Section: General Surgery

Original Research Article

EVALUATION OF LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY CONVERSION RATES WITH RELATION TO RISK FACTORS

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ABSTRACT

Background: Laparoscopic Cholecystectomy (LC), despite being the gold standard for the treatment of gallstone disease, requires conversion to Open Cholecystectomy (OC) at times for the safe and successful removal of Gallbladder. The aim of this study was to evaluate conversion rate and risk factors associated with conversion to open cholecystectomy in elective cholecystectomy.

Material and Methods: The records of 340 patients who underwent cholecystectomy from 1st January 2023 to 31st December 2023 were reviewed retrospectively. The demographics and clinical information about the patients was obtained from hospital records who required conversion to open cholecystectomy. Inclusion criteria is all patients who underwent elective laparoscopic cholecystectomy at the study site during the study period and exculsion criteria includes patients who had acute cholecystitis, Gall bladder perforation. Relevant medical and operative records were evaluated and appropriate tables and charts were made for record keeping using MS Excel.

Results: Conversion to open cholecystectomy was needed in 15 patients (4.4%),of which 53.3% of the cases had acute inflammation of the Calot's triangle. Female gender, recent acute cholecystitis, diabetes mellitus, hypertension and severity of inflammation were all significantly correlated with an increased conversion rate to open cholecystectomy.

Conclusion: Laparoscopic cholecystectomy is a reliable and safe surgery. With growing experience in laparoscopic technique, it is possible to bring complications and conversion rate to minimum. Distinguishing these risk factors may help to recognize the possibility and need for conversion and may also help to reduce the conversion rate.

Keywords: Conversion rate; laparoscopic cholecystectomy; open surgery; risk factors.

INTRODUCTION

Gallstone disease is a common gastrointestinal condition that commonly necessitates hospitalisation in the general population.[1] Laparoscopic cholecystectomy (LC) is a standard treatment for gallstone disease.[2] The term "conversion" refers only to cases in which cholecystectomy starts in laparoscopic and finishes in a laparotomic way.[3] The rate of conversion from laparoscopic to open surgery is currently between 2% and 15%.[4] Conversion to open cholecystectomy is neither a failure nor a complication, but an attempt to avoid complications.[5] Open conversion increases the operative time, complication rates, perioperative costs and the length of hospital stay.[6] Conversion rates vary widely, depending on several risk factors—including old age , male gender , obesity , previous abdominal surgery , diabetes and acute cholecystitis. Despite that patient-specific factors associated with a higher likelihood of conversion have been thoroughly studied, previous reviews

agreed on only two important risk factors—male gender and old age . For this reason, further efforts are needed to avoid the potential complications brought through an intraoperative conversion from Laparoscopic Cholecystectomy to Open Cholecystectomy.[3] Identification of the risk factors which are predictive of conversion preoperatively is beneficial for both the surgeon and the patient.[7]

MATERIALS AND METHODS

Study Population: All the patients who underwent Laparoscopic Cholecystectomy in Jorhat Medical College and Hospital, India.
Study Design: Retrospective Observational Study
Sample Size: 340 number of cases of Laparoscopic Cholecystectomy was performed, with 15 number of cases converted to Open Cholecystectomy.
Statistical Analysis: The collected data was analysed using proper statistical technique using IBM-SPSS Version 2.0.
Inclusion Criteria

- Includes all the patients admitted for elective Laparoscopic Cholecystectomy.

Exclusion Criteria

- All patients who had acute cholecystitis
- Gall bladder perforation
- Gall bladder malignancy, determined by preoperative scans
- Children < 10 yrs of age
- Pregnant females
- Previous abdominal surgery
- CBD stones were excluded.

Figure1: Instruments used for the procedure

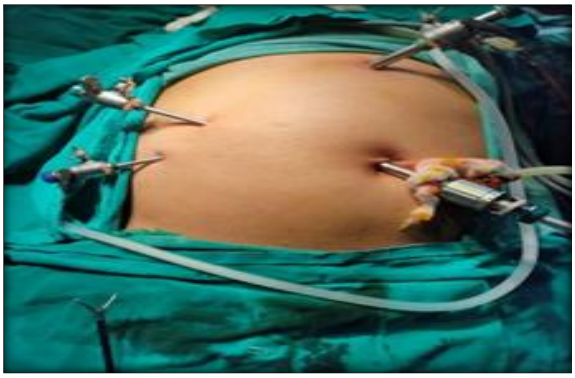

Figure 2: Placement of ports.

