REVERSE SEQUENTIAL TREATMENT: LC + POSTOPERATIVE ERCP-ES

If a laparoscopic transcystic IOC demonstrates CBD stones, and laparoscopic CBDE can not be performed for technical reasons or when the stone morphology is not suitable for laparoscopic exploration, the postoperative ERCP is the ideal approach. At most advanced centres this procedure achieved high success rate (about 100%), but in community centre the rate of failure is over 10%.

LAPAROSCOPIC CBD EXPLORATION

Laparoscopic CBDE can be attempted either through the cystic duct or through the CBD. For transcystic laparoscopic CBDE, the cystic duct is dilated up to a diameter of 7 mm without rupturing the duct. The stones are extracted with balloon catheters, flexible baskets, or thin flexible choledochoscopes. Alternatively, a laparoscopic choledochotomy can be performed with stones extracted by baskets or flexible choledochoscopes. Laparoscopic choledochotomy is even more challenging with increased risk of CBD injury especially if the duct is small. The choledochotomy then is repaired with or without a T-tube and closed suction drain is placed. Laparoscopic CBDE through the cystic duct or the CBD, thus requires technical expertise, special instrumentation, and favourable biliary anatomy. In fact even experienced surgeons report at least a 10% to 20% failure rate in terms of CBD stones clearance, requiring conversion to an open CBDE or postoperative ERCP.

LAPAROENDOSCOPIC "RENDEZVOUS"

Historical background

The first report of this new combined laparoendoscopic treatment was in 1993 by Deslandres that performed it in 3 patients. In the same year Mayrhofer also reported this combined approach in 32 open cholecystectomy and in one laparoscopic cholecystectomy. The procedure described by Deslandres consists of an intra-operative ERCP performed by the endoscopist after transcystic insertion of a guide wire to reach the Vater’s papilla to render the cannulation of the papilla more easily, and eventual sphincterotomy and endoscopic clearance of the CBD by a balloon or a basket. The procedure was completed with laparoscopic cholecystectomy. Feretis in 1994 was the only one to publish the results of laparoscopic transcystic antegrade sphincterotomy with a hydrophilic guide wire in 12 patients using the endoscope only to control the sphincterotomy. Nakajima in 1996 published a technical note pointing out the importance of the transcystic guide wire but reporting also his unsatisfactory experience with the antegrade transcystic sphincterotomy. These combined approaches did not gain immediate interest but slowly and independently, many authors started to try these techniques in the clinical routine. Micses in 1997 was the first to use the term "Rendezvous" for this simultaneous laparo-endoscopic treatment.

Technical procedure

RV procedure consists of LC together with IOC, ES and endoscopic CBD exploration. In fact the main difference between the sequential approach (ERCP + LC) and the RV is that the steps of the endoscopic procedure are reduced and facilitated because the surgeon helps the endoscopist by performing an antegrade cholangiography and, if needed, he passes a guide wire antegrade through the papilla. Because not in all cases the guide wire is mandatory for the procedure, the laparo-endoscopic RV can be defined as a combined laparo-endoscopic simultaneous approach involving the endoscopist and the surgeon in the operating room during one single administration of anesthesia to clear CBD stones or solve associated problems related to sludge or other problems at the papilla of Vater. An RV can also be performed in delayed time, leaving the guide wire passed during LC inside the bile duct and duodenum with the aim of facilitating the cannulation of the papilla a few days later.

The RV technique (Table 6-1) starts as a
Table 6.1. The crucial procedural points of RV technique

1. Supine position of the patients as for common laparoscopic cholecystectomy
2. Total anesthesia, endotracheal tube and nasogastric tube
3. Pneumoperitoneum and insertion of 3/4 trocars
4. Isolation of the cystic duct and of the cystic artery
5. Double clips of the cystic artery and its section
6. Single clip of the cystic duct and anterograde trans-cystic cholangiography
7. Endoscope insertion with the patient in the same supine position
8. Laparo-endoscopic rendezvous
9. Insertion of a guidewire through the cystic duct in the duodenum (if needed)
10. Endoscopic sphincterotomy
11. Endoscopic bile duct clearance by balloon or basket
12. Confirmation of the duct clearance by anterograde cholangiography
13. Extraction of the endoscope and the wire
14. Closure and section of the cystic duct
15. Laparoscopic cholecystectomy

common LC: the patient is in a supine position under general anesthesia with endotracheal tube and nasogastric tube (Fig. 6.1). Then the first crucial step in the technique is a good isolation of cystic duct and put a safe clip in the distal tract of the cystic duct. After that, a cysticotomy must be performed in order to cannulate the CBD with a catheter, enough large to pass, if needed, a guide wire (Fig. 6.2). At this time a cholangiography is performed, with a iodine contrast liquid
pancreatitis, hyperbilirubinemia, or CBD dilatation. In these cases the endoscopic sphincterotomy is advisable because often biliary sludge becomes stuck in the papilla and/or a sphincter of Oddi disfunction (with or without papillitis) can also affected the patient.

