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REVIEW

Biliary leakage from gallbladder bed after cholecystectomy: Luschka duct or hepaticocholecystic duct?

Fuite biliaire sur le lit vésiculaire après cholécystectomie : canal de Luschka ou canal cholécystohépatique ?

B. Doumenc, M. Boutros, R. Dégremont, A.F. Bouras*

Chirurgie générale et digestive, service de chirurgie générale et digestive, centre hospitalier Germon-et-Gauthier, rue Delbecque, BP 10809, 62408 Béthune cedex, France

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KEYWORDS
Luschka duct;
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Cholangiogram;
Biliary tract;
Cholecystectomy

Summary Anatomic variations in the biliary tract are common and can cause difficulties when a cholecystectomy is performed. One of the most common ones are hepaticocholecystic ducts and Luschka ducts, connecting the gallbladder or its bed to the bile ducts but distinction between these two types of ducts can be difficult. We do discuss here the differences between these anatomical variations, their origin and their clinical implications. These aberrant ducts may go unnoticed and may require further complementary procedures in case of postoperative biliary leakage. In addition to a careful surgical procedure and an examination of the cystic bed in the end of the intervention, an intraoperative cholangiography should be performed as often as possible.

MOTS CLÉS
Canal de Luschka ;
Canal cholécystohépatique ;
Fuite biliaire ;
Cholangiogramme ;
Arborisation biliaire ;
Cholécystectomie

Résumé Les variations de l'arborisation biliaire sont courantes et peuvent être source de difficultés lors de cholécystectomies. Les canaux cholécystohépatiques et les canaux de Luschka qui mettent en contact les voies biliaires et la vésicule ou son lit font partie des variations les plus souvent rencontrées, mais il est parfois difficile de faire la distinction entre ces deux types de canaux. Nous discutons ici les différences entre ces entités, leurs origines et leurs implications cliniques. Ces canaux peuvent passer inaperçus et peuvent nécessiter un geste complémentaire dans le cas de fuites biliaires postopératoires. En plus d'une intervention soigneuse et d'un examen minutieux du lit vésiculaire en fin d'intervention, une cholangiographie peropératoire doit être effectuée le plus souvent possible.

* Corresponding author.
E-mail address: afouadbouras@gmail.com (A.F. Bouras).

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Introduction

Cholecystectomy is one of the most frequent procedures in digestive surgery and can be performed either in conventional conditions or in an emergency situation. Injuries to the biliary tract can happen, even in the hands of skilled surgeons, and bile leakages in this setting can occur postoperatively, requiring a complementary management. A recent review from the French surgical association showed an increasing of the prevalence of minor bile duct injury of 0.1 to 1.7% [1]. Ducts of Luschka, also called subvesicular or supravesicular ducts and hepaticocholecystic also called cholecystohepatic ducts are rare communications between intrahepatic ducts and the gallbladder or its fossa [2,3] that can also lead to postoperative bile leakage, but confusion between these entities has always existed.

The aim of this article is to discuss the differences between these two clinical presentations and their surgical implication when a cholecystectomy is performed.

Embryology and definitions

The biliary tree develops in the 4th week of intrauterine life and all his elements are recognizable by the 5th [4]. The same embryological hypothesis is proposed to explain the origin of both Luschka duct and hepaticocholecystic ones: they would be anomalous ductal communications developing in the foetal life, which did not involute later. In the case of Luschka ducts, Kocabiyik et al. showed in human fetuses dissections that it might be an autonomic proliferation of the most distal biliary ducts formed from the pars hepatica. These biliary ducts may persist in certain zones where the liver parenchyma should regress secondarily during development [3]. Another hypothesis would also be evoked: ducts of Luschka would be formed by a failure of further hepatobiliary development at the interface that separates the liver from its envelope [3]. On the other hand, hepaticocholecystic ducts might be the result of abnormal resorption of the initially plexiform arrangement of the hepatic ducts [5]. Lastly, supernumerary bile ducts formed during the development of the liver and which fail to connect with biliary tract are supposed to become a source of polycystic disease [6].

