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CASE REPORT

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MRCP Findings Suggestive of Mirizzi Syndrome with Concomitant Choledocholithiasis: A Case Report

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Abstract

Background: *Mirizzi syndrome may coexist with distal choledocholithiasis, which can independently contribute to biliary obstruction.*
Case presentation: *A 45-year-old woman presented with recurrent right upper quadrant pain, jaundice and pruritus. MRI and MRCP showed intrahepatic biliary dilatation, marked distension of the gallbladder and cystic duct, and a suspected communication between the dilated cystic duct and common bile duct. A 2.3-cm calculus in the distal common bile duct produced a filling defect with upstream dilatation. The patient was referred for further management. Surgical, endoscopic and follow-up findings were unavailable.*
Conclusion: *MRCP delineated the biliary anatomy and suggested Mirizzi syndrome with a possible biliary fistula and concomitant distal choledocholithiasis. The fistula and the Csendes subtype remain unconfirmed.*

Keywords · Mirizzi syndrome, magnetic resonance cholangiopancreatography, choledocholithiasis, biliary fistula, obstructive jaundice

1. Introduction

Mirizzi syndrome is an uncommon complication of chronic cholelithiasis, accounting for less than 1% of gallstone disease. [1,2] It results from impaction of one or more gallstones in the cystic duct or gallbladder neck, leading to extrinsic compression or erosion of the common hepatic or bile duct. First described by the Argentine surgeon Pablo Luis Mirizzi in 1940, the condition remains a diagnostic challenge because of its variable clinical and imaging presentation. [1–3] Accurate preoperative identification is essential, as failure to recognize this anomaly significantly increases the risk of bile duct injury during cholecystectomy. [1,2,4] The coexistence of Mirizzi syndrome with distal choledocholithiasis presents an additional diagnostic and therapeutic challenge, as both entities can contribute to biliary obstruction.

2. Case Presentation

A 45-year-old woman presented with recurrent right upper quadrant pain, progressive jaundice, and pruritus of six months' duration. There was no prior history of abdominal surgery or trauma. There were no documented clinical signs of cholangitis at presentation.

Laboratory investigations were not available at the time of this report. No ultrasound or CT was performed at our institution before MRI/MRCP. Any prior imaging from other institutions was unavailable for review. Therefore, MRI/MRCP was the primary diagnostic imaging examination for this patient at our center.

MRI was performed on a GE Signa Creator 1.5T system (GE Healthcare, Milwaukee, WI, USA) using a phased-array body coil. The protocol included axial and coronal T2-weighted fast spin echo (FSE) sequences (repetition time [TR] 6316 ms, echo time [TE] 86.2 ms, slice thickness 5.0 mm, 1.0 mm spacing, matrix 288 × 224, 2.00 number of excitations [NEX]), balanced steady-state free precession fast imaging employing steady-state acquisition (FIESTA) sequences (TR 4.3 ms, TE 1.9 ms, slice thickness 5.0 mm, 1.0 mm spacing, matrix 196 × 244, 1.00 NEX), and T1-weighted sequences before and after intravenous contrast administration. A three-dimensional (3D) respiratory-triggered MRCP was performed using a fast recovery fast spin echo (FRFSE-XL) technique (TR 4286 ms, TE 606.5 ms, slice thickness 1.6 mm with −0.8 mm overlap, matrix 256 × 224, 1.00 NEX, acquisition time approximately 2 min 44 s). The MRCP acquisition was performed in the coronal plane, and maximum intensity projection (MIP) reconstructions were generated from the 3D dataset. The figures presented in this report were selected from the non-contrast T2-weighted and MRCP sequences to illustrate the suspected site of communication and the associated calculi. The T1-weighted and post-contrast sequences were reviewed at the time of reporting.

MRI and MRCP demonstrated moderate intrahepatic biliary dilatation, with the common hepatic duct measuring approximately 9.4 mm in diameter. The gallbladder and cystic duct were markedly distended and appeared continuous, with no clearly identifiable transition at the gallbladder neck. Apparent continuity between the dilated cystic duct and the common bile duct raised suspicion of a fistula (Figure 1). Multiple intraluminal signal voids consistent with gallstones were identified within the gallbladder and dilated cystic duct, the largest measuring approximately 1.7 cm (Figure 2). An additional rounded signal void measuring 2.3 cm was seen within the distal third of the common bile duct, producing a complete filling defect on MRCP and resulting in proximal ductal dilatation (Figure 3). The distal segment of the common bile duct beyond the stone was of normal caliber. The pancreas, spleen, kidneys, and other visualized upper abdominal structures were unremarkable.

