Radiology Case Reports 17 (2022) 2668–2672

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Rupture of pseudoaneurysm of a digiunal artery in the pancreatic duct ☆

Carlo Bova, MD[a,*], *Tommaso De Bartolo, MD*[b], *Mario Verta, MD*[c]

[a] *Unit of Internal Medicine, Azienda Ospedaliera, Via Migliori 1, Cosenza 87100, Italy*
[b] *Interventional Radiology Unit, Azienda Ospedaliera, Via Migliori 1, Cosenza 87100, Italy*
[c] *Gastroenterology Unit, Azienda Ospedaliera, Via Migliori 1, Cosenza 87100, Italy*

ARTICLE INFO

Article history:
Received 2 May 2022
Revised 13 May 2022
Accepted 14 May 2022

Keywords:
Pseudoaneurysm
Visceral artery
Interventional radiology

ABSTRACT

Visceral arterial pseudoaneurysms are uncommon vascular abnormalities affecting renal or splanchnic arteries. They can be complications of chronic pancreatitis, blunt or penetrating abdominal trauma, or surgical, endoscopic and interventional radiological procedures. Visceral arterial pseudoaneurysms can be life-threatening because of hemorrhagic shock secondary to rupture and massive bleeding. We report an unusual case of rupture of a pseudoaneurysm of a digiunal artery in the pancreatic duct.

Introduction

Visceral arterial pseudoaneurysms (VAPs) are uncommon vascular abnormalities affecting renal or splanchnic arteries, that are characterized by a tear in the vessel wall with subsequent formation of a peri-artery hematoma [1]. VAPs can be complications of chronic pancreatitis, blunt or penetrating abdominal trauma, or surgical, endoscopic and interventional radiological procedures [2]. Although sometimes VAPs are incidentally detected, they can be life-threatening because of hemorrhagic shock secondary to rupture and massive bleeding [3,4]. We report an unusual case of rupture of a pseudoaneurysm of a digiunal artery in the pancreatic duct, in which the interventional radiology allowed an appropriate emergency treatment.

Case presentation

A 75-year-old man was admitted to the emergency department of our hospital for hematemesis and melena. His clinical history was significant for pacemaker implant, chronic pancreatitis and diabetes. Physical examination revealed cold and pale skin, tachycardia (110 bpm) and arterial hypotension (blood pressure 80/40 mm Hg). Laboratory exams showed a low hemoglobin concentration (7.7 g/dL, normal values 13-17). An esophagogastroduodenoscopy did not identify foci of active bleeding. A computed tomography (CT) of the abdomen with administration of intravenous contrast material revealed an inhomogeneous and enlarged pancreas with multiple calcifications, a marked dilation of the pancreatic duct, and a hyper-

☆ Competing Interests: Each author declares that he or she has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

* Corresponding author.
E-mail address: carbova@libero.it (C. Bova).

