

Research Article

Early Versus Delayed Laparoscopic Cholecystectomy Post Endoscopic Retrograde Cholangio Pancreatography (ERCP)

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Keywords

- Endoscopic retrograde cholangio pancreatography (ERCP)
- Laparoscopic cholecystectomy
- Biliary stones

Abstract

Background: Endoscopic Retrograde Cholangio Pancreatography (ERCP) is the commonest method for treatment of biliary stones. In our study we compared 2 groups of patients managed with laparoscopic cholecystectomy post ERCP after maximum of 72 hours during same admission and after 28 days.

Patients and Methods: The study conducted from January 2012 to January 2015 and included 86 patients; Group I of 41 patients with ERCP followed by laparoscopic cholecystectomy within same admission and Group II of 45 patients with ERCP followed by laparoscopic cholecystectomy after at least 28 days.

Results: Group II patients showed more complications and more cases need drain insertion than group I. Mean hospital stay was shorter in Group I. Group II patients showed more cost due to the longer stay in the hospital for investigations and increased the conversion rates to open cholecystectomy.

Conclusion: In our study early laparoscopic cholecystectomy following ERCP was cost effective and safe with fewer complications than delayed laparoscopic cholecystectomy in patients with choledocholithiasis.

INTRODUCTION

The standard procedure for management of gall bladder stones is laparoscopic cholecystectomy. Incidence of co-existing common bile duct (CBD) stones in patients undergoing cholecystectomy for cholelithiasis is 3.4 - 15% [1,2]. Endoscopic retrograde cholangio pancreatography (ERCP) with or without sphincterotomy is widely accepted as the diagnostic and therapeutic modality for patients with CBD calculus. With ERCP, CBD stone extraction is successful in up to 97% of patients [3]. Most of the studies on ERCP revealed the safety and success of ERCP and laparoscopic cholecystectomy in treatment of gall stone disease [4,5]. The rate of conversion of LC after ERCP is higher than elective LC for uncomplicated cholelithiasis. Some studies have reported that early LC improves the outcome and reduces morbidity [6,7]. The possible explanation could be that ERCP causes cholangitis, leading to inflammation and adhesions around extra hepatic biliary tree, thus making a laparoscopic procedure more difficult. This inflammatory response will be more evident 2 to 6 weeks after ERCP. Also, during the interval of

cholecystectomy after ERCP, patients can have recurrent biliary complications, as high as 20% [3]. Several other studies have reported that the outcome after LC following ERCP is independent of interval between these two procedures [8-10]. Our present study was intended to compare two groups of patients managed with laparoscopic cholecystectomy post ERCP after 72 hours and after 28 days regarding safety, length of hospital stay, cost and conversion rates to open cholecystectomy.

PATIENTS AND METHODS

A prospective non randomized study was conducted on 86 patients, who underwent LC after ERCP for choledocholithiasis from January 2012 to December 2014 at Khamis Mushyate General Hospital Saudi Arabia. Data collected included patient's demographics, preoperative investigations, ERCP findings and complications, intraoperative findings, postoperative complications, hospital stay and cost were recorded. Provisional diagnosis of choledocholithiasis was based on signs and symptoms of obstructive jaundice along with abnormal liver

function tests and confirmed by abdominal ultrasound. Patients above 75 years, with gallstone pancreatitis, failed ERCP and carcinoma of gall bladder were excluded from the study. A written informed consent was taken from all the patients for both the procedures. Approval was obtained from local ethical committee for the study. ERCP and Endoscopic sphincterotomy (ES) with or without stenting was performed outside our hospital under sedation and patient was sent back to us in the same day. LC was performed using the standard four port technique by the author [11]. The operating time was calculated from the start of the incision to placement of the last suture. The operative time, intraoperative findings, postoperative complications, hospital stay and expenses were taken into account. Primary outcome was duration of surgery and secondary outcomes were intra and post-operative complications, hospital stay and hospital expenses. LC was classified as easy or difficult based on whether duration of surgery is less or more than 60 minutes respectively. Statistical analysis was performed with the use of SPSS 20.0 version. Continuous variables were expressed as mean \pm standard deviation (S.D). Comparison of continuous variables was done by independent sample t- test. Categorical data were compared by either Chi-square or Fisher's exact test. P value <0.05 was considered statistically significant.

