

CASE REPORT

Laparoscopic Cholecystectomy in a patient with Left-Sided Gallbladder Akashdeep Singh¹, Ashish Rathore², Vivek Kumar Sahu³, Marivada Hari Babu⁴

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ABSTRACT

The incidence of left-sided gallbladder (LSGB), a rare congenital anomaly, ranges from 0.1% to 1.2%. 5:1 more women than men have it than vice versa. Although many theories have been put forth, its exact cause is uncertain. Despite imaging studies, it is challenging to make a preoperative diagnosis because the symptoms are similar to those of a normal gallbladder. The diagnosis is typically made during surgery. The incidence of biliary tract lesions is high, and LSGB is linked to biliary anomalies. The four-port laparoscopic cholecystectomy for LSGB is a risk-free procedure. Each case requires a different surgical technique. In order to enhance the exposure and reduce the risk of bile duct injury, the surgeon should be aware about ductal and vascular anatomical variants as well as be able to modify the standard surgical technique.

Introduction

The left sided gallbladder (LSG) is regarded as a rare instance of a congenital gallbladder anomaly or anatomical variant. [1] In the True Aberrant form of LSG, the gallbladder is situated without situs inversus on the left side of the falciform ligament. [2] Hochestetter published the first account of LSG in 1886. [1] A left sided gallbladder is one that is located below the left lobe of the liver, either below segment III or below segment IV. [3] According to the estimates, 0.3% of the general population has reported LSG. [4]

It was previously possible for pre-operative investigations to miss the presence of true LSG, so it was frequently discovered during the intra-operative procedure. [5]

However, a well-planned laparoscopic cholecystectomy

can be performed with the aid of MRI/angiography and ultrasound or CT to detect LSG prior to surgery. [6]

Due to anatomical variations, the likelihood of intra-operative injuries/morbidities is higher when using a laparoscopic surgical approach for LSG. [7] In this report, we describe an acute cholecystitis symptom in a middle-aged female patient with an aberrant LSG, who had undergone laparoscopic cholecystectomy.

CASE PRESENTATION:

A 30-year-old middle-aged woman who complained of right upper abdominal pain radiating to her right shoulder and after-meal vomiting for past 2 days happened to visit our hospital. The pain was sporadic, barely lasting for 20 minutes, and later started to fade. No pertaining prior

medical or surgical history existed.

Examining the abdomen revealed that it was soft and that none of its four quadrants were tender.

Blood tests were ordered to analyse the condition of the kidney and liver's functioning as well as the total blood count, which came back normal.

A gallstone measuring 12 mm in size was discovered during an ultrasound examination of the gallbladder neck.

The gallbladder was seen on the CT scan, dislocated in the middle, and the wall enhancement had stopped.

Additionally, MRCP (Magnetic Resonance Cholangiopancreatography) results showed an abnormally thickened and enlarged gallbladder. All these noteworthy findings led to the scheduling of the patient for laparoscopic cholecystectomy.

The standard four port technique was employed (2 of 10 mm diameter and 2 of 5 mm diameter). The gallbladder was visible once the camera was inserted, located to the left of the falciform ligament and attached to segment III of the liver by a long mesentery. The gallbladder was then carefully pulled back to the right side, beneath the falciform ligament. Careful dissection was done at the calot's triangle, where the right and left cystic arteries were found, divided, and clipped. In addition, after identification of critical view of safety, cystic duct connecting to the hepatic duct was also found on the right side and it was clipped, and divided. The remainder of the

procedure was completed in accordance with the established protocol, and the gallbladder dissection went well. The post-operative period went very smoothly, and the patient was discharged after three days with no further complications.

DISCUSSION:

Gross provided two pathogenetic explanations for the development of true LSG in his review of gallbladder congenital anomalies. The first one considered the migration of the gallbladder bud to the left hepatic lobe, with the cystic duct crossing the CBD before joining it in a normal anatomical position. The second one considered the development of the gallbladder directly from the left hepatic lobe, with a cystic duct joining the CBD from the left side. [8] Because the cystic duct connected to the extra hepatic bile duct on the right side, we believe that the left-sided gallbladder in our case was caused in the first way.

