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Case Report

Bilobed gallbladder: a rare congenital anomaly of the biliary system

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ABSTRACT

Duplication of the gallbladder is a rare congenital anomaly, which Boyden first illustrated in 1926. No additional risk of cholelithiasis or malignancy with this congenital anomaly was documented. However, this congenital anomaly is associated with more risk for complications during and after laparoscopic cholecystectomy. So, preoperative diagnosis is essential in identifying anatomical abnormalities to avoid biliary injuries at the time of surgery or the performance of an incomplete operation. The removal of an asymptomatic double gallbladder remains controversial. Here, we are reporting a case of the incidentally detected duplex gallbladder in a teenager and review the literature that will enrich the reader's knowledge regarding this rare congenital anomaly.

Keywords: Congenital gallbladder abnormalities, Gallbladder duplication, Duplex gallbladder

INTRODUCTION

The anatomical variations of gallbladder are quite common, related to number, shape, position, and may also involve the anomaly of cystic artery and cystic duct.[1] Gallbladder duplication is a rare congenital malformation of the biliary system with an incidence of one in 3800-4000 births.[1] The exact incidence cannot be estimated, as most of them are asymptomatic. Few of them diagnosed on the autopsy table with an autopsy incidence of 0.02%.[1] It is associated with iatrogenic bile duct injury during cholecystectomy, more no. incidence with laparoscopic cholecystectomy, which is preferred surgical procedure in modern days.[2] Preoperative diagnosis of rare anatomical variation is not only helpful in preventing complications but also prior planning of removal both together at time. There is high probability of misdiagnosis intraoperatively in the absence of prior knowledge.[3]

CASE REPORT

A 14 years old school-going male teen of Indian descent presented with right upper quadrant pain for one week intermittently, which was more associated with fatty foods. He had one previous similar episode. No history of fever was present. He had no known comorbidities. Clinically, his abdomen was soft and non-tender. No apparent masses or clinical signs of jaundice was seen. Blood investigations were within the normal range. On abdominal ultrasonography (USG), two cystic structures were seen in the gallbladder fossa region, which was seen communicating with each other and drained into a single cystic duct (Figure 1). Lumen was echo-free with average wall thickness, and the common bile duct was appeared normal. As a result, he was diagnosed as a case of a duplicated gallbladder.

In order to delineate the anatomy and confirm the diagnosis, magnetic resonance cholangiopancreatography (MRCP) was performed, demonstrating duplex gallbladders with a single cystic duct and fusion of proximal part of both gallbladders (Figure 2, 3, and 4). So, the final diagnosis of V-type duplicated gallbladder was made. The patient was managed conservatively, as he was mildly symptomatic.

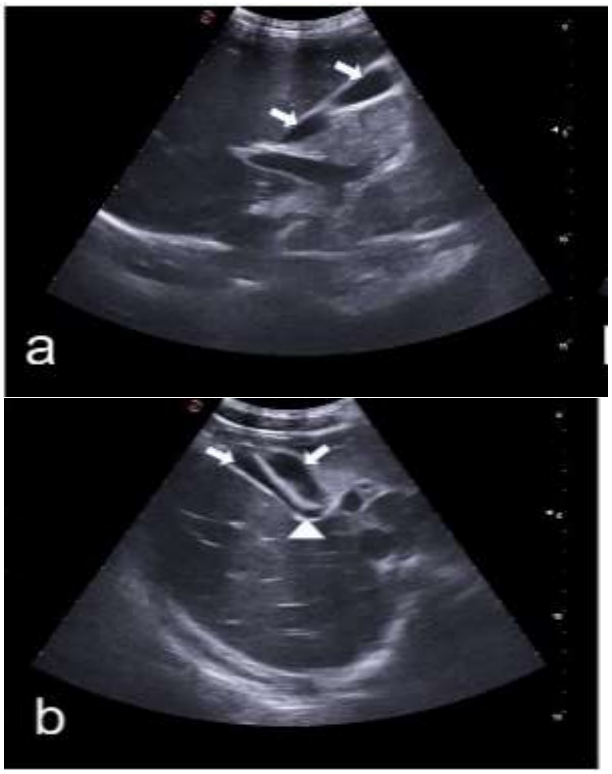

Figure 1 (A and B): USG abdomen done at right hypochondrium in left lateral decubitus position in sagittal view and transverse view of two cystic structures (arrow) in gallbladder fossa region with communication at proximal part (arrow head). Lumen was echo-free with normal wall thickness.

