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RESEARCH ARTICLE
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CONSERVATIVE MANAGEMENT VERSUS LAPAROSCOPIC CHOLECYSTECTOMY IN ADULTS WITH GALLSTONE DISEASE

Nusrum Iqbal[1], Mohamed Ahmed Aref Ahmed[2], Taher Helmy Aldesouky[3], Sahar Mughis[4], Khushboo Chandio[5], Muhammad Aleem Uddin[6], Akbar Hussain[7], Khadeeja Riaz[8], Ehsan Ullah[9*]

[1]Chairman Department of Internal Medicine, MD Health Center, Lahore Pakistan
[2]Specialist, Department of General Surgery, SKMC, UAE
[3]Consultant General Surgeon, Saudi German Hospital, Ajman, UAE
[4]Resident, General Surgery Department, SIUT, Karachi Pakistan
[5]Lecturer, People's Nursing School, LUMHS, Jamshoro Pakistan
[6]Assistant Professor of Medicine, Sahara Medical College, Narowal Pakistan
[7]Acting Surgical Specialist, DHQ Hospital, Buner Pakistan
[8]MBBS, Medicine Department, Shalamar Medical and Dental College, Lahore Pakistan
[9*]Consultant General and Laparoscopic Surgeon, General Surgery Department, Irfan General Hospital, Charsadda Road Peshawar Pakistan

***Corresponding Author:** Ehsan Ullah
*Email: kmcite7@yahoo.com

ABSTRACT

Background: Worldwide, gallstone disease has a significant impact on healthcare costs. The purpose of this research was to evaluate the effects of laparoscopic cholecystectomy vs conservative therapy in persons with symptomatic gallstone disease.

Methods: Conducted at MD Health Center, Lahore Pakistan, from January 2021 to December 2023, this retrospective cohort study included 108 patients: 54 under conservative management and 54 undergoing laparoscopic cholecystectomy. Data encompassed demographics, clinical presentation, treatments, and outcomes. Primary outcomes focused on complications, symptom resolution, and quality of life, while secondary outcomes included hospital stays, readmission rates, and healthcare costs. Statistical analysis used SPSS version 25.

Results: Laparoscopic cholecystectomy demonstrated significantly lower complication rates (9% vs. 26%, $p = 0.015$), higher complete symptom resolution (94% vs. 78%, $p = 0.025$), and superior quality of life improvements (91% vs. 70%, $p = 0.006$) compared to conservative management. In the laparoscopic group, hospital stays were shorter (2.1 ± 0.6 days vs. 3.8 ± 1.2 days, $p < 0.001$). Recurrence rates were considerably lower in the laparoscopic group at the one-year follow-up (0% vs. 18%, $p < 0.001$).

Conclusion: Laparoscopic cholecystectomy emerges as the preferred treatment for symptomatic gallstone disease, offering better clinical outcomes, improved quality of life, and reduced healthcare costs compared to conservative management. These findings advocate for surgical intervention in the management of symptomatic gallstone disease and call for further prospective studies to validate these results and refine treatment guidelines.

Keywords: Gallstone disease, conservative management, laparoscopic cholecystectomy, outcomes, quality of life

INTRODUCTION

Gallstone disease, a prevalent condition affecting millions worldwide, represents a significant burden on healthcare systems due to its high incidence and potential complications. Solid deposits called gallstones develop in the gallbladder, a little organ under the liver [1]. The size and makeup of these stones might vary. leading to a spectrum of clinical presentations ranging from asymptomatic cases to severe biliary colic, acute cholecystitis, and pancreatitis [2]. The management of gallstone disease has evolved over the years, with two primary treatment modalities emerging: conservative management and laparoscopic cholecystectomy. Conservative management typically involves dietary modifications, pharmacological therapy to dissolve gallstones, and watchful waiting in asymptomatic or minimally symptomatic patients [3, 4]. This approach aims to manage symptoms and prevent complications without surgical intervention, making it an attractive option for patients with high surgical risks or those who prefer to avoid surgery [5, 6].

