Case Report

Duplication of the gallbladder: Case report of a rare biliary malformation

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A B S T R A C T

Duplication of the gall bladder is a rare anatomic variation. The incidence is approximately 1 in 4000 in literature. Preoperative identification of such anomaly and its various types is very important since it can avoid damage to possible vascular and biliary aberrant anatomy during surgery. My case is a 29-year-old male patient with a complaint of epigastric pain which was on and off type. An abdominal ultrasonogram showed multiple calculi in the gallbladder lumen with normal wall thickness and no evidence of intra or extra-hepatic biliary tree dilatation. Another cystic structure was noted adjacent to it with no intraluminal pathology. Magnetic resonance cholangiopancreatography revealed the duplication of the gallbladder and a common cystic duct for both the cavities draining into a common hepatic duct. Multiple filling defects were noted within one of the cavities. The patient was discharged and advised to follow-up. Two months later the patient presented with an episode of acute cholecystitis which was managed by laparoscopic cholecystectomy. Preoperative radiological identification of this anatomic variation helps in planning the surgery accordingly and can prevent perioperative complications.

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Introduction

Congenital duplication of the gallbladder is a rare biliary malformation that can be of different morphologies occurring in about 1 in 4000 births [1]. Preoperative diagnosis is helpful because it can minimize the possible operative complications and resurgery. Current imaging modalities like magnetic resonance cholangiopancreatography (MRCP) and endoscopic retrograde cholangiopancreatography (ERCP)
help in preoperative detection and characterization of the malformation. Laparoscopic surgery removing both gallbladders with intraoperative cholangiography is the treatment of choice.

**Clinical history**

A 29-year-old male was presented to our hospital emergency department with a complaint of epigastric and right upper quadrant pain. Physical examination showed no remarkable tenderness. Hematologic and biochemical analysis showed leukocytosis and the other laboratory findings were normal. Vital signs were within the normal limit. An ultrasonogram of the abdomen and pelvis was performed which revealed cholelithiasis with an adjacent cystic structure. Then MR cholangiography was performed in our center for detailed anatomy of the biliary system using 1.5 Tesla MRI following standard imaging protocols.

Because the patient had no symptoms, he was just advised to follow-up. Two months later, the patient experienced an episode of acute cholecystitis, which was treated with intravenous antibiotics and laparoscopic cholecystectomy was performed.

**Imaging findings**

An ultrasonogram of the abdomen and pelvis revealed a normal gallbladder with multiple gallstones in the lumen and a fusiform cystic structure adjacent to the gallbladder (Figs. 1A and B). No evidence of dilatation of biliary tracts. The Wall of the gallbladder was normal in thickness and echogenicity.

The MR cholangiography shows a normal gallbladder with multiple intra-luminal stones and a second gallbladder adjacent to it. Both gallbladders have a common cystic duct entering the common hepatic duct. The common hepatic duct and common bile duct were normal without intraluminal filling defects. The maximum intensity projection (MIP) algorithm was done as post-acquisition image processing for the 3-dimensional cholangiogram (Figs. 2A and B).

**Discussion**

Duplication of the gallbladder is rare congenital anatomy with an accessory gallbladder. It is due to exuberant budding from the developing biliary tree when the caudal bud of the hepatic diverticulum divides. There is no evidence of increased...
risk of calculi and malignant transformation as compared to the single gallbladder. Congenital malformations of the gallbladder can be classified as morphological and gastrointestinal abnormalities while duplication is a morphological abnormality [1,2]. Gallbladder duplications are classified according to Boyden’s classification. The 2 common types of duplications are the vesica fellea divisa (bilobed gallbladder) and vesica fellea duplex (true duplication) having 2 different cystic ducts. The true duplication is sub-classified into the H-shaped type and Y-shaped type. The H-shaped type has 2 separate gallbladders and cystic ducts entering separately into the common bile duct whereas the Y-shaped type has 2 cystic ducts that unite before entering into the common bile duct. In our patient, we find a Y-shaped type of duplication [3,4].

Ultrasonogram is the primary imaging modality for gallbladder pathology. Ultrasound may find gallbladder duplication if the viscera are located separately. There are some criteria for ultrasonogram diagnosis of gallbladder duplication in limited case reports. Although it can suggest 2 gallbladder lumens it is difficult to find cystic ducts as in our case, we find only 2 cystic lumens which doesn’t help to distinguish between bilobed from true duplication. MRCP is an important, noninvasive imaging technique that helps to evaluate patients with suspected anomalies of the gallbladder in ultrasonogram. In our case, MRCP showed the gallbladder duplication and helped us determine the type of duplication. The differential diagnosis includes gallbladder diverticula, gallbladder fold, Phrygian cap, choledochal cyst, and pericholecystic fluid [5].

**Conclusion**

Gallbladder duplication is a rare anatomic malformation that requires surgical treatment. Preoperative diagnosis of an anomaly of the hepatobiliary tract is important to minimize the possible damage to the ductal system. Although ultrasonogram is the initial choice of imaging modality, MRCP is an important noninvasive technique for the evaluation of patients with suspected gallbladder duplication.

**Patient consent**

Informed written consent has been taken from the patient by myself, the principal author and can be reproduced as and when required.

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