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DOUBLE GALL BLADDER- A RARE CONGENITAL ANOMALY, PRESENTING WITH SYMPTOMATIC CHOLELITHIASIS IN THE SMALLER MOIETY - A CASE REPORT AND REVIEW OF LITERATURE.

Surgery

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ABSTRACT

Presence of double gall bladder is a rare occurrence in the population (1: 4000). This congenital anomaly may have various presentations and may pose difficulty during surgery.

We report a case of double gall bladder, presenting with symptomatic cholelithiasis in the smaller moiety. After preoperative diagnosis with ultrasound of abdomen and by magnetic resonance cholangiopancreatography laparoscopic cholecystectomy performed and follow up remained uneventful.

Laparoscopic cholecystectomy is the treatment of choice for symptomatic double gall bladder. Preoperative delineation of anatomy in such cases may prevent difficulty and associated biliary injury.

KEYWORDS

Double Gall Bladder, Laparoscopic Cholecystectomy, Duplication Of Gall Bladder.

Background:

Presence of double gall bladder (GB) i.e. duplication of GB is a congenital anomaly with rare occurrence. Various studies based on autopsy findings report an incidence to the tune of 1: 4000 [1, 2]. Apart from autopsy, diagnosis of the same can be made once the patient is symptomatic with associated cholelithiasis or polyps presenting as biliary colic. Preoperative diagnosis of duplication can be made on ultrasonography (USG) of abdomen or cross-sectional imaging such as computed tomography (CT) abdomen and magnetic resonance cholangiopancreatography (MRCP). Variation in the biliary anatomy can lead to injury during surgery; hence preoperative anatomical delineation should be done in such cases. Laparoscopic cholecystectomy (LC) is the treatment of choice in a symptomatic patient. Here, we present a case of double GB in a young patient having symptomatic cholelithiasis in the smaller moiety of the double GB managed by LC.

Case Report:

A 17-year-old female student, without any comorbidity, presented with complaints of on and off pain in her right upper quadrant of abdomen without any radiation and referral suggestive of biliary colic for 3 years. Her mother had history of gall stone disease for which she underwent LC 1 year back.

On examination she had adequate nutritional status with body mass index of 28 kg/meter ^{2}, rest of the general physical examination was normal.

She was evaluated with USG of abdomen [Fig- 1] elsewhere before presenting to us which showed a small accessory GB with multiple calculi in the smaller moiety seen adjacent to a well distended GB that was having anechoic lumen. Common bile duct (CBD) was normal.

She also underwent MRCP [Fig-2] which showed double GB with approximately 7mm size signal void suggestive of calculus within the smaller moiety. GB showed no wall thickening or mass lesion. Two short cystic ducts, uniting with each other appeared opening into the adjacent common hepatic duct (CHD). No intrahepatic biliary radical dilatation seen. Right posterior hepatic duct was seen opening separately abnormally low down into CBD.

Preoperative liver function tests were normal.

She was evaluated and found to have thalassemia trait during evaluation of hemolysis in view of early age of presentation of gall stone disease.

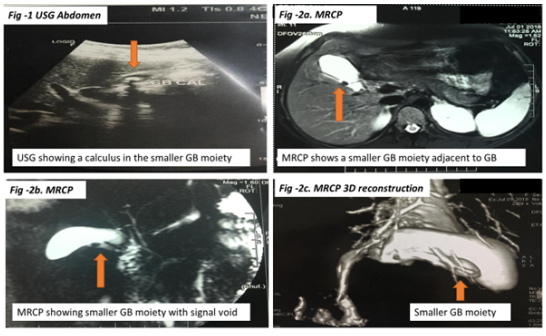
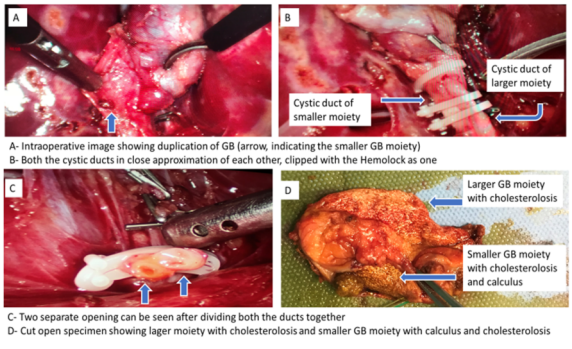


Figure-1, 2: Preoperative USG and MRCP.

Laparoscopy revealed [Fig-3] distended and thin walled GB. Small accessory GB was seen at the Hartmann's region. Critical view of safety demonstrated. It appeared that two cystic ducts lying close to each other were opening in the CHD as one 5 mm duct. No effort was made to separate two cystic ducts. They were clipped with Hemolock, and dissected. Two openings were seen in cystic duct stump. Cystic artery had two branches. On cut section of the specimen there were two gall bladders present. The accessory GB was small and contained single cholesterol stone of size 5mm. Mucosa had cholesterolosis.

Postoperative course was uneventful. Histopathological examination revealed chronic cholecystitis with cholesterolosis.



A- Intraoperative image showing duplication of GB (arrow, indicating the smaller GB moiety)
B- Both the cystic ducts in close approximation of each other, clipped with the Hemolock as one
C- Two separate opening can be seen after dividing both the ducts together
D- Cut open specimen showing lager moiety with cholesterolosis and smaller GB moiety with calculus and cholesterolosis

Figure- 3: Intraoperative images.

DISCUSSION:

GB develops from the hepatic diverticulum that appears in the ventral wall of the primitive midgut as early as 4th week of intrauterine life [3]. Duplication of GB results from split primordium of GB, while true accessary GB results from an extra primordium.

