

Laparoscopic Cholecystectomy: Conversion Rate and Associated Factors for Conversion

Malla BR, Shakya YR, Rajbhandari N, Karki B

Department of Surgery
Kathmandu University School of Medical Sciences
Dhulikhel, Kavre, Nepal.

Corresponding Author

Bala Ram Malla
Department of Surgery
Kathmandu University School of Medical Sciences
Dhulikhel, Kavre, Nepal.
E-mail: mallabr504@yahoo.com

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ABSTRACT

Background

Laparoscopic cholecystectomy is the standard surgical treatment of gall bladder disease. However, conversion to open cholecystectomy is inevitable in certain cases. Different centers has reported different conversion rate and factors associated with conversion.

Objective

To identify the conversion rate, postoperative complication and factors associated with conversion.

Method

This retrospective study included all laparoscopic cholecystectomy cases attempted in Dhulikhel hospital during the year 2015 and 2016. Records of all patients were reviewed to find out demography of the patients, indications of laparoscopic cholecystectomy, rate of conversion to open, underlying reasons for conversion and postoperative complications.

Result

Out of 644 cases of laparoscopic cholecystectomy, 452 (70.18%) were female and 192 (29.81%) were male with the mean age of 39 years. Over all conversion rate to open cholecystectomy was 1.86% with the frozen calot's triangle as the most common reason for conversion. The overall postoperative complication was found to be 1.24% with no major bile duct injury. Acute cholecystitis is a significant preoperative predictor for the conversion into open cholecystectomy.

Conclusion

Laparoscopic cholecystectomy can safely be done with low conversion rate and complication. Appreciation of the predictor factors help the patient and surgeon for appropriate treatment plan.

KEY WORDS

Laparoscopic cholecystectomy, Conversion, Open cholecystectomy

INTRODUCTION

In this modern era of medicine, laparoscopic cholecystectomy (LC) is the gold standard surgical treatment for symptomatic biliary lithiasis.^{1,2} A short hospital stay, less postoperative pain, better cosmetic and faster recovery are the advantages of LC over open cholecystectomy (OC).³ Despite these advantages, LC has steep learning curve with potential serious complications. Therefore, substantial proportion (from 3.6 to 13.8%) of LC are needed to convert into OC because of intraoperative complication or technical difficulties as per different studies.⁴⁻⁶

The aim of the study is to determine the rate of complication and conversion of LC and the associated factors for conversion.

METHODS

This is a retrospective descriptive study done in Dhulikhel Hospital, Kathmandu University Hospital. The study included all the cases who underwent laparoscopic cholecystectomy from 1st January, 2015 to 30th December, 2016 after approval from institutional review committee of Dhulikhel Hospital. The data was collected was done by reviewing the records of the patients.

The cases who had no record available in hospital medical record department were excluded from the study. Those laparoscopic cholecystectomy cases which got converted to open due to technical difficulty were also excluded. Technical difficulty means the fault in laparoscopic instruments or laparoscopic tower. The statistical analysis was done with chi-square test using SPSS 21 and p value < 0.05 was considered as significant.

The collected data included gender, age, history of acute cholecystitis, previous abdominal surgery, ultrasound findings of gallbladder, preoperative endoscopic retrograde cholangiography (ERCP) findings and indications for LC. All the cases were done by qualified surgeon who had done more than 50 cases of laparoscopic cholecystectomy.

We classified patients of age more than 60 years as old. Obesity of the patient could not be considered as many records had no body mass index (BMI) record.

Patients with clinical findings and ultrasonographic features suggestive of acute cholecystitis were grouped as acute cholecystitis. Patients without those features were taken as symptomatic cholelithiasis. It included biliary colic and biliary pancreatitis. LC was done within 3 days of ERCP in all post ERCP cases.

LC was performed using standard four ports. In all cases were given single preoperative dose of third generation cephalosporin except acute calculous cholecystitis. Two more doses of the antibiotic were given twelve hourly in cases with acute calculous cholecystitis. Retrograde cholecystectomy was done in seven difficult cases. The

frozen triangle means the dense adhesion around the calot's triangle. Post operative complications were graded as per Clavien-Dindo classification.⁷

RESULTS

There were total 644 cases of LC done in Dhulikhel Hospital, Kathmandu University Hospital during the study period. The study records 452 female (70.18) and 192 male (29.81) with the mean age of 39 years (ranges from 12-80 years). Majority (86.95) of the patients were below the age of 60 years. (table 1)

Table 1. Indications of LC

Diagnosis	Number of cases (n)	Percentage (%)
Symptomatic cholelithiasis	540	83.85
Acute calculous cholecystitis	62	9.62
Gallbladder Polyp	14	2.17
Post ERCP	28	4.37
Total	644	100

Table 2. Causes for conversion to OC

Cause	Number (n)	Percentage (%)
Frozen calot's triangle	8	1.24
Choledocholithiasis	2	0.31
Malignancy of gallbladder	2	0.31
Total	12	1.86

Symptomatic cholelithiasis was the most common indication for LC. A total of 12 cases (1.86%) were converted to OC. The most common cause for the conversion was frozen calot's triangle due to inflammation. Two patients were suspicious to have choledocholithiasis in intraoperative cholangiogram. These cases were converted to open common bile duct exploration. Gall bladder mass was found in two cases which were converted to open as frozen section showed malignancy so radical cholecystectomy was done. No cases were converted to open due to technical difficulty.

