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TRUE LEFT-SIDED GALLBLADDER (T-LSG) AS INCIDENTAL FINDING ON LAPAROSCOPIC CHOLECYSTOMY-CASE REPORT

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Abstract

Left-sided gallbladder, located medially to the falciform ligament, between segment III and IV of the liver, has complex embryological development explained by two different concepts: one founded upon foetal migration of the gallbladder; and the other founded upon complex foetal evolution of intrahepatic anatomy. 57-year-old male was admitted for elective cholecystectomy, and, after pneumoperitoneum was established, a true left-sided gallbladder was identified.

The patient was positioned in normal position and ports were placed on typical sites. After diligent dissection, cystic artery and duct were clipped as close as possible to gallbladder and dissected. During standard dissection in laparoscopic cholecystectomy, special attention was dedicated to obtaining posterior critical view of safety, providing adequate exposition of structures of Calot's triangle.

Posterior critical view of safety in left-sided gallbladder exposes cardinal structures of hepatic hilus. Although, during laparoscopy, difficult anatomy is met and there is high probability of bile duct injury, laparoscopic cholecystectomy is the recommended procedure of choice for left-sided gallbladder.

***Key words*:** left-sided gallbladder, posterior critical view of safety**.**

Introduction

Left-sided gallbladder was first described in 1886 by Hochstetter. By definition, the left-sided gallbladder is located medially to the falciform ligament, between segment III and IV of the liver. Clear distinction should be made between true left-sided gallbladder and a gallbladder located on the left of an abnormal right-sided ligament.

Although plethora of embryological theories regarding the development of left-sided gallbladder exist, all of them can be classified into two main concepts. The first concept describes alteration in development of the gallbladder, while the second concept describes alteration in development of the central segment of the liver.

According to the first concept, there are two potential modalities for development of the left-sided gallbladder: 1. normal gallbladder migrates from the right to the left side of the liver and the cystic duct originates from the right side of the bile duct; and 2. gallbladder is formed on the left side and the cystic duct originates from the left side[1].

True left-sided gallbladder implies insertion of the cystic duct to the left side of the bile duct. The second concept is founded upon complex foetal evolution of intrahepatic anatomy.

During embryological development, when the embryo is 6 mm long, two vitelline veins, a left one and a right one, can be identified. After the point when embryo reaches 7 mm, the right vein atrophies and the left one becomes dominant. If this atrophy of the right vein does not occur, rather, the left vein undergoes the atrophy, the gallbladder assumes left position in the liver [2].

Both right and left umbilical veins have two branches, one entering the liver and the other passing laterally to the liver. Intrahepatic right umbilical vein (IRUV) is a venous conduit that connects both internal branches.

The atrophy of the right umbilical vein affects the liver parenchyma depending on the site and extent of the atrophy. If the atrophy occurs in the deeper parts towards the hilum, it results in variations of the portal vein and the biliary tract; and if the atrophy occurs at the superficial parts, it leads to atrophy of the liver segment

Case report

57-year-old male, with history of several biliary colics, was admitted at our department for elective laparoscopic cholecystectomy. Prior to the admission, ultrasonography was performed, describing chronically inflamed gallbladder with single gallstone.

The thickness of the gallbladder was normal, and there was no indication of pericystic fluid or aberrant position.

he laboratory findings before the operation showed levels of inflammatory markers and serum bilirubin within normal parameters. We used the standard position of the patient. As soon as a 12 mm Hg pneumoperitoneum was established, camera was inserted via the umbilical port. (photo 1)

