



## Case Report

# An Unusual Case of Pancreatic Arteriovenous Malformation with Hemobilia

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**Citation:** Chen TJ, Tsai YF, Chen LK, Peng HL (2023) An Unusual Case of Pancreatic Arteriovenous Malformation with Hemobilia. Ann Case Report. 8: 1342. DOI:10.29011/2574-7754.101342

**Received:** 07 June 2023, **Accepted:** 12 June 2023, **Published:** 14 June 2023

### Abstract

We present a patient with pancreatic arteriovenous malformation (AVM), which was manifested by hemobilia. Diagnosed by multimodality approach, including ultrasonography (US), computed tomography scan (CT), and conventional catheter-based angiography. Treatment via transcatheter arterial embolization of the lesion, using coil and n-butyl-2-cyanoacrylate.

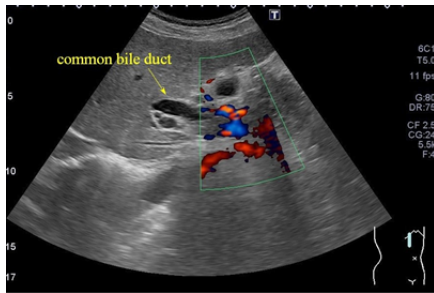
### Introduction

Arteriovenous malformations involving digestive organs are rare. Pancreatic AVM is an infrequent entity. Only 0.9% of all GI vascular malformations are in the pancreas [1]. The detailed clinical presentations and high rupture incidence make diagnosing and treating difficult. We report a case of pancreatic AVM presenting as hemobilia that was diagnosed with multimodality imaging and treated with transcatheter arterial embolization (TAE).

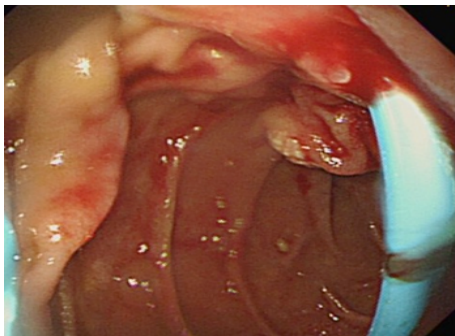
### Case Presentation

The patient is a 55-year-old male, non-alcoholic, history of hypertension. His Initial presentation has been associated with intermittent epigastric pain in recent days. Laboratory values showed elevated gamma-GT, alkaline P-tase, direct bilirubin, and leucocytosis. Biliary obstruction is likely. Abdominal gray-scale US showed dilated intra-hepatic and extra-hepatic bile ducts. Colour Doppler US revealed turbulent flow vascular structure at the pancreatic head surrounding the dilated common bile duct. Contrast-enhanced CT showed serpiginous early enhancing hyper vascular structures in the pancreatic head, encasing the distal common bile duct. Under the impression of cholangitis, endoscopic retrograde cholangiopancreatography (ERCP) was arranged for CBD stone retrieval and plastic biliary stent placement. His symptoms subsided after the procedure, and

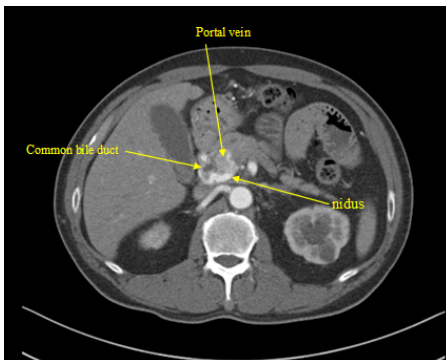
he was discharged. However, he had the recurrent symptom of abdominal pain after 2 weeks, which was suspicious to be due to bile duct obstruction. Pan endoscopy was performed, which showed intermittent active bleeding from the ampulla of Vater. Emergent DSA angiography was performed for therapeutic reasons. Angiography confirmed that the hypervascular lesion in the pancreatic head is an arteriovenous malformation. Numerous feeding arteries arose from branches of the gastroduodenal artery, superior mesenteric artery, hepatic artery proper, cystic artery, and right inferior phrenic artery. The drainage vein is the portal vein. The nidus on the posterior pancreaticoduodenal arcade was noted as the bleeder. Selective transarterial embolization was performed. To stop the bleeding, two microcoils were deployed in the posterior inferior pancreaticoduodenal artery and posterior superior pancreaticoduodenal artery at two ends of the posterior pancreaticoduodenal arcade. Therefore, the blood flow to the posterior pancreaticoduodenal arcade was blocked. To treat the pancreatic AVM. We cannulated to one branch of the dorsal pancreatic artery, which was one of the feeding arteries of pancreatic AVM. Embolization was achieved using n-butyl-2-cyanoacrylate. After the embolization, laboratory tests performed in the 24 h following the TAE showed that the blood hemoglobin level gradually recovered. The patient recovered uneventfully and was discharged (Figures 1-6).



