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Case Report

Empyema of gall bladder with missed CBD calculus in a child with heart disease: a rarity

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ABSTRACT

Empyema of the gall bladder is a rare condition, especially in the paediatric age group. We report a case of a 12-year-old male with empyema of the gall bladder who was previously operated on for transposition of the great arteries with ASD at 2 months of age. After initial resuscitation, open cholecystectomy was done. But symptoms persisted. So, the patient was again operated on for retained calculus in CBD and ERCP with retrieval of calculus and stenting was done. Now the patient is asymptomatic.

Keywords: Biliary peritonitis, Cholecystitis, Cholecystectomy, Empyema, Rare, Retained

INTRODUCTION

Empyema of the gallbladder is an uncommon but serious complication of acute calculous cholecystitis characterized by accumulation of pus within the gallbladder lumen due to cystic duct obstruction and superimposed infection. Although well described in adults, it is rarely reported in the pediatric population because gallstone disease itself is uncommon in children.[1] The condition develops when prolonged obstruction of the cystic duct results in bile stasis, bacterial infection, and progressive distension of the gallbladder. Early diagnosis and prompt management are essential, as untreated cases may progress to gallbladder gangrene, perforation, biliary peritonitis, and sepsis.[2] Choledocholithiasis occurs in approximately 5-15% of patients with gallstones and may occasionally be missed during initial evaluation or surgical intervention.[3] Ultrasonography is commonly used as the initial imaging modality but has the limited sensitivity for detecting distal common bile duct (CBD) stones.[4] Here we report a rare case of gallbladder empyema in a child with chronic calculous cholecystitis, complicated by a missed distal CBD calculus following open cholecystectomy, in a patient with a history of congenital heart disease and prolonged total parenteral nutrition in infancy.

CASE REPORT

A 12-year-old male child presented to the emergency department with severe abdominal pain in the right upper quadrant for two days, associated with non-bilious vomiting and refusal to feed. The child had a history of intermittent abdominal pain for the past 6-7 years.

On examination, the child appeared sick and dehydrated. The abdomen was soft but showed marked tenderness in the right hypochondrium. A palpable mass measuring 2×3 cm was noted in the right hypochondrium with a positive Murphy's sign. The mass was globular in shape and separate from the liver margin. There was no icterus.

The patient had a past history of arterial switch operation with direct atrial septal defect (ASD) closure for transposition of great arteries (TGA) at two months of age.

With a clinical diagnosis of acute on chronic calculous cholecystitis, ultrasonography of the abdomen was performed. USG revealed diffuse gallbladder wall thickening measuring 5 mm, with the lumen filled with sludge and multiple echogenic calculi measuring 3-4 mm. An echogenic calculus measuring 1 cm with posterior acoustic shadowing was noted at the gallbladder neck or cystic duct.

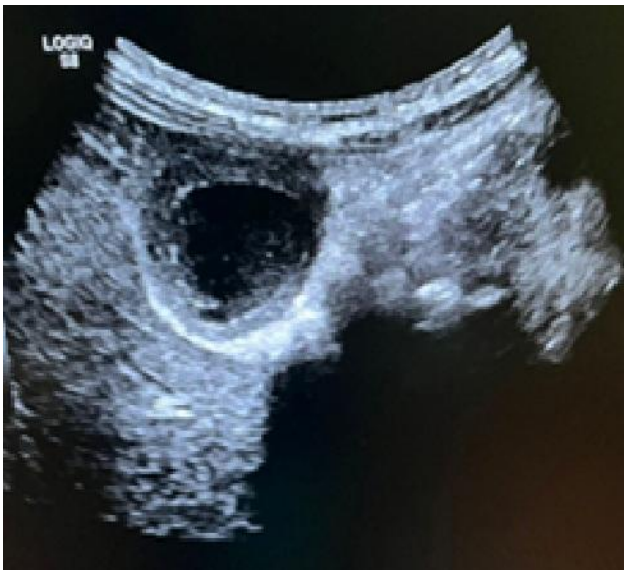

Figure 1: Ultrasonography of abdomen showing diffuse wall thickening of gall bladder with echogenic content within.

