

Laparoendoscopic cystogastric bypass of pancreatic necrosis. A case report

Derivación cistogástrica laparoendoscópica de una necrosis pancreática. Reporte de caso

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Keywords:

pancreatitis,
cystogastric bypass,
minimally invasive.

Palabras clave:

pancreatitis,
derivación
cistogástrica, mínima
invasión.

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ABSTRACT

The incidence of acute pancreatitis (AP) is increasing by up to 0.7 hospitalizations per 1,000 population in the U.S. In 80% of patients, AP is mild and self-limited, but up to 20% may present with a severe necrotizing course, responsible for substantial morbidity and a mortality rate of up to 27%. The leading cause of death is necrotizing infection, associated with a poor prognosis and a 15-39% mortality. Until recently, the gold standard for treating infected necrosis was surgical necrosectomy by laparotomy. This procedure provides broad access to infected necrosis but is highly invasive and is associated with morbidity rates of 34 to 95% and a mortality of 11 to 39%. Alternative methods primarily involve debridement by retroperitoneal, laparoscopic, endoscopic, or combinations of these approaches. They share the common goal of avoiding laparotomy and are collectively called “minimally invasive necrosectomy”. These techniques continue to evolve and undergo refinement. To date, no evidence or randomized trials comparing these techniques with traditional “open” necrosectomy or, equally importantly, comparing the different minimally invasive necrosectomy techniques with each other. These options present a problem for surgeons treating patients with pancreatic necrosis, as they need to consult the available evidence to guide their treatment selection. This case provides a general but concise description of a minimally invasive approach with reference to technique and outcome.

RESUMEN

La incidencia de pancreatitis aguda (PA) está aumentando hasta en 0.7 hospitalizaciones por cada 1,000 habitantes en los EE. UU. En 80% de los pacientes, la PA es leve y autolimitada, pero hasta 20% de los pacientes puede presentar un curso necrotizante grave, responsable de una morbilidad sustancial y una tasa de mortalidad de hasta 27%. La principal causa de muerte es la infección de la necrosis, que se asocia con un mal pronóstico con una mortalidad de 15 a 39%. Hasta hace muy poco el estándar de oro para el tratamiento de la necrosis infectada solía ser la necrosectomía quirúrgica mediante laparotomía. Este procedimiento proporciona un acceso amplio a la necrosis infectada, pero es muy invasivo y se asocia con tasas de morbilidad de 34 a 95% y una mortalidad de 11 a 39%. Los métodos alternativos implican principalmente el desbridamiento mediante abordajes retroperitoneales, laparoscópicos, endoscópicos o combinaciones de éstos. Comparten el objetivo común de evitar la laparotomía y en conjunto se conocen como “necrosectomía por mínima invasión”. Estas técnicas continúan evolucionando y sometiéndose a refinamiento. Hasta la fecha no hay pruebas o ensayos aleatorizados que comparen estas técnicas con la necrosectomía “abierta” tradicional o, lo que es igualmente importante, que comparen las diferentes técnicas de necrosectomía por mínima invasión entre sí. Esto representa un problema para los cirujanos que tratan a pacientes con necrosis pancreática, ya que necesitan consultar la evidencia disponible para guiar la selección de su tratamiento. Este caso proporciona una descripción general, pero concisa de un abordaje por mínima invasión con especial referencia en la técnica y el resultado.



How to cite: Carrillo LM, Barba-Valadez CT, Ramírez-Reyes D, Mora-Montoya CE, Rodríguez-Osuna JA, Chávez-Fernández DA. Laparoendoscopic cystogastric bypass of pancreatic necrosis. A case report. *Cir Gen.* 2022; 44 (3): 131-135. <https://dx.doi.org/10.35366/109773>

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Received: 07/21/2021
Accepted: 12/23/2022

INTRODUCTION

With the emergence of minimally invasive surgical procedures, the aim has been to minimize the impact on the patient, these methods being the treatment of choice in various pathologies, as in this case, the drainage of pancreatic collections. Historically, several terms have been used to describe fluid accumulations around and inside the pancreas; depending on their chronicity and characteristics, they are divided into four groups: acute peripancreatic fluid collections, necrotic fluid collections, pancreatic pseudocyst and walled-off pancreatic necrosis (WON). Pancreatic necrosis with collection formation is susceptible to infection, making it challenging due to the added morbidity of open drainage. Recently the percutaneous and endoscopic approaches have gained tremendous popularity due to their minimally invasive nature;^{1,2} however, the laparoscopic technique has demonstrated good therapeutic results and

more significant benefits to the patient, such as shorter hospital stay and less recovery time.²