Imaging interpretation: The findings suggested Mirizzi syndrome with possible fistulous communication and distal choledocholithiasis. The available images did not establish the presence or extent of a bile duct wall defect, so no Csendes subtype was assigned.

Clinical course: The patient was referred for further management. Surgical, endoscopic and follow-up findings were unavailable. The subsequent treatment and clinical outcome are unknown.

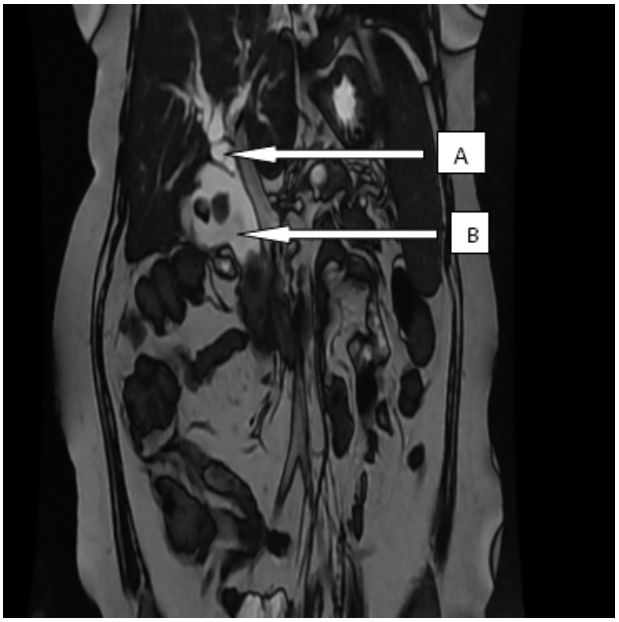


Figure 1. Coronal FIESTA MRI. Arrow A indicates the dilated common hepatic duct. Arrow B indicates the site where apparent continuity between the dilated cystic duct and the common bile duct raises suspicion of a fistula.

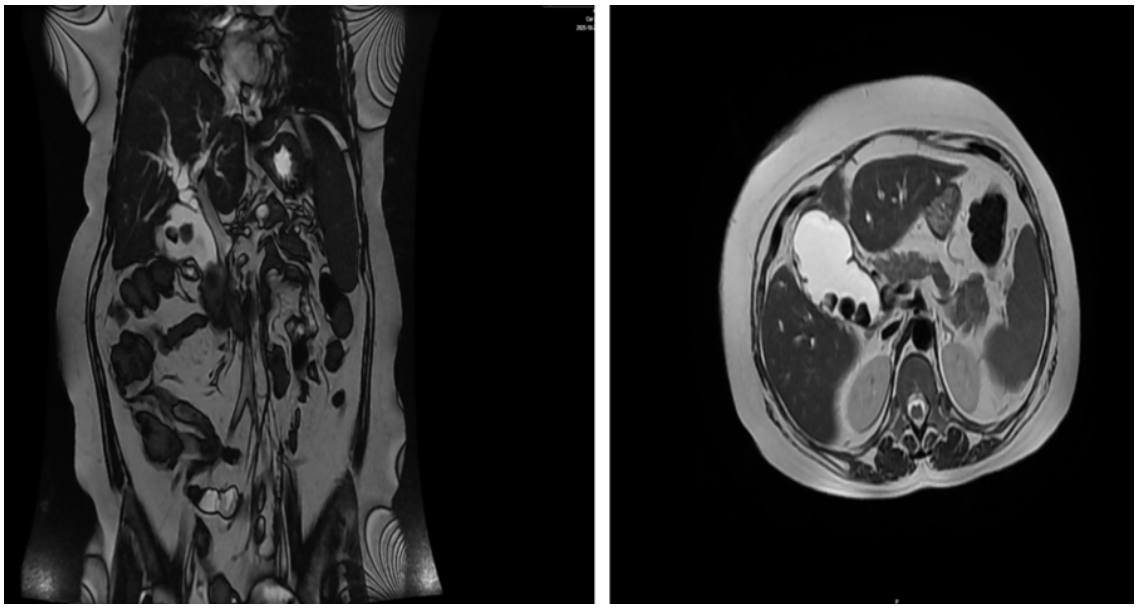


Figure 2. Coronal and axial T2-weighted MRI showing multiple signal voids consistent with gallstones in the dilated cystic duct.

