

Reverse Pancreatic Divisum with Aberrant Communication

Samanyu Handa¹, Diksha Goyal², Pankaj Sharma^{3*} and Itish Patnaik⁴

¹Junior Resident, Department of Radiodiagnosis, All India Institute of Medical Sciences, India

²Senior Resident, Department of Radiodiagnosis, All India Institute of Medical Sciences, India

³Additional Professor, Department of Radiodiagnosis, All India Institute of Medical Sciences, India

⁴Associate Professor, Department of Gastroenterology, All India Institute of Medical Sciences, India

***Corresponding author:** Pankaj Sharma, Additional Professor, Department of Radiodiagnosis, All India Institute of Medical Sciences, Rishikesh, India; Email : pankajrad7477@yahoo.com

Received Date: March 11, 2025; **Published Date:** April 25, 2025

Abstract

Pancreas divisum is a common variation of pancreatic duct anomaly, in which dorsal pancreatic duct drains through the minor papilla, while ventral pancreatic duct drains through major papilla. Reverse variant however is a rare entity, in which dorsal duct drains through major papilla with CBD; while accessory pancreatic duct drains through minor papilla. This is case of reverse variant of pancreas divisum with aberrant communication, a rare pancreatic ductal anomaly associated with recurrent acute pancreatitis.

Keywords: Pancreatic Ductal Anomaly; Recurrent Acute Pancreatitis; Pancreaticobiliary

Introduction

Pancreatic duct anomaly is one of etiology of chronic pancreatitis. Variations and anomalies of pancreatic and biliary ductal system, are usually diagnosed during radiologic examination. MRCP is a safe, non-invasive investigation which can suggest ductal alteration and anatomical variation. More number of pancreatic ductal anomalies are now being encountered due to increased availability of MR imaging. The Cambridge classification [1], which was initially developed for ERCP, has been suggested for use in CT and MRI, or MRCP interpretation by recent guidelines of the American Pancreatic Association [2]. Pancreas divisum is a common variation of pancreatic duct formation with an estimated prevalence of 6-10% in the general population³. It results from abnormal fusion of ventral and dorsal ductal pancreatic anlagen, leading to an isolated dorsal ductal unit draining the pancreatic tail, body and part of head through minor papilla, and an isolated ventral ductal unit draining part of head and uncinate process through the major papilla. Reverse variant is a rare entity, in which an isolated dorsal

duct drains through major papilla, with ductus choledochus, and accessory duct of Santorini drains through minor papilla [3-5]. Our case can be considered as a variant of reverse pancreas divisum in which there is an anomalous connection between the dorsal and ventral pancreatic duct systems. Knowledge of various common and uncommon presentation of pancreaticobiliary anomaly should be borne in mind, while thoroughly evaluating for chronic pancreatitis.

Case Presentation

A 14-year-old boy presented with complaint of persistent pancreatic type of abdominal pain for last 1 week, with elevated amylase and lipase levels, with history of recurrent acute pancreatitis. He was managed conservatively during previous episodes of acute pancreatitis, and he had no significant family history. The patient underwent ultrasonography and MRCP, followed by ERCP. Ultrasound showed mildly prominent pancreatic duct, with no signs of cholelithiasis. MRCP showed an atrophic pancreas with a tortuous MPD, which was joining CBD and opening into major

papilla. An anomalous 'Y-shaped' accessory pancreatic duct was opening directly into the minor papilla an anomalous communication was present between the main and accessory pancreatic duct ERCP confirmed the radiological findings (Figure 1-3).

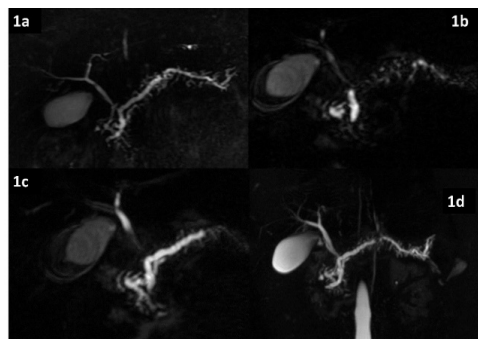


Figure 1: (1a) Coronal MR Cholangiopancreatography image showing tortuous and prominent main pancreatic duct with prominent side branches. (1b) MRCP MIP reconstruction showing dilated dorsal pancreatic duct and Y shaped anomalous ventral pancreatic duct. (1c) MRCP MIP reconstruction showing connection between dorsal pancreatic duct and Y shaped anomalous ventral pancreatic duct. (1d) MRCP MIP reconstruction showing the ductal anatomy in toto.

