

## Original Research Article

# Early laparoscopic cholecystectomy in acute cholecystitis: safety and advantages

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## ABSTRACT

**Background:** Cholecystectomy is a widely performed procedure all over world though popularized late in India. Today, Laparoscopic cholecystectomy is the method of choice to remove gall bladder. A concern exists in the minds of surgeons when it comes to immediate removal of an acutely inflamed gall bladder, laparoscopically. To analyze this hesitation, statistically, this study has been carried out.

**Methods:** A prospective and randomized study was conducted among 66 patients from March 2013 to February 2016. Thirty three patients presenting with acute calculous cholecystitis were subjected to delayed laparoscopic cholecystectomy (Group A) after an initial conservative treatment and gap of 6-8 weeks. Another group of 33 patients presenting with acute calculous cholecystitis were taken up for laparoscopic cholecystectomy within 72 hours of onset of symptoms (Group B). Results obtained, in both the groups, under different headings were compared and analyzed.

**Results:** Time taken for early laparoscopic cholecystectomy was significantly higher than that for delayed laparoscopic cholecystectomy. Cost of treatment and total hospital stay in delayed group was significantly high as compared to early group. No significant difference was found in incidence of conversion rate, common bile duct (CBD) and gastrointestinal tract (GIT) injury, requirement of drain, postoperative pain and analgesia requirement and port related complications.

**Conclusions:** Early cholecystectomy in acute cholecystitis is feasible, safe, cheaper and requires shorter hospital stay, if, performed within 72 hours of onset of symptoms.

**Keywords:** Acute cholecystitis, Laparoscopic cholecystectomy, Early, Delayed

## INTRODUCTION

Laparoscopic removal of gall bladder is the most common procedure practiced all over this planet.<sup>1</sup> We have been studying acute cholecystitis as contraindication for cholecystectomy and it was advised to first admit and treat the patient with nil per oral, intravenous fluids, antibiotics and analgesics. After remission of symptoms patient was discharged. Cholecystectomy was planned after an interval of 6-8 weeks.<sup>2,3</sup> This all was due to a concern in the mind of surgeons regarding unclear anatomy at inflamed Calot's triangle, chances of CBD and GIT injuries, excessive bleeding, high chances of

conversion, etc. Then, randomized and controlled trials were conducted to evaluate benefits of early laparoscopic cholecystectomy (performed within 72 hours of onset of symptoms) in acute cholecystitis with respect to overall cost and hospital stay for treatment, without affecting the morbidity and mortality.<sup>2,4,5</sup> Meta-analyses of such studies also supported the findings.<sup>6</sup>

In western world early laparoscopic cholecystectomy for acute cholecystitis started gaining popularity in 1980s but after carefully examining the results studies all over world the Japanese Society of Hepato-Biliary-Pancreatic Surgery in "The updated Tokyo Guidelines announced in

2013” cautiously suggested that early laparoscopic cholecystectomy is the first-line treatment in patients with mild acute cholecystitis, whereas in patients with moderate acute cholecystitis, delayed/elective laparoscopic cholecystectomy after initial medical treatment with antimicrobial agents is the first-line treatment.<sup>7</sup>

However, till now only a minority of surgeons is performing early laparoscopic cholecystectomy.<sup>8-10</sup> As this procedure demands a huge experience in laparoscopic cholecystectomy, the number of surgeons performing early laparoscopic cholecystectomy for acute cholecystitis in India is very small owing to late introduction of procedure in our country. Till now, the exact timing and potential benefits of early laparoscopic removal of gall bladder have not been clearly established and continue to be controversial.<sup>11</sup>

This study is aimed at evaluating peroperative and postoperative complications and benefits in terms of cost and hospital stay when acutely inflamed gall bladder is removed immediately using laparoscope instead of conservative management followed by elective removal.