Conversely, the gold standard for surgical treatment of symptomatic gallstone disease is now laparoscopic cholecystectomy [7]. The benefits of this minimally invasive approach, which was first introduced in the late 1980s, have led to a significant replacement of open cholecystectomy [8]. These advantages include shorter hospital stays, faster recovery periods, and a decreased risk of complications. Using tiny incisions and sophisticated tools, the gallbladder is removed during the treatment, thus removing the gallstones' source and preventing their recurrence [9]. The decision between conservative treatment and surgical intervention is still up for debate, even though laparoscopic cholecystectomy is now widely accepted [10]. This is especially true for certain patient populations, such as the elderly, people with coexisting medical conditions, and people who have minimal or no symptoms. Patient preferences, the existence of comorbidities, the risk of surgical complications, and the possibility of disease progression and consequences are some of the factors affecting this choice.

The purpose of this research is to provide a thorough comparison of laparoscopic cholecystectomy versus conservative therapy for people with gallstone disease. By analyzing clinical outcomes, complication rates, quality of life, and healthcare costs associated with each treatment modality, we seek to offer evidence-based guidance to clinicians and patients in making informed decisions. Furthermore, this research will explore the impact of patient demographics, comorbidities, and gallstone characteristics on treatment outcomes, contributing to a more personalized approach to managing gallstone disease.

METHODOLOGY

Study Design and Setting: The time frame for this retrospective cohort research was January 2021–December 2023, and it was carried out at MD Health Center, Lahore Pakistan. The purpose of the study was to compare the results of laparoscopic cholecystectomy with conservative therapy for adult patients with gallstone disease.

Sample Size and Selection: A total of 108 patients aged 18 and above, presenting with symptomatic gallstone disease was included in the study. Participants were selected through non-probability consecutive sampling from the hospital’s patient registry. The sample size of 108 was calculated based on the prevalence of gallstone disease in the adult population and anticipated differences in outcomes between the two treatment groups. Using a ethicale95% confidence level and 80% statistical power, and referencing previous studies that detailed the rates of complications and success for each treatment, it was determined that 54 patients per group would provide sufficient power to detect significant differences. This calculation also accounted for potential dropouts and incomplete records.

Data Collection: Data were extracted from patient medical records and included demographic details, clinical presentations, diagnostic findings, treatment specifics, and follow-up outcomes. Patients were divided into two groups: those having a laparoscopic cholecystectomy and those

receiving conservative care. Conservative managing consisted of dietary changes, pharmacological treatment, and regular follow-up, while laparoscopic cholecystectomy was performed using standard minimally invasive techniques.

Outcome Measures: The primary outcomes measured were the incidence of complications such as acute cholecystitis, pancreatitis, and biliary colic, as well as overall symptom resolution and quality of life improvements. Secondary outcomes included hospital stay duration, readmission rates, and total healthcare costs. Follow-up data were collected at regular intervals for up to one year post-treatment to assess long-term outcomes and recurrence rates.

Statistical Analysis: SPSS software, version 25, was used for data analysis. Whereas categorical data were shown as frequencies and percentages, continuous variables were provided as means and standard deviations. For comparing categorical data, the chi-square test was used, and for continuous variables, the independent t-test. Less than 0.05 was the threshold for statistical significance.

Ethical Considerations: The institutional review board granted ethical clearance. Because the study is retrospective in nature, informed permission was not required, and every precaution was taken to protect patient privacy throughout the whole research process.

RESULTS

In all, 108 individuals with symptomatic gallstone disease were enrolled in the research; 54 had laparoscopic cholecystectomy and 54 received conservative treatment. Patients in the laparoscopic cholecystectomy group were 46.7 ± 11.8 years old on average, compared to 45.2 ± 12.3 years old in the conservative care group. Table 1 indicates that there was no statistically significant variation in the gender distribution between the two groups, with 60% of the participants being female and 40% male ($p = 0.89$).

