

Endoscópico Peri Pancreatic Fluid Collection Drainage Guided by USE in a Highly Complex Hospital in Lima, Peru. A First National Case Series

Summary

Endoscopic drainage of pancreatic and peri pancreatic mature collections guided by USE actually is recognized as an alternative to other therapeutic modalities such as percutaneous and surgical interventions, because it is safe and achieves high success rates, being higher for pseudocysts. In this case series, we describe our initial experience in transmural endoscopic ultrasound guided drainage carried out with biliary plastic double pigtail stents in five patients with this type of collections secondary to acute pancreatitis.

Keywords: Pancreatic pseudocyst; Encapsulated necrosis; Endoscopic ultrasound guided drainage; Acute pancreatitis

Introduction

Pancreatic and peri-pancreatic collections may develop secondary to fluid leakage or liquefaction of pancreatic necrosis following acute pancreatitis, chronic pancreatitis, surgery or abdominal trauma [1]. According to the Atlanta classification [2], acute collections (evolution time less than 4 weeks) are the acute peri-pancreatic fluid collection and acute necrotic collection that rarely become infected and usually resolve spontaneously [3]. On the other hand, late complications are pseudocysts (a peri-pancreatic or pancreatic circumscribed fluid collection that persists for more than 4 weeks) and encapsulated necrosis or WON (walled off necrosis), which may be of pancreatic or extra pancreatic origin, which appears after 4 weeks of initiation of necrotizing pancreatitis [4].

The diagnosis of these lesions were initially made by contrast-enhanced tomography; however, that magnetic resonance cholangiopancreatography (MRCP) is more precise to define the content of these collections (such as the presence of detritus), which allows the differentiation between WON or pseudocysts, verify if there is communication with the main pancreatic duct [5]. Evaluation by Endoscopic retrograde cholangiopancreatography (ERCP) can be made prior to definitive therapy to define anatomy and guide the therapy [6].

The purpose of the present case series is to describe our initial experience in the endoscopic management of inflammatory pancreatic or peri-pancreatic collections (mainly pseudocysts) secondary to acute pancreatitis, through endoscopic drainage guided by USE performed by an expert endoscopist in the Hospital Nacional Edgardo Rebagliati Martins.

Case Report

Volume 6 Issue 1 - 2017

Angel Herrera García¹, Augusto Vera Calderón^{2*}, Ronald Arcana López³, Juan Llatas Pérez³, Alfonso Chacaltana Mendoza³ and Edson Guzman Calderón³

¹Fellow in Gastroenterology of the Hospital Edgardo Rebagliati Martins, Peru

²Head of the Therapeutic Endoscopy Service of the Hospital Edgardo Rebagliati Martins, Peru

³Assistant in Gastroenterology of the Hospital Edgardo Rebagliati Martins, Peru

***Corresponding author:** Augusto Vera Calderón, Head of the Therapeutic Endoscopy Service of the Hospital Edgardo Rebagliati Martins, Peru, Email: augustofvc@yahoo.com

Received: December 15, 2016 | **Published:** February 02, 2017

Case Series

Case 1

A 60-year-old male patient with a past medical history of severe acute pancreatitis (probable biliary etiology) with ICU management, hypertension and obesity. He presents 2 years later complaining of abdominal pain and bloating. Abdominal palpation revealed pain in the epigastrium. Laboratory results: normal. MRCP: an 18 x 6 cm pseudocyst with detritus in the pancreatic body and tail without communication with the main pancreatic duct. Endoscopic drainage was made using a 19G needle to puncture, placement of two 7F double Pigtail stents. Technical, clinical (asymptomatic at 5 months) and radiological success were obtained. In USE control (3 months later), there were signs of chronic pancreatitis (Figure 1 & 2).

Case 2

A 72-year-old female patient with a history of acute biliary pancreatitis, arterial hypertension, type 2 diabetes mellitus, and cholecystectomy. She presents 10 years after pancreatitis with 1 year of abdominal pain. Physical examination: evident protrusion and painful palpation in the left upper abdominal quadrant. Normal laboratory results. Contrast-enhanced CT and MRI showed an 11 x 9 cm pseudocyst. It was punctured with a 19G needle

and two 9 cm x 7F double Pigtail stents were placed (Figure 3 & 4). After 6 months of follow-up, only residual inflammation was evident and the stents were subsequently removed. Favorable clinical outcomes (Figure 5 & 6).

