

Hypogenesis of right hepatic lobe in a laparoscopic cholecystectomy for acute gallstone cholecystitis: A case report

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Summary

Hypogenesis or agenesis of right hepatic lobe is a rare abnormality and is generally associated with gallbladder and biliary tract abnormalities. Cases of biliary injury following cholecystectomy have been reported in patients with agenesis of right hepatic lobe because the anatomical anomalies complicate the surgical approach. We report a case of laparoscopic cholecystectomy in a patient with hypogenesis of right hepatic lobe. A 92-year-old male patient was admitted to our hospital with fever and right lower abdominal pain with suspected acute appendicitis. Abdominal computed tomography revealed gallstones with acute cholecystitis and hypogenesis of right hepatic lobe. He underwent laparoscopic cholecystectomy with the left semilateral decubitus position. The patient's postoperative course was uneventful. In conclusions, some patients with liver lobe hypoplasia do not present with the typical symptoms of acute cholecystitis due to dislocation of the gallbladder. The left semilateral decubitus position with modified placement of port sites is useful for laparoscopic cholecystectomy in patients with hypogenesis of right hepatic lobe.

Keywords: Hypogenesis of right hepatic lobe, acute cholecystitis, laparoscopic cholecystectomy, agenesis of right hepatic lobe

1. Introduction

Hypogenesis or agenesis of right hepatic lobe is a rare abnormality and is generally associated with anatomical variations of the gallbladder, biliary tract, and neighboring organs (1-4), including absence of the right portal vein and right intrahepatic bile duct. The incidence of lobar aplasia or hypoplasia is 0.005% in autopsy studies (5,6). Only 65 cases of hypogenesis or agenesis of right hepatic lobe have been reported until 2018 (5,7). Although patients with hypogenesis of right

hepatic lobe are generally asymptomatic, some exhibit portal hypertension and liver cirrhosis (4).

The tender point in acute cholecystitis is typically located in the right subcostal or epigastric region due to the normal location of the gallbladder. However, if this location varies, it may confound the evaluation of symptoms. Imaging tests like ultrasonography (US) and computed tomography (CT) are helpful for the diagnosis of cholecystitis and for anatomical evaluation prior to surgery.

Laparoscopic cholecystectomy was developed over 30 years ago and is currently the gold standard for cholecystectomy (8). Because anatomical abnormalities complicate the procedure, there are some reports of biliary injury during cholecystectomy in patients with congenital anatomical variations, including agenesis of right hepatic lobe (2,3,9). There is a case report of laparoscopic cholecystectomy in a patient with agenesis of right hepatic lobe (10). However, an

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accurate diagnosis was not possible before the surgery in that case, because the patient did not undergo CT or magnetic resonance imaging (MRI) before the surgery. After the operation, the patient was diagnosed with agenesis of the right hepatic lobe in that report. Herein, we report a patient with gallstone cholecystitis and a preoperative diagnosis of hypogenesis of right hepatic lobe who underwent uneventful laparoscopic cholecystectomy.

2. Case Report

A 92-year-old man presented to a clinic with fever and tenderness of the right lower abdomen; he was suspected of having acute appendicitis and was referred to our emergency room. His medical history included dementia, osteoarthritis of the knee, and hypertension, with no previous hepatobiliary conditions. He had never injured his abdomen or undergone surgery. Body temperature was 37.6°C.

The initial laboratory evaluation revealed a total bilirubin level of 2.2 mg/dL (normal 0.3-1.4 mg/dL), direct bilirubin 0.6 mg/dL (normal 0-0.5 mg/dL), aspartate aminotransferase 24 U/L (normal 10-35 U/L), alanine aminotransferase 22 U/L (normal 5-35 U/L), gamma glutamyl transferase 18 U/L (normal 5-60 U/L), alkaline phosphatase 212 U/L (normal 102-302 U/L), lactate dehydrogenase 225 U/L, (normal 100-250 U/L),

serum albumin 3.3 mg/dL (normal 4.0-5.3 mg/dL), white blood cell count 9.9 K/mm³ (normal 3.9-9.8 K/mm³), hemoglobin 13.1 g/dL (normal 13.5-17.6 g/dL), hematocrit 37.2% (normal 39.8-51.8%), platelet count 125 K/mm³ (normal 131-362 K/mm³), (100-250), and C-reactive protein 12.3 mg/dL (normal 0.0-0.3 mg/dL).