PRESENTATION OF THE CASE

A 48-year-old male patient with a history of smoking (TI of 23), intense alcoholism, marijuana use, hepatitis C, and a history of two events of mild acute pancreatitis of alcoholic origin resolved without apparent complications. Two and a half months later, he came to the emergency department for abdominal pain, presenting hyporexia, nausea, and vomiting after two days of evolution, finding on physical examination pain and increased volume on palpation at the epigastric level located at deep planes, with no evidence of peritoneal irritation. The diagnostic protocol was completed documenting moderately severe acute alcoholic pancreatitis. A computed axial tomography (CT) scan showed evidence of hypodense and irregular image measuring $13.47 \times 12.41 \times 8.53$ cm, with a defined

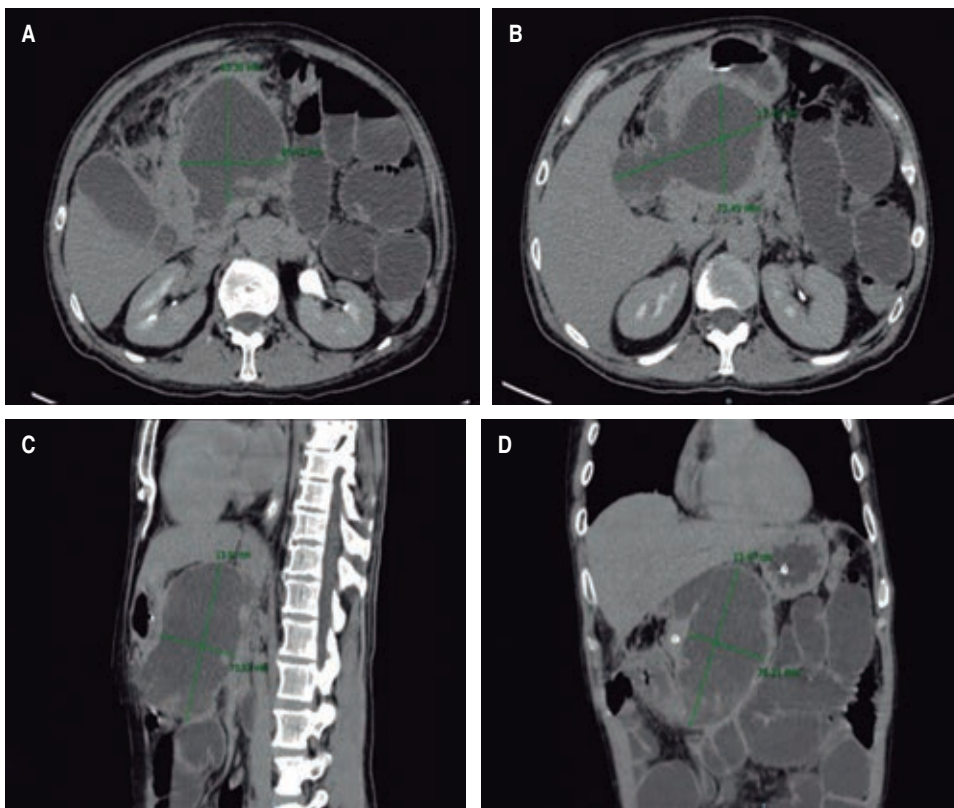


Figure 1:

Computerized axial tomography scan. A and B) Axial section. C) Sagittal section. D) Coronal section.

