

Aberrant Presentation of the Gallbladder During Laparoscopic Cholecystectomy

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ABSTRACT

Background: Aberrant gallbladder transposed to the left side is a rare congenital anomaly that has been seen in as many as 0.7% of the population. These gallbladders are situated under the left lobe of the liver between Segment III and IV and to the left of the falciform ligament. Many preoperative studies fail to identify the anomaly, causing confusion to the surgeon during laparoscopic resection. Selective use of intraoperative cholangiography and meticulous dissection can aid in safe resection.

Methods: A 61-year-old female was admitted with ultrasound confirmation of cholecystitis and subsequently taken to the operating room for a laparoscopic cholecystectomy.

Results: Evaluation of the gallbladder under laparoscopic view revealed an inflamed left aberrant gallbladder. An intraoperative cholangiogram was obtained to delineate the biliary anatomy that showed the cystic duct entering the common hepatic duct on the right side.

Conclusion: A left aberrant gallbladder is a rare presentation that requires awareness of biliary anatomy and selective use of intraoperative cholangiography to aid in the safe laparoscopic resection of the gallbladder.

Key Words: Left-sided gallbladder, Laparoscopic cholecystectomy, Situs inversus, Ultrasound.

INTRODUCTION

The gallbladder develops as an outpouching from the hepatic diverticulum and rests normally in the gallbladder fossa between liver segment IV and V. Rarely, ectopic locations can be found including transverse, intrahepatic, retrodisplaced and left-sided.¹ The presentation of a left-sided gallbladder usually occurs in the setting of situs inversus.² However, transposition of only the gallbladder is seen in up to 0.3% of the population.³ The associated anomalies with gallbladder transposition include the biliary system and portal vein anomalies, and segment IV atrophies.⁴⁻⁶ The complexity that may develop with an aberrant gallbladder requires careful understanding of the anatomy in the age of standard laparoscopic cholecystectomies. We report a case of ectopic gallbladder situated under the left liver.

CASE REPORT

The patient was a 61-year-old female who presented to the hospital with a 1-week history of right upper quadrant discomfort associated with nausea and vomiting. The abdomen was tender in the right upper quadrant and epigastric region with a positive Murphy's sign and no palpable masses.

Ultrasonography of the right upper quadrant showed a fatty enlarged liver and a thickened-wall gallbladder with a nonmobile 1.9 x 1.9 x 2.3-cm calculus in the gallbladder neck. The liver function test was unremarkable.

Laparoscopic cholecystectomy was performed with the patient in the supine position. After placement of the supraumbilical trocar, a 30-degree telescope was used for initial laparoscopic visualization. The gallbladder was inflamed and distended and was to the left of the falciform ligament (**Figure 1**). The original gallbladder fossa appeared atrophic (**Figure 2**) with no other organ abnormality seen. Because of the gallbladder location, subsequent port placement was modified; a 5-mm and 12-mm ports were placed in the left upper quadrant and a 5-mm port was placed in the epigastric region to the right of the falciform ligament that had to be taken down to facilitate exposure. Meticulous dissection was done to expose the Calot triangle contents. The cystic duct-gallbladder and

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Laparoscopic cholecystectomy was performed by Dr Awad with the assistance from Dr Qureshi. The manuscript was drafted and revised by Dr Awad and Dr Qureshi.

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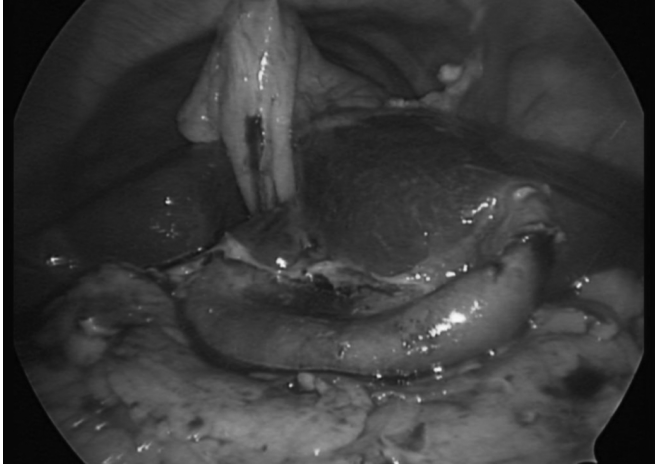


Figure 1. Alligator clip holding up falciform ligament shows gallbladder to the left of the falciform ligament under the left lobe of the liver.