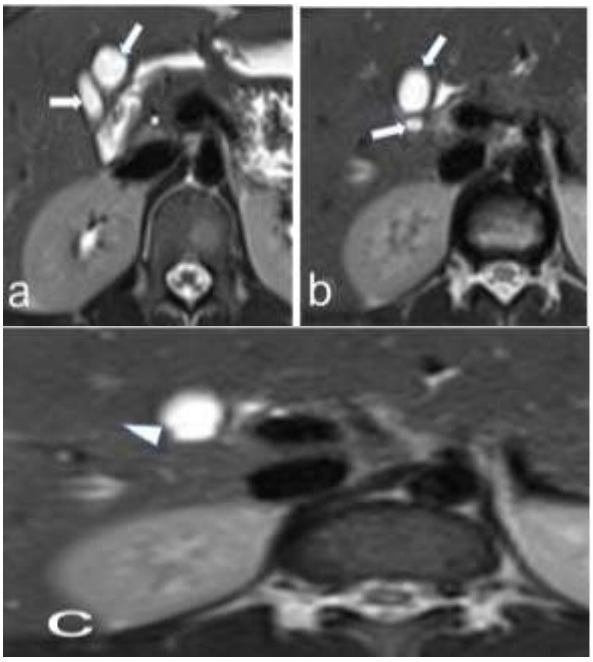

Figure 2 (A, B and C: Axial T2 weighted images of upper abdomen of 2 cystic structures (arrow) in gallbladder fossa region with communication at proximal part (arrow head). No filing defect seen within.

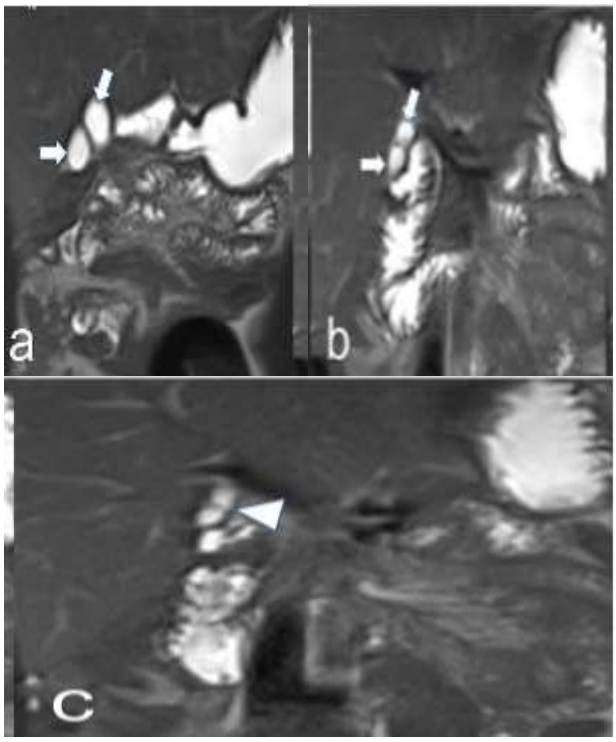

Figure 3 (A, B and C): Coronal T2 weighted images of upper abdomen of 2 cystic structures (arrow) in gallbladder fossa region with communication at proximal part (arrow head). No filing defect seen within.

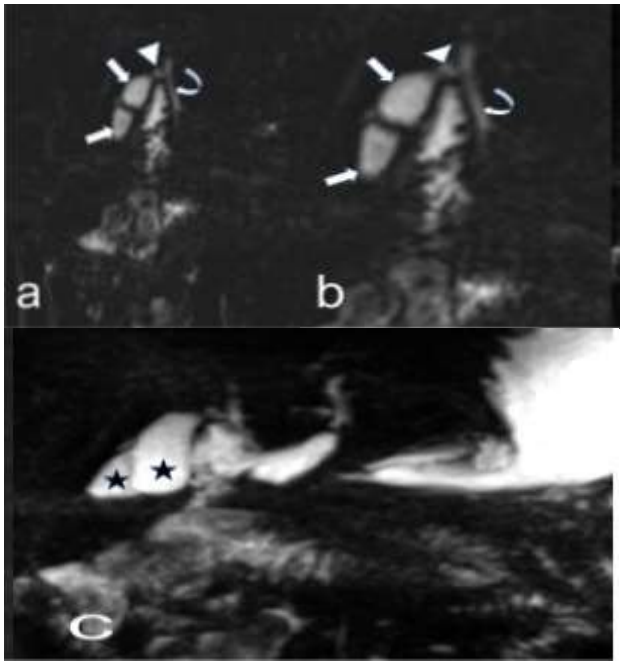

Figure 4 (A, B and C): 3D respiratory-triggered heavily T2 weighted FSE (fast sequence echo) sequence images in coronal oblique plane of 2 cystic structures (arrow) in gallbladder fossa region with a single cystic duct (arrow head) draining into common bile duct (curved arrow). Image "b" is zoomed image of "a". MIP of duplication of gallbladder (star).

