

A Study of Early Laparoscopic Cholecystectomy in A Case of Acute Cholecystitis With Respect To Their Advantages and Disadvantages- Cross Sectional Study

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Abstract

Introduction: Early laparoscopic cholecystectomy (LC) has gained much popularity in the treatment of acute cholecystitis. It is both safe and cost-effective and significantly decreases the length of hospital stays. Laparoscopic cholecystectomy (LC) has evolved as the preferred treatment of gallstone diseases, which have been diagnosed in the triad of symptoms, ultrasound findings, and abnormal liver function tests.

Aims and Objectives

To investigate the advantages and disadvantages of performing early laparoscopic cholecystectomy for patients with acute cholecystitis, using a cross-sectional study design.

Primary objectives: To study early laparoscopic cholecystectomy in a case of acute cholecystitis.

Secondary objective: To study the advantages of

laparoscopic cholecystectomy in the case of acute cholecystitis

Material and Methods

Study Design: A Cross-sectional Study.

Study Site: This study was conducted in the Department of Surgery at a tertiary health care centre.

Study Population: This study consists of the ‘Once the patient is admitted, the demographic data collected included age, sex, occupation at the time of admission’

Study Duration: The study was conducted between 1st January 2023 to 31st June 2024.

Sampling Method: The sample size is determined by the Complete Enumeration method.

Sample Size: The sample size is equal to 49.89, but 50 patients were included in the study.

Result: In this Study Overall, 50 study participants who underwent cholecystectomy (gallbladder removal). Most

participants were relatively old, with 64% falling within the 41-60 age group. The remaining 36% were in the 21-40 age range. The postoperative complications experienced by the study participants who underwent early laparoscopic cholecystectomy. 10% of patients developed wound site infection

Discussion: Overall, 50 study participants and the majority of participants were female, constituting 66% of the total sample. Males accounted for the remaining 34%.

The average operating time was 80.86 minutes, with a median of 80 minutes.

Keywords: Blood Loss, Cholangitis, Gallstones Affect, Laparoscopic Cholecystectomy

Introduction

Gallstone disease, a condition where hard deposits form in the gallbladder, has plagued humans for centuries. Today, gallstones affect 10-20% of the global adult population, with women being 2-3 times more likely to develop them than men. The prevalence also increases with age, peaking between 40 and 60 years old. Certain ethnicities, such as Native Americans and Hispanics, have a higher genetic susceptibility to gallstones.^{1,2+} Maintaining a healthy weight, exercising regularly, and eating a balanced diet can help prevent gallstone formation. Medications can also be used in some cases to dissolve small stones or prevent their formation. However, for symptomatic gallstones, laparoscopic cholecystectomy is the gold standard treatment.

Other potential complications of gallstones include acute cholecystitis (inflammation of the gallbladder), cholangitis (inflammation of the bile ducts), and pancreatitis (inflammation of the pancreas).^{5,6,7}

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Study Duration: The study was conducted between 1st January 2023 to 31st June 2024.

Sampling Method: The sample size is determined by the Complete Enumeration method. All the cases available during the study period are considered and studied with consideration of exclusion and inclusion criteria, All the relevant information will be recorded in case record form (CRF).

Sample Size

Cochran's formula:

$$N = (Z_{\alpha})^2 \times SD^2 / \text{Precision}^2$$

Where Z_{α} for 95% CI is 1.96,

SD= Standard Deviation (+8) by Bastiaenen VP et al.⁽¹⁴⁾

Precision= $Z_{\alpha} \times \text{SE of Mean}$ {where SE of mean= SD / \sqrt{n} } $d = 0.71$ Absolute Precision

$$n = (1.96)^2 \times (.76)^2 / (0.068)^2$$

$$= 49.89$$

The sample size is equal to 49.89, but 50 patients were included in the study.

