

Cystic Duct Draining to the Right Hepatic Duct: A Rare Anatomical Variant

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Background	The point of insertion of the cystic duct into the common hepatic duct may have frequent anatomic variations, although some of them are extremely rare.
Summary	We report the case of a 54-year-old patient admitted in our hospital for elective cholecystectomy. Intraoperative cholangiography revealed a cystic duct opening high into the right hepatic duct with no other abnormalities. Cystic duct most common anatomical variations are medial insertion, low insertion, and parallel course. However, this rare anatomic variation occurs only in 0.3 to 0.4% of patients. It is very important to diagnose preoperatively, if possible, or by intraoperative cholangiography, in order to reduce the risk of iatrogenic bile duct injuries and its associated morbidity.
Conclusion	The case described above reinforces the importance of considering all types of anatomical variations of the biliary duct system whenever performing a cholecystectomy.
Keywords	Cystic duct, biliary duct, anatomic variation

DISCLOSURE STATEMENT:

The authors have no conflicts of interest.

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Case Description

The cystic duct connects the neck of the gallbladder to the common hepatic duct (CHD) to form the common bile duct (CBD). The point of insertion usually runs halfway between the hepatic confluence and the ampulla of Vater, most commonly from its right lateral aspect.¹ Cystic duct anatomy may vary considering length, course, and insertion.² The importance of its proper recognition may help prevent complications during interventional procedures, whether percutaneous, endoscopic, or surgical. We report the case of a patient with an extremely rare anatomic variant, identified by intraoperative cholangiography during elective cholecystectomy for gallstone disease.

A 54-year-old female patient was admitted for elective laparoscopic cholecystectomy. The procedure was carried out without incidents, although intraoperative cholangiography revealed a very rare and interesting finding regarding cystic duct anatomy, in which the point of insertion took place exactly where the right posterolateral and right paramedian sector ducts joined to form the right hepatic duct (Figure 1).

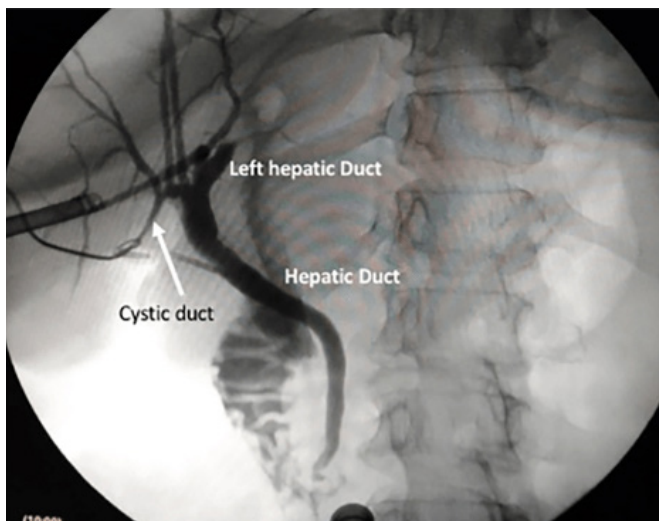


Figure 1. Intraoperative cholangiography showing cystic duct (white arrow) draining in the right hepatic duct.

Discussion

Bile duct anatomic variations are described following Huang's classification, based on the insertion of right posterior bile duct.³ According to this, five distinct anatomic types have been defined. With regard to the cystic duct, the classical anatomy draining in the right lateral aspect at the middle third of the common hepatic duct is seen in 58 to 75% of patients.⁴ Most common anatomic variations are related to the point of insertion in the extrahepatic bile duct: medial insertion, low insertion, and parallel course.⁵

Abnormal drainage of the cystic duct into the right hepatic duct, as seen in our case, is extremely rare, and is estimated to occur in 0.3 to 0.4% of patients.⁶ Even more infrequent is the presence of a right posterolateral duct opening in the cystic duct (Huang's A5 type of biliary tree variation), an exceedingly rare anatomic variant that was also recently reported.⁷

At our institution, we systematically achieved Strasberg's critical view and performed intraoperative cholangiography whenever possible to assess biliary anatomy and detect unsuspected choledochal gallstones. Although anatomic variations can be sometimes detected preoperatively by different imaging modalities such as ultrasound, computed tomography, magnetic resonance cholangiography, or even endoscopic retrograde cholangiopancreatography,⁸ not all of these might be indicated or even available before surgery. This is not unusual when there is no suspicion of bile duct gallstones, whether by clinical findings, laboratory tests, or even imageology, just as we stated in the case of our patient. In such cases, the only way to correctly assess bile duct anatomy and its variations is to perform intraoperative cholangiography.

While some anatomic variations of the biliary tract may not be clinically relevant, it is very important to diagnose the presence of a high union of the cystic duct into the common hepatic duct, the right hepatic duct, or the intrahepatic bile ducts, since this could increase the risk of iatrogenic injuries when not properly recognized.

Conclusion

Even though some anatomic variations of the biliary tract may not be clinically relevant, it is very important to diagnose the presence of a high union of the cystic duct into the common hepatic duct, the right hepatic duct, or the intrahepatic bile ducts, since this could increase the risk of iatrogenic injuries when not properly recognized.

Lessons Learned

The case described above reinforces the importance of considering all types of anatomical variations of the biliary duct system whenever performing a cholecystectomy. If surgeons are aware of these possible findings, the risk of iatrogenic bile duct injuries will be minimized.

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