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Case Report

A biliary dilemma resolved by endoscopy: Lemmel syndrome as a cause of non-lithiasic acute obstructive cholangitis

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ABSTRACT

Acute cholangitis is commonly caused by choledocholithiasis. A diagnostic and surgical dilemma arises when no stones are found. Lemmel syndrome—biliary obstruction secondary to a periampullary duodenal diverticulum—is a rare but crucial etiology to consider. This report describes its presentation, diagnosis, and endoscopic management. We present the case of a 73-year-old female with severe acute obstructive cholangitis without evidence of lithiasis. Evaluation included clinical history, physical examination, laboratory tests, ultrasound, and magnetic resonance cholangiopancreatography. The definitive diagnosis was established via endoscopic retrograde cholangiopancreatography (ERCP). Clinical and biochemical findings were consistent with cholangitis, but imaging studies revealed no choledocholithiasis. ERCP demonstrated a 30 mm periampullary duodenal diverticulum containing the major papilla, which was covered with food residue, confirming Lemmel syndrome. Management involved diverticular cleansing and endoscopic sphincterotomy, which successfully resolved the obstruction. This case highlights the importance of including Lemmel syndrome in the differential diagnosis of non-lithiasic acute cholangitis. Detailed endoscopic evaluation is essential to identify this anatomical alteration and avoid unnecessary surgical interventions. Targeted endoscopic treatment represents an effective and minimally invasive strategy.

Keywords: Lemmel syndrome, Acute cholangitis, Periampullary duodenal diverticulum, Endoscopic retrograde cholangiopancreatography, Biliary obstruction

INTRODUCTION

Acute cholangitis (AC) is a serious biliary infection most commonly caused by choledocholithiasis.[1] However, in approximately 10-15% of cases, no stones are identified, posing a diagnostic challenge.[2] Among these non-lithiopathic etiologies, Lemmel syndrome – defined as biliary obstruction secondary to a periampullary duodenal diverticulum (PDD) – represents a crucial and often overlooked differential diagnosis.[3,4] Its pathophysiology originates from the location of the papilla within the diverticulum, which alters Oddi's sphincter function, promotes duodenobiliary reflux, and leads to stasis and food impaction, culminating in an obstructive and infectious process.[5,6] This unique scenario creates a significant clinical dilemma: current management guidelines (e.g., Tokyo 2018) do not specify algorithms for this etiology, and the absence of an obvious obstructive cause can lead to delays in treatment or unnecessary surgical explorations.[7,8]

Consequently, a high index of suspicion is paramount. The definitive diagnosis is endoscopic, achieved via endoscopic retrograde cholangiopancreatography (ERCP).

This procedure allows direct visualization of the anatomy, conclusively rules out lithiasis, and enables therapeutic drainage, thereby resolving the obstruction and averting the need for surgery.[9,10]

CASE REPORT

We present a case that illustrates this dilemma and highlights the value of a sequential endoscopic approach. A 73-year-old man with type 2 diabetes mellitus presented to the emergency department with a one-week history of stabbing epigastric pain, jaundice, and a fever of 38.3°C, completing Charcot's triad. On admission, he presented with hypotension (BP 95/66 mmHg), tachycardia (HR 110 bpm), and tachypnea. Physical examination was notable for jaundice and a positive Murphy's sign. Laboratory studies revealed a cholestatic pattern (total bilirubin 11.25 mg/dl), marked leukocytosis (27.2×10³/µl with 93.8% neutrophils), elevated C-reactive protein (13.49 mg/dl), impaired renal function (creatinine 1.48 mg/dl), and lactic acidosis (serum lactate 4.5 mmol/l). These findings defined a case of acute cholangitis grade III (severe) according to the Tokyo 2018 criteria, complicated by septic shock, requiring the initiation of a norepinephrine infusion and transfer to the intermediate care unit.[7]

Abdominal ultrasound showed cholelithiasis, a hydropic gallbladder, and dilation of the bile duct without an apparent cause.

Magnetic resonance cholangiopancreatography (MRCP) identified a periampullary duodenal diverticulum compressing the distal common bile duct (Figure 1).