## METHODS

This study was carried out in a prospective and randomized fashion at Sri Guru Ram Das Institute of Medical Sciences and Research, Sri Amritsar between March 2013 and February 2016. Patients with physical, laboratory and ultrasonological findings corroborating with acute cholecystitis and who were operated laparoscopically were included in the study. To be acute cholecystitis, following criteria were to be fulfilled: right subcostal tenderness and pain; leucocytosis; distended, thickened and oedematous gall bladder with gall stones and pericholecystic fluid collection on ultrasound examination. Patients below 18 years and above 60 years, having severe medical ailments, pancreatitis, CBD stones, previous surgeries and diabetes were not included.

During 3 years period, 66 patients were studied. Thirty three patients with acute cholecystitis were admitted and treated conservatively with fasting, intravenous fluids, antibiotics and analgesics till the symptoms subsided. Patients hospital stay and treatment cost during this period was noticed and discharged. These patients constituted group A and were subjected to elective delayed laparoscopic cholecystectomy after 6-8 weeks interval. Other 33 patients with acute cholecystitis underwent laparoscopic cholecystectomy within 72 hours of onset of symptoms and they constituted group B. Patients diagnosed as having acute cholecystitis were randomized using a table of random numbers.

Laparoscopic cholecystectomy was performed using standard four port technique and oral intake to the patient was allowed 12 hours after surgery if patient had no nausea/vomiting. Severity of pain was calculated using

visual analog scale (VAS) and pain relief was achieved with diclofenac (75 mg) intramuscular injection or tablet depending upon patients' ability to accept orally.

Intraoperatively, operative time starting from incision for first port to stitch application to last port, conversion to open procedure, gall bladder perforation, CBD/GIT injury and requirement for drain were noted down.

In postoperative period, severity of pain using VAS and analgesic requirement, port infection and hospital stay was noticed in each patient. Each patient was discharged when he/she was accepting orally, afebrile, passing urine and stools, port stitches were healing and healthy and having reasonable control of pain with oral analgesic.

Total cost and hospital stay for treatment in group A was calculated summing up the cost and hospital stay for conservative and operative treatment. Mean hospital stay and cost was calculated using the total number of patients in each group as denominator.

Statistical analysis was performed using paired-test and Pearson chi-square test. “p” value <0.05 was considered as of statistical significance.

## RESULTS

Total 66 patients were evaluated, 33 in delayed and another 33 in early group. Both the groups were evenly matched with respect to age, sex and clinical and laboratory parameters. Results obtained in both the groups under various observation headings are tabulated in Table 1.

Time Taken for laparoscopic cholecystectomy in early group was significantly higher ( $p = 0.00$ ) than that in delayed group.

Though postoperative stay in early cholecystectomy group was insignificantly higher ( $p = 0.231$ ), total hospital stay (stay for conservative management + postoperative stay) was significantly higher ( $p = 0.00$ ) in delayed cholecystectomy group. Consequently, cost incurred on overall treatment (conservative treatment+operative treatment) for delayed removal of gall bladder was also significantly raised ( $p = 0.00$ ).

Difference in duration of intractable pain and requirement of analgesia after surgery in both groups was statistically insignificant ( $p = 0.128$ ) and same were the results with respect to requirement of drain after surgery in both the groups ( $p = 0.414$ ).

Conversion rate in early cholecystectomy and delayed cholecystectomy group didn't show significant difference ( $p = 0.572$ ). Five patients in each group had gall bladder perforation during surgery ( $p = 1.00$ ). No patient in either of the groups suffered CBD/GIT injury and 3 patients in each group had port infection.

**Table 1: Comparison of results between two groups.**

	Delayed laparoscopic cholecystectomy (Group A) n=33	Early laparoscopic cholecystectomy (Group B) n=33	p value
Mean age of patients (Yrs)	42.4	43.1	0.128
-Sex of patients (M/F)	8/25	6/27	
-Pain duration (Hrs.)	30	34.69	
-Operative time (min.)	54.45	63.33	0.000
-Postop hosp. stay (Days)	1.363	1.51	0.231
Conversions	5	4	0.572
Gall bladder perforations	5	5	1.000
Drain required	22	20	0.414
Total hosp. stay (Days)	7.9	1.51	0.000
Cost (INR)	18260	7853	0.000

