

Comparative Study between Early and Late Laparoscopic Cholecystectomy in the Treatment of Acute Cholecystitis

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) has become the gold standard in the treatment of symptomatic gallbladder stone. The common opinion about the treatment of acute cholecystitis (AC) is initially conservative treatment due to preventing complications of inflammation and following delayed laparoscopic cholecystectomy after 6–8 weeks. However, with the increase of laparoscopic experience in recent years, early LC has become more common.

Methods: This study included 40 patients of AC with comparison between early (20 patients) and delayed (20 patients) LC. In AC, initial conservative treatment was given and early LC performed within 72 hours and delayed LC was done after 6–8 weeks, both groups monitored since admission, during operations, and along the postoperative (PO) period.

Results: There was a significant difference in the successful LC conversion rates out of 20 each (20 early versus 19 delayed, p-value= 0.000), and conversion, open cholecystectomy (OC) to delay cholecystectomy conversion rates 5% or complication was found in delayed out of 20 in adhesion was 20%, wound Infection 1% and pain 15%; hospital stay was more significant in delayed LC 0.007 and USG finding in compared between early and delayed, was more common in delayed LC.

Conclusion: Intraoperative and PO complications being associated more with delayed LC as compared to early LC, so early LC should be preferred for treatment of AC.

Key-words: Acute cholecystitis, Early laparoscopic cholecystectomy, Delayed laparoscopic cholecystectomy, Open cholecystectomy

INTRODUCTION

The prevalence of cholesterol gallstones is increased in obese people. The risk is particularly high in those with a higher weight record. Weight reduction further builds the danger of gallstones. Around 33% of the stones are symptomatic. The expanded predominance of stones is generally because of super-saturation of bile with cholesterol, due to increased synthesis by the liver and emission into bile. Saturation is additionally increased during weight reduction ^[1,2]. LC is a method of choice in the management of calculus gallbladder disease in the general population.

Laparoscopic cholecystectomy has become the gold standard in the treatment of symptomatic gallstone disease. The significant points of interest of LC incorporate less PO pain, less time required for hospitalization and recovery and better cosmetic results. The general view in the treatment of AC is to firstly administer conservative therapy to prevent possible complications associated with inflammation and afterwards following 6 to about 8 weeks, to perform LC. Although over 70% of such patients respond to clinical treatment within the initial 24 to 48 hours ^[3,4].

The benefits of this minimally invasive technique over open surgery are less PO pain, earlier mobilization; less pulmonary function impairment, decreased operative stress, and a shorter hospital stay ^[5]. Be that as it may, the ideal timing of cholecystectomy in patients with AC stays disputable. The refreshed Tokyo Guidelines propose that an early laparoscopic cholecystectomy (ELC) is compulsory for patients with mild cholecystitis,

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whereas delayed laparoscopic cholecystectomy (DLC) can be performed in patients with moderate or severe cholecystitis [6]. The customary treatment (introductory) of acute calculus cholecystitis incorporates bowel rest, intravenous hydration, and normalization of electrolyte abnormalities, analgesia, and intravenous antibiotics [7-10]. As this strategy, requested a tremendous involvement with LC, the number of specialists performing early LC for AC in India is little inferable from the late presentation of methodology in our nation. Till now, the specific planning and potential advantages of early laparoscopic removal of gall bladder have not been settled and keep on being questionable [11]. Anyway, with the increase of laparoscopic involvement with ongoing years, early LC has gotten increasingly more common.

MATERIALS AND METHODS

The study was based on case-control and conducted in the Department of General Surgery, Associate LLRM Hospitals, GSVM Medical College, Kanpur, India from January 2018 to October 2019 on patients, who were admitted from casualty and outpatients department with a diagnosis of AC.

Inclusion criteria

- Age group >15–70 years
- Symptomatic gallstone disease (SGBS)
 - Biliary colic pain
 - Acute cholecystitis

Exclusion criteria

- Age below 15 or above 70 years
- Not willing to participate
- Severe concomitant disease
- Suspected Common Bile Duct stone
- Asymptomatic gall stone disease
- Acalculous cholecystitis

Selection of Early and Late laparoscopic cholecystectomy- Evaluation of these patients would be based on patient's characteristics, comprehensive study, hematological and radiological parameter, these patients would be taken for LC. Those patients, who were not fit or not willing for LC would be undergone OC.

The patients, who presented with AC was divided into two groups on alternate basis patients of one group go for early surgery within 72 hours onset of symptoms and the other group was managed conservatively and was

undergone LC after 6 weeks. The comparison was done between operative parameters of both the groups.