There is some confusion in the denomination of these ducts and their description. Hubert von Luschka, a German anatomist, described in 1863 the existence of fine ducts along the gallbladder fossa between the gallbladder and the liver parenchyma, called that time ''Luschka crypts'', then more recently derived to ducts of Luschka [2,7,8]. From a modern point of view, princeps publication of this author would for an important part of it probably describe lymphatic ducts, but progressively over the years, small subvesicular bile ducts were named ducts of Luschka [8]. Their incidence would vary from 1 to 50% and this variability could be explained by different study methods used to discover them (preoperative imaging, intraoperative cholangiography, histopathologic techniques) [3,9—11]. These ducts are abnormal embryological proliferations that should have undergone involution, so that they do not drain hepatic parenchyma and do not drain into the gallbladder [3,12]. Indeed, Ko et al. showed no communication between

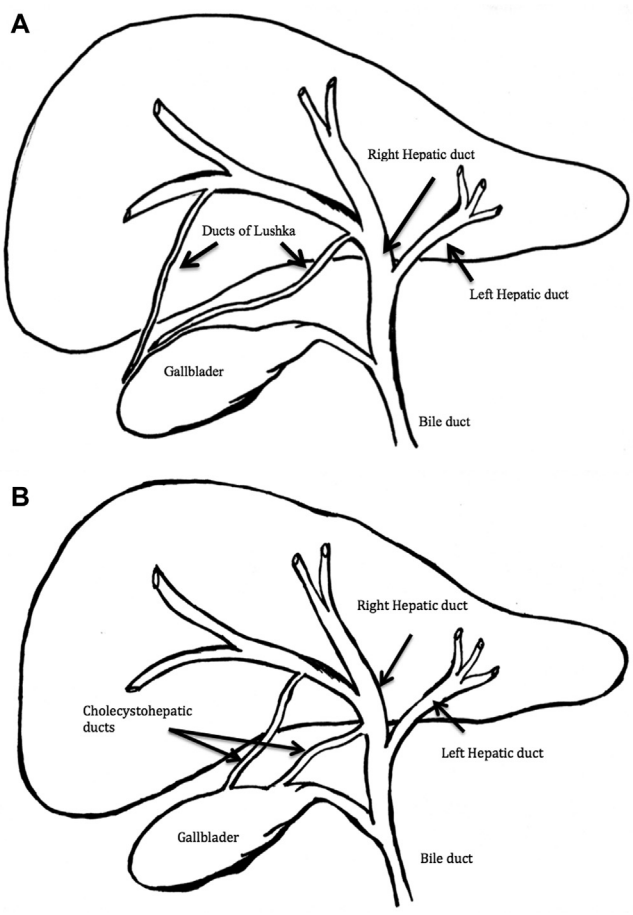

Figure 1 A. Diagram representing Luschka ducts. Note that a cholecystectomy close to the gallbladder wall can avoid the risk of injury. B. Diagram representing hepaticocholecystic ducts. In this situation an injury of these ducts cannot be avoided when a cholecystectomy is performed. A careful examination of the cystic bed in the end of the intervention is required.
A. Schémas représentant des canaux de Luschka. Noter qu'une cholécystectomie proche de la paroi vésiculaire permettrait d'éviter le risque de plaie. B. Schémas représentant des canaux cholécystohépatiques. Dans ce cas, une plaie ne peut être évitée lors d'une cholécystectomie. Un examen attentif du lit vésiculaire en fin d'intervention est donc nécessaire.

the gallbladder and the duct of Luschka during histopathological studies of hepatectomy specimen [2].

These ducts, detailed by Champetier et al., are narrow and would measure 1 to 2 mm in diameter and wouldn't be accompanied by veins or arteries, and thus would not progress into a glissonean pedicle [2,13]. These findings have been contradicted by recent studies that finally showed the presence of a vein and an artery accompanying the duct of Luschka [2]. They would come often from segments 4 and 5 and would be more frequently located in the middle of the cystic fossa or the peritoneal reflexions in the borders of the gallbladder [3,14].

Ducts of Luschka (Fig. 1A) should not be confused with hepaticocholecystic ducts, which are real variations in the biliary tract that drain into the gallbladder (Fig. 1B), with an incidence of 1—2% [2,15]. Fig. 2 shows an example of an