

## Timing of Laparoscopic Cholecystectomy after Endoscopic Retrograde Cholangiography; Is it Critical?

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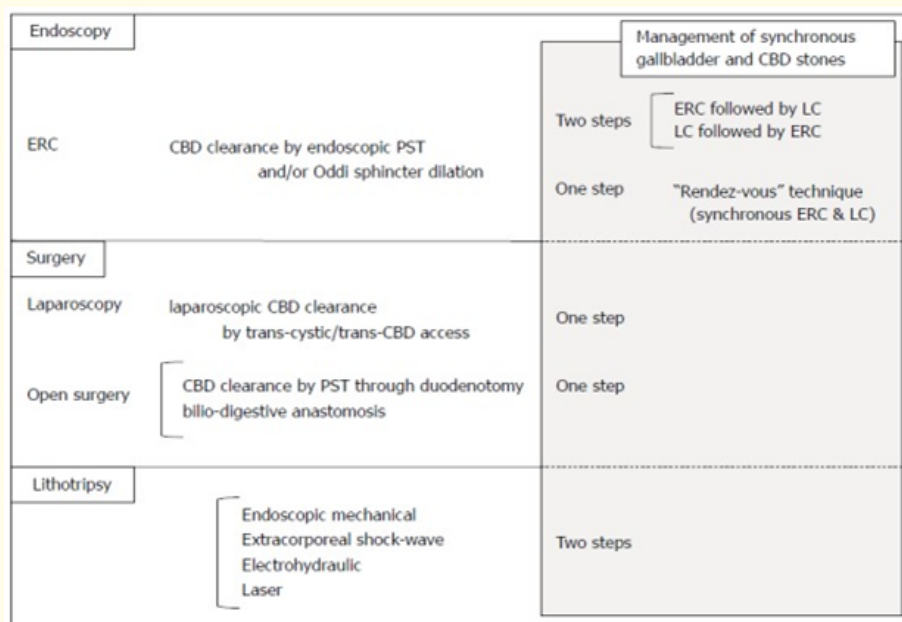
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Biliary lithiasis is an endemic condition in both Western and Eastern countries, in some studies affecting 20% of the general population. 11 to 21% of patients with cholelithiasis also have concomitant common bile duct stones (CBDS) at the time of surgery. Despite the wide variety of examinations and techniques available nowadays, two main open issues remain without a clear answer: how to cost-effectively diagnose CBDS and, when they are finally found, how to deal with them. CBDS management consists of CBD clearance and may be accomplished by surgery (traditional and laparoscopic), endoscopy and lithotripsy. Since, in most cases, CBDS are due to gallstone migration from the gallbladder which is still in situ, there is also a formal indication for cholecystectomy. Such a frequent eventuality may be dealt with in several ways, as a one-step or two-step-procedure; variously associating the above reported techniques and laparoscopic cholecystectomy (LC). Costi., *et al.* proposed an algorithm for management options for CBDS as shown in this algorithm.



**Figure:** Algorithm for management options for common bile duct stones [1].

CBD: Common Bile Duct; ERC: Endoscopic Retrograde Cholangiography; LC: Laparoscopic Cholecystectomy; PST: Papillosphincterotomy

Although the analysis of recent literature seems to be in favor of a large-scale diffusion of one-stage laparoscopic management of cholecystocholedochal lithiasis, as witnessed by the encouragement to surgeons to train in laparoscopic CBD clearance by the British Society of Gastroenterology guidelines, nevertheless, in common practice, only 20% of American surgeons regularly perform laparoscopic CBD exploration, and 75% consider preoperative ERC as the preferred approach. The reasons for such a limited diffusion of laparoscopic CBD exploration are the necessary learning curve for a not-so-frequent procedure, the non-reproducibility of referral centers' results in elective patients, long operative times and lack of equipment. ERC followed by endoscopic sphincterotomy has become the most widely used method for imaging and treating CBD stones.

Timing for ERC is a matter of debate, as ERC may be performed before, after, or even during cholecystectomy, according to the so-called “rendez-vous technique”. Preoperative ERC presents the drawback of needing a second surgical procedure to treat gallstones (cholecystectomy), but has the great advantage of allowing for a “strategy update” before surgery: if endoscopic sphincterotomy is successful, cholecystectomy will complete the mini-invasive management of cholecysto-choledochal lithiasis; if it is not, the “second step” will be a surgical procedure aimed at managing both gallstones and CBDS, which, in most environments, will be performed by laparotomy. The other major issue of this approach is patient selection to undergo ERC, since the systematic use of ERC is no longer acceptable in patients who are candidates for cholecystectomy. Performing ERC after cholecystectomy is also a “two step management” of cholecysto-choledochal lithiasis, and has the great advantage of performing ERC in virtually only those cases really needing CBD clearance, thus reducing to a minimum any possible ERC-related complications and costs. Unfortunately, the main drawback of postoperative ERC is the need for a third surgical procedure whenever postoperative ERC fails.

The rendez-vous technique avoids some of the critical issues of other techniques, since it involves CBDS diagnosis and the synchronous management of both gallstones and CBDS during the same procedure (“one step”), although it needs the systematic availability of dedicated instrumentation and a second team to perform intra-operative ERC whenever IOC/laparoscopic US shows CBDS.

In our study we reviewed the medical records of 99 patients who presented to the National Hepatology and Tropical Medicine Research Institute (NHTMRI) in Cairo, Egypt with CBDS. All patients were managed according to a fixed protocol, where suspicion of diagnosis by laboratory investigations and abdominal sonar was followed by referral to the endoscopy unit to perform ERC. The role of ERC was dual, first to confirm the presence of CBDS and second to deal with it by stone extraction (using dormia basket or balloon extraction) and PST with or without stent placement. All patients returned back to surgery department to have LC. Timing of operation was noticeably delayed for more than 2 weeks in this series of patients. Cause of the delay was multi-factorial either related to the patient due to improper medical fitness for surgery necessitating long preparation or long waiting list in the surgery department.

At operation, operative details were analyzed where the difficulty of the procedure (LC) was judged according to degree of adhesions encountered during Calot’s triangle dissection to ensure a safe critical view technique. Adhesions were classified into 4 grades as follows;

- Grade I: contracted gallbladder but still well-defined Calot’s triangle,
- Grade II: contracted gallbladder with adhesions obscuring Calot’s triangle,
- Grade III: adhesions between the gallbladder and common hepatic duct (CHD) but still dissectible from each other (Mirizzi type I, II), and
- Grade IV: contracted gallbladder non-separable from CHD (Mirizzi type III, IV).

Operative time was noticed to be longer. Also, the rate of conversion to open surgery in this group of patients was 33.3% which is relatively higher than the regular rate in ordinary circumstances.

Post-operative follow up revealed higher rates of morbidity especially concerning biliary leakage and subphrenic collection. Mortality was also encountered in 3 cases due to acute hepatic failure secondary to intra-operative hepatic ischemia- which is relatively a rare complication after LC. So, it can be concluded that delayed LC after ERC management of CBDS is associated with a higher rate of complications due to development of adhesions around the CBD. Concomitant or early LC (within 1 week) after ERC for CBDS is strongly recommended, otherwise, a high surgical expertise is advised to perform the procedure in case of delay.

### Bibliography

1. Renato Costi, *et al.* “Diagnosis and management of choledocholithiasis in the golden age of imaging, endoscopy and laparoscopy”. *World Journal of Gastroenterology* 20.37 (2014): 13382-13401.

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