Case Report
Cystohepatic duct: an anatomical pitfall during laparoscopic cholecystectomy

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Abstract: The variations of biliary anatomy in the biliary system are the most inevitable factor for leading serious operative complications. Here, we reported cystohepatic duct, a rare anatomical variation with direct observation. It may help surgeons know this rare anatomical variation more intuitively.

Keywords: Cystohepatic duct, laparoscopic cholecystectomy, anatomical variation

Introduction
Laparoscopic cholecystectomy (LC) is always considered as the gold standard for cure of benign gallbladder disease. However, bile duct injuries and bile leak are increasing with the widespread adoption of LC [1, 2]. Anatomical variation is the common risk factor for bile duct injuries and always induces serious operative complications [3]. Here, we reported a rare anatomical variation which would induce serious complications during LC.

Case report
A 22-year-old woman was hospitalized with a several-year history of episodic abdominal pain in the right upper quadrant. No jaundice, vomiting, fever, or weight loss was complained. The physical examination and the results of laboratory investigations were unremarkable. Findings on abdominal ultrasonography showed a gallstone size in 1.8 mm × 13 mm in the gallbladder (Figure 1A, arrow) and a little thicker common bile duct size in 0.9 cm. Given that the patient’s request and in order to rule out the possibility of cholelithiasis, magnetic resonance imaging (MRI) was performed. Interestingly, MRI unexpectedly showed a supernumerary duct linked between liver parenchyma and gallbladder (Figure 1B, arrow), however no abnormal condition was found in the common bile duct. Given that the supernumerary duct may be a hidden trouble during LC and the patient was young, gallbladder-preserving cholecystolithotomy with laparoscope was performed. During the operation, when we checked the cystic duct after the gallstone was taken out, two abnormal openings were found (Figure 1C, arrow; Supplementary 1) around the cystic duct and bile was outflowing from them. The patient had an uneventful recovery with no complications.

Discussion
There are variations of biliary anatomy in the biliary system and those are the most inevitable factor for leading to bile duct injuries and bile leak after cholecystectomy. Accessory hepatic ducts always locate in the calot’s triangle and open in the common hepatic duct, right hepatic duct or cystic duct. The abnormal openings which were observed by us during operation open in the cystic fossa, and they have blind distal ends and do not drain any liver parenchyma [4]. Given that the aberrant openings which were observed by us were characterized by locating in the gallbladder and bile was outflowing, bile ducts of Luschka was not correct explanation.
for them too. Cystohepatic ducts were true bile ducts that drain a portion of liver parenchyma and open into the right or left hepatic ducts, cystic duct, or very rarely the gallbladder. A large series based on operative and cholangiographic findings has demonstrated cystohepatic ducts in 12 of 1410 cases (0.85%), however, only one of them communicated with the gallbladder (at its neck) [5]. Because of its small size, short course and low incidence, cystohepatic ducts communicate with the gallbladder are always ignored in imaging examination before cholecystectomy. We also had not found the variations of anatomy by abdominal ultrasonography. Fortunately, the anatomical pitfall was found by MRI and bile leakage was avoided because of gallbladder-preserving cholelithotomy. We got the direct observation of cystohepatic ducts communicate with the gallbladder for the first time. Because this extremely rare variations of biliary anatomy leads to bile leak after cholecystectomy, sufficient and carefully imaging examination around gallbladder should be performed before surgery. For the patients who suffer from gallstone and have the rare variations of biliary anatomy, surgeons must avoid bile duct injury and bile leak as much as possible. For some young patients with active request, gallbladder-preserving cholelithotomy also can be considered to perform.

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Disclosure of conflict of interest

None.
Aberrant openings in gallbladder

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References


