



INCIDENCE OF COMPLICATIONS IN EARLY Vs. LATE LAPAROSCOPIC CHOLECYSTECTOMY AFTER ACUTE CHOLECYSTITIS

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ABSTRACT

Background: The most favorable moment for doing a cholecystectomy in cases of acute cholecystitis has been the focus of a great deal of study. In various studies, "early" cholecystectomy has been described differently, ranging from gallbladder surgery done within 3, 7, or 10 days of the onset of signs. On the other hand, "delayed" cholecystectomy has been described as the surgical procedure performed 7 or 45 days, or 6 weeks, following the initial diagnosis.

Aim and objectives: to estimate the efficacy of laparoscopic cholecystectomy with regard to the medical care of acute cholecystitis at two different time points: early (within a week) and late (afterward 6 weeks).

Subjects and methods: This prospective randomized controlled research was done throughout the period from November 2019 until July 2021 at the General Surgery Department, Beni-Suef University Hospitals.

Results: There was a statistically significant variance among the examined groups with respect to operational time, patient satisfaction, and VAS. There was no statistically significant variance amongst the examined groups as regards demographic data, physical examination findings, ultrasonographic findings, and laboratory data.

Conclusion: Based on the findings of this investigation, it appears that early laparoscopic cholecystectomy is a feasible & safe option for acute cholecystitis. It is correlated with lower VAS levels, shorter operative time, lower complication rates, and better patient satisfaction.

Keywords: laparoscopic cholecystectomy, cholecystitis, biliary diseases.

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INTRODUCTION

Biliary illnesses are the leading cause of digestive system problems. One of these is cholelithiasis, which can lead to more serious health problems and can only be cured through surgery. Gallstone disease strikes women three times more frequently than it strikes men ⁽¹⁾. From a prevalence of 4 percent in the 3rd decade of life, it rises steadily with age to a peak of 27 percent in the 7th decade of life. ⁽²⁾

Acute cholecystitis is a serious complication of gallstones. Research into less intrusive, less painful, and less expensive ways of treating gallstones has been ongoing for several decades. Stone content, stone size, and the quantity of stones present all place constraints on treatment options such as extracorporeal shock wave lithotripsy, contact dissolution agents, and oral desaturating agents. Furthermore, they abandon a gallbladder that is known to store lithogenic bile in its intact state. ⁽³⁾ Therefore, these nonoperative techniques are insufficient for a sizable percentage of individuals with gallstones and cannot guarantee a lasting cure for gallstone disease. ⁽⁴⁾

Consequently, cholecystectomy is still the go-to procedure for treating gallstones. For nearly a century, the treatment of choice for symptomatic cholelithiasis has been open cholecystectomy. However, the advent of the laparoscopic technique for performing cholecystectomy in the previous decade has completely changed the way this operation is carried out. ⁽⁵⁾

As a result, laparoscopic cholecystectomy is an elective treatment that aims to reduce recovery time, cost, postoperative pain, and cosmesis. In the beginning stages of surgery with minimal incisions, it was assumed that acute cholecystitis was somewhat contraindicated for laparoscopic cholecystectomy: the inflammatory modifications that made it difficult to dissect, the fragility of the tissues, and the ill-defined operational planes. ⁽⁶⁾ Laparoscopic cholecystectomy for acute cholecystitis is not currently standard practice because of ongoing debate over whether and how to approach surgical therapy for instances of acute cholecystitis. ⁽⁷⁾ Multiple investigations have shown that individuals who would otherwise require numerous hospitalizations for recurring symptoms

benefit greatly from having their cholecystectomy performed as soon as possible after being diagnosed with acute cholecystitis. ⁽⁸⁾

This research aimed to contrast the outcome of early (within one week) versus late (after 6 weeks) Cholecystectomy performed laparoscopically as a therapy option for acute cholecystitis.

PATIENTS AND METHODS

This research was Prospective randomized controlled research was done throughout the period among November 2019 till July 2021 at General Surgery department, Beni-Suef University hospitals.

Study question: Compared to the delayed procedure, what are the safety and efficacy of early cholecystectomy performed laparoscopically as a therapy option for acute cholecystitis?

