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True left-sided gallbladder: A case report and comparison with the literature for the different techniques of laparoscopic cholecystectomy for such anomalies

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ABSTRACT

INTRODUCTION: True left-sided gallbladder (LSG) is a rare finding that may present with symptoms similar to those of a normally positioned gallbladder. Moreover, it may be missed by preoperative imaging studies such as ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), or endoscopic ultrasound. True left-sided gallbladder is a surgical challenge and surgical technique may need to be modified for the completion of laparoscopic cholecystectomy.

PRESENTATION OF CASE: In this case report, we present a case of true left-sided gallbladder that produced right-sided abdominal symptoms. Ultrasound of the abdomen failed to show the left-sided position of the gallbladder. MRI showed the gallbladder located to the left of the ligamentum teres underneath segment III of the liver. Intraoperatively, the gallbladder was grasped and retracted to the right under the falciform ligament and it was removed using classical right-sided ports with no modification to the technique. No complications were encountered intraoperatively or postoperatively.

DISCUSSION: True LSG is a rare anomaly that may present with right-sided symptoms like normally positioned gallbladder. It may be missed in preoperative imaging studies and can be discovered only intraoperatively. Modification of laparoscopic ports, change in patient's position and/or surgeon's position, or conversion to open cholecystectomy may be needed for safe removal of the gallbladder.

CONCLUSION: Classical technique of laparoscopic cholecystectomy is feasible for left-sided gallbladder. However, if the anatomy is not clear, modifications of the surgical technique may be necessary for the safe dissection of the gallbladder.

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1. Introduction

Left-sided gallbladder (LSG) is a rare anomaly; the reported incidence ranges from 0.2% to 1.1 [1]. Normally, the gallbladder resides in the gallbladder fossa between hepatic segments IV and V. LSG is defined as a gallbladder located on the left side of the round ligament or ligamentum teres [2]. There are three recognized variants of LSG: LSG associated with situs viscerum inversus (SVI), true LSG (T-LSG), and gallbladder located to the left of abnormally located right-sided round ligament/ligamentum teres (R-LSG) [3]. LSG without SVI (LSG-woSVI), which comprises T-LSG and R-LSG, is a rare anomaly and is typically discovered incidentally during surgery [2]. T-LSG should be differentiated from R-LSG; it is positioned to the left of the ligamentum teres and falciform ligament and is located under the surface of the left liver lobe segment III

[3–5]. On the other hand, LSG due to abnormally located round ligament/ligamentum teres is normally located at segment IVb. It is important to recognize the R-LSG anomaly, particularly in patients scheduled for hepatectomy, because the condition is typically associated with other anomalies of intrahepatic portal veins and intrahepatic biliary branches [3].

T-LSG is the most common type of LSG-woSVI [2]. There are several theories pertaining to the embryological origin of T-LSG. According to one theory, the gallbladder develops from the hepatic diverticulum at its normal site; however, its attachment to the developing left lobe results in the migration of the gallbladder to the left lobe [5,6], which results in a long cystic duct that crosses the common hepatic duct from left to right and joins the common hepatic duct at its right side. According to another theory, the gallbladder develops directly from the left hepatic duct with regression of the main gallbladder [5,6]. In such cases, a cystic duct either drains into the left hepatic duct or joins the common bile duct from the left side [5–7]. Here, we present the case of a patient with true LSG that was laparoscopically removed using the same