**Table 2: Paired samples test.**

	Paired differences							
	Mean	Std. deviation	Std. error mean	95% Confidence limit		t	df	Sig. (2-tailed)
				Lower	Upper			
Pain duration	-1.45455	5.34492	93043	-3.34977	44068	-1.563	32	0.128
Operative time	-8.66667	4.48377	0.78052	-10.25654	-7.07679	-11.104	32	0.000
Post op hospital stay	-0.15152	0.71244	0.12402	-0.40414	0.10111	-1.222	32	0.231
Conversion	-0.06061	0.60927	0.10606	-0.27664	0.15543	-0.571	32	0.572
GB perforations	0.00000	0.50000	0.08704	-0.17729	0.17729	0.000	32	1.000
Drain required	0.09091	0.63066	0.10978	-0.13271	0.31453	0.828	32	0.414
Total hospital stay	6.1212	1.43086	0.24908	5.61385	6.62857	24.575	32	0.000
Cost	10382.90909	413.51424	71.98359	10236.28332	10529.53486	144.240	32	0.000

## DISCUSSION

Till recent past, cholecystectomy, 6-8 weeks after the episode of acute cholecystitis has been a standard protocol due to the belief that chances of hemorrhage, CBD/GIT/Liver injuries and conversion rate are high if surgery is attempted in acutely inflamed gallbladder.<sup>9</sup> As the experience and confidence of surgeons in laparoscopic cholecystectomy rose up, several clinical trials, though samples were small in size, proved that early laparoscopic cholecystectomy in acute cholecystitis is feasible, safe, cheaper and requires shorter hospitalization.<sup>2,4,9,10,12</sup> It was further suggested that these results can be achieved only if cholecystectomy is attempted within golden "first 72 hours" after the onset of symptoms of acute cholecystitis as the adhesions during

this period are not fibrosed and natural planes are preserved.<sup>13</sup>

Early laparoscopic cholecystectomy in acute cholecystitis is still not popular in India owing to the late introduction and sluggish spread of laparoscopic technique of gall bladder removal in our country.

Time taken for early laparoscopic cholecystectomy in our study was significantly higher due to obscure anatomy and friability at and around Calot's triangle. Distended, oedematous and friable gall bladder which gets easily perforated and stones spill out (if patience is not shown) are other reasons of more time consumption. These few extra minutes benefitted the early group patients by a huge margin in the cost and total hospital stay. We recommend aspiration of gallbladder at the start of early

cholecystectomy so that it is easy to handle, does not perforate readily and Calot's triangle is more retractable. Usage of blunt instruments like spatula and irrigation cannula, are of great help in dissection. Perforated gallbladder and spilled out stones were taken out using retrieval bag. Subhepatic drain was liberally used in both the groups and its requirement in both groups did not show significant difference.

A mental stress on patients of delayed group during 6-8 weeks waiting interval for surgery is an additional disadvantage which is not taken into account by the studies. It was observed in our study that 4 patients allocated to the delayed group had recurrent acute cholecystitis during 6-8 weeks waiting interval. These patients were operated within 72 hours of recurrence and excluded from the study. Patients suffering recurrent interval acute cholecystitis were replaced by other four patients by random selection.

Difference of cost and total hospital stay between two groups is very high in magnitude. In today's world, people are very much short of two things i.e. time and money.

Severity of pain and hence requirement of analgesics did not differ much in either of the groups as the type and method of surgery required was same.

Conversion rate was almost similar in both the groups due to obscure anatomy at Calot's triangle. Oedema and friability are the reasons of obscurity in early group while dense and fibrosed adhesions at Calot's triangle were the cause of conversion in delayed group. No CBD/GIT/major liver injury was noticed in either of the groups due to patient approach and flexible attitude towards conversion.

## CONCLUSION

Early laparoscopic cholecystectomy in acute cholecystitis is possible, safe, costs less and requires shorter hospital stay without affecting the morbidity and mortality if performed within 72 hours of onset of symptoms.

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