Sample size calculation

Exact - Proportions: Inequality, two independent groups (Fisher's exact test)

Options: Exact distribution

Analysis: A priori: Compute essential sample size

Input:	Tail(s) =	Two
	Proportion p1 =	0.8
	Proportion p2 =	0.4
	α err prob =	0.05
	Power (1- β err prob) =	0.80
	Allocation ratio N2/N1 =	1
Output:	Sample size group 1 =	27
	Sample size group 2 =	27
	Total sample size =	54
	Actual power =	0.8024322
	Actual α =	0.0248087

The study involved 54 patients diagnosed with acute cholecystitis throughout the research duration. The patients were randomly assigned utilizing a closed envelope technique.

Study groups

The involved cases were separated into two groups by random: The early group: including 27 cases who had laparoscopic cholecystectomy done in the first

week after diagnosis and The late group: comprised the remaining 27 patients who, following the acute attack had subsided, performed the same operation 6 weeks later.

Inclusion criteria

Cases of acute cholecystitis diagnosed in these cases. cases among the ages of 18 and 80 were involved in the research, and a diagnosis of acute cholecystitis was made if they met four criteria: Tenderness under the right costal border and severe discomfort in the upper abdomen, fever greater than 37.5°C, leukocytosis greater than 10,500/mm, and ultra-sonographic verification of the condition ⁽⁹⁾.

Exclusion criteria

Obstructive Jaundice, Cholangitis, Immunosuppression, Acute pancreatitis, previous upper GIT surgeries, Ineligibility for laparoscopy and general anesthesia contraindications.

Patients consent

After outlining and detailing the operational and postoperative aspects as well as the complications of each technique, a signed informed permission was collected from every patient in advance of the operation.

Ethical consideration

Beni-Suef University's local ethical committee & Institutional Review Board (IRB) authorized the research.

Patient evaluation

History taking, Local examination, General examination, Laboratory investigations and Pelviabdominal ultrasound.

Operative technique

General anesthesia was utilized for all procedures, using propofol for induction and atracurium for muscular blockade. The operation was done when the case was in reverse Trendelenberg position with slight steep to the left. Most surgeons preferred to use the four-port technique.

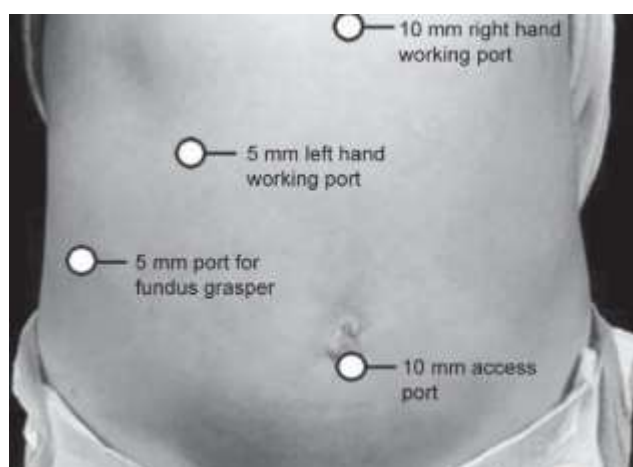


Figure (1): Port design.

The gallbladder was removed by retraction to & fro with a monopolar cautery hook from its bed,

and the laparoscopic suction tool was often used to facilitate that process.



Dissection of the gall bladder from the surrounding sealed omentum.



Dissection at Calot triangle to identify its structures.



Obtaining the critical view of safety.



Clipping and division of cystic duct and artery.



Dissection of the gallbladder from its bed using the suction device.



View after conversion to laparotomy. Kocher incision was performed, and a 50-cm syringe was used to aspirate the over distended gall bladder.



After gall bladder removal.



Opening of the surgical specimen revealing thick wall and the presence of stones.

Data Analysis

The IBM SPSS software package version 22.0 was utilized to do the analysis once the data were entered into the computer. The qualitative data were characterized with the use of numbers and percentages. After determining whether or not the quantitative data were normal using the Kolmogorov-Smirnov test, the data were reported utilizing the median (minimum and maximum) for

non-parametric data & using the mean and standard deviation for parametric data. The threshold of significance (0.05) was used in the evaluation of the results that were obtained.

