



Case Report

Endovascular management of a pancreaticoduodenal arcade aneurysm: case report and literature review

Embolización de un aneurisma de la arcada pancreatoduodenal. Reporte de un caso y revisión de la literatura

Carlos Torrealba Malpica, Ricardo Gallardo Ossío, Cristóbal Orellana Gajardo, Gabriel Figueroa Benavides, Andrea Manrique Castellanos

Hospital Clínico Metropolitano de la Florida Dra. Eloísa Díaz Insunza. La Florida. Región Metropolitana, Chile

Abstract

Introduction: aneurysms of the pancreaticoduodenal arcade are a rare condition. They represent 2 % of all visceral aneurysms. These are associated with occlusion or critical stenosis of the celiac axis, which explains their development due to hemodynamic alterations. Currently intervention is recommended for all of these regardless of their size and/or the presence of symptoms.

Case report: we present the case of a 72-year-old patient with a history of hypertension, who presents with diffuse abdominal pain diagnosing aneurysm of the pancreaticoduodenal arcade, which was satisfactorily treated with a 16-month follow-up without evidence of complications.

Discussion: treatment of all pancreaticoduodenal arcade aneurysms is recommended since their risk of rupture is not associated with their size. Endovascular treatment is the gold standard as it has shown excellent results.

Keywords:

Visceral aneurysm.
Pancreatoduodenal arcade aneurysm.
Aneurysm. PDAA.

Resumen

Introducción: los aneurismas de la arcada pancreatoduodenal (AAPD) son una patología poco frecuente. Representan el 2 % de todos los aneurismas viscerales. Están asociados a oclusión o estenosis crítica del tronco celíaco, lo que explica su desarrollo por alteraciones hemodinámicas. Actualmente se recomienda la intervención endovascular de todos estos, independientemente de su tamaño o de la presencia de síntomas.

Caso clínico: presentamos el caso de una paciente de 72 años de edad con antecedente de hipertensión arterial, quien cursa con un cuadro de dolor abdominal difuso. Se diagnostica un AAPD, que fue tratado satisfactoriamente por vía endovascular, con seguimiento a 16 meses sin evidencia de complicaciones.

Discusión: se recomienda el tratamiento de todos los aneurismas de la APDD, ya que su riesgo de rotura no está asociado a su tamaño. Se recomienda el tratamiento endovascular, ya que ha demostrado excelentes resultados.

Palabras clave:

Aneurisma visceral.
Aneurisma arcada pancreatoduodenal.
Aneurisma. AAPD.

Received: 06/26/2025 • Accepted: 08/05/2025

Conflicts of interest: The authors declare no conflicts of interest.

Artificial intelligence: The authors declare that no artificial intelligence (AI) or AI-based tools were used in the preparation of this article.

Torrealba Malpica C, Gallardo Ossío R, Orellana Gajardo C, Figueroa Benavides G, Manrique Castellanos A. Endovascular management of a pancreaticoduodenal arcade aneurysm: case report and literature review. Angiología 2025;77(6):341-344

DOI: <http://dx.doi.org/10.20960/angiologia.00797>

Correspondence:

Carlos Torrealba Malpica. Hospital Clínico Metropolitano de la Florida Dra. Eloísa Díaz Insunza. Froilán Roa, 6542. 8242238 La Florida. Región Metropolitana, Chile
e-mail: cltorrealba85@gmail.com

INTRODUCTION

The pancreaticoduodenal arcade (PDDA) is formed by the gastroduodenal artery and its superior and inferior pancreaticoduodenal branches, the latter arising from the superior mesenteric artery (SMA). An aneurysm is defined as a dilation exceeding 150 % of the expected diameter for a specific artery (1). PDAAs are rare and represented mostly by pseudoaneurysms (1). They are closely associated with celiac trunk (CT) occlusion, which explains their development due to hemodynamic alterations (2). Current recommendations favor endovascular intervention for all PDAAs, regardless of size or symptoms (3).

CASE REPORT

We present the case of a 72-year-old woman with a past medical history of hypertension and active smoking who underwent an abdominal ultrasound due to intermittent pain. Imaging revealed a saccular aneurysm of the SMA. A coronary computed tomographic angiography (CCTA) (Fig. 1A) revealed the presence of a CT occlusion and a true aneurysm arising from the PDDA measuring 1.5×1.7 cm in its maximum axes.

Preoperative evaluation included hematologic, hepatic, and biochemical testing, as well as an electrocardiogram and echocardiogram, all of which were unremarkable. The patient was scheduled for endovascular embolization of the aneurysm.

Under general anesthesia, percutaneous brachial access was obtained using a 4-Fr, 11-cm Prelude Road-

ster® introducer sheath (Merit Medical, South Jordan, UT, USA). Systemic heparin was administered at a dose of 100 IU/kg. A 0.035 in hydrophilic guidewire was advanced to the visceral aorta, followed by exchange for a 5-Fr, 45-cm Prelude Roadster® introducer sheath. Aortography confirmed the CT occlusion and the saccular aneurysm. Selective SMA catheterization and angiography followed, revealing a saccular aneurysm arising from the inferior pancreaticoduodenal artery with adequate collateral perfusion to the hepatic territory (Fig. 1B). The inferior pancreaticoduodenal artery was cannulated using a Progreat® microcatheter (Terumo, Tokyo, Japan), allowing catheterization of the aneurysm, which was located 3 mm from the arterial ostium. Embolization was performed with a 15×20 -cm helicoidal coil (Terumo, Tokyo, Japan) followed by a 14×34 framing coil (Terumo, Tokyo, Japan).

