

INTRAOPERATIVE ERCP AND ENDOSCOPIC SPHINCTEROTOMY COMBINED WITH LAPAROSCOPIC CHOLECYSTECTOMY FOR TREATMENT OF CHOLELITHIASIS WITH CHOLEDOCHOLITHIASIS

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Abstract: Objective: To evaluate the benefit of intraoperative ERCP and endoscopic sphincterotomy (EST) combined with laparoscopic cholecystectomy (LC) in the treatment of cholelithiasis with choledocholithiasis.

Methods: Fifty-two patients with cholelithiasis and choledocholithiasis (as determined by intraoperative cholangiography) were randomly divided into 2 groups during LC. In group A (27 patients), common bile duct stones were extracted by intraoperative EST during LC. In group B (25 patients), common bile duct (CBD) stones were extracted by conversion to open CBD exploration and cholecystectomy. Results: The success rate was 26/27 (96.3%) in group A and 25/25 (100%) in group B ($0.25 < P < 0.5$); The mean postoperative hospitalization was 3.32 ± 0.56 days in group A and 17.5 ± 4.61 days in group B ($P < 0.001$). In group A, two cases were complicated transient hyperamylasemia after the combined procedure. In group B, one case of bile leakage and one case of duodenal ulcer occurred after conversion to open cholecystectomy with CBD exploration. There were no retained stones in group A but 2 cases in group B.

Conclusion: Intraoperative ERCP and endoscopic sphincterotomy combined with LC for treatment of cholelithiasis and choledocholithiasis is safe, effective and results in shorter hospitalization and fewer complications than traditional open cholecystectomy with CBD exploration.

Key words: choledocholithiasis, EST, LC, ERCP

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INTRODUCTION

In recent years LC has become the most common therapeutic modality for cholelithiasis. (Fruzee, R. C. et al., 1993) The finding of CBD stones by intraoperative cholangiography is the major reason for resorting to open cholecystectomy. This research was done to compare combined LC and EST with open cholecystectomy and CBD exploration for treatment of cholelithiasis with choledocholithiasis.

PATIENTS AND METHODS

From December 1997 to August 1999, 52 patients (13 males, 39 females) with cholelithiasis and choledocholithiasis diagnosed by intraoperative cholangiography were randomly divided into 2 groups according to the patient's ID number and admission date. Group A, 27 patients (5 males, 22 females, average age of 50.3)

underwent EST combined with LC. Group B, 25 patients (8 males, 17 females, average age of 53.9) underwent laparotomy conversion from LC. After standard wide skin preparation for abdominal surgery, all patients underwent general anesthesia. After insertion of laparoscope, cystic duct was dissected and cystic duct cholangiography was performed according to the technique described by Alfred Cuschieri and Hong (Cuschieri, et al., 1992; Hong et al., 1998). As soon as the presence of CBD stones was confirmed, the patients were randomly divided into two groups. For Group A patients, the operating table was changed into level supine position. After deflating abdominal CO₂, a side view cholangiopancreascope (Olympus JF 100, JF 140 or JF 100) was inserted by mouth and advanced into the duodenum. Once the position of the ampulla of Vater was determined, a standard EST was undertaken. The size of the sphincterotomy was about 0.8 - 1.5 cm. Stones were extracted by either basket or balloon (Wil-

son Cook EBC-12-200, EBC-8. 5-200). Big stones were fragmented then extracted by a wire lithotripter. Cholangiography was repeated after the stone was removed. In the patients with multiple stones, several extraction attempts were needed. LC was done after the cholangiopancreascope was removed. There are some differences between the common EST and the intraoperative EST. Because the patients were under anesthesia, the mandible should be elevated to avoid trachea insertion and sometimes this required laryngoscope. The pressure of the pneumoperitoneum should be released to allow visualization of the duodenal papilla in the compressed intestinal cavity. Injection of the normal saline through the contrast tube to the cystic duct can facilitate the insertion of sphincterotomy knife. A basket or balloon is selected according to the size, number, and the hardness of the stone. Large stones should be first fragmented and the residual stone fragments can be irrigated with normal saline. Finally, gas and contrast medium should be suctioned before extraction of the endoscope. It turned out that it is easier to remove the CBD stones by a combination of LC with EST, because the endoscopist can benefit from general anesthesia. The surgeons can help the endoscopist localize the proper position of the ampulla of Vater and irrigate the CBD by injecting normal saline through the cholangiography catheter and wash out fragmented stones. Several studies have reported that the procedure can be much easier with a guide wire introduced through the cystic duct and the ampulla into the duode-

num (Nakajima et al., 1998). We have no such experience yet. For Group B, LC was converted to open cholecystectomy and choledocholithotomy. The operation duration, post operation hospital duration, rates of residual stones, complications, and the rates of stones cleared successfully in both groups were recorded.