https://doi.org/10.1016/j.radcr.2022.05.041

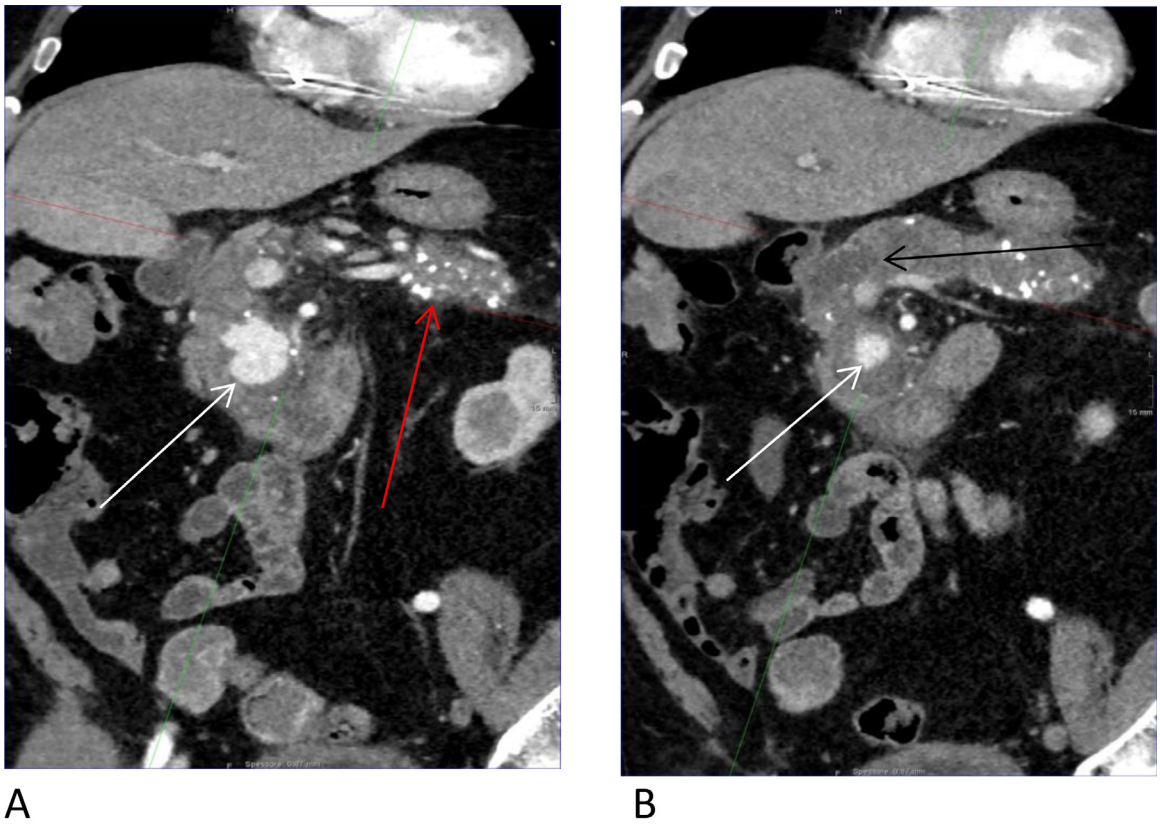

Fig. 1 – Coronal contrast-enhanced CT image showing an enlarged pancreas with multiple calcifications (red arrow) (A) and a marked dilation of the pancreatic duct (black arrow) (B). A pseudoaneurysm at the level of the head of the pancreas is evident (white arrows) (A and B).

dense area in the cephalic site as for pseudoaneurysm with likely origin from a digiunal artery (Figs. 1 and 2).

A digital angiography was performed. The exam confirmed a pseudoaneurysm of a digiunal artery in the cephalic-pancreatic region of a dilated pancreatic duct. An emergency procedure was then carried out. A right common femoral artery approach with a 7F catheter was done. The superior mesenteric artery was catheterized using a 6F long sheath introducer. The affected digiunal artery was catheterized in a super-selective way by a 2.9-F micro-catheter, and the pseudoaneurysm was embolized with 12 controlled release spirals. Initially a casting was carried out with 5 standard ruby coils (Penumbra Inc, S. Francisco, CA). Then a framing with 3 soft ruby coils was performed. Finally, a filling of the pseudoaneurysm with packing coil was obtained. During the procedure a small extravasation of contrast medium was noted, as for (further) rupture of the pseudoaneurysm. However, at the final check the complete exclusion of the lesion from the arterial circulation was documented (Figs. 3–5).

After the procedure the conditions of the patient rapidly improved, and he was discharged from the emergency department on the third hospital day. At the 1-month follow-up a CT of the abdomen with contrast material showed the disappearance of the pseudoaneurysm and a reduction of the pancreatic duct dilation (Figs. 6 and 7)

Discussion

VAPs are detected in 0.01%-0.2% of autopsies [5,6]. The most common sites are the splenic (60%) and hepatic arteries (20%), while digiunal arteries are rarely affected [6]. Sixty-eight percent of VAPs are reported to be secondary to pancreatitis or to a pseudocyst formation [2] and their incidence in chronic pancreatitis, in about 5 years of follow-up, ranges from 0.03% to 0.8% [7,8]. VAPs are believed to be secondary to a leakage of proteolytic enzymes in the setting of pancreatitis, with subsequent destruction of the vessel wall [2,3,9]. However VAPs can also be due to surgical, endoscopic and interventional radiological procedures, or be secondary to trauma, infectious, or inflammatory conditions [2,10]. Clinical features of VAPs vary from absence of symptoms to hemorrhagic shock and death [11–13]. Gastrointestinal bleeding due to rupture of pseudoaneurysms arising from splanchnic arteries, hematuria from renal artery pseudoaneurysms, and intra-abdominal hematoma, are the most common symptoms. Pain is another common presentation. In about one third of patients, pseudoaneurysms are discovered incidentally (13). When detected, VAPs should be always treated as soon as possible, because of their high probability of rupture [14]. This complication is associated with a mortality rate

