Clinical Case

Laparoscopic Cholecystectomy of a Left-Sided Gallbladder: Case Report

Colecistectomia Laparoscópica de Vesícula Biliar do Lado Esquerdo: Caso Clínico

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ABSTRACT

Left-sided gallbladder (LSGB) is a rare congenital anomaly of the gallbladder, defined as a gallbladder located on the left side of the falciform ligament in the absence of *situs inversus*. It is mostly an asymptomatic condition, thus not causing the patient any harm, most of the time being an accidental intraoperative finding. LSG is frequently associated with alterations of both the portal branches and the intrahepatic biliary tree, increasing the risk of bile duct injury. We describe a case of a patient with a left-sided gallbladder, diagnosed during an elective laparoscopic cholecystectomy, which was performed with no complications. The patient had no other associated anatomical anomalies. LSGB is usually encountered by chance during surgery and it can be successfully and safely managed through laparoscopic cholecystectomy with a critical view of safety.

Keywords: Cholecystectomy, Laparoscopic; Gallbladder/abnormalities; Gallbladder/surgery; Gallbladder Diseases

RESUMO

A vesícula biliar do lado esquerdo (VBLE) é uma anomalia congénita rara da vesícula biliar, caracterizada por uma vesícula biliar localizada do lado esquerdo do ligamento falciforme, sem *situs inversus*. Trata-se geralmente de uma condição clínica assintomática,

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não causando qualquer problema clínico ao doente e sendo na maior parte das vezes um achado intraoperatório acidental.
A VBLE está frequentemente associada a alterações tanto dos ramos portais como da árvore biliar intra-hepática, aumentando o risco de lesão das vias biliares durante a cirurgia. Descrevemos o caso de um doente com vesícula biliar do lado esquerdo, diagnosticada durante uma colecistectomia laparoscópica eletiva, que foi realizada sem complicações. O doente não apresentava outras anomalias anatómicas associadas. A VBLE é geralmente diagnosticada durante a cirurgia e pode ser tratada com sucesso e segurança através de colecistectomia laparoscópica tendo em conta a segurança do procedimento.

Palavras-chave: Colecistectomia Laparoscópica; Doenças da Vesícula Biliar; Vesícula Biliar/anomalias congénitas; Vesícula Biliar/cirurgia

INTRODUCTION

A true left-sided gallbladder (LSGB) is a rare congenital anomaly in the gallbladder, which is defined as a gallbladder located on the left side of the falciform ligament, under the surface of the left liver lobe segments III (or II), without *situs inversus*, instead of its normal location in the gallbladder fossa between hepatic segments IV and V.[1,2] The reported prevalence of this ectopia ranges from 0.2% to 1.1%.[3] During normal development, the hepatic diverticulum forms from the foregut and gives rise to the liver, gallbladder, and bile ducts. In the case of a left-sided gallbladder without *situs viscerum inversus*, three embryologic hypotheses have been proposed: (1) the gallbladder attaches to the developing left liver lobe and migrates left of the round ligament; (2) an accessory gallbladder develops from the left hepatic duct while the primary one regresses or fails to form; and (3) the quadrate lobe fails to develop, as seen in surgical observations.[4,5] It is mostly an asymptomatic condition, thus not causing the patient any harm, most of the time being an accidental intraoperative finding, which is why they are probably more common than generally believed.[1] It is of considerable importance to be aware that LSG is frequently associated with portal vein and/or biliary system anomalies, segment IV atrophy and variations in hepato-biliary vascular anatomy, making bile duct injury not unusual.[2,6] The association of these anomalies, therefore, represents an important risk of complications in cases where surgical treatment is necessary.[6] This case report aims to raise awareness about the existence of a rare condition that can seriously affect the surgical outcome.

CASE REPORT

For the use of images from surgical intervention and results from complementary diagnostic methods, institutional approval was obtained and informed consent from the patient was obtained.

A 49-year-old male patient was referred for surgical consultation by the attending physician due to symptomatic gallstone disease. He reported postprandial abdominal pain for one year. His medical history included diabetes mellitus and hypertension. He had no surgical history. An abdominal ultrasound was performed, which described "gallbladder in physiological distension, with regular walls and normal thickness. In the lumen, a 23 mm stone can be seen in the infundibulum. Bile ducts of normal caliber. Maintained hepatic vascular pathways. No other alterations." The patient was proposed for laparoscopic cholecystectomy in outpatient surgery, which he accepted.