Inclusion Criteria

20-60-year patients with acute cholecystitis admitted at tertiary care centre

Exclusion Criteria

1. Patients who are not willing to participate in the study
2. Patients below 20 years of age
3. Patients above 60 years of age
4. Patient with other co-morbidities.

Statistical analysis

- Data will be recorded in a predesigned case record form compiled in Microsoft Excel version 2018 and analysed.
- Descriptive statistics for quantitative variables

Result

Table 1: Age-Wise Distribution of Study Participants in Early Laparoscopic Cholecystectomy.

Sn.	Age Groups	Frequency	Percentage
1	21-40 years	18	36%
2	41-60 years	32	64%
Total		50	100%

The table shows the age distribution of 50 study participants who underwent cholecystectomy (gallbladder removal). Most participants were relatively

will be represented as mean +/- SD.

- Qualitative variables will be represented as frequency & percentages.
- Fisher test or Chi-square test will be used to test the association of columns and rows in tabular data, in the case of qualitative, categorical data.
- Pearson or Spearman correlation will be done, depending on the normality of the distribution, to evaluate the correlation of any variable.
- Graphical representations will be done wherever applicable. The level of significance will be considered as $P < 0.05$.
- Data will be analysed using Graph pad prism software version 3.06

old, with 64% falling within the 41-60 age group. The remaining 36% were in the 21-40 age range.

Figure 1: Age-Wise Distribution of Study Participants in Early Cholecystectomy.

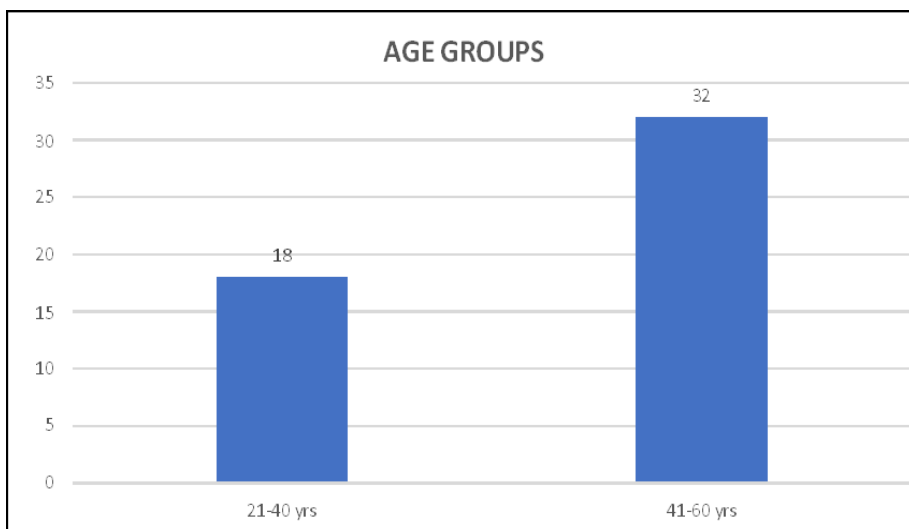


Table 2: Gender-Wise Distribution of Study Participants in Early Laparoscopic Cholecystectomy.

Sn.	Gender	Frequency	Percentage
1	Male	17	34%
2	Female	33	66%
Total		50	100%

The table presents the gender distribution of the 50 study participants. A majority of the participants were female, comprising 66% of the total. Males accounted for the remaining 34%.

Figure 2: Gender-Wise Distribution of Study Participants in Early Laparoscopic Cholecystectomy

