

## Case Report

# A rare case of double gall bladder: a case report and review of literature

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### ABSTRACT

Double gall bladder is a rare congenital anomaly of the Hepatobiliary system with an incidence of 1:4000 due to abnormalities resulting during the embryogenesis during fourth to sixth week of gestation. Boyden was first to describe the duplication of the gallbladder and Harlaftis classification describes three types for the duplication of the gallbladder. Preoperative diagnosis of the duplication of the gallbladder has to be confirmed to minimise the complications during the surgery and post operatively. Sometimes the duplication of the gallbladder is missed preoperatively and hence increasing the risk and complications during the cholecystectomy. MRCP is the investigation of choice for preoperative diagnosis of the duplication and the laparoscopic cholecystectomy being the treatment of choice for the double gallbladder. We encountered a 25 year old girl with duplicate gallbladder who underwent laparoscopic cholecystectomy with removal of both gallbladders successfully.

**Keywords:** Duplication of gall bladder, Double gall bladder, Accessory gallbladder, Laparoscopic cholecystectomy, Case report, Duplex gall bladder

### INTRODUCTION

Duplication of gall bladder is a rare congenital anomaly of hepatobiliary system with an incidence of 1:4000 live births. Duplication of gall bladder and its variable anatomy was first described by Boyden in the year 1926.<sup>1</sup> Harlaftis classification is widely used to classify duplication of the gallbladder.<sup>2</sup> Preoperative diagnosis of duplication of gall bladder is important to have minimal complications during the surgery. Preoperative diagnosis by a routine ultrasound and MRCP is sufficient for the diagnosis. Laparoscopic cholecystectomy is the preferred surgical treatment for the removal of both the gallbladder.<sup>3</sup> We present a unique case report on duplication of the gallbladder according to the SCARE guidelines managed by laparoscopic cholecystectomy.<sup>8</sup> Our case report consists of various challenges faced

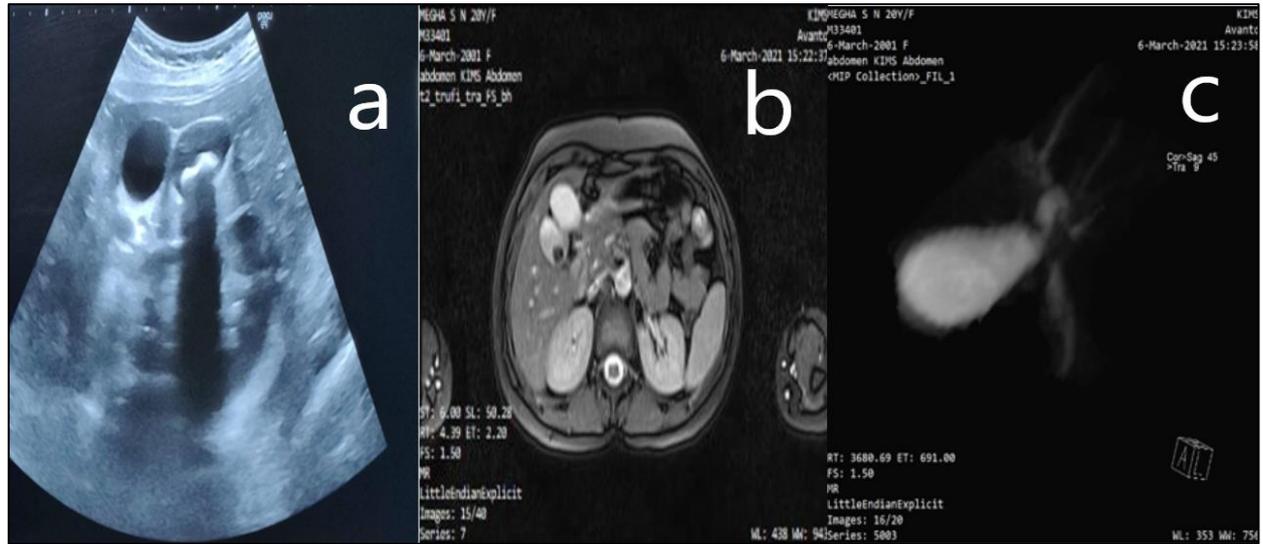
during the diagnosis and the management of this rare entity of duplication of the gallbladder along with the review of literature.

