

Recurrent Choledocolithiasis After Cholecystectomy and Endoscopic Treatment: A Case Report and Review of Risk Factors

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Introduction:

The presence of gallstones in the common bile duct (CBD) defines choledocolithiasis. Stones can form in the CBD or they can migrate to the CBD from the gallbladder, or less commonly, the intrahepatic biliary tree (hepatolithiasis). Symptoms include episodic right upper quadrant (RUQ) abdominal pain, nausea, fever, jaundice, and weight loss. Symptoms of biliary colic can quickly progress to pancreatitis, hepatitis, or most commonly, cholangitis^(1,2). Once discovered, endoscopic retrograde cholangiopancreatography (ERCP) can be performed for diagnostic and therapeutic management. Cholecystectomy is not always required and remains controversial for patients with primary choledocolithiasis. However, if a large stone cannot be removed with ERCP, surgery is indicated. The recurrence of choledocolithiasis after surgical and endoscopic management likely involves multiple mechanisms with some risk factors having been previously identified.

Case Description:

A 38 year old male with no past medical history presented to the emergency department with right upper quadrant (RUQ) abdominal pain and jaundice. Labs were notable for acute cholestatic liver injury with a total bilirubin of 19.6 mg/dl. The initial differential diagnosis included drug induced liver injury (DILI) from a recently used pre-workout supplement versus other cholestatic processes. Abdominal ultrasound of RUQ showed hepatosplenomegaly, normal biliary tree, and a CBD diameter within normal limits (3 mm). However, magnetic resonance cholangiopancreatography (MRCP) revealed intrahepatic bile duct dilation with numerous calculi in the distal CBD (Figure 1). ERCP further visualized two stones in the lower middle third of the CBD with the largest stone measured at 9 mm. A sphincterotomy and balloon extraction was performed, but only the smaller of the two stones was able to be removed. A temporary plastic stent was then placed in the CBD. Days later general surgery performed robotic assisted cholecystectomy which the patient tolerated well. He was discharged home and followed up for a repeat ERCP to remove the remaining larger stone. During repeat ERCP, one irregular-shaped stone was seen in the middle third of CBD (Figure 2). It was successfully removed following papillary dilation and balloon extraction. No remaining stones were seen on occlusion cholangiogram. Five months later the patient represented to the hospital with similar symptoms of abdominal pain accompanied with nausea and emesis. His lab work showed mixed liver injury favoring cholestasis. MRCP again showed a dilated CBD (1 cm) with a recurrence of choledocolithiasis (Figure 3). ERCP extracted a large 12 mm obstructing stone along with sludge (Figure 4). No stones remained and a covered metal stent was placed into the ampulla. Four weeks later the metal stent was successfully removed without stones or filling defects seen in the entire biliary tree (Figure 5).

Discussion:

The incidence of choledocolithiasis is estimated between 10-15% of the adult population in the United States⁽³⁾. Primary choledocolithiasis is the formation of stones within the CBD and is generally due to biliary stasis⁽⁴⁾. Some anatomic factors that promote biliary stasis include CBD dilation, periampullary diverticulum, biliary strictures, and papillary stenosis^(5,6). In the United States, secondary choledocolithiasis is the more common etiology and represents the travel of gallstones formed in gallbladder or intrahepatic biliary tree that arrest in the CBD⁽⁷⁾.

Management for choledocolithiasis depends on severity of clinical symptoms. Endoscopic ultrasound (EUS) and MRCP can confirm stone location prior to endoscopic or surgical management. However, a patient presenting with acute cholangitis may require urgent therapeutic management without prior imaging. Therapeutic options for choledocolithiasis include ERCP with or without elective cholecystectomy, laparoscopic cholecystectomy with cholangiography, or laparoscopic cholecystectomy with intraoperative or postoperative ERCP.

Following definitive surgical or endoscopic management, the recurrence of choledocholithiasis is estimated between 4-24%⁽⁸⁾. One study of 278 patients reported a choledocolithiasis recurrence rate of 20 % following ERCP and cholecystectomy⁽⁹⁾. 80% of cases with recurrence after cholecystectomy occur within the first 3 years following surgery^(1,10). Although the pathophysiology of recurrent CBD stones is not fully understood, some risk factors have been identified. Angulation of the CBD (< or = 145 degrees), CBD diameter (\geq 15 mm), prior open cholecystectomy, and CBD stone number (\geq 2) are associated with increased rates of symptomatic recurrence⁽¹¹⁻¹³⁾. Albeit more rare, cases of stone recurrence more than ten years later have been reported. These cases were attributed to surgical clip migration and cystic duct remnants⁽²⁾.

Our case represents an example of recurrent choledocholithiasis five months after definitive surgical and endoscopic removal of multiple common bile duct stones. The review of literature suggests CBD stone recurrence after ERCP and cholecystectomy occurs in 5-20% of cases. Clinicians should carefully review risk factors for recurrence and consider choledocolithiasis in patients presenting within the first three years following cholecystectomy.

