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Successful laparoscopic management of duplicate gallbladder: A case report and review of literature

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ABSTRACT

INTRODUCTION: Gallbladder duplication is a rare congenital anomaly. Recognition of this anomaly and its various types is important since it can complicate a simple hepatobiliary surgical procedure.
PRESENTATION OF CASE: We report a case of a 42 year old female who presented a 6 year history of intermittent right upper quadrant abdominal pain. Her basic blood investigations including liver function tests were normal. Pre-operative imaging revealed a cystic lesion communicating with biliary tree representing duplicated gallbladder. She subsequently underwent successful laparoscopic cholecystectomy. The operative challenges were more than those anticipated at the usual laparoscopic gallbladder procedures. After six months follow up the patient remained asymptomatic.
DISCUSSION: Preoperative diagnosis plays a crucial role in planning surgery, and preventing possible biliary injuries or re-operation if accessory gallbladder has been overlooked during initial surgery. Magnetic resonance cholangiopancreatography (MRCP) is the imaging modality of choice for suspected duplicate gallbladder. Laparoscopic cholecystectomy for duplicate gallbladder is a challenging operation and should be performed with meticulous dissection of the cysto-hepatic triangle.
CONCLUSION: Gallbladder anomalies should be anticipated in the presence of a cystic lesion reported around the gallbladder. The laparoscopic cholecystectomy remains feasible for intervention and should be done by an experienced laparoscopic surgeon.

1. Introduction

Gallbladder duplication is a rare congenital anomaly. Anticipation and recognition of this anomaly and its various types are important to avoid surprises. Preoperative diagnosis plays a crucial role in planning surgery and preventing possible surgical complications or re-operation if accessory gallbladder has been overlooked during initial surgery. We present a case report in accordance with the case report (CARE) guidelines [35] of an unusual case of bilobed gallbladder managed successfully by laparoscopic cholecystectomy. Our review sought to determine the challenges in the diagnosis and management of this rare anomaly.

2. Case report

A 42 year old lady was presented to hepatopancreatobiliary surgery outpatient clinic with a six year history of intermittent right upper quadrant (RUQ) pain associated with occasional nausea and vomiting. She had no history of jaundice or fever. She had been on iron supplement and oral contraceptive pill for iron deficiency anemia secondary to menorrhagia. Physical examination revealed soft abdomen with no tenderness or palpable mass. Her blood investigations were normal including complete blood count, liver function test, bilirubin and tumor markers. Abdominal ultrasound (US) showed a multi-septated echoic cystic lesion in the right liver adjacent to segment V and gallbladder. Abdominal computed tomography (CT) showed a non-enhancing lobulated cystic lesion in segment V with extension reaching the gallbladder (Fig. 1). She was further investigated with magnetic resonance cholangiopancreatography (MRCP), which demonstrated a multilocular cystic lesion communicating with biliary tree most likely representing duplicated gallbladder (Fig. 2). Patient was admitted for elective laparoscopic cholecystectomy. Informed consent was obtained after explaining the surgical procedure and possible complications. During surgery, while dissecting the gallbladder from the liver bed, a thick fibrous structure was found adherent to gallbladder's posterior surface at the infundibulum. Careful dissection of this fibrous band revealed its communication with the intrahepatic cystic lesion that was anticipated and confirmed later to be the duplicate gallbladder.

The dissection of the intrahepatic gallbladder was challenging because of its close proximity to the right portal vein and middle

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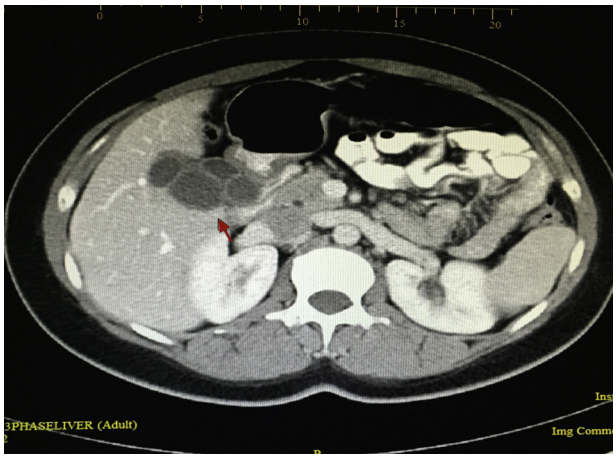

Fig. 1. A lobulated cystic lesion seen in segment V on CT scan.

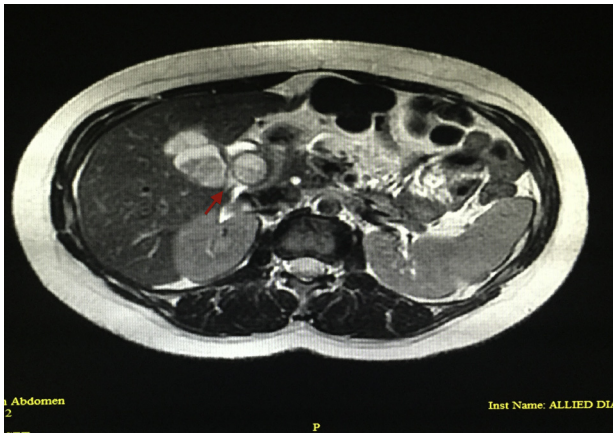

Fig. 2. Duplicate gallbladder on MRCP.