RESULTS

Our patients were 86 patients and were divided into 2 groups: Group I (41 patients) 37 females (90.8%) and 4 males (9.2%), mean age 39.3 ± 16.7 (range 25-59 years). Group II (45 patients) 39 females (84.8%) and 6 males (15.2%), mean age 42.3 ± 15.8 (range 28-65 years). There were no complications related to ERCP, clearance of CBD stones were successful in both groups.

The demographic characteristics of patients, belonging to both groups, were more or less comparable. Following ERCP, Eighteen patients had no CBD stones on ERCP (Table 1). All Group I patients underwent laparoscopic cholecystectomy with no conversion to open surgery. Only two cases in Group II patients were converted to open cholecystectomy. The overall conversion rate was 2.3%. Mean operative time was shorter in group I: 53.6 minutes (range: 45 - 105 minutes) than in group II: 79.8 minutes (range 55 - 160 minutes). The cost of all cases in Group I was less than in Group II (Table 2). Mean hospital stay was shorter in group I (4.1 days), rather than (6.1 days) in group II ($P = 0.023$). Only five patients had complications in the form of biliary leak from cystic duct stump in two cases one from each group, one postoperative bleeding (group II only) and two wound infection in group II only (Table 2).

DISCUSSION

Laparoscopic cholecystectomy (LC) preceded by pre-operative ERCP remains the cornerstone and most commonly practiced strategy worldwide for management of co-existing gallbladder and CBD stones [12,13]. There is a controversy regarding outcome of LC following ERCP. According to recent studies, if LC is performed early (< 72 hours) then outcome is good [12,6,7]. However, some studies claim that delaying LC after ERCP allows the gallbladder area to cool off and give time to recover from the acute illness [13,14]. But the major drawback of delaying LC is the incidence of biliary complication, which is as

Table 1: Patient's Characteristics.

Variable	Group I (n=41)	Group II (n=45)	P value
Age mean \pm SD years range	39.3 ± 16.7 25-59	42.3 ± 15.8 28-65	0.39
Sex female/male (%)	37/4(90.4%)	39/6(84.8%)	0.64
Abnormal Liver function tests (%)	39(95.1%)	43(93.3%)	0.91
Ultrasound findings: Dilated CBD (%)	40/41(97.6%)	45/45(100%)	0.79
CBD stones	33/41(80.5%)	35/45(77.8%)	0.97

high as 20% [3]. To the contrary, Donkervoort et al. reported in 2010 that the interval between LC and ERCP failed to influence the outcome of surgery [10]. Our practice in managing these cases is to perform LC following ERCP as early as possible. The primary outcome in our study was duration of surgery, which signifies the difficulty of the procedure. On comparing the mean operative time of each group, the P value was 0.0001, which is highly significant. In our study we compared the results in two groups who underwent ERCP followed by laparoscopic cholecystectomy after 72 hours and 28 days regarding the safety, hospital stay, conversion rate and costs. In our study Group I patients showed shorter hospital stay which was statistically significant ($p=0.023$) compared to other studies it was shorter than in other studies [10-12]. The conversion rate to open cholecystectomy was 2.33% (2 patients) in Group II only compared from those reported by Meshikhes(1%) [15] and Romano (7.3%) [16].

The cost was more in Group II due to longer stay in the hospital for investigations and complications.

A study found that the incidence of bactobilia increases over time after endoscopic sphincterotomy, it increases with age and time and patients with bactobilia tend to develop more biliary-related complications while awaiting surgery [17]. In the present study, the mean operative time in group I was 53.6 ± 32.18 min and in group II was 79.8

± 26.3 min, i.e. the mean operative time in the early group is shorter than that of the delayed group and this was similar with the results of the study done by Csendes et al. [18], The operating time was longer in Group II patients who underwent delayed cholecystectomy, mostly due to scarring and fibrosis of the biliary tree and Calot's triangle which make us very cautious during dissection of the junction between cystic duct, common hepatic duct and CBD.

