

## Original Research Article

# Predicting the conversion of laparoscopic to open cholecystectomy: an experience in a tertiary care hospital of central India

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy is the gold standard procedure for symptomatic cholelithiasis. However some laparoscopic cholecystectomies need to be converted into an open cholecystectomy for various reasons. So it will be very helpful if criteria can be developed for the prediction of difficult laparoscopic cholecystectomies. The objective of this study was to evaluate pre-operative risk factors amounting to the conversion of laparoscopic cholecystectomy into an open cholecystectomy.

**Methods:** This is a prospective study in which 255 patients presenting with definitive diagnosis of cholelithiasis meeting the inclusion criteria, undergoing laparoscopic cholecystectomy were included in the study. Their demographic data, symptomatology and associated illness were documented.

**Results:** Out of 255 patients 19 (7.4%) patients required conversion to open cholecystectomy. In converted group of patients, 73.33% patients were more than 50 years, 52.63% had BMI more than 30, 68.42% had >2 episodes of cholecystitis, 63.16% had leukocytosis, 68.42% had gallbladder wall thickness >3 mm, 63.16% had pericholecystic collection.

**Conclusions:** Clinical and ultrasonographic factors can help to predict difficult laparoscopic cholecystectomy and likelihood of conversion of laparoscopic cholecystectomy to open surgery.

**Keywords:** Conversion, Laparoscopic cholecystectomy, Open cholecystectomy

## INTRODUCTION

Gallstone disease is one of the most common problems affecting the digestive tract. Autopsy report shown prevalence of gallstone ranges from 11-36%.<sup>1</sup> With advancement in surgery, morbidity and mortality rate has come down to minimum. The National Institute of Health consensus development conference in the year 1992 concluded that laparoscopic cholecystectomy provides a safe and effective treatment for most patients with symptomatic gallstones.<sup>2</sup> However of all Laparoscopic cholecystectomies, 1-13% requires conversion to open procedure.<sup>3</sup> This study is based on the assumption that

difficult laparoscopic cholecystectomies can be predicted and its design is directed towards the identification of pre-operative risk factors.

## METHODS

The prospective study conducted from 1<sup>st</sup> September 2013 to 30<sup>th</sup> April 2016, in which 255 patients admitted to the surgical ward of our institution who underwent laparoscopic cholecystectomy, were included in this study.

Detailed history of all the 255 cases were taken according to the Performa and examined in detail.

All patients were investigated with routine hematological investigation, ultrasound of the abdomen and CT scan if needed. Risk and complications of the procedure were explained to the patients and written informed consent taken.

## RESULTS

Out of 255 patients, 19 (7.4%) patients required conversion to open cholecystectomy. In converted group of patients, 73.33% patients were more than 50 years, 52.63% had BMI more than 30, 68.42% had >2 episode of cholecystitis, 63.16% had leukocytosis, 68.42% had GB wall thickness >3 mm, 63.16% had pericholecystic collection.

**Table 1: Age and sex distribution of all the patients included in the study.**

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
<30	-	-	22	10.43	22	8.63
30-40	12	27.28	66	31.28	78	30.59
40-50	21	47.72	65	30.80	86	33.72
50-60	11	25	52	24.65	63	24.70
>60	-	-	6	2.84	6	2.35
<b>Total</b>	<b>44</b>	<b>100</b>	<b>211</b>	<b>100</b>	<b>255</b>	<b>100</b>

**Table 2: Age and sex distribution of conversion of LC to open cholecystectomy.**

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
<30	-	-	2	13.34	2	10.53
30-40	-	-	3	20	3	15.79
40-50	1	25	2	13.34	3	15.79
>50	3	75	8	53.33	11	73.33
<b>Total</b>	<b>4</b>	<b>100</b>	<b>15</b>	<b>100</b>	<b>19</b>	<b>100</b>

