CASE REPORT

Left-sided Gallbladder: An Intraoperative Surprise during Laparoscopic Cholecystectomy

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Received on: 06 September 2021; *Accepted on*: 06 September 2022; *Published on*: 07 December 2022

Abstract

Aim: This article reports a case of the left-sided gallbladder (GB) which is more often than not an intraoperative surprise. The knowledge about the entity and associated anatomical variations is crucial to prevent complications.

Background: Cholecystectomy is a commonly performed surgical procedure. Left-sided GB is an intraoperative surprise. The reported incidence of left-sided GB is 0.04–1.1% of cases. There is an increased incidence of variant anatomy and a 7% incidence of bile duct injury in these patients.

Case description: A 29-year-old lady underwent laparoscopic cholecystectomy for symptomatic cholelithiasis. During laparoscopy, the falciform ligament was unusually stretched toward the right lobe of the liver, going to the region where one would normally see the fundus of GB. Hence, an additional 5-mm port was placed mid-way between the xiphoid process and umbilicus to the left of midline, apart from the standard ports. The fundus and the body of the GB were seen to the left of the falciform ligament. While the infundibulum of the GB was anterior and to the left of the hepatoduodenal ligament, distorting the Calot's triangle. We proceeded with the "fundus first" approach and could complete the procedure. Retraction of the fundus toward the right shoulder with a downward and a lateral traction at the infundibulum helped in Calot's dissection. The patient had an uneventful postoperative course.

Conclusion: Left-sided GB is a rare anomaly, most often detected intraoperatively. Use of an additional port and the fundus-first approach helped in successful laparoscopic completion of the procedure.

Clinical significance: This case report highlights an intraoperative surprise, a left-sided GB, encountered in laparoscopic cholecystectomy, one of the most commonly performed operations. The knowledge about the entity and the associated variations in critical structure anatomy would be crucial for the surgeons to safely complete the procedure by laparoscopic means.

Keywords: Aberrant gallbladder, Cholecystectomy, Laparoscopy, Left-sided gallbladder.

World Journal of Laparoscopic Surgery (2022): 10.5005/jp-journals-10033-1513

Background

Cholecystectomy is a commonly performed surgical procedure. Left-sided GB is an intraoperative surprise. The reported incidence of left-sided GB is 0.04–1.1% of cases. There is an increased incidence of variant anatomy and a 7% incidence of bile duct injury in these patients. Herein, we report a case of left-sided GB detected during surgery who underwent a successful completion of the procedure laparoscopically.

Case Description

A 29-year-old lady with no comorbidities presented with complaints of pain in the right hypochondrium for the last 3 months. Ultrasound evaluation suggested a single gallstone of size 1.8 cm. Her liver-function tests were normal. The patient was taken up for laparoscopic cholecystectomy after adequate pre-anesthetic evaluation. During laparoscopy, the falciform ligament was unusually stretched toward the right lobe of the liver, going to the region where one would normally see the fundus of GB. In addition, there were peri-cholecystic omental adhesions. Hence, an additional 5-mm port was placed mid-way between the xiphoid process and umbilicus to the left of the midline, apart from the standard ports. Then, the pericholecystic omental adhesions were lysed, after which the fundus and the body of the GB were seen to the left of the falciform ligament. While the infundibulum of the GB was anterior and to the left of the hepatoduodenal ligament, distorting the Calot's triangle. The Rouviere's sulcus was seen. We proceeded with the "fundus first" approach. The GB was dissected from the bed in the body region, and subsequently, the dissection was carried out toward the neck of the GB. As a next step, retraction of the fundus toward the right shoulder with a downward and a lateral traction at the infundibulum helped in Calot's dissection. The cystic artery and cystic duct were dissected and no other tubular structures were seen entering the GB. The cystic artery and the duct were clipped and divided in the usual manner. There was no bleeding encountered during the procedure. The patient had an uneventful postoperative course. She was discharged on the first postoperative day on a normal diet (Fig. 1).

Discussion

Cholecystectomy is a commonly performed procedure. The anatomical position of GB is along the Cantlie line, to the right of the falciform ligament attached to the undersurface of the liver. Gallbladder in other locations is termed aberrant GB.[1] Left-sided GB

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How to cite this article: Nachiappan M, Thota RK, Gadiyaram S. Left-sided Gallbladder: An Intraoperative Surprise during Laparoscopic Cholecystectomy. World J Lap Surg 2022;15(3):258–259.

