

# A Study of Laparoscopic Cholecystectomy in Patients Above and Below 50 Years of Age.

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Received: December 2017

Accepted: December 2017

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## ABSTRACT

**Background:** Cholecystectomy is the commonest operation of the biliary tract. Laparoscopic cholecystectomy (LC) is the standard treatment of symptomatic gallbladder disease. It has numerous advantages over open cholecystectomy (OC). However, current literature suggests that rate of conversion from LC to OC is 1%–15%. **Methods:** This retrospective study aims to evaluate the risk factors of conversion of LC to open between the elderly (> 50 years old) and the young (≤ 50 years old) and its relation with preoperative data and intraoperative findings. A total of 120 patients, 60 in each group, over a period of January 2016 to June 2017 were studied. **Results:** A total of 36 cases out of 120 were converted. Of these 36, 14 were in the young age group and 22 in the elderly. In each group, majority cases who were converted, were men (P value <0.05) and duration of symptoms of more than 1 year (P value <0.001). There was highly significant difference seen in the cases converted in the young age group and comorbidities (P value <0.001). Of all the converted cases, a highly significant difference was seen in both age groups with adhesions, intrahepatic and gangrenous gall bladder. **Conclusion:** We believe this is the first study in a developing country like ours suggesting laparoscopic cholecystectomy is a safe procedure irrespective of the age of the patient. While in fact, it is the chronicity of the symptoms, the gender and the intraoperative findings which predict and mandate the conversion of LC to OC.

**Keywords:** Laparoscopic cholecystectomy, conversion, preoperative and intraoperative risk factors.

## INTRODUCTION

Laparoscopic cholecystectomy (OC) has widely replaced open cholecystectomy (LC).<sup>[1,2]</sup> However, current literature suggests that the rate of intraoperative conversion from LC to OC is 1%–15%.<sup>[3,4]</sup> Conversion is also associated with complications including death, bile duct injury, bile leak, or bleeding, requiring reoperation or transfusion.<sup>[5]</sup> It is, therefore, essential to identify risk factors for conversion to allow for safer procedures and better surgical planning. A systematic assessment of these factors pre-operatively allows determination of whether OC should be performed initially, avoiding the potential complications brought through an intraoperative conversion from LC to OC. Further, effective conversion prediction models allow patients the right to be better informed of such risks before they give consent. Conversion should not be regarded as a complication but as a prudent choice to avoid additional risks/damage in particular cases.

Longer life expectancies together with a higher incidence of cholelithiasis increasing in conjunction with increasing age has resulted in a greater number of elderly patients being operated on today for symptomatic cholelithiasis. Limited functional reserves and the presence of associated chronic comorbidities increase the operative morbidity and mortality of these patients. Although laparoscopic cholecystectomy has become the gold standard for the treatment of cholelithiasis, its safety in elderly patients is still questioned.<sup>[6]</sup> There have been no studies reported which compare the younger and older age groups in the developing nations in order to study the demographic and clinical data along with the comorbidities and the intraoperative findings leading to conversion of laparoscopic cholecystectomy to an open procedure.

Hence, this study aims to evaluate the risk factors associated with conversion of laparoscopic cholecystectomy to open between the elderly (> 50 years old) and the young (≤ 50 years old) and its relation with the preoperative data and intraoperative findings.

## MATERIALS AND METHODS

Records of laparoscopic cholecystectomies performed for symptomatic cholelithiasis from

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January 2016 to June 2017 in our department were reviewed. 120 patients (n=120) were divided in two age group of 60 patients of and below 50 years and 60 patients above 50 years into Group A and B, respectively. All patients who were converted to OC (n=36) were enrolled as cases. They were considered as 'converted' if LC was planned but a conversion was mandated. A retrospective evaluation of demographic data, duration of symptoms, history of comorbidities and intraoperative findings was performed to study which factors were statistically associated with conversion. The demographic and clinical data are noted in [Table 1]. Intraoperative reasons for conversion such as massive adhesions, gangrenous or perforated gall bladder, intrahepatic gall bladder, anatomic variations if any, were all documented in each patient.

### Statistical analysis

In this study, the data analysis was done by using SPSS (Statistical Package for Social Sciences) version 20.0. Qualitative data variables were expressed by using frequency and percentage (%). Quantitative data variables were expressed by using Mean and Standard Deviation. Chi-square test and Fisher's exact test were used to compare the various qualitative data variables with respect to Conversion from laparoscopic to open cholecystectomy as Yes/No. The level of significance assessed was at P value < 0.05 and P value < 0.001.