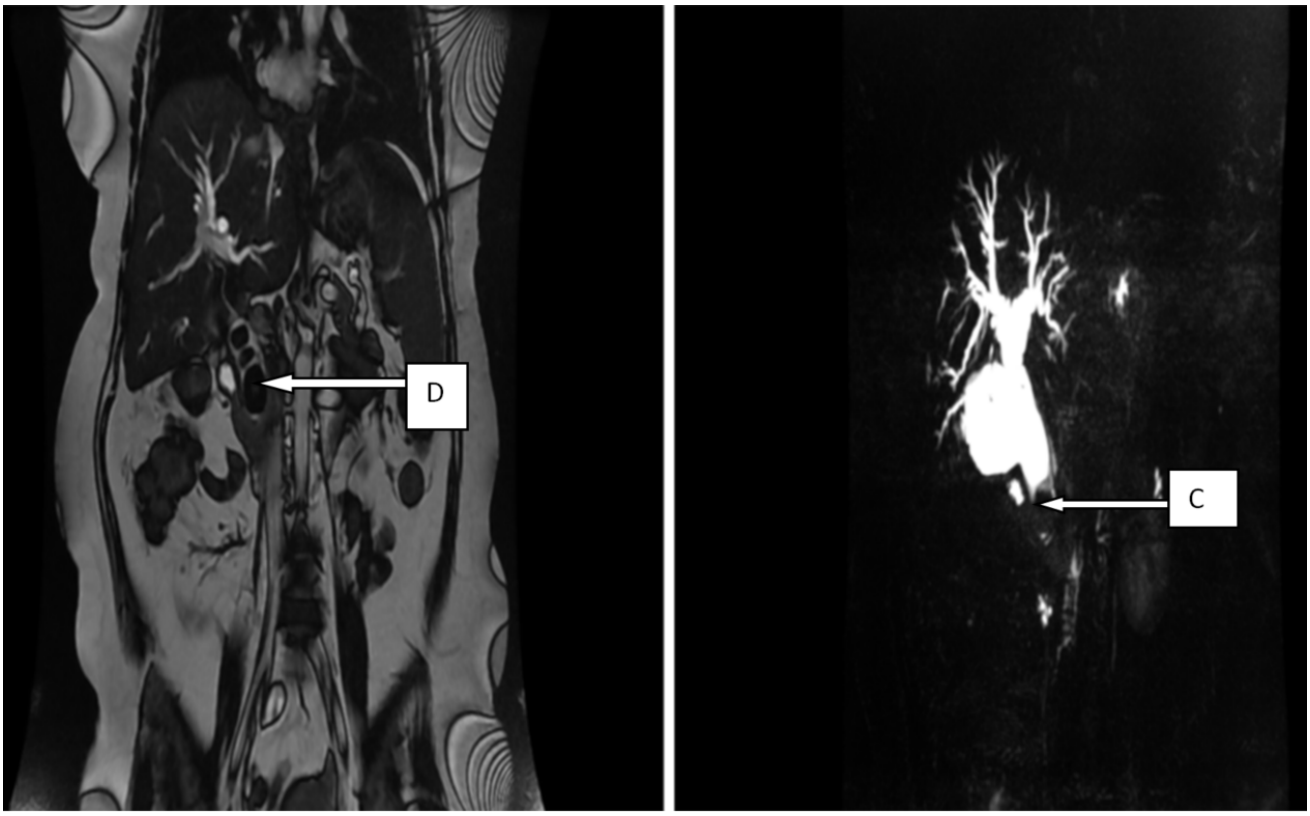


Figure 3. Coronal T2-weighted MRI and MRCP show a distal common bile duct calculus (D) and the corresponding filling defect (C), with upstream ductal dilatation.

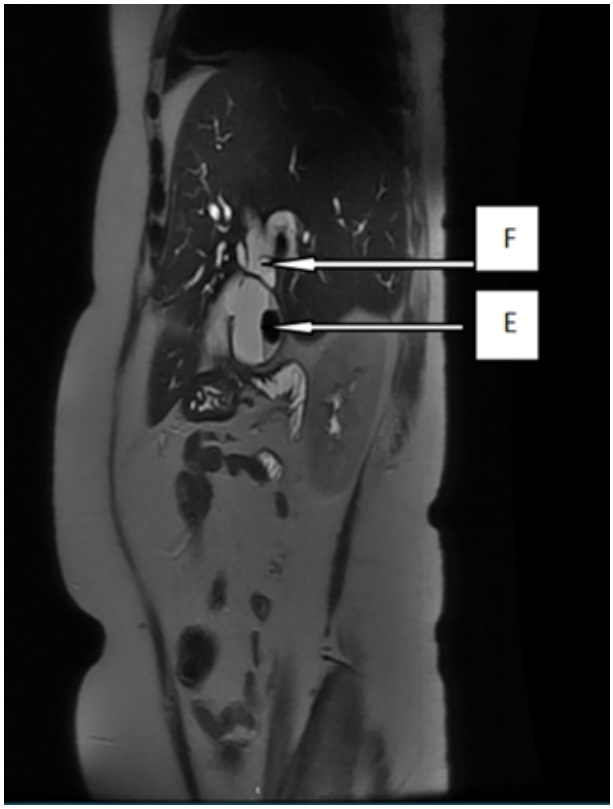


Figure 4. Sagittal T2-weighted MRI shows a calculus (E) in the dilated cystic duct and apparent compression of the common hepatic duct (F).

