Unusual Case

Standard laparoscopic cholecystectomy for malposition of the gallbladder caused by right-sided ligamentum teres

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Abstract

Atypical localization of the gallbladder associated with right-sided ligamentum teres is a rare anomaly of the biliary system. Although the conventional nomenclature as being a left-sided gallbladder is usually used, this definition may be incomprehensive because of lacking the anatomical detail. This report describes atypical localization of the gallbladder associated with right-sided ligamentum teres and abnormal intrahepatic portal venous branching, surgically removed laparoscopically.

Key words: Cholecystectomy, ectopic gallbladder, gallbladder diseases, laparoscopic, right-sided ligamentum terese

INTRODUCTION

Atypical localization of the gallbladder (GB), as a rare anomaly of the biliary system, is defined as a GB located to the left side of the ligamentum teres (LT) without situs inversus viscerum.[1,2] Because of its localization just to the left of LT, it was usually misnamed as only a left-sided gallbladder (LSGB) without detailed anatomic examination which gives exact pathology causing this anomaly.[1-4] An association with anomalies of the biliary and portal venous systems is an important issue especially during laparoscopic cholecystectomy and hepatectomy, particularly with living donor transplantation.[1,2]

In this report, we aim to present an atypical localization of GB related to RSLT treated by standard laparoscopic cholecystectomy, and its detailed anatomic topography.

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CASE REPORT

A 31-year-old female patient was admitted to the surgical clinic because of recurrent right upper quadrant pain during the last 2 months. Clinical examination and laboratory analysis were normal. Stones in the GB were detected on abdominal ultrasonography. She was taken into the operating theatre with a diagnosis of cholelithiasis. At exploration, the GB was absent from its normal location, and it was found just left to LT [Figure 1]. It had edematous and hydropic appearance with an impaction of a calculus at the neck. With the standard localization of ports and a LT lift, it was possible to perform cholecystectomy via laparoscopically in a retrograde manner. During the operation, it was found that there was a short and wide cystic duct joining to the common bile duct on the right side, and the cystic artery with anterior and posterior branches originating normally from the right hepatic artery. She was discharged uneventfully at the first postoperative day. Pathologic examination showed chronic calculous cholecystitis.

Magnetic resonance cholangiopancreatography and angiography were performed to understand the biliary and portal venous system anomalies. This showed the first branch of the portal vein (PV) running to the right posterior segment, and then formation of the main trunk of the left and right anterior PVs [Figure 2]. The latter vein formed saccularly dilated umbilical portion of PV and finally joined to LT [Figure 3].

DISCUSSION

In the absence of situs inversus, atypical localization of GB is a rare anomaly of the biliary system, which was reported firstly by Hochstetter in 1886.[1,5] In the literature, this anomaly was reported, mostly from Japan, with an incidence of 0.1-1.2 %.[3,4,6,7] With advance of imaging techniques, atypical localization of GB associated with or without RSLT, usually accompanied by abnormal intrahepatic portal venous branching is increasingly reported.[1]

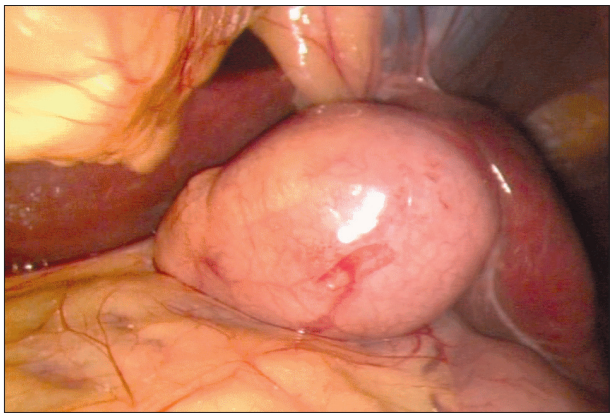

Figure 1: Intraoperative demonstration of the gallbladder located to the left side of the ligamentum teres

It is accepted that for a diagnosis of LSGB, it must be located not only to the left of LT, but also under the surface of the left liver where the main middle hepatic vein clearly runs to the right of GB, and LT itself should be originated from the left PV.[2 6]

