

## Case Report

# Large duplicated gallbladder: a rare congenital anomaly

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### ABSTRACT

Gall bladder duplication is a rare congenital anomaly, which may be asymptomatic or may present with disorders similar to that of a single gall bladder. The finding is important due to its association with biliary ductal and hepatic arterial anatomical variations, which may lead to inadvertent complications during laparoscopic surgery. We present a case of duplicated gallbladder with one of the gall bladder appearing large, elongated and coiled, without signs of cholelithiasis / cholecystitis. MRCP was helpful in tracing the two cystic ducts. This case emphasizes on importance of pre-operative anatomical delineation with MRCP in unsuspecting cases in order to minimize the incidence of post surgical complications.

**Keywords:** Duplicated, Duplication, Gall bladder, Rare congenital anomaly

### INTRODUCTION

Duplication of gall bladder is a rare congenital anomaly, occurring with an incidence of 1 in 4000 births.<sup>1</sup> The incidence of disorders involving a duplicated gall bladder is similar to that of a single gall bladder. However, it is usually associated with anomalies / variations in biliary ductal and hepatic arterial anatomy which leads to inadvertent complications if laparoscopic surgery is performed without pre surgical delineation of anatomy.<sup>2,3</sup> Hence pre operative imaging, especially with Magnetic resonance Cholangio-Pancreatography (MRCP) is essential and provides adequate multiplanar anatomical delineation and helps in surgical planning, hence reducing the risk of post operative complications. Laparoscopic removal of both the gall bladders followed by intraoperative cholangiography to exclude for biliary ductal injuries is considered appropriate in such cases.

We present a case of duplicated gallbladder, with one normal sized and another large elongated gall bladder. Both the gall bladders showed no signs of calculi / inflammation. Tracing the two cystic ducts was

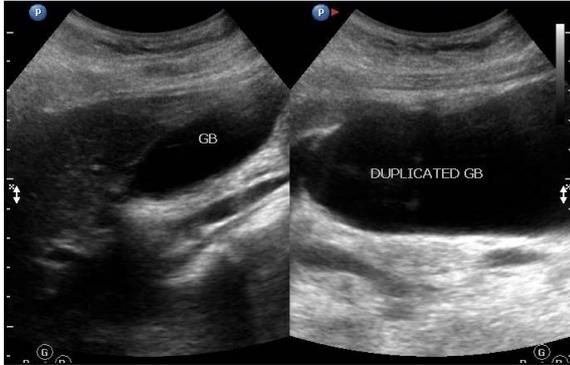
challenging on ultrasound, which was better visualized on MRCP. This case highlights the importance of delineation of anatomy with imaging modalities in previously undiagnosed / asymptomatic cases to avoid inadvertent injury during surgery and hence minimize the complications. Ultrasound is the first choice in such cases; whereas MRCP is a better problem solving tool in doubtful cases.

### CASE REPORT

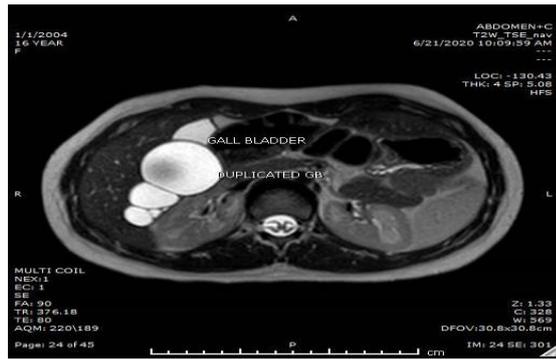
A 17 years old female presented with upper abdominal pain to surgical out patient department. She had no significant co-morbidities / past medical / surgical history. She was Clinical examination revealed mild fullness in right hypochondrium. Rest of the abdomen was soft on palpation and non-tender. Her routine laboratory investigations were within normal limits.

She was referred for ultrasound abdomen which revealed an elongated tubular anechoic cystic structure folded on itself and tapering towards one side, in right hypochondrium, abutting adjacent left lobe of liver. It

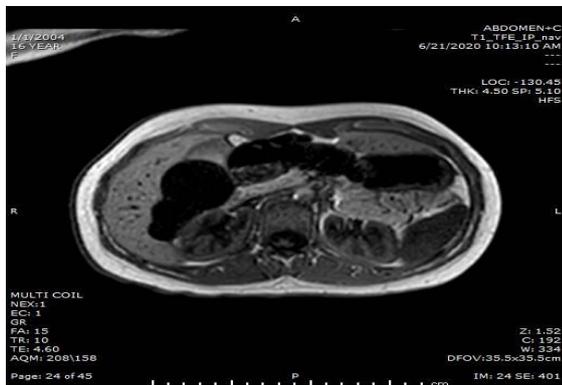
showed morphology similar to gall bladder and measured ~ 15x5 cm. No obvious calculi / solid components / vascularity demonstrated. The gall bladder was separately visualized, appearing partially distended with clear contents (Figure 1). Separate cystic ducts were not delieable on ultrasound. Common bile duct was of normal caliber.