**Table 1: Demographic Characteristics.**

Characteristics	Below 50 years of age (n=60)	Above 50 years of age (n=60)
Sex		
Female	42	56
Male	18	04
Duration of symptoms		
1 week	33	11
2 weeks	25	16
>2 weeks	02	33
Comorbidities		
None	42	08
Diabetes	08	25
Hypertension	07	19
Koch's Abdomen	03	08

## RESULTS

The study comprised 120 cases. Patients less than and equal to 50 years of age were in Group A (n=60). Patients above 50 years of age were in Group B (n=60). The mean age of patients in the below and above 50 years groups was  $36.48 \pm 7.541$  years and  $60.15 \pm 6.045$  years, respectively. The overall mean age of patients was  $48.32 \pm 13.69$  years.

Out of 120 cases, 36 (30%) were converted to OC. Details are reported in [Table 2]. Out of the total cases (n=36) converted to open cholecystectomy, 22 (61%) were male and 14 were female (39%). The

gender distribution among the two age groups in the converted cases is shown in [Table 3]. Statistically, a significant difference was seen with the male gender in the conversion rate among both the age groups (P value < 0.05). The duration of symptoms was divided as less than or equal to one year, one to two years and more than two years. A significant difference (P value < 0.001) was found Group A and in total. However, no significant difference was seen in Group B as reported in [Table 4]. Out of the 36 cases who were converted to open cholecystectomy, comorbidities were present in all 36 of them (100%). In Group A, 29 patients were suffering with comorbidities, of which 14 got converted to open cholecystectomy. In Group B, 52 patients were suffering with comorbidities, of which 22 got converted to open cholecystectomy. Statistically, significant difference (P value < 0.05) was found in Group A and in total. However, no significant difference was seen in Group B.

**Table 2: Cases converted to open cholecystectomy in the two age groups**

Conversion	Below 50 years of age (n=60)	(%)	Above 50 years of age (n=60)	(%)	P Value
Yes	14	23.33	22	36.67	0.163
No	46	76.67	38	63.33	

**Table 3: Rate of conversion among the two age groups and the gender.**

Age Group (Years)	Gender	Conversion		Total	P Value
		YES	NO		
≤ 50	Male	8	12	20	0.051
	Female	6	34	40	
>50	Male	14	13	27	0.034
	Female	8	25	33	

**Table 4: Rate of conversion and duration of symptoms among the age groups.**

Age Group	Duration of Symptoms (year)	Conversion				Total	P Value
		YES	(%)	NO	(%)		
≤ 50	≤ 1	0	0.0	25	100.	25	<0.001*
	1-2	9	0	20	00	29	
	>2	5	31.	01	68.9	06	
	Total	14	03	46	7	60	
>50	≤ 1	0	0.0	2	100.	2	0.434
	1-2	13	0	17	00	30	
	>2	9	43.	19	56.6	28	
	Total	22	33	38	7	60	
Total	≤ 1	0	0.0	27	100.	27	<0.001*
	1-2	22	0	37	00	59	
	>2	14	37.	20	62.7	34	
	Total	36	29	84	1	120	
			41.		58.8		
			18		2		

\* p Value is significant

Among the 14 cases converted to OC in Group A, adhesions were present in 10, intrahepatic gall bladder was seen in 5, 4 patients had a gangrenous gall bladder and 2 patients had a perforated gall bladder as an intraoperative finding (I/O/F). While, among the 22 cases converted to OC in Group B, adhesions were present in 12, intrahepatic gall bladder was seen in 11, 16 patients had a gangrenous gall bladder and 5 patients had a perforated gall bladder as an intraoperative finding (I/O/F). Statistically, a significant difference (P value < 0.05) was found among the each age group and in total, except for gangrenous gall bladder which was of significant difference in Group B.