Chisquare test or t-test were used for statistical comparisons.

RESULTS

The success rate was 26/27 in group A vs. 25/25 in group B. In group A, the stones sizes varied from 3 mm – 16 mm and numbered from 1-15. One patient was converted to open CBD exploration because of stone incarceration. One patient's CBD suspected of being perforated was found to be intact by laparotomy. A patient's mild bleeding due to papillotomy incision was controlled by endoscopic hemostasis. Two patients developed transient hyperamylasemia after the combined procedure. No severe complication occurred. In group B, all 25 patients had stones successfully removed. All needed sedation on the first day after operation; the T-tube limited patient movement. Two cases of residual stones were noted by T-tube cholangiography. The stones in both cases were successfully extracted by trans fistula cholangioscopy. One case required reoperation for bile leakage after the extraction of the T-tube. One case required gastroscopic hemostasis for a bleeding duodenal ulcer.

Table 1 The mean post-operation hospitalization, mean operation duration and the success rates are listed

Group	Mean postoperative hospitalization	Mean operation duration	Success rate (%)	Rate of residual stones (%)	Rate of complications (%)
A	3.32 ± 0.56	3.5 ± 0.8	26/27(96.3)	0	2/27(7.41)
B	17.5 ± 4.61	3.3 ± 0.95	25/25(100)	2/25(8)	5/25(16)
P value	P < 0.001	0.05 < P < 0.1	0.25 < P < 0.5	0.1 < P < 0.25	0.1 < P < 0.25

DISCUSSION

According to statistics, 6 – 10% (Zhang et al., 1993) of patients with cholelithiasis had choledocholithiasis and 50 – 60% (Barkun et al., 1993; Kullman et al., 1997) of cholelithia-

sis patients with indication of cholangiography had choledocholithiasis. LC has become in recent years the recommended procedure for treatment of cholelithiasis, but it is inadequate for treatment of CBD stones. The current treatment for cholelithiasis and choledocholithiasis include:

1. Resorting to laparotomy with CBD explo-

ration. Although it is a safe and reliable method, it requires a relatively long postoperative hospitalization, and results in a moderate rate of residual stones (In our research 2 patients in 25 had residual stones).

2. Extraction of the CBD stones with a cholangioscope inserted through the cystic duct by laparoscope after laparoscopic cholecystectomy. But the narrowness of the cystic duct and the angle to the CBD present a real challenge to the surgeon; and CBD injury is often severe.

3. EST pre or post LC is used worldwide (Traver et al., 1993). However, the patients must undergo two procedures and occasionally still require laparotomy.

4. Stones smaller than 3 mm can pass spontaneously if the sphincter of oddis is not stenotic. But this may be complicated by pancreatitis or cholangitis.

5. laparoscopic choledochostomy. This method is limited by the cystic duct anatomy and stones sizes. High technical standards are needed. (Hong et al., 1998)

Wang Binsheng (1994) reported that most Binsheng CBD stones were located in the distal end of the CBD which is an indication for EST. EST combined with LC has operation duration similar to that for choledocholithotomy, but a shorter post-operative hospitalization. LC can be considered for immediate open operation, so the patients can avoid another procedure. During intraoperative EST, it is relatively easy for the operator to extract CBD stones, because the basket or balloon is parallel to the CBD. The procedure can be repeated (15 stones were extracted in one patient), post-operative cholangiography revealed no residual stone in our study. The success rate was 96.3% (one case of stone incarceration required CBD exploration).

The combination of EST and LC for treatment of cholelithiasis and choledocholithiasis is a safe, effective and less traumatic method. It is more convenient to the endoscopist and should be recommended.

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