

From Biliary Colic to Severe Jaundice: A Case Report of Complex Choledocholithiasis

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ABSTRACT

Obstructive jaundice is a common clinical condition caused by biliary tract obstruction, with choledocholithiasis representing one of the most frequent etiologies. This case report aimed to describe the clinical presentation, diagnostic evaluation, and surgical management of severe obstructive jaundice caused by complex choledocholithiasis. A 44-year-old man presented with progressive right upper quadrant abdominal pain, jaundice, pruritus, pale stools, and dark urine. Physical examination revealed icteric sclera and right upper quadrant tenderness. Laboratory investigations demonstrated marked hyperbilirubinemia with total bilirubin of 23.5 mg/dL, direct bilirubin of 18.4 mg/dL, alanine aminotransferase of 64 U/L, aspartate aminotransferase of 40 U/L, and leukocyte count of $12.82 \times 10^3/\text{mm}^3$. Abdominal ultrasonography identified a 4 cm gallstone at the gallbladder neck. Computed tomography and magnetic resonance cholangiopancreatography demonstrated multiple gallstones and multiple common bile duct stones, including a largest stone measuring approximately 1.6 cm, accompanied by intrahepatic and extrahepatic biliary dilatation. The patient underwent exploratory laparotomy with cholecystectomy, common bile duct exploration, stone extraction, and T-tube placement. Postoperative follow-up showed significant clinical improvement with resolution of jaundice and abdominal symptoms. This case highlighted the importance of comprehensive imaging evaluation and demonstrated that open surgical exploration with T-tube drainage remained an effective therapeutic option in complex choledocholithiasis when endoscopic management was not feasible.



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INTRODUCTION

Obstructive jaundice is a clinical syndrome characterized by impaired bile flow from the liver to the duodenum, resulting in the accumulation of conjugated bilirubin in the bloodstream and subsequent yellow discoloration of the skin and sclera. This condition represents a significant diagnostic and therapeutic challenge in daily clinical practice due to its wide range of etiologies, including gallstones, benign strictures, and malignant biliary obstruction.^{1,2} Among these causes, choledocholithiasis remains the most common benign etiology, accounting for a substantial proportion of obstructive jaundice cases worldwide.³

Choledocholithiasis occurs when gallstones migrate into or form within the common bile duct, leading to partial or complete biliary obstruction. The pathophysiological mechanism involves increased intrabiliary pressure, hepatocellular dysfunction, and impaired bilirubin excretion, which clinically manifests as jaundice, pruritus, pale stools, and dark urine.^{4,5} If left untreated, prolonged obstruction may progress to serious complications such as ascending cholangitis, acute pancreatitis, and secondary biliary cirrhosis.⁶ Previous studies have reported that up to 10–15% of patients with gallstone

disease develop choledocholithiasis, with higher prevalence observed in older individuals and patients with metabolic risk factors such as obesity.^{7,8}

Advances in diagnostic imaging, including ultrasonography, computed tomography, and magnetic resonance cholangiopancreatography, have significantly improved the detection of biliary obstruction and stone burden.^{9,10} These modalities allow for non-invasive evaluation of biliary anatomy, level of obstruction, and associated complications. Current clinical guidelines emphasize the importance of accurate risk stratification and imaging-based diagnosis to guide appropriate therapeutic strategies.¹¹ Endoscopic retrograde cholangiopancreatography has become the preferred therapeutic approach for most cases of choledocholithiasis; however, this modality may not be feasible or effective in complex cases involving large stones, multiple stones, or anatomical variations.¹²

Despite the widespread adoption of endoscopic techniques, open surgical exploration of the common bile duct remains an important treatment option in selected cases, particularly in resource-limited settings or when endoscopic intervention fails or is unavailable. The use of T-tube drainage following bile duct exploration, although less frequently reported in recent literature, continues to play a role in ensuring postoperative bile drainage and ductal decompression.¹³ However, contemporary case reports and clinical discussions regarding this classical surgical approach have become increasingly scarce, creating a gap in the literature related to its current clinical relevance and outcomes.