Final angiography demonstrated appropriate contrast flow into the SMA and PDDA and complete embolization of the aneurysm (Fig. 1C). A covered stent was not placed due to insufficient landing zone for adequate sealing in the inferior pancreaticoduodenal artery toward the SMA. CT revascularization was not pursued because hepatic perfusion remained uncompromised.

Brachial access was uneventfully closed with a Perclose Prostyle® percutaneous closure device (Abbott Vascular, Lake Bluff, IL, USA). The patient has now completed an 18-month follow-up. The CCTA at 30 days and 12 months demonstrated persistent exclusion of the aneurysm and preserved SMA-PDDA perfusion (Fig. 1D).

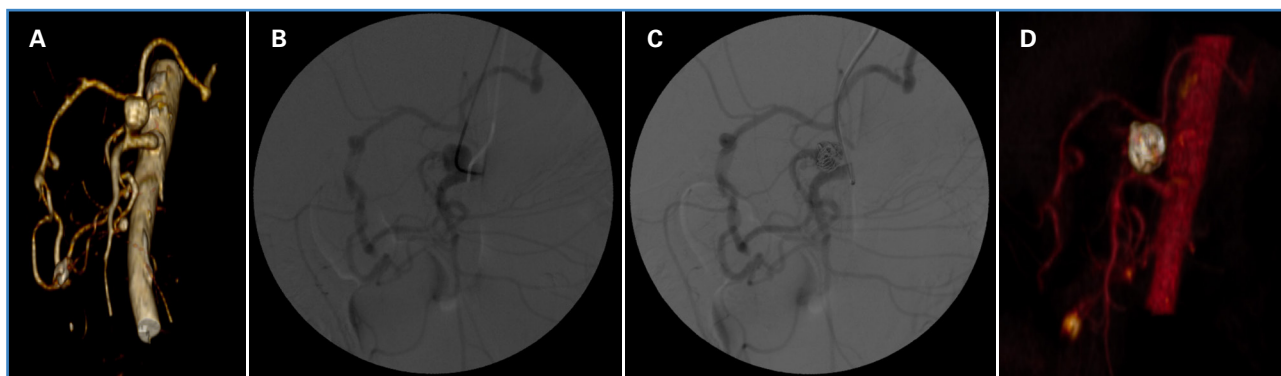


Figure 1. A. Three-dimensional reconstruction of preoperative CCTA demonstrating the aneurysm arising from the inferior pancreaticoduodenal artery. B. Selective SMA angiography showing the aneurysm and the PDDA with CT occlusion. C. Final angiography demonstrating both coils within the aneurysmal sac and contrast passage into the PDDA. D. Twelve-month postoperative CCTA reconstruction showing aneurysm exclusion with maintained PDDA and SMA perfusion.

DISCUSSION

PDAAs are rare. Most are pseudoaneurysms due to trauma, pancreatitis, infection, or prior surgery (1). True aneurysms represent approximately 2 % of all visceral aneurysms. 4 Between 10 % and 25 % of patients present initially with aneurysm rupture, with a 30-day mortality rate of approximately 10 % (2).

The most common symptom of PDAAs is abdominal pain, and the most frequent complication is rupture, which may manifest as upper GI bleeding, hemoperitoneum, or-most commonly-retroperitoneal hemorrhage (2,3).

Multiple published series confirm a strong association between significant CT stenosis or occlusion and the development of PDAAs in up to 95 % of cases (2,3). This phenomenon was first described by Sutton and Lawton in 1973,⁵ who suggested that aneurysm formation results from increased retrograde SMA flow through the arcade to maintain hepatic perfusion, leading to aneurysmal degeneration in arteries whose walls are weakened by CT stenosis or occlusion (Fig. 2).

Importantly, rupture risk in PDAAs is not correlated with aneurysm size (2,3). Therefore, the most recent clinical practice guidelines from the Society for Vascular Surgery (SVS) recommend repair of all PDAAs whenever the patient's condition permits.³ However,

Stoecker-the author of the largest published PDAA series-reported an intriguing association suggesting that CT occlusion may be a protective factor against rupture. He proposed that patients with this combination of findings may be safely monitored without immediate repair (2).

Endovascular treatment is considered first-line therapy due to its high success rate (3). Treatment options include coil embolization of the aneurysm, with or without exclusion using covered stents. When direct aneurysm embolization is not feasible, embolization of feeding vessels from the CT and SMA has also been described.^{4,6} Because PDAAs frequently occur in the context of CT atherosclerotic disease, hepatic perfusion must always be considered. Although < 10 % of patients with CT occlusion undergoing PDAA intervention develop postoperative hepatic ischemia, biochemical monitoring of liver function is recommended when revascularization is not performed (2,7,8).

