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A RARE CASE OF GALLBLADDER DUPLICATION

Radiology

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ABSTRACT

Gallbladder duplication is a rare congenital anatomic malformation, having an incidence of about 1 in 3000 - 4000 live births. Diagnosis of this condition by preoperative imaging is important in order to avoid iatrogenic bile duct injuries. Patients are usually asymptomatic, laparoscopic cholecystectomy being the treatment of choice in symptomatic patients. In this report, we present a case of duplicated gall bladder in a 55 year old female which was incidentally detected on imaging.

KEYWORDS

Gallbladder, duplication, bile duct, Magnetic Resonance Cholangiopancreaticography

INTRODUCTION:

Gallbladder duplication is a rare congenital anomaly of biliary ductal organogenesis. The hepatic diverticulum in a normal embryo develops after the 4th week of gestation and divides into a cranial and a caudal bud during the 6th week. The cranial bud (*pars hepatica),* gives rise to the liver with its intrahepatic biliary ducts, and the caudal bud (*pars cystic)*, gives rise to the extrahepatic biliary ducts, including the gallbladder, the cystic duct and the common bile duct. Between the 5th and 8th week of gestation, the *pars cystica* migrates down toward the *pars hepatica*, and from the 8th to the 12th week, all ducts become patent.[6] All these steps may be altered and give rise to one or two accessory gallbladders, according to the time of embryologic development.

The presence of a double gallbladder was first reported in 31 BC by Pliny.[9] Detection of this anomaly and its types is important as it can predispose to a number of complications [2,3] and since it can complicate a simple hepatobiliary surgical procedure. Preoperative diagnosis is important to plan surgery and to further prevent possible surgical complications or re-operation if accessory gallbladder has been overlooked during initial operation. We report an unusual case of a duplicated gallbladder detected on ultrasonography and characterized on MRCP, with a distal common bile duct stricture, managed by ERCP guided biliary stenting.

Case Report:

A 55 year old female presented with complaints of mild right hypochondrial pain and fatigue for one week. She had no history of fever, vomiting, cough.

She was a known case of diabetes mellitus and systemic hypertension for the past ten years, coronary artery disease for the past one year on regular medication and blind in the right eye.

On examination, she was afebrile, hypertensive, had yellowish discoloration of eyes and right hypochondrial tenderness.

Routine blood and biochemical investigations were done and showed elevated total (6.09 mg/dl) and direct (3.7 mg/dl) bilirubin, SGOT (325 units/l), SGPT (350 units/l), and alkaline phosphatase (385 IU/l).

Transabdominal ultrasound and Computed tomography were done and showed evidence of gallbladder duplication (Figures 1 & 2).

Magnetic Resonance Cholangiopancreaticography showed gallbladder duplication with two separate cystic ducts. (Figure 3)

The cystic duct draining the medially positioned gallbladder was shorter and not dilated. The cystic duct draining the laterally located gallbladder was seen to have a longer course joining the distal aspect of the common bile duct, appearing dilated (5.7mm). (Figure 4)

The proximal common bile duct was dilated (11mm) with an abrupt narrowing of the distal common bile duct. (Figure 4)

The patient was thus diagnosed to have H type Vesica fellea duplex gallbladder with a distal CBD stricture, for which ERCP guided biliary stenting was done (Figure 5). Patient was symptomatically relieved and advised to follow up.

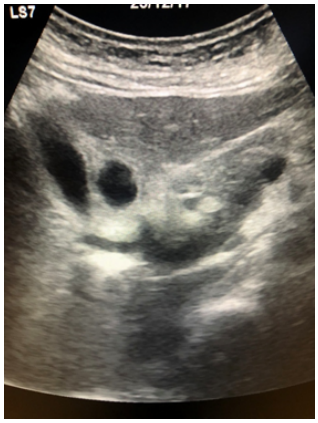

Figure 1: Transabdominal Ultrasound at the level of the right hypochondrium shows duplicated gallbladder with dilated proximal common bile duct.

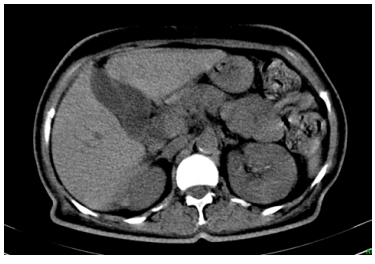

Figure 2: Plain Computed tomography, axial section of the abdomen showing duplicated gallbladder.

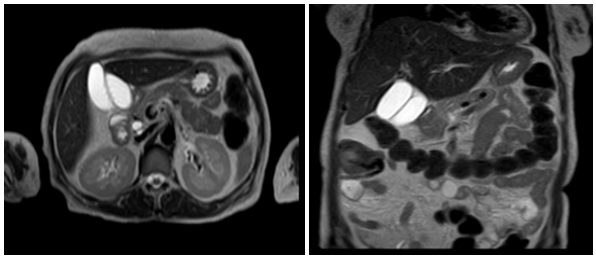

Figure 3: Axial (left) and Coronal (right) T2 weighted MRI images of the abdomen showing duplicated gallbladder

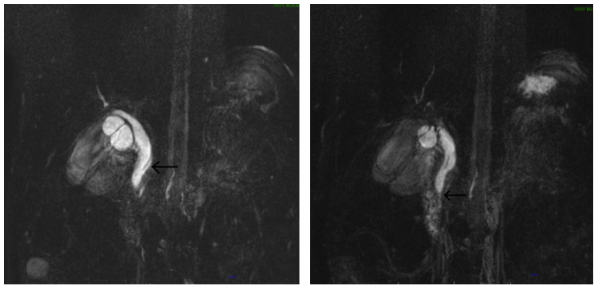

Figure 4: Coronal MRCP images showing lower insertion of the cystic duct draining the laterally located gallbladder (arrow on the left image) and abrupt narrowing of the distal portion of common bile duct (arrow on the right image).