Previous studies have primarily focused on endoscopic management and minimally invasive approaches, with limited emphasis on detailed clinical progression, imaging correlation, and surgical decision-making in severe obstructive jaundice caused by complex choledocholithiasis.¹⁴ Furthermore, reports describing cases with marked hyperbilirubinemia and extensive intrahepatic and extrahepatic biliary dilatation remain limited, particularly in adult patients without malignant obstruction. This gap underscores the need for well-documented case reports that highlight comprehensive diagnostic pathways and alternative therapeutic strategies.

Therefore, the novelty of this case report lies in its detailed presentation of severe obstructive jaundice caused by multiple large common bile duct stones, emphasizing the stepwise diagnostic imaging approach and the successful use of open surgical exploration with T-tube placement. This report aimed to describe the clinical features, diagnostic evaluation, and management outcomes of complex choledocholithiasis, while reinforcing the continued relevance of surgical intervention in selected cases of obstructive jaundice.

CASE PRESENTATION

A 44-year-old Indonesian man presented to the emergency department of a secondary referral hospital in Palembang on November 28, 2024, with a chief complaint of right upper quadrant abdominal pain that had worsened over the previous day. The pain was described as intermittent over the past six months and became severe and persistent one day prior to admission. The patient reported that the pain initially improved after receiving treatment from a midwife six months earlier but recurred intermittently thereafter.

Three months prior to admission, the patient experienced episodes of intermittent fever. Two months before admission, he noticed pale-colored stools and dark brown urine, accompanied by mild yellow discoloration of the skin. Over the following month, the jaundice progressively worsened, involving both the skin and sclera, and was associated with generalized pruritus. Three days before hospital admission, the patient underwent abdominal ultrasonography at a local clinic in Lahat, which revealed a gallstone at the neck of the gallbladder. Surgical intervention was recommended at that time, but the patient initially declined. While visiting Palembang, the abdominal pain became unbearable one day prior to admission, prompting him to seek emergency care.

The patient had no history of hypertension, diabetes mellitus, stroke, cardiovascular disease, renal disease, asthma, allergy, or atopic conditions. Family history was unremarkable for hypertension and diabetes mellitus. The patient reported a history of smoking but denied alcohol consumption.

On admission, the patient appeared moderately ill. He was fully conscious with a Glasgow Coma Scale score of E4M6V5. Vital signs revealed a blood pressure of 140/80 mmHg, heart rate of 101 beats per minute, respiratory rate of 20 breaths per minute, body temperature of 37.4°C, and oxygen saturation of 100% on room air. The patient weighed 87 kg and measured 170 cm in height, with a body mass index of 30.11 kg/m², classified as obesity class I.

Physical examination of the head revealed icteric sclera bilaterally, with no conjunctival pallor or ocular discharge. The chest examination was unremarkable, with symmetrical chest movement, vesicular breath sounds, and no adventitious lung sounds. Cardiac examination revealed regular heart sounds without murmurs or gallops. Abdominal examination showed a distended abdomen with tenderness on palpation of the right hypochondrium. Bowel sounds were present and normal. No costovertebral angle tenderness was noted. Examination of the extremities revealed warm extremities with capillary refill time of less than two seconds and generalized jaundice, without edema or cyanosis.

Initial laboratory investigations performed on November 28, 2024, showed a hemoglobin level of 13.5 g/dL, leukocyte count of $12.82 \times 10^3/\text{mm}^3$, platelet count of $521 \times 10^3/\mu\text{L}$, and hematocrit of 36.4%. Coagulation parameters revealed a prothrombin time of 12.3 seconds and activated partial thromboplastin time of 34.2 seconds. Liver function tests demonstrated elevated alanine aminotransferase of 64 U/L and aspartate aminotransferase of 40 U/L. Total bilirubin was markedly elevated at 23.5 mg/dL, with direct bilirubin of 18.4 mg/dL and indirect bilirubin of 5.1 mg/dL. Random blood glucose level was 102 mg/dL.