Laparoscopic cholecystectomy: Pneumoperitoneum performed through an umbilical port after placement of a 10 mm umbilical trocar. Placement of a 10 mm epigastric trocar and two 5 mm right infracostal trocar ports under visualization. Identification of the gallbladder with inflammatory signs, rotated to the left of the round ligament (Fig. 1).

Placement of a 10 mm left hypochondrium trocar. The entire gallbladder, including the Calot´s triangle, is located to the left of the round ligament (Fig. 2).

Suspension of the gallbladder and visualization of the gallbladder adherent to the main bile duct. Dissection of the Calot´s triangle with release of the gallbladder from the bile duct (Fig. 3).

Isolation of the cystic duct, ligation with Hem-o-loks and section (Fig. 4). Isolation of the cystic artery, ligation with clips and section. Retrograde laparoscopic cholecystectomy procedure, without a clear dissection plane of the liver. Removal of the gallbladder with a sac. Review of hemostasis. Suture of the umbilical and epigastric aponeurosis. Closure of the skin with staples. Post-operative diagnosis: gallbladder rotated to the left of the round ligament, adherent to the bile duct with acute cholecystitis.

At the post-operative follow-up appointment, one month after the surgery, the patient was asymptomatic and the

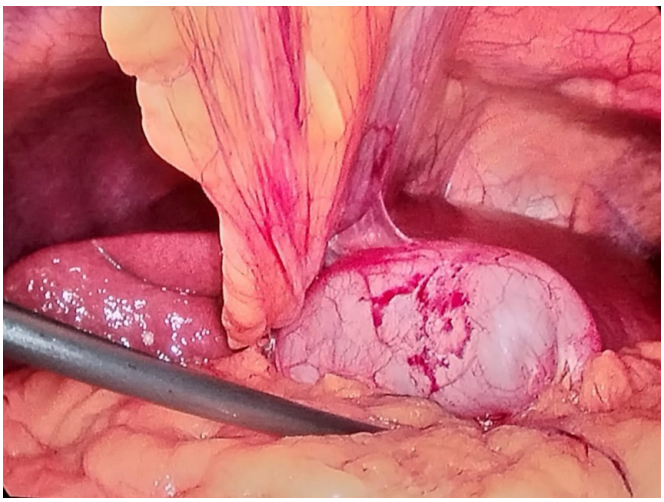

Figure 1: Gallbladder with inflammatory signs, rotated to the left of the round ligament.

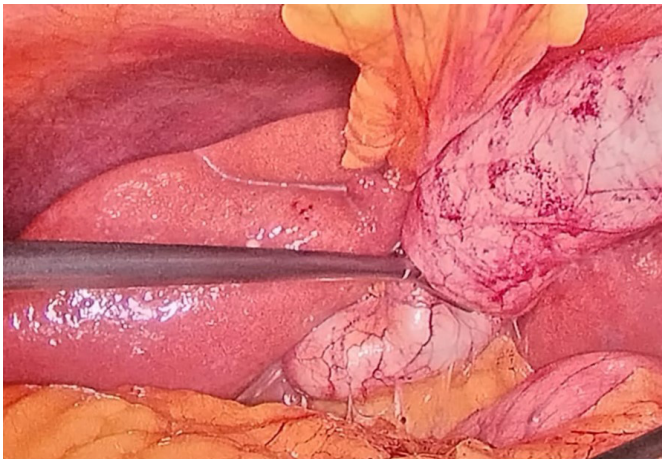

Figure 2: Entire gallbladder, including the Calot´s triangle, located to the left of the round ligament.

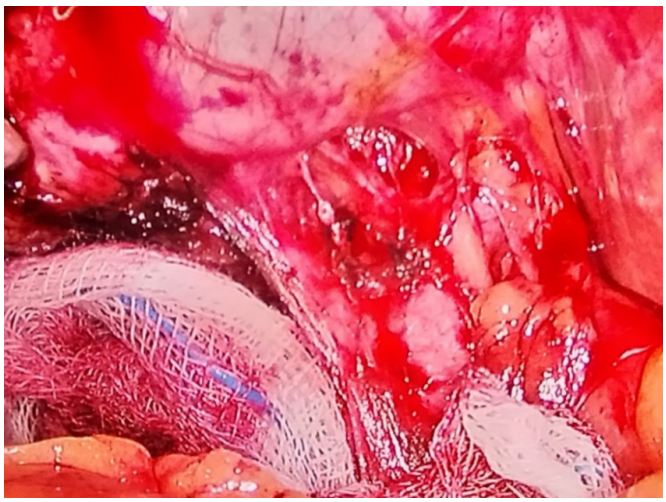

Figure 3: Calot´s triangle exposed.