RESULTS

There was no statistically significant variance amongst the examined groups concerning age, sex, BMI & Comorbidities [Table 1]

Table (1): Demographic data of the participants.

	Early group (n = 27)	Late group (n = 27)	P value
Age (years)	47.64 ± 7.25	46.81 ± 8.60	0.365
Sex			0.212
-Male	4 (14.81%)	5 (18.52%)	
-Female	23 (85.19%)	22 (81.48%)	
BMI (Kg/m²)	33.15 ± 3.4	33.67 ± 3.35	0.582
Comorbidities			0.142
-Smoking	3 (11.11%)	3 (11.11%)	
-Diabetes	2 (7.4%)	3 (11.11%)	
-Hypertension	5 (18.52%)	4 (14.81%)	

There was no statistically significant variance amongst the examined groups relative to Tenderness, Rebound tenderness, Palpable gall

bladder, Positive Murphy sign and Fever (> 38°) [Table 2]

Table (2): Physical examination results in the examine groups.

	Early group (n = 27)	Late group (n = 27)	P value
Tenderness	27 (100%)	27 (100%)	1
Rebound tenderness	2 (7.45)	3 (11.11%)	0.234
Palpable gall bladder	14 (51.85%)	16 (59.26%)	0.104
Positive Murphy sign	25 (92.59%)	24 (88.89%)	0.222
Fever (> 38°)	13 (48.15%)	11 (40.74%)	0.118

There was no statistically significant variance amongst the examined groups relative to Ultrasonographic findings (Thick edematous wall,

distended gall bladder and Pericholecystic fluid). [Table 3]

Table (3): Ultrasonographic findings in the examine groups.

	Early group (n = 27)	Late group (n = 27)	P value
Thick edematous wall	26 (96.29%)	25 (92.59%)	0.214
Distended gall bladder	19 (70.37%)	22 (81.48%)	0.062
Pericholecystic fluid	4 (14.81%)	4 (14.81%)	1

There was no statistically significant distinction among the examined groups relative to Laboratory data. [Table 4]

Table (4): Laboratory data within the examine groups.

	Early group (n = 27)	Late group (n = 27)	P value
Hemoglobin (gm/l)	11.90 ± 1.39	12.33 ± 0.63	0.215
WBCs (10³/ml)	11.71 ± 1.25	12.09 ± 1.49	0.176
PLTs(10³/µl)	262.20 ± 52.39	249.60 ± 40.35	0.136
SGPT (ALT) (IU/ml)	21.08 ± 5.83	23.72 ± 5.22	0.224
SGOT (AST) (IU/ml)	25.01± 6.41	24 .70 ± 5.20	0.687
Bilirubin (mg/dl)	1.02 ± 0.33	1.06 ± 0.25	0.461
Albumin (gm/dl)	4.14 ± 0.17	4.08 ± 0.18	0.265
Alkaline phosphatase (KAU/dl)	9.25 ± 2.10	10.8 ± 2.61	0.356
INR	1.07 ± 0.06	1.09 ± 0.03	0.897
Creatinine (mg/dl)	0.92 ± 0.26	0.94 ± 0.27	0.980

There was a statistically significant distinction among the examined groups relative to Operative time. There was no statistically significant

distinction amongst the examined groups relative to Blood loss, Conversion to open and drains. [Table 5]

Table (5): Operative data.

	Early group (n = 27)	Late group (n = 27)	P value
Operative time	37.98 ± 5.7	76.12 ± 4.56	< 0.001*
Blood loss	135.5 ± 30.6	142.1 ± 28.5	0.114
Conversion to open drains	0 (0%)	2 (7.4%)	0.462
	27 (100%)	27 (100%)	1

There was a statistically significant variance between the examined groups relative to Patient satisfaction and VAS. There was no

statistically significant distinction among the examined groups in relation to Hospital stay and Complications. [Table 6]

Table (6): Post-operative data.