Source of support: Nil

Conflict of interest: None

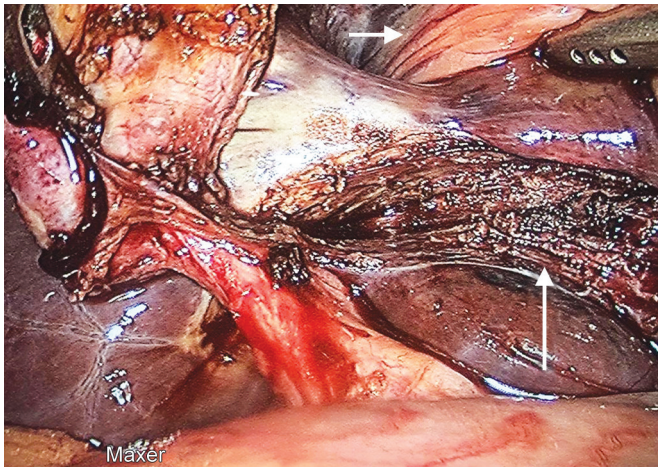

Fig. 1: Intraoperative photograph, GB dissected off the bed from the undersurface of the segment 3 of the liver (long arrow) by "fundus-first" technique. The falciform ligament (short arrow) is to the right of the GB

is a variant of aberrant GB. It can be associated with situs inversus. In the absence of situs inversus, left-sided GB could either be a true left-sided GB or an apparent left-sided GB.[1] True left-sided GB is one where the GB is in the undersurface of segment 3, and the falciform ligament is to the right of it. Whereas in an apparent left-sided GB, GB remains attached to the undersurface of segment 4, but because of the relative shift in the position of the round ligament to the right, it is identified as a left-sided GB. True left-sided GB is more commoner, constituting around 83% of 55 patients reviewed in a study by Abongwa et al.[2] The reported incidence of true left-sided GB is 0.04–1.1% of the cases undergoing cholecystectomy.[3]

Preoperative diagnosis of left-sided GB is more of a serendipity than a norm. Over 80% of the left-sided GBs are identified for the first time during surgery.[4] Lee et al. reported that, despite repeated investigation, eight out of ten patients were diagnosed with surgery.[5] In cases where a preoperative diagnosis is made, a thorough evaluation with contrast-enhanced triple-phase computed tomography of the abdomen and a magnetic resonance cholangiography is appropriate.[6] This helps in identifying any variation in the vascular and biliary anatomy of the liver.

Several variations in the anatomy are noticed in the patients with left-sided GB. These have implications whether the patient is undergoing a simple cholecystectomy or a complex liver resection.[1] Cystic-duct insertion could be into the common bile duct (CBD) or the left hepatic duct (LHD) based on the embryological pattern.[7] In a normal GB bud, which migrates and gets attached to the left liver, the cystic duct opens into the CBD. Whereas, failure of development of a right-sided GB along with a GB bud developing from the left side is associated with cystic duct opening into the LHD or the left side of the CBD. This variation is associated with atrophy of the right lobe of the liver. Apart from this, there are several variations reported in the portal venous, hepatic venous, and hepatic arterial anatomies. Lee et al. reported the aberrant anatomy that is commonly seen with the right branches of the portal vein and the hepatic veins in these patients.[5] Similarly, the biliary tree also is shown to have aberrant anatomy, including duplication and hypoplasia, in patients with left-sided GB. Bile duct injury is reported in 7% of patients with left-sided GB.[8] Therefore, a clear understanding of the arterial, venous anatomy, and the biliary tree is critical before any major biliary or hepatic surgery is contemplated in these patients.

Various technical modifications to laparoscopy have been reported for successful and safe completion of the procedure. They include placing the right-hand epigastric port to the left of the midline,[9] inserting the right-hand port after evaluation of the GB with the left-hand port for proper triangulation,[5] mirror image setup of the ports,[6] tilting the table so that the left side of the patient is up,[8] using additional ports, clipping the cystic duct as close to the infundibulum as possible,[10] fundus-first approach where the Calot's anatomy is not clear or dissection is unsafe, and finally, conversion to open surgery for safe completion of the procedure.[11] Thus, with some technical modifications, it is possible to complete the procedure by laparoscopic means. However, safety is paramount, and a low threshold for conversion should be maintained at all times.

Conclusion

Left-sided GB is a rare anomaly, most often detected intraoperatively. The use of an additional port and the fundus-first approach helped in successful laparoscopic completion of the procedure.

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