**Figure 1: USG through right hypochondrium: normal sized gall bladder and another separate, large, elongated duplicated gall bladder.**



**Figure 2: Axial T2 weighted MRI upper abdomen: normal sized gall bladder anteriorly and duplicated gall bladder coiling and tapering posteriorly.**



**Figure 3: Axial T1 weighted MRI upper abdomen: normal sized gall bladder anteriorly showing hyper intense contents and duplicated gall bladder posteriorly showing hypo intense contents.**

She was then referred for contrast MRI abdomen which revealed:

Well defined elongated coiled tubular cystic structure tapering towards one side, in right hypochondrium, appearing hypo intense on T1 and hyper intense on T2 / SPAIR sequences with thin T2 hypo intense smooth walls (Figures 2-5). No evidence of calculi / enhancing mural nodule / wall enhancement noted on post gadolinium sequences. It was located in hepato-renal pouch, closely abutting adjacent hepatic and renal surfaces. Anteriorly its diameter was wide (measuring ~ 2.9x6.2 cm); it gradually tapered to cystic duct posteriorly (Figure 6). Overall dimensions of the structure measured ~ 9.7x5.1x11.0 cm (Figure 7). Separate cystic duct was visualized posterior to native cystic duct, which was normal in caliber. The native cystic duct and common bile duct showed normal caliber with no obvious calculi.



**Figure 4: Sagittal T2 weighted MRI: normal sized gall bladder anteriorly and large duplicated gall bladder posteriorly.**



**Figure 5: Sagittal T2 weighted MRI: large elongated duplicated gall bladder coiling and tapering posteriorly.**

The gall bladder was located anterior and antero-medial to superior aspect of the above mentioned structure. It demonstrated normal wall thickness and T1 hyper intense contents, in keeping with concentrated bile (Figure 2). No obvious evidence of filling defects noted to suggest calculi. The native cystic duct was normal in caliber

without obvious evidence of intraductal calculus. The confluence of duplicated cystic duct with CBD was not clearly delineable.

Other solid abdominal organs were within normal limits.

With above imaging findings of two separate gall bladders and cystic ducts, the diagnosis of large duplicated gall bladder was made.

She was then referred to higher centre for further evaluation and management. She was managed conservatively with resolution of symptoms. She is on regular follow up.



**Figure 6: Coronal T2 weighted MRI: duplicated gall bladder coiling and tapering posteriorly into cystic duct.**



**Figure 7: MRCP: normal sized gall bladder and large elongated coiled duplicated gall bladder.**

## DISCUSSION

Gall bladder duplication is a rare congenital anomaly, occurring with an incidence of 1 in 4000 births.<sup>1</sup> Embryologically, it is thought to be secondary to excessive budding of the biliary tree.<sup>4</sup> The widely followed classification which was suggested by Boyden divides such cases into: Vesica fellea divisa (bilobed or bifid GB – double GB with common neck) and Vesica fellea duplex (true duplication – double GB with 2 cystic ducts). Further

true duplication could be of two subtypes- Y-shaped (2 cystic ducts uniting before entering biliary tree) and (H-shaped (2 cystic ducts separately entering biliary tree).<sup>1,4</sup>

The differential diagnosis of duplicated gall bladder includes GB diverticulum, GB fold, Phrygian cap, choledochal cyst and loculated pericholecystic fluid.<sup>5,6</sup> In cases of a larger duplicated GB (as in our case), additional differentials to consider include cystic lymphangioma / choledochal cyst (type II) / biliary cystadenoma.

Usually cases with GB duplication are asymptomatic. The incidence of clinically significant disorders and diseases (from cholelithiasis and cholecystitis to carcinoma) involving a duplicated gall bladder is similar to that of a single gall bladder.<sup>5</sup> However, it is usually associated with anomalies / variations in biliary ductal and hepatic arterial anatomy which leads to inadvertent complications if laparoscopic surgery is performed without pre surgical delineation of anatomy.<sup>2,3</sup> Hence pre operative imaging, with cross sectional imaging modalities is preferred. Ultrasound is usually the initial imaging modality in patients with suspected biliary disease. It may diagnose true duplication of GB if separate cystic ducts could be delineated. However in many cases tracing the cystic ducts may not be possible due to obscuration by bowel gas or co-existing pathology.<sup>7</sup> Contrast computed tomography (CECT) may also be helpful in diagnosis of duplication and other associated diseases, especially cholelithiasis and cholecystitis.<sup>8</sup> MRI with Magnetic resonance Cholangio-Pancreatography (MRCP) provides adequate multiplanar anatomical delineation and helps in surgical planning, hence reducing the risk of post operative complications.<sup>9</sup>

Prophylactic removal of duplicated gall bladder is generally not advisable as the incidence of diseases is similar in duplicated GB cases as compared to single GB.<sup>2</sup> Surgery is advisable in cases of disease involving either of the gall bladders. Laparoscopic removal of both the gall bladders followed by intraoperative cholangiography to exclude for biliary ductal injuries is considered appropriate in such cases.<sup>5,10</sup>

We present a case of duplicated gallbladder, where one of the gall bladder was of normal size and the other was large, elongated and coiled. Both gall bladders showed no signs of calculi / wall thickening / pericholecystic fluid. Tracing the 2 cystic ducts was challenging on ultrasound, which was better visualized on MRCP. Patient was treated conservatively and she showed improvement. She is on regular follow-up.

## CONCLUSION

Though gall bladder duplication is a rare occurrence, suspicion should be raised if a cystic structure is visualized in right hypochondrium. Such cases should be evaluated with MRCP for adequate anatomical delineation, prior to surgery, in order to minimize post surgical bile duct / hepatic artery injuries.

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