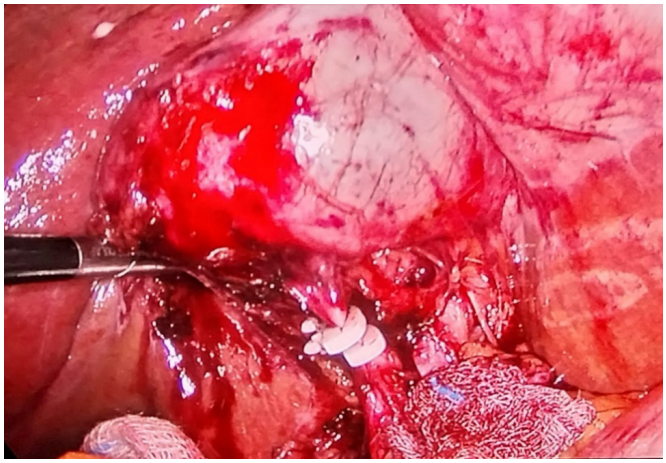

Figure 4: Isolation of the cystic duct and ligation with Hem-o-loks.

abdomen was unremarkable. Due to the gallbladder anatomic variation detected and the possibility of other associated anomalies, an abdominal computed tomography (CT) scan was ordered.

Abdominal CT scan described the liver with normal morphology and dimensions at the upper limit of normality, with a diffuse decrease in its density reflecting steatosis involvement. No focal lesions or bile duct ectasia were apparent. Cholecystectomy patient. Normal permeability and caliber of the splenoportal axis and suprahepatic vessels, as well as the large retroperitoneal vessels. No other alterations.

In summary, the patient had a left-sided gallbladder, diagnosed during an elective laparoscopic cholecystectomy, which was performed with no complications. The patient had no other associated anatomical anomalies.

DISCUSSION

Left-sided gallbladder (LSGB) remains a rare but significant anatomical variation that poses diagnostic and surgical challenges. Despite its estimated prevalence of 0.2%–1.1%, it is often overlooked preoperatively due to a non-specific clinical presentation and limitations of standard imaging.[3] As demonstrated in this case, routine ultrasonography failed to detect the anomaly, and the diagnosis was only established intraoperatively.

From a surgical standpoint, the most critical risk associated with LSGB is the potential for bile duct injury. Aberrant anatomical

relationships between the cystic duct, common bile duct, hepatic ducts, and vascular structures, such as a right hepatic artery crossing anterior to the bile duct, can increase the likelihood of iatrogenic damage.[6] This underlines the necessity of achieving the critical view of safety (CVS) before any structure is divided, especially in anomalous biliary anatomy.

Another key point in this case was the retrograde dissection approach, used after the gallbladder was found rotated and adherent to the common bile duct. Surgeons must be prepared to adapt their strategy based on intraoperative findings. In cases where visualization is compromised, additional ports, as in the placement of the left hypochondrium trocar in this case, or conversion to open surgery should be considered without hesitation.

This case also underscores the importance of postoperative imaging. Although no additional anomalies were identified on CT, the literature documents frequent associations of LSGB with segment IV atrophy and portal vein or biliary tree variations, which may have future clinical or surgical implications.[2]

To conclude, although usually encountered by chance during surgery, LSGB can be successfully and safely managed through laparoscopic cholecystectomy with the critical view of safety. This case contributes to the limited but growing body of literature on LSGB and reinforces the need for heightened surgical awareness of rare biliary anomalies. Improved understanding and early recognition of such variants can significantly enhance patient safety and surgical outcomes.

ETHICAL DISCLOSURES

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Confidentiality of Data: The authors declare that they have followed the protocols of their work center on the publication of patient data.
Patient Consent: Consent for publication was obtained.
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CONTRIBUTORSHIP STATEMENT

SG: Bibliographical search, study design, data collection, drafting of the article.
RD: Study design; critical review of the article's content.
BF: Bibliographical search and critical review of the article's content.
VC: Study design, drafting of the article, and final review of the article.
FS: Final review of the article.
All authors approved the final version to be published.

DECLARAÇÃO DE CONTRIBUIÇÃO

SG: Pesquisa bibliográfica, conceção do estudo, recolha de dados, redação do artigo.
RD: Conceção do estudo; revisão crítica do conteúdo do artigo.
BF: Pesquisa bibliográfica e revisão crítica do conteúdo do artigo.
VC: Conceção do estudo, redação do artigo e revisão final do artigo.
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