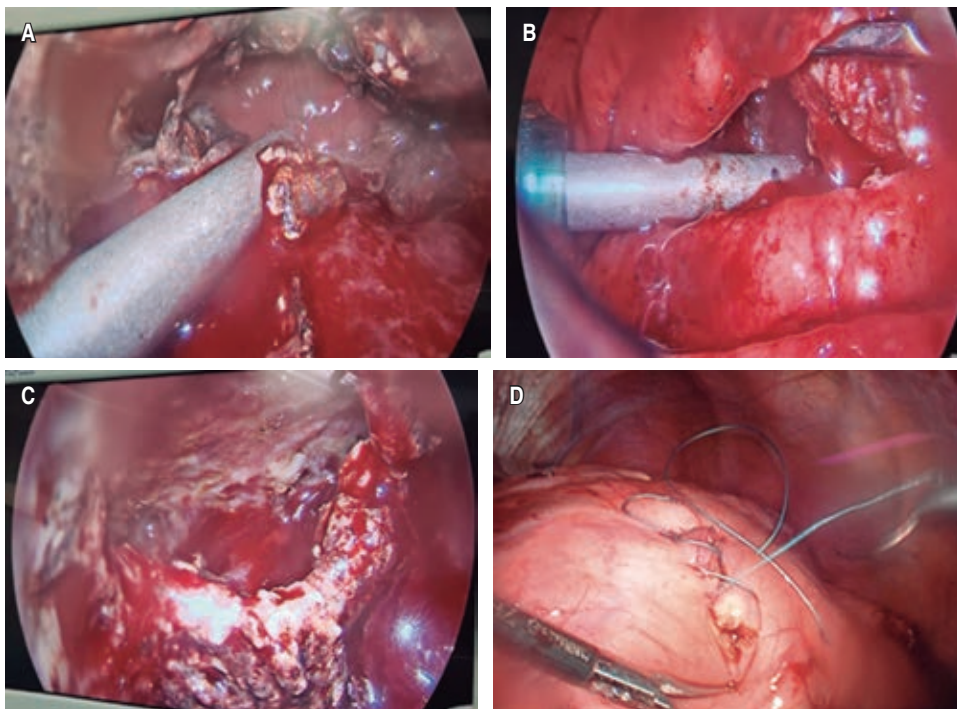


Figure 2:

Drainage sequence. A) Opening towards the pseudocyst in the posterior wall of the stomach. B) Debridement of pancreatic necrosis. C) Drained cavity. D) Closure of the stomach wall in two planes.

wall and heterogeneous content corresponding to a pancreatic pseudocyst of 746 ml of volume (Figure 1). He started with supportive management until the remission of acute pancreatitis. Laparoendoscopic cystogastric bypass was performed, with findings of a pancreatic pseudocyst with septated necrotic content, which displaced the stomach, obtaining a total of 700 mL of cloudy liquid and detritus (Figure 2). A triple lumen nasojejunal tube was placed for immediate enteral feeding and gastric decompression. The patient was discharged in two days from the General Surgery Service of the Centenario Hospital “Miguel Hidalgo” with a nasojejunal tube and outpatient control, which was removed three weeks after the surgical event, adequately tolerating the oral route.

DISCUSSION

Surgical treatment of severe acute pancreatitis has evolved significantly in the last two decades with the emergence of minimally invasive surgery.³ For its resolution, there are several therapeutic options: percutaneous drainage, endoscopic management, either

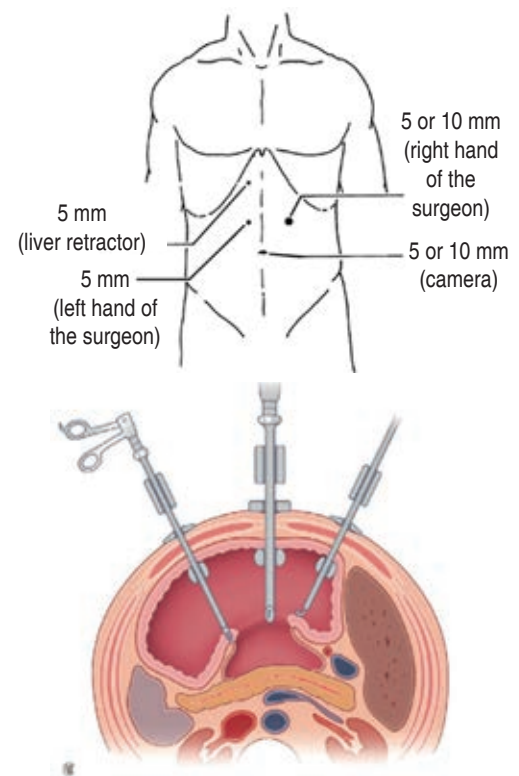


Figure 3: Schematic drawing showing port locations and dissection approach.

transpapillary or transmural, laparoscopic, and open technique.^{2,4,5}

The main indication for drainage is persistent symptomatology (food intolerance, persistent discomfort, poor quality of life, and continuous pain), infection, or other complications. In our case, the patient presented with oral intolerance and persistent symptomatology. Given the weight of literature over the past three decades, it is clear that deferred surgical intervention of up to four weeks has proven to be safer and advantageous concerning almost all measurable outcomes.⁶⁻¹⁰

The standard treatment consists of an open necrosectomy to remove the affected tissue completely.⁷ However, this “gold standard” approach is associated with significant morbidity, especially high rates of pancreatic fistulas (40%), enteric fistulas (20%), and incisional hernias (25%), as well as mortality rates ranging from 11-39%, coupled with the risk of long-term pancreatic insufficiency.^{6,11,12}

Thus, we are facing the rise of minimally invasive surgery;⁴ it has recently been shown that combining different approaches could significantly optimize clinical management in critically ill patients affected by complicated

necrotizing pancreatitis.^{10,11} Recent literature supports that minimally invasive approaches are associated with better outcomes than early open necrosectomy.¹⁰

