

CASE REPORT

Laparoscopic Cholecystectomy in a 10-Year-Old Male Patient with Symptomatic Cholelithiasis: A Case Report

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ABSTRACT

Laparoscopic cholecystectomy (LC) is a minimally invasive procedure widely used to treat gallbladder diseases, including cholelithiasis, in pediatric patients. A 10-year-old boy presented with a one-year history of intermittent right upper quadrant abdominal pain, worsened by fatty food intake, accompanied by nausea and vomiting without fever or jaundice. Ultrasonography and magnetic resonance cholangiopancreatography (MRCP) confirmed multiple gallstones, the largest measuring 0.5 cm, with no evidence of biliary obstruction. Due to persistent symptoms and risk of complications, laparoscopic cholecystectomy was performed. The procedure was completed successfully without intraoperative complications, and the patient had an uneventful recovery with significant symptom resolution. He was discharged within 48 hours. This case highlights the safety and effectiveness of laparoscopic cholecystectomy in managing symptomatic pediatric cholelithiasis. Preoperative MRCP played an important role in clarifying anatomy and excluding biliary pathology, supporting safe surgical planning and optimal outcomes.

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adult cohorts, leaving a paucity of data on the technical nuances required for complex pediatric cases (2).

CASE REPORT

A 10-year-old male presented with a one-year history of recurrent right upper quadrant abdominal pain. The pain was intermittent, often aggravated by fatty foods. The patient also reported associated nausea and vomiting but had no jaundice or fever. He had been initially diagnosed with acid reflux, but the symptoms persisted despite treatment.

An ultrasound performed revealed multiple gallstones with the largest stone measuring approximately 0.83 cm, prompting further investigation with magnetic resonance cholangiopancreatography (MRCP). The MRCP confirmed multiple gallstones, with the largest measuring 0.5 cm. There was no evidence of biliary duct obstruction, choledocholithiasis, or any other abdominal masses (Figure 1).

Given the persistent symptoms and the risk of potential complications, the decision was made to perform laparoscopic cholecystectomy. The procedure was completed without complications. Postoperative recovery was uneventful, and the patient was discharged within 48 hours. Follow-up visits showed no recurrence of symptoms, and the patient resumed normal activities without further complaints.

INTRODUCTION

Laparoscopic cholecystectomy (LC) has become the gold standard treatment for symptomatic cholelithiasis in pediatric patients due to its minimally invasive nature, which offers reduced recovery times and fewer complications compared to open surgery. Although cholelithiasis in children is rare, its incidence has increased in recent years, particularly in children with underlying conditions such as obesity, metabolic syndrome, or hemolytic diseases. Clinical symptoms, including right upper quadrant abdominal pain, nausea, and vomiting, are common indicators. Surgical intervention is typically warranted when symptoms are persistent, and there is a risk of complications such as acute cholecystitis, biliary obstruction, or pancreatitis. In this case, the patient was diagnosed with multiple gallstones, and laparoscopic cholecystectomy was performed successfully without intraoperative complications. This report underscores the role of LC as a safe and effective procedure for managing symptomatic cholelithiasis in pediatric patients (1,2). However, despite the widespread adoption of LC, there remains a significant research gap regarding the standardized management of. Most existing literature focuses on

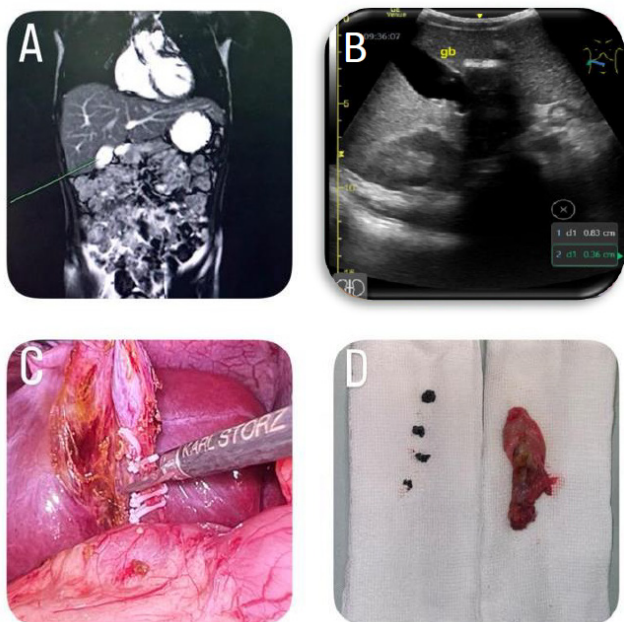


Figure 1: A: Multiple cholelithiasis with a displaced size of 0.5 cm observed on MRCP (green arrow). B: Multiple cholelithiasis with a displaced size of 0.8 cm observed on USG. C: Laparoscopic cholecystectomy procedure. D: The divided vesica velea and the appearance of cholelithiasis.