The gallbladder could not be identified during an US through the abdominal wall, but an abdominal CT for screening of abnormalities revealed gallstones and signs of acute cholecystitis, such as pericholecystic fat stranding. In addition, the gallbladder was shown to be located on the right dorsal side of the liver, which was missing the right lobe (Figure 1A). The right portal vein was not visualized in the contrast-enhanced CT (Figure 1B). Two hepatic arteries originated from the superior mesenteric artery and perfused the medial side of the liver, and the cystic artery branched out from one of them. There was no right hepatic vein (Figure 1C). Magnetic resonance imaging (MRI) for visualization of the pancreaticobiliary system showed multiple hepatorenal cysts and absence of the right intrahepatic bile duct (Figure 1D).

The patient was diagnosed with acute cholecystitis due to gallstones and hypogenesis of right hepatic lobe. However, percutaneous transhepatic gallbladder drainage was difficult for the patient due to dislocation of the gallbladder. He was hospitalized and underwent conservative treatment for 9 days until the scheduled

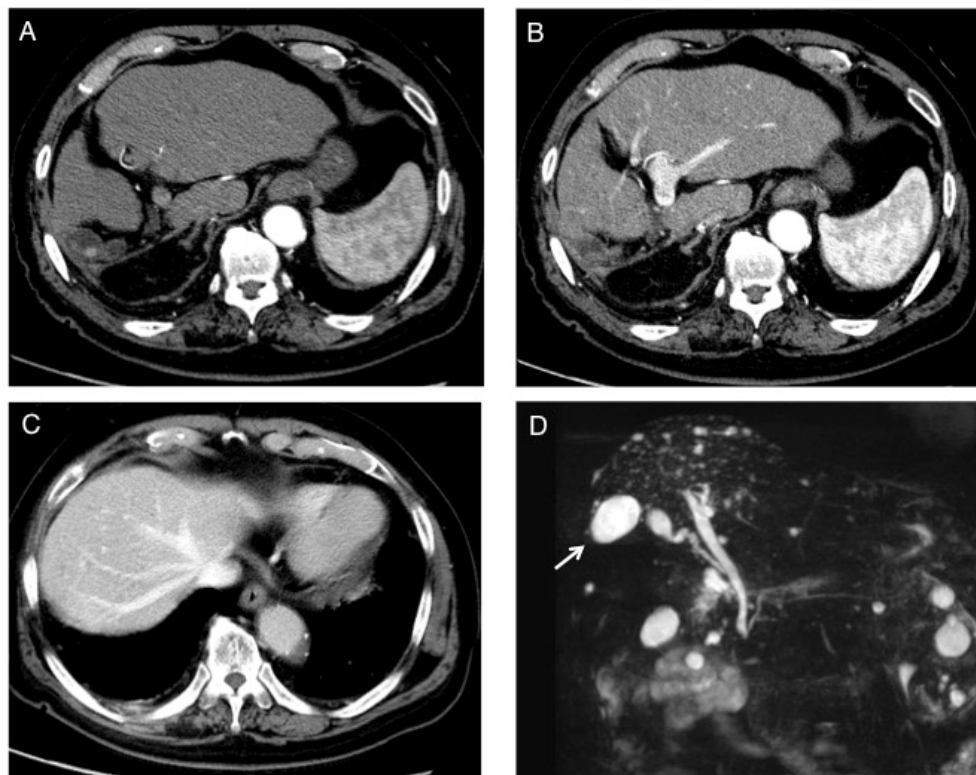


Figure 1. A-C Contrast-enhanced CT. (A) The gallbladder was located on the right dorsal side of the liver, which had no right lobe; **(B)** The right portal vein was not visualized; **(C)** There were several veins draining the medial side, but no right hepatic vein; **(D)** MRI cholangiography showed no right hepatic duct.