Surgical transgastric necrosectomy (TGN) is a procedure with little discussion.⁹ The retrospective study by Driedger et al.⁹ represents the most extensive experience of TGN within the current literature, which exposed a series of 178 patients at three hospital centers and concluded that TGN is an excellent one-step surgical option for symptomatic walled pancreatic necrosis, as it limits the risk of possibly inadequate pancreatic debridement and subsequent occurrence of a pancreatic-cutaneous fistula after traditional necrosectomy.^{9,12}

Tan et al.³, in a retrospective study, which was the first comparison between the laparoscopic and open surgical treatment of infected pancreatic necrosis, showed that the complication rate, estimated blood loss, and mean postoperative hospital stay was significantly higher in the open approach group. However, the mean operative time was longer in laparoscopy.³

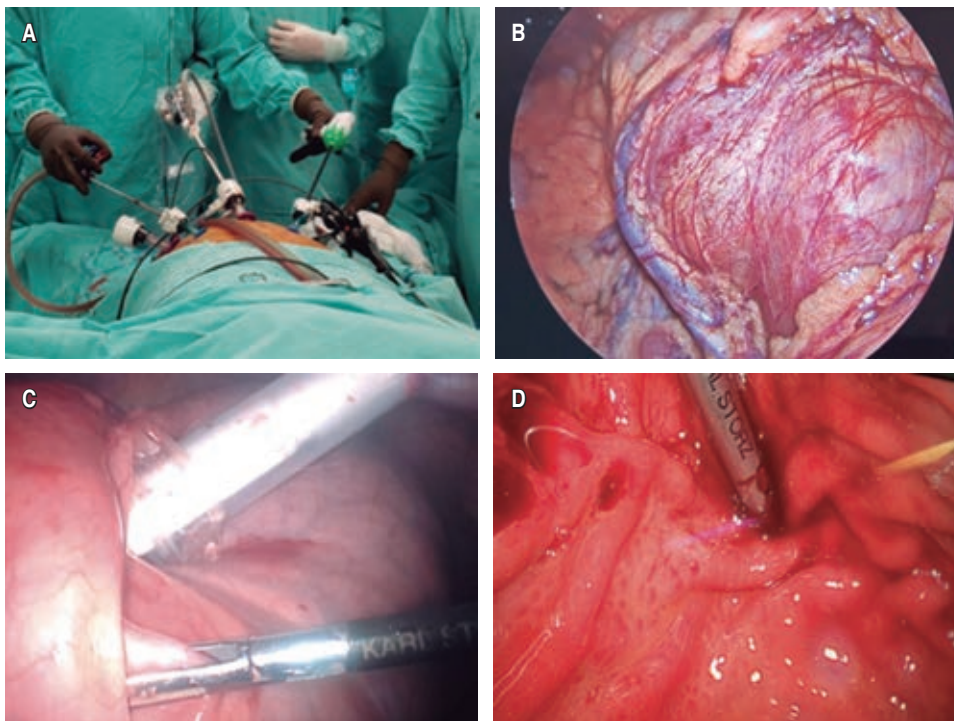


Figure 4:

Initial approach. A) Use three 5 mm and one 10 mm trocars (optical). B) Increased stomach volume due to extrinsic compression of the pseudocyst. C) Gastrotomy and introduction of the trocar to the stomach. D) Identification of the most swollen area.

Surgical technique

In the present case, the surgical plan consisted of a laparoscopic procedure with an endoscopic variant, internal drainage, and transgastric pancreatic necrosectomy (*Figure 3*): a 10 mm transumbilical optical trocar was placed under the Hasson technique, followed by a pneumoperitoneum at 12 mmHg and two working ports in the subcostal region: right 10 mm and left 5 mm. If the left lobe of the liver is very prominent, a 5 mm trocar can be used in the epigastric region with a hepatic retractor (*Figure 4*). Anterior gastrotomies were performed for the introduction of transgastric trocars, insufflation of the gastric chamber with CO₂ for endoscopic vision, a 6 cm posterior gastrotomy at the site of contact with the pancreatic cyst for the performance of cystogastric bypass was performed, ending with curettage and aspiration of the cystic cavity for the extraction of necrotic tissue and detritus. In the end, trocars were removed to the peritoneal cavity for gastrorrhaphy with 2-0 vicryl cross stitches (*Figure 2*); a soft drainage of the Penrose type was placed towards the surgical bed, and trocars were removed for subsequent closure of the abdominal wall in the usual way.

CONCLUSION

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

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Ethical considerations and responsibility: the authors declare that they followed the protocols of their work center on the publication of patient data, safeguarding their right to privacy through the confidentiality of their data.

Funding: no financial support was received for this work.

Disclosure: the authors declare no conflict of interest in carrying out the work.

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