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The best approach to treat concomitant gallstones and common bile duct stones. Is ERCP still needed?

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Common bile duct stones (CBDS), also called choledocholithiasis, and gallstones (GS) or cholecystolithiasis coexist in about 15% of patients. Nowadays, a majority of surgeons prefer having a clean common bile duct (CBD) before proceeding to laparoscopic cholecystectomy (LC). Thus, a lot of scores to rule out CBDS in the presence of GS have been developed. The easiest way to confirm or exclude CBDS is to perform a magnetic resonance cholangiopancreatography (MRCP) scan provided the patient has no contraindications such as a pacemaker. When CBDS are present, an ERCP (endoscopic retrograde cholangiopancreatography) procedure is usually performed to remove choledocholithiasis.

ERCP was initially developed in 1974 to extract CBDS in patients without gallbladder after cholecystectomy (1,2). This represented a major breakthrough since newly developed CBDS after gallbladder removal required no repeat surgery to be extracted. In this older era prior to LC patients with concomitant CBDS and GS were cured in a single surgical procedure. At the time gallbladders were removed in “an open manner”, that is, with a large abdominal incision, which provided a good surgical field allowing to remove the gallblader with its stones, and to perform an intraoperative cholangiogram. When CBDS were present, the CBD was opened and choledocholithiasis removed. In addition, T-tubes, also called “Kehr tubes” in some countries, were inserted to seal the CBD incision and to perform new cholangiograms as well as biliary washouts to complete stone clearance.
With the advent of LC surgeons lost their “surgical field” and “surgical skills” to open and explore the CBD. Now, ERCP remained nearly the only procedure available for CBDS removal.

In this issue of The Spanish Journal of Gastroenterology (Revista Española de Enfermedades Digestivas) a new aspect is shown in the “race” between surgeons and gastroenterologists to deal with CBDS. Our surgical colleagues have learnt to work within the CBD during a LC procedure. The term designed for this “choledochal job” is “exploration”. Therefore, laparoscopic common bile duct exploration (LCBDE) refers primarily to the ability to remove CBDS laparoscopically.

Zhou et al. (3) compared the single-stage procedure to remove both CBDS and GS during LC with the two-stage procedure involving ERCP for CBDS extraction followed by LC for gallbladder removal.

Before delving deeper into the scientific aspects of this article, such as its methods or statistical analysis, an obvious bias may be seen just by looking at the authors’ affiliations. The first four authors are surgeons, and the fifth one is a gastroenterologist. As was to be expected, no good times for ERCP here! And these same authors also recognize that their results might be skewed when they write “As a surgical department has been involved in the study, a certain bias may have occurred in favor of LCBDE” (1). Now let’s analyze the study.

One hundred patients older than 80 years were divided into two groups –54 underwent LCBDE, therefore a single-stage procedure to remove both CBDS and the gallbladder in just one operation. The remaining 46 patients had first an ERCP under conscious sedation with midazolam and pethidine, and on the next day underwent LC. Results were worse in the ERCP-LC group as compared with the LCBDE arm of the study. That is, 89% vs 100% for complete CBDS clearance, 10% vs 0% for procedural complications, and 23.9% vs 3.7% for long-term complications. However, ERCP-LC was superior to LCBDE in avoiding post-operative bile leaks (0% vs 11.1%).