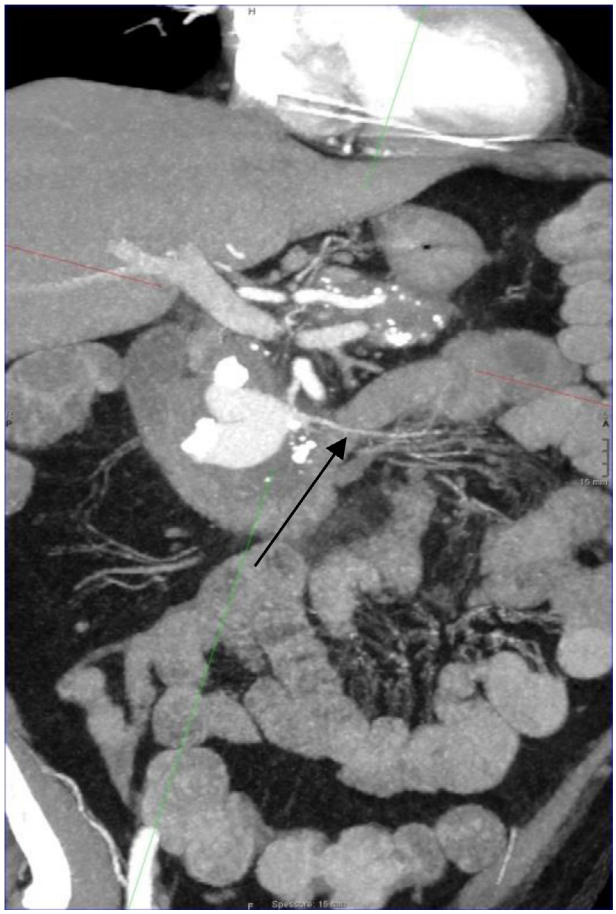

Fig. 2 – Coronal contrast-enhanced CT. Digiunal artery feeding the pseudoaneurysm (arrow).

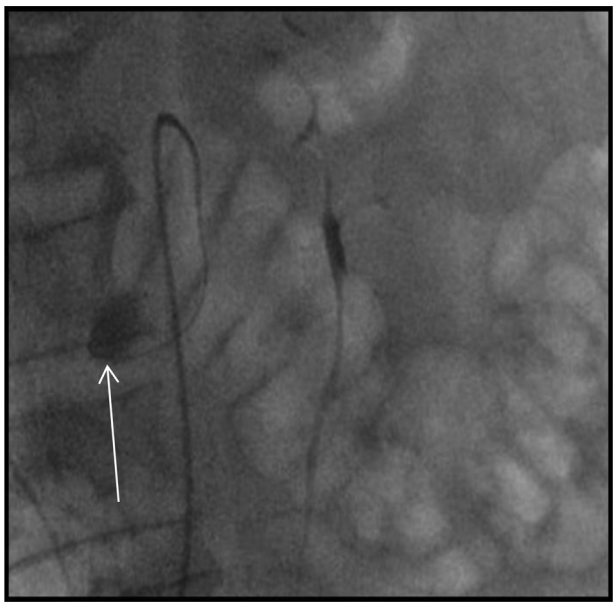

Fig. 3 – Digital subtraction angiography (DSA). Super-selective catheterization, by a 2.9-F micro-catheter, of the pseudoaneurysm (arrow).

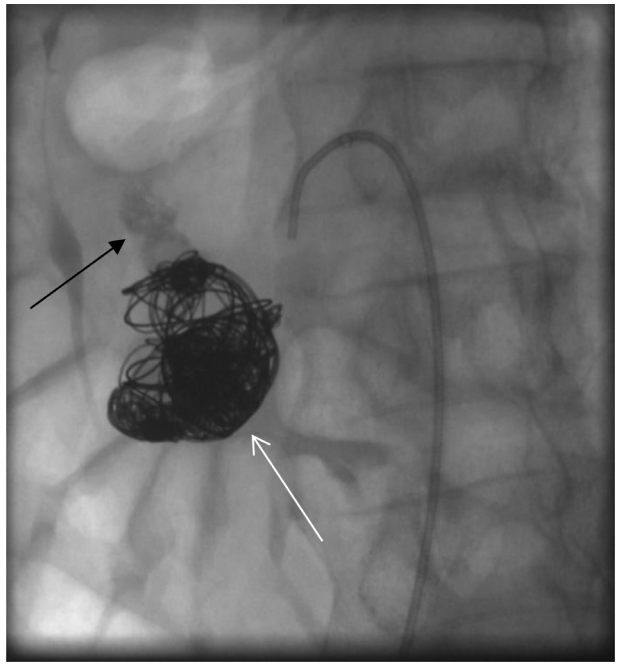

Fig. 4 – DSA. Filling of the pseudoaneurysm with packing coil (white arrow). Extravasation of contrast medium for pseudoaneurysm rupture (black arrow).