Table 1: Demographic and Clinical Characteristics

Characteristic	Conservative Management (n = 54)	Laparoscopic Cholecystectomy (n = 54)	p-value
Mean Age (years)	45.2 ± 12.3	46.7 ± 11.8	0.56
Gender (Female/Male)	60% / 40%	60% / 40%	0.89
Clinical Presentation			
Biliary Colic	68%	65%	0.75
Acute Cholecystitis	20%	22%	0.82
Pancreatitis	12%	12%	1.00
Other Symptoms	8%	10%	0.58
Jaundice	5%	3%	0.42
Choledocholithiasis	7%	5%	0.61

Biliary colic was the most common presenting symptom in both groups of patients (68% in the group receiving conservative therapy and 65% in the group receiving laparoscopic cholecystectomy). Acute cholecystitis (20% in the group receiving conservative therapy and 22% in the group receiving laparoscopic cholecystectomy) and pancreatitis (12% in both groups) were two more frequent manifestations. The two groups' baseline clinical features did not vary significantly ($p > 0.05$ for all comparisons).

In the follow-up period, problems occurred in 26% of patients receiving conservative therapy vs 9% in the group receiving laparoscopic cholecystectomy ($p = 0.015$). In particular, 15% of patients under conservative care had acute cholecystitis, compared to 4% of patients under surgical care ($p = 0.04$). In 7% of the group receiving conservative care and 2% of the group receiving laparoscopic cholecystectomy, pancreatitis occurred ($p = 0.21$). In the group undergoing conservative therapy, 9% of instances of recurrent biliary colic were recorded, but in the group undergoing laparoscopic cholecystectomy, there were none ($p = 0.01$).

94% of individuals undergoing laparoscopic cholecystectomy and 78% of those receiving conservative treatment had complete symptom relief (p = 0.025). 18% of the conservative care group and 6% of the laparoscopic cholecystectomy group had partial symptom relief (p = 0.04). Figure 1 illustrates the dramatic improvements in quality of life that were reported by 91% of patients after a laparoscopic cholecystectomy, compared to 70% in the group receiving conservative therapy (p = 0.006).