Taking these results into account, it appears that ERCP adds failures and complications to LC, but then offers protection against bile leaks after surgery. Interestingly, LCBDE leaks resolved spontaneously without any special intervention. ERCP is usually the first-choice procedure for bile leak management after LC (4).
ERCP defends itself despite its associated difficulties and adverse events. ERCP remains the least invasive way to drain the CBD. In the study by Zhou et al. (1) a great number of ERCP complications occurred due to sedation, which is a prerequisite for the procedure but not the technique itself. Whether the duodenal perforation that caused one patient to die was secondary to biliary sphincterotomy for CBDS extraction or to attempts at deep CBD cannulation is not reported. Furthermore, biliary sphincterotomy was the only method employed for stone extraction. It is now well known that biliary sphincterotomy dilation increases success rate for complete stone removal (5). In addition, the higher rate of recurrent choledocholithiasis in the ERCP-LC group may also be attributable to incomplete CBDS clearance because of absent sphincterotomy dilation (Fig. 1). Zhou et al. (1) do not report stone size. Larger diameter CBDS are difficult to extract by ERCP, a difficulty that presumably occurs during LCBDE as well. In the study we are discussing stones, in the single-stage procedure, were removed using a retrieval basket followed by repeated bile duct flushing. CBDS may have been larger in the ERCP-LC group as compared to patients undergoing LCBDE since Lyu et al. (6) found just the opposite, that is, that ERCP-LC was associated with a higher CBDS clearance rate and less postoperative bile leakage. Negative aspects in the two-stage procedure in Lyu’s study included a higher rate of pancreatitis secondary to manipulation of the papilla of Vater, and longer hospital stay. Indeed, removal of both GS and CBDS using a minimally invasive surgical procedure is a very attractive way to manage all kinds of biliary stones. This is the new approach to the old open cholecystectomy and choledochotomy procedures. In the public healthcare setting older patients undergoing ERCP for CBDS-related complications such as jaundice, cholangitis or colicky biliary pain are commonly seen. After removal of choledocholithiasis some of these patients are never referred for cholecystectomy, and others are put on a “wait-and-see” follow-up scheme. Sousa et al. (7) found that in elderly patients cholecystectomy after ERCP prevented the occurrence of further biliary events, although a non-statistically significant difference in mortality was also found.
In general, cholecystectomy should be performed after ERCP stone removal in patients with concomitant gallstones. In a retrospective analysis of more than 4,500 patients hospitalized with choledocholithiasis, Huang et al. (8) found that cholecystectomy was not performed after ERCP in almost half of the cases. Although both early and delayed cholecystectomy equally reduced the risk of subsequent recurrent biliary events, patients were at a tenfold higher risk of recurrent biliary events while waiting for delayed cholecystectomy when compared to those undergoing early cholecystectomy. Therefore, delayed cholecystectomy is a cost-effective strategy that must be balanced against the risk of loss to follow-up.

Peponis et al. (9) also favor LCBDE as single procedure since they found that preoperative ERCP was associated with a threefold increase in the risk of surgical site infection after laparoscopic cholecystectomy. Therefore, it appears that any previous endoscopic procedures should be avoided.

Also favoring LCBDE, Platt et al. (10) performed the procedure in 124 elderly patients with different comorbidities and found it safe and effective, with outcomes being similar to those of younger patients. Therefore, elderly patients with concomitant gallstones and choledocholithiasis should be offered LCBDE as an alternative to ERCP. LCBDE has emerged as a recommended option for the management of choledocholithiasis.

We would like to summarize the comparison between LCBDE (single-stage) and ERCP-LC (two-stage) in the treatment of patients with concomitant gallstones and CBDS quoting the conclusions of a recent meta-analysis on the subject (11). In selected patients LCBDE may be considered the preferred approach. However, the findings of eleven randomized, controlled trials including a total of 1,338 patients (666 LCBDE vs 672 ERCP-LC) have to be carefully interpreted due to the presence of heterogeneity. Furthermore, patient condition and operator experience should also be accounted for when making treatment decisions.

However, apart from ERCP-LC and LCBDE, there are at least two additional minimally invasive strategies for the treatment of CBDS in the presence of gallstones. Ricci et al. (12) compared preoperative ERCP plus LC versus LC with LCDBE, versus LC plus intraoperative ERCP, versus LC plus postoperative ERCP. In 20 trials involving 2,489
patients (and 2,489 procedures) they found that the combined LC and intraoperative ERCP approach had the greatest odds to be the safest procedure, and appeared to be the most successful one. LBCDE seemed to reduce the risk of acute pancreatitis because ERCP is avoided, but may be associated with a higher risk of biliary leakage.

What is the best approach for a specific patient? Look for availability and expertise. From our point of view, small CBDS may be appropriately managed with LCBDE, but large and complex stones will probably require ERCP (13). Digestive Endoscopy and Surgery should continue to work together for the benefit of patients. Besides searching for the most optimal management of CBDS, many other fields deserve attention, including whether stent insertion or operation is the best option to treat initial left-sided tumoral colonic obstruction. Collaboration and mutual understanding may secure good results for our patients.

REFERENCES


Fig. 1. Large common bile duct stone removed after biliary sphincterotomy dilation.