Figure 3: Visualisation of Critical view of safety

RESULTS AND DISCUSSIONS

Age Distribution
In the present study, mean age of the study subject was 43.26 yrs with 33.33% of the cases were between 31-40 yrs and 26.66% of the cases were between 41-50 age group. In the study by Gabriel R, Kumar S, 43% (n=18) out of 42 patients in age group 31–40 years had conversion surgery. The findings shows that the increase in conversion occurs predominantly in the middle age group.

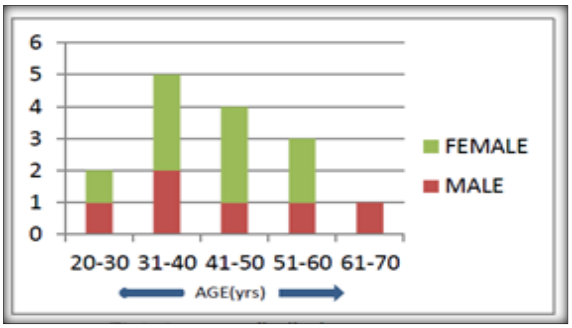

Figure 4: Age group distribution

Sex Distribution
Strong female predominance was seen among study subjects as there were 60% females and 40% males, with female to male ratio of 1.5 : 1. Mallik et al and Al Ghadhban et al also observed in their study, a ratio of male: female being about 1:5 and female (83.3%) vs male (16.7%) each in their study respectively.[8] However, in a study by Pawan Yadav et al and Thyagarajan et al in their study found that conversion rate was higher in male population.[9]

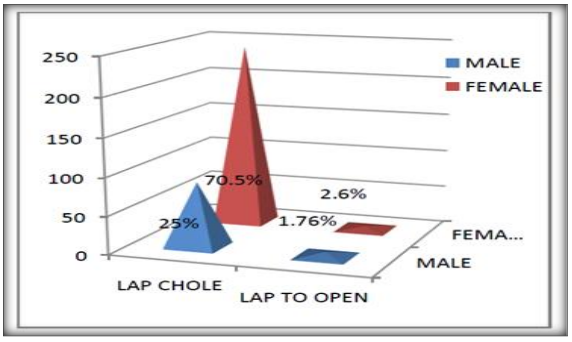

Figure 5: Sex Distribution

Indications for Conversion

Most common indications for conversion rates were -Recent acute cholecystitis (53.3%), chronic calculous cholecystitis (26.6%), biliary pancreatitis (13.3%). Similarly, Srikantegowda et al found recent acute cholecystitis to be the commonest indication in 52.9% of the case study.[10]

Table 1: Conversion rates for different indications of cholecystectomy

Indication	Lap to Open Cholecystectomy	
	No. of patients	%
Chronic Calculous Cholecystitis	4	26.6
Recent Acute Cholecystitis	8	53.3
Biliary Pancreatitis	2	13.3
Recent Obstructive Jaundice	1	6.6

Associated Co-morbities

In this context, the comorbidities such as diabetes and hypertension were associated with a higher conversion rate.In a study by Roberta Magnano et al, the comorbidities such as diabetes and hypertension were associated with a higher conversion rate.[11]

Table 2: Characteristics of the patients

Comorbidities	No. of cases
Diabetes Mellitus	11
Hypertension	8
Obesity	6
Cardiovascular	2
Respiratory	3

Causes for Conversion

The most common condition leading to the conversion was the difficult dissection of Calot's triangle(53.3%).Madhusudhan BV et al and Richards ML et al. also claimed that commonest cause of conversion was frozen Calot's triangle, 62.5% and 50% respectively.[12,13]

Table 3: Cause for conversion

Indications	No. of patients	%
Adhesions	02	13.3
Frozen/ inflammed Calot's	08	53.3
Fibrosis	01	6.6
Post ERCP status	02	13.3
Bile Duct Injury	01	6.6
Cholecystoduodenal /colic fistula	01	6.6

Conversion Rate

In the present study

Total no. of cases	Cases completed by Laparoscopy	Cases converted to open	Conversion rate
340	325	15	4.4%

Conversion Rate in similar other studies.[14,15,16]

Studies	Conversion rate (%)
Agarwal et al	6
Awan et al	5.8
Dalal et al	1.27

CONCLUSION

Laparoscopic cholecystectomy is a reliable and safe surgery. Distinguishing these risk factors may help to recognize the possibility and need for conversion and may also help to reduce the conversion rate.It is, therefore, mandatory to explain to the patients about the possibility of conversion to open technique at the time of taking consent for Laparoscopic Cholecystectomy. Funding: No funding sources **Conflict of interest:** None declared.

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