Abdominal ultrasonography performed on November 25, 2024, demonstrated a gallstone measuring 4 cm at the neck of the gallbladder. A non-contrast abdominal computed tomography scan performed on November 29, 2024, revealed multiple stones within the common bile duct causing intrahepatic and extrahepatic biliary obstruction, with dilation of the intrahepatic bile ducts extending to the common bile duct. A stone measuring approximately 1.5×2 cm was identified in the common bile duct. Multiple gallstones were also noted in the gallbladder, with the largest measuring approximately 1.3×1.6 cm. Magnetic resonance cholangiopancreatography subsequently confirmed the presence of multiple gallstones and a common bile duct stone measuring approximately 1.6 cm, associated with dilation of both intrahepatic and extrahepatic bile ducts.

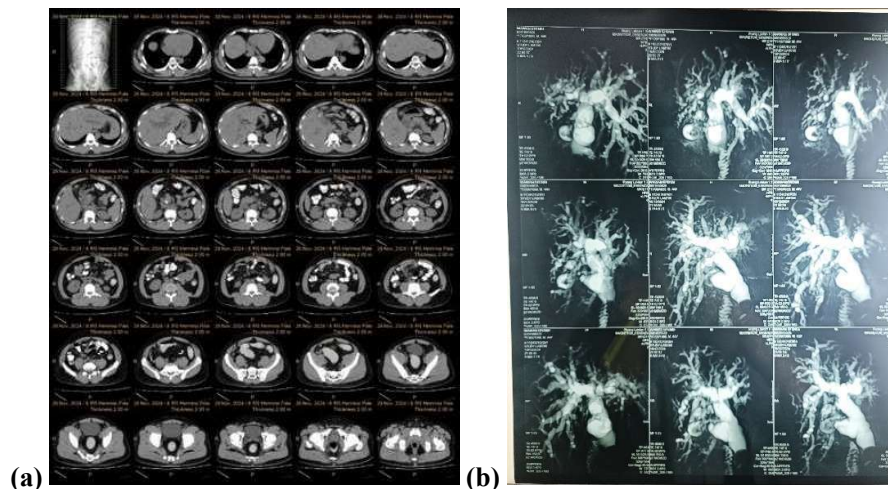


Figure 1. (A) CT Scan, (B) MRCP

The patient was diagnosed with obstructive jaundice secondary to choledocholithiasis and cholelithiasis. Initial management included intravenous fluid resuscitation with normal saline, intravenous ranitidine, ketorolac, and cefotaxime. Oral medications prescribed for referral included omeprazole and paracetamol. The patient was planned for referral to a tertiary care center for further management.

Daily follow-up examinations from November 29 to December 1, 2024, showed persistent right upper quadrant pain with gradual improvement. Vital signs remained stable, and physical examination findings were consistent with resolving abdominal tenderness but persistent scleral icterus. The patient was discharged with oral medications and referred to a tertiary referral hospital. At a tertiary referral hospital, on December 9, 2024, the patient continued to complain of jaundice and generalized pruritus. Vital signs were stable, and physical examination remained notable for scleral icterus without abdominal tenderness. Magnetic resonance cholangiopancreatography revealed multiple gallstones, a 1.6 cm stone within the common bile duct causing intrahepatic and extrahepatic bile duct dilation, and bilateral renal cysts. The patient received intravenous fluids, ceftriaxone, omeprazole, and intramuscular vitamin K.

On December 11, 2024, the patient underwent exploratory laparotomy under general anesthesia. Intraoperative findings included adhesions involving the omentum and gallbladder, a hydropic gallbladder, and a dilated common bile duct. Cholecystectomy was performed, followed by exploration of the common bile duct, during which a distal common bile duct stone was extracted. A T-tube was placed, hemostasis was secured, abdominal lavage was performed, a drain was inserted, and the surgical wound was closed in layers.

Postoperative follow-up demonstrated progressive clinical improvement. On postoperative day one, the patient reported postoperative pain, with stable vital signs and persistent scleral icterus. Intravenous antibiotics, analgesics, proton pump inhibitors, and intravenous fluids were continued, and T-tube output was monitored. Over subsequent days, pain gradually decreased, scleral icterus resolved, and no significant complications were observed. On December 15, 2024, the patient reported minimal pain and overall clinical improvement. Scleral icterus had resolved, vital signs were stable, and the patient was discharged with oral cefixime and paracetamol.

