

Imaging findings of gallbladder duplication due to two cases: case report and review of literature

Rahsan Gocmen¹, Yakup Yesilkaya²

¹Department of Radiology, Hacettepe University Hospital, Turkey

²Department of Radiology, Kirsehir Ahi Evran University Hospital, Turkey

Abstract

Duplication of the gallbladder, a rare congenital anomaly, is important in clinical practice as it may cause some clinical, surgical, and diagnostic problems. This anomaly is also important for surgeons due to the increased risk of complications especially after laparoscopic cholecystectomy. We report ultrasonography, computed tomography, and magnetic resonance cholangiopancreatography findings in two cases of a symptomatic duplicated gallbladder.

Keywords: duplication, gallbladder, ultrasound, magnetic resonance imaging, computed tomography.

Introduction

Double gallbladder is a very rare congenital biliary anomaly with a reported incidence of one per 4,000-5,000 persons [1,2]. It is important in clinical practice because it may cause some clinical, surgical, and imaging problems. Several entities may mimic a duplicate gallbladder including a folded gallbladder, choledochal cyst, phrygian cap, pericholecystic fluid, gallbladder diverticulum and vascular band across the gallbladder [2,3]. Congenital anomalies of the gallbladder and anatomical variations of their positions are associated with an increased risk of complications after laparoscopic cholecystectomy. The pre-operative diagnosis of this anomaly is especially important to prevent possible surgical complications and repeated laparotomies [4-6]. We describe

here two cases of gallbladder duplication, visualized by different imaging modalities.

Case 1

The patient is a 35-year-old woman with no medical history. She was admitted in the surgery department due to chronic right upper quadrant pain. Physical exam showed slight tenderness in the right upper quadrant and negative Murphy's sign. Admission laboratory findings, including transaminases, lactic dehydrogenase, total bilirubin, alkaline phosphatase, and white blood cell count, were within normal limits. Her temperature was 37.5°C and the rest of her vital signs were normal. Ultrasonography (US) of the abdomen showed two separated ellipsoid-shaped cystic structures with a well-defined wall, side by side in the gallbladder fossa (fig 1). The US examination two hours after a meal containing fat and eggs showed that both cystic structures were contracted, with smaller sizes. There was no evidence of gallbladder stones, sludge, or inflammation of the wall. These findings closely resembled gallbladder duplication. Magnetic resonance cholangiopancreatography (MRCP) revealed a true duplication of the gallbladder (fig 2). Surgery treatment was recommended but the patient refused the surgical intervention.

Received 15.06.2012 Accepted 02.07.2012

Med Ultrason

2012, Vol. 14, No 4, 358-360

Corresponding author: Yakup Yesilkaya, MD

Ahi Evran University, Educational and
Research Hospital, Department of Radiology
Kirsehir 40100, Turkey
Phone: +90-386-213-45-15,
Fax: +90-386-213-33-98,
E-mail: dryakup23@hotmail.com

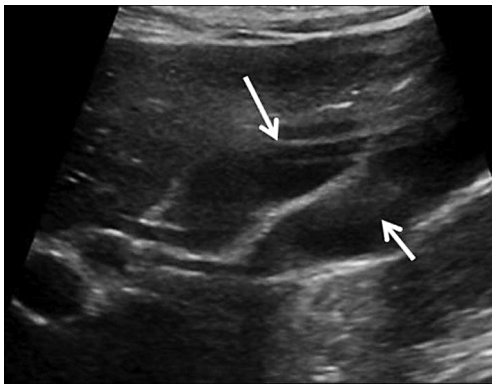


Fig 1. Ultrasound image of abdomen showing two adjacent fluid-filled structures and cystic ducts in gallbladder fossa (arrows).

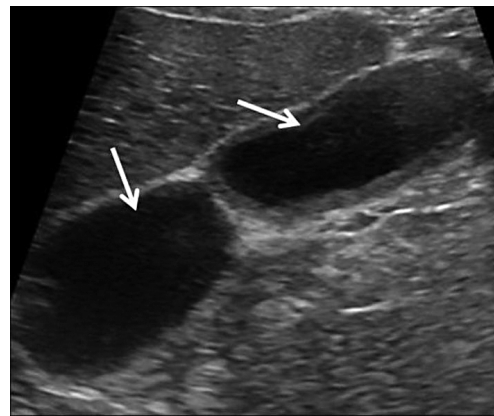


Fig 3. Ultrasound image of abdomen showing two adjacent fluid-filled structures

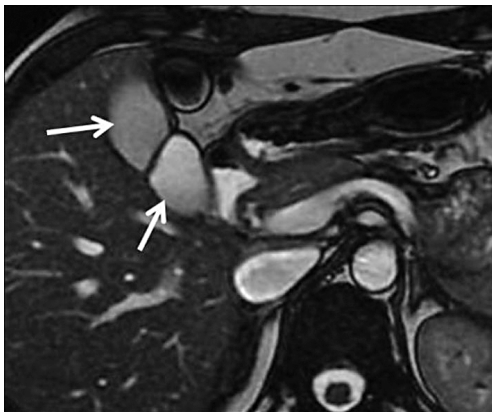


Fig 2. Magnetic resonance imaging showed gallbladder duplication.