Some technical variations of the RV procedure have been described as: total a dissection of the gallbladder before the cholangiography; change of the patient position before the endoscopic procedure; retrograde cholangiography by the sphincterotomy; or the same person performs the surgical procedure and the endoscopic procedure.

The technical problems of RV technique are related to both the supine position that could make retrograde cannulation of the papilla more difficult as well as to the gas that is needed for endoscopy, which could interfere with LC because the distension of bowel loops. Technical solutions have been proposed to solve these difficulties. Before starting the endoscopic phase, the laparoscopic surgeon should dissect completely both the Calot triangle and the attachment between gallbladder and liver to minimize the dissection needed after ERCP, when the bowel loops will be distended by endoscopic insufflation. Furthermore, anatraumatic laparoscopic bowel clamps should be positioned on the first jejunal loop to reduce bowel distension, or simply the endoscopist could minimize the insufflation and prolong the aspiration prior to extract the endoscope. To facilitate the identification and cannulation of the papilla, a guide wire is inserted through the cystic duct by the laparoscopic surgeon. This is the main crucial point of the RV technique that should be performed routinely as suggested first by Micsus, but also by others. On the contrary, trying to minimize the trauma of manipulation to the papilla of Vater, others consider a more tailored approach to limit the guide wire insertion only in the cases in which the endoscopist is not able to cannulate the papilla without help. The transcystic injection of saline is a useful manoeuvre facilitating endoscopic localization and cannulation of the papilla. The surgeon’s aid is a clear...
advantage in this procedure, as an endoscopic retrograde cannulation failure can be related to an unsuccessful ERCP in up to 14-23% of cases. After the guide wire passage, it is caught with an endoscopic polypectomy loop, extracted from the operative channel and the papilla is cannulated with a sphincterotome. This is then pulled through the papilla in the CBD, thus completing the so called “rendezvous technique”. At the end of the endoscopic procedure, the surgeon completes the laparoscopic choledochectomy.

INDICATIONS FOR LAPARO-ENDOSCOPIC RENDEZ-VOUS

Gallbladder lithiasis is worldwide a very common illness that involves general practitioners, gastroenterologists and surgeons but also frequently the endoscopist, especially if the presence or the simple suspicion of stones in the CBD becomes the main problem. All the cases where the CBD stones are easily extractable through the cystic duct by the surgeon during LC should be excluded in but unfortunately this evaluation is never possible prior to surgery so that a planning of all treatment options is mandatory. When transcystic extraction of stones is not possible, as happens in about 30-40% of the patients with CBD stones, the combined laparo-endoscopic approach as RV should be considered as the preferable option for many simple technical and clinical reasons. The main indications for a RV are shown in Table 6-II.

The other procedures are indicated in selected cases. Sequential ERCP-ES+LC should be reserved for patients who require urgent CBD decompression or have clear evidence of choledocholithiasis by ultrasonography. In routine case in which there is no expectation of endoscopic failure, postoperative ERCP remains reasonable. But in case in which the endoscopic failure is high possible (as in patients who have undergone prior gastric resection or bypass with roux-limb reconstruction) the RV would be the ideal because surgical duct clearance can be performed immediately if endoscopy fails.

Table 6-II. Main indications for combined endo-laparoscopic rendezvous in patient with cholecystolithiasis

1. Common bile duct stones non extractable through the cystic duct
2. Multiple small common bile duct stones, large friable stones, with high risk of residual fragments
3. Any type of bile duct stones with abnormally delayed passage of the contrast medium at transcystic cholangiography
4. Common bile duct stones with multiple episodes of cholangitis
5. Common bile duct stones with history of recurrent acute biliary pancreatitis, or hyperbilirubinemia
6. Common bile duct stones with sphincter of Oddi dysfunction (SOD)
7. Common bile duct stones and/or overmentioned problems in patients with Billroth II gastric resection during open cholecystectomy (Manual drive of the endoscope in the afferent jejunal loop)
8. CBD stones, SOD, related acute pancreatitis in children or patients with normal or small common bile ducts (pneumatic papilla dilatation) (difficult laparoscopic CBD exploration and risk of stenosis after the suture)
9. CBD stones and/or SOD in patients after failure of preoperative ERCP-ES or recurrence of acute biliary pancreatitis
10. Unexperienced surgeon for laparoscopic CBD exploration
11. Intraoperative suspicion of cancer of the papilla or common bile duct stones

ADVANTAGES OF RV

The two main advantages of the RV seem to be to avoid the main risk factors of iatrogenic damage of the retrograde ERCP-ES and to render both the endoscopic and laparoscopic procedures easier.

But other advantages have been proposed. First, the confirmation of common duct stones by IOC allows for more effective use of ERCP. Second, stones can be cleared endoscopically without the use of additional anaesthesia or sedation. Finally, if the endoscopic stone clearance should prove technically impossible, surgical exploration of the common duct can be performed without delay.

The advantages of the RV compared to total laparoscopic transcystic procedure are