

Original Article**A Comparative Study between Early Versus Delayed Laparoscopic Cholecystectomy for Acute Cholecystitis in a Tertiary Care Center of Nepal****Ashok Koirala*, Ram sagar Shah, Sachidanand Shah, Dinesh Adhikari, Amit Bhattarai, Richa Niraula, Ajay Kumar Yadav**

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Article Received: 10th October, 2022; Accepted: 12th December, 2022; Published: 31st December, 2022**DOI: <https://doi.org/10.3126/jonmc.v11i2.50439>****Abstract****Background**

Laparoscopic cholecystectomy is considered as a gold standard treatment for symptomatic cholelithiasis. The timing of surgery for acute cholecystitis is still controversial, weather to go early surgery or wait for six to eight weeks after conservative management. Therefore, the aim of this study is to compare the clinical outcomes of early versus delayed laparoscopic cholecystectomy for acute cholecystitis.

Materials and Methods

A prospective study was conducted in Nobel Medical College Teaching Hospital, Biratnagar, Nepal. A Total of 80 patients with the diagnosis of acute cholecystitis were enrolled in the study. The patients were equally divided in two groups: 40 underwent early laparoscopic cholecystectomy within 72 hours of admission (Group A) and next 40 underwent delayed laparoscopic cholecystectomy after 6-8 weeks of conservative management (Group B).


Results

Out of 80 patients of acute Cholecystitis, mean age of the patients in Group A was 43.40±13.45 years and that in Group B was 44.80±14.36 years. The mean operative time in Group A was 90.22±2.81 minutes whereas in Group B it was 80.97±4.47 minutes. Mean duration of Hospital stay in Group A was 2.02±0.15 days whereas in Group B it was 2.15±0.36 days. Two patients in Group A and one patient in Group B converted to open cholecystectomy. Three patients of Group A and one patient of Group B landed in outpatient department with superficial surgical site infection. Group B patients underwent second hospital admission compared to Group A patients.

Conclusion

Early Laparoscopic cholecystectomy for acute cholecystitis is almost comparable with delayed Laparoscopic cholecystectomy. However, early laparoscopic cholecystectomy reduces the morbidity of patients as well as it is cost-effectiveness.

Keywords: *Acute Cholecystitis, Laparoscopic cholecystectomy, Nepal*

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Citation

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Introduction

Laparoscopic cholecystectomy is a gold standard treatment for symptomatic gall stones disease [1]. Acute cholecystitis was managed conservatively initially followed by interval cholecystectomy after 6-8 weeks in early days [2]. But the meta-analysis, randomized control trials showed the benefits of early surgery within 72 hours of admission compared with delayed surgery in terms of cost effectiveness, morbidity and mortality [3-5].

In our Hospital, we were practicing both early and delayed laparoscopic cholecystectomy for treatment of acute Cholecystitis.

Therefore, the aim of this study is to compare the clinical outcomes between early versus delayed laparoscopic cholecystectomy for acute Cholecystitis.

Materials and Methods

A prospective comparative study was conducted in department of general and laparoscopic surgery of Nobel Medical College and Teaching Hospital, Biratnagar from July 2021 to June 2022. All patients diagnosed as a case of acute cholecystitis who underwent early laparoscopic cholecystectomy within 72 hours of admission as well as interval cholecystectomy after 6 to 8 weeks of conservative management were enrolled in the study. The ethical clearance was taken from the Institutional Review Committee. Written informed consent was taken from all patients. The diagnosis of acute Cholecystitis was made on the basis of history, clinical examinations and Ultrasonography of abdomen and pelvis.

Patients with cirrhosis and bleeding disorder, choledocholithiasis, cholangitis, pregnancy, psychiatric illness, and severe cardiac, pulmonary diseases were excluded from the study. The eighty selected patients were allocated to two treatment groups: early laparoscopic cholecystectomy group (Group A) and delayed laparoscopic cholecystectomy (Group B) with forty patients in each group. Injection ceftriaxone (1gm) and metronidazole (500mg) was started for each acute cholecystitis patient. Intravenous antibiotics was continued in (Group A) patients till first postoperative day and switched over to oral antibiotics and discharged. In (Group B) patients intravenous antibiotics was continued for 48 to 72 hours then switched over to oral antibiotics and discharged; interval cholecystectomy was done after 6 to 8 weeks. Four-port laparoscopic cholecystectomy was performed, creating 10 mm camera port around umbilicus, next 10mm in epigastric region and two more 5 mm ports in

