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Pancreatico-Gastric Fistula Complicating Intraductal Papillary Mucinous Neoplasm: A Multimodal Imaging Case Report

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Abstract **Case Report**

Intraductal papillary mucinous neoplasms (IPMNs) are cystic pancreatic tumors with malignant potential. Fistulization into adjacent organs, including the stomach, is a rare but recognized complication. Imaging plays a pivotal role in diagnosis and management. We report a 52-year-old patient presenting with chronic epigastric pain and unremarkable laboratory findings. Computed tomography (CT) revealed a multiloculated cystic lesion in the pancreatic head. Magnetic resonance cholangiopancreatography (MRCP) demonstrated a multilocular lesion communicating with a dilated main pancreatic duct. A fistulous tract connecting the lesion to the gastric lumen was identified as well as on ultrasound. This case highlights the crucial role of multimodal imaging in diagnosing IPMN complicated by pancreatico-gastric fistula. Recognition of imaging patterns is essential for early detection and appropriate management.

Keywords: IPMN, Pancreatic cystic tumor, Pancreatico-gastric fistula, CT, MRCP, Ultrasound.

INTRODUCTION

Intraductal papillary mucinous neoplasms (IPMNs) of the pancreas are mucin-producing epithelial tumors characterized by cystic dilatation of the pancreatic ducts, with different degrees of dysplasia ranging from low-grade, high-grade to invasive carcinoma [1-3]. These lesions are classified depending on the duct involved into: main duct (MD), branch duct (BD), and mixed type [4-5].

Although IPMNs are frequently asymptomatic and incidentally identified, they may present with non-specific symptoms such as abdominal pain, episodic pancreatitis, jaundice, or weight loss [1-6-7].

One of the rare but significant complications of IPMN is fistulization into adjacent organs, including the stomach, duodenum, bile ducts and colon [1,4]. The prevalence of fistula formation ranges from approximately 1.9% to 6.6% [2-4-8].

Imaging modalities such as computed tomography (CT), magnetic resonance cholangiopancreatography (MRCP), and endoscopic ultrasound (EUS) are essential for diagnosis, characterization, and management planning [1-5].

Herein, we report a case of IPMN complicated by pancreatico-gastric fistula with a particular enhance on multimodal imaging findings.

CASE REPORT

A 52-year-old patient presented with chronic epigastric discomfort and pain with no significant history of smoking or alcohol use. Physical examination showed epigastric tenderness to superficial and deep palpation. Basic laboratory investigations were within normal limits.

An abdominal CT scan served as the initial diagnostic modality, revealing a multiloculated cystic mass located in the pancreatic head associated with main pancreatic duct dilatation, prompting further evaluation with MRI. In addition, we noted an intraluminal thrombus within the portal vein. (Figure 1).

MRCP demonstrated a 68 mm multilocular lesion involving the pancreatic head that appeared heterogeneously hypointense on T1-weighted images and markedly hyperintense on T2-weighted images. No significant enhancement was identified after gadolinium administration, and no diffusion restriction was demonstrated. This lesion was communicating with the main pancreatic duct (Wirsung) which was dilatated

measuring 7,1 mm as well as several adjacent secondary branch ducts. Additionally, a fistulous tract was identified toward the posterior gastric wall. The rest of the corporeo-caudal pancreatic parenchyma appeared moderately atrophic. (Figure 2).

An abdominal ultrasound confirmed the presence of the fistula by visualizing communication between the cystic lesion and the stomach. (Figure 3).

These findings were consistent with mixed type IPMN complicated by pancreatico-gastric fistula.

After a multidisciplinary discussion, surgical treatment was proposed. The patient underwent total pancreatectomy with wedge resection of the stomach including the fistula. Histopathological study confirmed the diagnosis of mixed type IPMN. Carcinoma cells were not identified.

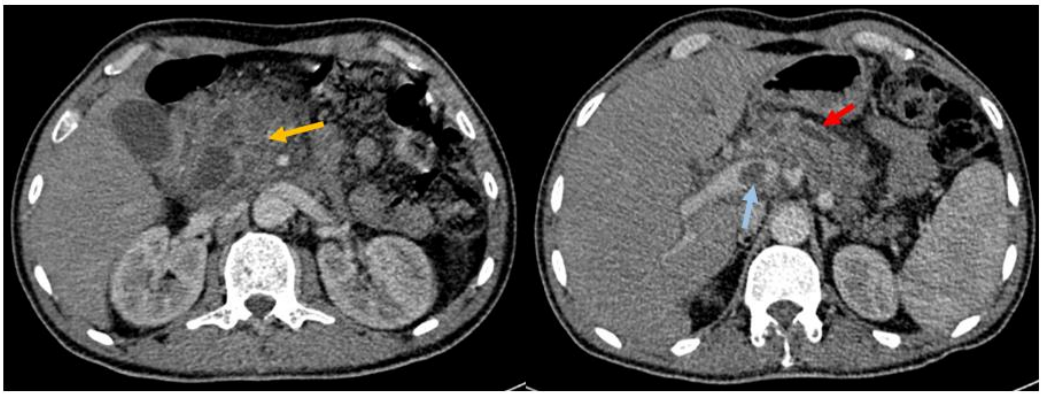

Figure 1: Axial abdominal CT scan revealing a multiloculated cystic mass located in the pancreatic head (yellow arrow) associated with main pancreatic duct dilatation (red arrow) and thrombosis of the portal vein (blue head arrow)

