

Persistent Double Duct Sign Following CBD Stone Removal and Cholecystectomy: A Benign Course in a Malignant Mimic

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1. Abstract

1.1. Background

The double duct sign, defined as concurrent dilation of the common bile duct (CBD) and pancreatic duct, is classically associated with malignant obstruction at the ampulla or pancreatic head. However, benign etiologies such as choledocholithiasis can also produce this radiological finding.

1.2. Case Presentation

We report a case of a 58-year-old male presenting with chronic right upper quadrant pain, mild jaundice, and elevated cholestatic liver enzymes. Initial MRCP revealed the double duct sign without a definitive obstructing mass. ERCP confirmed CBD stones, which were extracted following papillotomy with temporary stent placement. EUS with biopsy ruled out malignancy. The patient subsequently underwent laparoscopic cholecystectomy. A follow-up MRCP post-stent removal showed persistent double duct dilation despite complete clinical and biochemical resolution.

1.3. Conclusion

This case highlights the importance of a systematic approach to double duct sign, demonstrating that in the absence of mass lesions and in the setting of resolved obstruction, persistent ductal dilation may be a benign sequela of prior pathology. Judicious use of endoscopy and biopsy can prevent unnecessary surgical or oncologic interventions.

2. Introduction

The double duct sign, seen on cross-sectional imaging or endoscopic retrograde cholangiopancreatography (ERCP), often raises alarm for malignancies at the head of the pancreas or ampullary region [1]. However, benign causes such as choledocholithiasis, chronic pancreatitis, and papillary stenosis can mimic this pattern [2,3]. In the modern imaging era, MRCP and EUS

have become essential tools in delineating benign from malignant obstruction, allowing for non-invasive and tissue-confirmed evaluation [4]. This case underscores how a classical malignant radiological sign can be misleading in a patient with benign biliary disease and a favorable clinical outcome.

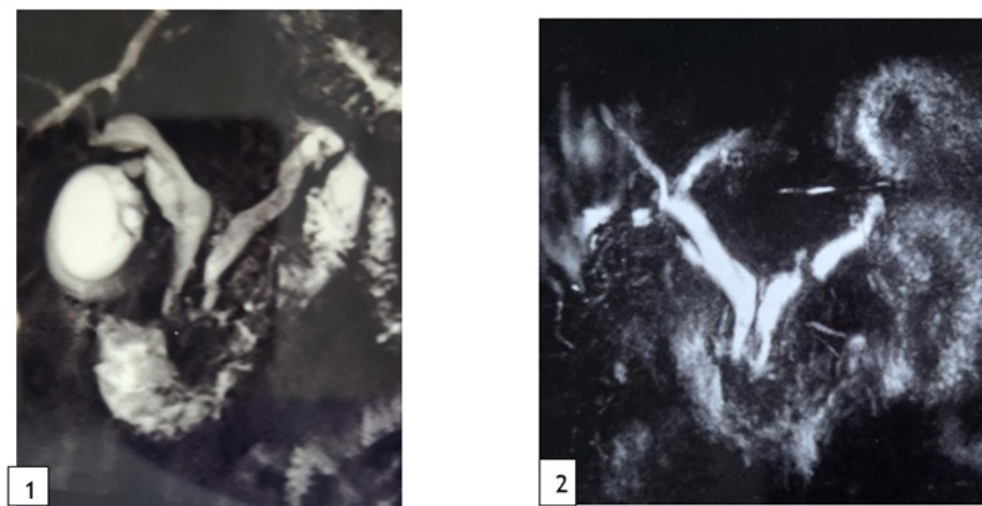
3. Case Presentation

A 58-year-old male presented with a 3-month history of postprandial right upper quadrant discomfort, pruritus, dark urine, and mild jaundice. He had no significant weight loss, fever, or history of alcohol use. Examination revealed mild scleral icterus without abdominal tenderness or mass.

3.1. Laboratory Results Included

- Total bilirubin: 4.6 mg/dL (direct 3.1)
- ALP: 580 IU/L
- GGT: 390 IU/L
- ALT: 72 IU/L, AST: 58 IU/L

MRCP revealed a distended gallbladder with intraluminal stones and dilated CBD (12 mm) and main pancreatic duct (4.5 mm) consistent with the double duct sign, without a definite obstructing mass. ERCP was performed for evaluation and therapy. A papillotomy was done, revealing multiple small stones in the CBD. A temporary plastic biliary stent was placed. Following the procedure, EUS with biopsy of the ampullary region and distal pancreas showed no malignant features or suspicious lymphadenopathy. Histology confirmed benign glandular epithelium with no dysplasia or malignancy. The patient underwent an uncomplicated laparoscopic cholecystectomy. The biliary stent was removed 6 weeks later. A repeat MRCP at 3 months post-cholecystectomy revealed persistent dilation of both ducts but no new obstruction or mass. The patient remained asymptomatic with normalized liver function tests.



Figures 1: showing MRCP before Cholecystectomy 1 and after Cholecystectomy 2.

4. Discussion

The double duct sign has a high specificity (up to 88%) for malignancy in the periampullary region, but its positive predictive value drops significantly in the absence of a visible mass or clinical red flags [5-7]. In our patient, the presence of gallstones, jaundice, and a dilated CBD raised concern; however, the absence of a pancreatic or ampullary mass, normal tumor markers, and negative EUS-guided biopsy shifted the differential towards a benign cause. Multiple studies have shown that CBD stones can transiently block the ampulla and cause pancreatic duct back-pressure, mimicking malignancy [8-10]. Even after stone clearance and cholecystectomy, residual ductal dilation can persist due to:

- Chronic inflammatory remodeling of the bile duct wall
- Ductal compliance loss
- Functional outflow abnormalities (e.g., sphincter of Oddi dysfunction) [11-13]

Persistent ductal dilation in asymptomatic patients with normalizing LFTs does not necessarily indicate ongoing pathology and may not require further invasive intervention [14,15].

5. Conclusion

This case illustrates that double duct sign is not pathognomonic for malignancy. In patients with resolved symptoms and negative diagnostic workup (EUS, biopsy, ERCP), persistent dilation post-therapy can represent a benign, stable finding. A multidisciplinary, stepwise approach helps avoid overtreatment in such patients.

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