

A Study Of Laparoscopic Cholecystectomy, Rate Of Conversion And Factors Influencing For Conversion In Rural Setup-A Retrospective Study

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ABSTRACT

Background & Objectives: Laparoscopic Cholecystectomy (LC) provides a safe and effective treatment for most patients with symptomatic gallstones. The goal of both Laparoscopic Cholecystectomy and Open Cholecystectomy (OC) is to remove the gallbladder with low mortality, little morbidity and early recovery. LC is the gold standard treatment for gall bladder diseases, conversion to OC is obligatory in significant proportion of cases. Hence the aim of our study is to know the conversion rate of LC to open surgery and to know the factors responsible for the conversion. **Methods:** A retrospective study in a sample size of n=116. The data was collected from the patient record underwent LC. **Results:** The males were 37/116 (31.8%) and females 79/116 (68.1%). Age ranged from 20-70 years. The LC was converted to open cholecystectomy in 10 (8.6%) patients. The factors associated with conversion were adhesions (5.1%), fibrosis of Calot's triangle (1.7%), Cystic artery injury (0.8%) and bile duct injury (0.8%). **Interpretation & Conclusion:** Laparoscopy to open surgery conversions though associated with a prolonged hospital stay, the post-operative period was uneventful in all the cases. So with predictive factors and unexpected complications conversion is mandatory to reduce the morbidity and further complications.

Key-words: conversion rate, factors causing conversion, laparoscopy cholecystectomy, open cholecystectomy.

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INTRODUCTION

The traditional open cholecystectomy was first performed in 1882 by a German Surgeon Carl August Langerbach stated that "gall bladder should be removed not because it contains a stone, but because it forms stones." Gallstone disease is a major health problem worldwide particularly in the adult population.¹ Cholecystectomy is the procedure of choice for asymptomatic gall stones. Laparoscopic cholecystectomy was first performed in Lyon, France by

Philleppe Mouret, Qubios and Persatt in 1987.² Laparoscopic cholecystectomy has revolutionized a treatment of gallbladder disease. It is the gold standard treatment for gallstones and the commonest operation performed worldwide.^{3,4} Various studies have shown the advantage of Laparoscopic cholecystectomy and Open cholecystectomy. The laparoscopic approach brings numerous advantages like minimally invasive, less patient discomfort, better cosmetic results, shorter

hospital stay and shorter interval to return to work.⁵ Despite of increased experience and technical innovations many occasions that required conversion of Laparoscopic procedure into open surgical procedures. The overall conversion rate varies from 1.9% to 26% worldwide⁶ and it is being influenced by various factors like age, sex, weight, duration and clinical findings of the disease, expertise in the surgical skills, etc. Here we have conducted a study in our institution to know the rate of conversion and factors influencing or causing conversion to open surgery. The aim of our study is to know the conversion rate of LC to open surgery and to determine the predictive factors of conversion in patients undergoing Laparoscopic Cholecystectomy.

MATERIALS AND METHODS

This was a retrospective study consisting of 116 patients undergone Laparoscopic Cholecystectomy for gallstone disease in tertiary care teaching hospital in a rural area from April 2013 to March 2015. Data was collected from the medical records department with the permission of the Institutional Ethical Committee.

Inclusion criteria: Age above 20 years and both Sexes, who undergone LC irrespective of the indications was included in the study.

Exclusion criteria: Age above 70, History

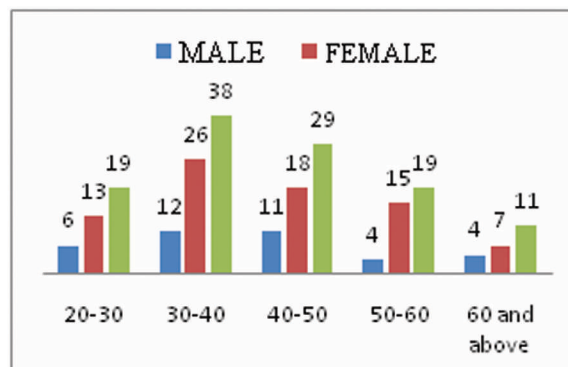
of Common Bile Duct Stone by Ultra Sonogram, History of prior abdominal surgeries, History of chronic liver diseases, perforated gall bladder, patient testing positive for Hepatitis B or C in the screening test or those deferred by the anesthetist.

RESULTS

A total (n=116) patients diagnosed with clinical presentations and by Ultrasonogram as Chronic Cholecystitis due to gallstone formation (Cholelithiasis) had undergone Laparoscopic Cholecystectomy (LC). Among the total of 116 patients, the males were 37/116 (31.8%) and females 79/116 (68.1%). The age distribution of both sexes is given in the Fig 1. Out of 116 patients, 10 cases were ended for open surgery with a conversion rate of 8.6%. (Table 1) Amongst the converted open surgery cases (n=10), six were male (5.2%) and four were female (3.4%). The factors observed for the conversion from LC to open cholecystectomy were mainly due to adhesions (5.2%), followed by fibrosis of the Calots triangle (1.7%), Cystic artery injury (0.8%) and common bile duct injury (0.8%). (Table 2) Among the converted cases the common factors accountable for conversion are severe adhesions (60%), fibrosis of Calot's triangle (20%), cystic artery injury (10%) and common bile duct injury (10%).