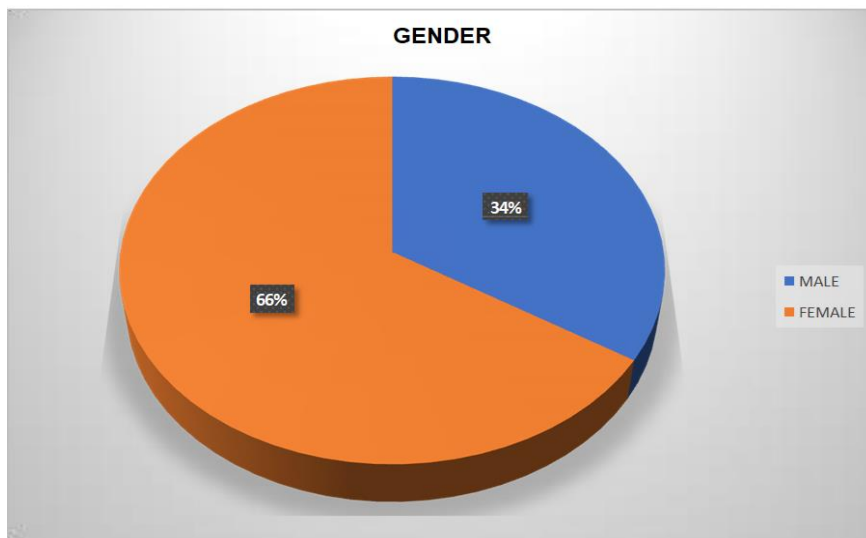


Table 3: Operating Time-Wise Distribution of Study Participants in Early Laparoscopic Cholecystectomy.

Sn.	Duration	Values (Minutes)
1	Mean	80.86 Minutes
2	Median	80 Minutes
3	Maximum	105 Minutes
4	Minimum	65 Minutes
5	Standard Deviation	9.282
6	Range	65-105 Minutes
Total		50

The table provides a statistical summary of the operating time for early laparoscopic cholecystectomy procedures. The average (mean) operating time was 80.86 minutes, with a median of 80 minutes, indicating that half of the procedures took less than 80 minutes

and half took longer. The shortest procedure lasted 65 minutes, while the longest took 105 minutes. The standard deviation of 9.282 minutes suggests that there was a small amount of variation in operating times.

Table 4: Hospital-Stay in A Days-Wise Distribution of Study Participants In Early Laparoscopic Cholecystectomy.

Sn.	Hospital-Stay	Values
1	Mean	2.98 Days
2	Median	3 Days
3	Maximum	5 Days
4	Minimum	2 Days
5	Standard Deviation	0.86
6	Range	2-5 Days
Total		50

The table summarizes the hospital stay for patients who underwent early laparoscopic cholecystectomy. The average hospital stay was 2.98 days, with half of the patients staying for 3 days or less. The shortest stay was

2 days, while the longest was 5 days. The standard deviation of 0.86 days indicates a relatively small amount of variation in hospital stay lengths.

Table 5: Blood Loss -wise distribution of study participants

Sn.	Blood Loss	Number	Percentage
1	<50 ML	35	70%
2	50-100 ML	15	30%
Total		50	100%

The table shows the blood loss experienced by the study participants. A majority of patients (70%) had minimal

blood loss of less than 50 millilitres. The remaining 30% lost between 50 and 100 millilitres.

Figure 3: Blood Loss -wise distribution of study participants.

