

Appendix 6: Changes in the management of common bile duct stones

Routine intraoperative cholangiography

Should all patients, including those with a low likelihood of having a common bile duct stone, have routine intraoperative cholangiography? The arguments for the routine use of intraoperative cholangiography hinge around two issues. The first is the risk for injury of the common bile duct. On a retrospective nationwide cohort analysis of 1,570,361 Medicare patients undergoing cholecystectomy, there were 7,911 common bile duct injuries; 0.39% in those undergoing intraoperative cholangiography vs. 0.58% in those not having intraoperative cholangiography (adjusted RR 1.71; 95%CI, 1.38 to 2.28)¹. The authors suggest that the use of intraoperative cholangiography may have prevented bile duct injury or allowed its earlier diagnosis¹. However, a recent cohort study of 31,838 patients from 114 Swiss institutions found the incidence of injury of the common bile duct to be 0.3% whether intraoperative cholangiography was used or not².

The second issue relates to the need to detect each and every common bile duct stone at laparoscopic cholecystectomy in order to minimize retained symptomatic stones. Most authors agree that the increased morbidity and cost of routine intraoperative cholangiography to avoid a single symptomatic residual stone in the common bile duct is difficult to justify⁵. Based on modern series of thousands of unselected patients undergoing laparoscopic cholecystectomy, and followed over many years, the incidence of *asymptomatic* retained common bile duct stones peaks at 4%, with only 15% of these patients (i.e., 0.6%) *ever* becoming *symptomatic*⁵. It has been suggested that in order to detect a single stone in the common bile duct causing symptoms in a patient with no suspicion of these stones prior to laparoscopic cholecystectomy, one would need to perform 167 intraoperative cholangiograms⁵. Much of this argument relates to the concept of the “silent common bile duct stone” which we have discussed in the main article.

Routine imaging alternatives to intraoperative cholangiography

A randomized controlled trial compared 312 patients with uncomplicated gallstone disease undergoing laparoscopic cholecystectomy who either received preoperative imaging or no imaging. Routine CT cholangiography or magnetic resonance cholangiopancreatography prior to laparoscopic cholecystectomy did not result in a reduction in the incidence of symptomatic common bile duct stones within the first year post operatively⁶. It is also widely agreed that routine ERCP prior to laparoscopic cholecystectomy is unwarranted as it carries too great a risk of unjustified complications.

Cholecystectomy after endoscopic sphincterotomy and common bile duct stone removal

Endoscopic sphincterotomy at ERCP is often used upon initial presentation in patients with common bile duct stones. The question arises as to whether a cholecystectomy should be performed afterward, especially if the patient is a poor surgical candidate. A meta-analysis⁷ based on five randomized trials with 662 patients compared a wait-and-see policy to prophylactic cholecystectomy after clearance of common bile duct stones with endoscopic sphincterotomy. It showed that the wait-and-see group exhibited a 78% increased risk of mortality, especially in those at high surgical risk, higher rates of recurrent biliary pain, jaundice or cholangitis, and repeat ERCP. The benefit of subsequent cholecystectomy was especially noted with laparoscopic cholecystectomy. It is therefore now recommended that any patient post-endoscopic sphincterotomy with a

gallbladder left *in situ* be offered cholecystectomy, unless they have overwhelming contraindications to surgery.⁸

Gallstone pancreatitis

A discussion of the management of gallstone pancreatitis can be found in the main article (available at www.cmaj.ca/lookup/doi/10.1503/cmaj.110896).

References

1. Flum DR, Dellinger EP, Cheadle A, Chan L, Koepsell T. Intraoperative cholangiography and risk of common bile duct injury during cholecystectomy. *JAMA* 2003;289:1639-44.
2. Giger U, Ouaiissi M, Schmitz SF, Krahenbuhl S, Krahenbuhl L. Bile duct injury and use of cholangiography during laparoscopic cholecystectomy. *Br J Surg* 2011;98:391-6.
3. Tranter SE, Thompson MH. A prospective single-blinded controlled study comparing laparoscopic ultrasound of the common bile duct with operative cholangiography. *SurgEndosc* 2003;17:216-9.
4. Snow LL, Weinstein LS, Hannon JK, Lane DR. Evaluation of operative cholangiography in 2043 patients undergoing laparoscopic cholecystectomy: a case for the selective operative cholangiogram. *SurgEndosc* 2001;15:14-20.
5. Metcalfe MS, Ong T, Bruening MH, Iswariah H, Wemyss-Holden SA, Maddern GJ. Is laparoscopic intraoperative cholangiogram a matter of routine? *AmJSurg* 2004;187:475-81.
6. Jarhult J. Is preoperative evaluation of the biliary tree necessary in uncomplicated gallstone disease? Results of a randomized trial. *ScandJSurg* 2005;94:31-3.
7. McAlister VC, Davenport E, Renouf E. Cholecystectomy deferral in patients with endoscopic sphincterotomy. *CochraneDatabaseSystRev* 2007:CD006233.
8. Williams EJ, Green J, Beckingham I, Parks R, Martin D, Lombard M. Guidelines on the management of common bile duct stones (CBDS). *Gut* 2008;57:1004-21.