Table:1 Number of patients undergone LC and conversion to OC

Type Of Surgery Done	Male	Female	Total
Laparoscopic Cholecystectomy	37 (31.8%)	79 (68.1%)	116
Open Cholecystectomy (Conversion)	6 (5.2)	4 (3.4%)	10 (8.6%)

Figure: 1 Age distribution of the patients undergone LC**Table: 2 Factors influenced the conversion of LC to OC in our study**

Factors	Male	Female	Total
Adhesions	4	2	6
Fibrosis Of The Calots Triangle	1	1	2
Cystic Artery Injury	0	1	1
Bile Duct Injury	1	0	1
Total	6	4	10

DISCUSSION

In our study, our objectives are to find out the rate of conversion among LC and factors influencing for conversion. The conversion rate in our study was 8.6% is in comparison with studies observed by Prieg et al⁵ and Ibrahim, et al.⁶ The rate of conversion of LC to open cholecystectomy perceived in many studies is from 1.9% to as high as 26.1% (Table 3).

Table 3: Conversion rate of LC to OC in different studies

Author	Dinkel HP ¹⁵ 2000	DucaS ¹⁶ 2003	Tayeb ¹¹ 2005	Ibrahim ⁸ 2006	Gabriel ¹⁷ 2009
Conversion rate (%)	6.7	1.9	7.5	10.3	26.1
Author	Priego P ⁷ 2009	Ballal M ⁹ 2009	SakpalSV ¹⁸ 2010	Venkata RS ⁶ 2015	Present study
Conversion Rate (%)	8.3	5.2	4.9	5.73	8.6

The incidence of conversion common in elderly patients was observed in many studies which is comparable to our study. Among the ten patients, seven patients (70%) were above the age of 45 years.^{7,8,9,10,11} The reason explained in few studies were like recurrence and chronicity of the disease pattern which goes well with

our study as all the cases were chronic cholecystitis due to cholelithiasis. Also conversion rate in our study was more with male patients (5.1%) and female (3.4%) which has been allied universally and similar to most of the referred studies.^{7,8,9,10,}

¹¹ The reason for higher conversion rate in

male patients undergoing LC was explained by Yol et al¹² by their observation that in the male the tissue hydroxyproline and collagen deposition was more with increased inflammatory cells in the submucosal region of the gall bladder wall. Furthermore the study by Kartal et al¹³ expounded that the fibrosuppression effect of estrogen decreased the incidence of adhesion formation in women indirectly hints the cause for more fibrosis in male patients.

Additionally the nature of surgery decides the conversion rate. The emergency LC for acute cholecystitis leads to higher conversion to open surgery whereas in our study all the patients were planned for elective LC.⁹ In spite of meticulous planning, we faced the conversion of 8.6%, which is similar to the study observed by Venkata et al.⁶ Among

the conversion, the expected elective open surgery was carried out in 6/10 cases because of predicted dense adhesions in which four were male and two were female patients. The remaining four cases ended up with emergency conversion to open surgery, which is due to fibrosis of Calots triangle in two cases, cystic artery injury and bile duct injury of each one case. The risk factors responsible for the conversion were observed and analyzed in many studies which highlights the single most common factor is adhesion.^{8, 10, 11} Bleeding due to cystic artery injury is lesser in our study in appraisal with other studies. The overall incidence in our study is 0.8% and among the conversion cases is 10%. The study by Priego et al⁷ declared the bleeding due to cystic artery injury was (0.76%) but it was managed well without open surgery. (Table 4)

Table :4 Factors for conversion-comparison with other studies

Factors	Tayeb ¹¹ 2005	Simopoulos C ¹⁰ 2005	Ibrahim ⁸ 2006	Volkan Genc ¹⁹ 2011	Venkata RS ⁶ 2015	Present study
Adhesions	56.2	74.47	67.9	59.5	66.66	60
Fibrosis of Calots triangle	-	-	-	7.4	-	20
Bleeding	-	3.19	27.2	8.5	23.8	10
Bileduct injury	2.73	2.13	1.9	3.6	4.76	10
Equipment failure	-	9.57	-	-	0.00	0.00
Suspicious growth	-	1.06	-	0.6	4.76	0.00

The common bile duct injury was noted in one case which is about 0.8% among total patients and 10% among conversion cases. (Table 4) The bile duct injury is slightly higher in our study in comparison with other studies.^{6,8,10,11,19} It has been perceived that as the usage of LC has increased so has the incidence of bile duct injury. Also, two dimensional images, limited visual field, absence of tactile sensation may be responsible for this complication.¹⁴ Complications like bleeding and common bile duct injury

could have been avoided with the experienced laparoscopy surgeons. But Ibrahim et al claimed that there was a higher conversion rate when junior surgeons are operating. Nevertheless, in our study all LC was handled by experienced senior surgeons alone and same opinion was given by Misawa et al¹⁴

CONCLUSION

The conversion rate of LC to OC in our institute was 8.6% and the main factor responsible for conversion was an

adhesion (60%) which was observed more in elderly male patients. The unexpected emergency conversion to OC was carried out in fibrosis of Calots triangle (20%), Cystic artery injury (10%) and Common bile duct injury (10%). Our study concluded that laparoscopy cholecystectomy is still the gold standard procedure for gallstone disease and 91.4% of total cases benefited with this procedure. Laparoscopic to open surgery conversions though associated with a prolonged hospital stay, the post-operative period was uneventful in all the cases. So with predictive factors and unexpected complications conversion is mandatory to reduce the morbidity and further complications.

Conflict of Interests: No conflict of interests.

Source of Funding: Nil.

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