatic pancreatic walled off necrosis as it limits the risk of potentially inappropriate pancreatic debridement and

subsequent occurrence pancreatico-cutaneous fistula after traditional necrosectomy [12, 15].

Tan et al [4], a retrospective study that was the first comparison between endoscopic and open surgical treatment of infected pancreatic necrosis, showed that the complication rate, estimated blood loss, and mean postoperative hospital stay were significantly higher in the open approach group; although the mean operative time was greater in endoscopic.

## 4. Surgical Technique

In the present case, the surgical plan consisted of a laparoscopic procedure with an endoscopic variant, performing internal drainage and transgastric pancreatic necrosectomy (Figure 2): a 10-mm transumbilical optical trocar was placed under the Hasson technique, pneumoperitoneum at 12 mmHg and 2 left and right pararectal working ports of 5 mm above the navel and at the intersection with the midclavicular line. If the left lobe of the liver is very prominent, a 5 mm trocar can be used in the epigastric region with a liver retractor (Figure 2). Gastrotomies were performed on the anterior face for the introduction of transgastric trocars, insufflation of the gastric chamber with $CO_2$ for endoscopic vision, a 6 cm posterior gastrotomy at the site of contact with the pancreatic cyst for the performance of cystogastric bypass, curettage and aspiration of the cystic cavity were performed to removal of necrotic tissue and debris. At the end, trocars were removed to the peritoneal cavity for gastrorrhaphy with absorbable multifilament suture 2-0 cross stitches (Figures 3 and 4), a soft and flexible drainage tube is placed towards the surgical bed, and trocars were removed for subsequent closure of the abdominal wall as usual.

## 5. Conclusion

Currently, minimally invasive procedures are the gold standard for the treatment of pancreatic pseudocysts and associated necrosis, given the low rate of complications, lower incidence of pancreatic fistula, and no contamination of the peritoneal cavity, thus reducing associated morbidity, shorter hospital stay and a favorable evolution with rapid incorporation into the routine activities of each patient.

## Conflicts of Interest

The authors of this research declare that they have no conflicts of interest.

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