	Early group (n = 27)	Late group (n = 27)	P value
Hospital stay	2 (1 – 3)	2 (1 – 13)	0.154
VAS	3 (2 – 5)	4 (3 – 6)	0.015*
Patient satisfaction			
-Completely satisfied	20 (74.07%) A	13 (48.15%) B	< 0.001*
-Satisfied	4 (14.81%) A	3 (11.11%) A	
-Fairly satisfied	3 (11.11%) A	3 (11.11%) A	
-Unsatisfied	0 (0%) A	8 (29.63%) B	
Complications			
-Biloma	0 (0%)	2 (7.4%)	0.462
-Cystic duct stump leakage	0 (0%)	2 (7.4%)	0.462
-Bile duct injury	0 (0%)	2 (7.4%)	0.462
-Port site infection	1 (3.7%)	2 (7.4%)	0.208

A, B: Similar letters represent no statistically significant variance among the adjacent groups.

Different letters represent presence of statistically significant variance among the adjacent groups.

DISCUSSION

In cases of acute cholecystitis, laparoscopic cholecystectomy is both possible & safe.¹⁰ In the first decade of laparoscopic era, acute cholecystitis was thought to be incompatible with laparoscopic surgery; nevertheless, today, laparoscopic cholecystectomy is often suggested as the 1st line of therapy for cases with this condition.⁽⁹⁾ The benefits of doing a cholecystectomy at an earlier stage have been highlighted by a meta-analysis that has already

been published.⁽¹⁰⁾ Even more reassuringly, a second literature evaluation found no association between laparoscopy and a higher rate of complications following surgery.⁽¹¹⁾

The average ages of participants in the early and late groups were 47.64 & 46.81 years old, respectively, in the present research. There was not a statistically significant distinction among the two groups on that parameter (p = 0.365).

Another research also stated no significant variance among the two groups concerning patient age ($p = 0.416$). In additions, the same authors reported mean age values near to ours, as the involved cases had mean values of 47.28 and 50.96 years in the early and late groups respectively. ⁽¹³⁾ This was further confirmed by another study conducted in 2016. ⁽¹⁴⁾

Our research showed that females were more common than men in all of the groups we looked at (85.19 vs. 81.48 percent). There was not a statistically significant distinction among the sexes in this study ($p = 0.212$).

Our results are consistent with those of different research, which likewise found no statistically significant distinction among the sexes ($p = 0.114$). More women than men were affected, with 86.67 and 93.33 percent of instances occurring in the early & late groups respectively. ⁽¹⁵⁾ Even Agarwal agreed with the prior conclusions. ⁽¹³⁾

In contrast, more recent Egyptian research found that males accounted for a greater proportion of cases than females in the early and late groups respectively (71.6% vs 68.9%, $p = 0.719$). ⁽¹⁶⁾

In the present research, we stated no significant variance among the two groups concerning systemic comorbidities ($p = 0.142$). Other authors also negated any significant variance among the two groups concerning the preexisting systemic comorbidities like diabetes and hypertension ($p > 0.05$). ⁽¹⁴⁾ The same findings were stated by another research. ⁽¹⁷⁾

In our research, all of the included patients reported right hypochondrial tenderness, whereas rebound tenderness was detected in 7.45 and 11.11% of patients in the early & late groups respectively.

Other authors also validated our results regarding right hypochondrial tenderness that was present in all of the included cases in both groups (100%).² Özkardeş et al. reported the same findings. ⁽¹⁷⁾ The same study reported that rebound tenderness was present in 13.3 & 26.7% of participants in the early and late groups respectively ($p = 0.197$).

In the present research, the distended gall bladder was palpated in 51.85 and 59.26% of participants in the same groups respectively, with no significant variance when contrasting the two groups ($p = 0.104$).

In line with our results, previous research also reported that there was no significant variance among the two groups concerning the presence of palpable gall bladder ($p = 0.427$). It was noticed in 32.4 and 27% of patients in the early & late groups respectively. ⁽¹⁶⁾

In our study, Murphy sign was positive in 92.59 and 88.89% of cases in the two groups respectively, without any significant variance among the two groups ($p = 0.222$).

Likewise, Arafa and his associates negated any significant variance among the two groups

regarding Murphy sign, which was elicited in 55.4 and 64.9% of patients in the early & late groups respectively, without any significant variance among the two groups ($p = 0.240$). ⁽¹⁶⁾

When it comes to the sonographic findings in the present research, There was not a statistically significant distinction among the two groups, with 96.29 and 92.59 percent of cases detecting thick edematous gall bladder wall ($p = 0.214$).