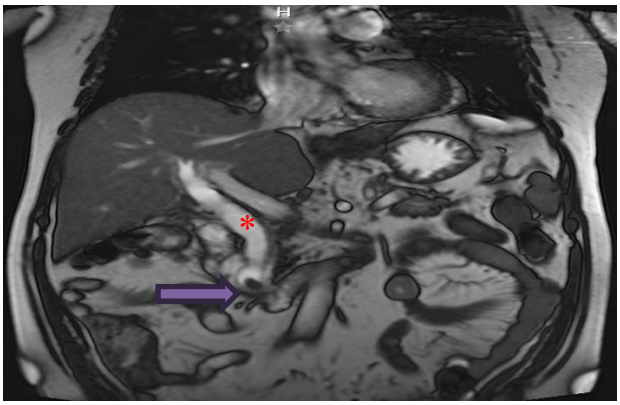

Figure 1: MRCP - a dilated 16 mm common bile duct is observed (asterisk), where a heterogeneous duodenal image measuring 4.2×3.2 cm exerts a mass effect (arrow). Adjacent to it, an 8.4 mm ovoid image with signal void is identified, consistent with a periampullary duodenal diverticulum.

An urgent ERCP was performed, which revealed a 30 mm diverticulum with the major papilla located inside it, covered with food residue, and no evidence of choledocholithiasis (Figure 2), confirming Lemmel syndrome.[3] Management included thorough cleaning of the diverticulum and endoscopic sphincterotomy, resolving the obstruction. Following the procedure and targeted antibiotic therapy, the patient showed progressive hemodynamic improvement, allowing for the withdrawal of vasopressors within 24 hours.

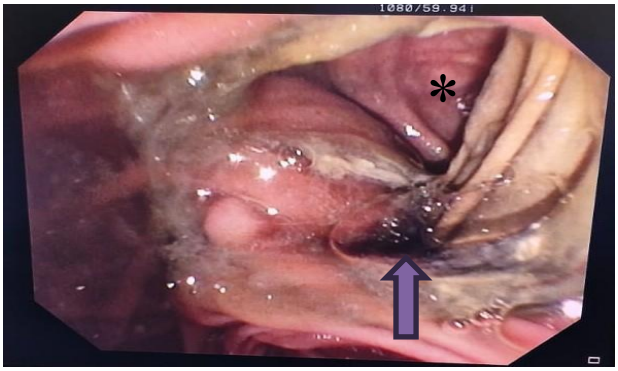

Figure 2: Endoscopy - the second portion of the duodenum is visualized with the duodenal papilla (arrow) located inside a 30 mm diameter diverticulum (asterisk) containing food residue.

DISCUSSION

This case exemplifies the diagnostic and therapeutic challenge posed by severe acute obstructive cholangitis without evidence of choledocholithiasis. The identification of Lemmel syndrome as the definitive etiology underscores the critical importance of including this entity in the differential diagnosis, particularly when cross-sectional imaging such as MRCP reveals a periampullary duodenal diverticulum (PDD).[3]

Although PDDs are frequently considered incidental and are often associated with choledocholithiasis, they can independently act as the primary cause of biliary obstruction.[5,6] The pathophysiology, clearly illustrated in our patient, originates from the location of the major papilla within the diverticular sac. This aberrant anatomy leads to sphincter of Oddi dysfunction, promoting duodenobiliary reflux, bile stasis, and the impaction of food debris—a sequence that culminates in both obstruction and infection.[6]

From a management perspective, this case strongly advocates for prioritizing diagnostic and therapeutic ERCP over surgical exploration in cases of acute cholangitis without an obvious obstructive cause.[8] A meticulous endoscopic evaluation that identifies a PDD as the culprit lesion can prevent unnecessary and potentially hazardous surgeries, such as urgent choledochotomy. This is especially vital for high-risk patients, including the elderly or those who are hemodynamically unstable. As demonstrated, a first-line endoscopic strategy—involving diverticular clearance to relieve the obstruction, followed by sphincterotomy to ensure durable drainage—proved to be a definitive and minimally invasive solution.[9,10]

Furthermore, this experience highlights the complementary roles of advanced imaging and endoscopy. While MRCP is excellent for suggesting the diagnosis by revealing biliary dilation juxtaposed to a diverticulum, ERCP remains indispensable. It provides definitive anatomical confirmation, allows direct assessment of the

papilla's location, rules out occult lithiasis, and enables immediate therapeutic intervention.[4,9] Finally, it is essential to recognize that these patients carry a higher long-term risk of recurrent cholangitis and post-ERCP complications, mandating structured clinical follow-up.[5,7]

CONCLUSION

In conclusion, Lemmel syndrome represents a crucial and often underrecognized surgical mimic that must be considered in the differential diagnosis of acute cholangitis without evident lithiasis. ERCP stands as the diagnostic and therapeutic cornerstone, enabling definitive confirmation and effective management in a single session. This approach resolves the obstructive process directly, addresses the underlying infectious focus, and thereby prevents unnecessary surgical intervention. Ultimately, a high index of clinical suspicion followed by timely endoscopic evaluation is a critical determinant for achieving a favorable patient outcome.

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