During embryologic development, with the atrophy of RSLT in some individuals, left-sided LT becomes dominant and causes localization of the umbilical portion of PV in the left liver anatomically. Therefore, in the case of RSLT, the GB was located on its normal site but located to the left of LT and, consequently, was diagnosed according to the conventional definition as being left sided. A recent meticulous anatomic study on this anomaly has already proven both normoposition of the gallbladder and anomalous connection of the ligamentum teres to the right paramedian portal pedicle.[8] Therefore, we offer to name this anomaly as a RSLT, not as a LSGB.[1,3-5]

Angiographic examination of RSLT patients usually shows portal venous anomaly, mostly one of the trifurcation types in which PV, after the first branch running posteriorly, forms a trunk giving off the left and anterior right PVs. The right anterior PV joins to LT.[1,6] This type of anomaly is important especially during a plan of left hepatectomy in which ligation of the portal trunk resulting in lack of portal flow in three-fourth of the liver.[1,2,6,9,10] Although preoperative understanding of RSLT and associated anomalies are usually possible with detailed imaging in the case of major surgeries, it is very difficult to show

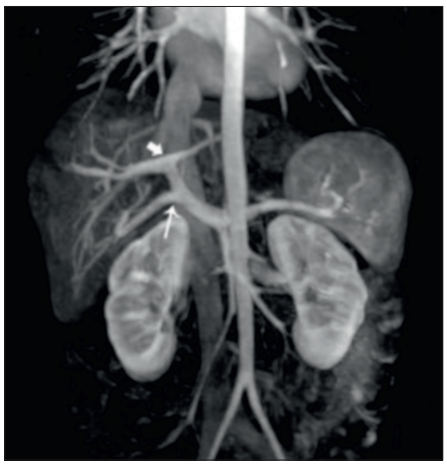

Figure 2: Coronal reformatted magnetic resonance angiography image. Main portal vein gives off the right posterior portal vein as the first branch (thin white arrow), and then continue with formation of the main trunk of the left and right anterior portal veins (thick white arrow)

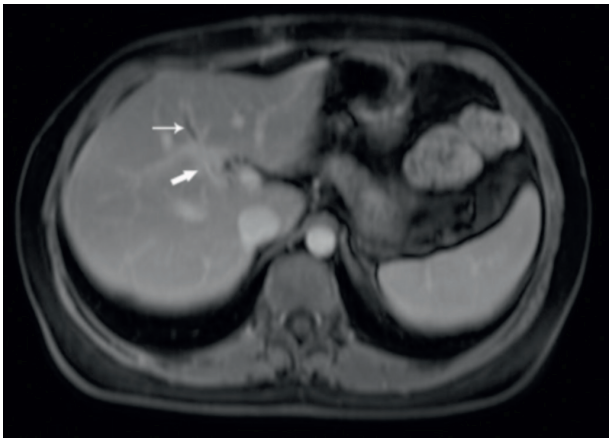

Figure 3: Contrast-enhanced axial T1W magnetic resonance image of the liver at the level of the ligamentum teres shows that saccularly dilated umbilical portion of the right anterior portal vein (thin white arrow) finally joins to the ligamentum teres (thick white arrow)

their presence by routine ultrasonography used for cholelithiasis as in our case.[3,5]

Laparoscopic cholecystectomy with standard port sites with a LT lift can be performed as in our case, but more medial positioning of the GB retracting port, and placement of the right-hand operating port to the left of the midline is suggested for laparoscopic removal of the GB in the case of RSLT.[1,10] Full dissection of Calot's triangle can enable safe completion of the operation laparoscopically. In selective cases, intraoperative cholangiography, antegrade dissection of GB or conversion to the open operation aid in the safe management of an unpredictable confluence of GB into the common bile duct.[5]

Summary

In conclusion, it is shown that the presence of LT at the right side causes GB to locate to the left but on its normal site. Therefore, it is offered to name this anomaly as RSLT. As a rare anomaly of the biliary system, it should be investigated in detail because of its association with abnormal intrahepatic portal venous branching. During surgical procedures such as laparoscopic cholecystectomy and hepatectomy, particularly with living donor transplantation, knowledge of RSLT helps to surgeon to avoid iatrogenic injuries especially to the portal venous system.

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