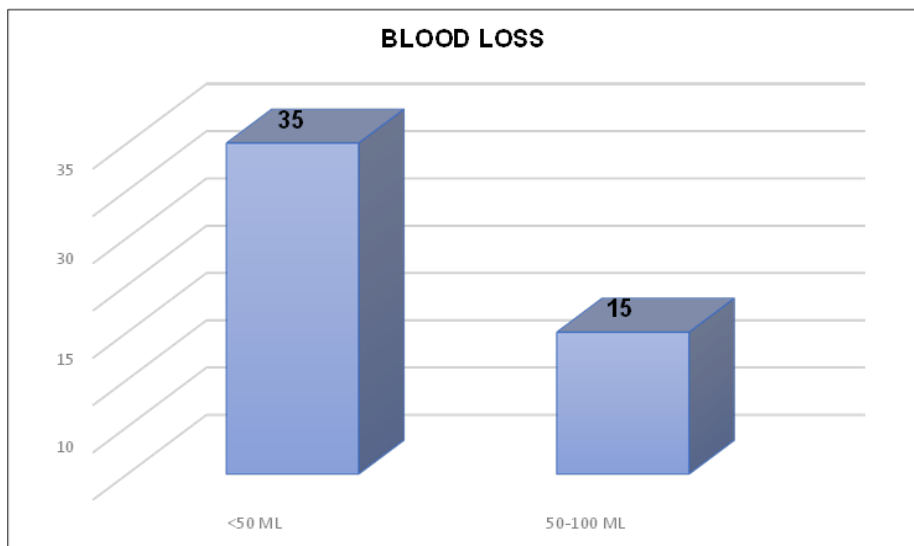


Table 6: Wound Site infection -wise distribution of study participants

Sn.	Wound Infection	Number	Percentage
1	Present	05	10%
2	Absent	45	90%
Total		50	100%

The table presents the occurrence of wound site infections among the study participants. A small percentage of patients (10%) developed wound infections, while the remaining 90% did not experience any complications related to the surgical wound.

Figure 4: Wound Site Infection -Wise Distribution of Study Participants

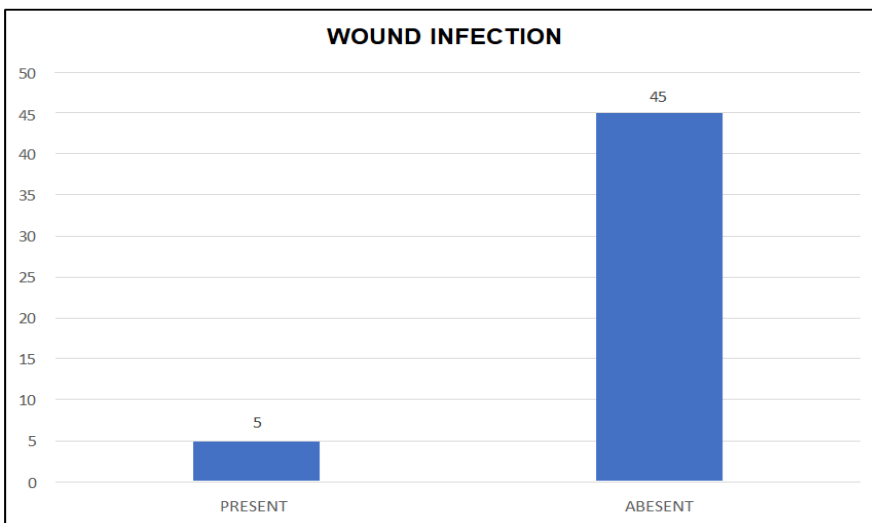


Table 7: Post Operative Complications Wise Distribution of Study Participants in Early Laparoscopic Cholecystectomy.

Sn.	Complications	Frequency	Percentage
1	Wound Site Infection	5	10%
2	Biliary Leak	00	0%
3	Peritonitis	00	0%
4	Pulmonary Complications	00	0%
5	Mortality	00	0%
Total		50	100%

The table shows the postoperative complications experienced by the study participants who underwent early laparoscopic cholecystectomy. 10% of patients developed wound site infection, none of the patients developed biliary leak, peritonitis, pulmonary complications, or mortality, indicating a high rate of successful surgery with minimal complications.

Figure 5: Post Operative Complications Wise Distribution of Study Participants In Early Laparoscopic Cholecystectomy.

