Państwo i Społeczeństwo
State and Society

2021 (XXI) nr 1

e-ISSN 2451-0858
ISSN 1643-8299

DOI: 10.48269/2451-0858-pis-2021-1-011
Received: 29.01.2021
Accepted: 16.03.2021

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GALLBLADDER DUPLICATION WITH GALLSTONE MIGRATION. A CASE REPORT AND LITERATURE REVIEW

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Abstract
Congenital gallbladder anomalies and variations in their anatomical position are associated with an increased risk of complications after laparoscopic cholecystectomy. A 28-year-old female patient with no previous medical history, presented to the emergency department with complaints of epigastric pain, radiating to the back, associated with constipation, and progressively increasing in intensity over 5 days. No gallstones were visualized in the distal CBD. Neither any pancreatic mass, nor dilation of the main pancreatic duct was identified. A voluminous gallstone of 20 mm in the gallbladder and multiple microlithiasis in the gallbladder neck were identified. The diagnosis of symptomatic cholelithiasis with gallstone migration was retained, and the decision was taken to

hospitalize the patient in order to institute symptomatic treatment and to carry out further investigations to explore the etiology of the CBD dilatation. On MRCP the presence of a congenitally folded gallbladder, containing gallstones was confirmed. The decision was made to operate on the patient one month later by laparoscopy. A laparoscopic cholecystectomy was performed one month later, on an outpatient basis. The surgery was carried out without any difficulty, and Calot's triangle was dissected relatively easily.

Key words: gallbladder duplication, gallstones, biliary tree anatomy

Introduction

Duplication of the gallbladder is a rare congenital malformation, occurring in about one per 4000 births [1]. Congenital gallbladder anomalies and variations in their anatomical position are associated with an increased risk of complications after laparoscopic cholecystectomy [2–5]. In patients with gallbladder duplication, preoperative radiologic workup remains a key element for diagnosis. Laparoscopic removal of both gallbladders, in association with a morphological study in order to analyze cystic duct variations, appears to be crucial for appropriate treatment.

An anatomopathological classification has been developed by E.A. Boyden, which distinguishes between *Vesica fellea divisa* and *Vesica fellea duplex* based on the number of cystic ducts and their relations.

Report case: To report a new case of gall bladder duplication associated with gallstone migration.

Case description

A 28-year-old female patient with no previous medical history, presented to the emergency department with complaints of epigastric pain, radiating to the back, associated with constipation, and progressively increasing in intensity over 5 days. On being admitted to the ER, the patient was hemodynamically stable, afebrile, and her laboratory workup revealed disturbed liver function tests with elevated transaminase levels of 7N for SGOT and 8N for SGPT, with a GGT of 14N.

Pertinent blood tests: SGOT = 240 IU/l, SGPT = 423 IU/l, LDH = 352 IU/l, GGT = 506 IU/l, ALP = 155 IU/l, lipase = 22 IU/l.

Abdominal ultrasound (Figure 1)
Intra and extra hepatic bile duct dilatation, with suspected homogeneous parietal thickening at the level of the distal common bile duct (CBD).
No gallstones were visualized in the distal CBD.
Neither any pancreatic mass, nor dilation of the main pancreatic duct was identified.

A voluminous gallstone of 20 mm in the gallbladder and multiple microlithiasis in the gallbladder neck were identified.
There were no signs of acute cholecystitis.