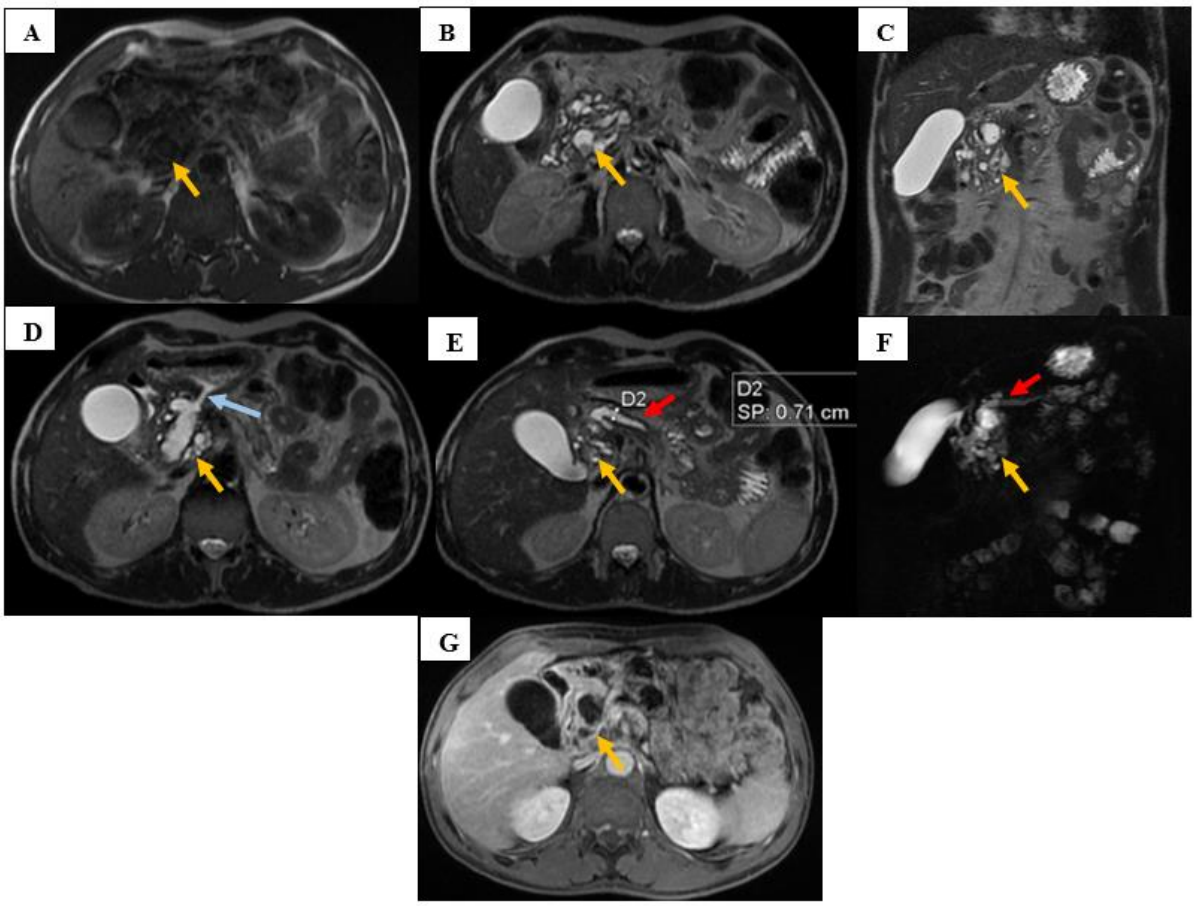

Figure 2: MRCP demonstrating a multilocular lesion involving the pancreatic (yellow arrow) appearing heterogeneously hypointense on T1 (A), markedly hyperintense on T2-weighted images (B, C, D, E) communicating with the main pancreatic duct (red arrows) which was dilatated (E, F), and with the posterior gastric wall through a fistulous tract (D) (blue arrow). No significant enhancement was identified after gadolinium administration (G)

