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Case Report
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An Unusual Case: Atypical Localization of the Gallbladder

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Abstract

We present a case of a rare congenital anomaly in a sixty-eight-year-old male patient scheduled for metabolic surgery, characterized by the unusual placement of the gallbladder in the left lobe of the liver. Preoperative evaluations did not reveal any gallbladder-related pathology in the patient, but during metabolic surgery, it was observed that the gallbladder was localized to the left lobe of the liver and adhered to the surrounding tissues. The case, which was considered as "Acalculous Cholecystitis," was decided to undergo cholecystectomy. The procedure progressed smoothly and was successfully completed without complications, following the criteria for safe cholecystectomy.

The biliary system is an area where anatomical variations are quite common, and a biliary surgeon must be well-versed in these variations. However, to avoid certain unwanted injuries, it is advisable to take the following technical precautions:

- Trocar entry sites can be adjusted as needed.
- Anterograde dissection can be performed.
- All anatomical structures should be clearly delineated before clipping.
- The cystic duct should be clipped from the closest point to the infundibulum.

Keywords: Congenital biliary anomaly; Gallbladder variations; Cholecystectomy

Introduction

The bile ducts begin to form during the 4th week of fetal life, starting as a budding process from the ventral wall of the foregut. A significant portion of congenital anomalies is related to changes in the original budding from the foregut and insufficiencies in the recanalization of the gallbladder and bile diverticulum [1]. The gallbladder is in the right upper quadrant of the liver, between segments 4 and 5. It consists of the fundus, body, and neck, generally measuring 7 cm to 10 cm in length and 2.5 cm in width, with a wall thickness of less than 3 mm and a volume of approximately 30 ml to 50 ml [2]. The lower surface of the gallbladder is covered by the liver's visceral peritoneum, while the upper part is not [3].

A gallbladder located on the left side without situs inversus is a rare congenital anomaly, known as a left-sided gallbladder (with a right-sided falciform ligament). This condition is described as the gallbladder being situated on the left side beneath the liver's left lobe lateral segment (segment III), next to the round ligament [4]. The incidence of this rare congenital anomaly varies between 0.04% and 1.1% [5]. This anatomical variant was first identified by Hoochstetter in 1886 [4]. In the case presented, a patient undergoing metabolic surgery was also planned for a concurrent cholecystectomy after identifying the atypically located gallbladder, which was completed laparoscopically.

Case Presentation

A 68-year-old male patient presented to our clinic for metabolic surgery. He had been diagnosed with diabetes for about four years, with uncontrolled blood sugar levels despite current treatments. Blood tests, abdominal ultrasound, and examination did not reveal any abnormalities related to the gallbladder. For the planned metabolic surgery, a Veress needle was inserted into the abdomen from the left lateral below the umbilicus for CO_2 insufflation, followed by the insertion of an optical trocar. Additional trocars were placed in the right upper quadrant in line with the axilla, at 5 and 15 mm, and in the left umbilical and epigastric regions at 12, 5, and 5 mm, respectively. Exploration revealed the gallbladder to be located in the left lobe of the liver (Figure 1).

During the metabolic surgery, a dissection of the duodenum was performed. At our clinic, cholecystectomy is routinely conducted alongside metabolic surgery involving duodenal dissection. This approach is due to the gallbladder being within the surgical field during dissection and to

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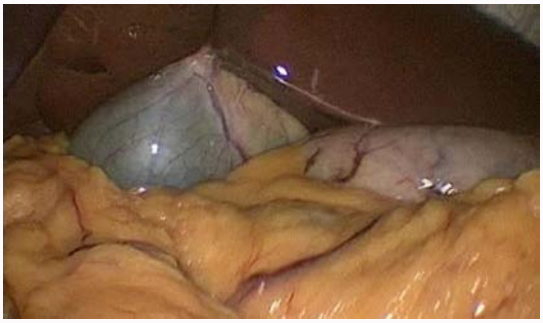

Figure 1: Gallbladder seen incidentally in the inhibitory left lobe.