Another research reported that there was no significant variance amongst the two groups as concerns the existence of thick gall bladder wall. It was detected in all of the included cases in both groups.² Another research stated that thick walled gall bladder was reported in 76.7 and 70% of participants in the early & late groups respectively ($p = 0.771$). ⁽¹⁷⁾

There was not a statistically significant distinction among the two groups as concerns the existence of a dilated gall bladder in our research ($p = 0.062$), with 70.73 and 81.48 percent of patients in both groups respectively.

Agarwal reported that distended gall bladder was detected by US in 92 and 84% of patients in the early & late groups respectively ($p = 0.667$). ⁽¹³⁾

In our research, total leukocytic count had mean values of 11.71 and 12.09 in the two groups respectively. No significant variance was noticed among the two groups concerning that perspective ($p = 0.176$).

In another Egyptian research, the presence of leukocytosis ($> 11.000/ml$) was detected in 66.2 and 54.1% of the involved patients in early and late groups respectively ⁽¹⁶⁾, which supports our results. In the present research, fever $> 38^\circ$ was noticed in 48.15 and 40.74% of those in the same groups respectively, with no significant variance among the two groups.

Another investigation supported our conclusions, as there was no significant variance among the two groups concerning body temperature. ⁽¹⁸⁾

In the present research, there was a statistically significant variation among the operational times of the early and delayed groups (76.12 versus 37.98 minutes, $p < 0.001$).

Waiting for an inflammatory gallbladder to calm down, as has been suggested by previous research, permits the encircling inflammation to develop, causing adhesions that complicate the dissecting process. ⁽¹⁹⁾

We found no statistically significant distinction among the early and late groups relative to blood loss, with mean values of 135.5 and 142.1 ml in the two groups, respectively ($p = 0.114$). Similar to our prior results, Agarwal stated that the average blood loss in the early group was 159.6 mL (± 58.1) and in the late group was 146.8 mL (± 10.5). There was no

statistically significant variation in blood loss ($p = 0.418$).⁽¹³⁾

In the present research, 7.4% of participants in the late group were converted to the open approach, while there were no such conversions in the early group. There was no significant variance among the two groups ($p = 0.462$). In 10% of early cases and 6.67 percent; of late cases, conversion to open method was done by Verma and colleagues ($p = 0.780$).⁽¹⁵⁾ This is quite close to the conversion rate we found.

There was no statistically significant distinction among the two groups in our research for the length of their hospital stays (median = 2 in both groups, $p > 0.05$).

Also, another research found no statistically significant distinction among the two groups for the same parameter (1.67 versus 1.47 days in the early & late groups, respectively; $p = 0.379$).⁽¹⁵⁾

In our research, bile leak was one of only two postoperative complications seen in the delayed group (7.4%), whereas it was not seen at all in the early group (0%). Furthermore, the incidence rate of cystic duct stump leaking was comparable across the two groups.

In a second Pakistani research, bile leak happened in 6.6% of early patients & 8.9% of late cases, with no statistically significant variance among the two time periods ($p = 0.78$).⁽⁹⁾

Only two patients in the late group (7.5%) in the present research experienced common bile duct damage. The two groups did not vary significantly from one another in that respect.

The common bile duct was injured in 1.4 percent of early cholecystectomy patients and 5.4% of delayed cholecystectomy cases, respectively, according to other Egyptian writers. The two groups did not vary significantly from one another on this complication ($p = 0.366$).⁽¹⁶⁾

Our results revealed that there was not a statistically significant distinction amongst the two groups relative to the incidence of surgical site infections (3.7 and 7.4%, respectively). Previous reports of incidence rates are consistent with our own findings. Gul et al. found no statistically significant variance in the rate of infection at the site of operation among the two groups ($p = 1.0$). Both groups had the similar detection rate of 3.33 percent.⁽²⁾

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CONCLUSION

According to the results of the present study, it appears that early laparoscopic cholecystectomy is a safe and feasible option for acute cholecystitis. It is associated with lower VAS levels, shorter operative time, lesser complication rates, and better patient satisfaction.

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