Laboratory investigations showed total leukocyte count of 12,000/mm³ with neutrophil predominance (84%). Serum amylase and lipase were 102 U/l and 77 U/l, respectively.

The patient was initially managed conservatively with nil per oral, intravenous fluids, antibiotics, and analgesics. Pain and tenderness improved after one day; however, the palpable lump persisted, and surgical intervention was planned. A laparoscopic cholecystectomy was attempted. Intraoperatively, the gallbladder wall was markedly thickened, oedematous, and densely adherent to surrounding omentum. During dissection, iatrogenic perforation of the cystic duct occurred, resulting in the release of pus from the gallbladder lumen, confirming the diagnosis of gallbladder empyema. The procedure was converted to open laparotomy via a right subcostal incision, and the gallbladder was removed after ligation of the cystic duct and cystic artery. The specimen was sent for histopathological examination.

The postoperative period was uneventful, and the patient was discharged on postoperative day four. However, 15 days after discharge, the patient presented again with severe abdominal pain and non-bilious vomiting. On examination, the patient was icteric, although the abdomen remained soft and non-tender.

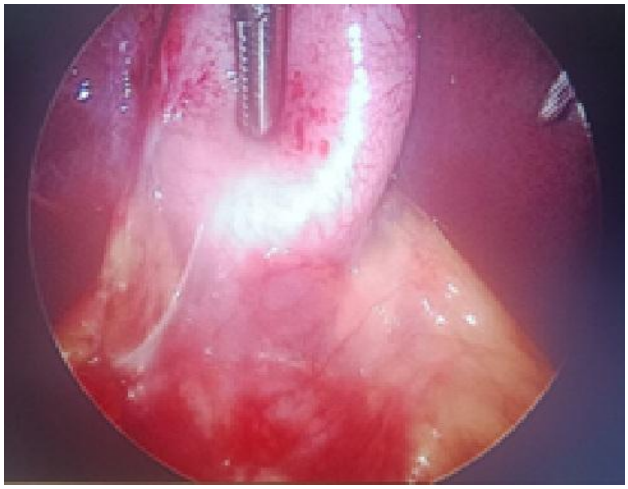

Figure 2: Intraoperative picture showing gall bladder with densely adhered omentum.

Liver function tests revealed direct hyperbilirubinemia (4 mg/dl) with elevated ALT (641 U/l), AST (584 U/l), and ALP (1176 U/l). Ultrasonography demonstrated a 10-mm calculus in the distal CBD with dilatation of the proximal CBD and intrahepatic biliary radicles. Contrast-enhanced CT scan confirmed two calculi measuring 9×8.5 mm and 5×4 mm at the distal CBD, with CBD dilatation to 10 mm and moderate intrahepatic biliary dilatation.

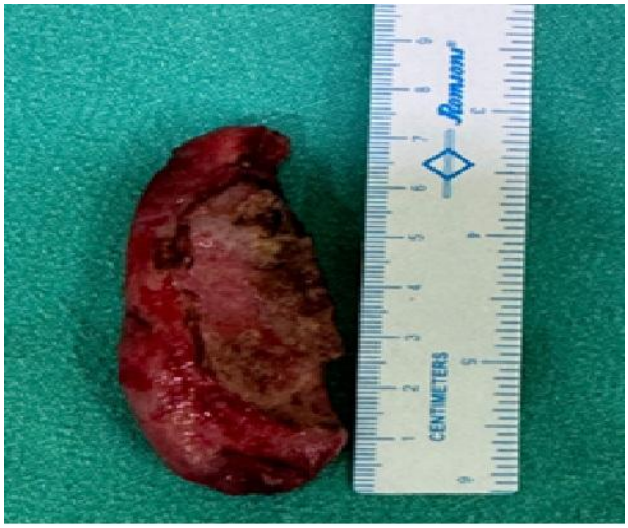

Figure 3: Specimen of gall bladder showing thick and inflamed wall.

