



PREOPERATIVE ASSESSMENT OF LAPAROSCOPIC CHOLECYSTECTOMY DIFFICULTY WITH AID OF RANDHAWA AND PUJAHARI SCORE

General Surgery

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ABSTRACT

Introduction: Laparoscopic cholecystectomy (LC) is a widely performed surgical procedure globally. Assessing the difficulty of the procedure before surgery is crucial to prevent complications, ensure readiness, and ensure a smooth surgical process. However, currently, there is no established scoring system to predict the difficulty of LC before the operation. **Methods:** In our study, we aimed to predict the complexity of laparoscopic cholecystectomy (LC) preoperatively using a modified scoring system proposed by Randhawa et al. Patients diagnosed with gallbladder stones requiring LC underwent evaluation based on several criteria: age, gender, duration of illness, history of previous gallbladder disease, BMI, location of abdominal scars (infraumbilical or supraumbilical), palpability of the gallbladder, and sonographic findings such as gallbladder wall thickness and presence of pericholecystic collection or impacted stones. Various clinical, radiological, and intraoperative parameters were assigned scores. Each LC procedure was classified by the operating surgeon as easy, difficult, or very difficult based on their individual assessment. We analyzed these parameters to determine their correlation with predicting the difficulty of LC and assessed the degree of surgical complexity accordingly. **Results:** Preoperative scoring system proposed by Randhawa et al was found to be appropriate for predicting operative outcome in Laparoscopic cholecystectomy with a p value of 0.000076 with a sensitivity of 88.89% and specificity of 83.33% with accuracy of 86.67% according to this study. **Conclusions:** The Randhawa and Pujahari scoring system proves to be effective and suitable for forecasting surgical outcomes in laparoscopic cholecystectomy, thereby enhancing preoperative readiness.

KEYWORDS

Lapcholecystectomy, Prediction, Scoring

INTRODUCTION

Laparoscopic Cholecystectomy (LC) is widely recognized as the preferred method for treating symptomatic gallstones and is a frequently performed surgical procedure¹.

Erich Muhe pioneered laparoscopic cholecystectomy in 1987. Since then, LC has become the preferred standard of treatment, replacing open cholecystectomy. Its benefits include lower morbidity rates, shorter hospital stays, quicker recovery times, improved cosmetic outcomes, and overall reduced costs.

Occasionally, laparoscopic cholecystectomy (LC) becomes challenging, extending operating times and sometimes necessitating conversion to an open procedure due to bile or stone spillage². Predicting preoperatively whether the surgery will be straightforward or difficult is extremely challenging. Furthermore, accurately foreseeing the degree of difficulty is nearly impossible. Currently, there is no established scoring system to predict the complexity of LC before surgery.

For laparoscopic cholecystectomy, assessing complexity before surgery assists surgeons in determining whether to proceed with minimally invasive techniques, opt for an open procedure¹. While laparoscopic cholecystectomy typically has low morbidity and mortality rates and a low conversion rate to open surgery, the presence and severity of inflammation notably influence its outcomes².

Ultrasonography is a very important tool not only for diagnosis of gallbladder pathology but also for predicting the difficulty in surgical outcome³.

Accurate prediction can alert high-risk patients in advance about the likelihood of conversion, allowing them to make necessary arrangements ahead of time⁴. This assessment also aids in explaining the potential risks associated with both laparoscopic and open approaches⁵.

The aim of my prospective study is to anticipate the challenges of laparoscopic cholecystectomy before surgery using Randhawa and Pujahari scoring system and to verify the effectiveness of this system.

Methods

This non-randomized prospective observational study involves 30

patients, who underwent laparoscopic cholecystectomies in Department of General Surgery, Alluri Sitaramaraju Academy Of Medical Sciences during time period of 9 months (March 2023-December 2023).

Inclusion criteria

- All patients above 18 years diagnosed to have cholelithiasis and posted for laparoscopic cholecystectomy and willing to be part of the study.

Exclusion criteria

- Suspected malignant gallbladder disease
- Patients with Choledocholithiasis

Table 1: Randhawa et al, scoring system.

History	Fact	Maxscore
Age	<50Y >50Y(1)	1
Gender	Female(0) Male (1)	1
H/O hospitalization	No (0) Yes(4)	4
Clinical		
BMI	<25(0) 25.1-27.5(1) >27.5(2)	2
Palpable gallbladder	No (0) Yes(1)	1
Abdominal scar	No (0) Infra-umbilical (1) supra-umbilical(2)	2
Sonographical		
Wall thickness	Thin(0) Thick >4mm(2)	2
Pericholecystic collection	No Yes(1)	1
Impacted stone	No (0) Yes(1)	1

0-5 easy

6-10 difficult

11-15 very difficult

Total maximum score -15

The individual parameters were assigned scores based on statistical analysis. These scores were used to categorize LC (laparoscopic cholecystectomy) into three levels: easy, difficult, and very difficult, with score ranges of 0-5, 6-10, and 11-15 respectively^{6,7,8}. We compared these predictions with intraoperative findings to determine whether surgeries categorized as easy, difficult, or very difficult matched the actual intraoperative conditions. Factors considered by us to grade the

surgeries included duration of surgery, injury to the cystic artery, cystic duct, and common bile duct (CBD), bile spillage, gallstone presence, and conversion to open surgery⁹.