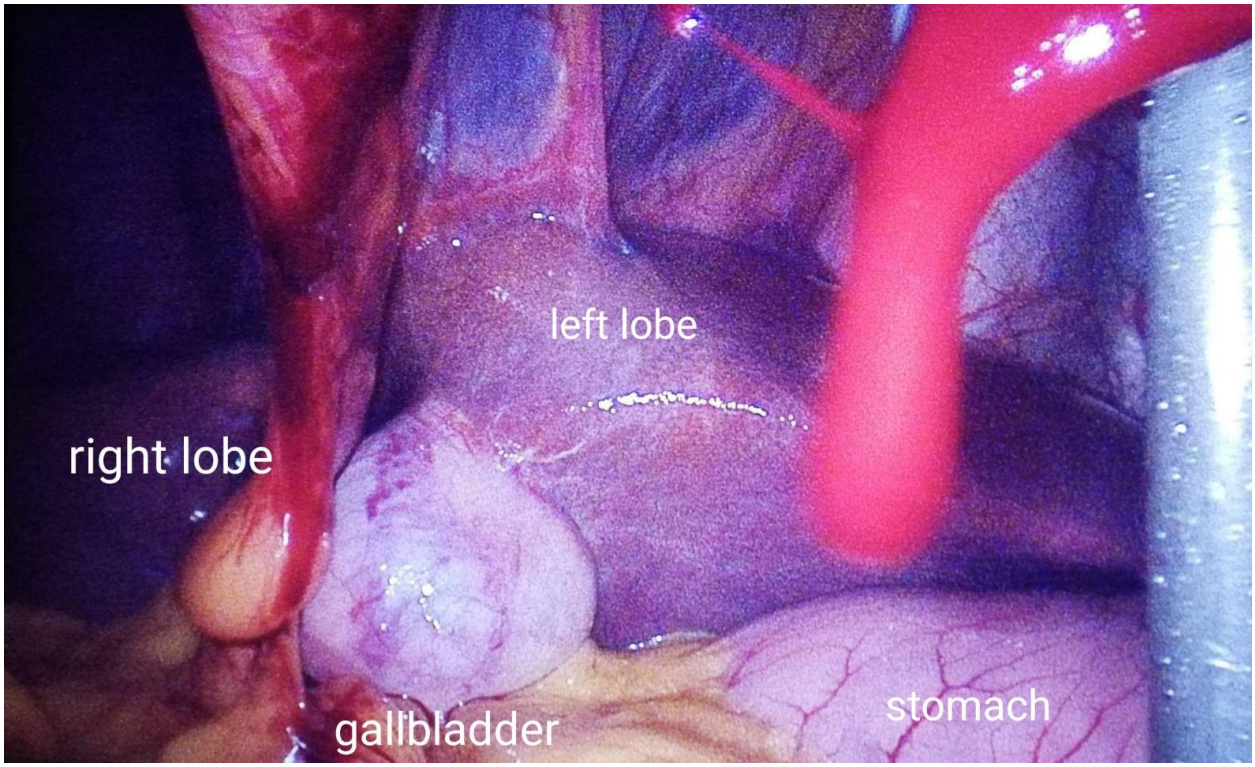

Figure 1.Left-sidded gallbladder on laparoscopy

Upon exploration, true left-sided gallbladder was identified.

The other three ports were positioned in a typical position. The dissection was conducted from the infundibulum.

The infundibulum was grasped and lateralized to the right. Diligent dissection of the peritoneum and the fatty tissue exposed the elements of the Calot's triangle.

The cystic duct originated from the left side of the bile duct. Special attention was dedicated to obtaining the posterior critical view of safety. (photo 2)