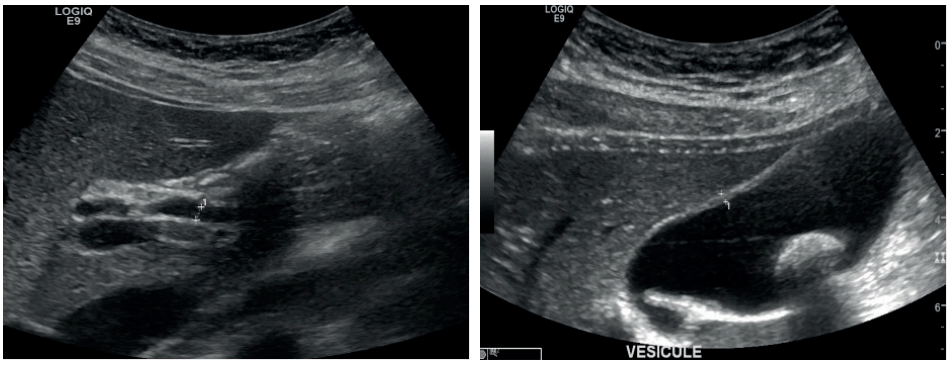


Figure 1. Abdominal ultrasound

Abdominal CT scan (Performed in the ER without IV contrast)
There were no signs of bowel obstruction.
The gallbladder was empty and contained a gallstone.
There was a right non obstructing kidney stone.

Management and Plan
The diagnosis of symptomatic cholelithiasis with gallstone migration was retained, and the decision was taken to hospitalize the patient in order to institute symptomatic treatment and to carry out further investigations to explore the etiology of the CBD dilatation (there was doubt over possible diverticulum or choledochal cyst).

The evolution was marked by rapid clinical and laboratory improvement with normalization of SGPT and SGOT. Bowel movement was resumed after two days of hospitalization.

Magnetic Resonance Cholangiopancreatography – MRCP (Figure 2)
The presence of a congenitally folded gallbladder, containing gallstones.
Visualization of the intrahepatic bile ducts.
Absence of dilation of the extrahepatic bile ducts.
Absence of choledocholithiasis.
Absence of choledochal cysts.

Decision
The decision was made to operate on the patient one month later using laparoscopy.

A laparoscopic cholecystectomy was performed one month later, on an outpatient basis.

The surgery was carried out without any difficulty, Calot's triangle was dissected relatively easily, using the approach of the critical view of safety (CVS), as seen in Figure 3.

