

Left-Sided Gallbladder (Sinistroposition) With Duplication of the Common Bile Duct

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ABSTRACT

A left-sided gallbladder sinistroposition is a rare finding. These gallbladders are situated left of the falciform ligament and are located under the left lobe of the liver, between segments III and IV. Common bile duct duplication is also rare, and its cause is not yet fully understood. A 55-year-old woman presented to our hospital with symptoms of chronic cholecystitis. During the laparoscopic cholecystectomy, it was discovered that not only was her gallbladder to the left of the falciform ligament, but she also had a duplication of her common bile duct. Although cases of left-sided gallbladders have been reported in the past, and there has been a report of a sinistroposition of both gallbladder and common bile duct, we believe this is the first reported case of left-sided gallbladder sinistroposition with the complete duplication of the common bile duct. As we learn more about various anatomical anomalies of the gallbladder through the use of laparoscopic cholecystectomies, surgeons encountering a left-sided gallbladder should be aware of the potential for associated anomalies.

Key Words: Left-sided gallbladder, Laparoscopic cholecystectomy, Duplication of the common bile duct, Sinistroposition.

INTRODUCTION

Left-sided gallbladder with a duplication of the common bile duct has never been reported in the literature. Left-sided gallbladders usually occur as a component of situs inversus.¹ An isolated left-sided gallbladder is considered a rare anomaly. The reported incidence of 1764 patients undergoing laparoscopic cholecystectomy in 2 hospitals between 1989 and 1994 for symptomatic gallstone disease that exhibited the transposition of only the gallbladder was 0.3%.² We report on the extremely rare presentation of a patient who not only had sinistroposition of the gallbladder, but duplication of the common bile duct as well.

CASE REPORT

The patient was a 55-year-old female known to have diabetes. She presented with a 2-month history of right upper quadrant discomfort with nausea. The pain radiated to the right side of her back and right flank and was most severe after a meal. The patient was admitted to the hospital with signs and symptoms of chronic cholecystitis. Her liver function tests revealed normal serum bilirubin, [total (0.2 mg/dL) and direct (0.1 mg/dL)]. Her alkaline phosphatase was elevated at 148 IU/L. ALT and AST were normal with values of 22 IU/L and 11 IU/L, respectively. Pancreatic function tests showed an elevated amylase of 125 IU/L. Ultrasound revealed an unremarkable appearing gallbladder with a common bile duct that appeared normal in diameter. Nuclear medicine (HIDA scan) with hepatobiliary duct imaging was conducted and revealed that there was physiologic uptake and excretion from the liver into the gallbladder and small bowel. The patient's gallbladder ejection fraction was 20% after CCK stimulation. Ultrasound did not show that the gallbladder was to the left of the falciform ligament. On examination, her heart was regular, and the heart sounds were in the typical location. Her lung sounds were clear. Her abdomen was soft and mildly tender in the right upper quadrant without peritoneal signs. There was no Murphy's sign on examination and no palpable mass. Her bowel sounds were active, and there were no abdominal bruits. The patient had a previous surgical history of a hysterectomy with a lower midline incision for leiomyoma. She also had a

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Pfannenstiel incision from a Cesarean section. No evidence of herniation was found along either of the old scars. Surgery took place one month after diagnosis of the chronic cholecystitis. Laparoscopic cholecystectomy was performed with the patient placed in the supine position and with general endotracheal anesthesia. During laparoscopic cholecystectomy, the gallbladder was found to be to the left of the falciform ligament (**Figure 1**). The remainder of the intraabdominal contents appeared normal. The gallbladder appeared inflamed. With careful dissection, the cystic duct was isolated and a cholangiogram was performed. The cholangiogram revealed a duplication of the biliary ductal system with a complete duplication of the common bile duct; each common bile duct entered the duodenum (**Figure 2**). Each common bile duct appeared to originate from a hepatic duct from each lobe of the liver and entered the duodenum separately. Two clips were placed proximally in the cystic duct, and the cystic duct was transected with endoscopic scissors. Both common bile ducts were not injured during dissection and had no evidence of choledocholithiasis. A small cystic artery was controlled with a single clip proximally and distally. It was transected with the endoscopic scissors. The gallbladder was placed in an endobag and removed through the left-sided port. Pathological examination revealed a benign gallbladder with mild chronic cholecystitis and cholesterosis including cholesterol polyp formation.