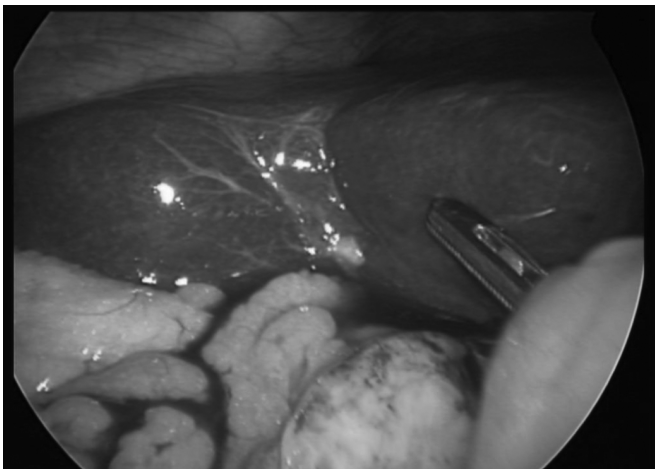


Figure 2. Original gallbladder fossa shown with absent gallbladder.

the cystic duct-common hepatic junction were clearly displayed (**Figure 3**). An intraoperative cholangiogram was obtained that showed an intact right and left ductal system with the cystic duct entering the common hepatic duct from the right side (**Figure 4**). The cystic duct was then clipped and divided from the 12-mm port. The gallbladder was dissected off the liver and placed in an endobag and extracted through the 12-mm port. The patient was discharged home on the first postoperative day.

DISCUSSION

A left-sided gallbladder with right-sided falciform ligament is a rare anomaly that was described first by Hochstetter in



Figure 3. Dissection of biliary tree with exposure of cystic duct and common bile duct.

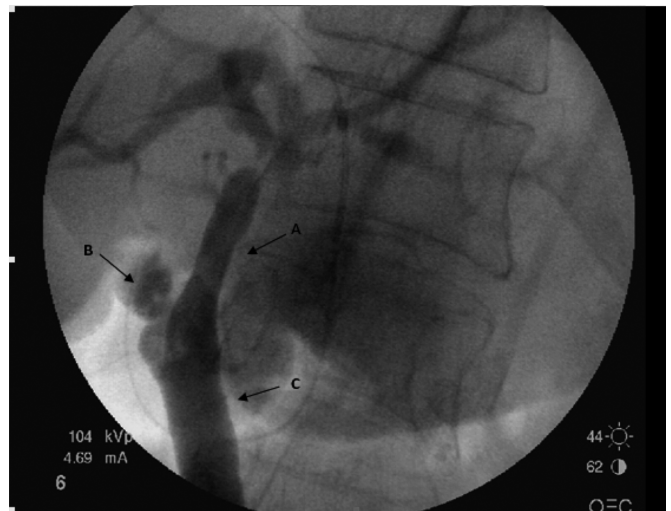


Figure 4. Intraoperative cholangiogram. (A) Common hepatic duct. (B) Cystic duct. (C) Common bile duct.

1886. It was described as a “gallbladder lying over the left side of the falciform ligament.”⁷ Since its first description, malposition of the gallbladder occurring in the absence of situs inversus has been described as a rare anomaly.³

Anatomical descriptions of ectopic gallbladder have shown that the cystic artery crosses in front of the common bile duct from right to left. The cystic duct may enter the common hepatic duct on the right or the left side in a curving manner.

Left-sided gallbladder embryologically can arise in 4 different manners. First, the gallbladder develops from the

normal hepatic diverticulum and migrates to the left lobe of the liver and is carried across to the left side of the falciform ligament. Second, an accessory gallbladder may develop directly from the left hepatic duct, and the main gallbladder either fails to develop or regresses.⁸ Third, the 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.⁴ Fourth, studies by Nagai et al⁹ have shown that the anomaly associated with a right-sided falciform ligament during development exists with a right and left umbilical ligament. In normal development, the right umbilical ligament atrophies and the left side becomes dominant. In rare instances, the left ligament atrophies and the right ligament becomes dominant, which has been seen in 0.7% of the population.¹⁰ The gallbladder in such anomalies is situated in the normal site, but the rare right-sided falciform ligament makes the gallbladder appear aberrant beneath the left lobe of the liver.

The diagnosis of the malformation is difficult to obtain preoperatively. Clinical presentation is of pain on the right side because aberrant gallbladders are prone to similar diseases as normally positioned gallbladders including cholelithiasis. Preoperative ultrasound or ERCP often does not indicate a left-sided gallbladder.¹¹ If an ectopic gallbladder is encountered, the surgeon should be aware of the possibility of the anomalies of the cystic artery and ductal system. Therefore, meticulous dissection should be used, and division of structures should be avoided until a cholangiogram provides a clear picture of the biliary system. Conversion to open cholecystectomy is advised if anatomy remains unclear.

CONCLUSION

Left-sided gallbladders are a rare entity without the presence of situs inversus and can present as an unusual surprise during laparoscopic cholecystectomy. A strong knowledge of the biliary anatomy, awareness of the unpredictable presentation of a left-sided gallbladder, and

selective use of an intraoperative cholangiogram can greatly aid in a safe laparoscopic resection of the gallbladder.

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