

Laparoscopic Cholecystectomy with and without Prior ERCP

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ABSTRACT

Objective To find out operative difficulties in patients undergoing laparoscopic cholecystectomy after ERCP in comparison with those without prior ERCP.

Study design Comparative study.

Place & Duration of study Surgical Unit IV Civil Hospital Karachi, from June 2011 to June 2013.

Methodology Patients were divided into 2 groups. Group 1 consisted of 40 patients with choledocholithiasis, who underwent ERCP followed by laparoscopic cholecystectomy while in Group 2 there were 40 patients with uncomplicated gallstones who had no intervention prior to laparoscopic cholecystectomy.

Results A total of 80 patients underwent laparoscopic cholecystectomy. Male: female ratio was 8:32 and 5:35 and mean age was 40.20 ± 11.27 year and 39.58 ± 11.29 year in Groups 1 and 2 respectively. Statistically significant difficulties were encountered during operation between the groups. Such difficulties were found in 29 (72.5%) and 3 (7.5%) patients in Group 1 and 2 respectively ($p < 0.0001$). The laparoscopic procedure was converted to open in eight (20%) patients in Group 1 and 1 (2.5%) patient in Group 2 ($p = 0.01$). Patients with difficult laparoscopic cholecystectomy had a mean ERCP frequency of 1.34 ± 0.74 while those with no difficulty encountered had a mean ERCP frequency of 1.15 ± 0.38 ($p = 0.05$). Statistically significant difference was found when comparing the operative difficulties encountered in patients who underwent ERCP and surgery in the same settings and in those where surgery was delayed after ERCP ($p < 0.001$).

Conclusions Laparoscopic cholecystectomy after ERCP was difficult and challenging. To minimize the complications and conversion, these patients should be operated in same sitting as for ERCP.

Key words Choledocholithiasis, ERCP, Endoscopic sphincterotomy, Laparoscopic cholecystectomy.

INTRODUCTION:

Common bile duct stones typically originates in gallbladder. The quoted prevalence of common bile duct stones in patients with symptomatic gallstones varies between 0 and 20%.^{1,2} Endoscopic retrograde cholangiopancreatography (ERCP) is the optimal

treatment for choledocholithiasis.^{3,4} Due to recurrent biliary events in about 36% of patients with cholelithiasis, definitive surgery (laparoscopic cholecystectomy) is recommended.⁵ Studies have reported that laparoscopic cholecystectomy (LC) after ERCP is more difficult than for simple cholelithiasis.^{6,7} The etiology is thought to be due to disruption of sphincter of Oddi and ascending infection resulting in inflammation and scarring of hepatoduodenal ligament rendering dissection of Calot's triangle difficult.⁸ The risk of complications therefore is higher, and the optimal interval between ERCP and LC is disputed.

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The aim of this prospective cohort study was to assess the difficulties of post ERCP cholecystectomy, as compared with LC for cholelithiasis.

METHODOLOGY:

This study was conducted at Surgical Unit IV of Civil Hospital Karachi from June 2011 to June 2013 on 80 patients. They were divided in two groups. Group 1 consisted of 40 patients with choledocholithiasis. They underwent ERCP followed by laparoscopic cholecystectomy while in Group 2 there were 40 patients with uncomplicated gallstones who had no intervention prior to laparoscopic cholecystectomy.

Patients with evidence of malignancy, CBD stones who already underwent open cholecystectomy and CBD exploration were excluded from the study. Data of all these patients was collected on a proforma. Difficult laparoscopic cholecystectomy was defined as more than 20 minutes taken to dissect Calot's triangle, injury to surrounding viscera or any laparoscopic cholecystectomy converted to the open procedure.⁹ All the procedures were performed by experienced laparoscopic surgeons. The duration of surgery was taken from placement of first port to the extraction of the gall bladder. The time period from ERCP to surgery was divided into same setting when patients were operated within the same admission time and delayed when they were discharged and called back after 4-6 weeks.

Data was entered into Linux (Ubuntu) PSP 0.7.9, a program for the analysis of sampled data. A p-value <0.05 was taken as statistically significant. Comparison of categorical data was done by cross tabulation and Chi square test. Mean and standard deviation were computed for numeric variables. Comparison of continuous data was done by Student's *t*-test.

RESULTS:

A total of 80 Patients underwent laparoscopic cholecystectomy. Male to female ratio was 8:32 and 5:35 and mean age was 40.20±11.27 year and 39.58±11.29 year in Group 1 and 2 respectively. The time duration of surgery was divided into 3

groups (table I). In Group 1, 13(32.5%) patients were operated within 60 minute, 14(36%) patients between 60-90 minutes, while in 13(32.5%) it took more than 90 minutes. In Group 2, 38(92.5%) patients were operated within 60 minutes.