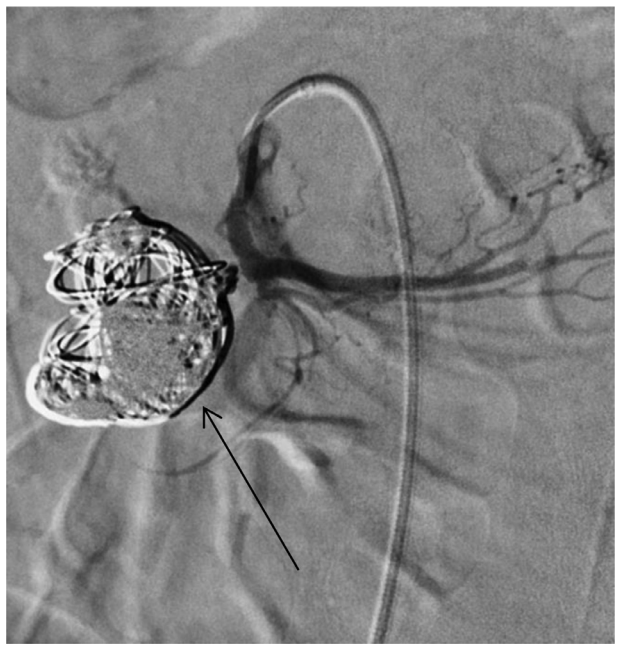

Fig. 5 – DSA. Exclusion of the pseudoaneurysm from the arterial circulation (arrow).

ranging from 25% to 70%, depending upon the diameter and the location of the pseudoaneurysm [15].

The diagnosis of VAPs relies on CT angiography and on digital angiography, that remains the gold standard [2]. The therapy of VAPs can be surgical (arterial bypass, exclusion of the aneurysmal sac, vessel ligature), percutaneous (thrombin in-

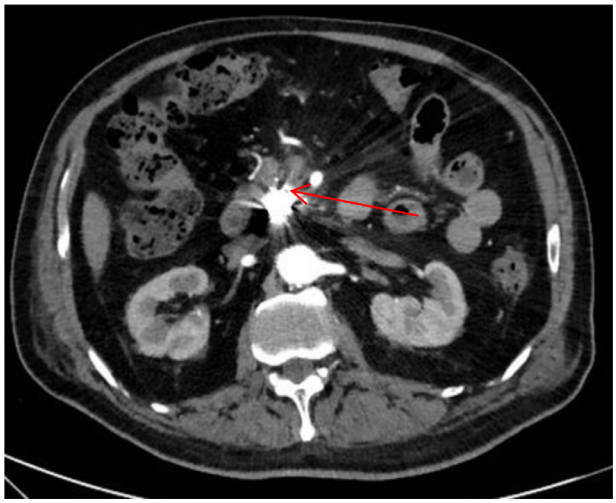

Fig. 6 – Axial contrast enhancement CT. No evidence of the pseudoaneurysm in the pancreatic region (arrow).

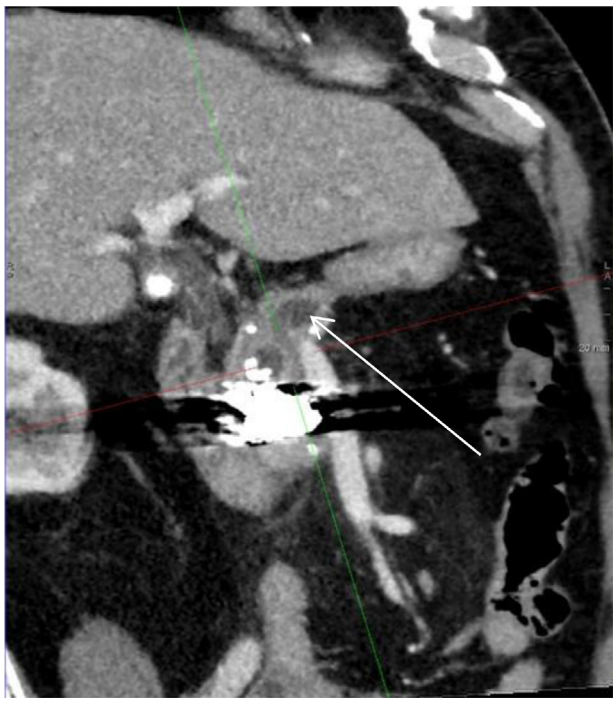

Fig. 7 – Coronal contrast-enhanced CT. Reduction of the pancreatic duct dilation (arrow).

jection), or endovascular, with this latter being the treatment of choice [2]. The main aim of radiological intervention is excluding the pseudoaneurysm from systemic circulation. This can be achieved by placing coils within the pseudoaneurysm ("sack packing", for saccular pseudoaneurysms), within the afferent and efferent arteries ("sandwich technique", for pseudoaneurysms with collateral inflow vessels), or within the afferent artery only (proximal occlusion, for end arteries); using embolization with glue; or placing stent grafts (in larger arteries, for pseudoaneurysms with wide neck) [13]. Complications of endovascular treatment include rupture of the pseudoaneurysm, arterial dissection, non-target embolization, visceral ischemia, and migration or straight deployment of coil [13].