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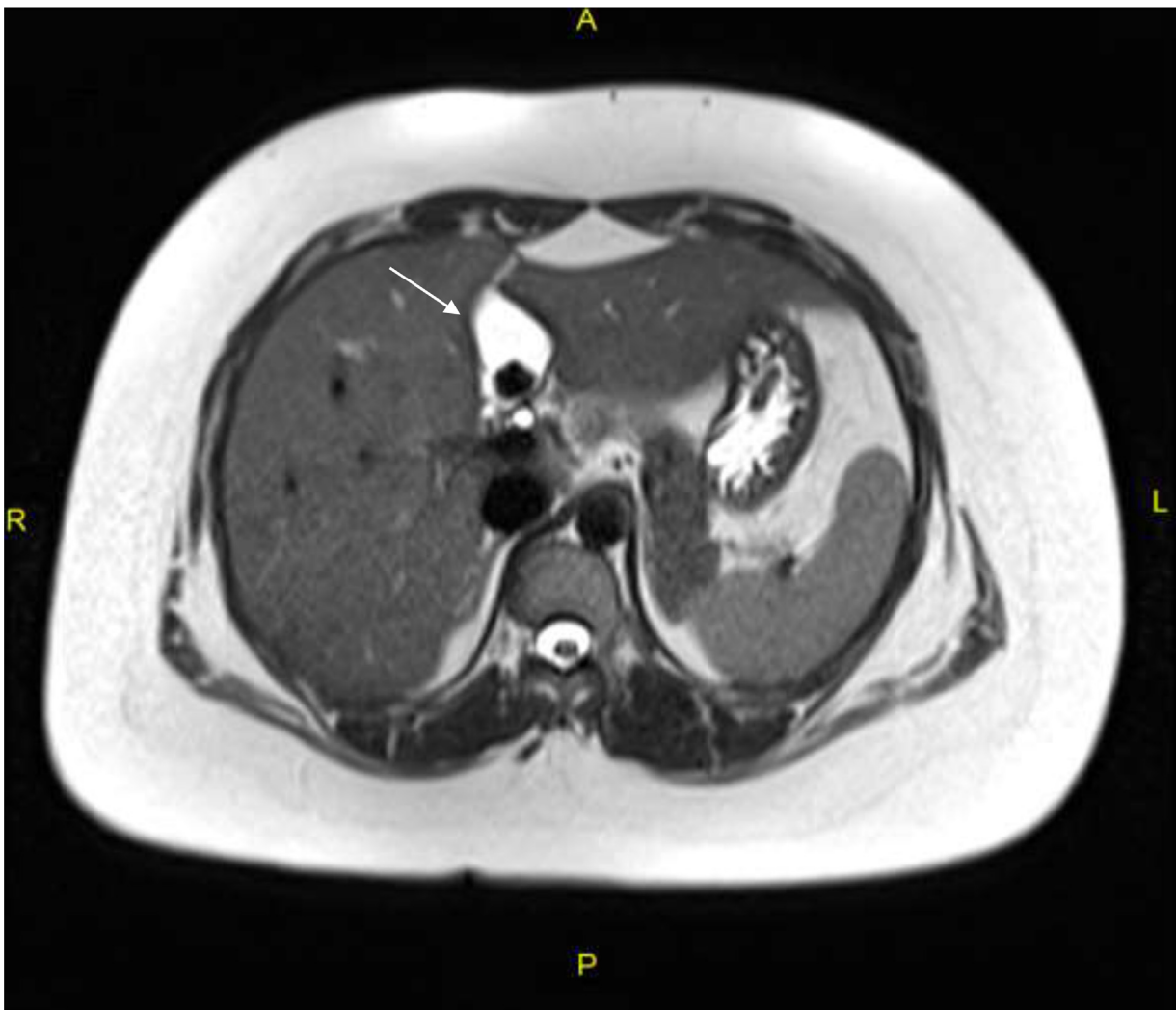


Fig. 1. Transverse T2-weighted magnetic resonance image showing the gallbladder (arrow) with a stone inside, located to the left of the fissure for ligamentum teres under segment III.

classical ports that are routinely used for normally positioned gallbladder. This work has been reported in line with the SCARE criteria [7].

2. Case report

A 26-year-old Pakistani woman presented to our clinic with chief complaints of recurrent right upper quadrant (RUQ) colicky pain associated with nausea and vomiting since the last few months. She has a history of polycystic ovarian disease with irregular menstruation. There was no other relevant medical history or history of prior surgery. On clinical examination, the abdomen was soft; there was no tenderness in any of the four quadrants of the abdomen. Laboratory investigations including complete blood count and liver and renal function tests were normal. Abdominal ultrasound showed a contracted gallbladder with large stones measuring 1.8 cm and a well-defined hypoechoic lesion (2.6×1.4 cm) in the right liver lobe. Magnetic resonance imaging (MRI) revealed that the gallbladder was located to the left of fissure for ligamentum teres underneath segment III (Fig. 1); a focal fat-sparing lesion was observed in segment VI. The patient was booked for elective laparoscopic cholecystectomy. Surgery was performed using the conventional four-port technique; a 10-mm supraumbilical port and three 5-mm ports (in the epigastrium, right midclavicular line,

and right anterior axillary line, respectively). Upon insertion of the camera, the gallbladder was immediately visualized to the left of the falciform ligament (Fig. 2), attached to segment III of the liver with a long mesentery (Fig. 2). The gallbladder was grasped and retracted to the right side under the falciform ligament (Fig. 2). Careful dissection was performed at the Calot's triangle and, two cystic arteries (right and left) were found. After identification, both the right and left cystic arteries were clipped and divided. A cystic duct was found joining the common hepatic duct on the right side. It was also clipped and divided. The rest of the operation was performed as per the standard protocol and with meticulous dissection of the gallbladder border. The postoperative period was uneventful and she was discharged on the second day. Histopathological examination of the gallbladder revealed chronic cholecystitis.

3. Discussion

True LSG is a rare and unusual, albeit a well-recognized, anomaly; it may present with right-sided symptoms and exhibit a clinical picture similar to that associated with a normally positioned gallbladder. This makes its preoperative diagnosis a clinical challenge [2]. Abongwa *et al.* [2] reviewed 55 patients with LSG-woSVI, of which 83% of patients had T-LSG; a vast majority (75%) of these patients presented with RUQ pain. It is suggested that

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