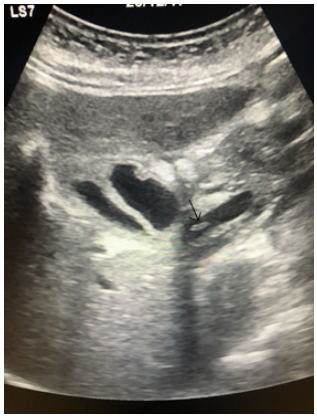

Figure 5: Transabdominal Ultrasound image Post ERCP guided biliary stenting with presence of the stent (arrow) in the common bile duct.

DISCUSSION:

Gallbladder duplication is a rare congenital malformation, with an estimated autopsy and radiological occurrence of 0.02% and 0.03%, respectively.[4,6] It is thought to be due to a rare embryonic diverticulum of the hepatic duct, occurring during the fifth or sixth week of gestation. Two well known classifications (Boyden's and Harlaftis') are followed for gallbladder duplication/ multiple gallbladders.

Boyden classifies gallbladder duplication into two major types:

1. Vesica fellea divisa, bilobed gallbladder with incomplete division, having a common neck, sharing a common embryological origin (primordium).
2. Vesica fellea duplex, double gallbladder with two seperate cystic ducts, uniting before entering the common bile duct (Y subtype) or entering the biliary tree separately (H type). These have a dual embryological origin (dual primordium).

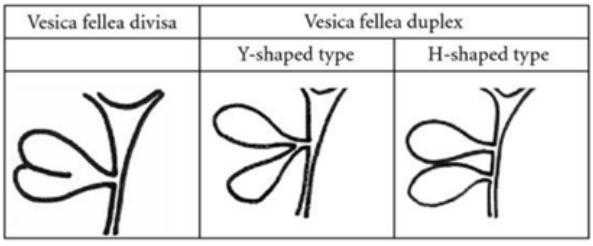

Figure 6: Boyden's classification of gallbladder duplication[1]

According to Harlaftis' classification of multiple gallbladders, there are four types,

1. Type 1 comprises a group of split primordial GBs, subdivided into septate, V-shaped and Y-shaped types (similar to the vesica fellea divisa and Y-shaped type of vesica fellea duplex of Boyden). When the cystic primordium splits during embryogenesis, both gallbladders share a common cystic duct.
2. Type II includes the accessory gallbladder types, which can be ductular (as in the H-shaped type of the vesica fellea duplex of Boyden), duodenal where the cystic ducts enter the duodenum or trabecular where one of the cystic ducts enters the intrahepatic biliary duct. These arise from two separate primordia on the biliary tree and possess separate cystic ducts.
3. Type 3 includes any anomaly with triple gallbladder that cannot be categorized into the above mentioned 2 types, not being classified by Boyden et al.
4. Type 4 is where there is an undrained accessory gallbladder with absence of cystic duct.

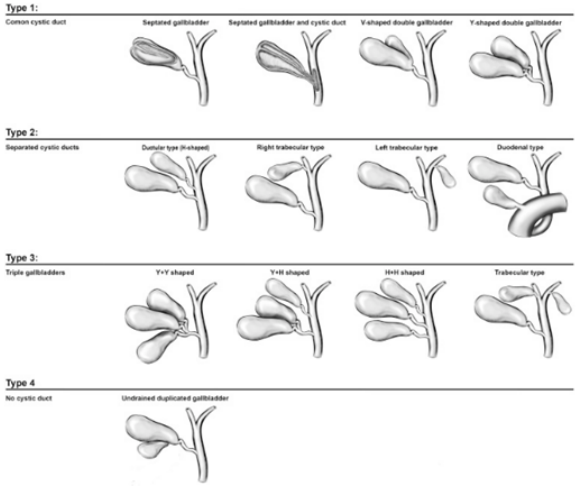

Figure 6: Harlaftis' classification of multiple gallbladders[7,8]

Patients are usually asymptomatic, or can occasionally present with right upper quadrant pain, tenderness and sometimes jaundice.

Ultrasonography is considered to be the initial imaging modality to diagnose gallbladder duplication. However, cystic ducts are usually not identified and thus make it difficult to categorize the type. To overcome this, MR Cholangiopancreaticography has proved to be the most accurate non invasive imaging technique to evaluate patients with gallbladder anomalies after initial ultrasound scanning. Computed tomography scan is also helpful. Oral cholecystography, scintigraphy, endoscopic retrograde cholangiopancreaticography and percutaneous transhepatic cholangiography also find their role in the detection of gallbladder anomalies, but are less preferred.

The differential diagnoses include gallbladder diverticulum, phrygian cap, gallbladder fold, pericholecystic fluid, choledochal cyst and intraperitoneal fibrous (Ladd's) bands.

Gallbladder duplication has occasionally been known to predispose to complications such as acute or chronic cholecystitis, cholelithiasis, empyema, torsion, cholecystocolic fistula, lump in the abdomen, and carcinoma.[2,3]

In asymptomatic patients, prophylactic cholecystectomy is not required, whereas in symptomatic patients, management includes both conservative and invasive methods, laparoscopic cholecystectomy with excision of both gallbladders being the treatment of choice.[2]

CONCLUSION:

Gallbladder duplication is a rare congenital anomaly, which requires adequate imaging assessment of the biliary ductal anatomy, to prevent repeated surgeries and unexpected intraoperative complications. Laparoscopic cholecystectomy with intraoperative cholangiography is the treatment of choice in symptomatic patients.

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