We believe that our case is interesting. Indeed, the digiunal arteries are an unusual site of splancnic pseudoaneurysms [6]. In addition, the rupture and bleeding of the pseudoaneurysm in the pancreatic duct was rarely reported [3,9].

Patient consent statement

A written informed consent for the publication of this case has been obtained from the patient.

Authors' contributions

Bova C, De Bartolo T, Verta M: Conception and design of study. Bova C: drafting the manuscript. All authors read and approved the final manuscript.

REFERENCES

[1] Cordova AC, Sumpio BE. Visceral artery aneurysms and pseudoaneurysms-should they all be managed by endovascular techniques? Ann Vasc Dis Vol. 2013;6(4):687–93.

[2] Abdelgabar A, d'Archambeau O, Maes J, Van den Brande F, Cools P, Rutsaert R. Visceral artery pseudoaneurysms: two case reports and a review of the literature. J Med Case Rep. 2017;11(1):126.

[3] Volpi MA, Voliovici E, Pinato F, Sciuto F, Figoli L, Diamant M, Perrone LR. Pseudoaneurysm of the gastroduodenal artery secondary to chronic pancreatitis. Ann Vasc Surg 2010;24:1136 e1137-1111.

[4] Shawky MS, Tan J, French R. Gastroduodenal artery aneurysm: a case report and concise review of literature. Ann Vasc Dis 2015;8:331–3.

[5] Huang YK, Hsieh HC, Tsai FC, Chang SH, Lu MS, Ko PJ. Visceral artery aneurysm: risk factor analysis and therapeutic opinion. Eur J Vasc Endovasc Surg 2007;33:293–301.

[6] Stanley JC, Wakefield TW, Graham LM, Whitehouse WM Jr, Zelenock GB, Lindenauer SM. Clinical importance and management of splanchnic artery aneurysms. J Vasc Surg 1986;3:836–40.

[7] Sagar S, Soundarajan R, Gupta P, Kumar PM, Samanta J, Sharma V, et al. Efficacy of endovascular embolization of arterial pseudoaneurysms in pancreatitis: a systematic review and meta-analysis. Pancreatology 2021;21(1):46–58.

[8] Vujasinovic M, Dugic A, Nouri A, Brismar TB, Baldaque-Silva F, Asplund E, et al. Vascular complications in patients with chronic pancreatitis. J Clin Med 2021;10:3720.

[9] Bender JS, Levison MA. Pseudoaneurysm of the gastroduodenal artery arising within a pancreatic pseudocyst. Ann Vasc Surg 1992;6:171–2.

[10] Ikeda O, Tamura Y, Nakasone Y, Iryou Y, Yamashita Y. Nonoperative management of unruptured visceral artery aneurysms: treatment by transcatheter coil embolization. J Vasc Surg 2008;47:1212–19.

[11] Saad NE, Saad WE, Davies MG, Waldman DL, Fultz PJ, Rubens DJ. Pseudoaneurysms and the role of minimally invasive techniques in their management. Radiographics 2005;25(Suppl 1):S173–89.
[12] Lu M, Weiss C, Fishman EK, Johnson PT, Verde F. Review of visceral aneurysms and pseudoaneurysms. J Comput Assist Tomogr 2015;39:1–6.
[13] Madhusudhan KS, Venkatesh HA, Gamanagatti S, Garg P, Srivastava DN. Interventional radiology in the management of visceral artery pseudoaneurysms: a review of techniques and embolic materials. Korean J Radiol 2016;17(3):351–63.
[14] Pitton MB, Dappa E, Jungmann F, Kloeckner R, Schotten S, Wirth GM, et al. Visceral artery aneurysms: incidence, management, and outcome analysis in a tertiary care center over one decade. Eur Radiol 2015;25:2004–14.
[15] Ferrero E, Viazzo A, Ferri M, Robaldo A, Piazza S, Berardi G, et al. Management and urgent repair of ruptured visceral artery aneurysms. Ann Vasc Surg 2011;25:981 e987–911.