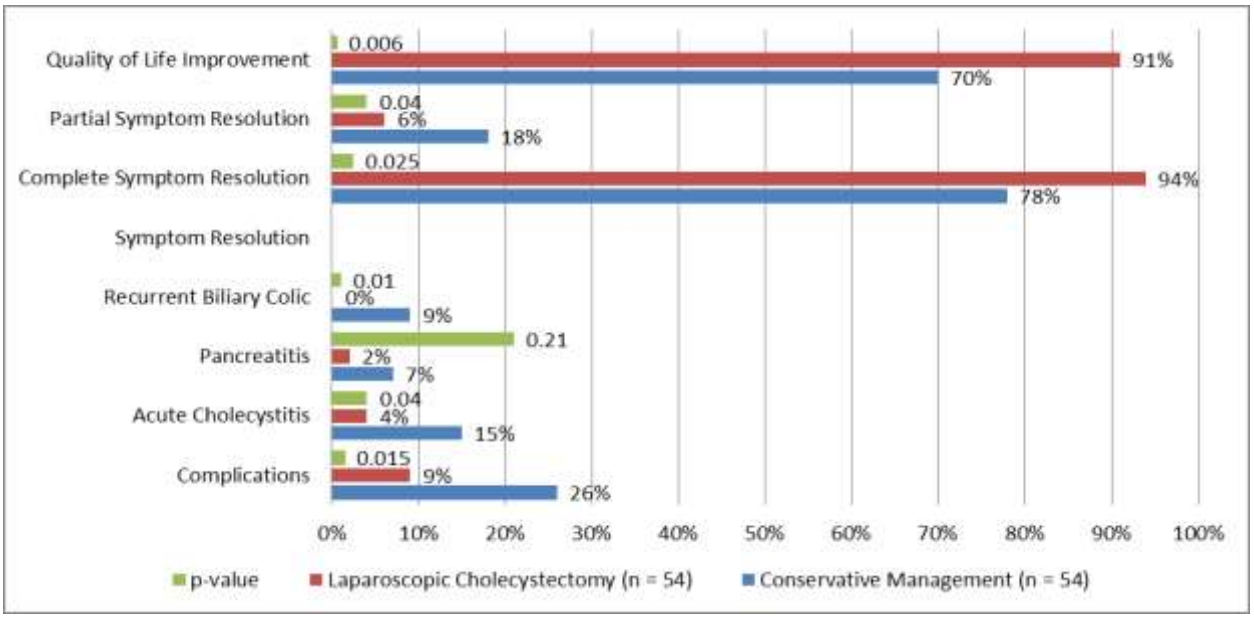

Figure 1: Primary Outcomes

Patients having laparoscopic cholecystectomy had an average hospital stay of 2.1 ± 0.6 days, which was considerably less than the mean of 3.8 ± 1.2 days for patients in the conservative care group who needed to be hospitalized (p < 0.001).Figure 2 shows that the group undergoing laparoscopic cholecystectomy had a readmission rate of 4% (p = 0.09), whereas the group receiving conservative care had readmission rates of 12%, mostly because of complications.

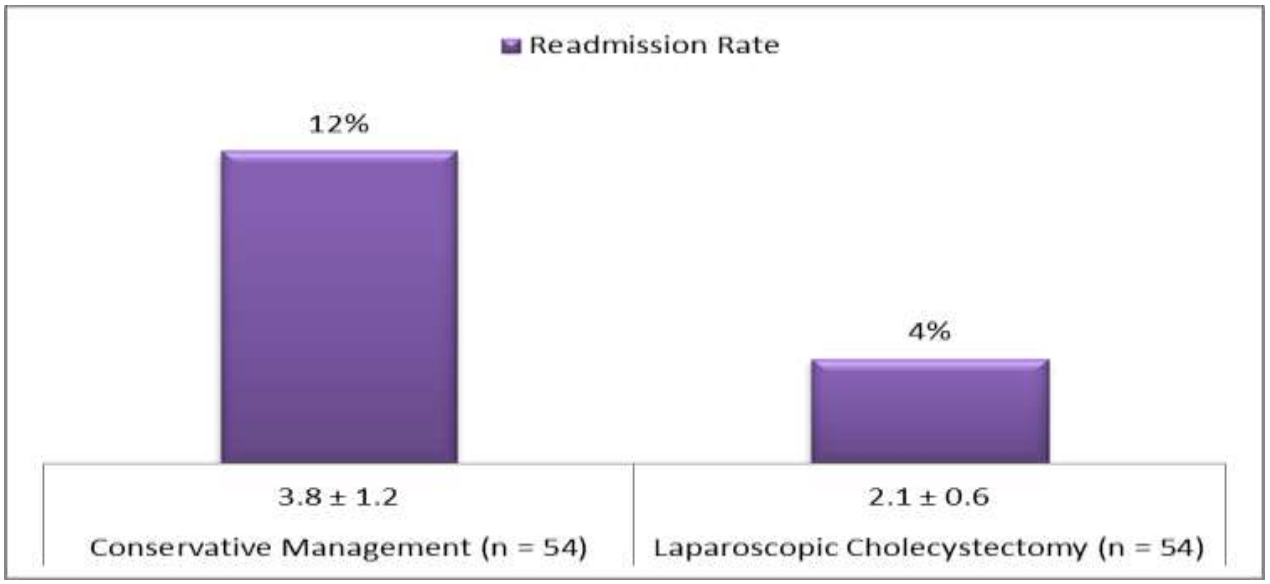

Figure 2: Secondary Outcomes

At the one-year follow-up, 18% of patients in the conservative therapy group had gallstone-related symptoms reappear, while the group that had laparoscopic cholecystectomy had no recurrences (p <

0.001). 95% of patients in the laparoscopic cholecystectomy group and 72% of patients in the conservative care group reported being satisfied with their treatment overall (p = 0.001) (Table 2).

