

Review

Laparoscopic Management of Concomitant Gallstones and Common Bile Duct Stones - Current Practice and Our Experience

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REZUMAT

Managementul laparoscopic pentru litiaza concomitentă a căi biliare principale și vezicii biliare - situația actuală și experiența noastră

În ciuda progreselor multiple realizate în ultimele decenii tratamentul optim pentru litiaza colecisto-coledociană încă este controversată. În timp ce pentru litiaza biliară asimptomatică necesitatea intervenției chirurgicale suscită dezbateri, există un consens larg în ceea ce privește indicația extragerii calculilor de la nivelul căi biliare principale, care pare a fi asociată litiazei biliare în 3-10% dintre pacienți (1). Înainte de era laparoscopiei tratamentul standard pentru litiaza căi biliare principale a fost colecistectomie deschisă urmată de explorarea căi biliare principale. ERCP cu sfincterotomie endoscopică și extracția calculilor a fost o alternativă valoroasă, rar de sine stătătoare, pentru pacienții la care intervenția chirurgicală are riscuri majore sau prezintă complicații severe, cum ar fi colangita acută, icter și pancreatită. Odată cu popularizarea colecistectomiei laparoscopice în 1987-1988, noi tehnici s-au adăugat în arsenalul tratamentului litiazei cai biliare principale. Reddick & Olsen (2,3) au susținut ERCP cu sfincterotomie endoscopică și extragerea calculilor încă din 1990; Petelin (4), aproape simultan, a introdus explorarea laparoscopică a cai biliare principale (LCBDE). Standardele actuale de practică recunosc 3 opțiuni: combinat laparo-endoscopic, total laparoscopic și abordarea deschisă.

Cuvinte cheie: litiază coledociană, litiază a căi biliare principale

ABSTRACT

Despite many advances in the last decades the optimal treatment for concomitant gallstones and common bile duct (CBD) stones is still controversial. While for the asymptomatic gallbladder stones the need for surgery is still under debate, there is large consensus regarding the indication to remove the CBD stones, which appear to be associated in 3-10% of patients (1). Before the laparoscopic era the standard treatment for CBD stones was open cholecystectomy and CBD exploration. For the patients unfit for surgery, or with severe complications such as acute cholangitis, jaundice and pancreatitis, ERCP with endoscopic sphincterotomy (ES) and

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stone extraction was a valuable, seldom stand alone, life saving, alternative. With the advent of laparoscopic cholecystectomy (LC) in 1987-1988, new techniques added to the armamentarium of CBD stones treatment. Reddick & Olsen (2,3) sustained the ERCP with endoscopic sphincterotomy (ES) and stone extraction as early as 1990; Petelin (4), introduced almost simultaneously, the laparoscopic CBD exploration (LCBDE). The current standards of practice recognise 3 options: the combined laparo-endoscopic, the totally laparoscopic and the open approach.

Key words: choledocolithiasis, common bile duct lithiasis, laparoscopy

The present paper is aiming to discuss these options with a focus on LCBE.

The choice between the 3 options is depending on many factors, given the final objective to obtain CBD clearance in the safest way, with minimal patient aggression and in the most cost-effective manner.

The first aspect to discuss is the stone detection moment: preoperative, intra or postoperative. The preoperative CBD stones diagnosis is problematic. The most predictive sign appears to be acute cholangitis, with up to 100% CBD stones present (5). The clinical signs suggestive for CBD stones such as cholecystitis, biliary colic, acute pancreatitis and jaundice proved to be associated with stones in 7%, 16%, 20% and 45% of cases respectively (5). The case is similar for the lab tests, with up to 50% false positive/negative results. The standard transabdominal US, while very sensible in showing gallbladder stones has only 50-80% specificity in detecting CBD stones and, in addition, is very operator dependent. From the opposite perspective it has been demonstrated on 1000 consecutive LC with intraoperative cholangiography (IOC) and unsuspected CBD stones the presence of calculi in 14.2% of cases (5). Thus, confirmation tests are necessary for preoperative detection.

ERCP is highly sensitive (90-95%) in detecting CBD stones and extracting them (over 90%) when ES is associated. However, it is an invasive procedure and has been shown to have significant post procedural morbidity - bleeding, perforation, acute pancreatitis - in 16% of cases, even related mortality in 1% (6). Additionally, even if strict criteria based on high suspicion index for CBD stones are used, only 10-60% of patients will actually have stones at the time of ES (7,8). As a result, a number of unnecessary ERCP-ES procedures are being performed, with their own morbi-mortality. Currently, ERCP is no longer accepted for CBD stones detection; it is a

valuable instrument for preoperative use in patients with confirmed stones, for treatment purposes only (9). Some authors have advocated ES either concomitant, or post LC (stones detected by IOC or operative US), thus avoiding the unnecessary ERCP-ES. There are clear advantages, yet post ERCP morbidity & mortality remain the same (10).

EUS is a more recent valuable diagnostic test. Some centres which perform routinely preoperative EUS report 98% sensitivity and 99% specificity (11). The problem is, more than for conventional US, the operator dependency. Never the less, in trained centres, it is an excellent alternative for preoperative stone detection.