Post operative complication was found in 8 cases (1.24%). (table 3) However only two patients (0.31%) had grade III b complication and rest of the complications were grade I as per the Clavien-Dindo classification.⁷

Table 3. Postoperative complications

Complications	Number of cases (n)	Percentage (%)
Superficial surgical site infection	2	0.31
Surgical emphysema	2	0.31
Bleeding	2	0.31
Bile leak	2	0.31
Total	8	1.24

Table 4. Factors associated with conversion to OC

		No conversion		Conversion		Chi square value	P value
		n	%	n	%		
Gender	Female	188	97.91	4	2.08	0.072	0.788
	Male	444	98.23	8	1.76		
Age	> 60 yrs	82	97.61	2	2.38	0.142	0.707
	<60 yrs	550	98.21	10	1.78		
Acute cal. Cholecystitis	Yes	54	87.09	8	12.90	45.725	<0.001
	No	578	99.31	4	0.68		

In case with post operative bleeding, open exploration was done. Bleeding point at the margin of liver bed was cauterized in one case and oozing surface of liver bed was cauterized and packed with Abgel® in other case.

Subhepatic drain kept during operation was sufficient to manage the cases of post operative bile leak. Drain was removed in 5th post operative day in one case and on 6th post operative day in other case.

Cases diagnosed with acute calculous cholecystitis on clinical evidence and abdominal ultrasonography findings were found to have high conversion rate with p value < 0.001. (table 4) age and sex were not found to be associated with increase rate of conversion. Similarly, pre-operative ERCP did not appear to increase the conversion rate in this study.

DISCUSSION

Over the past two decades, LC has become the gold standard treatment for the surgical treatment of gall bladder disease. Mean age for LC was 39 years with female predominance which is similar to the study done in Nepal by Bajrachayra et al. and Koirala et al.^{7,8}

LC provides the advantages to the patient and the economic benefit to the society.⁹ However the risk of conversion to open surgery is always present. The conversion rate depends upon experience of the surgeon and the degree of difficulty faced during the surgery. The rate of conversion is reported to be variable ranging from 1.5 to 7.7 in different studies.¹⁰⁻¹² The conversion rate is 1.86 in our study which is comparable. Frozen triangle is reported as the most common cause for the conversion to OC in many literatures.^{13,14} This is also true in this study.

As per Biswas et al. the rate of post operative complication following LC is 1.58% with the rate of bile leak 0.4% and major bile duct injury 0.13%.¹⁵ Similarly, Nijssen et al. is showing postoperative complication rate 8.8% with the

rate of bile leak 1.1% and major bile duct injury 0.6%.¹⁶ Our study shows the postoperative complication rate of 1.24% with bile leak 0.31% and no major bile duct injury which is comparable to the study done by Biswas et al.¹⁵ However we saw disparity in post operative complication, biliary leak and major bile duct injury rate with the study done by Nijssen et al.¹⁶ This disparity may be due to inclusion of high number of cases (n=1116) compare to our study (n=664) and less use of critical view of safety during cholecystectomy. In their study we use critical view of safety in all cases. This may have lead to no major bile duct injury in our study.

Acute cholecystitis has been mentioned by many authors as one of the factors, which is highly predictive of conversion.¹⁷⁻²⁰ It is also true in our study. In our series, the conversion rate for the case with acute cholecystitis is 12.90% versus 0.68% without acute cholecystitis with the p- value < 0.001.

Licciardello et al. had not shown gender as a significant preoperative predictor for conversion as in our study done.²⁰

Similarly, Abdulhussein et al. had shown age (> 60 years) and preoperative ERCP is not a significant predictor for conversion.²¹ Similar findings are noted in our study.

BMI and past history of laparotomy could not be considered in the study due to the lack of the records of the patient.

CONCLUSION

Laparoscopic cholecystectomy can safely be done with low conversion rate and complication. Conversion rate of LC to open surgery can be increased in cases with acute calculous cholecystitis. Understanding of the factors associated with conversion will help the surgeon to get better informed consent from the patient about the surgery.

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