References:

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Figures

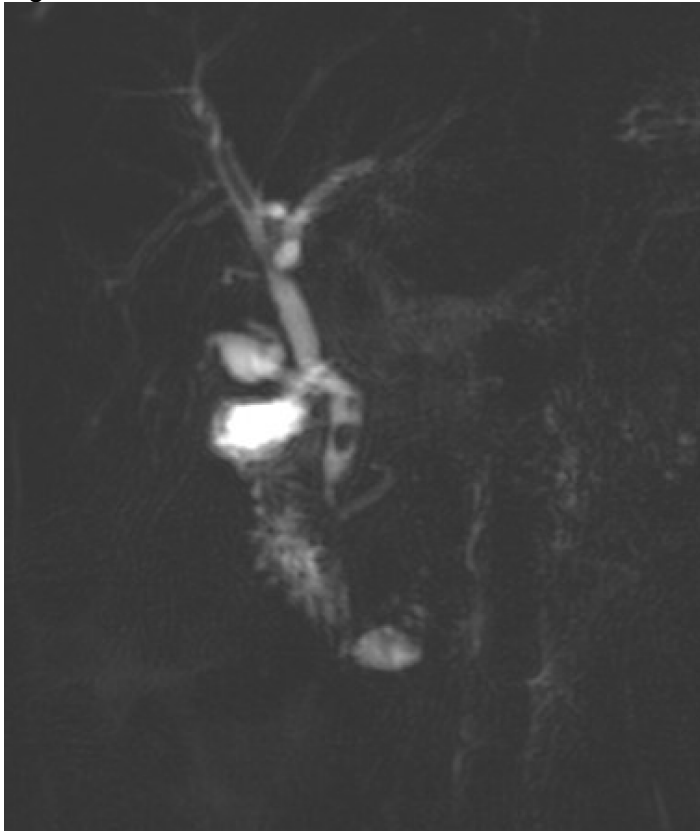


Figure 1: MRCP with multiple stones in CBD



Figure 2: Repeat ERCP with remaining large stone prior to extraction

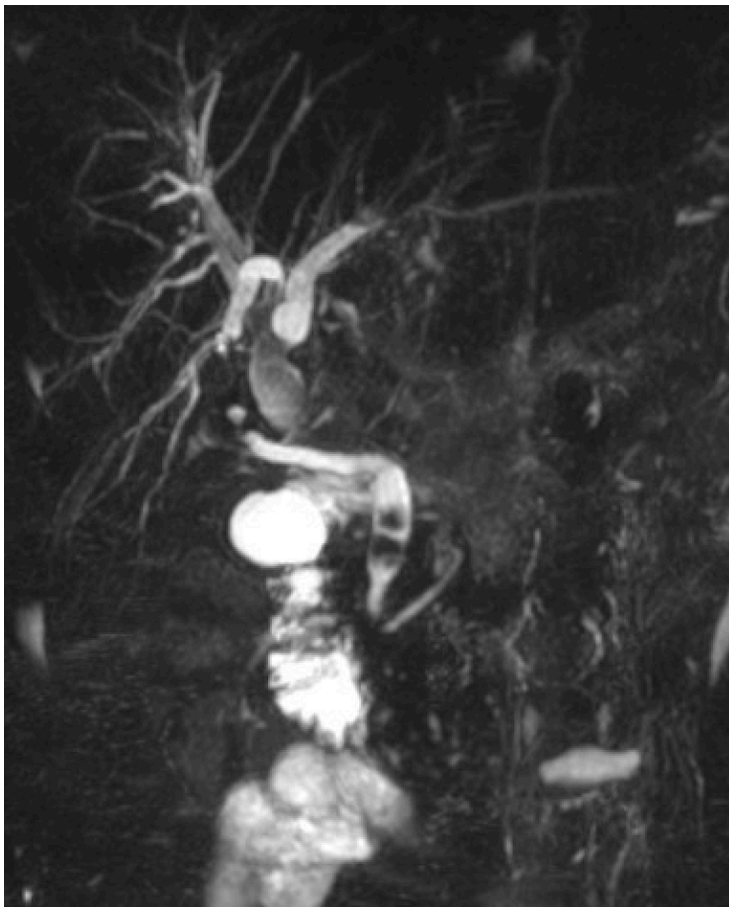


Figure 3: MRCP with recurrence of multiple stones 5 months after cholecystectomy and ERCP.

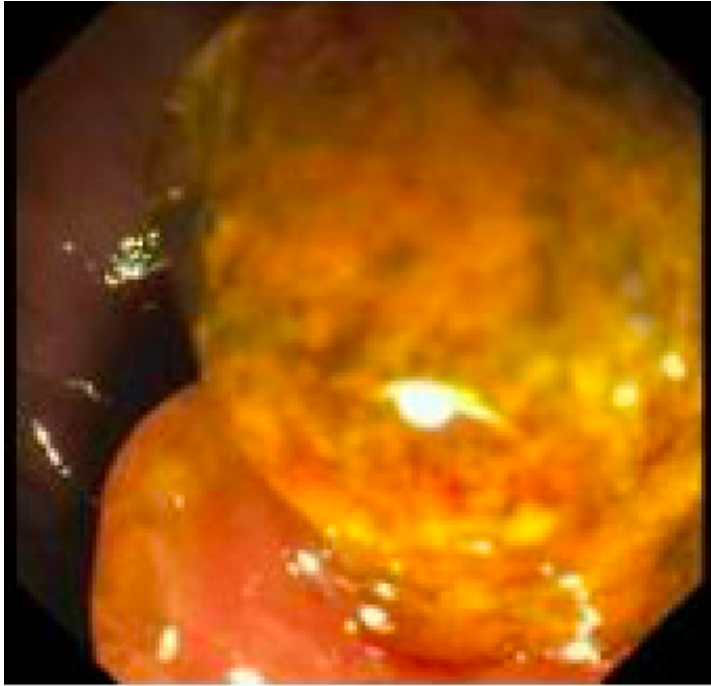


Figure 4: Large 12 mm obstructing CBD stone removed on ERCP.



Figure 5: Biliary tree without obstruction during ERCP stent removal.