right hypochondrium and right lumbar region. Pneumoperitoneum was achieved with Verres needle technique and pressure was maintained at 12-15 mm of Hg. The patients were placed in reverse Trendelenburg position with slight tilt to left. Calots triangle dissected, critical view of safety achieved, cystic duct and cystic artery ligated and divided, gall bladder removed from liver bed, hemostasis achieved, and gall bladder kept in retrieval bag and taken out through umbilical port. All specimens were sent for histopathological examinations. Patients were orally allowed after 2 hours of surgery, started with liquid to soft diets. Intravenous injection ketorolac (30mg) was given 8 hourly for 24 hours then switched over to oral analgesic flexon (Ibuprofen 400mg +Paracetamol 500mg) post operatively. Patients were discharged once vitals were stable, good pain control and tolerated normal diets. The parameters examined in the study were demographic data (Age, sex), operative time (from skin incisions to closure), length of Hospital stay (counted as in which postoperative day patient was discharged), conversion to open cholecystectomy and surgical site infections (defined as redness, purulent or seropurulent discharge from wound site). Laboratory results of Group A and Group B patients at the time of admission along with histopathology reports were documented in the study.

All data were collected and statistical analysis done using SPSS version 25.0. The numerical data were expressed as mean and standard deviation. Independent sample t tests for parametric continuous variables were used. P-value of < 0.05 was considered statistically significant.

Results

Eighty patients underwent laparoscopic cholecystectomy. Mean age of the patient in Group A was 43.40 ± 13.45 years where as in Group B it was 44.80 ± 14.36 years. In Group A there were 26 females and 14 male patients whereas In Group B there were 28 females and 12 male patients as shown in Table 1. Mean duration of operative time in Group A was 90.22 ± 2.81 minutes whereas in Group B it was 80.97 ± 4.47 minutes which was statistically significant ($P < 0.001$) as shown in Table 3. Mean duration of hospital stay of Group A was 2.02 ± 0.15 days whereas Group B was 2.15 ± 0.36 days which was statistically insignificant as shown in Table 4. Out of 80 patients, 2 patients in Group A and 1 patient in Group B needed conversion to open cholecystectomy as shown in Table 5. During follow up in Out Patient Department, surgical site infection was noted in 3



patients of Group A and 1 patient of Group B as shown in Table 5.

Table 1: Demographic comparisons of Group A and Group B

Age (Years)	Group A(N=40)	Group B(N=40)	P value
	43.40±13.45	44.80±14.36	0.65
Sex	Female 26(65%) Male 14 (35%)	Female 28(70%) Male 12 (30%)	0.63

Table 2: Comparison of operative time between Group A and Group B

	Group A	Group B	P value
Operative time in minutes	90.22±2.81	80.97±4.47	<0.001

Table 3: Comparison of hospital stay between Group A and Group B

	Group A	Group B	P value
Duration of hospital stay in days	2.02±0.15	2.15±0.36	0.30

Table 4: Comparison of conversion to open cholecystectomy between Group A and Group B

	Group A	Group B	P value
Conversion to open cholecystectomy	2	1	0.55

Table 5: Comparison of wound infection between Group A and Group B

	Group A	Group B	P value
Wound infections	Infected = 3 Non infected =37	Infected =1 Non infected =39	0.30

Table 6: Laboratory results of Group A and Group B patients along with histopathological report

	Group A (n=40)	Group B(n=40)	P value
Laboratory Findings			
Bilirubin			
Total Bilirubin (mg/dl)	1.6 (0.4 – 3.7)	1.4 (0.4 – 2.6)	0.411
Direct Bilirubin (mg/dl)	0.64 (0.1 – 2.1)	0.2 (0.1 – 2.1)	0.034
AST/SGOT (IU/L)	56 (22 – 176)	29 (11 – 148)	0.239
ALT/SGPT (IU/L)	48(16 – 144)	21(10 – 98)	0.611
Alkaline phosphatase (IU/L)	91 (46 – 188)	116 (36 – 221)	0.262
Total leukocytes count (10 ⁹ /L)	14.3 (8.8 – 24.2)	15.1 (9.1 – 31.7)	0.165
Hemoglobin (mg/dl)	11.2 (8.2 – 17.4)	10.7 (7.1 – 15.6)	0.864
Urea (mg/dl)	15.1 (7.6 – 28.4)	13.6 (6.2 – 31.2)	0.391
Creatinine (mg/dl)	1.1 (0.7 – 2.2)	0.9 (0.6 – 2.8)	0.466
Histopathological Examination			
Acute gangrenous Cholecystitis	4	0	
Acute Cholecystitis	22	0	<0.001
Acute on chronic Cholecystitis	12	3	
Chronic Cholecystitis	2	37	

