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Hiding in plain sight: An unusual case of intrahepatic gallbladder

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Abstract

Intrahepatic Gallbladder (IHGB) is a rare anatomical anomaly where the gallbladder is embedded within the anteroinferior aspect of the liver parenchyma. It can exhibit impaired function due to incomplete emptying, leading to bile stasis and gallstone development. Surgery is subsequently often required. This can be challenging due to unusual anatomy and diagnostic uncertainty on pre-operative workup. This case report follows the findings and treatment of a 37-year-old gentleman who presented for elective open cholecystectomy following multiple complications after previous failed cholecystectomy. IHGB was ultimately diagnosed and managed intra-operatively. Pre-operative blood tests were unremarkable. Computed-tomography abdomen/pelvis on admission demonstrated cholelithiasis, with no intra or extrahepatic bile duct dilatation. Open cholecystectomy revealed complete IHGB, requiring diathermy through the liver and gallbladder identification via needle aspiration. It was successfully removed via a modified approach. We present a remarkable case of IHGB and highlight the diagnostic and therapeutic difficulties this unusual diagnosis can pose.

Keywords: Intrahepatic gallbladder; Ectopic gallbladder.

Introduction

Intrahepatic Gallbladder (IHGB) is a rare anatomical anomaly where the gallbladder is embedded partially or completely within the anteroinferior aspect of the liver parenchyma. It can exhibit impaired function due to incomplete emptying, leading to bile stasis and gallstone development. Surgery is subsequently often required. This can be challenging due to unusual anatomy and diagnostic uncertainty on pre-operative workup. Estimated incidence of ectopic gallbladder is 0.1 to 0.7%. IHGB is the second most common location for an ectopic gallbladder [1].

Case report

A 37-year-old man was admitted to our facility for repeat elective open cholecystectomy following multiple complications after two failed attempts at gallbladder removal 2 and 11 years prior. 2 years ago, laparoscopic cholecystectomy was attempted and abandoned due to difficulty finding the gallbladder intra-operatively. He developed peri-hepatic collections post-operatively, possibly caused by iatrogenic injury to the gallbladder. Common duct injury was excluded via ERCP, which showed normal bile and intrahepatic ducts and very low entry cystic duct. His past medical history included cholelithiasis, hypertension, gastro-oesophageal reflux disease, and obesity. The patient

underwent a preoperative computed tomography scan of his abdomen/pelvis, which showed a non-dilated gallbladder containing gallstones with no evidence of acute cholecystitis, and no intra- or extra-hepatic bile duct dilatation. No comment was made by the reporting radiologist about the location of the gallbladder. Further, his blood tests results including liver function and inflammatory markers were unremarkable. The diagnosis of completely IHGB was ultimately made intra-operatively. The location of the gallbladder was confirmed with intra-operative ultrasound and needle aspiration. Diathermy and LigaSure were used to dissect through the liver where the gallbladder were then identified. The cystic duct and artery were intrahepatic and could not be dissected using conventional means. Cholecystectomy via fundus-first approach was used. Gallstones were removed under vision. The cystic duct was identified at the end of the Hartmann pouch intraluminally. The gallbladder was removed and the Hartmann's pouch was closed over the cystic duct. After haemostasis, a 19Fr tube drain was left in the gallbladder fossa. The patient had an uneventful post-operative course and was discharged home after 6 days. Histological results confirmed acute on chronic cholecystitis.

Discussion

Various classifications of gallbladder anomalies exist, but two main types of intrahepatic variants are typically described: partial or complete. Deve (1903) was the first to describe this condition in 1903 [2], identifying 12 partial or complete cases amongst the autopsies of 130 infants. During embryonic development, the gallbladder originates from the caudal bud, which stems from the hepatic diverticulum of the primitive midgut around 4th week of gestation. During the second month of development, it remains an intrahepatic structure before eventually emerging as an extrahepatic organ. Alternate ectopic locations of the gallbladder include beneath the left liver lobe, transverse, retroplaced, and in rare cases, in the falciform ligament and anterior abdominal wall [3,4]. Its aberrant positioning may be regarded as an instance of positional arrest during development [5]. A displaced gallbladder can present significant complications, including concurrent cholelithiasis due to stagnant bile flow, inflammation/sepsis, misdiagnosis, and technical difficulties during operation as noted in our case report. Although cases of IHGB diagnosed pre-operatively have been published [6], an important problem is its radiographic similarities to other diseases [7], including hepatic cysts [8,9]. Choice of therapeutic approach for treating IHGB remains contentious, with case reports describing techniques ranging from gallbladder drainage with choledocholithotomy [10], to open cholecystectomy with hepatectomy [11,12]. In our case, intra-operative ultrasound and needle aspiration helped us pinpoint the gallbladder's location. A fundus-first approach was used, and the cystic duct could only be identified intraluminally.

Conclusion

This case highlights the diagnostic and therapeutic challenged with IHGB. Preoperative workup may not reliably provide definitive evidence of aberrant gallbladder position, thus necessitating intraoperative confirmation. Techniques such as use of ultrasound and needle aspiration may be helpful in certain cases. Surgical management nonetheless remains controversial, with various approaches reported in the literature. Our choice of surgical approach in this specific case exemplifies the adaptability required to address unexpected anatomical variations.

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