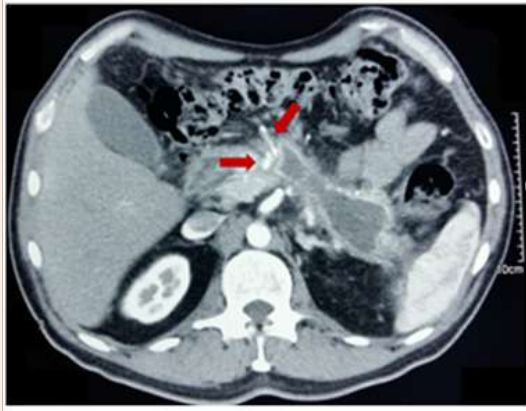


Figure 1: Contrast-enhanced CT: pseudocyst of the body and tail of pancreas with decrease in dimensions 5 months after endoscopic drainage with stents *in situ* (arrows).



Figure 2: Contrast-enhanced CT: residual inflammatory process (arrows) without evidence of pseudocyst (6 months after drainage).

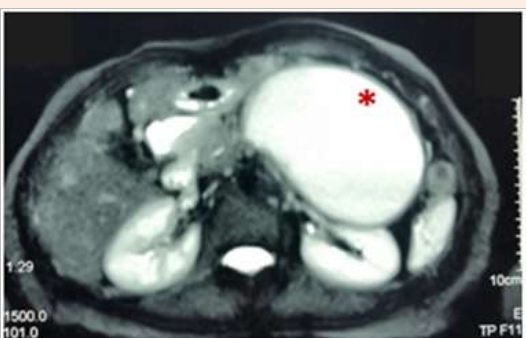


Figure 3: Pre-drainage MRCP (T2 weighted image): Pseudocyst of the body and tail of pancreas (asterisk) that exerts a compressive effect on the stomach, small bowel, and left kidney.

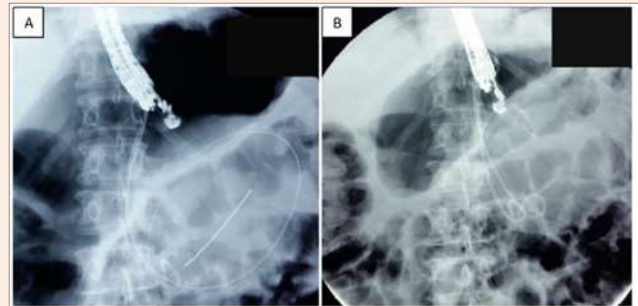


Figure 4: Fluoroscopic images of endoscopic drainage. A. Passage of guidewires. B. Successful placement of two double Pigtail stents.

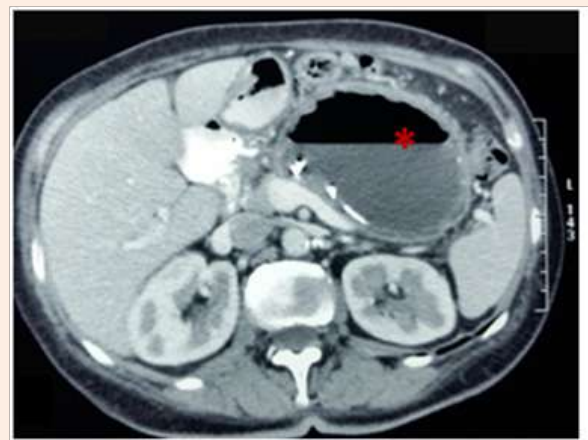


Figure 5: Contrast-enhanced CT: (15 days after drainage). Dimensions decrease of the pseudocyst (asterisk). With hydroaerous level in this one with stent *in situ*.

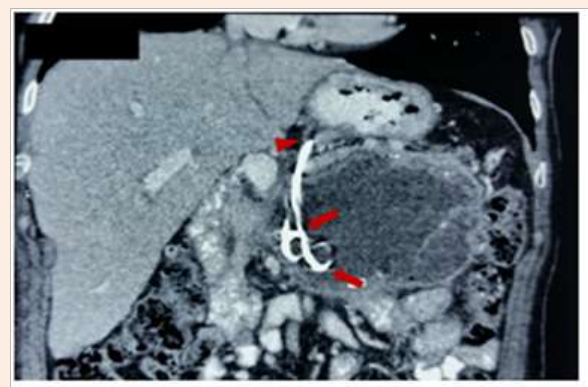


Figure 6: Contrast-enhanced CT: (15 days after drainage). 2 double Pigtail stents in situ between the stomach (arrowhead) and the pseudocyst (arrows).