In our study, the mean length of postoperative hospital stay in group I (4.1 ± 2.3 days) was significantly lower than that of group II (6.1 ± 5.1 days) and this also was in accordance with a study by Donkervoort et al. [10], who found significant reduction in the hospital stay. The patients in the delayed group have significantly longer hospital stay than patients in the early group, which may be due to more postoperative complications in the delayed group (P value 0.043).

Our study shows, a higher conversion rate when LC was performed beyond 3 days following ERCP (P value 0.516, not statistically significant). There were no conversions in group I

Table 2: Postoperative Patient's Outcome.

Parameter	Group I (n=41)	Group II (n=45)	P value	Total (n=86)
Mean operative time minutes range	53.6 ± 32.18 45-105	79.8 ± 26.3 55-160	0.0001*	63.42 ± 29.6
Converted to open cholecystectomy cases (%)	0	2(4.44%)	0.516	2(2.33)
Mean hospital stay in days Range	4.1 ± 2.3 3-7	6.1 ± 5.1 5-13	0.023*	4.8 ± 4.2 3-13
Recurrent biliary symptoms cases (%)	0	4 (8.89%)	0.149	4(4.65%)
Post-operative complications :				
Bleeding cases (%)	0	1(2.22%)	0.961	1(1.16%)
Bile leak	1(2.44%)	1(2.22%)	0.566	2(2.33%)
Wound infection	0	2(2.44%)	0.516	2(2.33%)
Drain insertion cases (%)	9/41(21.95%)	22/45(48.8%)	0.0178*	31/86(36.05%)
mean Cost (Saudi Ryal) range	2300 ± 276 1600-3800	5983 ± 1698 2800-8600	0.0001*	4216 ± 1935 1600-8600

*significant

and two patients needed conversion to open cholecystectomy in group II. Studies on LC performed within days after ERCP show conversion rates as low as those for patients with uncomplicated cholelithiasis and our study is similar to the study by Bostanci and colleagues [9] who found significant reduction in the conversion rate that was mostly attributed to inflammatory adhesions.

Abdominal drain was placed in those patients who had intra-operative difficulty, as severe adhesion and inflammation with more blood loss. The comparison of number of patients in different groups who required drain was statistically significant ($P = 0.0178$).

In agreement with our findings, in studies by Lau et al., [5] and Costi et al. [19], ERCP followed by LC was advocated for choledocholithiasis because of greater long-term morbidity and mortality in the ERCP alone group. Salman et al. [7], in their study on the timing of LC following ERCP, stated that after 72 h, the inflammation makes surgery more difficult in patients and recommended performing LC within 24 - 72 h after ERCP. Schiphorst et al. [20], in their study concluded that cholecystectomy within 1 week after ES may prevent recurrent biliary complications in the majority of cases and reduce the postoperative hospital stay. Akaraviputh et al. [21], in their study proved that same day approach for choledocholithiasis using endoscopic stone removal followed by LC is preferable. Zang et al. [22], recommended that early LC after endoscopic CBD stone extraction in developing countries is feasible and safe and also reduces the total hospital cost effectively.

Based on the above results, we can suggest that carefully selected cases can undergo ERCP and LC during same hospital stay, thereby reducing the hospital expenses. Limitations of our study were its small sample size and non-randomized. So, a Randomized controlled trial (RCT) with a larger patient population is required to further evaluate our study results.

CONCLUSION

In conclusion, the optimum time to perform LC is within 3 days after ERCP. The longer the interval between ERCP and LC, the higher the incidence of complications and increased conversion rate (Although statistically insignificant) as well as

prolonged operative time, cost and hospital stay. In our study we found that the short interval between ERCP and laparoscopic cholecystectomy was safe with less complication and cost effective in patients with choledocholithiasis.

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