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Case Report

Duplicated common bile duct with pancreatic adenocarcinoma

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ABSTRACT

A 42-year-old South Asian male presented to our hospital with anorexia, abdominal pain, and jaundice. Abdominal ultrasonography revealed a 3.5×3.5 cm hypoechoic solid mass in the pancreatic head with central necrosis, resulting in dilatation of the proximal common bile duct, main pancreatic duct, and intrahepatic biliary system. Magnetic resonance cholangiopancreatography (MRCP) confirmed the ultrasonographic findings and identified complete duplication of the biliary system with a mildly dilated duplicated common bile duct that exhibited pancreaticobiliary maljunction (PBM) with narrowing and was opening into the main pancreatic duct at the pancreatic body level. Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) of the pancreatic mass revealed adenocarcinoma. This case illustrates the rare occurrence of a duplicated common bile duct (DBCD) associated with a pancreatic head mass, underscoring the need for comprehensive imaging and a multidisciplinary approach in the management of complex hepatopancreatic biliary pathologies. This case also suggests a modification to the existing Choi classification of DBCD to include PBM anomalies. Further research is required to understand the long-term outcomes of these anatomical variations in pancreatic malignancies.

Keywords: Duplicated common bile duct, Pancreaticobiliary maljunction, MR cholangiopancreatogram

INTRODUCTION

Loss of appetite, abdominal pain, and yellowish discoloration of the eyes are a common clinical manifestation that often indicates underlying hepatobiliary or pancreatic pathologies. These symptoms, particularly when accompanied by jaundice, warrant thorough investigation, as they may be indicative of various conditions ranging from benign obstructive disorders to malignancies. Out of many causes a double common bile duct (DBCD)with obstruction is there rarest DBCD was first described 24 cases by Telium et al, in 1986 followed by Yamashita et al, in 2002.[1,2] This case report presents an unusual finding of a mass in the head of the pancreas associated with a duplicated common bile duct (DBCD), highlighting the rarity of the condition and the importance of comprehensive imaging studies in diagnosing complex anatomical variations and their association with potential malignancies of the hepatopancreatic biliary system.

CASE REPORT

A 42-year-old South Asian non-diabetic male presented to our hospital with complaints of loss of appetite, abdominal pain, and yellowish discoloration of the eyes. The patient reported a gradual onset of symptoms over the past few weeks, including noticeable decrease in appetite, persistent abdominal discomfort, and jaundice. He had no significant medical history and denied any recent travel or changes in diet or lifestyle.

Clinical findings

On physical examination, the patient appeared jaundiced with yellowish scleral discoloration. Abdominal

examination revealed mild tenderness in the right upper quadrant, without any palpable masses. The results of the remaining physical examination were unremarkable.

Timeline

Day 1: Initial presentation and physical examination. Day 2: Laboratory tests and ultrasound of the abdomen. Day 4: MR cholangiopancreatogram (MRCP). Day 7: Multidisciplinary team discussion and treatment planning laboratory investigations revealed altered liver function with elevated serum bilirubin (2.3 mg/dl and mildly increased transaminase levels. The serum amylase levels were within normal limits. Abdominal ultrasonography demonstrated a 3.5×3.5 cm hypoechoic solid mass at the head of the pancreas with central necrosis. The mass caused dilatation of the proximal common bile duct and main pancreatic duct, as well as intrahepatic biliary dilatation (Figure 1).

MRCP confirmed the ultrasound findings and additionally revealed a distended gallbladder. Notably, MRCP also identified complete duplication of the biliary system with a mildly dilated duplicated common bile duct with pancreaticobiliary maljunction (PBM) with narrowing and opening into the main pancreatic duct at the level of the body of the pancreas (Figure 2).

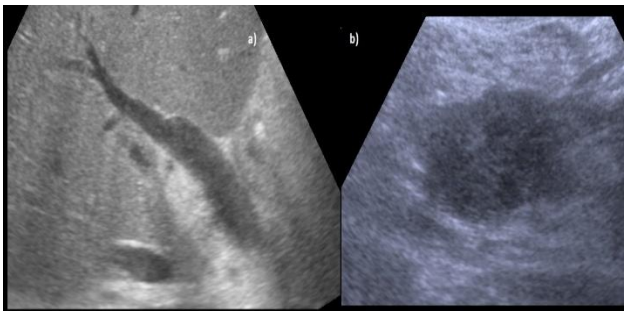

Figure 1: (a) Sonogram showing dilated common bile duct & (b) transverse showing hypoechoic mass lesion at head of pancreas.

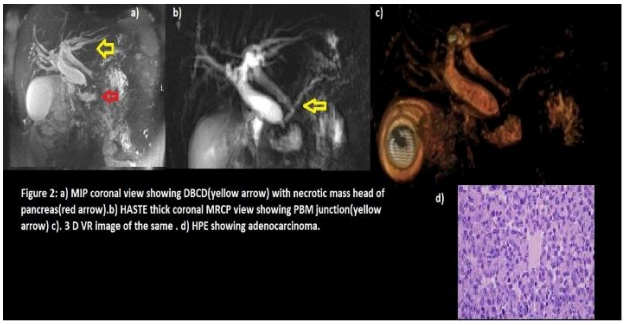

Figure 2: (a) MIP coronal view showing DBCD (yellow arrow) with necrotic mass head of pancreas (red arrow); (b) HASTE thick coronal MRCP view showing PBM junction (yellow arrow); (c) 3D VR image of the same; and (d) HPE showing adenocarcinoma.