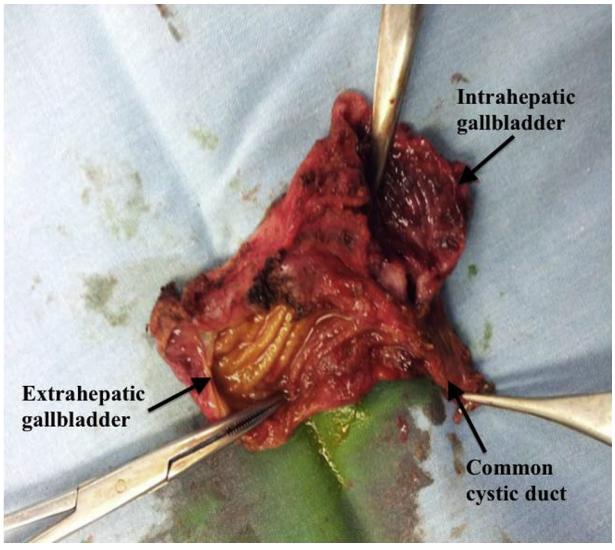

Fig. 3. Specimen of bilobed gallbladder.

hepatic vein, and extending partially into segment VIII. The dissection was continued carefully until the duplicate gallbladder was completely removed en bloc. On the back table the gallbladder was confirmed to be bilobed joining at the infundibulum with a single cystic duct. The intrahepatic gallbladder wall was thick with mucous content (Fig. 3).

In the recovery room, patient complained of mild chest tightness and shortness of breath. Air pulmonary embolism was suspected, which was resolved with oxygenation and changing patient's position to the left lateral decubitus. Patient was discharged home on postoperative day 2. Final histopathology revealed features of chronic cholecystitis. The adjacent pouch showed ulcerated epithelium with extensive hemorrhage in the wall, and proliferation of glands with gastric metaplasia. No evidence of dysplasia or malignancy was found. After six months follow up the patient remained asymptomatic.

3. Discussion

Gallbladder duplication is a rare congenital anomaly that occurs in 1 per 4000 individuals [1], occurring nearly twice in women than in men [2]. Duplication of gallbladder occurs during the 5th or early 6th embryonic week during which a single primordium bifurcates [1]. The time that bifurcation occurs determines the type of duplication that will occur i.e. the earlier the bifurcation; the more complete the degree of duplication [1]. A true accessory gallbladder arises from two separate primordia on the biliary tree and possesses a separate cystic duct. Histologically, gallbladder duplication is differentiated from a choledocal cyst by the presence of a muscular wall with an epithelial lining [3].

In 1929 Boyden reported 20 cases of double gallbladder he found in the literature from 1674 to 1929 [1]. He described a system to classify gallbladder duplications including "vesica fellea divisa" (bilobed gallbladder that has one cystic duct) and "vesica fellea duplex" (true gallbladder duplication). The latter is subclassified into "Y-shaped type" (two cystic ducts uniting before entering the common bile duct), and "H-shaped or ductular type" (two cystic ducts enter separately into the common bile duct).

In 1936, Gross described congenital abnormalities of gallbladder and classified them into six types labeled A–F [4]. In 1977, Harlaftis et al. further modified the classification by describing two main types based on morphology and embryogenesis [2] (Table 1). Although his classification is the most universally accepted, a modified Harlaftis classification has been reported in the literature by describing a left trabecular variant to type 2 classification [5]. Hassan et al. reported an accessory gallbladder branching from both the left and right hepatic ducts [6]. Causey et al. reported a new variant in which a septated type 1 gallbladder has 2 cystic ducts [7]. Our case represents Boyden type I, Gross type C, and Harlaftis type I septated gallbladder.

There are no specific symptoms or signs associated with duplicate gallbladders. Cholelithiasis, acute/chronic cholecystitis, empyema, fistula, torsion, papilloma and carcinoma that are seen in a single gallbladder can affect a duplicated gallbladder [8–13]. However, the most common complication is stone formation [14], and the risk is similar to that of a single gallbladder [3,15]. Surgery should be the treatment of choice only in symptomatic gallbladder duplication. It is recommended to remove both gallbladders at one stage to prevent subsequent disease in the remnant gallbladder at a later date.

Preoperative diagnosis of duplicate gallbladder is important because diagnosis of a second gallbladder may be overlooked during surgery. Factors that can lead to overlooking of the diagnosis include non-specific signs and symptoms, lack of awareness of the surgeon of the anatomic variations and inadequacy of the imaging techniques [16]. This may result in recurrence of symptoms or biliary complications. Although successful preoperative diagnosis is reported in only half of all cases [5], the imaging methods for viewing anatomic structures of the biliary tree and diagnosing the disease have progressed recently [17,18].