

Case Report

**Duct of Luschka: an anatomical variation of the biliary tree
detected during cholecystectomy***Ducto de Luschka: uma variação anatômica da árvore biliar detectada
durante a colecistectomia***Olival Cirilo Lucena da Fonseca Neto¹, Beatriz Costa Nava Martins²,
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ABSTRACT: The Luschka duct is an anatomical alteration that is not easily identified in the preoperative imaging exams. Knowledge of the anatomy and the possibility of finding this anatomical structure provides greater safety in the surgical procedure. The case described addresses an intraoperative biliary leak due to the presence of the Luschka duct during an open cholecystectomy and its management. *Objective:* To describe the case of a patient with cholelithiasis, submitted to a conventional cholecystectomy in an elective manner, in which the presence of the Luschka duct was detected intraoperatively, as well as the surgical and clinical management of the case. *Result:* The patient underwent cavitation drainage intraoperatively, as well as duct ligation. She presented good evolution in the following days, with clinical improvement, and was discharged from the hospital in good condition on the 4th postoperative day. *Discussion:* The Luschka duct is one of the most common anatomical variations of the biliary tree. The identification of this duct in the preoperative period is extremely difficult and rare, and its surgical treatment usually consists of lavage of the abdominal cavity, closure of the Luschka duct and intraoperative cholangiography to confirm that the biliary tree is intact. *Conclusion:* The importance of knowledge and surgical and clinical management of this anatomical structure is important for a good evolution of the patient.

Keywords: Luschka duct; Bile duct; Cholecystectomy.

RESUMO: O ducto de Luschka é uma alteração anatômica que não é facilmente identificada nos exames de imagens pré-operatórios. O conhecimento da anatomia e da possibilidade de encontrar essa estrutura anatômica propicia maior segurança no procedimento cirúrgico. O caso descrito aborda um vazamento biliar intraoperatório pela presença do Ducto de Luschka durante uma colecistectomia aberta e o seu manejo. *Objetivo:* Descrever o caso de uma paciente com colelitíase, submetida a uma colecistectomia convencional de forma eletiva, na qual foi detectada, no intraoperatório, a presença do ducto de Luschka, bem como foi realizado o manejo cirúrgico e clínico do caso. *Resultado:* A paciente foi submetida a drenagem cavitária no intraoperatório, bem como foi realizada a ligadura do ducto. Apresentou boa evolução nos dias seguintes, com melhora clínica, tendo alta hospitalar em boas condições no 4º DPO. *Discussão:* O ducto de Luschka é uma das variações anatômicas mais comuns da árvore biliar. A identificação desse ducto no pré-operatório é extremamente difícil e rara e seu tratamento cirúrgico usualmente consiste em lavagem de cavidade abdominal, fechamento do ducto de Luschka e colangiografia intraoperatória para confirmar que a árvore biliar está intacta. *Conclusão:* A importância do conhecimento e da condução cirúrgica e clínica dessa estrutura anatômica é importante para a boa evolução do paciente.

Palavras-chave: Ducto de Luschka; Ducto biliar; Colecistectomia.

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INTRODUCTION

The Luschka duct was first described by the German anatomist Hubert Von Luschka in 1863 as a small bile duct passing from the right lobe of the liver into the gallbladder fossa joining with the right hepatic duct or common hepatic duct¹. They are often located within the connective tissue and less frequently in the gallbladder's wall². Studies estimate the presence of this duct in 12-50% of the population³.

The presence and anatomical variations of the Luschka duct is a risk factor for surgical complications, accounting for almost 2% of complications in cholecystectomies due to significant bile leakage, usually due to duct involvement². The authors described the case of a patient with cholelithiasis, submitted to a conventional cholecystectomy in an elective manner, in which the presence of the Luschka duct was detected intraoperatively, as well as the way in which the surgical and clinical management of the case was performed.

CASE DESCRIPTION

Patient, 47 years old, female, with a history of pain in the right hypochondrium that worsens with intake of fatty food. A full abdominal ultrasound was performed on 02/04/16, which showed cholelithiasis. The patient underwent elective open cholecystectomy on 05/27/16 in a referral hospital in Recife-PE.

During the procedure, it was observed that, after the isolation of the cystic duct, the cystic artery and the dissection of the gallbladder of the hepatic bed, there was the presence of bile drainage. It was found that such leakage did not come from the cystic duct, nor was it from the hepatic duct, but from a duct coming from the right lobe of the liver.

After a thorough review of the structures of the Calot triangle (Hepatocystic⁴) due to the persistent maintenance of bile flow, a new investigation in the hepatic bed of the gallbladder was conducted. In this location, a tubular structure was found, white-brownish, measuring about 2-3mm with bile outlet. As there was no availability to perform intraoperative cholangiography, a superficial suture of the structure using the appropriate 3-0 thread was performed. This option was authorized after evidence of the path that this structure took didn't get to the hepatic hilum. The cessation of the leak occurred immediately.

It was decided to perform a cavity drainage with Jackson Pratt drain during the surgical procedure. The patient's evolution was favorable, with drainage of serobilious secretion of 45 ml of volume on the first postoperative day, with subsequent decrease in the subsequent days, and the drain was removed on the third postoperative day. The patient's hospital discharge occurred

on the 4th day in good clinical condition. The patient returned to the outpatient clinic, about 15 days after hospital discharge, without complaints. In follow-up until the 6th postoperative month, the patient continued to evolve well, without complaints and with laboratory tests of normal liver biochemistry.