Operative parameters

- (a) Assess to peritoneal cavity: Access will be also designated as easy or difficult.
- (b) Gall bladder dimension: GB will be either designated as contracted, normal or distended (as in mucocele or empyema).
- (c) Calot's triangle anatomy: Calot's triangle anatomy will be designated normal, variable or obscure.
- (d) Calots triangle adhesions: Adhesions would be mentioned either present or absent.
- (e) Calot's triangle dissection: will be designated as easy or difficult.
- (f) Dissection of gall bladder from bed: Designated as easy or difficult.
- (g) Spillage of bile and stones: Designated as yes or no.
- (h) Duration of Surgery: Duration of surgery will be defined as the time taken from the first incision to the closure of the last port.
- (i) Conversion to open: Conversion to open will be designated as yes or no and cause of conversion was mentioned.

Statistical Analysis- The results are presented in mean±SD, percentage and chi square test. Percentage of test was used to compare the categorical variables between present or absent complication. The p-value<0.05 was considered significant. All the analysis was carried out by using SPSS 21.0 version (Chicago, Inc., USA).

RESULTS

Demographic findings- As depicted in Table 1, the study groups, which underwent early or delayed laparoscopic cholecystectomy, showed no difference in age and sex distribution. Initial clinical findings and medical history were also similar between groups, except for the fever, which was significantly higher in the delayed to early LC group (54.77±10.57 versus 43.2±2.76; p=0.0001) respectively.



Table 1: Demographic data of patients in the early and delayed LC groups

Variables	Early LC (n=20)	Delayed LC (n=20)	p-Value
Age	30.5±7.52	40.12±13.04	0.006
Sex (%)			
Male	0(0)	2(10)	>0.05
Female	20(100)	18(90)	
Hospital stay	2.4±0.50	2.7±0.82	0.1705
Pain duration (h)	1.85±0.366	1.8±0.383	0.6753
Operation time	43.2±2.76	54.77±10.57	0.0001

The complication rate, conversion to early laparoscopic cholecystectomy and duration of surgery showed no significant differences between early and late laparoscopic cholecystectomy except for jaundice no complications for the early and delayed LC group (Table 2).

Table 2: Complications early and delayed LC groups

Complains	Early (n=20)	Delayed (n=20)
Right Hypochondrial Pain		
Present	20 (100%)	3(15%)
Absent	0(0%)	17(85%)
Fever		
Present	3(15%)	1(5%)
Absent	17(85%)	19(95%)
Vomiting		
Present	12(60%)	0(0%)
Absent	8(40%)	20(100%)
Nausea		
Present	8(40%)	2(10%)
Absent	12(60%)	18(90%)
Jaundice		
Present	0(0%)	0(0%)
Absent	20(100%)	20(100%)

In Table 3, total each group 20 patients undergone USG finding of the whole abdomen, in early and LC size

distended (100%), gall bladder wall thickness (100%), multiple stones (100%), CBD normal (100%), IHBR not dilated (100%); in delayed LC bladder size distended (40%) and normal (60%), gall bladder wall thickness (85%) and normal (15%), multiple stones (80%) and solitary stone (20%), CBD normal (100%), IHBR normal (100%), respectively.

Table 3: USG findings in early and delayed laparoscopic Cholecystectomy

USG Finding	Early (n=20)	Delayed (n=20)
Gall Bladder Size		
Distended	20 (100%)	8 (40%)
Normal	0 (0%)	12 (60%)
Gall bladder wall thickness		
Normal	0 (0%)	3 (15%)
Thickened	20 (100%)	17(85%)
Gall Bladder Stone		
Multiple Stone	20(100%)	16(80%)
Solitary Stone	0 (0%)	4(20%)
CBD		
Normal	20 (100%)	20 (100%)
Dilated	0 (0%)	0 (0%)
IHBR		
Dilated	0 (0%)	0 (0%)
Normal	20 (100%)	20 (100%)

IHBR= Intrahepatic Biliary Radicals, CBD= Common Bile Duct

Table 4 shows the pearson correlation between hospital stay in early LC to delayed LC was positive significant (p= 0.007) and delayed LC to early LC was not significant correlation (p=0.295), respectively.

Table 5 shows the conversion rate in early was 0% and in delayed cases, conversion to Open Cholecystectomy (5%); It was statically significant (p value=0.000) respectively.



Table 4: Comparison of hospital stays in early and delayed laparoscopic Cholecystectomy

		Early LC	Delayed LC	
Early cholecystectomy	Pearson Correlation	1	-.246	
	Sig. (2-tailed)	0.007*	.295	
	Sum of Squares and Cross-products	4.800	-2.000	
	Covariance	.253	-.105	
	N	20	20	
	Delayed cholecystectomy	Pearson Correlation	-.246	1
		Sig. (2-tailed)	.295	0.007*
Sum of Squares and Cross-products		-2.000	13.750	
Covariance		-.105	.724	
N		20	20	

LC- Laparoscopic cholecystectomy

Table 5: Comparison of conversion rate in early and delayed LC

Procedure	Early (n=20)	Delayed (n=20)	p= value
Successful LC	20	19	
Conversion to OC	0	1	0.000*
Conversion rate	0%	5%	

OC= Open cholecystectomy, LC= Laparoscopic cholecystectomy

Table 6 shows the correlation between intra operative was CBD injury in early and delayed statically significance (p-value=0.00) with no complication. GIT injury in early and delayed statically significance (p-value =0.00) with no complication. Adhesion in delayed LC was found (20%). In post operative delayed, LC complication was wound infection (5%) and pain (15%) found.