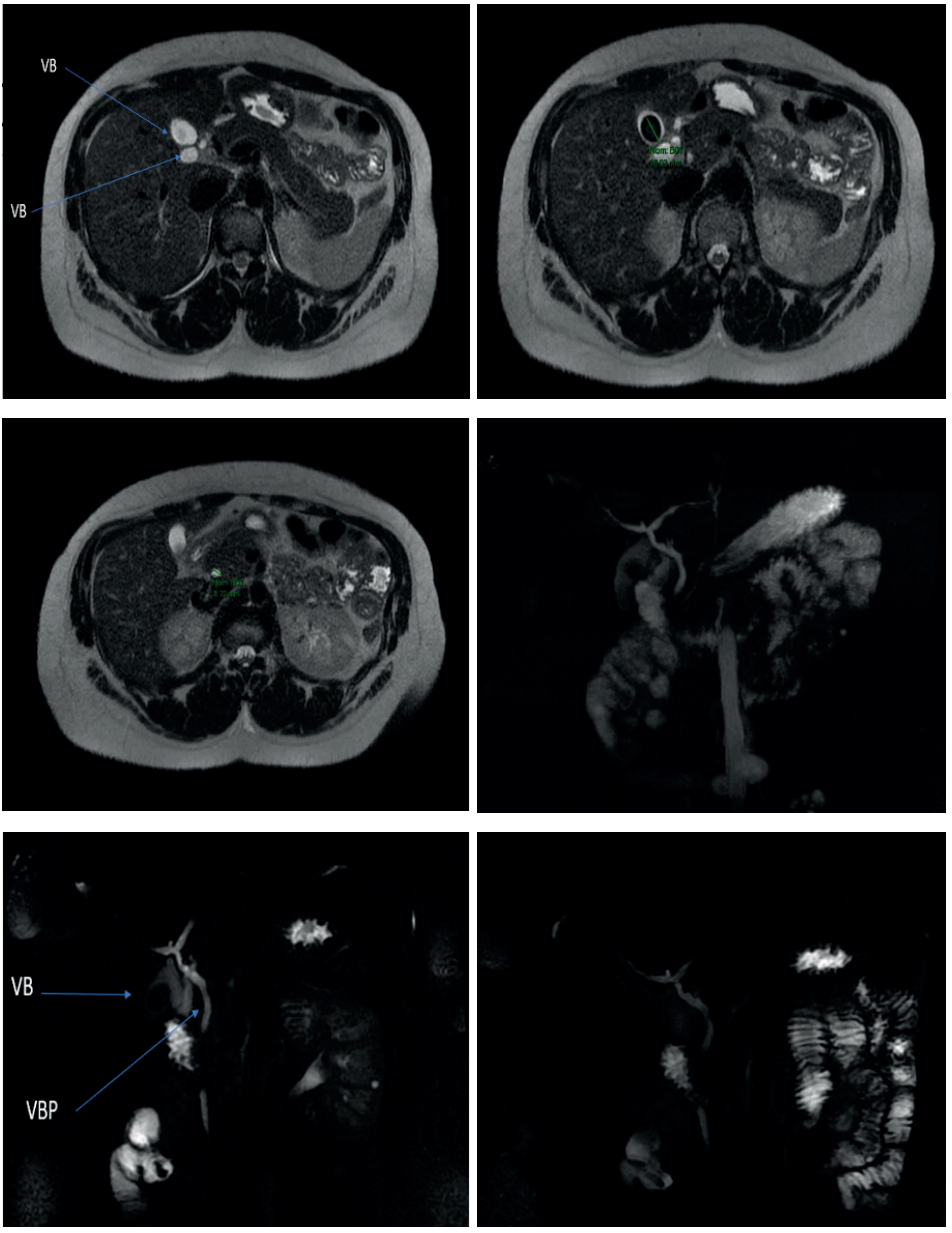


Figure 2. Bili-IRM

VB: Gall bladder; VBP: Main biliary tract.

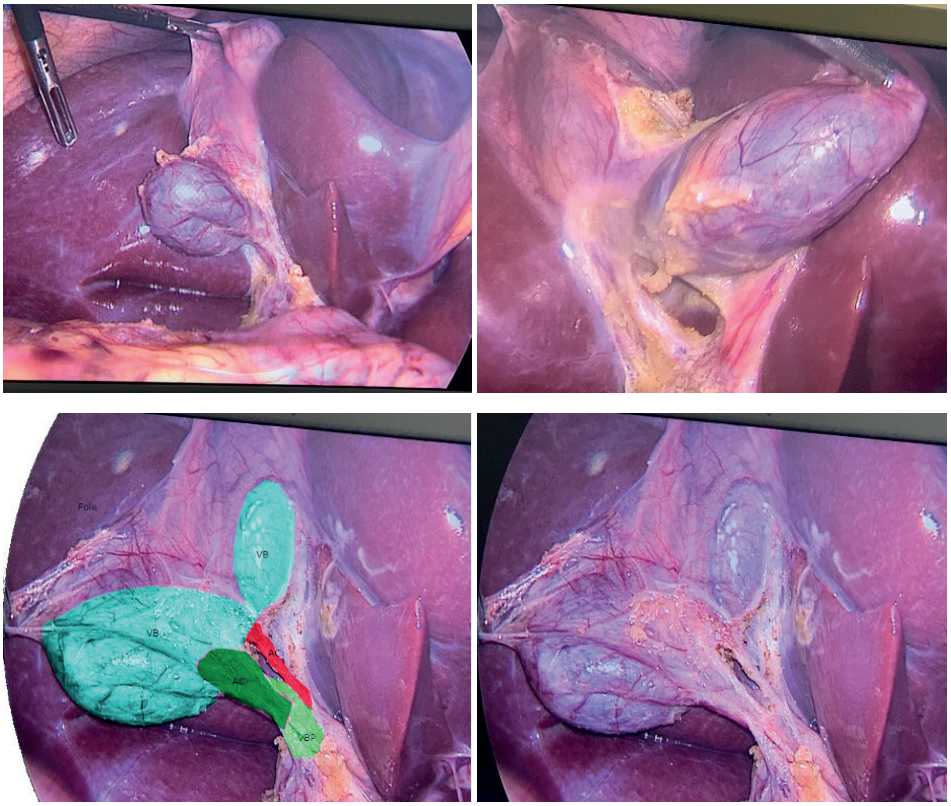


Figure 3. Intraoperative aspect

VB: Gallbladder; AC: Cystic Artery; CS: Cystic Canal; VBP: Main Bile duct.