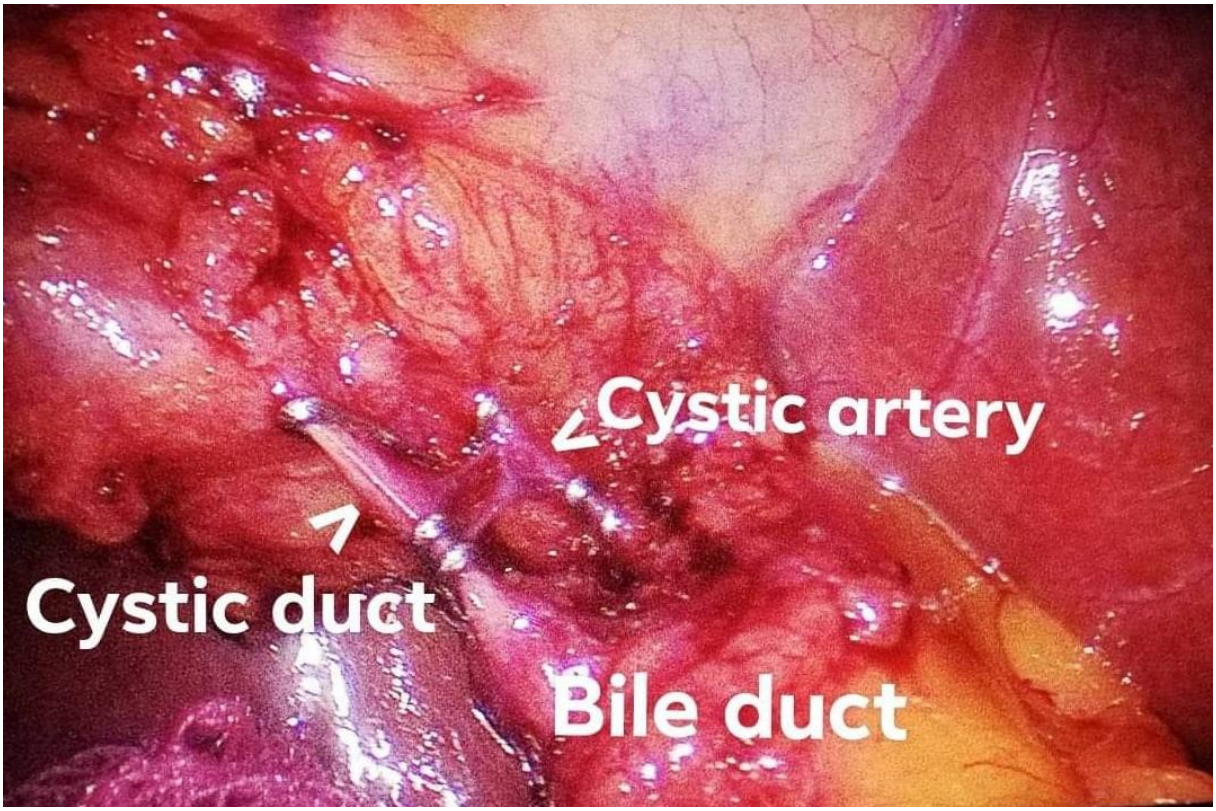

Figure 2. Elements of triangle of Calot

As soon as the elements of the Calot's triangle were identified, the cystic artery and cystic duct were clipped as close as possible to the gallbladder and dissected. The dissection from the liver bed was conducted in a typical manner with L-hook. The operating time was 60 minutes. The patient was discharged the following day.

Discussion

Laparoscopic cholecystectomy is one of the most common procedures performed worldwide. Although anomalies of the portal system, bile ducts or vascular structures are common, anomalies in the gallbladder position are very rare. Nevertheless, considering the frequency of this laparoscopic procedure, these anomalies become increasingly relevant. The main obstacle that has to be overcome comes from the specific location of the gallbladder.

During standard dissection, special attention is dedicated to obtaining posterior critical view of safety. By obtaining the critical view of safety, as a concept, the surgeon is provided with adequate exposition of the Calot's triangle structures. It is advised to proceed with clipping and dividing the structures only if adequate recognition is obtained.

The main disadvantage of laparoscopy, as a procedure, is the lack of tactile experience and the fact that the surgeon is dependent on previous experience and adequate visual exposition. When the surgeon is faced with a true left-sided gallbladder, obtaining the posterior critical view of safety exposes cardinal structures of hepatic hilus.

This fact only provides higher margin of error for iatrogenic lesion of the biliary tract. Regardless of the potential risks, laparoscopic cholecystectomy remains recommended procedure of choice in the setting of left-sided gallbladder[3].
It is very rare that the operating surgeon is aware of the left-sided gallbladder before the surgery, and this fact usually becomes evident after the inserting of the camera. There are several authors that suggest different positions of the ports in order to meet the specific anatomy[4].

The first reported left-sided gallbladder laparoscopic cholecystectomy, performed in 1993, advised anterograde approach, in order to visualize the adequate structures. Several authors suggest strong tendency to convert to open cholecystectomy, if difficult anatomy is met or there is high probability of bile duct injury[5].

The majority of reports suggest that laparoscopic cholecystectomy with standard position of the ports and standard position of the patient is adequate for safe cholecystectomy [6].

Left-sided gallbladder, per se, is asymptomatic and the diagnosis is purely incidental. The formation of gallstones follows the same pathways as in general population. The different position of the gallbladder does not change the afferent pain pathways, resulting in typical right upper quadrant pain.

Conclusion

Left-sided gallbladder, although very rare anomaly in the position of the gallbladder, with high frequency of laparoscopic cholecystectomies represents serious challenge for operating surgeon and potential basis for serious injury of the bile duct, that has to be overcome by previous experience, early recognition, and exact visual discrimination of the structures in the hepatobiliary triangle.

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