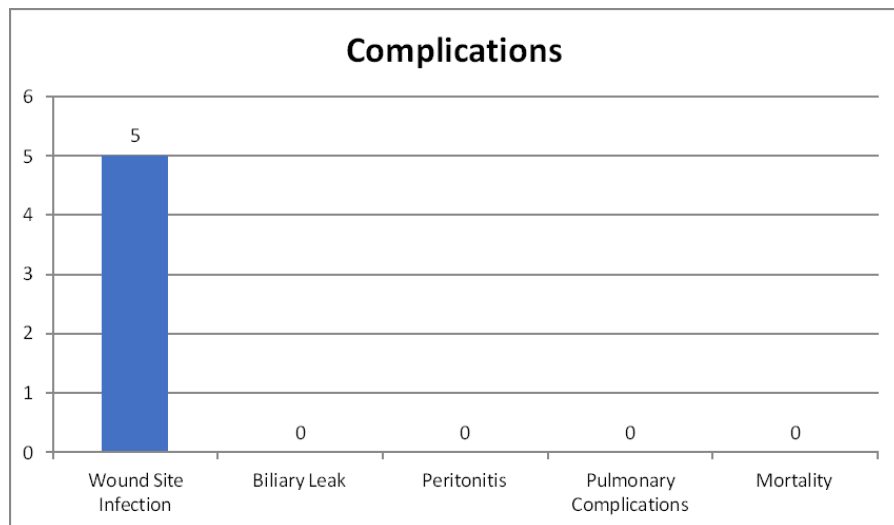


Table 8: Distribution of the Study Participants as Per Post Operative Parameters. (Antibiotic Use)

Sn.	Antibiotic Use (Days)	Number	Frequency	Mean ± Sd
1	≤ 3 Days	36	72%	2.98 ± 0.86
2	> 3 Days	14	28%	
Total		50	100%	

Table shows the distribution of antibiotic use duration following early laparoscopic cholecystectomy. The table reveals that the majority of patients (72%, or 36 participants) received antibiotic for less than or equal to

3 days. The remaining 28% (or 14 participants) received antibiotic for a longer duration exceeding 3 days. On average, patients received antibiotics for 2.98 days with a standard deviation of 0.86 days.

Figure 6: Distribution of the Study Participants as Per Post Operative Parameters. (Antibiotic Use)