Case 3

A 57-year-old woman with a history of severe acute biliary necrotizing pancreatitis (necrosis of 40% of the gland); type 2 diabetes mellitus and controlled hypothyroidism; cholecystectomy

(10 years before pancreatitis) and appendectomy. She was admitted 3 years after acute pancreatitis with a course of 1 year of abdominal pain. Physical examination: painful deep palpation in epigastrium. Laboratory results: ALT: 72 IU/ L; Alkaline phosphatase: 153 IU/ L. MRCP: a 10 cm sized pseudocyst in the body of pancreas that produces dilatation of the main pancreatic duct and mechanical effect on the gastric cavity. It was punctured with a 19G needle on the posterior aspect of the gastric body and 2 double Pigtail stents (one of 9 cm x 7F and another of 7 cm x 7F) were placed. After the procedure the patient suffered a post-drainage infection that resolved with intravenous broad-spectrum antibiotics. Fifteen days later, she returned for partial intestinal obstruction and pseudocyst infection (purulent contents were aspirated). Two additional plastic stents were placed by ERCP and intravenous antibiotics were administrated. She was discharged with favorable clinical progress (Figure 7-9).

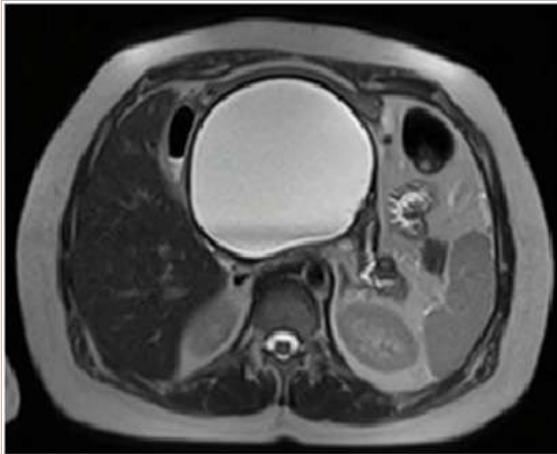


Figure 7: MRCP before drainage: (T2 weighted image). Pseudocyst in the body of pancreas (with minimal detritus) that produces dilation of the main pancreatic duct in the tail and mechanical effect on gastric lumen.



Figure 8: Contrast-enhanced CT (4 weeks after drainage). Pigtail stents between dilated stomach (asterisk) and pseudocyst (arrowheads).



Figure 9: Contrast-enhanced CT (a year post-drainage). Resolution of pseudocyst.

Case 4

A 67-year-old patient with a history of acute biliary pancreatitis (treated in another hospital), cholecystectomy + drainage of gallbladder abscess and arterial hypertension. She presents 7 months later, complaining of abdominal pain and obstructive symptoms that began 7 days after withdrawal of percutaneous drainage of per pancreatic pseudocyst. Physical examination: upper abdominal distention and painful palpation. No alterations in laboratory results. MRCP revealed a per pancreatic pseudocyst of 5.5 cm of diameter in the pancreatic neck, that was punctured with a 19G needle and one double Pigtail stent was placed only because of initial guidewire displacement. After 3 months of drainage, there was clinical resolution and stent was removed (Figure 10).

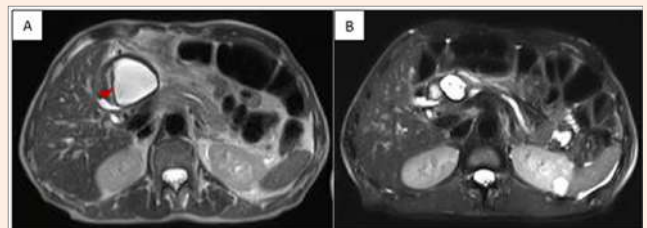


Figure 10: MRCP (T2 weighted image). A. pseudocyst prior to drainage (arrowhead). B. resolution of pseudocyst (3 months after drainage).

Case 5

A 62-year-old woman with a history of cholelithiasis and acute biliary pancreatitis managed in a private clinic (severity not specified). She comes 7 months later for abdominal pain and obstructive symptoms (episodes of nausea and post-prandial vomiting). Abdominal palpation revealed pain in epigastrium. Laboratory results: alkaline phosphatase: 422 IU / L. MRCP: walled-off necrosis of 14 x 12 cm in the pancreatic body and

tail. EUS: hypoechoic lesion of 10 x 8.3 cm with a solid content of 30 - 40%. Under fluoroscopic and endoscopic guidance, it was punctured with a 19G needle and 2 double Pigtail stents were left. Due to extensive bleeding in the stomach by puncture of vessels in the gastric wall, the patient underwent an urgent exploratory laparotomy and transfixing points at the site of puncture. No perforation was evident. He had a favorable evolution and was discharged (Figure 11 & 12).