Table 2: Easy/difficult present study criteria.

FACTORS	EASY	DIFFICULT	VERYDIFFICULT
Time taken	<60min	60-120	>120min
Bile/stones spillage	No	Yes	Yes
Injury to ductor Artery	No	Duct only	Both
Conversion to open	No	No	Yes

Statistical analysis

30 patients undergone laparoscopic cholecystectomy were taken into study. Preoperative assessment of patients with Randhawa and Pujahari scoring system was done and intraoperative outcome is documented. All the collected data was entered into excel sheets and statistical analysis was done by using chi square test. All the statistical methods were done using SPSS for windows. $P < 0.05$ was considered statistically significant. Chi square test are used comparing two or more independent proportions.

Table No.3

No of patients	Percentage	Preoperative risk category
18	60%	Easy
12	40%	Difficult
0	0%	Very difficult

Table No.4

No of patients	Percentage	Surgical outcome
18	60%	Easy
12	40%	Difficult
0	0%	Very difficult

Table No 5

Surgical outcome	Preoperative classification		
	Easy	Difficult	Very difficult
Easy	16	2	0
Difficult	2	10	0
Very difficult	0	0	0
CHI SQUARE TEST P VALUE IS 0.000076 (<0.05) SIGNIFICANT STATISTICAL ASSOCIATION			

Table No 6

PARAMETERS	EASY
SENSITIVITY	88.89%
SPECIFICITY	83.33%
ACCURACY	86.67 %

RESULTS

- 17 Patients (56.6%) were under the age of 50 years, 13 patients (43.3%) were above the age of 50 years.
- 19 patients (63.3%) were females, 11 (36.6%) were males. There was female predominance in cholelithiasis.
- 12 patients (40%) had a history of previous hospitalization.
- 12 patients (40%) were under 25 kg/m² BMI, 10 Patients (33.3%) were between 25-27.5 kg/m², 8 patients (26.6%) were above 27.5 kg/m².
- 11 patients (36.6%) had no abdominal scar, 19 patients (63.3%) had infra umbilical scar.
- 30 patients (100%) had no palpable gall bladder.
- 25 patients (83.3%) had normal gall bladder thickness (<4mm), 5 patients (16.6%) had more than 4mm.
- 30 patients (100%) had no pericholecystic collection.
- 30 patients (100%) had no impacted stone.
- Preop scoring is statistically significant in predicting the surgical outcome (p value is 0.000076).
- The scoring system is useful as it predicts the outcome with a sensitivity of 88.89% and specificity of 83.33% with an accuracy of 86.67%.

DISCUSSION:

Age & sex:

In this study, out of 30 patients - 13 patients were above the age of 50 years. Out of 30 patients, 11 are male and 19 are female. Overall female and male ratio is 1.72:1. Gall stone disease is found to be more common in females as compared to males in this study.

Previous hospitalization:

In this study, 12 patients were found to have history of previous hospitalization for the treatment of acute cholecystitis. Out of those 12 patients, the surgical outcome was difficult in 10 patients. According to this study history of previous hospitalization was found to be significant.

Bmi:

BMI has been found to be a significant factor, resulting in difficult surgical outcome in this study. Out of 30 patients, 8 patients had BMI >27.5, all 8 patients had difficult surgical outcome.

Palpable gall bladder:

Out of 30 patients, no one had palpable gall bladder. So significance cannot be defined.

Old scar:

Out of 30 patients, 19 patients had visible scar in infraumbilical abdominal wall, giving indication of previous surgery. Only 9 patients with old scar had difficult surgical outcome. In this study old scar versus difficult surgical outcome was not significant.

Ultrasound:

In this study, Ultrasonography falls as an important tool that have helped in anticipating difficulty preoperatively and on Ultrasonography ground we could plan on standard protocol of management.

In this study, 5 patients had thickened gall bladder wall. All 5 patients had difficult surgical outcome. Thickened Gall bladder is a significant factor in this study.

Factors such as Pericholecystic collection and impacted stone cannot be elicited as no patients had these factors in Ultrasound.

It is mandatory for a surgeon to know about gall bladder wall thickness, status of gall bladder (Contracted or distended), number of stones, cystic duct length, acute inflammation, pericholecystic fluid, emphysematous gall bladder¹⁰.

Severe inflammation or fibrosis of gall bladder, thick wall gall bladder and frozen calot's triangle, Mirizzi's syndrome, portal hypertension, liver disease will make completion of laparoscopic cholecystectomy safe or impossible.

Scoring system:

Preoperative scoring versus surgical outcome was found to be significant according to this study (p value 0.000076 i.e. p value <0.05). However the scoring system is useful as it predicts outcome with a sensitivity of 88.89% and specificity of 83.33% with an accuracy of 86.67%.

CONCLUSION

We suggest that a scoring system be consistently employed as a protocol to predict the difficulty level of laparoscopic cholecystectomy preoperatively. This can aid in determining the surgical approach, advising patients, and reducing complication rates, conversion rates, and overall medical costs. The scoring system proposed by Randhawa and Pujahari is effective. Overall Randhawa & Pujahari scoring system is useful for preoperative assessment of a patient with gallstone disease and planned for laparoscopic cholecystectomy as it helps to assess the probability of difficulty.

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