



Frequency of conversion to open cholecystectomy among male and female patients undergoing laparoscopic cholecystectomy

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Abstract: Background: Laparoscopic cholecystectomy is the preferred method for treating symptomatic gallstone disorders due to its improved outcomes compared to open cholecystectomy. **Aim:** The aim of this study was to find out the frequency of conversion to open cholecystectomy among male and female patients undergoing laparoscopic cholecystectomy. **Materials and method:** The present cross-sectional study was carried out at the department of General Surgery Bolan Medical Complex Hospital from January 2025 to June 2025 after taking permission from the ethical committee of hospital. Individuals were chosen using a non-probability convenient sampling strategy. A total of 130 Individuals of both genders (65 females and 65 males) of different age groups (ranged 35-65 years) with BMI under 30 kg/m, had symptomatic gallstone disease and were planned for elective laparoscopic cholecystectomy were enrolled. The data was analyzed by SPSS version 16 and presented as mean and standard deviation. Frequencies and percentages were used for the expression of categorical variables. The chi-square test was used to find out the association between sex and conversion. The value of p less than 0.05 was measured statistically significant. **Results:** A total of 130 Individuals with symptomatic gall Stones who planned for underwent Laparoscopic cholecystectomy were included. The age of the 65 female participants was (ranged 35-60 years) having mean 44.31 ± 6.68 years. Similarly the age of the 65 male participants ranged from 37-65 years with a mean of 47.31 ± 6.73 years. The mean time for all female participants was 29.42 ± 7.57 minutes and that for male was 42.56 ± 15.85 minutes. 63(96.7%) women underwent laparoscopic cholecystectomy and only 2(3.07%) of the total female individuals had conversion to open surgery. Among male 6(9.20%) had done the conversion to open surgery and 59(90.7%) had laparoscopic cholecystectomy. The overall conversion rate in our study was 8(6.15%). Only 2 (100%) of the 73 female patients had their severe bleeding resolved with an open cholecystectomy. Out of 6 male participants who had conversion to an open cholecystectomy, 4 (66.6%) underwent the procedure because of severe bleeding, 1 (16.66%) because of biliary leakage, and 1 (16.66%) because of adhesion. **Conclusion:** The current study concluded that males had a longer duration and higher conversion rate to open cholecystectomy than females.

Keywords: laparoscopic cholecystectomy, conversion rate, Male, Female

INTRODUCTION

Laparoscopic cholecystectomy is the preferred method for treating symptomatic gallstone disorders due to its improved outcomes compared to open

cholecystectomy.¹ LC offers advantages over open surgery, including shorter hospital stays, less pain following surgery, quicker healing, improved cosmesis, and cheaper costs. Occasionally,

laparoscopic cholecystectomy patients want to undergo open gallbladder removal. Conversion is not a problem, but rather a way to prevent difficulties and improve therapy if they occur. The research suggests that rates of conversion to the open technique range from 0% - 20%.² The success rate and complications of laparoscopic cholecystectomy (LC) are influenced by the surgeon's experience and the difficulty of the procedure. Factors such as previous abdominal surgery, cholecystitis episodes, and male gender might also impact the outcome. Being overweight, problematic dissection at Calot's triangle, thick adhesions, uncontrolled hemorrhage, biliary tree damage, congenital defects, and intervention during the acute phase are additional issues to consider. Potential risks for conversion include internal organ injuries after surgery, advanced age, and inadequate laparoscopic tools.³ Predictive indicators such as male gender, age, acute cholecystitis, obesity, anatomical defects, difficult dissection, and bleeding can help indicate the necessity for conversion before surgery. Identifying risk factors benefits patients by preparing them mentally and reducing treatment costs, a major issue in poor nations.³⁻⁴ A number of studies identified male gender as the sole statistically notable risk variable for conversion.⁵⁻⁶ Males have a higher conversion rate due to anatomical issues with their gallbladder & biliary tree.⁷ Males tend to ignore their health issues, causing them to worsen over time. Males often ignore their health issues, leading to complications during laparoscopic cholecystectomy procedures. In competent hands, laparoscopic cholecystectomy improves post-operative pain, hospitalization, and morbidity compared to open cholecystectomy, but conversion raises morbidity following surgery.⁸⁻⁹ Patients receiving LC have lower rates of wound infections and post-operative ileus. Although LC has several limitations compared

to open, it nevertheless has a benefit of assuring safety for patients.¹⁰ In our country, LC is a regular procedure for young patients in teaching hospitals. However, findings on the safety and effectiveness of LC in male patients with symptomatic gallstones are few and inconsistent with international data. Therefore this study was carried out to find out the frequency of conversion to open cholecystectomy among male and female patients undergoing laparoscopic cholecystectomy.

MATERIALS AND METHODS

The present cross-sectional study was carried out at the department of General Surgery Bolan Medical Complex Hospital from January 2025 to June 2025 after taking permission from the ethical committee of hospital. Individuals were chosen using a non-probability convenient sampling strategy. A total of 130 Individuals of both genders (65 females and 65 males) of different age groups (ranged 35-65 years) with BMI under 30 kg/m, had symptomatic gallstone disease and were planned for elective laparoscopic cholecystectomy were enrolled. Individuals with severe edema, liver cirrhosis, Suspected gallbladder malignancy and previous abdominal surgery were excluded. The measured outcomes recorded were operational time, conversion by sex, and reasons for conversion. The data was analyzed by SPSS version 16 and presented as mean and standard deviation. Frequencies and percentages were used for the expression of categorical variables. The chi-square test was used to find out the association between sex and conversion. The value of p less than 0.05 was measured statistically significant