DISCUSSION

Pediatric cholelithiasis, although rare, is increasingly recognized, especially as the prevalence of metabolic disorders such as obesity and hemolytic diseases rises in children. The clinical presentation of pediatric cholelithiasis includes right upper quadrant abdominal pain, nausea, vomiting, and postprandial discomfort, which is consistent with the findings in this case. While the patient did not exhibit jaundice or fever, the persistence of these symptoms despite initial conservative management raised suspicion for gallstones, which was later confirmed by ultrasound and MRCP. Preoperative transabdominal ultrasound demonstrated multiple amorphous hyperechoic lesions within the gallbladder, with the dominant calculus measuring approximately 0.83 cm. Given the multifocal nature and the irregular morphology of these stones, there was a heightened clinical suspicion for biliary migration into the Common Bile Duct (CBD). It is widely recognized that transabdominal ultrasonography possesses inherent diagnostic limitations in achieving comprehensive visualization of the distal CBD, frequently secondary to obscuration by overlying duodenal gas or constitutional patient factors. Consequently, to definitively exclude occult choledocholithiasis and verify a stone-free biliary tree prior to laparoscopic intervention, MRCP was utilized as the non-invasive gold standard.

Laparoscopic cholecystectomy has become the preferred treatment for symptomatic cholelithiasis in children due to its advantages over open surgery. These advantages include reduced postoperative pain, shorter

recovery times, and fewer complications such as wound infections, intra-abdominal abscesses, and adhesions. Numerous studies have demonstrated the safety and efficacy of laparoscopic cholecystectomy in pediatric patients, which is consistent with this case where the patient had an uneventful recovery and rapid return to normal activities (3)(4). From a pathophysiological perspective, the utility of LC is rooted in the significant attenuation of the systemic inflammatory response. Unlike open surgery, the minimal tissue disruption in LC limits the release of pro-inflammatory cytokines, specifically Interleukin-6 (IL-6) and Tumor Necrosis Factor-alpha (TNF- α).² At the molecular level, this technique reduces the activation of the hypothalamic-pituitary-adrenal (HPA) axis, thereby maintaining metabolic homeostasis and minimizing oxidative stress a crucial benefit for pediatric patients who possess more limited physiological reserves than adults (5).

The decision to perform cholecystectomy in children is generally based on the severity and persistence of symptoms, the presence of complications, and the risk of future complications such as biliary obstruction or pancreatitis. In this case, the patient had recurrent symptoms that were not resolved with medical treatment, and imaging revealed multiple gallstones without evidence of biliary duct obstruction, making laparoscopic cholecystectomy an appropriate choice.

While the incidence of cholelithiasis in children remains relatively low compared to adults, the rising prevalence of risk factors such as obesity and metabolic syndrome in pediatric populations suggests that this condition may become more common. Imaging techniques like ultrasound and MRCP are invaluable tools in diagnosing cholelithiasis, particularly in distinguishing between simple gallstones and more serious conditions such as choledocholithiasis or biliary tract obstruction. In this case, MRCP was critical in confirming the diagnosis and ruling out biliary duct obstruction, allowing for a straightforward laparoscopic approach.

The primary strength of this case report lies in the comprehensive diagnostic utility of MRCP, which facilitated a high-fidelity surgical roadmap and ensured the definitive exclusion of occult biliary migration—a critical precautionary step that is frequently overlooked in routine pediatric presentations. The academic novelty of this report is underscored by the documented discrepancy between ultrasound (US) and MRCP findings, wherein the dominant calculus was measured at 0.83 cm and 0.5 cm, respectively. This finding emphasizes that MRCP should be regarded not merely as a supplementary imaging tool, but as a definitive modality for precise preoperative sizing and anatomical mapping in the pediatric population, thereby serving as a crucial safeguard against iatrogenic bile duct injury.

However, certain limitations must be acknowledged; as

a single case study, the clinical findings and technical outcomes may not be fully generalizable to the broader pediatric population or diverse clinical settings. Additionally, ongoing research into the long-term outcomes of pediatric laparoscopic cholecystectomy is essential. Studies that assess recurrence rates of gallstones, the potential for complications in adulthood, and the effectiveness of preventive measures in high-risk pediatric populations would contribute to improving treatment protocols and patient outcomes.

CONCLUSION

Laparoscopic cholecystectomy remains a safe and definitive gold standard for pediatric symptomatic cholelithiasis. However, this case emphasizes that surgical success is profoundly dependent on meticulous preoperative diagnostic protocols. The integration of MRCP proved essential in resolving discrepancies in stone characterization and definitively ruling out occult biliary migration, which transabdominal ultrasound may fail to delineate due to inherent technical limitations. Early intervention, guided by a high-fidelity anatomical roadmap, ensures optimal recovery and mitigates the risk of iatrogenic injury, particularly in complex pediatric presentations with multifocal calculi.

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