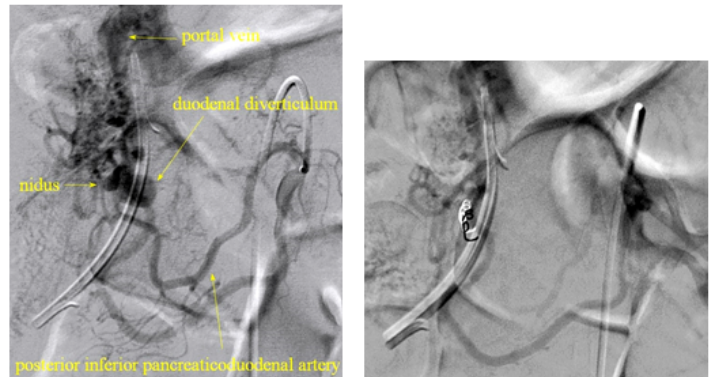
**Figure 1:** Colour Doppler transabdominal ultrasound sagittal view demonstrates dilated bile ducts with a turbulent multidirectional flow vascular structure surrounding the distal common bile duct.



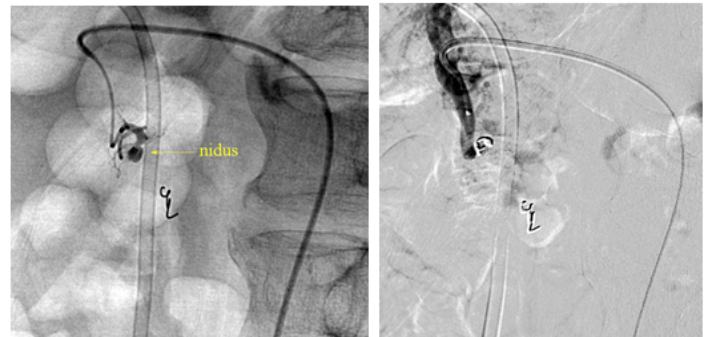
**Figure 2:** Panendoscopy showed active bleeding from the ampulla of Vater.



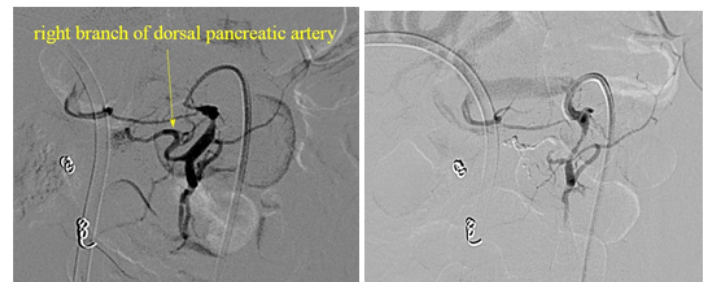
**Figure 3:** Axial contrast-enhanced CT in the arterial phase shows a serpiginous hypervascular structure with focal fusiform dilatation (nidus) in the pancreatic head, surrounding the portal vein and CBD, associated with early enhancement of the portal vein.



**Figure 4:** 4a. Initial angiography of the inferior pancreaticoduodenal artery revealed: An aneurysmal nidus on the pancreaticoduodenal arcade with active contrast extravasation and pooling in a juxtapapillary duodenal diverticulum. 4b. Transarterial embolization through the posterior inferior pancreaticoduodenal artery by coil.



**Figure 5:** 5a & 5b. Another coil was placed in the posterior superior pancreaticoduodenal artery, proximal to the nidus.



**Figure 6:** 6a. Another feeding artery arises from the right branch of the dorsal pancreatic artery. 6b. We embolized the feeder with n-butyl-cyanoacrylate.

## Discussion

Pancreatic AVM was first reported by Halpern et al. in 1968 [2], defined as an abnormal vascular net arising from an aberrant bypass anastomosis of the arterial and venous systems in the pancreas. Patients with pancreatic AVM are generally asymptomatic. The most commonly associated complications of pancreatic AVM were bleeding, followed by pancreatitis, portal hypertension, and pancreatic pseudocyst [3]. Pancreatic AVM is an infrequent cause of hemobilia. In our case, the leading cause of the patient's hemobilia was the erosion of the bile ducts by biliary stents. The most common causes of pancreatic AVM-related GI bleeding include duodenal bleeding and portal hypertension-induced variceal bleeding [4]. Diagnosis of pancreatic AVM is usually made by imaging, including color Doppler US, contrast-enhanced CT, MRI, and catheter angiography. The most common differential consideration would include vascular tumors and chronic pancreatitis. The treatment methods for p AVM are surgery (57.1%); nonsurgical therapy, including embolization, irradiation, or a portovenous shunt (14.3%); and no treatment (28.6%) [5]. Surgery is the only way to ensure a complete cure and eliminate the possibility of recurrent bleeding. However, excision of the pancreatic head is a highly invasive procedure that carries a high risk of complications. Transarterial embolization is an excellent alternative treatment for controlling hemorrhage from various bleeding foci in cases of AVM [6]. In our case, there were numerous feeders, and it was impossible to embolize all the fine feeders. TAE could temporarily control the bleeding, but repeated hemorrhage may occur.

## Conclusion

Pancreatic AVMs often require aggressive management if GI bleeding occurs. Imaging plays a crucial role in diagnosis and monitoring. Transarterial embolization can be a safe and effective treatment for stopping bleeding from pancreatic AVM.

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