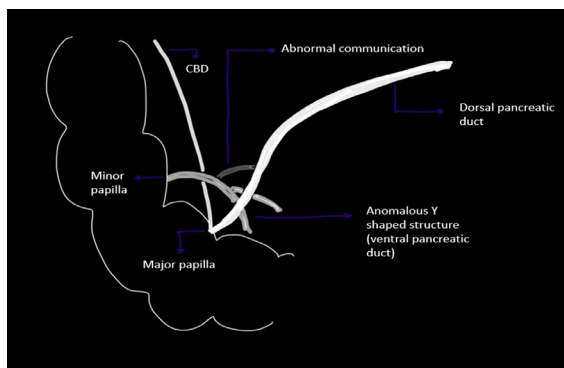


Figure 2: Schematic diagram.

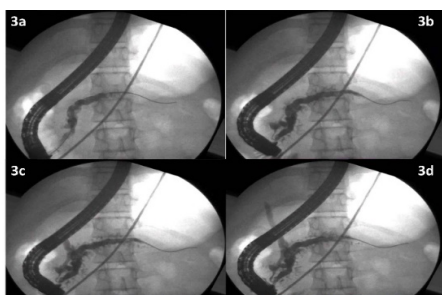


Figure 3 (a,b,c,d): ERCP findings confirm the MRCP findings.

Discussion

Pancreatic divisum is seen upto 4 to 14% of autopsy specimens [4]. In about 15% cases of Pancreatic divisum, we can see a small branch of ventral pancreatic duct communicating with dorsal pancreatic duct, and this is referred to as incomplete type of Pancreatic divisum [5]. The communicating branch in these cases is generally narrow and inadequate for draining pancreatic secretions, when pancreatic gland is stimulated. Reverse variant is a rare entity, in which an isolated dorsal duct drains through major papilla, with ductus choledochus, and accessory duct of Santorini drains through minor papilla. The clinical implications of incomplete and complete pancreas divisum are the same. However, endoscopist should take this into account when cannulating minor papilla, with purpose to visualize the pancreas. Symptoms likely occur in these cases because the minor papilla orifice is inadequate to drain pancreatic juice during active secretion, resulting in persistent or recurrent pancreatic intraductal hypertension. Inability to drain pancreatic juice may worsen in presence of minor papilla sphincter dysfunction or stenosis. A stenotic minor papilla may also lead to a Santorinicele, a cystic dilation of terminal portion of accessory duct of Santorini, that may occur particularly when minor papilla is located within a diverticulum.

Conclusion

Knowledge of various common and uncommon presentations of pancreaticobiliary anomalies should be borne in mind, while evaluating for chronic pancreatitis.

Teaching Points

- Pancreatic duct anomaly, like Pancreatic divisum is one of etiology of chronic pancreatitis.
- Before doing ERCP, clinician should know pancreatic duct variants, especially if pancreatic secretion is draining through minor papilla.

MCQs

- Which pancreatic ductal pattern is seen in Type 2, according to Cambridge classification:

1. Bifid configuration with dominant duct of Wirsung.
2. Ansa Pancreatica.
3. Bifid configuration with dominant duct of Santorini without divisum.
4. Rudimentary non-draining duct of Santorini.

Answer: C

- Papillotomy can be accomplished by which technique:

1. Section by a pull-type standard sphincterotome or mini

papillotome, generally wire-guided.

2. Section by needle knife cut over a plastic stent placed into the dorsal duct.

3. Section by wire-assisted needle knife.

4. All of the above

Answer: D

Funding and Conflict of Interest

The authors declare that they have no conflict of interest and have not received any funding.

References

1. Adibelli ZH, Adatepe M, Imamoglu C, Esen OS, M Yildirim (2016) Anatomic variations of the pancreatic duct and their relevance with the Cambridge classification system: MRCP findings of 1158 consecutive patients. Radiol Oncol 50(4): 370-377.
2. Conwell DL, Lee LS, Yadav D, Longnecker DS (2024) American Pancreatic Association practice guidelines in chronic pancreatitis: evidence-based report on diagnostic guidelines. Pancreas 43(8): 1143-1162.
3. Gutta A, Fogel E, Sherman S (2019) Identification and Management of Pancreas Divisum. Expert Rev Gastroenterol Hepatol 13(11): 1089-1105.
4. Sharma S, Sureka B, Yadav T, Panda A (2024) The Varieties of Ignorance : Imaging of Congenital Variants of Pancreas and Its Ductal System - A Pictorial Review. Ind J Radiol Imag 34: 324-331.
5. Testoni S, Testoni PA (2020) Endoscopic Treatment of Pancreas Divisum: Facts and Unsettled Issues. Pancreat Disord Ther 10(3): 1-6.