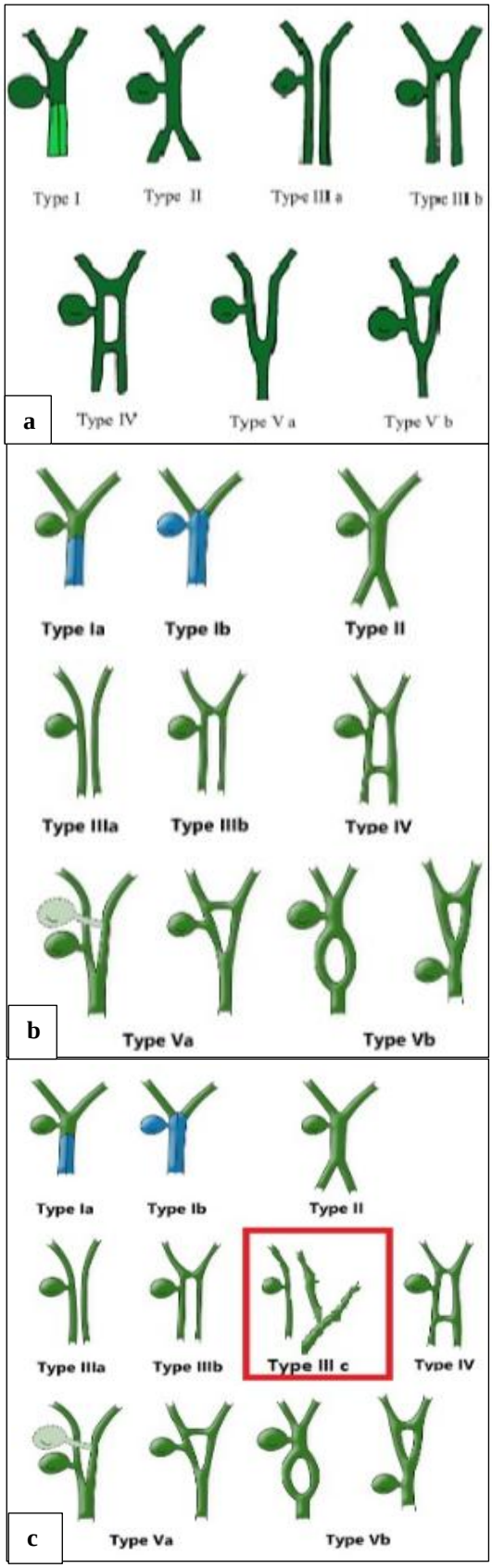

Figure 3: (a) Pictorial drawing of classification of DBCD by Choi et al; (b) modified Choi classification by Sheng et al; and (c) new modified Choi classification by Kapoor et al.

Therapeutic interventions

Given the complex anatomical findings and suspicion of pancreatic malignancy, the patient was referred to a hepatobiliary surgeon for further evaluation and management. A multidisciplinary team discussion was held to determine the most appropriate course of action, considering the unique anatomical variation of the duplicated common bile duct.

Follow-up and outcomes

The patient was scheduled for endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) of the pancreatic mass to obtain a tissue diagnosis, which revealed adenocarcinoma. Based on the results of the biopsy and further staging investigations, a tailored treatment plan could be developed, potentially including surgical resection, chemotherapy, and/or radiation therapy.

DISCUSSION

This is a rare case with a constellation of three findings that need to be discussed. A) Rare type of morphology of the anomaly B) Association with malignancy C) Implications of the combination of a pancreatic head mass and a duplicated common bile duct and poses diagnostic and therapeutic challenges.

Rare anomaly

Choi (3) described the classification for DBCD in 2007 as Choi Classification of Double Common Bile Duct (DCBD) into five types (Figure 3): Type I: Septum within the Common Bile Duct-This type involves a septum that partially (Type Ia) or completely (Type Ib) separates the lumen of the common bile duct. It is characterized by a single duct with an internal septum, rather than two separate ducts. Type II: bifurcation of the distal bile duct. In this type, the distal bile duct bifurcates into two independent drainage channels, leading to separate bile drainage pathways. Type III: double biliary drainage this type of drainage is characterized by double biliary drainage, which can occur without any communication between the ducts (Type IIIa) or with intrahepatic communication (Type IIIb). Type IV: double biliary drainage with extrahepatic communication. type V: single biliary drainage of duplicated ducts-Type Va-without communication and (Type Vb) with communication.

This classification system provides a comprehensive framework for understanding the variations in common bile duct duplication, aiding in diagnosis and treatment planning.