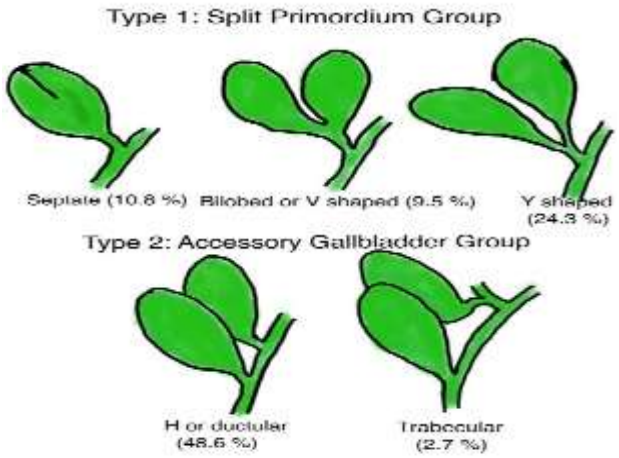

Figure 5: Boyden's classification.[1] The frequency of occurrence with each subtype.

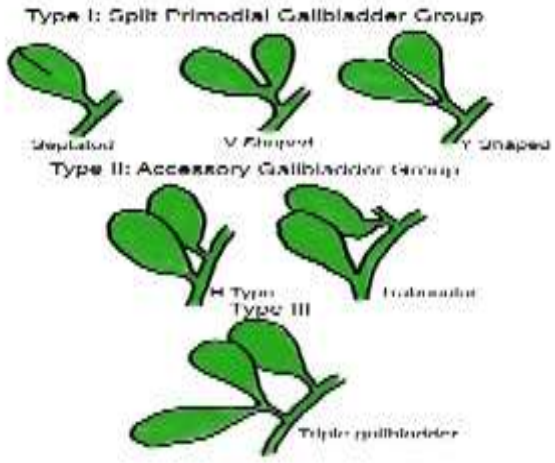

Figure 6: Classification of duplex gallbladder.[5]

DISCUSSION

The gallbladder develops from the hepatic diverticulum, which arises as proliferation from the endoderm of posteroventral foregut on the eighteenth day of gestation.[4] The cranial part of the hepatic diverticulum is called pars hepatic and gives rise to hepatic parenchyma ad intrahepatic biliary radicles. The caudal part of the hepatic diverticulum is known as pars cystica and forms the extrahepatic bile duct, gallbladder, and ventral pancreas. The pars cystica develops into gallbladder primordium that ultimately matures into the gallbladder. Double gallbladder arises either due to splitting this cystic primordium during embryogenesis around the 5th and 6th week of gestation or budding the extra biliary primordium to form an accessory gallbladder.[5]

The most common presenting complaints associated with this anatomical malformation are abdominal pain, vomiting, and jaundice, mimicking biliary colic, acute cholecystitis, and cholelithiasis.[6] Ultrasound is highly sensitive and specific for its diagnosis and preferred modality.[7] Folded gallbladder, phrygian cap, choledochal cyst, the vascular band across gallbladder, pericholecystic fluid, gallbladder diverticulum, and focal adeno-myomatosis can mimic a double gallbladder on USG.[6] This anomaly can be misdiagnosed on USG due to its rarity or the lack of prior experience of the USG operator. CT and MRI can be used as a non-invasive modality to delineate the anatomy.[8] Apart from these, oral cholecystography HIDA scan, percutaneous transhepatic cholangiogram, or endoscopic retrograde cholangiopancreatography (ERCP) are other investigations options for detecting the double gallbladder.

Boyden initially described the double gallbladder and classified this anomaly as described in Figure 5 in 1926.[1] Later, Harlaftis et al reclassified the duplicated gallbladder into the split primordium and accessory gallbladder groups in 1977 as described in Figure 6.[5] The split primordium group has a common cystic duct and is further classified into septated, bilobed, and Y-shaped.[9] The accessory gallbladder group has more than one cystic duct and is further classified into ductular (H-shaped) and trabecular.[9] In addition to the duplex gallbladder, eleven cases of triple gallbladder were seen reported in the literature.[10] The gallbladder closest to the liver is termed as accessory one.

Duplication of the gallbladder can be asymptomatic and present with not specific symptoms. So, this condition may remain undiagnosed. These are also not even predisposing the gallbladder malignancy or stone formation. So, prophylactic surgery is not advisable for asymptomatic or mildly symptomatic patients, like our case.[5] Missed preoperative diagnosis can cause biliary tract peri-operative injury or persistent biliary symptoms due to leftover gallbladder. More risk for these complications is associated with the laparoscopic procedure if not diagnosed prior.[2]

CONCLUSION

Duplication of the gallbladder, a rare anomaly associated with cholelithiasis and cholecystitis, can be undiagnosed. That may lead to both intraoperative and postoperative complications with the laparoscopic procedure, which is the preferred surgical procedure for cholelithiasis. Only prior imaging experience can prevent such mishappens. Our imaging experience in USG and MRCP of a v-type of the duplicated gallbladder, which is second-rarest, will strengthen the imaging experience and sensitize our fellow radiologists to diagnose this rare anomaly.

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Ethical approval: Not required

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