

Assessment of Pre-Operative Factors Predicting Difficult Laparoscopic Cholecystectomy at a Tertiary Centre in the Eastern Region of India

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Abstract

Background: Laparoscopic cholecystectomy (LC) has become the procedure of choice for management of symptomatic gallstone disease. The present study was conducted to assess pre-operative factors predicting difficult laparoscopic cholecystectomy.

Materials & Methods: 58 patients of laparoscopic cholecystectomy of both genders were enrolled. Randhawa and Pujahari scores were given based on history, clinical examination and sonological findings, 1-day prior to surgery.

Results: Out of 58 patients, males were 32 and females were 26. Patients with >2 attacks had significant high rates of difficulty and conversion compared to patients with 2 and less than 2 attacks. Sensitivity, specificity, positive predictive value and negative predictive value of no. of attacks >2 in predicting difficult laparoscopic cholecystectomy was 37.6%, 96.5%, 87.2% and 78.4%. The sensitivity, specificity, positive predictive value and negative predictive value of no. of attacks >2 in predicting conversion laparoscopic cholecystectomy was 50.6%, 89.4%, 20.8% and 96.4%. The difference was significant (P< 0.01).

Conclusion: The difficult laparoscopic cholecystectomy and conversion to open surgery can be predicted preoperatively based on number of previous attacks of cholecystitis.

Keywords: laparoscopic cholecystectomy, gallstone disease, open surgery

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Introduction

Laparoscopic cholecystectomy (LC) has become the procedure of choice for management of symptomatic gallstone disease [1]. Approximately, 2–15% of attempted LC has to be converted to an open procedure due to various difficulties faced while performing the procedure [2]. Various clinical and ultrasonological

parameters that may help to predict the difficulty level preoperatively were analyzed in the present study. Such prediction done preoperatively may help the patient as well as the surgeon in being better prepared for the intra-operative challenges [3]. The prevalence of gallstone varies widely from place to place. It is

estimated that approximately 20 million people in the United States have gallstones and that approximately 1 million new cases of cholelithiasis develop each year. [4] In India the prevalence is estimated to be around 4% changing incidence in India is mainly attributed to westernization of diet, change in socioeconomic structure and availability of ultrasound as investigation in both rural and urban areas. [5] The National Institute of Health (NIH) consensus development conference in the year 1992 concluded that laparoscopic cholecystectomy provides a safe and effective treatment for most patients with symptomatic gallstones. [6] The present study was conducted to assess pre-operative factors predicting difficult laparoscopic cholecystectomy.

Materials & Methods

The present prospective and observational study comprised of 58 patients of laparoscopic cholecystectomy of both genders. All gave their written consent for the participation in the study. All patients with laparoscopic cholecystectomy were carried out over a two-year period, from July 2018 to June 2020, at the Department of Surgery, All India Institute of Medical Science, Patna, Bihar (India), and the Department of Surgery, Katihar Medical College and Hospital, Katihar, Bihar (India), after receiving approval from the

institutional ethical committee and permission from the heads of the departments. Consent was taken from all enrolled patients. Data such as name, age, gender, etc. was recorded. Randhawa and Pujahari scores were given based on history, clinical examination and sonological findings, 1-day prior to surgery. The scores were added up to get a total score and the patients were divided into categories of risks based on the total score. Parameters such as time taken for surgery, bile/stone spillage, injury to cystic duct or cystic artery and conversion to open cholecystectomy was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Of the 58 patients included in the study, 32 were male (55.17%) and 26 were female (44.83%). The mean age group of the study was 39.58 ± 11.03 (Mean \pm SD) years, with the minimum age being 20 years and the maximum age being 64 years. The majority of patients were in the age group of 50 years (48 patients), and only 17.24% (10) were >50 years. 40 were scored as easy (68.97%) and 11 (18.97%) were difficult group. There were 12 patients with a body mass index (BMI) of >28.5 kg/m².

Table 1: Distribution of patients

Total- 58		
Gender	Males	Females
Number	32	26

Table 1 shows that out of 58 patients, males were 32 and females were 26.

Table 2: Change in frequency of difficulty and conversion with number of attacks

Number of attacks	Easy	Difficult	Conversion	P value
1	23	6	1	0.05
2	14	3	2	0.01
3	3	2	4	0.17
Total	40	11	7	

Table 2, Figure 1 shows that patients with >2 attacks had significant high rates of difficulty and conversion compared to patients with 2 and less than 2 attacks. The difference was significant (P< 0.05)