The patient subsequently underwent endoscopic retrograde cholangiopancreatography (ERCP), which revealed a bulky ampulla with an impacted calculus. The stone was extracted and balloon sweeping of the CBD was performed. A 7 Fr double-pigtail stent was placed. Repeat liver function tests performed three days later showed improvement (ALT 226 U/l, AST 60 U/l, direct bilirubin 1.62 mg/dl). The patient's symptoms improved significantly. A repeat ERCP after six weeks was performed for stent removal. Following removal of the

stent, the patient remained asymptomatic during six months of follow-up.

DISCUSSION

Empyema of the gallbladder is an uncommon but severe complication of acute cholecystitis, accounting for approximately 5-15% of cases.[2] Although it is more frequently observed in adults, it is rarely reported in children because gallstone disease itself is uncommon in the pediatric population.[1] In the present case, the patient had a long history of intermittent abdominal pain, which likely represented chronic calculous cholecystitis. Prolonged cystic duct obstruction may result in bacterial infection and accumulation of pus within the gallbladder, leading to empyema. Similar mechanisms have been described in previous studies.[5] Clinically, our patient presented with right hypochondrial tenderness, a palpable mass, and a positive Murphy's sign. Khan et al reported that gallbladder wall thickening and positive Murphy's sign are important predictors of empyema and gangrenous cholecystitis, particularly in patients with acute inflammatory gallbladder disease.[6] The ultrasound findings in our case, including gallbladder wall thickening of 5 mm and multiple calculi, are consistent with imaging findings reported in previous studies of gallbladder empyema.

Another important factor in our patient was the history of congenital heart disease and prolonged total parenteral nutrition (TPN) in infancy. Long-term TPN has been associated with gallstone formation due to bile stasis and impaired gallbladder motility.[7] These factors may explain the development of gallstone disease at a relatively young age in our patient. A unique aspect of this case is the missed distal CBD stone following open cholecystectomy. Choledocholithiasis occurs in 5-15% of patients with gallstones, and retained or missed stones may present with obstructive jaundice after surgery.[3] Detection of distal CBD stones using ultrasonography alone may be difficult because of limited sensitivity, particularly in the distal duct.[4] In our patient, despite preoperative imaging and open cholecystectomy, the CBD stone was not identified initially. Similar cases of retained CBD stones following cholecystectomy have been reported in previous studies, highlighting the need for careful evaluation of the biliary tree in complicated gallbladder disease.[8]

Endoscopic retrograde cholangiopancreatography (ERCP) remains the gold standard for diagnosis and treatment of choledocholithiasis.[4] In this case, ERCP successfully removed the impacted stone and relieved biliary obstruction, resulting in rapid clinical and biochemical improvement. This case illustrates several important clinical points, including the rarity of gallbladder empyema in children, the role of predisposing factors such as prolonged TPN, and the possibility of missed CBD stones despite surgical management.

CONCLUSION

Empyema of the gallbladder is a rare but potentially life-threatening complication of gallstone disease in children. Early diagnosis and prompt surgical management are essential to prevent serious complications such as gallbladder perforation and peritonitis. This case highlights the importance of considering gallbladder empyema in pediatric patients presenting with acute right upper quadrant pain and a history of chronic abdominal symptoms. Additionally, predisposing factors such as congenital heart disease and prolonged total parenteral nutrition may contribute to early gallstone formation. The occurrence of a missed distal CBD stone in this case underscores the need for thorough evaluation of the biliary tree in complicated gallbladder disease and consideration of advanced imaging or endoscopic techniques when clinically indicated. Reporting such rare cases contributes to improved understanding of pediatric gallbladder empyema and emphasizes the importance of comprehensive perioperative assessment to avoid missed biliary pathology.

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