Statistically significant differences were encountered when comparing operative difficulties between the 2 Groups (table II). Total number of difficult encounters were 29 (72.5%) in Group 1 and 3 (7.5%) in Group 2 (p<0.0001). Difficult dissection in Calot's triangle was noted in 22 (55%) and 2 (5%) in Group 1 and 2 respectively (p<0.001). There were 5 (12.5%) patients with visceral injuries in Group 1 and 1 (2.5%) in Group 2 (p=0.09). The laparoscopic procedure was converted to open in eight (20%) patients in Group 1 and 1 (2.5%) patient in Group 2 (p=0.01).

Frequency of ERCP ranged from 1-4 with a mean of 1.30±0.65. Patients with difficult laparoscopic cholecystectomy had a mean ERCP frequency of 1.34±0.74 while those with no difficulty encountered had a mean ERCP frequency of 1.15±0.38 (p=0.05) (table III). Time interval between ERCP and surgery and difficulty encountered in laparoscopic cholecystectomy is given in table IV.

DISCUSSION:

ERCP is the optimal management for CBD stones. Many studies revealed that this procedure is safe particularly prior to laparoscopic cholecystectomy to prevent cholangitis and recurrent pancreatitis.^{4,9,10}

Several randomized controlled studies suggest that performing ERCP alone for stone extraction will result in recurrence of symptoms in 15% to 37% of patients and they require cholecystectomy during follow up period.¹¹ Several retrospective studies have shown that LC after ERCP is more difficult than LC for uncomplicated cholelithiasis.¹²

ERCP and ES disrupts the sphincter of Oddi resulting in biliary reflux and bacterial colonization.⁸ This theory of bacterial colonization is strengthened by studies showing that bile from patients who have undergone ERCP is infected in 60% of cases.⁹ This

Table I: Duration of Surgery

| Duration of Surgery | Group 1 N=40 | Group 2 N=40 | P value |
|---------------------|-----------------|-----------------|---------|
| 60 Minutes | 13 (32.5%) | 38 (95%) | <0.001 |
| 60 to 90 Minutes | 14 (33%) | 1 (2.5%) | <0.001 |
| 90 Minutes | 13 (32.5%) | 1 (2.5%) | <0.001 |

Table II: Operative Difficulties Encountered

| | Group 1 N=40 | Group 2 N=40 | P value |
|---------------------------------------|-----------------|-----------------|---------|
| Operative Difficulties | 29 (72.5%) | 3 (7.5%) | <0.0001 |
| Difficult Calot's Triangle Dissection | 22 (55%) | 2 (5%) | <0.001 |
| Visceral Injuries | 5 (12.5%) | 1 (2.5%) | 0.09 |
| Bleeding Alone | 2 (5%) | 0 | |
| Conversion To Open Procedure | 8 (20%) | 1 (2.5%) | 0.01 |

Table III: Frequency of ERCP and Difficulty Encountered in LC.

| Frequency of ERCP | n | Difficulty in LC |
|-------------------|------------|------------------|
| 1 | 31 (77.5%) | 22 (70.96%) |
| 2 | 7 (17.5%) | 6 (85.71%) |
| 3 | 1 (2.5%) | 1 (100%) |
| 4 | 1 (2.5%) | 1 (100%) |

Table IV: Time Interval between ERCP and Surgery and Difficulty Encountered in LC P<.001)

| Time of ERCP | n | Difficulty |
|-----------------|----|------------|
| Same setting | 08 | 0 |
| Within 3 months | 18 | 13 |
| Within 6 months | 08 | 08 |
| Within 1 year | 04 | 04 |
| After 1 year | 02 | 02 |

study demonstrated the obvious difference between the groups. Patients with difficult LC had a mean ERCP frequency of 1.34 ± 0.74 . This can also be explained by the fact that surgery in patients with multiple ERCP's was delayed, resulting in difficult Calot's triangle.

A recent randomized clinical trial showed that recurrent biliary events were avoided only if patients went on to have early cholecystectomy after ERCP than LC performed later than 6-8 weeks, as practiced in many centers.² In our study 8(20%) patients were operated during same admission as for ERCP. Statistically significant difference was found when comparing the operative difficulties encountered in patients who underwent ERCP and surgery in the same settings and in those where surgery was delayed after ERCP.

The conversion rate after previous ES has been reported as high as 8-55% versus lower than 5%

in patients with uncomplicated disease.^{13,14} Fewer complications and conversions occur if cholecystectomy was performed by an experienced surgeon.¹² In our study all surgeons performing laparoscopic cholecystectomy were experienced and therefore negating any bias. In our study in Group1, 8(20%) patients were converted to open procedure while in Group 2, 1 patient (2.5%) was converted to open procedure. There was seven time increase in conversion rate in Group 1 as compared to Group 2. The results are in accordance with international studies.

CONCLUSIONS:

Laparoscopic cholecystectomy after ERCP was difficult and challenging. To minimize the complications and conversion, these patients should be operated in same sitting as for ERCP.

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