**Table 3: Incidence of conversion according to body mass index.**

BMI	No of patients	Percent
<18.5	2	10.53
18.5-29.99	7	36.84
>30	10	52.63
<b>Total</b>	<b>19</b>	<b>100</b>

**Table 4: Incidence of conversion according to number of attacks of cholecystitis.**

No. of previous attack	No. of patients	Percent
1	2	10.52
2	4	21.05
>2	13	68.42
<b>Total</b>	<b>19</b>	<b>100</b>

**Table 5: Incidence of conversion according to total leucocyte count (TLC).**

TLC	No. of patients	Percent
4000-11000	7	36.84
>11000	12	63.16
<b>Total</b>	<b>19</b>	<b>100</b>

**Table 6: Incidence of conversion according to GB wall thickness.**

GB wall thickness	No. of patients	%
<3 cm	06	31.58
>3 cm	13	68.42
<b>Total</b>	<b>19</b>	<b>100</b>

**Table 7: Incidence of conversion according to pericholecystic collection.**

Pericholecystic collection	No. of patients	Percent
Present	12	63.16
Absent	7	36.84
<b>Total</b>	<b>19</b>	<b>100</b>

## DISCUSSION

The findings revealed that the conversion of laparoscopic cholecystectomy (LC) to open surgery is fairly predictable with preoperative specifications of the patients. LC is the gold standard treatment of symptomatic cholelithiasis. Preoperative analysis of the general parameters of patients like age, sex, BMI, laboratory investigations like total leucocyte count and

preoperative ultrasonography (USG) may be helpful in picking up patients with increased chance of conversion into open cholecystectomy.

The overall conversion rate in our study was 7.4%. Tiwari KS et al showed a conversion rate of 7.81%, Sharma SK et al showed 4% while Nachnani J et al had 11.4% conversion rate in their study.<sup>3-5</sup>

Four out of 44 male patients and 15 out of 211 females were converted to open cholecystectomy. Fried GN et al found male gender as an independent risk factor for conversion of laparoscopic cholecystectomy into open cholecystectomy.<sup>6</sup> The mean age in non-converted patients was 38.44 years and 56.21 years in converted group. Randhawa et al found that age more than 50 years is associated with increased risk of conversion into open cholecystectomy.<sup>7</sup>

In present study most (52.63%) of the patients who were converted to open cholecystectomy had BMI more than 30. Vivek MK et al also had similar result.<sup>8</sup> It has been seen that maximum patients (68.42%) in converted group had > 2 episodes of cholecystitis. Similar results has been concluded in other studies.<sup>6,9</sup> In the study 63.16% patients in converted group had TLC more than 11000. Ibrahim et al and Bedirli et al showed similar results.<sup>10,11</sup>

Preoperative USG is a major tool in assessing the risk of conversion into open cholecystectomy. USG findings like increased gallbladder wall thickness is considered as a risk factor in many studies. In our study 68.42% patients of converted group had gallbladder wall thickness more than 3 mm. Fried GM et al also showed gallbladder wall thickness >3 mm had increased risk of conversion.<sup>6</sup> Another USG finding which helps in identifying cases at risk is pericholecystic collection seen in preoperative USG. In our study 63.16% patients of converted group had pericholecystic collection. Nachani et al also concluded pericholecystic collection as a risk factor for conversion.<sup>5</sup>

## CONCLUSION

Pre-operative evaluation of the risk of conversion into an open cholecystectomy is an important aspect of planning laparoscopic cholecystectomy. In patients with preoperative risk factors for conversion; early decision of conversion can be made so as to avoid unnecessarily prolonging the surgery and to prevent complications. Many studies have attempted to make a scoring system which can predict a difficult LC, but most of them are complex, use large number of determining factors, and they are difficult to use in day today practice.

Through this study it was concluded that conversion of laparoscopic cholecystectomy to an open cholecystectomy pre-operatively on the basis of age, sex, BMI, no. of previous attack of cholecystitis, total leucocyte count, GB wall thickness, and pericholecystic collection can be predicted.

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