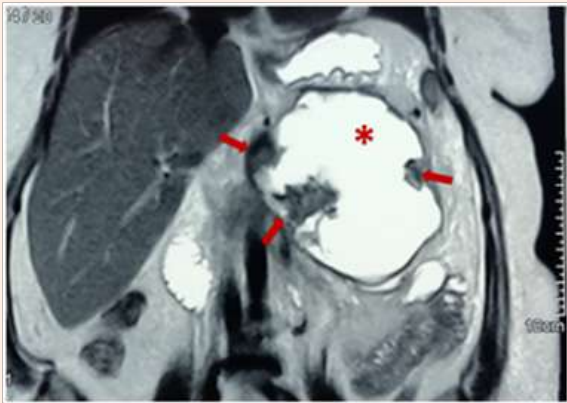


Figure 11: MRCP (T2 weighted image). Delimited lesion in the pancreatic body and tail with solid (arrows) and cystic contents (asterisk).

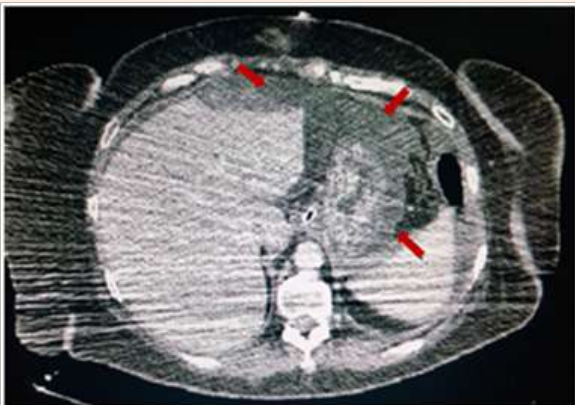


Figure 12: Contrast-enhanced CT with radiological artifacts at third postoperative day shows mild ascites (arrows).

Discussion

The drainage of the inflammatory collections can be done by a percutaneous (interventionist radiology), surgical (conventional or laparoscopic) or endoscopic approach, being the last one of first choice and usually performed after 4 weeks of evolution because procedure associated complications are reduced with a mature wall of the collection. A study of 242 patients found that mortality decreased as the intervention (endoscopic, percutaneous or surgical) was delayed more from hospital admission in patients with necrotizing pancreatitis (0 - 14 days: mortality rate of 56%, 14 - 29 days: 26% and > 29 days: 15%, $p < 0.01$) [7].

Indications for pseudocysts drainage are: presence of symptoms such as abdominal pain, partial or complete obstruction of the gastrointestinal or biliary tract and others, continuous growth and infection [8]. As for necrotizing pancreatitis, indications are usually infection with clinical deterioration or persistent organic failure (for several weeks after the onset of acute pancreatitis) without infection or symptomatic collection (gastrointestinal or biliary obstruction) [9]; while the absolute contraindications for endoscopic drainage are non-encapsulated collections (although there are reports of intervention in these ones), collections located more than 1 cm away from the gastrointestinal tract and the presence of pseudoaneurysms [10].

Regarding endoscopic therapy of pseudocysts, the approach may be transmural (most used), Trans papillary or combined. This will depend on four factors: anatomical relationship of the collection to the stomach or duodenum, presence of ductal communication, cyst content and collection size [4].

In the transmural technique, which has been used in our case series, drainage is done through the creation of a communication between the pseudocyst and the duodenal or gastric wall. Two biliary plastic stents (double Pigtail) are generally placed; although fully covered self-expanding biliary metal stents (SEMS) are also being used. Recently, was including one specifically Lumen Apposing Metal Stent (LAMS) designed for drainage of pseudocysts (Hot Axios™) [11-13]. The diameter or number of plastic stents used does not appear to be associated with the number of interventions required for the resolution of uncomplicated pseudocysts [14]. Although the advantage of SEMS is that one is sufficient for drainage, there is no evidence to demonstrate the superiority of SEMS over plastic stents for resolution of pancreatic fluid collections [15]. Because the risk of migration is greater with metallic stents (with the exception of the Lumen apposing metal stent) some endoscopist prefer to place inside of this 2 double Pigtail stents as an anchor [12].