## DISCUSSION

Laparoscopic cholecystectomy is regarded as the gold standard in treating symptomatic cholelithiasis.<sup>[7-13]</sup> Its benefits compared to open cholecystectomy are lower morbidity, shorter hospital stay, quicker recovery and decreased postoperative pain.<sup>[9,13]</sup> Conversion to open cholecystectomy is, however, still necessary in up to 20% of the cases.<sup>[7]</sup>

Conversion should not be considered a failure or complication, but in fact a means of preventing complications when safe completion of the laparoscopic procedure cannot be ensured.<sup>[7-9]</sup>

In our study the conversion rate of laparoscopic cholecystectomy (LC) to open cholecystectomy (OC) among the younger age group was 23.33% and in the older age group was 36.67% with a P value of 0.163. This was somewhat similar to that reported generally.<sup>[7-9,11,12]</sup> Most reports on conversion rates, however, have been published from highly specialized centers with extensive and special expertise in laparoscopic surgery.<sup>[11]</sup> General surgical practice has somewhat less favorable results.<sup>[13,14]</sup>

When we compared outcomes of laparoscopic cholecystectomy in the elderly and young population, we did not find statistical differences in the rate of complications, and conversion to open cholecystectomy between the elderly and young groups. The conversion rate in the elderly was lower than that previously reported which may be due to the selection of patients. In our study there were no significant differences in the conversion rate between the two age groups.<sup>[15,16]</sup>

In the present study, conversion rate appeared to be significantly higher for men (61%) than women (39%), a finding that has been reported previously.<sup>[7,8]</sup> The reason for the increased risk of conversion for men is not clear. We hypothesize that this may create increased technical difficulty in exposure and therefore might explain the increased conversion rate in men. This is supported by male gender significantly correlated with an increased conversion rate to OC and also because male gender associated with higher complication rates.<sup>[17,18]</sup>

Multivariate analysis identified male gender as independent predictors of conversion.<sup>[19]</sup>

None of the patients with symptoms less than one year had LC converted to OC. The majority of patients in this study underwent laparoscopic cholecystectomy for recurrent biliary colic and chronic symptoms which are similar to the ones reported.<sup>[20,21]</sup> Most of these patients suffer from repeated inflammation resulting in a contracted gallbladder with dense adhesions to surrounding structures, rendering laparoscopic surgery difficult.<sup>[21,22]</sup>

Co-morbidity has been earlier found to be a predictive factor for conversion in the univariate analysis, however not in the multivariate analysis. Some authors showed that diabetes mellitus is associated with an increased conversion rate of 18–30%,<sup>8</sup> but this finding has not been reported consistently.<sup>[7,9]</sup> Hence, we found that 29 patients (48.33%) out of 60 in Group A and 52 patients (86.67%) in Group B had history of comorbidities. In our study the presence of comorbidity was an independent risk factor (P value < 0.001 in Group A) for postoperative complications which is similar to what is reported by other studies.<sup>[23]</sup> In each age group, maximum were diabetic (18.33% and 40%) and hypertensive (20% and 36%). Out of 120 patients, among the 35 patients who were diabetic, 16 were converted to OC while out of 34 hypertensive patients 13 were converted to OC. This finding is supported in the study showing that diabetes significantly correlated with an increased conversion rate to OC and when a multivariate analysis identified diabetes mellitus as independent predictors of conversion.<sup>[19,22]</sup> Overall, patients with multiple comorbid diseases undergoing nonelective laparoscopic cholecystectomy are more likely to require conversion.<sup>[24]</sup>

In contrast to our study, the most reported reasons for conversion in a recent study were inability to identify anatomical structures in Calot's triangle and create a critical view of safety due to infiltration, adhesions, indicating recent inflammation as can be expected with (recent) acute cholecystitis and obstructive jaundice. These reasons for conversion are described consistently by others as well.<sup>[11,25]</sup>

The reasons for conversion in our study, however, were different in the two age groups. There was no mortality in our study (0%) unlike reported mortality rate of 0.3% in previous study.<sup>[26]</sup>

## CONCLUSION

Despite all, we believe that this is the first study in a developing country like ours suggesting that laparoscopic cholecystectomy is a safe procedure irrespective of the age of the patient. While in fact, it is the chronicity of the symptoms, the gender and the intraoperative findings which predict and mandate in some cases the conversion of LC to OC. Our results

of laparoscopic cholecystectomy in elderly (aged above 50) patients are comparable with those previously reported studies. However, we do realize the limitations of our study were the small study population and the retrospective and single centered design. We could not include some data like patients' BMI. We also acknowledge our limitation of not being able to compare postoperative recovery of laparoscopic cholecystectomy with open cholecystectomy in the two age groups. Hence, in order to validate our findings, further appropriately designed prospective studies are recommended especially in developing countries with limited resources.

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**How to cite this article:** Mutha NR, Sharma SC, Sinha SP. A Study of Laparoscopic Cholecystectomy in Patients Above and Below 50 Years of Age. *Ann. Int. Med. Den. Res.* 2018; 4(1):SG39-SG42.

**Source of Support:** Nil, **Conflict of Interest:** None declared