According to Dr Vinayak Kshirsagar et al (2023), the frequency of the uncommon congenital anomaly of a gallbladder on the left side is 0.1-0.7%. [9]

The majority of left-sided gallbladder cases that have been documented are brought on by a right-sided round ligament, also known as a "false" left-sided gallbladder. It is extremely uncommon to have a left-sided gallbladder

that has a normal left-sided round ligament, which is known as a "true" left-sided gallbladder. [10]

In a retrospective review, Abongwa HK et al (2017) revealed 55 cases of LSG without situs inversus who had undergone cholecystectomy from 1996 to 2014. The findings were as follows; Mean age was 51 years \pm 17; male :female ratio was 2:1. The prominent clinical presentation was right upper abdominal pain in 75.5% and pre-operative diagnosis had reached around 16.3%. [11] Due to abnormalities in the bile duct, portal vein, and other structures, LSG has been linked to a higher risk of intraoperative bile duct injuries (up to 7.3%). [12]

Using preferred reporting items, Ryan Pereira et al. (2019) carried out a systematic review on 53 studies involving 112 patients, 80% of whom had symptomatic gallstones. 108 patients had pre-operative imaging done, and 32 of those patients had LSG observed. During surgery, the remaining LSG cases were found. [13]

The patient in our case study presented to our hospital complaining of right upper abdominal pain radiating to her right shoulder and after-meal vomiting for the previous two days without any pertinent prior medical or surgical history. The pre-operative diagnosis was made with the aid of ultrasound, CT, and MRCP, which revealed that the gallbladder was dislocated in the middle, the wall enhancement in the CT findings had stopped, and

the gallbladder was abnormal and swollen on MRCP. These results led to the patient being scheduled for a laparoscopic cholecystectomy.

However, a left-sided gallbladder discovered during surgery should not prevent the choice to continue laparoscopically with a few minor adjustments to the usual approach and port placement.

In a patient with dextrocardia, laparoscopic cholecystectomy was successfully carried out with careful dissection and port site modification. [14]

R. Donith et al. (2001) described a case of cholecystitis in a patient whose gallbladder was situated to the left of the round ligament; a successful laparoscopic cholecystectomy was carried out, and the patient's recovery went smoothly. [15]

Reddy PK et al. (2005) suggested that careful intraoperative cholangiography use as well as knowledge of the unexpected combination of the cystic duct into the common bile duct assist in the safe laparoscopic management of this unusual occurrence. [3]

With an incidence of 0.3%–0.7%, bile duct injury (BDI) is the most severe LC complication. It is associated with significant perioperative morbidity and mortality, decreased quality of life, and high rates of subsequent medico-legal litigation. The primary cause of BDI is typically a misinterpretation of the biliary anatomy that results in unanticipated biliary lesions. In both elective

and emergency settings, near-infrared fluorescent cholangiography is becoming increasingly common in clinical practise to define biliary anatomy during LC. [16]

13 (0.26%) of the 4910 patients studied by Jung YK et al who underwent LC for the treatment of gallbladder disease between August 2007 and December 2019 were found to have LSGB. Through the perioperative imaging workups, we retrospectively analysed these 13 patients to look for general characteristics, perioperative outcomes, and other variations. The "critical view of safety (CVS)" was confirmed after the operation was carried out successfully using the standard four-trocar technique. He came to the conclusion that LC combined with CVS can effectively manage LSG. [17]

For a 75-year-old woman with a left-sided gallbladder who was suspected of having cholecystocholedocholithiasis, Matsumura N et al (2009) performed a laparoscopic cholecystectomy (LC) with choledocholithotomy. For LC, standard ports were added to the American configuration. The post-operative period was uneventful. The gallbladder was normogradely separated from the gallbladder fossa, and the fundus of the gallbladder was lifted ventrally and toward the patient's right shoulder. [18]

Complications can be kept to a minimum by carefully dissecting the affected area, establishing the critical view of safety, and taking into account any potential anatomic

variations associated with the condition. The cystic duct and artery should be joined and divided close to the gallbladder. The surgeon should try their best to locate important anatomical landmarks, just as they would try to do during a typical cholecystectomy.

Four ports positioned in standard locations were used to perform laparoscopic cholecystectomy in the current case. The right and left cystic arteries were located, divided, and clipped with great care at the calot's triangle. Additionally, a cystic duct connecting to the hepatic duct was discovered on the right side after the critical view of safety was identified. This duct was divided and clipped. The gallbladder dissection went smoothly, and the rest of the procedure was carried out in accordance with the established protocol. The patient's recovery from surgery went very smoothly.

A new navigational surgical technique called fluorescence cholangiography (FC) can be used to locate extra hepatic biliary structures and get to the "critical view of safety." In challenging cases, it can be used as an additional technique during laparoscopic cholecystectomy to prevent biliary tract injury. [19]

CONCLUSION:

A left-sided gallbladder is a rare anatomical variation. Symptoms of cholecystitis and biliary colic are frequently present in patients. The sensitivity of imaging studies for

preoperative diagnosis is low. It's possible that the abnormal location won't be identified until the laparoscopic procedure has begun. A majority of these procedures, if not all of them, can be carried out using minimally invasive methods with the proper anatomic identification of important landmarks.

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