

Comparative Study of Early versus Delayed Laparoscopic Cholecystectomy in Acute Cholecystitis and its Associated Complications**Pankaj Kumar¹, Amit Kumar²**¹Assistant Professor, Department of General Surgery, NMCH, Jamuhar, Sasaram²Assistant Professor, Department of General Surgery, NMCH, Jamuhar, Sasaram

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Conflict of interest: Nil

Abstract

Background and Objectives: Acute cholecystitis is a common surgical problem and was usually treated with conservative management followed by a delayed laparoscopic cholecystectomy after an interval of 6 to 8 weeks. Our aim was to compare the efficacy of immediate laparoscopic cholecystectomy (ELC) with delayed laparoscopic cholecystectomy (LLC) in patients of acute cholecystitis, and also to assess the complications between the two.

Materials and Methods: This is prospective Study randomized controlled trial in NMCH Jamuhar Sasaram. Study duration of Two years. that was conducted on 50 consecutive patients diagnosed to have acute cholecystitis. 25 patients underwent immediate laparoscopic cholecystectomy within 24-72 hours of admission and 25 patients underwent a delayed laparoscopic cholecystectomy after 6- 8 weeks of the initial episode.

Conclusion: Early laparoscopic surgery had similar intraoperative and postoperative complications compared to delayed surgery in acute cholecystitis, but was associated with a shorter surgery and lesser stay in hospital.

Keywords: Early laparoscopic cholecystectomy, Delayed laparoscopic cholecystectomy, Late laparoscopic cholecystectomy, acute cholecystitis.

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Introduction

Acute cholecystitis is a common general surgical emergency scene in various setting from district hospital to specialized tertiary level institutions. [1] Acute cholecystitis is due to gallstones in up to 90% of patients the reported prevalence of gallstones is up to 10% in adult Eastern population and upto 15% in adult Western population. It is estimated that 20 to 40% of individuals with gallstones will develop associated symptoms and 12% will develop after cholecystitis. [2] First performed in 1985 by Dr. Erich Muhe. Laparoscopic cholecystectomy has now replaced open cholecystectomy as a first choice of treatment for gallstones and information of the gallbladder unless contraindications are found with the laparoscopic approach. With the development in laparoscopic skills and equipment, laparoscopic cholecystectomy has been reported to have significantly lower complication rates than open cholecystectomy. [3] Now-a-days, laparoscopic cholecystectomy for acute cholecystitis is mainly performed after the acute episode occurs while conservative therapy, usually antibiotics, and delayed laparoscopic cholecystectomy are still common in many centers. [3] Laparoscopic cholecystectomy is currently the gold standard treatment. [4] Many prospective randomized studies demonstrated that early

cholecystectomy within 7 days of the onset of symptoms was the preferred strategy to manage the acutely inflamed gallbladder, because of shorter hospital stay and reduced potential risk of late complications such as gangrenous or emphysematous cholecystitis, without an increase of postoperative morbidity and mortality. [5] However, the timing of laparoscopic cholecystectomy still remains controversial regarding the inflammation, edema, and adhesions during the acute course of the disease. [3]

Objectives

To assess the benefits of early laparoscopic cholecystectomy compared with delayed laparoscopic cholecystectomy in patients with acute cholecystitis.

To assess the complications associated with early laparoscopic cholecystectomy and delayed laparoscopic cholecystectomy in patients with acute cholecystitis.

Material and Methods

This is prospective Study randomized controlled trial in NMCH Jamuhar Sasaram Rohtas. that was conducted on 50 consecutive patients diagnosed to have acute cholecystitis. 25 patients underwent

immediate laparoscopic cholecystectomy within 24-72 hours of admission and 25 patients underwent a delayed laparoscopic cholecystectomy after 6- 8 weeks of the initial episode. All patients presenting with acute cholecystitis to Narayan medical college and hospital Sasaram, Bihar. Study duration of Two years.

Inclusion Criteria

All adults, between the ages 25 to 60 years, were chosen for the study who presented with features of acute cholecystitis were then diagnosed with acute cholecystitis based on clinical and relevant investigations.

Acute upper abdominal pain with tenderness under the right costal margin; fever more than 37.5 C. Leukocytosis.

Ultrasonographic evidence (thickened gallbladder wall, edematous wall, and presence of gallstones, ultrasonographic Murphy's sign, and Pericholecystic fluid collection).