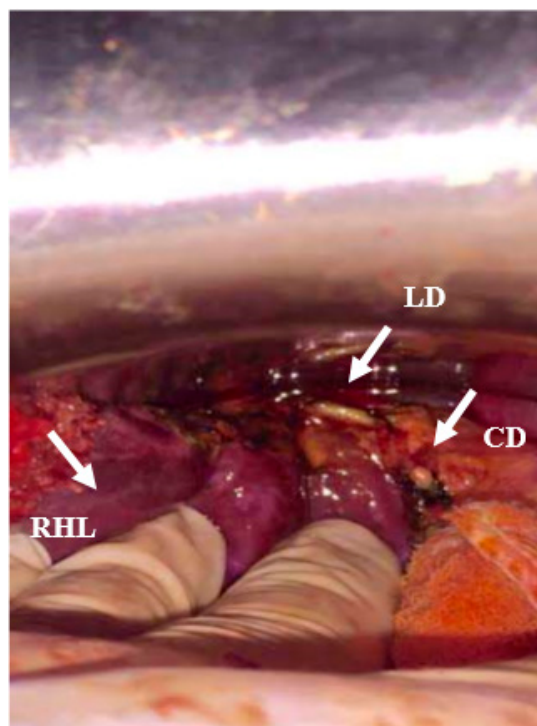


Figure 1. Intraoperative finding of Luschka duct in hepatic bed. Luschka duct (LD), right hepatic lobe (RHL), cystic duct (CD).

DISCUSSION

In cholecystectomy surgery, the understanding of the normal anatomy of the biliary tree and its anatomical variations are important. The Calot triangle, an important anatomical space in the identification, isolation, connection and section of the cystic artery and cystic duct, is formed superiorly by the lower edge of the liver, inferiorly by the cystic duct and medially by the common hepatic duct⁴.

There are numerous anatomical variations of the extrahepatic biliary tree, of which the Luschka duct is one of the most common. In 1882, the area of surgical anatomy started more intense and constant scientific studies with the advent of cholecystectomy. It is essential to highlight that the lack of knowledge about these anomalies and anatomical variations, focusing on the biliary system, can result in iatrogenic injury and duct injury with bile leakage. These lesions and bile extravasation can cause disasters to the patient in case of mismanagement, as well as absence of management. Complications such as the development of septic shock can put the patient at great risk of mortality^{3,5}.

The Luschka duct measures about 1-2 mm in

diameter and passes through the hepatic bed of the gallbladder to join the right hepatic duct or common hepatic duct⁶. The Luschka duct may be subvesicular or supravascular. It is not accompanied by an artery or vein⁷. Usually, this duct originates from the hepatic parenchyma that has undergone a process of hypertrophy³. In a series of dissections, the occurrence of the Luschka duct has been confirmed in a number of cases. The duct was found in two main places in relation to the gallbladder: in the center of the hepatic bed and also in the lateral, peritoneal reflection². The bile duct was found in 4.6% of the cases studied, none of which communicated with the gallbladder⁶.

Authors have demonstrated six cases finding the duct of Luschka intraoperatively, although examinations before surgery (cholangiography and computed tomography) did not observe this structure⁶. This confirms the randomness of the presence of this duct, as well as the great challenge and difficulty in detecting its presence in preoperative exams, once again corroborating the need for surgeons to be able to identify and correctly manage this finding intraoperatively, especially in an era of many laparoscopic surgeries².

The identification of this duct in the preoperative period is very rare, with only one case identified with the use of ultrasound prior to the procedure³. There is another report of preoperative identification with dynamic hepatobiliary scintigraphy, but they seem to be isolated cases, as well as due to the infrequent use of hepatobiliary scintigraphy in the public system, being even more complex to⁸. Generally,

its identification occurs only after hepatobiliary surgery, in which there was a complication with bile leakage, or in the perioperative period of a surgery³.

Unnoticed lesions can occur and generate bilioma or coleperitoneum in the post-operative period⁷. Ideally, intraoperative cholangiography should be used for laparoscopic cholecystectomies that present any doubt about the anatomy of the biliary tract, in an attempt to better identify variations and minimize damage to the patient³. Surgical treatment consists of lavage of the abdominal cavity, closure of the Luschka duct, and intraoperative cholangiography to confirm that the biliary tree is intact⁹. The duct may stop spontaneously draining if leakage is limited and accompanied by external drainage⁷.

Thus, the case described was in agreement with most of the findings of other scientific studies. The duct was detected only during the procedure, and the treatment chosen was that recommended in the literature, performed duct ligation, followed by simple drainage of the region, since the volume overflowed was not large, and the daily monitoring of drainage until its healing and cessation was followed.

CONCLUSION

Knowledge of anatomical variations, such as the Luschka duct, is important to avoid postoperative complications for patients undergoing cholecystectomy.

Participation of each author: *Olival Cirilo Lucena da Fonseca Neto* – Case selection, discussion, conclusion and review. *Beatriz Costa Nava Martins* – Introduction, description of the case, discussion and conclusion. *Maria das Graças Lapenda Pedrosa* – Case selection, case description and review.

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