Patients with duplication of GB may present as symptomatic cholelithiasis, cholecystitis, carcinoma or incidentally on imaging, done for other purposes.

USG abdomen can detect the additional GB, but sensitivity may not be 100 % as it may be confused with the appearance of other entities such as gallbladder diverticula, gallbladder fold, Phrygian cap, choledochal cyst, pericholecystic fluid, focal adenomyomatosis, and intraperitoneal fibrous bands [4]. MRCP can accurately detect the additional GB and its cystic duct [5]. Other imaging modalities such as oral cholecystography, isotope hepatobiliary scintigraphy, helical CT and endoscopic retrograde cholangio-pancreaticography may also be used.

As per Boyden's classification [6] described in 1926, duplication of the GB can be classified into 2 main types (Fig- 4). First is the bi-lobed gallbladder (Vesica fellea divisum), in which a longitudinal septum or invaginating cleft separates the lumen into two chambers. Both GBs share a common embryological origin (primordium) in this type. The second type is the double GB (Vesica fellea du-plex), in which there are two separate GBs with their own cystic ducts. In such cases, a double embryological origin is considered (dual primordium).

With the correlation of MRCP our case appears to be the 'Y' type in the split primordium group.

1. Double GB with 'Y' shaped cystic duct opening in CBD
2. Double GB with independent cystic ducts entering the CBD
3. Accessory GB draining via separate cystic duct in left hepatic duct (LHD)
4. Accessory GB draining via separate cystic duct in right hepatic duct (RHD)

More than 200 cases of double GB have been reported in literature and the published cases which have been managed laparoscopically are approximately 30. James Sherren performed first cholecystectomy for double GB [9].

Figure- 4: Boyden's classification.

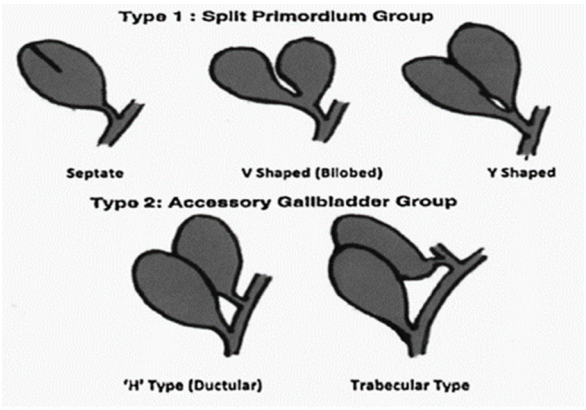


Figure 4 – Boyden's classification [6]

Similar to Boyden's classification, Harlaftis et al [7] divided GB duplication into two broad groups of split primordium and accessory GB.

Jeanty and Sutter [8] have described four main types of GB duplication:

Literature search reveals following available reports till now (Table-1) about surgical management of double GB. Preoperative delineation of anatomy may help to reduce intraoperative difficulty. As in our case after dissecting both the cystic ducts together, showing two lumens at the cystic duct stump may create a false impression of common bile duct (CBD) transaction, which is seen in the classical LC injury.

Table 1 [1, 2, 4, 9-18] – Available case reports of double gallbladders reported in literature:

Sr. No.	Author and year reported	Age (in years) and gender of patient	Pre operative diagnosis of double GB	Intra operative diagnosis of double GB	Intraoperative difficulty	Disease process
1	Garcia J, 1993	21 Male	Yes		No, but only partial cholecystectomy	Cholelithiasis in both
2	Miyajima N et al, 1995	28 Male	Yes		No	Cholelithiasis in both
3	Cummiskey et al, 1997	39 Female		Yes		Cholelithiasis
4	Gigot et al, 1997	29 Female	Yes		Difficult dissection; staged removal	Cholelithiasis, recurrent cholecystitis
5	Horattas MC, 1998	35 Female	Yes	-	No	Chronic cholecystitis in both
6	Tsutsumi et al, 2000	74 Female	Yes	-	No	Cholelithiasis in both
7	Kaya Yorganci et al, 2001	48 Female	-	Yes	No	Cholecystitis, no changes
8	Vahit Ozmen, 2003	34 Female	Yes	-	No	Chronic inflammation erosions
9	Yasuo O et al, 2003	44 Male	Yes	-	No	Cholelithiasis adenomyomatosis
10	Shirahane et al, 2003	61 Female	-	-	-	-
11	Amit Goel et al, 2003	25 Female	Yes	-	No	Cholelithiasis
12	Claudio C M et al, 2004	36 Female	-	Yes	No	Cholelithiasis, no changes
13	R Vijayaraghavan, 2005	32 Male	-	Yes	No	Pyocoele acute cholecystitis and cystadenoma
14	Ibrahim Barut, 2006	55 Female	-	Yes	No	-
15	S K Ghosh, 2014	21 Male	Yes	-	-	Cholecystitis in one, empyema in other
16	Yagan Pillay, 2015	56 Female	yes	-	No	Chronic cholecystitis
17	Painuly et al, 2018	61 Female	-	Yes	No	-
18	Present case, 2018	17 Female	yes	-	No	Chronic cholecystitis

CONCLUSION:

Double GB has similar clinical presentation and features as a single GB. Preoperative imaging may reveal the exact anatomy, and cross-sectional imaging should be considered in a doubtful case on USG. Simultaneous removal of both GBs at surgery is recommended to avoid cholecystitis and biliary colic in the remaining organ, especially in patients with risk factor for developing gall stones such as thalassemia trait, as in our case. The removal of an asymptomatic double GB remains controversial.

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