



PANCREATIC PSEUDOLESIONS: watch out for the traps!



Paulo G. M. Lopes, Fernanda G. Velloni, Roberto Blasbalg Sao Paulo, Brazil

BACKGROUND

The complex anatomic relationship of the pancreas with adjacent structures, as well as its wide range of anatomical variations of this organ, can lead to doubts of diagnostic interpretation with consequent generation of exams and subsequent procedures, sometimes with questionable indication.

The purpose of this study was to exemplify some of these situations, highlighting the clinical relevance, the radiological aspects and the therapeutic implications related to them.

LEARNING OBJECTIVES

To exemplify situations in which pancreatic anatomical variants or peripancreatic lesions can be misinterpreted;

To highlight the radiological aspects of these most commons situations and their therapeutics implications.

To demonstrate that the knowledge of their main imaging findings may avoid misdiagnosis and impact the conduction of the case. **IMAGING FINDINGS**

ANATOMICAL VARIATION

ACCESSORY PANCREAS

PANCREAS DIVISUM

ANNULAR PANCREAS

CIRCUMPORTAL PANCREAS

BIFID TAIL OF THE PANCREAS

INTRAPANCREATIC FAT / PANCREATIC LIPOMA

INTRAPANCREATIC SPLEEN



CT axial arterial phase

CT axial venous phase

CASE 1. Hypervascular nodule adjacent to the gastric antrum (arrows in A and B) showing lobulated contours and presenting the same enhancement pattern of the pancreas. This nodule is compatible with ACCESSORY PANCREAS. In this case it can mimic an exophytic gastric lesion.





MR axial T2-weighted

MR axial arterial phase

MR coronal venous phase

CASE 2. Patient with a history of duodenal submucosal lesion characterized in a previous endoscopic study. In the subsequent MR evaluation, it is noted that the nodule adjacent to the duodenum (arrows in A, B and C) shows lobulated contours and presents the same enhancement pattern of the pancreas compatible with ACCESSORY PANCREAS.





MR coronal T2-weighted

MR coronal T2-weighted

MR axial T2-weighted

CASE 3. Diffuse main duct dilatation in a **PANCREAS DIVISUM** (arrow in A). Note the main pancreatic duct draining into the minor papilla, without communicating with the ventral or bile ducts (arrow in B). Pathological study confirmed intraductal papillary mucinous neoplasm (IPMN) of the main pancreatic duct. The ventral parenchyma was atrophied (arrow in C) and the normal dorsal pancreatic parenchyma (arrowhead in A) may mimic a pancreatic lesion.



MR axial arterial phase

MR axial diffusion-weighted

MR coronal T2-weighted

CASE 4. Completely encasement of the duodenum by the pancreatic tissue (arrow in A and B). The axial images can mimic a pancreatic lesion. Coronal T2 image shows the duodenum encased by the pancreas tissue (arrow in C), compatible with an ANNULAR PANCREAS.





CT axial arterial phase

CT axial venous phase

CT coronal venous phase

CASE 5. Completely encasement of the portal vein by the pancreatic tissue (arrow in A and B). Coronal reformatted shows the portal vein encased by the pancreas tissue (arrow in C), compatible with a CIRCUMPORTAL PANCREAS.



CASE 6. Note the bifurcated pancreas tail with dorsal bud (arrow) and ventral bud (arrowhead), compatible with BIFID TAIL OF THE PANCREAS (pâncreas bifidum).



CT axial pre contrast





MR axial T2-weighted

MR axial fat-suppressed T1 weighted

MR axial T1 weighted out-of-phase

CASE 7. Nodule in the uncinate process of the pancreas showing high signal intensity on non fatsuppressed (A and C) and low signal intensity on fat-suppresed (B) sequences. The surrounding chemical shift artifact (C) confirms a fat-containing lesion, compatible with INTRAPANCREATIC FAT.





MR coronal T2-weighted

MR axial fat-suppressed T1 weighted

MR axial water-suppressed T1 weighted

CASE 8. Nodule in the uncinate process of the pancreas head (arrow in A, B and C), with T2high signal intensity (A) low signal intensity on fat-suppresed T1 (B) and high signal on watersuppressed sequence (C), compatible with a INTRAPANCREATIC FAT / PANCREATIC LIPOMA.





MR axial T2-weighted

MR axial diffusion-weighted

MR axial arterial phase

CASE 9. Nodule in the pancreas tail with T2-intermediate signal intensity (arrow in A) showing diffusion restriction (arrow in B) and mimicking a neuroendocrine tumur. The inhomogenous enhancement (similar to splenic pattern of enhancement - arrow in C) is the key point to confirm the diagnosis of INTRAPANCREATIC SPLEEN.



VASCULAR DISORDERS

SPLENIC ARTERY ANEURYSM

VEIN ANEURYSM

CAVERNOMATOUS TRANSFORMATION

VENOLYMPHATIC MALFORMATION



CASE 10. T2-low signal intensity round image (arrow in A) showing intense contrast enhancement (arrow in B) and communication with the splenic artery (arrow in C). The marked T2-low signal intensity represents flow void artifact of a SPLENIC ARTERY ANEURYSM. The intense postcontrast enhancement can mimic a neuroendocrine tumor.