### CASE REPORT

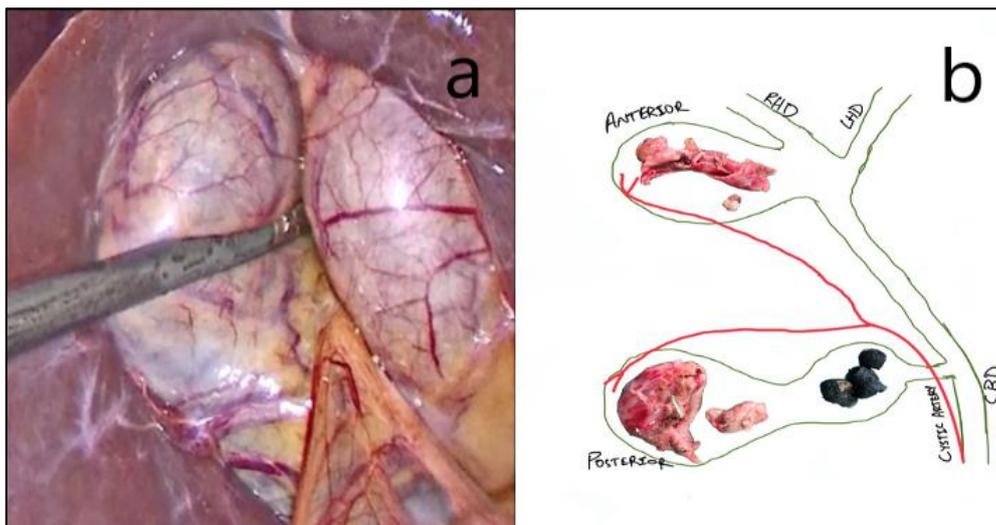
A 25 year old female came with complaints of dyspeptic symptoms for the past 3 months. She was subjected to ultrasound examination, in which she was incidentally diagnosed with duplication of gall bladder with cholelithiasis of one of the gall bladders (Figure 1). MRCP revealed duplication of gallbladder with cystic ducts, with multiple hypointense calculi and the largest calculus measuring 17×9 mm in posterior gallbladder. The cystic duct of anterior gall bladder was seen opening into the CHD at the confluence and the cystic duct of posterior gallbladder was seen opening into the CBD.

CECT abdomen showed two gallbladders in the gallbladder fossa with two separate cystic ducts, and each gallbladder was supplied by two separate cystic arteries arising from the common hepatic artery. In all three

radiographic investigations, gall bladder wall and CBD were reported to be normal. Preoperative routine investigations including LFT was normal.



**Figure 1:** (a) USG Abdomen showing two gallbladder lumens in gallbladder fossa with gallstone (with post acoustic shadow) (b) MRI Abdomen showing two gallbladder lumen in gallbladder fossa with gallstone in the posterior gallbladder. (c) MRCP showing opening of the posterior gallbladder into the CBD. Anterior gallbladder not visible.



**Figure 2:** (a) Intraoperative image of Double gallbladder (b) Pictorial representation of the positions of gall bladder in relation to CBD.

Patient was treated with laparoscopic cholecystectomy and intraoperatively two gallbladders with two cystic ducts noted in the gallbladder fossa with a single cystic artery supplying both of them was noted. Grade I Nassar’s adhesions were noted. Two separate lymph nodes of Lund noted for each of the gallbladder. Anterior gallbladder was found to be intrahepatic and extending into a depth of 2 cm within the liver bed with white bile as its content, widened cystic duct ending into the CHD near the confluence (Figure 2). The white bile is suggestive of blind ending cystic duct. Clips were applied to the cystic duct of the posterior gallbladder and the

cystic artery separately (before its branching) and cut. A gall stone of size 17×11 mm was extracted from the posterior gallbladder. Loop ligation was done for the anterior gallbladder after mobilization due to its close proximity to the CHD. The specimen and stones were extracted in endobag and sent for Histopathological examination, which confirmed the histology of two gall bladders, with features of chronic calcific cholecystitis in the posterior gallbladder. Intra operative and post-operative period was uneventful and the patient was discharged on post-operative day 3. Patient was followed up after 2,4 and 12 weeks and she had no complaints.