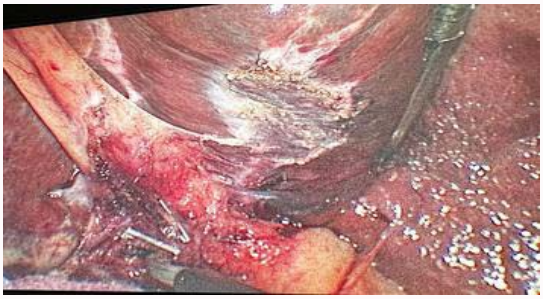

Figure 2: Gallbladder dissected from the bed of the left lobe of the liver.

mitigate complications such as choledocholithiasis and cholecystitis that might arise post-surgery. After completing the metabolic procedure, a cholecystectomy was performed. The cystic artery and duct were dissected using an antegrade approach, revealing the cystic artery's origin from the right hepatic artery and its connection to the bile duct. Following clear visualization, these were clipped and cut. The gallbladder, located in the left lobe of the liver, was then dissected, and removed from the abdominal cavity. The operation concluded with hemostasis, and the patient was discharged four days post-operatively without complications (Figure 2).

Discussion

The gallbladder located in the left lobe of the liver is a rare congenital anomaly, with fewer than 150 cases reported in the literature since the first publication in 1886 [6,7]. A retrospective study by Abawanga et al., covering cases from 1996 to 2014 across 13 countries, reported 55 cases of Left-Sided Gallbladder (LSG). This study found a female-to-male ratio of 5:1. The majority of LSG cases are incidentally discovered during intraoperative procedures [8].

Due to the limitations of routine preoperative tests in detecting a Left-Sided Gallbladder (LSG), surgeons may encounter surprises during laparoscopy. When LSG is discovered intraoperatively, it's crucial to remember the possibility of ductal and vascular anomaly variations. Surgeons must thoroughly expose the anatomy to avoid mishaps. Studies have indicated that in such scenarios, the limited visibility necessitates avoiding clipping or cutting any structure until the cystic duct and artery are definitively identified, to prevent accidental injury [9].

Aberrant gallbladders can be categorized into four types based on their location: Left-sided, intrahepatic, transverse, and retro-positioned. Among these, the gallbladder located in the left lobe of the liver without situs inversus is the rarest type [4]. No specific signs or symptoms exclusively indicate this condition before diagnosis, often leading to its discovery during surgical procedures prepared with standard examinations. Normally, the gallbladder is situated to the right of the falciform ligament, in line with the mid-hepatic vein. Anomalies in liver segmentation, development atrophy of the left medial segment, and other associated conditions such as intra-abdominal vascular anomalies, intrahepatic portal vein anomalies, and anomalies in the pancreaticobiliary system can accompany a left-sided liver lobe gallbladder [10,11]. This condition may exist alone or in conjunction with one or more of these anomalies [12-14].

The presence of a left-sided gallbladder poses significant challenges for physicians during surgeries for cholelithiasis and other diseases (pancreatic surgery, liver transplantation surgery) [12,13]. Swelling local to the area and unexpected anatomy can lead to bile duct injuries and bleeding [4]. This situation, unfamiliar to surgeons, disrupts their routine due to the abnormal anatomy, leading to technical difficulties. Anomalies of the cystic artery and bile ducts can be beyond the more commonly encountered anomalies [15]. Laparoscopic cholecystectomy and advanced laparoscopic surgical procedures are commonly performed in our clinic. In the case we examined, the anatomy was safely delineated laparoscopically. The cystic duct can open into the hepatic duct from the right, middle, or left sides. In our case, the cystic duct joined the hepatic duct from the right side. Being aware of this condition can prevent undesired injuries or allow for their perioperative repair. Being prepared for anomalies of the bile ducts and gallbladder is necessary for a safe surgical operation.

In cases of the rare left-sided gallbladder, utilizing trocar positions in various configurations, along with a surgeon's awareness of gallbladder anomalies, understanding of anatomical variations, and mastery of safe surgical techniques, can reduce the likelihood of complications during laparoscopic surgery. It's crucial, before cutting any structure during the operation, to clearly identify all anatomical structures and ensure the gallbladder is meticulously dissected from its liver bed. This approach minimizes the risk of inadvertent injury and enhances the safety of laparoscopic interventions for left-sided gallbladder conditions.

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