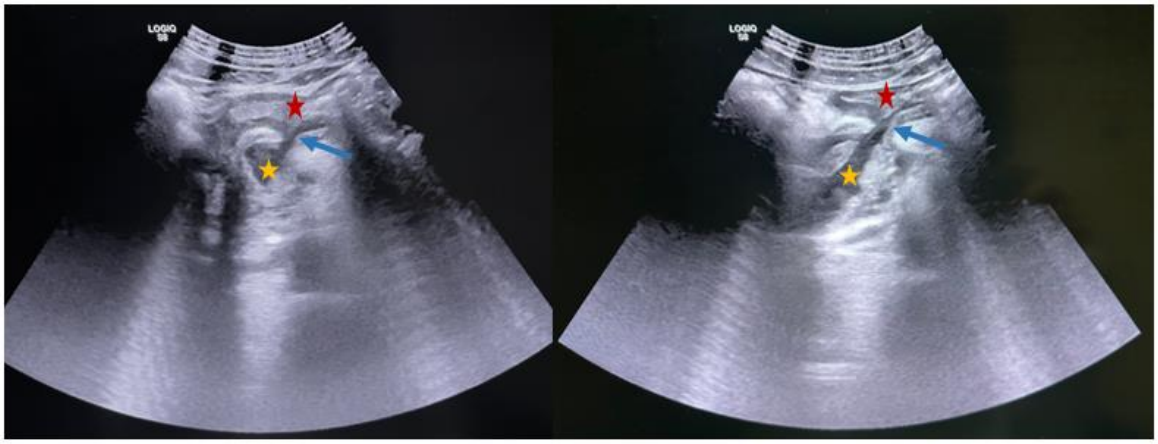

Figure 3: Abdominal ultrasound confirming the presence of the fistula (blue arrows) by visualizing communication between the cystic lesion (yellow asterisk) and the stomach (red asterisk)

DISCUSSION

IPMN is a pancreatic exocrine tumor that was first described in 1982 by Ohashi as a mucin-producing tumor (5,9,10). It is characterized by papillary growth with thick mucin secretion leading to dilatation of the involved pancreatic duct [6].

Its incidence has gradually increased due to improved diagnostic and imaging techniques [1-11].

The majority are usually diagnosed in the 6th-7th decade in patients presenting some risk factors such as diabetes, smoking, chronic pancreatitis and family history of pancreatic ductal adenocarcinoma [6].

Anatomically, IPMNs are classified into three types: main duct (MD), branch duct (BD) and mixed type [6]. MD-IPMN is defined as IPMN with partial or diffuse dilatation of the main pancreatic duct exceeding 5 mm in the absence of other obstructive causes; This type is more likely to harbor a malignancy than a branch duct type [1-2-12]. BD-IPMN is characterized by the presence of pancreatic cysts, sometimes showing as grape-like clusters of cysts, communicating with the main pancreatic duct that is not dilated. Mixed type meets the criteria for both MD-PMN and BD-IPMN [2-11].

Histologically, based on mucin expression profiles, IPMNs can be further classified as intestinal, pancreatobiliary, gastric and oncocytic subtypes [4].

An infrequent occurrence is the fistulization into adjacent organs such as the stomach, duodenum, bile duct, colon, and small intestine [2-6-12]. All adjacent organs may be affected [13] and multiple fistulas may occur in the same patient [1-4-5].

Fistula formation may occur from two main mechanisms that may coexist: direct tumor invasion in malignant cases, or mechanical rupture due to high intraductal pressure from mucin accumulation [8-10-13]. The chronic inflammatory pattern of the pancreatic tissue may also contribute to the formation of fistulas [9].

Several radiological imaging methods such as CT and MRCP have been reported not only in diagnosing IPMN, but also in classifying and detecting complications [5].

The duct/cyst content appears hypodense in both unenhanced and after intravenous contrast administration in CT images; While it is of high signal intensity in T2-weighted images and low signal intensity in T1-weighted images. [11]

Enhanced mural nodules, thickened/enhancing cyst wall, main pancreatic duct ≥10 mm are classified as high-risk stigmata features of malignancy [9-11-13].

MRCP is considered the best non-invasive modality for evaluating ductal communication, classifying IPMN, and visualizing fistulas (4). When a fistula is highlighted, the role of the radiologist is to provide accurate cartography of the number of fistulas and their exact location. The use of multiplanar reformations is essential in this context [13].

Although less commonly reported, ultrasound may provide dynamic confirmation of fistulous communication, such in our case.

To increase the diagnostic yield of IPMN, a biopsy via an endoscopic ultrasound (EUS) guided through-the-needle biopsy has been helpful in certain cases [5].

Overall, AbuDalu et al. highlight that combined CT, MRCP and EUS significantly increases diagnostic accuracy.

Differential diagnoses include serous cystic neoplasm, mucinous cystic neoplasm, pancreatic intraepithelial neoplasia, pseudocysts, and large duct

type pancreatic ductal adenocarcinoma [3]. The differentiation is based on the proof of communication of the cystic lesion with the main pancreatic duct, best identified via MRCP examination [11].

Surgical management with extended resection remains the mainstay of curative treatment [7-8].

CONCLUSION

Pancreatico-gastric fistula is an uncommon complication of IPMN that may indicate advanced disease or increased intraductal pressure.

Multimodal imaging, particularly CT and MRCP, are the most effective tools and play a central role by demonstrating ductal communication and fistula formation.

Radiologists have an increasing role in the chain of patient management as each case requires a tailored approach and personalized treatment.

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