The drainage of walled-off necrosis under the transmural approach is similar to that of pseudocysts; nevertheless, the techniques are more complex and the post-procedure management after initial drainage is more extensive [16]. The nasocystic drainage associated with the placement of two transmural Pigtail stents have been traditionally performed to facilitate the evacuation of necrotic remains and improve the rate of success. If clinical improvement with nasocystic lavage and transmural drainage is not achieved after 48 - 72 hours, some authors suggest transmural endoscopic necrosectomy (multiple sessions performed every 48-72 hours to achieve complete removal of the necrotic remains) [9,17]. Several sites of endoscopic drainage or percutaneous drainage associated can be performed. This combination therapy has been shown to avoid surgical necrosectomy [18] and is not associated with pancreatic-cutaneous fistulas or procedure related deaths.

The *multiple transluminal drainage* technique is another modality, which demonstrated a higher clinical success rate compared to those who received conventional drainage in a study of 60 patients with WON modality [19].

A small unicentric study suggests that performing direct endoscopic necrosectomy at the time of initial drainage and stent placement may lead to higher resolution rates, shorter hospital stay and decreased use of health care when compared to the stepwise approach for WON [20].

It is important to define prior to the intervention the type of collection that we are facing, since the response to endoscopic therapy is different: 86 - 100% in pseudocysts as opposed to 63 - 81% when walled-off necrosis is treated. Most frequent complications associated with these endoscopic procedures are hemorrhage, perforation, post-procedure infection, and stent migration. In a case report in our country, tension pneumoperitoneum was documented following pseudocyst transgastric drainage guided by endoultrasonography [21].

In the GEPARD study [22], complications from endoscopic necrosectomy (n = 93) occurred in 26% of patients with a mortality rate of 7.5% at 30 days; while in the Japanese study JENIPaN [23], the rate of complications from endoscopic necrosectomy was 33% with a mortality rate of 11%. In general, the rate of complications is much lower with endoscopic drainage of pseudocysts compared to the drainage of walled-off necrosis [24].

Ruiz J et al. [25], described 12 patients who underwent endoscopic drainage of pancreatic pseudocysts in our country demonstrated a success rate of 91.7% [25]. This report is the first cases series in Peru of endoscopic drainage of pancreatic collections guided by USE, in which we have seen favorable technical success in all patients and clinical and radiological success too. We had two procedure-associated complications: one patient return to emergency room with WOPN infection, and was resolved with endoscopic drainage plus antibiotic therapy; a second patient (old age patient) who presented gastric hemorrhage that need cistogastrostomy closure by surgical management and stents were removed.

Conclusion

Endoscopic drainage guided by USE is a safe technique for the management of this type of pancreatic and per pancreatic collections; nevertheless, more prospective clinical studies and evidence are needed in our country to determine success and complications rates in this type of therapy.