## DISCUSSION

Duplication of gall bladder is a rare congenital anomaly of hepatobiliary system seen in 1:4000 live births. Duplex or bilobed gallbladder develop during the 5th and 6th week of gestation due to excessive budding from the caudal bud of the hepatic diverticulum and failure of regression of the accessory buds may result in split or bifurcate gallbladder, with earlier bifurcations resulting in more complete duplication. Accessory gallbladders tend to arise from separate primordia on the biliary tree, with separate cystic ducts. And for a gallbladder to be considered as a 'true gallbladder', it must consist of valves at the neck, a tunica muscularis and the ability to concentrate bile.

In 1929, Boyden initially classified the duplication of gallbladder as "vesica fellea divisa" (bilobed gallbladder with a single cystic duct) and "vesica fellea duplex" (true gallbladder duplication) depending on the autopsies conducted on cats and various other animals.<sup>1</sup> In 1977, Harlaftis classified them further by describing three main types depending on their morphology and embryogenesis.<sup>2</sup> Type 2 ductular is the most common presentation.<sup>3</sup> Our case represents Harlaftis type 2 trabecular double gallbladder.

Congenital variants of gall bladder and biliary tree are recognized preoperatively in only 50% of the cases and most of the times it is diagnosed either intra operatively or during the autopsy. This anatomic biliary variant leads to increased risk of complications including bile duct injuries during the laparoscopic cholecystectomy, hence preoperative diagnosis plays an important role in minimizing the complications during the surgery. Complications of laparoscopic cholecystectomy is more often associated with the dissection of anterior gall bladder, hence anatomy of which should be demonstrated on table.<sup>3</sup>

A simple ultrasonography is used to diagnose this entity but has its own limitations; It is difficult to assess the altered anatomy of the biliary tree, and many structures can mimic duplication of gall bladder such as choledochal cyst, gall bladder diverticulum, phrygian cap, fibrous bands and collection around the gall bladder. Hence, MRCP is the investigation of choice for assessing the anatomical variations of the biliary tree and it should be considered whenever anatomical variations are suspected or cystic lesions are seen around the gallbladder in sonography.<sup>4</sup>

Preoperative diagnosis of the duplication of the gallbladder should be emphasized upon. This is of paramount importance so as to avoid missing crucial intraoperative anomalies, if present. For example, the second gallbladder may be missed or sometimes the biliary tree may be injured during the surgery due to inadequacy of imaging techniques or lack of awareness by the surgeon. Although only 50% of the cases can be

diagnosed preoperatively, the presence of two cystic lesions in the gallbladder fossa found in abdominal ultrasound should be further subjected to MRI abdomen with MRCP to delineate the biliary tree and confirmation of the diagnosis of duplication of the gallbladder. A routine abdominal ultrasound followed by a MRCP is the investigation of choice for the diagnosis of the double gallbladder, and to assess any anatomical variation of the biliary tree preoperatively. Abdominal CT cannot differentiate gallbladder anomalies and its relation with the biliary tree in most of the cases, but a 3-dimensional intravenous infusion cholangiography- spiral CT (IVC-SCT) may help in the diagnosis of double gallbladder. Endoscopic retrograde cholangiopancreatography (ERCP) accurately delineates the biliary tract anatomy in the duplication of the gallbladder but is an invasive procedure. Similarly, intraoperative cholangiogram (IOC) can also be used to diagnose the anomalies on operating table.<sup>5</sup>

The rate of complications in the duplication of gall bladder is similar to the single organ counterpart like gallstone formation, cholecystitis, adenocarcinoma and other complications.<sup>5</sup> Laparoscopic cholecystectomy is the preferred treatment of choice for the removal of both gallbladder.<sup>6</sup> As the rate of complication during laparoscopic cholecystectomy is more, especially during the removal of second gallbladder the surgery should be carried out by an experienced laparoscopic surgeon. Asymptomatic cases should not be intervened if the gall bladder is not diseased.<sup>7</sup>

## CONCLUSION

Hepatobiliary system is known for its anatomic variations, with gallbladder duplication being one of its rare entities. Preoperative diagnosis of the gall bladder status with its blood supply is essential, to avoid intraoperative and postoperative complications. Ultrasound of the abdomen followed by MRCP is the investigation of choice for the diagnosis of duplication of gallbladder with Laparoscopic cholecystectomy being the preferred surgery for removal of both the gall bladders. During cholecystectomy it is more likely to have difficulty with the removal of second gallbladder, and therefore preoperative knowledge of biliary anatomy acts as a guide for a better outcome.

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