Intraoperative cholangiography is still indicated after preoperative endoscopic cholangiography for gallstone disease

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Received: 31 July 2001/Accepted: 13 November 2001/Online publication: 8 February 2002

Abstract

Background: Intraoperative cholangiography (IOC) is frequently omitted in patients undergoing laparoscopic cholecystectomy (LC) if they have had successful preoperative endoscopic retrograde cholangiography (ERC).

Methods: A prospectively maintained divisional laparoscopic cholecystectomy database was searched from 1991 to 1997 for patients who had IOC after preoperative ERC. The presence of recurrent or residual common duct stones seen on IOC and their impact on subsequent management were evaluated.

Results: We identified a group of 127 patients who underwent preoperative ERC. Thirty-one patients (31/127, or 24%) went on to receive an IOC during cholecystectomy. In 15 patients whose preoperative ERC was reported normal, five (33%) had an abnormal IOC. In 16 patients whose ERC was reported as having cleared the duct, eight (50%) had an IOC abnormality. Eight of these 31 patients required a further procedure to clear the duct.

Conclusion: Retained or recurrent common duct stones at cholecystectomy following diagnostic or therapeutic ERC were more common than expected. Therefore, IOC is recommended during LC regardless of the findings yielded by the preoperative ERC.

Key words: Cholangiography — Choledocholithiasis — Gallbladder — Laparoscopic cholecystectomy — Endoscopic retrograde cholangiography (ERC) — Intraoperative cholangiography (IOC)

There is evidence that single-stage clearance of the common duct at the time of laparoscopic cholecystectomy (LC) in fit patients is preferable to two-stage clearance by preoperative endoscopic retrograde cholangiography (ERC) followed some time later by LC [6, 8]. The combination of the low yield and perceived risk of preoperative ERC has led to a major reduction in its use. Yet some authors still consider ERC to be the method of choice when stones are suspected preoperatively [1, 9]. So although it is less commonly practiced than in the early days of LC, ERC is still performed in ≤5% of patients referred for cholecystectomy. Surgeons can now perform intraoperative cholangiography (IOC) during LC with >95% success rates, yet many surgeons do not perform this study routinely. Furthermore, it is tempting to believe that if the duct has been shown to be clear by preoperative ERC, there is little point to cholangiography during LC. However, solid evidence for this view is lacking.

When our database was initiated in 1991, IOC was performed during LC on a strictly selective basis. If the patient’s duct was reported to be clear on prior ERC, IOC was not deemed necessary. In 1993, we began performing IOC more liberally and were surprised by the frequency of retained or recurrent stones in patients who had undergone preoperative ERC, even when it was administered by experienced endoscopists. We therefore decided to track the incidence of this occurrence in subsequent patients.

Methods

A prospective database of patients undergoing LC maintained since 1991 by two of US (M.E., B.S.) was used to record the indications for surgery, the results of the preoperative ERC (if performed), the results of the IOC (if performed), the overall surgical outcome, and the need for subsequent duct clearance procedures, including laparoscopic exploration of the common bile duct (LCBDE) and postoperative ERC.
All patients who had undergone preoperative ERC were extracted from the database and divided into three groups based on the result of the ERC (see Fig. 1): those who had a normal duct that was free of stones (a diagnostic study, ERC positive); those in whom stones had been cleared successfully (a therapeutic study, ERC positive); and those in whom ERC had failed to cannulate or clear the duct. From the first two groups, totaling 116 patients, 85 (73%) had undergone laparoscopic cholecystectomy without IOC and were not evaluated for the purposes of this report. In the balance of the patients, IOC was performed using 25% sodium diatrizoate (Hypaque) and digital real-time fluoroscopy with still-image and videotape documentation. Contrast is used in 1:1 dilution because a less dense solution is less likely to conceal the mobile densities that it surrounds in the duct. All 11 patients in the third group whose ERC had failed later underwent laparoscopic common duct clearance or drainage and were therefore also excluded.

When duct stones were found on IOC, the type of LCBDE performed depended on the stone size, the diameter of the cystic duct, the presence of a sphincterotomy, or the patency of the papilla.

Results

In this series, preoperative ERC reached a peak in 1992 of 10.7% of all patients referred for cholecystectomy, falling to 2% in 1997. We accumulated 1866 patients in the database who underwent a laparoscopic biliary procedure between 1991 and 1997; 127 of them had undergone preoperative ERC. Thirty-one of these 127 patients (24%) had undergone both successful preoperative ERC and IOC. In 22, the IOC had been performed on a routine basis, regardless of the result of the ERC or the presence of intraoperative indications of choledocholithiasis (e.g., cystic duct stones, common duct dilatation). In nine patients, intraoperative indications led the surgeon to perform IOC.

Of the 31 patients, one-third (five of 15) who had a preoperative ERC that was reported as normal had an abnormal IOC. Despite the results of the postoperative ERC, three of these five cases were considered significant enough to warrant LCBDE, two of which required choledochotomy. An attempt to clear the duct transcystically in the third case, was unsuccessful, so the patient underwent repeat ERC and sphincterotomy. In the remaining two cases, the stones were thought to be small enough to pass spontaneously, so no exploration or subsequent ERC was performed.

One-half of the patients (eight of 16) whose duct had reportedly been cleared by preoperative ERC, usually with sphincterotomy, had an abnormal IOC. LCBDE was attempted in five cases and was successful in three cases (Fig. 2). Two of these five were converted to laparotomy, each because of difficulty with an impacted ampullary stone. In the first conversion, the cystic duct entered the common duct low on the left side. Cholangioscopic visualization of the lower duct was not possible, transduodenal sphincteroplasty was necessary to resolve the problem. In the second conversion (in a patient who had undergone endoscopic sphincterotomy), after antegrade disimpaction of the stone through the ampulla at laparoscopy, there was concern that the common duct might have been perforated. The patient was opened, a Kocher maneuver was performed, and methylene blue dye was injected into the duct, confirming the absence of extravasation from the lower duct. Postoperative ERC may have been a preferable way to manage this impacted stone because the papilla was known to be accessible. Three patients had tiny opacities that we believed would pass spontaneously. Two of these three patients had undergone endoscopic sphincterotomy.

Thus, eight of 31 cholangiograms (26%) identified clinically significant common duct stones, necessitating further efforts at duct clearance.

In addition to these 31 patients, there was a third group of 11 patients (11/127, or 9%) in whom at preoperative ERC the common duct had not been cannulated or had not been cleared of stones. One of these...