References

1. Kawakami H, Itoi T, Sakamoto N (2014) Endoscopic Ultrasound-Guided Transluminal Drainage for Peripancreatic Fluid Collections: Where Are We Now? *Gut and Liver* 8(4): 341-355.
2. Banks PA, Bollen TL, Dervenis C, Gooszen HG, Johnson CD, et al. (2013) Classification of acute pancreatitis 2012: revision of the Atlanta classification and definitions by international consensus. *Gut* 62(1): 102-111.
3. Lenhart D, Balthazar E (2008) MDCT of acute mild (necrotizing) pancreatitis: abdominal complications and fate of fluid collections. *AJR Am J Roentgenol* 190(3): 643-649.
4. Muthusamy V, Chandrasekhara V, Acosta R, Bruining D, Chathadi K, et al. (2016) The role of endoscopy in the diagnosis and treatment of inflammatory pancreatic fluid collections. *Gastrointestinal endoscopy* 83(3): 481-486.
5. Morgan DE, Baron TH, Smith JK, Robbin ML, Kenney PJ (1997) Pancreatic fluid collections prior to intervention: evaluation with MR imaging compared with CT and US. *Radiology* 203(3): 773-778.
6. Nealon W, Walser E (2002) Main pancreatic ductal anatomy can direct choice of modality for treating pancreatic pseudocysts (surgery versus percutaneous drainage). *Ann Surg* 235(6): 751-758.
7. van Santvoort HC, Bakker OJ, Bollen TL, Besselink MG, Ahmed Ali U, et al. (2011) A conservative and minimally invasive approach to necrotizing pancreatitis improves outcome. *Gastroenterology* 141(4): 1254-1263.
8. Holt B, Varadarajulu S (2015) The endoscopic management of pancreatic pseudocysts. *Gastrointest Endosc* 81(4): 804-812.
9. Working Group IAP/APA Acute Pancreatitis Guidelines (2013) IAP/APA evidence-based guidelines for the management of acute pancreatitis. *Pancreatology* 13(4 Suppl 2): e1-e15.
10. De-Madaria E, Abad-González A, Aparicio J, Aparisi L, Boadas J, et al. (2013) The Spanish Pancreatic Club's recommendations for the diagnosis and treatment of chronic pancreatitis: part 2 (treatment). *Pancreatology* 13(1): 18-28.
11. Majumder S, Buttar N, Gostout C, Levy M, Martin J, et al. (2016) Lumen-apposing covered self-expanding metal stent for management of benign gastrointestinal strictures. *Endosc Int Open* 4(1): E96-E101.
12. Penn DE, Draganov PV, Wagh MS, Forsmark CE, Gupte AR, et al. (2012) Prospective evaluation of the use of fully covered self-expanding metal stents for EUS-guided transmural drainage of pancreatic pseudocysts. *Gastrointest Endosc* 76(3): 679-684.
13. Shah RJ, Shah JN, Waxman I, Kowalski TE, Sanchez-Yague A, et al. (2014) Safety and efficacy of endoscopic ultrasound-guided drainage of pancreatic fluid collections with lumen-apposing covered self-expanding metal stents. *Clin Gastroenterol Hepatol* 13(4): 747-752.
14. Bang JY, Wilcox CM, Trevino JM, Ramesh J, Hasan M, et al. (2014) Relationship between stent characteristics and treatment outcomes in endoscopic transmural drainage of uncomplicated pancreatic pseudocysts. *Surg Endosc* 28(10): 2877-2883.
15. Bang J, Varadarajulu S (2013) Metal versus plastic stent for transmural drainage of pancreatic fluid collections. *Clin Endosc* 46(5): 500-502.
16. Baron T, Kozarek R (2012) Endotherapy for organized pancreatic necrosis: perspectives after 20 years. *Clinical Gastroenterology and Hepatology* 10(11): 1202-1207.
17. Voermans R, Besselink M, Fockens P (2015) Endoscopic management of walled-off pancreatic necrosis. *J Hepatobiliary Pancreat Sci* 22(1): 20-26.
18. Ross AS, Irani S, Gan SI, Rocha F, Siegal J et al. (2014) Dual-modality drainage of infected and symptomatic walled-off pancreatic necrosis: long-term clinical outcomes. *Gastrointest Endosc* 79(6): 929-935.
19. Varadarajulu S, Phadnis MA, Christein JD, Wilcox CM (2011) Multiple transmural gateway technique for EUS-guided drainage of symptomatic walled-off pancreatic necrosis. *Gastrointest Endosc* 74(1): 74-80.

20. Kumar N, Conwell D, Thompson C (2014) Direct endoscopic necrosectomy versus step-up approach for walled-off pancreatic necrosis: comparison of clinical outcome and health care utilization. *Pancreas* 43(8): 1334-1339.
21. Prochazka R, Mostajo G, Villa-Gómez G, Illescas A, Pereira N (2012) Neumoperitoneo a tensión como complicación de drenaje transgástrico de pseudoquiste pancreático guiado por ultrasonografía endoscópica. Reporte de caso clínico y revisión de la literatura. *Revista de Gastroenterología del Perú* 32(1): 88-93.
22. Seifert H, Biermer M, Schmitt W, Jürgensen C, Will U, et al. (2009) Transluminal endoscopic necrosectomy after acute pancreatitis: a multicenter study with long-term follow-up (the GEPARD Study). *Gut* 58(9): 1260-1266.
23. Yasuda I, Nakashima M, Iwai T, Isayama H, Itoi T, et al. (2013) Japanese multicenter experience of endoscopic necrosectomy for infected walled-off pancreatic necrosis: The JENIPaN study. *Endoscopy* 45(8): 627-634.
24. Varadarajulu S, Wilcox CM, Latif S, Phadnis M, Christein JD (2007) Role of EUS in drainage of per pancreatic fluid collections not amenable for endoscopic transmural drainage. *Am Surg* 77(12): 1650-1655.
25. Ruiz J, León F, Pernía L, Torres R, Rodríguez F (1996) Tratamiento Endoscópico del Pseudoquiste de Páncreas. *Revista de Gastroenterología del Perú* 16(1): 27-33.