Anatomopathological result

Samples taken from the zone of duplication show a pouch arising from the gallbladder wall, separated from the gallbladder lumen by muscle fibers. This pouch is lined by a mucosal lining of gallbladder type.

A calcular gallbladder with a parietal diverticulum compatible with gallbladder duplication is identified at the level of its neck.

There are no histological signs of malignancy.

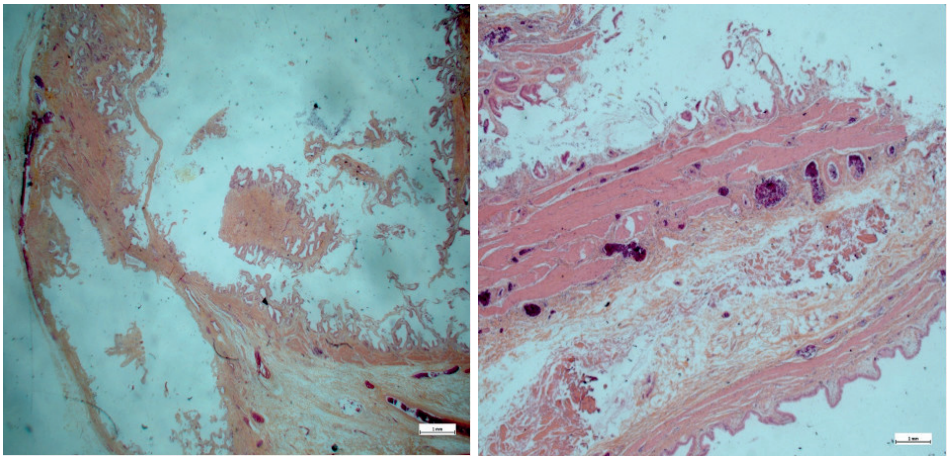


Figure 4. Microscopic aspect

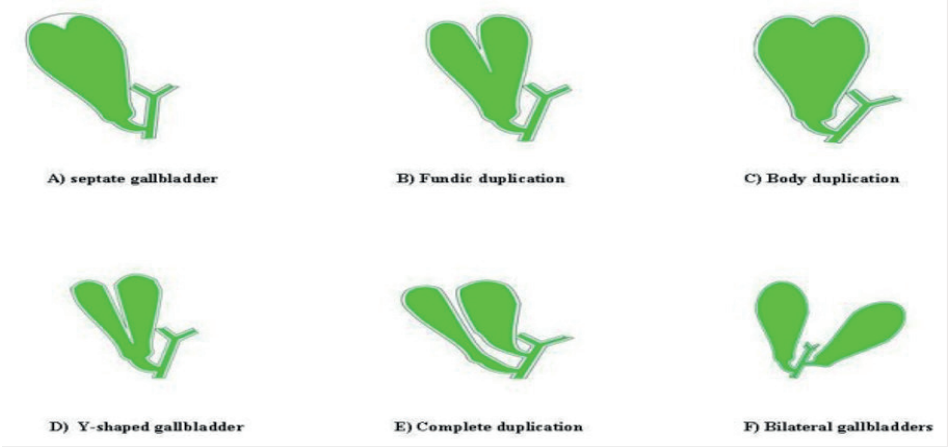
Discussion

Duplication of the gallbladder is a rare congenital anomaly, occurring in about one per 4000 births [1]. It is thought to be due to the exuberant budding of the developing biliary tree when the caudal bud of the hepatic diverticulum divides [6–7].

The association of gallstone migration is not common in this context, hence the importance of preoperative magnetic resonance imaging to give the surgeon a better understanding of the variations in the cystic duct anatomy, and particularly for gallbladders classified as *Vesica fellea duplex*.