Magnetic resonance cholangiopancreatography (MRCP) is another alternate diagnostic test with 95-100% accuracy in detecting CBD stones (12). It is non invasive, less operator dependent and considered the current diagnostic standard for patients with medium to high suspicion index for choledocholithiasis (9). The problems with MRCP are availability and high cost which limit its usage. Short sequence MRCP might limit cost without impeding on accuracy (12).

Helical computed tomography (HCT) is a newer test, with comparable value to MRCP (13) The disadvantage is linked with contrast injection.

Different modalities for successfully treating common bile duct stones are accepted. The appropriate therapy depends on the patient's condition and more important the equipment, local expertise in laparoscopy, endoscopy and interventional radiology. In practice there are three recognised options: the combined laparo-endoscopic with endoscopy prior to surgery, the totally laparoscopic and the open approach. Noble designed one trial to compare single stage (LC + LCBDE) approach with two stages (ERCP + LC) approach in higher risk patient (over 50 years with BMI higher than 40, over 60 years with comorbidity or those over 70 years). (14) Patients with severe pancreatitis and cholangitis or

which require emergency ERCP were excluded.

Endoscopic retrograde cholangiography plays an important role in the early treatment of common bile duct stones for patients with jaundice, cholangitis or severe pancreatitis. Also for elderly patients who may not tolerate an operation, performing ERCP and leaving the gallbladder in situ is an alternative but with a lot of risks. However the routine ERCP for suspected choledocholithiasis is not accepted. There are some studies who demonstrate that up to 61% of patients with suspected common duct stones undergo an unnecessary ERCP and which maybe is associated with morbidities. (15)

Much of the morbidity linked with ERC/ES is associated with the sphincterotomy. Endoscopic papillary dilation has been suggested as an alternative; however, a recent multicenter, controlled randomized study demonstrated that endoscopic balloon dilatation resulted in a higher rate of pancreatitis compared with sphincterotomy and recommended that it should be avoided in routine practice. (16)

Laparoscopic CBD exploration can take place via the cystic duct (transcystic technique) or by directly incising and opening the CBD with stone retrieval (laparoscopic choledochotomy). Small stones can often be flushed through the ampulla into the duodenum. Intravenous glucagon may be used to relax the sphincter of Oddi, followed by flushing of 100–200 ml of saline. When these methods fail, a helical stone basket can be passed over a guide wire through the cystic duct and into the CBD to extract stones under fluoroscopic guidance. If attempts at transcystic basket extraction fail, a choledochoscope (<10 Fr) should be tried next to remove the stones under direct vision. If the CBD stone is larger than the lumen of the cystic duct, the cystic duct should first be balloon-dilated to a maximum of 8 mm diameter, but never larger than the internal diameter of the CBD. (17)

If the transcystic approach fails, we recommend laparoscopic longitudinal choledochotomy. Indications for choledochotomy are multiple or large stones with small distal CBP or those positioned within the proximal bile ducts in patients with a CBD diameter larger than 8–10 mm. Choledochotomy is accomplished with fine absorbable sutures by using intracorporeal suturing techniques and if a T-tube is used, it is exteriorized through the lateral port site. Others have shown decreased complications with

primary closure compared with T-tube use. The patient is generally discharged 2–4 days postoperatively. If a T-tube is used, a final cholangio-gram is performed 2–3 weeks postoperatively with removal of the tube if no abnormalities are found. Others have shown decreased complications with primary closure compared with T-tube use. (18)

Prospective randomized trial comparing two-stages with single – stage management demonstrate equivalent success rate for laparoscopic common bile duct exploration versus ERCP followed by laparoscopic cholecystectomy with reduced hospital stay for laparoscopy. (19)

Open CBD exploration should be considered the good technique adapted to local situation, not a “failure”, if laparoscopic CBDE and/or postoperative ERC are unsuccessful. The most common reason to convert to open CBDE is an impacted stone at the ampulla of Vater, and these cases require a transduodenal exploration. Open CBDE should also be considered as the initial procedure of choice if patients present dilated CBD or multiple common bile duct stones. This entails either performing a choledochenterostomy.

In “Floreasca” Emergency Clinical Hospital magnetic resonance cholangiopancreatography (MRCP) and, when it is not available, computed tomography have been used to diagnose choledocholithiasis. Also intraoperative cholangiography is used in selective cases. Diagnostic ERCP is abandoned. Regarding our experience the standard is SE + CL.

The experience with LCBDE is limited to a single surgical team and it is performed occasionally because of financial difficulties. Between 2001 and 2008, 108 patients were operated in laparoscopic approach. The exclusion criteria were papillary impaction, acute pancreatitis, acute cholangitis or other severe comorbidities. The diagnosis was confirmed by MRCP in 69 patients, 8 patients by ultrasound and in 32 cases by cholangiography. In 40 cases we used choledochoscope and we confirmed the choledocholithiasis. The first choice for us is to remove the stones by transcystic approach because it is technically simple, is effective in more than 85% of cases and does not affect CBP. Laparoscopic choledochotomy was performed for 63 patients getting clearance in 62 cases.

Open surgery remains an option for failure of minimally invasive methods, intrahepatic lithiasis,

complex CBP lithiasis or in particular cases of acute cholangitis.

CONCLUSIONS

Choledocholithiasis remains a complicated and challenging disease with a treatment which depends on operator's expertise and available resources. Single-stage is equivalent in terms of results about postoperative morbidity and mortality with two-stages therapy but reduces the number of procedures per patients.

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