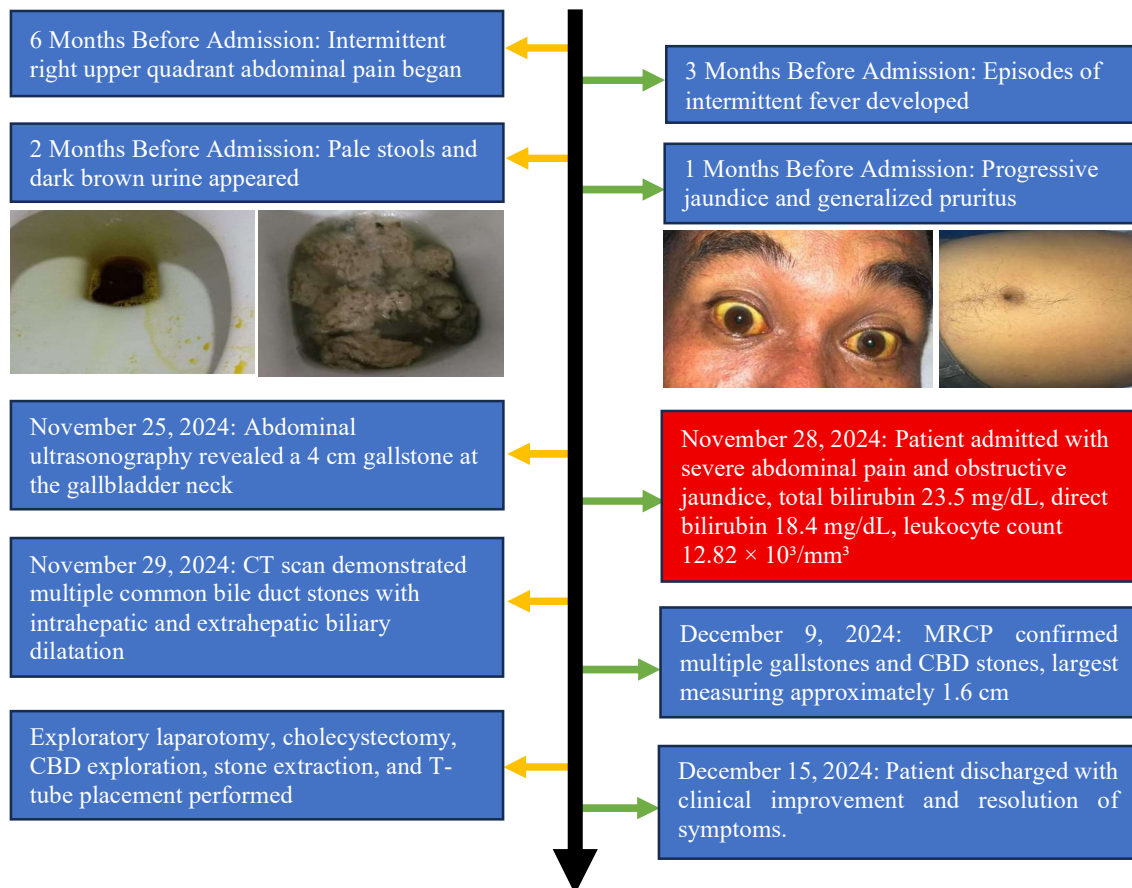


Figure 2. Case Report Timeline Presented According to CARE Guidelines

DISCUSSION

This case illustrated a clinically significant presentation of obstructive jaundice caused by choledocholithiasis, characterized by progressive jaundice, pruritus, pale stools, and dark urine. These manifestations reflected impaired bile flow resulting from mechanical obstruction of the common bile duct, leading to accumulation of conjugated bilirubin in the systemic circulation. The markedly elevated total bilirubin level observed in this patient, with a predominance of the direct fraction, was consistent with a cholestatic pattern commonly reported in obstructive biliary diseases.^{15,16}