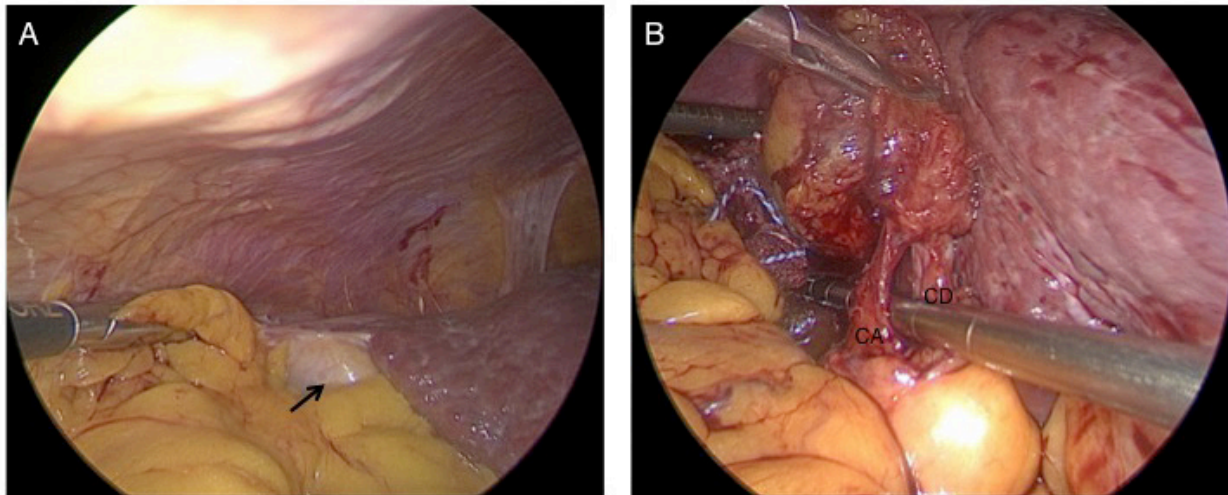


Figure 2. (A) There was no hepatic parenchyma to the right of the fundus (arrow) of the gallbladder. The liver surface was nodular; (B) The cystic bile duct (CD) and cystic artery (CA) were isolated, clipped, and dissected.

laparoscopic cholecystectomy.

The left semilateral decubitus position is commonly used for laparoscopic right liver resection, as natural shifting of the liver provides better visualization and an easier approach (11); therefore, we chose this position for the laparoscopic cholecystectomy. We placed all four ports approximately 3 cm to the right of the conventional 4-port placement for laparoscopic cholecystectomy to create an improved surgical workspace. The patient was placed in the reverse Trendelenburg position and rotated the left side. The liver had a nodular surface and showed hypogenesis of right hepatic lobe (Figure 2A). The retrohepatic gallbladder had adhesions with the omentum and retroperitoneum, which were dissected with laparoscopic coagulating shears. The hepatic portal area and hepatic duodenum ligament, including the common bile duct, were identified and safely secured against injury. The cystic duct and cystic artery were isolated, clipped, and dissected (Figure 2B). The gallbladder was dissected from the liver and excised. No drain was inserted. The patient's postoperative course was uneventful, and he was discharged 12 days after surgery. After the operation, he had no hepato-biliary problem for two years.

3. Discussion

Congenital absence of a hepatic lobe is a rare anomaly (1,2,3,4,12). For patients with hypogenesis of right hepatic lobe, the gallbladder is located in an abnormal position; therefore, they may not exhibit the typical symptoms of acute cholecystitis. Our patient first presented with right lower abdominal pain and was therefore suspected of having acute appendicitis. Because patients with hypogenesis of right hepatic lobe are generally asymptomatic, they are unaware

of their condition, which makes acute cholecystitis in these patients difficult to diagnose based on symptoms alone. Therefore, whenever a case of hypogenesis of right hepatic lobe is discovered incidentally, the patient should be informed of their condition.

There is a previous case report of laparoscopic cholecystectomy in a patient with agenesis of right hepatic lobe (10); however, in that case, the patient did not have a preoperative agenesis of right hepatic lobe. Therefore, the position of the patient and the location of the ports during that surgery were not modified. The patient with hypogenesis of right hepatic lobe has a gallbladder on the dorsal side of the liver compared with normal patients. Therefore, laparoscopic cholecystectomy for them with normal position and normal port sites is expected to be more difficult than that with normal anatomy. We searched PubMed for English-written articles that mention hypogenesis or agenesis of right hepatic lobe. To our knowledge, until the time of this writing in March 2019, this is the first report of laparoscopic cholecystectomy in a patient with a preoperative diagnosis of hypogenesis of right hepatic lobe. Due to improvements in diagnostic imaging, increasing numbers of patients with a preoperative diagnosis of hypogenesis or agenesis of right hepatic lobe are expected. We chose the left semilateral decubitus position and shifted the four ports approximately 3 cm to the right, and these modifications were helpful in the safe completion of the procedure. However, the most appropriate position and port sites should be based on the preoperative evaluation and selected according to the anatomical variations in each patient.

There have been some previous reports of biliary injury during cholecystectomy in patients with agenesis of right hepatic lobe (2,3,9), and conversion to open surgery is required in some cases to avoid such injury

(9). However, the laparoscopic approach has the advantage of a clearer operative field of view compared with laparotomy and may provide better visualization of the right retrohepatic area. Conversely, open surgery may require a large incision and mobilization of the liver in patients with hypogenesis of right hepatic lobe due to the location of the gallbladder.

Here we present a case of hypogenesis of right hepatic lobe in a patient who underwent laparoscopic cholecystectomy for acute cholecystitis. We conclude that in the present study, due to the retrohepatic location of the gallbladder, the left semilateral decubitus position and modification of the port sites were advantageous for successful completion of the procedure.

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