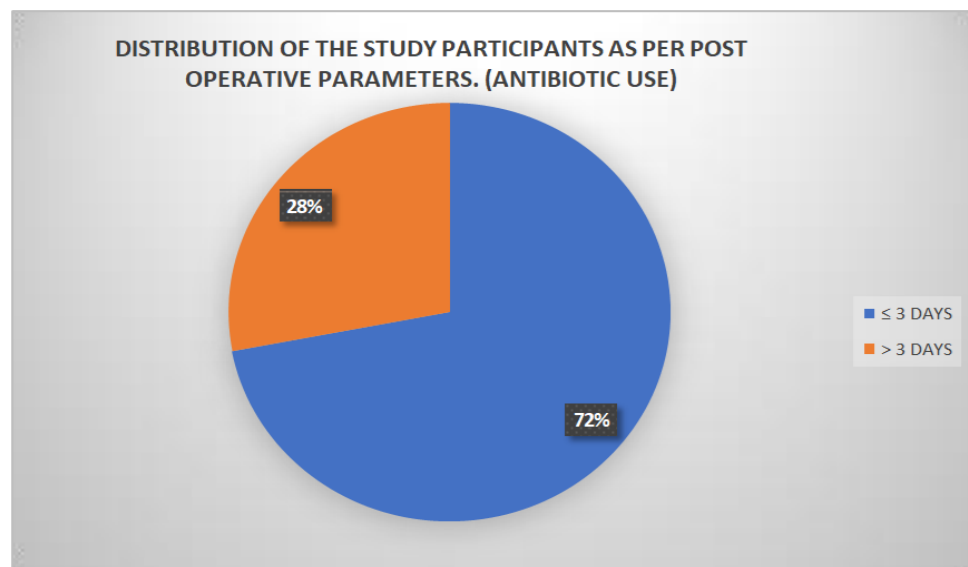


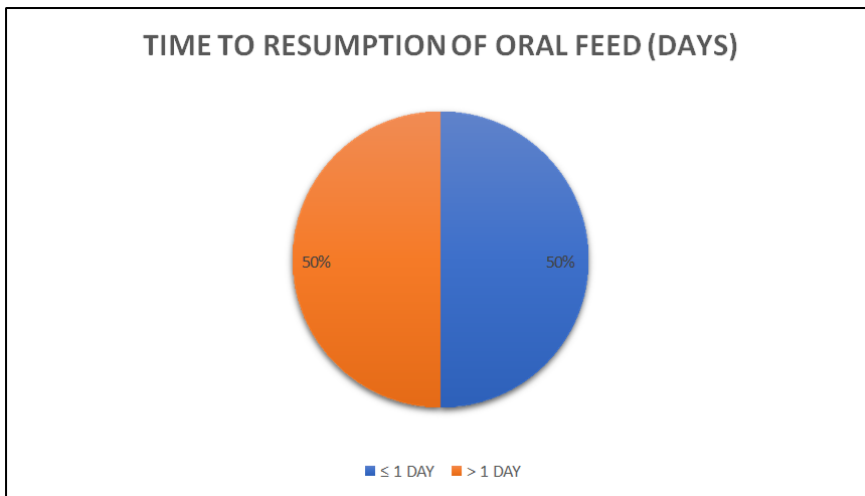
Table 9: Distribution of Study Participants as Per The Postoperative Course.

Sn.	Time To Resumption Of Oral Feed (Days)	Number	Frequency	MEAN ± SD
1	≤ 1 Day	25	50%	1.5 ± 0.5
2	> 1 Day	25	50%	
Total		50	100%	

Table presents the postoperative course of study participants, including the time to resumption of oral feed following early laparoscopic cholecystectomy. The table reveals that the half of patients (50%, or 25 participants) resumed oral feed within a day following

early laparoscopic cholecystectomy. The remaining 50% (or 25 participants) resumed oral feed for a duration exceeding 1 day. On average, patients resumed oral feeding within 1.5 days.

Figure 7: Distribution of Study Participants as Per The Postoperative Course.



Discussion

The present study's findings show the majority of the present study's participants were in the 41-60 years age group, the participants in the latter study had a higher mean age, with the median age in both the early and delayed groups exceeding 50 years.

Additionally, the gender distribution in the present study was skewed towards females.

The operating time and hospital stay duration for participants undergoing early laparoscopic cholecystectomy were evaluated. The operating times ranged from a minimum of 65 minutes to a maximum of 105 minutes, with a standard deviation of 9.282 minutes.

The average hospital stay was 2.98 days, with a median of 3 days. The maximum and minimum hospital stays were 5 and 2 days, respectively. The standard deviation was 0.86 days.

70% of participants experienced blood loss of less than 50 mL, while the remaining 30% had blood loss between 50-100 millilitre.

40% of participants required intra-abdominal drain insertion, while 60% did not.

10% of participants developed wound site infection. 30% of participants experienced intraoperative bleeding (50-100 mL), but there were no cases of conversion to open surgery or bile duct injury.

Majority of patients (72%) received analgesic and antibiotics for less than or equal to 3 days. The remaining 28% received analgesic and antibiotics for a longer duration exceeding 3 days.

50% of participants resumed oral feed within a day following early laparoscopic cholecystectomy. The remaining 50% resumed oral feed for a duration exceeding 1 day. On average, patients resumed oral feeding within 1.5 days.

The distribution of blood loss, wound site infections, intra-abdominal drain insertions, and postoperative complications among participants undergoing early laparoscopic cholecystectomy was analysed. Postoperative parameters such as analgesic and antibiotic use, along with intraoperative complications during early cholecystectomy, were evaluated

Conclusion

Based on the findings of this study, early laparoscopic cholecystectomy appears to be a safe and effective treatment option for patients with symptomatic cholelithiasis. The procedure is associated with minimal blood loss, a short hospital stay, and a low risk of complications. These outcomes highlight the benefits of early intervention in managing cholelithiasis.

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