The patient's clinical presentation evolved gradually over several months, beginning with intermittent biliary colic and progressing to persistent pain and overt jaundice. This progression supported existing pathophysiological models in which prolonged biliary obstruction increases intraductal pressure, disrupts hepatocellular excretion of bile, and eventually produces systemic manifestations such as pruritus due to bile salt deposition in the skin.¹⁷ The presence of intermittent fever prior to admission raised concern for inflammatory involvement of the biliary tract, which raised concern for acute cholangitis during hospitalization.¹⁶

Laboratory findings in this case demonstrated leukocytosis, thrombocytosis, elevated transaminases, and severe hyperbilirubinemia. Such abnormalities have been frequently described in choledocholithiasis, particularly in cases with prolonged obstruction or large stone burden. Elevation of alanine aminotransferase and aspartate aminotransferase in biliary obstruction is attributed to hepatocellular injury secondary to increased intrabiliary pressure and bile reflux into hepatic parenchyma.^{15,18} The extreme bilirubin elevation observed in this patient highlighted the severity of obstruction and underscored the importance of timely definitive intervention. Imaging played a central role in establishing the diagnosis and guiding management. Abdominal ultrasonography served as an initial screening tool, identifying gallstones but providing limited visualization of the distal common bile duct. Subsequent computed tomography and magnetic resonance cholangiopancreatography revealed multiple large common bile duct stones with intrahepatic and extrahepatic biliary dilatation. This stepwise diagnostic approach aligned with current recommendations that emphasize the use of non-invasive imaging modalities for accurate anatomical assessment and risk stratification.⁹ Magnetic resonance cholangiopancreatography, in particular, has been shown to offer high diagnostic accuracy for choledocholithiasis while avoiding the risks associated with invasive procedures.¹⁹

Based on the Tokyo Guidelines 2018 (TG18), the diagnosis of acute cholangitis is established through the presence of systemic inflammation, cholestasis, and imaging evidence of biliary obstruction. In this case, the patient fulfilled the diagnostic criteria for definite acute cholangitis. The patient demonstrated evidence of systemic inflammation through leukocytosis ($12.82 \times 10^3/\text{mm}^3$) and a history of intermittent fever, cholestasis manifested by marked jaundice with total bilirubin of 23.5 mg/dL and predominant direct hyperbilirubinemia, as well as imaging findings showing multiple common bile duct stones with intrahepatic and extrahepatic biliary dilatation. However, despite the marked hyperbilirubinemia and leukocytosis, the patient did not demonstrate organ dysfunction, hemodynamic instability, altered mental status, renal failure, or respiratory compromise suggestive of severe (Grade III) acute cholangitis according to TG18 severity grading. Therefore, this case was more consistent with moderate acute cholangitis (Grade II). According to TG18, Grade II acute cholangitis generally requires early biliary drainage or intervention in addition to supportive management and antibiotic therapy.²⁰

Endoscopic retrograde cholangiopancreatography is widely accepted as the first-line therapeutic modality for choledocholithiasis and acute cholangitis. However, several factors may limit its effectiveness, including large stone size, multiple stones, and anatomical considerations.²¹ In the present case, the presence of multiple stones and a large distal common bile duct stone favored a surgical approach. Open cholecystectomy with common bile duct exploration and T-tube placement was therefore selected as definitive management. Although less frequently reported in recent literature, this approach remains a valuable option in complex cases and in settings where endoscopic intervention is unavailable or unsuccessful.²² In addition, although the patient fulfilled the diagnostic criteria for acute cholangitis according to the Tokyo Guidelines 2018, he remained hemodynamically stable and did not demonstrate organ dysfunction or clinical features suggestive of severe (Grade III) cholangitis.