3. Discussion

The imaging findings suggested Mirizzi syndrome with a possible cholecystobiliary fistula. Persistent inflammation and pressure necrosis from an impacted calculus may lead to fistula formation. [1,5] In the Csendes classification, type I denotes external compression. Types II, III and IV denote fistulae involving less than one-third, up to two-thirds and the full circumference of the bile duct wall, respectively. [5] The distinction depends on the extent of wall involvement. [6] The available imaging and follow-up data do not support assigning a specific subtype in this case.

Concomitant distal choledocholithiasis was a notable finding. The 2.3-cm distal common bile duct calculus produced a complete filling defect on MRCP with upstream dilatation. A distal common bile duct stone can independently contribute to the jaundice, pruritus and upstream biliary dilatation. [4] The relative contributions of the distal stone and the suspected Mirizzi component to the obstruction could not be determined from the available data.

The differential diagnosis included uncomplicated choledocholithiasis, benign inflammatory stricture and cholangiocarcinoma. [1,4,6] The marked cystic duct dilatation and apparent continuity with the common bile duct raised concern for a fistula. At the marked site (Figure 1, arrow B), normal ductal confluence, inflammatory adherence and external compression remain plausible alternatives. No additional image planes or acquisitions were available to resolve this distinction. Endoscopic or operative findings were unavailable to confirm a fistula. [6]

Figure 4 shows a cystic duct calculus with apparent compression of the common hepatic duct. This supports a possible compressive component. The appearance alone does not establish erosion of the bile duct wall or progression to a fistula. [1,5,6]

Ultrasonography can demonstrate gallstones and biliary dilatation. CT and MRI can help assess other causes of obstruction. [4,6] MRCP can delineate altered biliary anatomy, show the level of obstruction and raise suspicion of a fistula. [4,6,7]

In this case, MRCP delineated the distended gallbladder and cystic duct and the separate distal common bile duct stone. The available images did not establish the presence or extent of bile duct wall erosion.

ERCP can provide further diagnostic information and therapeutic access. Operative findings can establish the degree of bile duct wall involvement and help determine the appropriate surgical approach. [2,6,7]

Preoperative recognition of suspected Mirizzi syndrome is important because altered anatomy increases the risk of bile duct injury during cholecystectomy. [1,2,8] Management depends on the extent of duct involvement, associated stones and operative findings. [2,3,6,9] The lack of endoscopic, operative and follow-up records limits correlation between the imaging findings and the clinical outcome.

4. Conclusion

MRI and MRCP suggested Mirizzi syndrome with a possible biliary fistula and demonstrated a separate distal common bile duct calculus that could independently contribute to obstruction. The fistula, Csendes subtype and clinical outcome remain unconfirmed.

Abbreviations

CBD – Common Bile Duct · CT – Computed Tomography · ERCP – Endoscopic Retrograde Cholangiopancreatography · FIESTA – Fast Imaging Employing Steady-State Acquisition · FSE – Fast Spin Echo · MIP – Maximum Intensity Projection · MRCP – Magnetic Resonance Cholangiopancreatography · MRI – Magnetic Resonance Imaging · NEX – Number of Excitations · TE – Echo Time · TR – Repetition Time

Declarations

Consent for publication. The patient gave verbal informed consent by telephone for publication of the clinical details and accompanying images after the authors explained the purpose of the case report. Written consent for publication was not obtained.

Ethics approval. No formal institutional ethics approval or exemption was obtained during preparation of this case report.

Author contributions. Oluwaseun Olaoluwa Oyelayo, Adewale Wasiu Akeem and Ikechukwu Emmanuel Onwunta wrote the manuscript. Oluwaseun Olaoluwa Oyelayo and Hakeem Kayode Alade prepared the figures. Oluwaseun Olaoluwa Oyelayo and Ikechukwu Emmanuel Onwunta performed the imaging examination. All authors reviewed the manuscript.

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Competing interests. The authors declare no competing interests.

Data availability. Data sharing is not applicable to this case report because no research dataset was generated. Further clinical information cannot be shared publicly because of patient confidentiality.

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