ERCP optional.

Exclusion Criteria

Adults also diagnosed to have the following were excluded:

- Acute pancreatitis,
- Cholangitis
- Choledocholithiasis

This was a randomized control study and the randomization was done by odd-even method.

The sample size of the study was 50 patients.

Patients fulfilling the selection criteria were invited to participate in the study and informed consent was taken.

Patients were clinically examined and following investigations are done:

CBC, RFT, LFT, GRBS, Serum Electrolytes, Serology, Urine Routine and Microscopy. USG Abdomen, Chest X-Ray, ERCP optional.

All selected patients were randomized into two groups – one group underwent early laparoscopic cholecystectomy (ELC) and the second group underwent delayed or late laparoscopic cholecystectomy (LLC). The early operation group was operated on within 24 -72 hours of admission (25 patients), whereas the late operation group were started on conservative treatment and were discharged after a complete relief of symptoms and were called for laparoscopic cholecystectomy after 6 or 8 weeks, when the acute episode had subsided (25 patients).

All patients were followed up till postoperative discharge of the patient.

Results

Table 1: Distribution of subjects according to sex between 2 groups (ELC and LLC)

SEX	Surgery		Total	P value
	ELC	LLC		
Female	12 48.0%	12 48.0%	24 48.0%	1.00
Male	13 52.0%	13 52.0%	26 52.0%	
Total	25 100.0%	25 100.0%	50 100.0%	

48% of the subjects were female and 52% of them were male. Male and female had equal distribution in both types of surgery. There was no statistical significant difference found between distribution of subjects according to sex between 2 groups (ELC and LLC).

Table 2: Comparison of Mean Age between 2 groups (ELC and LLC)

	Surgery	Mean	Std. Deviation	P value
Age (in years)	ELC	40.16	10.148	0.227
	LLC	36.92	8.490	

Mean age in ELC was 40.16yrs±10.14yrs and Mean age in LLC was 36.92yrs±8.49yrs. There was no statistical significant difference found between the mean ages between 2 groups (ELC and LLC).

Table 3a: Distribution of subjects according to vomiting between 2 groups (ELC and LLC)

Vomiting	Surgery		Total	P value
	ELC	LLC		
NO	13 52.0%	18 72.0%	31 62.0%	0.260
YES	12 48.0%	7 28.0%	19 38.0%	

Total	25	25	50	
	100.0%	100.0%	100.0%	

12 patients (48%) in ELC group and 7 patients (28%) in LLC group presented with complaints of vomiting. There was no statistical significant difference found between vomiting between 2 groups (ELC and LLC).

Table 3b: Distribution of subjects according to guarding between 2 groups (ELC and LLC)

Guarding	Surgery		Total	P value
	ELC	LLC		
NO	23	23	46	1.000
	92.0%	92.0%	92.0%	
YES	2	2	4	
	8.0%	8.0%	8.0%	
Total	25	25	50	
	100.0%	100.0%	100.0%	

On examination 2 patients (8%) in ELC group and 2 patients (8%) in LLC group had guarding. There was no statistical significant difference found between guarding between 2 groups (ELC and LLC).

Table 4: Distribution of subjects according to pericystic fluid collection between 2 groups (ELC and LLC)

Pericystic Fluid Collection	Surgery		Total	P value
	ELC	LLC		
NO	13	8	21	0.176
	52.0%	32.0%	42.0%	
YES	12	17	29	
	48.0%	68.0%	58.0%	
Total	25	25	50	
	100.0%	100.0%	100.0%	

12(48%) patients in ELC and 17(68%) patients in LLC were found to have pericystic fluid collection. There was no statistical significant difference found between pericystic fluid collection between 2 groups (ELC and LLC).

Table 5: Comparison of mean duration of surgery between the 2 groups (ELC and LLC)

Duration Of Surgery (In Mins)	Surgery	Mean	Std. Deviation	P value
	ELC	76.16	23.387	
LLC	116.48	23.141		

Mean duration of surgery was more in LLC when compared with ELC. There was a statistical significant difference found between duration of surgery and the 2 groups

Table 6: Comparison of mean hospital stay between the 2 groups (ELC and LLC)

Hospital Stay (in days)	Surgery	Mean	Std. Deviation	P value
	ELC	3.84	2.267	
LLC	6.48	5.774		

Mean hospital stay was more in LLC when compared with ELC (6.48 days vs 3.84 days). There was a statistical significant difference found between hospital stay and type of surgery.