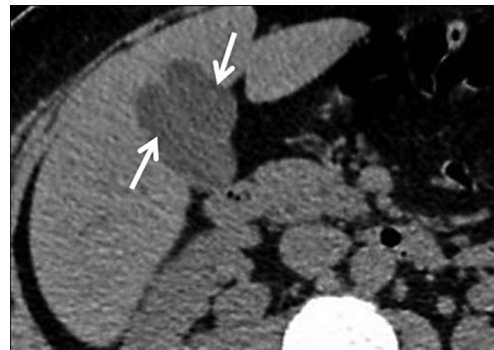


Fig 4. Axial computed tomography images of abdomen demonstrating gallbladder duplication (arrows).

Case 2

The patient is a 45-year-old woman with no medical history. She was admitted to the surgery department because of chronic right upper quadrant pain and nausea. Physical examination was normal. Murphy's sign was negative. Admission laboratory tests were all within normal limits. Her temperature was 37.0°C, and the rest of her vital signs were normal. An US of the abdomen showed two separated ellipsoid-shaped cystic structures with a well-defined wall, side by side in the gallbladder fossa (fig 3). The US examination two hours after standardized fatty meal showed that both cystic structures were similar contracted. No gallbladder stones or sludge, or inflammation of the wall were found. Computed tomography (CT) confirmed the gallbladder duplication (fig 4). Surgery treatment was recommended but the surgical intervention was postponed by patient.

Discussion

Anatomic duplications of the gallbladder are still classified according to Boyden's three types: 1) Y gallbladder consists of two completely separate gallbladders, each with a cystic duct. The two ducts join to form a common cystic duct before entering the common bile duct; 2) H or ductular gallbladder the cystic and accessory cystic ducts enter the common bile duct separately. This is the commonest variant of gallbladder duplication; 3) trabecular gallbladder in which the accessory cystic duct enters the right intrahepatic system [7]. Gallbladder duplication is important to be recognise due to the clinical, surgical, and imaging difficulties. Accurate pre-operative diagnosis of this anomaly becomes important to prevent possible surgical complications and repeated surgery. As most errors in gallbladder surgery result from failure to appreciate the anatomic variations

of the biliary system, the preoperative documentation of the anatomy has a critical role especially when considering laparoscopic cholecystectomy. US is the first step for evaluation. However, US imaging alone presents some drawbacks and this technique does not always allow a precise diagnosis of gallbladder malformations. Several entities may mimic a duplicate gallbladder including a folded gallbladder, choledochal cyst, phrygian cap, pericholecystic fluid, gallbladder diverticulum, vascular band across the gallbladder and focal adenomyomatosis on US examination. US may demonstrate wall thickness, lumen pathology and the number of the gallbladders but is unable to define always the exact anatomy of the biliary tree. CT is available as simple imaging modality of double gallbladder and the presence of mass can be identified. It should be supplemented with MRCP or endoscopic retrograde cholangiopancreatography (ERCP) to detail biliary tract anatomy and its variations. MRCP is a relatively new MR imaging technique that is used for noninvasive work-up of patients with biliary disease. A potential use of MRCP is evaluation of bile duct anatomy before cholecystectomy. By demonstrating aberrant anatomy before surgery, the risk of bile duct injury should be reduced, especially during laparoscopic cholecystectomy, which is associated with double the risk of bile duct injury compared with that of open cholecystectomy. MRCP is becoming the initial imaging tool for the biliary system, with ERCP reserved for therapeutic indications. MRCP is noninvasive, cheaper, uses no radiation, requires no anesthesia and less operator dependent; allows better visualization of biliary ducts

when combined with conventional T1- and T2-weighted sequences [8]. Preoperative assessment of gallbladder duplication is very important and the diagnosis of this anomaly is beneficial to the patient.

References

1. Keuntje H. Duplication of the gallbladder. *Zentralbl Chir* 1981;106:178-180.
2. Ozgen A, Akata D, Arat A et al. Gallbladder duplication: imaging findings and differential considerations. *Abdom Imaging* 1999;24:285-288.
3. Hekimoglu K, Bayrak A, Ulu F, Coskun M. Combined use of ultrasonography, MDCT and MRCP for the diagnosis of gallbladder duplication: case report. *J Dig Dis* 2010;11:115-118.
4. Singh B, Ramsaroop L, Allopi L et al. Duplicate gallbladder: an unusual case report. *Surg Radiol Anat* 2006;28:654-657.
5. Maddox JM, Demers ML. Laparoscopic management of gallbladder duplication: a case report and review of literature. *JSLs* 1999;3:137-140.
6. Safioleas MC, Papavassiliou VG, Moulakakis KG et al. Congenital duplication of the gallbladder. *Am Surg* 2006;72:217-220.
7. Nouira F, Taieb C, Hela L et al. Duplication of gallbladder. *Tunis Med* 2011;89:798-799.
8. Vitellas KM, Keogan MT, Spritzer CE, Nelson RC. MR cholangiopancreatography of bile and pancreatic duct abnormalities with emphasis on the single-shot fast spin-echo technique. *Radiographics* 2000;20:939-957; quiz 1107-1108, 1112.