MR axial arterial phase

MR coronal venous phase





CT Axial pre-contrast

Ct axial venous phase

CT coronal venous phase

CASE 11. Enlargement of the pancreas head (arrow in A) mimicking a pancreatic lesion. The venous phase CT imagens shows an **ANEURYSM OF THE CONFLUENCE OF THE SUPERIOR MESENTERIC AND SPLEEN VEINS** (arrows in B and C).





CT axial venous phase

CT coronal venous phase

CT axial venous phase

CASE 12. Numerous tortuous venous channels surrouning the pancreas which can mimic multiple pancreatic hypervascular nodules (* in A) or vascular malformation (* in B). Note a large collateral vein draining into left portal vein (arrow in C). These findings are compatible with chronic thrombosis of portal, superior mesenteric and spleen veins with **EXUBERANT CAVERNOMATOUS TRANSFORMATION**.



PANCREAS

Axial US image

MR coronal venous phase

MR coronal T2-weighted

CASE 13. Multicystic retroperitoneal lesion seen in ultrasound mimicking a pancreatic lesion (thin white arrow in A). The MR images confirmed **EXTRAPANCREATIC RETROPERITONEAL VENOLYMPHATIC MALFORMATION** involving retroperitoneal vessels (white arrows) and normal pancreas (white arrowheads) in B and C. Note other venolymphatics malformations in spleen and vertebral bodies (black arrows in B and C), confirming the multisystemic affection.



ADJACENT STRUCTURES

CASTLEMAN'S DISEASE

METASTATIC LYMPH NODES

PERIPAPILLARY DUODENAL DIVERTICULUM

SPLENIC HEMANGIOMA

CHOLEDOCHOLITHIASIS

DUODENAL GASTROINTESTINAL STROMAL TUMOUR



MR coronal T2-weighted

MR axial arterial phase

MR coronal delayed phase

CASE 14. Nodule adjacent to the pancreas head (arrow in A, B and C), with T2intermediate signal intensity (A) and intense post-contrast enhancement (B). Pathological study confirmed lymphadenopathy related to **CASTLEMAN'S DISEASE**. This nodule can also mimic a neuroendocrine tumor.





CT axial venous phase

CT coronal venous phase

CT axial venous phase

CASE 15. Hypovascular heterogenous retroperitoneal mass (arrow in A and B), adjacent to the pancreas head and body. No pancreatic ductal dilatation is noted. Proeminent hepatic lesions (arrowhead in A, B and C) and retroperitoneal lymph nodes (black arrow in C) are also present. This patient has a medical history of colon neoplasm and thus the peripancreatic mass is compatible with METASTATIC LYMPH NODES. It can mimic a primary pancreatic adenocarcinoma.



CT Axial pre-contrast



CASE 16. Gas containing PERIPAPILLARY DUODENAL DIVERTICULUM (arrow in A, B and C) insinuating in the uncinate process of the pancreas, partially filled by the oral contrast media (B)



CT Axial pre-contrast

CT coronal venous phase



MR axial delayed phase

MR axial T1 weighted in-phase

CASE 17. Small lesion adjacent to the cephalic portion of the main pancreatic duct (arrow in A and B). The in-phase T1 weighted image shows gas-signal inside the lesion, compatible with **PERIPAPILLARY DUODENAL DIVERTICULUM**. It can mimic a pancreatic cyst.





CT axial arterial phase

MR axial arterial phase

MR axial T2-weighted

CASE 18. Hypervascular nodule in the splenic hilum (arrow in A and B), adjacent to the pancreas tail showing T2-high signal intensity (arrow in C) compatible with a **SPLENIC HEMANGIOMA**. This nodule can mimic an esophytic pancreatic neuroendocrine tumor.





CT Axial pre-contrast

CT coronal venous phase

3D MRI cholangiopancreatogram

CASE 19. Hyperdense nodule in the pancreas head (arrow in A and B) causing dilatation of the biliary tree. The MR cholangiopancreatography shows a filling defect chos (arrow in C), confirming the diagnosis of CHOLEDOCHOLITHIASIS.





CT sagittal venous phase

CT coronal venous phase

CT axial venous phase

CASE 20. Hypervascular heterogenous retroperitoneal mass (arrow in A, B and C), adjacent to the pancreas (arrowhead in A, B and C). Pathological study confirmed a **DUODENAL GASTROINTESTINAL STROMAL TUMOUR (GIST)**. The main differential diagnosis in this case is a pancreatic neuroendocrine tumor.



CONCLUSION

Imaging studies play a fundamental role in evaluating the structures morphology and in detecting and characterizing intraabdominal lesions. The combined analysis of clinical, epidemiological, radiological and evolutionary aspects may help in the correct interpretation of "pancreatic pseudolesions", avoiding unnecessary examinations and procedures.

Grupo