AST/SGOT = Aspartate transaminase / Serum glutamic oxaloacetic transaminase ALT/SGPT = Alanine transaminase / Serum glutamic pyruvic transaminase *Values are expressed as median (range) unless specified otherwise

Discussion

Laparoscopic cholecystectomy is gold standard treatment for symptomatic gall stone disease [1]. Phillipe Mouret from France did first laparoscopic cholecystectomy in 1987 [6]. However the treatment of choice for acute cholecystitis is still controversial. Laparoscopic cholecystectomy was considered as a relative contraindication for acute cholecystitis in early days [7, 8]. But recent meta-analysis and randomized controlled trials showed benefits of early cholecystectomy within 72 hours of one set of symptoms than delayed surgery in terms of morbidity, mortality and cost-effectiveness [3-5]. Therefore, we conducted prospective randomized control trial comparing early [Group A] versus delayed [Group B] laparoscopic cholecystectomy for treatment of acute cholecystitis.

Mean age of patient in Group A was 43.40±13.45 years whereas in Group B it was 44.80±14.36 years which does not show any statistical significant difference (p=0.65) with female predominance in each group as shown in Table 1. These findings were comparable with the study conducted by Shrestha et al, as well as a study conducted earlier in our institute [9, 10]. The mean duration of operative time in (Group A) patients was 90.22±2.81 minutes where as in (Group B) patients it was 80.97±4.47 minutes, which was statistically significant (p<0.001). The study conducted by Siddiqui et al who analyzed four clinical studies containing 375 patients mentioned longer operative time in early laparoscopic cholecystectomy [11]. Similar findings were shown by Skouras et al [12]. These two studies were comparable with our study. In our study, longer operative time was noted in (Group A) patients because our techniques were modified according to intraoperative findings of gall bladder such as some needed decompression of gall bladder, some underwent partial/subtotal cholecystectomy and drain placement was needed in few cases. All these procedures were time consuming. But very few cases in (Group B) needed such modifications.

The mean duration of Hospital stay in (Group A) patient was 2.02±0.15 days whereas in (Group B) it was 2.15±0.36 days which was statistically insignificant (p=0.30). These timings were calculated after operation to discharge of both groups of patients. But, if the total days of hospital admission are calculated, obviously it was longer in (Group B) patients because they needed second admission. The Swedish survey conducted from 1989 to 2006 for acute gallbladder disease, total hospital stay was shorter for patients who had emergency cholecystectomy compared with elec-



tive cholecystectomy [13]. Two patients in Group A and one patient in Group B needed conversion to open cholecystectomy with ($p=0.55$) which showed no statistical significant difference. The study conducted by Siddiqui et al also showed no difference in conversion rates between early and delayed laparoscopic cholecystectomy which is comparable with our study [11]. But the meta analyses of randomized clinical trials in the literature comparing early versus delayed laparoscopic cholecystectomy mentioned conflicting results on conversion rates [5, 11, 12, 14].

Surgical site infection was noted in three patients of Group A and one patient of Group B, which was statistically insignificant ($p=0.30$). However, the study conducted by Chang et al mentioned higher rate of wound infection in early laparoscopic cholecystectomy group compared with delayed group [4]. Laboratory findings like total leukocyte counts, renal function test, hemoglobin and liver function tests were comparable between two groups. However Acute Cholecystitis was prevalent feature on histopathological examination ($p < 0.001$) in Group A patients as shown in Table 6.

There was no significant difference between early versus delayed laparoscopic cholecystectomy in our study except operative time. However, early laparoscopic cholecystectomy avoided the second admission of patient, prevented the reattack of acute cholecystitis, resulted better quality of life thus reduced the morbidity of patient. Though we did not calculate the total cost of treatment, obviously it was more in (Group B) patients as they underwent two times hospitalization and treatment. Various study mentioned cost-effectiveness in early laparoscopic cholecystectomy [15, 16].

The study had some limitations that sample size was small and the hospital cost could not be analyzed. It was conducted in single center with limited follow-up of 4 weeks postoperatively and long term complications were not evaluated.

Conclusion

There was no significant difference between early versus delayed laparoscopic cholecystectomy. However, early laparoscopic cholecystectomy seems safe, shortens the total hospital stay and is cost-effective because there is no need of second hospital admission as well as second treatment.

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Conflict of interest: None

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