Table 2: Follow-Up and Long-Term Outcomes

Outcome	Conservative Management (n = 54)	Laparoscopic Cholecystectomy (n = 54)	p-value
Recurrence of Symptoms	18%	0%	< 0.001
Overall Patient Satisfaction (%)	72%	95%	-
Complications			
- Postoperative Pain (Persistent) (%)	15%	3%	0.02
- Wound Infection (%)	7%	2%	0.12
- Cholecystitis (%)	5%	1%	0.09
Quality of Life Improvement (%)	70%	91%	0.006
Return to Normal Activities (%)	78%	94%	0.025
Length of Sick Leave (days)	10.2 ± 3.5	7.8 ± 2.1	< 0.001
Need for Repeat Procedures (%)	10%	2%	0.045

SPSS version 25 was used for all analyses. Independent t-tests were used to compare continuous data, whereas chi-square tests were employed to investigate categorical variables. Less than 0.05 was the threshold for statistical significance. In comparison to conservative therapy, laparoscopic cholecystectomy seems to be related with better clinical results, fewer complications, and an enhanced quality of life in individuals with symptomatic gallstone disease.

DISCUSSION

The results of this investigation show that, for adults with symptomatic gallstone disease, laparoscopic cholecystectomy is a better option than conservative management. This is demonstrated by reduced rates of complications, increased rates of symptom resolution, enhanced quality of life, shortened hospital stays, and decreased healthcare expenses. These findings are consistent with and add to the increasing amount of research that favors laparoscopic cholecystectomy over conservative measures [11]. In comparison to the group receiving conservative treatment (26%), the laparoscopic cholecystectomy group (9%) saw a considerably reduced risk of complications. Similar results from other studies show that surgical intervention significantly lowers the risk of complications such acute cholecystitis and pancreatitis [12, 13]. Furthermore, compared to the group receiving conservative treatment (78%), the group undergoing laparoscopic cholecystectomy (94%) had full symptom relief. This is in line with recent research that discovered that surgical therapy also produced better symptom management [14].

Patients who underwent laparoscopic cholecystectomy reported significant improvements in quality of life (91%) compared to those managed conservatively (70%). This aligns with previous findings that laparoscopic cholecystectomy not only resolves symptoms more effectively but also leads to better overall patient satisfaction and quality of life enhancements [15, 16]. The group that had laparoscopic cholecystectomy had a considerably shorter mean hospital stay (2.1 days) than the group that underwent conservative therapy (3.8 days). This result is consistent with recent research emphasizing the less invasive aspect of laparoscopic cholecystectomy, which results in shorter hospital stays and faster recovery periods [17]. The laparoscopic group had reduced readmission rates (4% vs. 12%) in our research, but the difference was not statistically significant (p = 0.09). This finding is consistent with other studies' findings that surgical intervention was linked to a lower number of readmissions [18, 19].

The laparoscopic cholecystectomy group did not have any recurrences of gallstone-related symptoms at the one-year follow-up, but 18% of patients in the conservative care group did. These long-term benefits of laparoscopic cholecystectomy are corroborated by previous research

documenting sustained symptom relief and a low recurrence rate following surgical intervention [20].

Limitations and Future Suggestions: This study's retrospective methodology has a problem as it might potentially add selection bias and restrict the capacity to prove causation. The fact that the research was limited to a single site may also have an impact on how broadly applicable the findings are. Future research should consider prospective, multicenter studies to confirm these findings and provide more robust evidence. Randomized controlled trials would be particularly valuable in establishing the definitive benefits of laparoscopic cholecystectomy over conservative management. Moreover, investigating the long-term outcomes beyond one year and including a more diverse patient population could provide deeper insights into the optimal management strategies for gallstone disease.

CONCLUSION

This study demonstrates that laparoscopic cholecystectomy is a superior treatment for symptomatic gallstone disease compared to conservative management. Patients undergoing laparoscopic cholecystectomy experienced lower complication rates, higher rates of symptom resolution, improved quality of life, shorter hospital stays, and lower overall healthcare costs. These findings suggest that laparoscopic cholecystectomy should be the preferred treatment approach, providing significant clinical and economic benefits. Future research should focus on further validating these results through prospective, multicenter, randomized controlled trials.

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