Same-day laparoscopic cholecystectomy and ERCP for choledocholithiasis

The introduction of laparoscopic cholecystectomy (LC) around 1990 changed the ERCP landscape almost instantly. Like the giant asteroid that doomed the dinosaurs 65.5 million years ago, the arrival of LC was an extinction level event for extracorporeal shock wave lithotripsy (ESWL), which had caught the public’s imagination as a way to avoid major abdominal surgery. With the widespread adoption of LC, ESWL for gallstones became obsolete almost overnight. Suddenly, the demand was for ERCP to look for and, if necessary, remove common bile duct stones (CBDS) before LC. Unfortunately, there was also a significant demand for endoscopic cholangiography to evaluate and treat biliary leaks and injuries. The price to be paid for the surgical learning curve in LC was a rash of bile duct injuries and transections that kept specialist biliary surgeons and malpractice lawyers busy for years. Over time, the technology and technique of LC matured to a point at which injuries and leaks became infrequent, so that the principal indication for ERCP became the hunt for CBDS. In the early days of LC, there was a determined effort to establish laparoscopic bile duct exploration (LBDE) as an alternative to ERCP. This was fueled in large part by the concern of surgeons that leaving CBDS for endoscopists to deal with was a gamble, because ERCP for stone removal might fail and require a second open surgical procedure. Worse still, the failed ERCP might be complicated by acute pancreatitis, bleeding, or perforation. Because many bile duct stones are small (5 mm or less) and occur in nondilated ducts, LBDE can be technically demanding and sometimes fails, although in experienced hands the results equal those of ERCP. Without doubt it adds time to the standard LC procedure. The majority of surgeons performing LC in the United States have not embraced LBDE and prefer to leave these cases to endoscopists, who are usually eager to perform ERCP. To address concerns about failed ERCPs, in nonurgent cases these procedures are often done days to weeks in advance of LC, so that a tertiary center ERCP referral can be made for another attempt if necessary. An ERCP endoscopist who can cannulate the bile duct 95% of the time or more, and complete stone removal with low morbidity is an invaluable asset to any abdominal surgeon.

How do we know that a patient requiring cholecystectomy has CBDS? Numerous algorithms have been developed to predict the presence or absence of biliary calculi, typically based on bile duct diameter by imaging and the presence or absence of deranged liver enzymes during attacks of biliary colic or acute pancreatitis. Transabdominal US is a noninvasive, cheap, and usually reliable way to image the extrahepatic bile duct in a search for stones. EUS is even more sensitive and specific. CT and MR cholangiopancreatography (MRCP) perform best for biliary stones 5 mm or larger in diameter.

In this issue of Gastrointestinal Endoscopy, Mallick et al5 from the University of Minnesota present a retrospective cohort study of patients undergoing ERCP and LC between April 2011 and August 2014. Being retroactive, it has distinct limitations, but it also raises plenty of issues. Thirty-three patients underwent both procedures (LC followed by ERCP) in a single session (ie, under 1 anesthetic session, on the same operating/floroscopy table), and 80 control patients, chosen from a pool of 186, had 2 separate procedures performed within a 30-day period. The authors conclude that “single-session ERCP and LC is safe, effective, and economically viable, and reduces hospital stay when compared with performing ERCP and LC during separate anesthesias.” Bile duct clearance was achieved in all patients in the same-session cohort. The 2 groups did not differ in terms of total procedure time (142 ± 64 minutes vs 142 ± 58 minutes), anesthesia duration (251 ± 64 minutes vs 225 ± 69 minutes), or overall cost ($49,300 ± $24,500 vs $42,300 ± $23,200). Hospitalization was significantly longer in the separate-session group (6.2 ± 3.3 days vs 4.8 ± 2.6 days), however. The patients were all over 16 years old. Those with
Roux-en-Y gastric bypass, those having ERCP for clarification of altered biliary anatomy or treatment of postoperative bile leak, and those with a prior sphincterotomy or suspicion of pathologic condition other than CBDS (such as malignancy) were excluded. The indication for ERCP in this population was CBDS identified by transabdominal US or CT scan “combined with strong clinical suspicion,” or, adjunctively, by MRI (MRCP), EUS, or intraoperative cholangiography (IOC). For the same-session group, LC was performed first “to avoid limitation in visualization due to endoscopic insufflation.” If an IOC was performed and stones were identified, LC was completed without passing a guidewire antegrade through the cystic duct and CBD, with a single exception (prior failed cannulation resulting from papilla hidden in a diverticulum).