Therefore, urgent stabilization or staged biliary drainage prior to definitive intervention was not considered mandatory, allowing definitive surgical management to be performed directly.²³

However, ERCP may become technically challenging in cases involving multiple stones, large stone burden, impacted distal stones, or difficult biliary anatomy, and it also carries procedure-related risks such as post-ERCP pancreatitis, bleeding, and perforation. Laparoscopic common bile duct exploration (LCBDE) has emerged as an alternative minimally invasive single-stage approach that allows simultaneous cholecystectomy and bile duct clearance, with studies demonstrating outcomes comparable to ERCP in selected patients. Nevertheless, LCBDE requires advanced laparoscopic expertise and specialized equipment, and may be technically demanding in patients with severe inflammation, adhesions, or complex choledocholithiasis.²⁴ In contrast, open common bile duct exploration, although associated with longer recovery and greater surgical trauma, provides direct visualization of the biliary tract and facilitates more extensive exploration and complete stone extraction in difficult cases. Previous literature has emphasized that open exploration still retains an important role in patients with large or multiple common bile duct stones, failed endoscopic intervention, or technically challenging anatomy.²⁵

During the operation, common bile duct patency was assessed intraoperatively following stone extraction. A small-caliber tube was inserted distally through the choledochotomy into the common bile duct, followed by irrigation with physiological saline using a syringe connected to the tube. The absence of saline backflow during irrigation suggested adequate distal duct patency and no remaining distal obstruction within the common bile duct. In addition, satisfactory bile flow was observed prior to T-tube placement. Intraoperative saline irrigation and duct exploration remain commonly used conventional techniques to help assess duct clearance and biliary patency, particularly in settings where intraoperative choledochoscopy is unavailable. The use of a T-tube following common bile duct exploration was intended to provide adequate postoperative biliary drainage and reduce intraductal pressure while allowing monitoring of bile output and early detection of possible residual or recurrent obstruction. In addition, T-tube placement may help maintain duct patency during the postoperative inflammatory phase following bile duct manipulation. Primary closure or biliary-enteric anastomosis such as choledochoduodenostomy was not selected in this case because the local condition of the common bile duct still demonstrated significant inflammatory changes intraoperatively, which could potentially increase the risk of anastomotic failure and bile leakage. Therefore, T-tube drainage was considered a safer and more feasible option in this complex inflammatory setting. Previous literature has also reported that T-tube drainage may still retain an important role in selected patients with complex choledocholithiasis, difficult bile duct exploration, or inflamed biliary tissue despite the increasing adoption of primary closure techniques.^{13,26}

Then, the patient demonstrated gradual postoperative improvement, with resolution of jaundice and pruritus and stabilization of clinical parameters. This favorable outcome supported previous reports indicating that surgical exploration with T-tube drainage provides effective biliary decompression and allows postoperative monitoring of bile flow.⁸ Despite advances in minimally invasive techniques, classical surgical management continues to play a role in selected patients with complex biliary stone disease.

This case carried important clinical implications. First, it emphasized that severe obstructive jaundice with extreme hyperbilirubinemia may still arise from benign etiologies such as choledocholithiasis.¹⁵ Second, it reinforced the importance of comprehensive imaging evaluation in determining disease severity and guiding therapeutic decisions.¹⁹ Finally, it highlighted that open surgical intervention remains a relevant and effective treatment option in the modern era.²⁷ Nevertheless, this report was limited by its single-case design and lack of long-term follow-up data. Future studies, including larger case series or comparative analyses, are warranted to further clarify optimal management strategies for complex choledocholithiasis.

CONCLUSION

This case report demonstrated that severe obstructive jaundice with marked hyperbilirubinemia may arise from benign biliary pathology, particularly complex choledocholithiasis with multiple and large common bile duct stones. The patient also fulfilled the diagnostic criteria for moderate acute cholangitis according to the Tokyo Guidelines 2018, highlighting the potential inflammatory complications associated with prolonged biliary obstruction. The progressive clinical course, characteristic laboratory abnormalities, and comprehensive imaging findings underscored the importance of timely and accurate diagnostic evaluation to prevent potentially life-threatening complications. Although endoscopic management remains the preferred first-line treatment for choledocholithiasis, this case demonstrated that open surgical exploration with common bile duct exploration and T-tube drainage may remain a feasible and effective therapeutic option in selected clinically stable patients with complex stone burden when endoscopic intervention is not feasible or technically challenging. By highlighting a structured diagnostic approach and successful definitive surgical management, this report suggested that classical surgical techniques may still retain clinical relevance in selected modern clinical settings and emphasized the importance of individualized treatment strategies in patients with severe obstructive jaundice and complex choledocholithiasis.

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