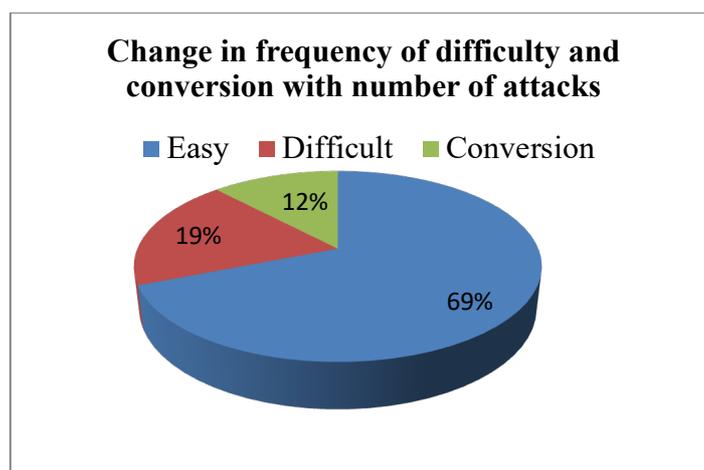


Figure 1: showing percentage wise Change in frequency of difficulty and conversion with number of attacks

Table 3: Predicting difficult laparoscopic cholecystectomy and conversion of laparoscopic cholecystectomy to open surgery based on number of attacks >2

Difficult	Value	Conversion	Value
P value	0.05	P value	0.04
Sensitivity	37.6	Sensitivity	50.6
Specificity	96.5	Specificity	89.4
PPV	87.2	PPV	20.8
NPV	78.4	NPV	96.4

Table 3 shows that the sensitivity, specificity, positive predictive value and negative predictive value of no. of attacks >2 in predicting difficult laparoscopic cholecystectomy was 37.6%, 96.5%, 87.2% and 78.4%. The sensitivity, specificity, positive predictive value and negative predictive value of no. of attacks >2 in predicting conversion laparoscopic cholecystectomy was 50.6%, 89.4%, 20.8% and 96.4%. The difference was significant ($P < 0.01$).

Discussion

As laparoscopic cholecystectomy (LC) is the gold standard treatment of symptomatic cholelithiasis, preoperative prediction of the risk of conversion is an important aspect of planning laparoscopic surgery [7]. It is important to predict difficult LC preoperatively so that senior surgeons can be requested to be present during surgery rather than less experienced junior surgeons prolonging the surgery, which may lead to intraoperative

complications[8]. Preoperatively predicted to be a conversion, an early decision of conversion can be made so as to avoid unnecessarily prolonging the surgery and to prevent complications. [9] Many studies have attempted to form a scoring system to predict difficult LC, but most of them are complex, use a large number of determining factors, and are difficult to use in day-to-day practice. [10] The present study was conducted to assess pre-operative factors predicting difficult laparoscopic cholecystectomy. We found that, out of 58 patients, 32 were males and 26 were females. Patients with >2 attacks had significantly higher rates of difficulty and conversion compared to patients with 2 or less than 2 attacks. Nidoni et al. [11] studied clinical and radiological parameters to predict difficult laparoscopic cholecystectomy and conversion. A total of 180 patients meeting the inclusion criteria undergoing LC were included in the study. Out of 180 patients included in this study, 126 (70%) were easy, 44

(24.44%) were difficult, and 3 (5.56%) required conversion to open cholecystectomy. The overall conversion rate was 5.6%. TLC > 11000, more than two previous cholecystitis attacks, GB wall thickness greater than 3mm, and pericholecystic collection were all statistically significant predictors of the difficult LC and its conversion. We observed that the sensitivity, specificity, positive predictive value, and negative predictive value of the number of attacks >2 in predicting difficult laparoscopic cholecystectomy were 37.6%, 96.5%, 87.2%, and 78.4%. The sensitivity, specificity, positive predictive value, and negative predictive value of the number of attacks >2 in predicting conversion laparoscopic cholecystectomy were 50.6%, 89.4%, 20.8%, and 96.4%. Agrawal et al. [12] evaluated difficult LC preoperatively. There were 30 cases operated by a single experienced surgeon. There are total 15 score from history, clinical and sonological findings. Score up to 5 for predicted easy, 6-10 for difficult, and > 10 for extremely difficult. Predictions came true in 76.4% of easy and 100% of difficult cases; there were no cases with a score above 10. The factors like previous history of hospitalization, clinically palpable gallbladder (GB), impacted GB stone, pericholecystic collection and abdominal scar due to previous abdominal surgery were found statistically significant in predicting difficult LC. Sanabria et al. [13] found in their study of 628 patients that patients with multiple attacks (ten or more) were significantly associated with conversion. Schrenk et al [14] reported in a study of 300 patients assessing 24 variables for conversion that patients with history of acute cholecystitis within the last 3 weeks were at increased risk of conversion [15].

The limitation of the study is the small sample size.

Conclusion

Authors found that the difficult laparoscopic cholecystectomy and conversion to open surgery can be predicted preoperatively based on number of previous attacks of cholecystitis.

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