ERCP was performed on the same fluoroscopy table as the just-completed LC, without transporting the patient to another suite and generally without repositioning to the prone position. Carbon dioxide insufflation was used, as was C-arm fluoroscopy. Prophylactic pancreatic duct (PD) stents were placed before biliary sphincterotomy if there was significant guidewire passage or instrumentation of the PD. The biliary stones were removed after performance of a standard biliary sphincterotomy, often followed by balloon dilation up to the size of the duct by use of 6-mm to 12-mm dilating balloons. When there was concern about residual stones or significant postprocedure edema, a biliary stent was left in place. No cholangiography or intraductal lithotripsy was performed during the same session as LC. ERCP was successful for bile duct cannulation and stone clearance in 100% and 98% of cases in the single-session and separate-session cohorts, respectively. Definite stones, rather than just sludge, were found in 28 of 33 patients in the single-session group but in only 60 of 80 the separate-session patients. Five ERCPs in the latter group were negative for stones or sludge. In 73 of the 80 control patients having separate-session procedures, ERCP was done before LC. It is unclear what, if any, additional imaging was performed before ERCP to confirm the continued presence of CBDS before LC. Twenty-four of the 33 patients in the single-session group underwent ERCP in the supine position.

Post-ERCP pancreatitis, bleeding, or perforation was not seen in either group, and there were no deaths. Two patients in the separate-session group underwent conversion from LC to open cholecystectomy (none in the single-session group). Two patients had postprocedure ileus and 4 had postoperative infection in the separate-session group (0 and 2 cases, respectively, in the same-session group).

The authors comment that “IOC was not routinely used to identify patients for single-session procedures.” In response to reviewers’ queries, they responded that “IOC was not frequently performed in our patients” and opined that “this seems related in part to provider preference and increased duration of procedure and some element of technical failure when used by surgeons who do not perform IOC routinely.” It is surprising to us that tertiary-center surgeons eschew IOC when it offers a way to identify the presence or absence of CBDS and therefore the need for ERCP to remove them. The authors added, “At our institution, the decision to proceed with intraoperative ERCP had often been made prior to the procedure with the use of high-fidelity imaging modalities.” These imaging modalities—and “strong clinical suspicion”—are clearly not infallible, because 15% and 25% of the patients in the same-session and separate-session groups, respectively, did not have stones at ERCP, but rather biliary sludge. Whether this sludge was a substantial plug of material or simply a few flecks of grit was not discussed. The authors responded to another reviewer query that “IOC itself, although a useful examination, can carry a false-positive rate of up to 60%.” Quite a damning statistic! However, they continued “we agree with the reviewer that IOC can be a very (useful) study to reduce rates of unnecessary procedures with negative studies.” Therefore, the authors dismissed IOC, which their surgeons are disinclined to perform anyway, and relied on other tests with supposedly higher pretest probability for CBDS for their decision making. Or perhaps the surgeons—and not the endoscopists—were making the decisions about the need for ERCP? The rates of ERCP adverse event were commendably low in the authors’ experienced hands, but was every effort made to avoid unnecessary ERCP? Did the authors consider visualizing the bile duct with EUS immediately before committing to ERCP? Only 18% of the same-day patients, and 24% of the separate-day ones, underwent EUS. Spontaneous discharge of biliary stones into the duodenum over time is expected, resulting in fewer calculi recovered over time from the index event (eg, biliary colic, acute pancreatitis). So the higher yield of CBDS in the authors’ same-session procedures is no surprise. Given that most of the stones found in this study were small, we were surprised by the frequent use of balloon dilation of the sphincterotomy site (45% and 65% of the same-session and separate-session cases, respectively) and liberal placement of biliary stents to guarantee drainage (one third of the same-session patients and two thirds of the separate-day patients).

What can we learn from this retrospective study? Same-day LC and ERCP can be done with the patient during 1 anesthetic session safely and effectively in suitably equipped centers by experienced endoscopists. It has been shown previously that ERCP can be done before rather than after LC, with similar benefit. CO₂ instead of air insufflation for ERCP addresses problems with bowel distension. Patients can be positioned as needed for ERCP and LC while intubated; the endoscopist does not have to “make do” with the supine position for ERCP. IOCs were generally not done in favor of ERCP. Transcystic guide wires were rarely placed because cannulation failure was
not expected in this specialist center. Separate-session procedures (almost always ERCP followed by LC) failed in 5 cases to identify either sludge or stones, suggesting the need for repeated imaging before pre-LC ERCP.

We commend the investigators for their impressive efforts. However, we would like to see this study repeated in a prospective fashion to eliminate the inevitable biases. The combination of LC and ERCP has distinct benefits, especially for patients with major comorbidities, if the logistics can be addressed. IOC—and intraductal ultrasound—should not be dismissed so casually as aids to determine the need for ERCP, and, for those less skilled at biliary cannulation, the option for transcystic guidewire placement through the papilla for intraoperative rendezvous\(^7\) should be in every LC surgeon’s toolbox.

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Abbreviations: CBDS, Common bile duct stones; CO\(_2\), carbon dioxide; CT, computed tomography; ERCP, endoscopic retrograde cholangiopancreatography; EUS, endoscopic ultrasound; ESWL, extracorporeal shock wave lithotripsy; IOC, intraoperative cholangiography; LBDE, laparoscopic bile duct exploration; LC, laparoscopic cholecystectomy; MRCP, magnetic resonance cholangiopancreatography; MRI, magnetic resonance imaging; PD, pancreatic duct; TUS, transabdominal ultrasound.

**REFERENCES**


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