Table 6: Comparison of complication in early and delayed LC in intra and post operative cases

Complication (Intra Operative)	Early Laparoscopic (n=20)	Delayed Laparoscopic (n=20)
CBD Injury	0 (0%)	0 (0%)
GIT Injury	0 (0%)	0 (0%)
Adhesion		
Found	0(0%)	4 (20%)
Not Found	0 (0%)	16 (80%)
Complication (Post Operative)		
Biliary Leakage	0 (0%)	0 (0%)
Wound Infection	0 (0%)	1 (5%)
Pain		
Yes	0(0%)	3(15%)
No	0 (0%)	17 (85%)

Intra-abdominal gastrointestinal Injury (GIT Injury), Common Bile Duct (CBD)

DISCUSSION

The occurrence of gall stone disease is on a rise globally due to vast dietary changes, way of life changes related to high junk diet utilization and increment inactive way of life alteration. The predominance of cholelithiasis (acute and chronic) is variable and has been accounted for like 2–29% in India with differences in interstate and interregional. The commonness was generally normal among North Indians than South Indians especially among the individuals of the seaside locale. This is mostly credited to westernization and facilitates of accessibility of examination under USG or looks for clinical consideration because of episodic pain in the abdomen. Cholelithiasis is a very common surgical problem.

The aggregate of 40 cases were included in the present study and informed written consent was acquired from all the cases. Beksac *et al.* [12] described in their study, age group from 15 years to 70 years of AC were most common during the early LC of the most widely recognized age group 26–35 years (40%) and delayed LC of the most well-known age group 36–45 years (55%). The mean age of the study group was early (30.5±7.52), delayed (40.12±13.04) and statically importance p-value 0.006. the comparable study was observed by Pimpale *et*

al. [13], total of 92 patients were enlisted of which 62 (68.89%) were female, with mean period of 45.03±13.59. LC was done in 71 (77.17%) patients with a conversion rate of 6.57%. Total 19 (20.65%) were OC with or without CBD exploration and 2 experienced LC. Gender distribution in early male (0%) and female (100%) and Delayed Laparoscopic male (10%) and female (90%) it isn't significant (0.993).

Previous study i.e. Zhong *et al.* [14] was similar to our study, the overall morbidity and complications are less in ELC contrasted with DLC. Mean number of hospital stay was less in ELC (4.90%), while DLC (6.30%). The mean number of long periods of anti-microbial inclusion was less in ELC (3.9 days) in compared to DLC (5.30 days). Mean operative time was less in ELC (60 minutes) and DLC (82 minutes). Overall the complications, morbidity, mortality, ICU admissions, and readmissions are less in early LC (Madhu and Kumar [15]) at the similar study preferred to our approach for patients managed by surgeon with adequate experience in LC.

In past study, Verma *et al.* [16] was found no significant difference in the conversion rates (3 early versus 2 delayed), PO analgesia requirements, postoperative pain scores, or span of postoperative stay (1.67 days early versus 1.47 days delayed). Our study concluded that early LC for AC is safe and feasible, offering the extra advantage of a shorter hospital stays. It should be offered to patients with AC, provided the surgery is performed within 72 h from the beginning of side effects.

Ozkardes *et al.* [17] past outcome was compared about the clinical result and cost of early versus delayed LC for AC. Sixty patients with AC were randomized into early (within 72 hours of admission) or delayed (following 6-8 weeks of conservative treatment) LC groups. Intraoperative and PO complications were recorded in 8 patients in the delayed LC groups, whereas no complications happened in the early LC groups (P=0.002). Our study was finding that of intraoperative and PO complexities being related more with delayed LC compared with early intervention, early LC should be favored for treatment of AC as a result of its advantages of shorter hospital stay and lower cost.

CONCLUSIONS

The level of difficulty in technique, peri-operative and post-operative complication and hospital stay were higher in delayed laparoscopic cholecystectomy. If

surgeons with adequate experience and laparoscopic cholecystectomy for acute cholecystitis performed within 72 hours of admission then above complications were reduced.

Finally, the outcome of this study was intra-operative and PO complications being associated more with delayed LC as compared to early LC, so early LC should be preferred for treatment of AC.

CONTRIBUTION OF AUTHORS

Research concept- Prof. GD Yadav, Dr. Manish Kumar

Research design- Dr. Manish Kumar

Supervision- Prof. GD Yadav

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Data collection- Dr. Manish Kumar

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