Discussion

Acute cholecystitis develops in up to 10% of patients with symptomatic gall stone disease. In 90-95% of cases, acute cholecystitis is related to gall stone disease and is caused by complete obstruction of the cystic duct. At the time of introduction of laparoscopic cholecystectomy, acute cholecystitis was a relative contraindication, but with increased experience, laparoscopic cholecystectomy has become the gold standard method to treat the condition.

Till recently, a patient with acute cholecystitis would be treated non-operatively and would be

advised an interval cholecystectomy – which was usually planned after 6 to 8 weeks. Over years, many randomized controlled trials have demonstrated no difference in morbidity among patients undergoing early versus delayed surgery. In fact, early cholecystectomy reduced overall hospital stay and costs. Early cholecystectomy also decreases the risks of failed conservative management and recurrent bouts of acute cholecystitis in the waiting period. In our study, the mean age of patients undergoing early laparoscopic cholecystectomy was 40.16yrs±10.14yrs and the mean age in late laparoscopic cholecystectomy group was a statistically comparable 36.92yrs±8.49yrs. 13 female and 12 male patients underwent early cholecystectomy and 13 female and 12 male patients underwent late laparoscopic cholecystectomy respectively. Totally, 48% of subjects were male and 52% of them were

female. In a study by Ann Y. Lee et al [6], the mean age of patients in ELC age group was 44 ± 16 yrs while in LLC group was 42 ± 14 yrs and was found to be statistically insignificant as well. A study by Alper Bilal Ozkerdes (2014) [7] showed that both groups revealed similar physical examination findings: all patients had tenderness and defence in the abdominal area (this term means tensing the muscles in the abdominal area, a clinical finding that may present when the internal organs are inflamed in some manner) and 90% had Murphy sign, and 13.3% in the early and 26.7% in the late laparoscopic cholecystectomy groups had rebound tenderness. Blood count and liver function results were not different between groups. Another study conducted by Abdulmohsen A et al (2008) [8] showed that there were 2 conversions (2.4%) in ELC and 8 in LLC (7%) ($P=0.3$). Obscure anatomy at Calot's triangle was the sole reason for conversion in group 1. A study by Christos Skouras (2012) [9] showed no significant difference was demonstrated in the morbidity, but the DLC group had a larger number of complications (13% in the ELC group versus 29% in the DLC group, $P=0.07$). One of the DLC patients that underwent an urgent interval procedure suffered a common bile duct injury, which was managed with a hepaticojejunostomy. Guruswamy et al (2013) [10] performed a meta-analysis of 5 randomized controlled trials; the RCTs of Lo et al, Lai et al, Johansson et al and Kolla et al were included, as well as the RCT of Dávila et al. A study conducted by Zhu B et al (2012) [11] showed that patients undergoing ELC experienced a significantly shorter operating time (44.1 ± 5.32 vs. 66.4 ± 3.05 min, $p<0.01$). There was no significant difference regarding wound infection rates [$1/34$ (2.94 %) vs. $2/99$ (2.02 %), $p>0.05$] or postoperative hospital stay (6.50 ± 1.31 vs. 6.67 ± 0.73 , $p>0.05$) between groups. A retrospective analysis by Minutolo V (2014) [12] included 91 patients, 52 female and 39 male, with a mean age of 55. Early surgery was performed in 32 cases and delayed surgery in 59 cases. The two groups were comparable for demographics data and severity of disease on admission. Uchiyama K et al 2004 [13]: A retrospective analysis of 73 patients with acute cholecystolithiasis who were treated by either early laparoscopic cholecystectomy within 72 hours after initial onset or initial conservative treatment followed by delayed laparoscopic cholecystectomy 4 days later. A retrospective cohort study by Sánchez-Carrasco M et al (2016) [14] included 1043 patients, with a group of 531 EC cases and a group of 512 DC patients. The following parameters were recorded: (1) postoperative hospital morbidity, (2) hospital mortality, (3) days of hospital stay, (4) readmissions, (5) admission to the Intensive Care Unit (ICU), (6) type of surgery, (7) operating time, and (8) reoperations.

Conclusion

DLC is associated with a longer total hospital stay but equivalent morbidity as compared to ELC for patients presenting with acute cholecystitis. ELC would appear to be the treatment of choice for patients presenting with ELC.

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