In conclusion, PDAAs should be evaluated carefully due to their high risk of rupture. International clinical practice guidelines recommend endovascular intervention at diagnosis due to the high rates of technical success reported in the literature. Meticulous preoperative planning with thorough assessment of arterial anatomy is essential for optimal outcomes.

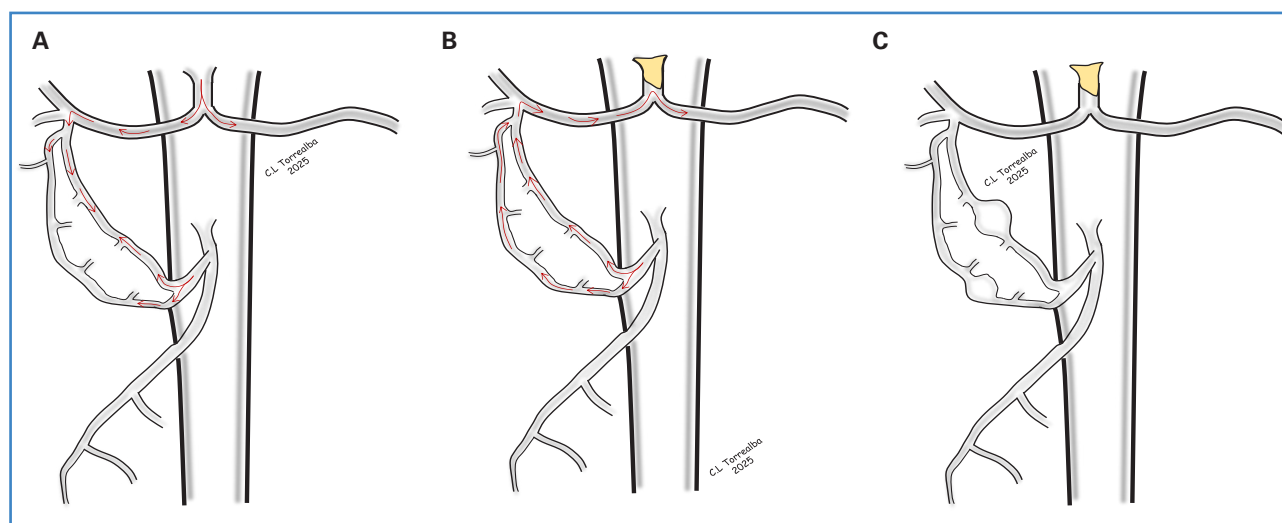


Figure 2. Development of pancreaticoduodenal arcade aneurysms in the presence of celiac trunk occlusion. A. Normal hemodynamics. B. Retrograde flow with CT occlusion. C. Aneurysm formation.

REFERENCES

1. Paty PS, Cordero JA, Shah M. Aneurysms of the pancreaticoduodenal artery. *J Vasc Surg* 1996;23(4):710-3. DOI: 10.1016/s0741-5214(96)80054-1
2. Corey MR, Ergul EA, Cambria RP, Patel VI, Lancaster RT, Kwolek CJ, et al. The presentation and management of aneurysms of the pancreaticoduodenal arcade. *J Vasc Surg* 2016;64(6):1734-40. DOI: 10.1016/j.jvs.2016.05.067
3. Stoecker JB, Eddinger KC, Glaser JD, Wang GJ, Shlansky-Goldberg RD, Fairman RM, et al. A large series of true pancreaticoduodenal artery aneurysms. *J Vasc Surg* 2022;75(5):1634-42.e1. DOI: 10.1016/j.jvs.2022.01.021
4. Chaer RA, Abularrage CJ, Coleman DM, Eslami MH, Kashyap VS, Rockman C, et al. The Society for Vascular Surgery clinical practice guidelines on the management of visceral aneurysms. *J Vasc Surg* 2020;72(1S):3S-39S. DOI: 10.1016/j.jvs.2020.01.039
5. Sutton D, Lawton G. Coeliac stenosis or occlusion with aneurysm of the collateral supply. *Clin Radiol* 1973;24(1):49-53. DOI: 10.1016/s0009-9260(73)80114-x
6. Laganà D, Carrafiello G, Mangini M, Dionigi G, Caronno R, Castelli P, et al. Multimodal approach to endovascular treatment of visceral artery aneurysms and pseudoaneurysms. *Eur J Radiol* 2006;59(1):104-11. DOI: 10.1016/j.ejrad.2006.02.004
7. Corey MR, Ergul EA, Cambria RP, English SJ, Patel VI, Lancaster RT, et al. The natural history of splanchnic artery aneurysms and outcomes after operative intervention. *J Vasc Surg* 2016;63(4):949-57. DOI: 10.1016/j.jvs.2015.10.066
8. Katsura M, Gushimiyagi M, Takara H, Mototake H. True Aneurysm of the Pancreaticoduodenal Arteries: A Single Institution Experience. *J Gastrointest Surg* 2010;14(9):1409-13. DOI: 10.1007/s11605-010-1257-0