Figure 1. Falciform ligament on left. Alligator clip holding up gallbladder and is positioned left of the falciform ligament. On the base of the gallbladder is omental scar tissue that is clinically insignificant.

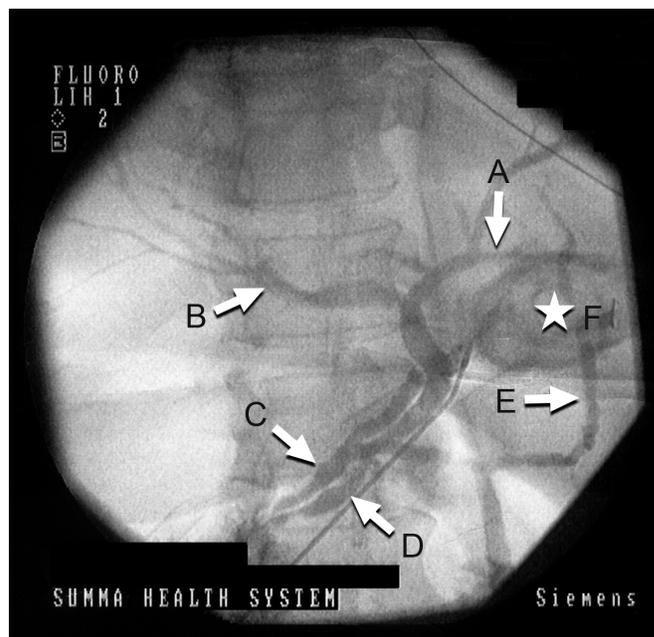


Figure 2. Cholangiogram showing duplicated common bile duct. Duplication appears on the left side, as indicated by arrows. (A) Cystic Duct; (B) Right Hepatic Duct; (C/D) Duplicated Common Bile Duct; (E) Left Hepatic Duct; (F) Gallbladder.

DISCUSSION

In this patient, situs inversus was not present, and the anatomic arrangement of the gallbladder is considered a much rarer anomaly than having situs inversus. Left-sided gallbladders arise embryologically in 3 possible ways. In the first way, the gallbladder develops from the normal hepatic diverticulum. However, it becomes attached to the developing left lobe of the liver and is carried across to the left side of the round ligament. The other possibility for development is that a second gallbladder develops directly from the left hepatic duct as an accessory gallbladder. The main gallbladder either regresses or fails to develop.³ The last pattern of development of a left-sided gallbladder may also result from the failure of the quadrate lobe of the liver to develop as shown in operative findings.²

Duplications of the common bile duct associated with a left-sided gallbladder have not been reported. However, duplications of the common bile duct have been reported in association with biliary atresia and common bile duct cysts.^{4,5} Despite cases of duplicated common bile ducts, the cause of duplicated common bile ducts remains unknown.⁴

Routine preoperative studies, such as ultrasound and ERCP (endoscopic retrograde cholangiopancreatography), often do not indicate a left-sided gallbladder with

duct abnormality. When such a gallbladder is discovered, the findings indicate that there may be an associated anomaly of the extrahepatic bile ducts. A case of sinistroposition of the gallbladder and common bile duct has been reported by Shen,⁶ and also a case has been reported of a left-sided gallbladder associated with hypoplasia of the left lobe of the liver.⁷

A surgeon encountering a left-sided gallbladder should be aware of the possibility of associated anomalies and should initiate the dissection carefully and as close to the gallbladder as possible. The cystic artery and cystic duct appear longer in the left-sided gallbladder and to some extent allow for dissection. However, dissection should be maintained to the left of the common bile duct, and no attempt should be made to trace the cystic artery and cystic duct to their origins.² An anatomical variation of the cystic duct in left-sided gallbladders may include the cystic duct crossing the common bile duct.² Dissection or clamping of the cystic duct may lead to damage of the common bile duct. As soon as a left-sided gallbladder is noted, a cholangiogram should be performed and used as a guide to the dissection.

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