Later, three more types were added to the classification by Sheng et al, in 2022 and named the modified Choi classification (Figure 3).[4] Yamashita et al, pointed out that there was still a shortfall in this classification, as it does not mention the opening of the aberrant duct. Based on the findings of this case, we agree with Yamashita et al, that PBJ anomalies must be mentioned in the classification, and there is a need to further modify the Choi classification 2024 into three subtypes of type IIIa-b instead of only two, that is, type IIIa and IIIb with anomalous PMB.[2]

From a malignancy association point of view

The Yamashita et al, review of 47 cases of DCBD reported that 25.0 % of cases were associated with cancers, the incidence of which varied depending on the opening site of the accessory duct; however, they could not explicitly link DBCD to pancreatic cancer in this context.[2] Kamisawa et al, suggested that PBM leads to chronic inflammation-dysplasia carcinogenesis, leading to biliary malignancies.[5] The type of malignancies would depend on the site of drainage i.e., stomach, duodenum or pancreas. The most common malignancies are cholangiocarcinoma and adenocarcinoma. The literature review also explained that DBCD with the mass head of the pancreas in this case was not incidental. Mason et al, suggested that gallbladder and ampullary cancers only developed in patients with DCBD openings into the second portion of the duodenum, pancreatic duct and with concomitant anomalous pancreaticobiliary ductal union (APBDU).[6]

From management point of view

Duplicated common bile ducts are uncommon congenital anomalies that pose significant challenges in the diagnosis and management of hepatobiliary and pancreatic disorders.[7,8] The presence of such anatomical variations can complicate surgical planning and increase the risk of iatrogenic injury during the procedure.[9-11] There is not only an increased risk of bile duct injury in such patients, but also abandoning the procedure due to the complexity of the problems.[12] Another common complication observed in such patients is the increased incidence of stone formation due to biliary stasis.[13-15]

CONCLUSION

This case report highlights the importance of comprehensive imaging in patients presenting with obstructive jaundice and suspected pancreatic masses. The incidental finding of DBCD associated with a pancreatic head mass emphasizes the need for careful preoperative evaluation and a multidisciplinary approach in managing complex hepatopancreatic biliary pathologies. The finding in this case leads to a modification of the existing Choi classification of DBCD. However, further research is needed to understand the long-term outcomes of these anatomical variations in pancreatic malignancies.

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REFERENCES

1. Teilum D. Double common bile duct. Case report and review. Endoscopy. 1986;18(4):159-61.
2. Yamashita K, Oka Y, Urakami A, Iwamoto S, Tsunoda T, Eto T. Double common bile duct: a case report and a review of the Japanese literature. Surg. 2002;131(6):676681
3. Choi E, Byun JH, Park BJ, Lee MG. Duplication of the extrahepatic bile duct with anomalous union of the pancreaticobiliary ductal system was revealed using magnetic resonance cholangiopancreatography (MRI). Br J Radiol. 2007;80(955):150–4.
4. Sheng H, Chen G, Yang M, Guan H. A proposed feasible classification of common bile duct duplications based on a newly described variant and review of existing literature. BMC Pediatr. 2022;2(1):647.
5. Kamisawa T, Kikuyama M, Kuruma S, Koizumi S, Chiba, K., Tabata, T. Biliary carcinogenesis in pancreaticobiliary maljunctions. J Gastroenterol. 2016;52(2):158-63.
6. Mason R, Filipe I. The aetiology of gastric stump carcinoma in the rat. Scand J Gastroenterol. 1990;25(10):961-5.
7. Kosar I, Ataseven H, Yonem O, Cakmak E, Ozer O, Ozer H, et al. A new variant of bile duct duplication with coexistence of distal cholangiocarcinoma. Nat Rev Gastroenterol Hepatol. 2010;7(9):527–30.
8. Ono J, Akita H, Sakoda K. Surgical aspects of cystic dilatation of the bile duct. Annals of Surg. 1982;195(2):203–8.
9. Paraskevas G, Papaziogas B, Ioannidis O, Kitsoulis P, Spanidou S. Double Common bile duct: A case report. Acta Chir Belg. 2009;109(4):507–9.
10. Hoepfner L, Sweeney MK, White JA. Duplicated extrahepatic bile duct identified following cholecystectomy injury. J Surg Case Rep. 2016;4:64.
11. Arora A, Sureka B, Kasana V, Patidar Y, Bansal K. Common Bile Duct Duplication: murkier. Saudi J Gastroenterol. 2015;21(1):51–4.
12. Nuamah NM, Ibis C, Gok AFK, Ekiz F, Acunas B. Duplicated common bile duct: A recipe for biliary injury. Report of a new variant. J Surg Case Rep. 2017;2:12-8.
13. Fan XX, He LF, Khadaroo PA, Zhou DZ, Lin H. Duplication of the extrahepatic bile duct: A case report and review of the literature. Medicine (Baltimore). 2018;97(8):9953.
14. Kolli S, Etienne D, Reddy M, Shahzad S.Review of the double common bile duct and its sequelae. Gastroenterol Res.2018;11(1):1–4.
15. Kim SW, Park H, Shin HC, Kim IY, Park SH, Jung EJ, et al. Duplication of the extrahepatic bile duct in association with choledocholithiasis, as depicted by MDCT. Korean J Radiol. 2008;8;9(6):550.

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