In a study carried out on 1823 patients, Senecail *et al*. found morphological variations and abnormalities in more than 33% of cases, among which only three cases were identified as real gallbladder duplication on the basis of ultrasonic exploration of the gall bladder [8]. The anatomical variations of gallbladder duplication are commonly classified as per Boyden's classification as follows (Figure 5) [1–6].

In our case, the gallbladder is classified as Type D (Y-shapes gallbladder).



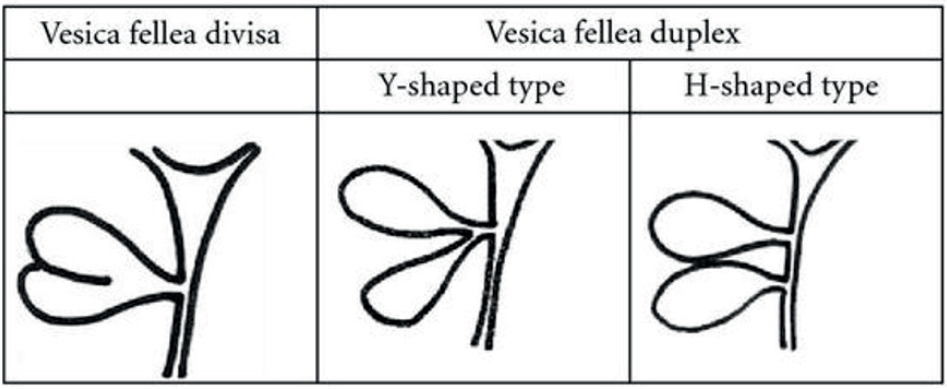


Figure 5. Boyden classification

Differential diagnosis

Radiologic differential diagnoses include the following:

- Gallbladder diverticulum;
- ”Phrygian cap” gallbladder;
- Choledochal cyst;
- Focal adenomyomatosis;
- Intraperitoneal fibrous adhesions (Ladd’s bands);
- A residual enlarged cystic duct.

Conclusion

Duplication of the gall bladder is a rare congenital anomaly that can be associated with anatomical variations of the cystic duct. Therefore, preoperative imaging, and particularly MRCP, plays an important role in detecting these anomalies in

order to better guide the surgeon during cholecystectomy, and thus avoid possible postoperative complications related to bile duct injury. The association of gallstone migration with gallbladder duplication is not common and its management does not differ from that of gallbladders with typical morphology.

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Zdwojenie pęcherzyka żółciowego z migracją kamienia. Opis przypadku z przeglądem literatury

Streszczenie

Wrodzone anomalie i odmiany anatomiczne pęcherzyka żółciowego są elementem ryzyka powikłań podczas cholecystektomii laparoskopowej. Do SOR została przyjęta 28-letnia pacjentka bez wcześniejszego wywiadu, skarżąca się na bóle w nadbrzuszu promieniujące do pleców połączone z zaparciami, nasilające się w ciągu 5 dni. Nie stwierdzono kamicy w dystalnej części przewodu żółciowego wspólnego (PŻW). Nie stwierdzono również zmian guzowatych w trzustce ani poszerzenia przewodu trzustkowego. Stwierdzono natomiast duży, 20 mm kamień w pęcherzyku oraz drobną kamicę w szyi pęcherzyka. Postawiono rozpoznanie objawowej kamicy pęcherzyka

żółciowego z migracją kamienia i podjęto decyzję o hospitalizacji i leczeniu objawowym w celu poszerzenia diagnostyki poszerzenia PŻW. W badaniu MRI dróg żółciowych stwierdzono wrodzoną duplikację pęcherzyka żółciowego. Chora została zakwalifikowana do planowej laparoskopowej cholecystektomii miesiąc później w ramach pobytu jednodniowego. Zabieg przebiegł bez powikłań ze względnie prostym preparowaniem struktur trójkąta Calota.

Słowa kluczowe: zdwojenie pęcherzyka żółciowego, kamica pęcherzykowa, anatomia dróg żółciowych