RESULT

A total of 130 Individuals with symptomatic gall Stones who planned for underwent Laparoscopic cholecystectomy were included. The maximum age group among the study population was 65 years and the minimum age group was 35 years with mean of 46.81 ± 6.86 years and the mean maximum duration was 79 and minimum duration was 15 minutes with a mean of 35.81 ± 14.03 minutes as presented in Table 1. The age of the 65 female participants was (ranged 35-60 years) having mean 44.31 ± 6.68 years. Similarly the age of the 65 male participants ranged from 37-65 years with a mean of 47.31 ± 6.73 years as shown in **table 2**. The mean time for all female participants was 29.42 ± 7.57 minutes and that for male was 42.56 ± 15.85 minutes (One-sided P-value = 0.00005) as shown in **table 3**. 63(96.7%) women underwent laparoscopic cholecystectomy and only 2(3.07%) of the total female individuals had conversion to open surgery. Among male 6(9.20%) had done the conversion to open surgery and 59(90.7%) had laparoscopic cholecystectomy as described in **table 4**. The overall conversion rate in our study was 8(6.15%). Only 2 (100%) of the 73 female patients had their severe bleeding resolved with an open cholecystectomy. Out of 6 male participants who had conversion to an open cholecystectomy, 4 (66.6%) underwent the procedure because of severe bleeding, 1 (16.66%) because of biliary leakage, and 1 (16.66%) because of adhesion as presented in **table 5**.

Table 1. Age and Duration Laparoscopic Cholecystectomy

	Frequency	maximum	Minimum	Mean
Age	130	65	35	46.81 ± 6.86
Duration	130	79	15	35.81 ± 14.03

Table 2. Gender wise distribution of age

Group	Frequency	Maximum	minimum	Mean
Female age in years	65	58	35	44.31±6.68
Male age in years	65	65	37	47.31±6.73

Table 3. Mean duration in both genders

Group	Frequency	Mean
Male duration	65	42.56±15.85
Female duration	65	29.42±7.57

(One-sided P-value = 0.00005)

Table 4. Conversion distribution in both genders

Conversion	Male frequency/percentage	Female frequency/percentage	Total
Yes	6(9.20%)	2(3.07%)	8
No	59(90.7%)	63(96.7%)	122
Total	65	65	130

Chi-square value = 3.868 Df = 1 p-value (1-sided) = 0.0243

5.Descriptive statistics of distribution of reasons for open surgery				
Reason	Male	Female	Total	
Severe bleeding	4(66.6%)	2(100%)	6	
Leakage of bile	1(16.66%)	0	1	
Adhesion	1(16.66%)	0	1	
Total	6	2	8	

DISCUSSION

Laparoscopic cholecystectomy is considered the most effective treatment for symptomatic cholelithiasis. The advantages of this procedure over open cholecystectomy include reduced morbidity, shorter hospitalization, faster recovery, and less post-operative pain. Conversion to open cholecystectomy is still essential.

Conversion increases operation time and hospital stay, as well as morbidity.¹⁰ A variety of risk factors have been postulated for this conversion. These include surgical team skill, patient variables, and equipment failures. While the surgical staff has the necessary knowledge and equipment for a successful treatment, it is important to investigate patient-related variables as a potential cause of conversion. Male patients are at higher risk of converting to open surgery. The overall conversion rate in our study was 8(6.15%). This research compares to one conducted in a teaching hospital in Karachi, where the conversion rate was 6.5 percent.¹¹ In a research conducted at a tertiary community hospital, the conversion rate was 4.9%.¹² Daradkeh¹³ found a 2.6% conversion rate from LC to OC.¹³ Ishizaki et al, reported a 7.5% conversion rate.¹⁴ Ibrahim et al. revealed up to 10.3%.¹⁵ In our study 6(9.20%) male had done the

conversion to open surgery and only 2(3.07%) of the total female individuals had conversion to open surgery. The research was conducted at the teaching hospital in Karachi. The male conversion ratio was larger, which supports our findings, with 16.45 percent of male needed conversion in opposition to 5.09% of women.¹¹ However, a study conducted at a community hospital, men had a higher prevalence (9.1%) than women (3.5%).¹² Male gender was shown to be the independent predictive factor for conversion to open in another study conducted at the general teaching hospital; the conversion rate for men appeared to be much higher (20.4%) than for women (9.2%).¹⁶ The study found that adhesions, severe bleeding and biliary leakage were the leading reasons of conversion. According to other studies, adhesions from chronic cholecystitis (36.36%), acute inflammation (52.27%), the problematic anatomy at Calot's triangle (54.32%), & equipment failure (14.81%) are among the reasons of conversion.¹¹ However, our study found that hemorrhage (100% in females while 66.6% in men) and biliary leak in stage 1 (16.66%) in males due to adhesions were common reasons of conversion. In the other research findings, adhesions were the most common cause of conversion (40.4%), followed by CBD injury (1.8%).¹² But in another study, fibrosis of Calot's triangle (30%) along with adhesions (27%), were shown to be the most prevalent reasons of conversion.¹⁶ Another study discovered that a frozen Carol's triangle was the cause

of conversion in 50% of instances, with abnormal anatomy accounting for 25% of cases.¹⁷ There is no obvious reason why males are more likely to convert. Men are likely to have a more vigorous inflammatory response, which might result in thicker adhesions. Men may experience a delayed beginning of the condition. There has also been conjecture about a more common link between severe, acute, and chronic disease. The general consensus is that men have up to twice as much visceral adipose tissue as women. This may explain men's greater conversion rates & technical issues.

CONCLUSION

The current study concluded that males had a longer duration and higher conversion rate to open cholecystectomy than females. This causes difficult dissections following laparoscopic cholecystectomy in male patients. Males with symptomatic gallstone disease should be treated early.

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