

Preoperative Prediction of Difficult Laparoscopic Cholecystectomy Using Randhawa and Pujahari Scoring System

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Abstract

Aim: The aim of this study is to evaluate the factors determining the preoperative prediction of difficult laparoscopic cholecystectomy, To reduce the conversion ratio of laparoscopic to open cholecystectomy and to assess the validity of Randhawa & Pujahari scoring system in predicting preoperative difficult laparoscopic cholecystectomy.

Methods : From January to December 2018, a prospective study of the cases admitted to Department of General Surgery in Coimbatore Medical College & Hospital Coimbatore, planned for laparoscopic cholecystectomies were recruited. Preoperatively a score was given according to Rhandhawa and Pujahari scoring system. That includes history, clinical and sonological findings. Intraoperative score was given based on time taken for surgery, bile/stone spillage, injury cystic duct/ cystic artery and conversion to open cholecystectomy.

Results: In this study, out of 30 patients - 11 patients were above the age of 50 years. Overall female and male ratio is 1.72. Gall stone disease is found to be more common in females as compared to males in this study. According to this study history of pervious hospitalization was found to be significant. BMI has been found to be a significant factor, resulting in very difficult surgical outcome in this study. Out of 30 patients, 7 patients had BMI > 27.5, out of which 3 patients had very difficult surgical outcome resulting in conversion to open cholecystectomy. Out of 30 patients, 3 patients had palpable gall bladder. All the 3 patients had difficult surgical outcome resulting in conversion. Out of 30 patients, 15 patients had visible scar in abdominal wall, giving indication of previous surgery. Out of which, 14 patients had infraumbilical scar and one patient had supraumbilical scar. Only 4 patients with old scar had difficult surgical outcome requiring conversion. In this study old scar versus difficult surgical outcome is not significant. In this study, 2 patients had thickened gall bladder wall. Out of which 1 patient had difficult surgical outcome and the other patient had very difficult surgical outcome requiring conversion. However the scoring system is useful as it predicts very difficult surgical outcome requiring conversion with a sensitivity of 63.64% and a specificity of 94.70%. Also the positive predictive value is 87.50%. This scoring system predicts difficult surgical outcomes requiring conversion with an accuracy of 83.33%. Hence this scoring system is an useful parameter which can be used to predict very difficult surgical outcome which would result in conversion of laparoscopic cholecystectomy to open cholecystectomy.

Conclusion: The scoring system is useful as it predicts very difficult surgical outcome requiring conversion with a sensitivity of 63.64% and a specificity of 94.70%. Also the positive predictive value is 87.50%. This scoring system predicts difficult surgical outcomes requiring conversion with an accuracy of 83.33%.

This scoring system is a good test for pre-operative predicting the difficulty of LC.

Key Word: laparoscopic cholecystectomy, scoring system, prospective study

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I. Introduction

Laparoscopic cholecystectomy has become the procedure of choice for the management of symptomatic gallstone disease, because it is minimally invasive, causes less pain and early recovery. Sometimes

laparoscopic cholecystectomy becomes difficult. It may take a longer time and occasionally requires conversion to open cholecystectomy. It is very difficult to predict preoperatively whether it is going to be easy or difficult. The degree of difficulties is again impossible to predict. Gall stone disease is a common problem affecting human being. Over the past two decades, laparoscopic cholecystectomy has become the gold standard for the surgical treatment of gallbladder disease. The advantages of laparoscopic cholecystectomy are many, but not without complications. The complications during laparoscopic cholecystectomy, some are specific to the unique technique and some are common to laparoscopic surgery in general. Approximately 2% to 15% of patients require conversion to open surgery for various reasons. Because of conversion to open technique time, cost and morbidity are increased. J.S. Randhawa & A.K. Pujahari, from the department of general surgery in Indian Air Force hospital Bangalore formed a scoring system for preoperative prediction of difficult laparoscopic cholecystectomy. In the present study, the preoperative factors that predict the chances of conversion from laparoscopic to open cholecystectomy as per Randhawa and Pujahari scoring system are assessed.

II. Materials And Method

AIM AND OBJECTIVE: To predict preoperatively the difficult laparoscopic cholecystectomy using a scoring system-Randhawa and Pujahari.

STUDY AREA :

Department of General Surgery, Coimbatore Medical College & Hospital, Coimbatore

Study population:

Patients with symptomatic gall stone disease admitted in Department of General Surgery, Coimbatore Medical College & Hospital, Coimbatore.

INCLUSION CRITERIA:

1. Gall bladder stone disease.
2. Age more than 18 years

EXCLUSION CRITERIA:

1. Carcinoma gall bladder,
2. CBD stone,
3. Dilated CBD,
4. Obstructive jaundice, and
5. Age less than 18 years &
6. Equipment failure.

STUDY PERIOD:

From JANUARY TO DECEMBER 2018

SAMPLE SIZE:

30

STUDY DESIGN:

Prospective study

METHODS

Serial 30 patients admitted with symptomatic gall stone disease planned for laparoscopic cholecystectomy, in our hospital, subjected to our study. After the OPD workup, the scores are given on history, clinical examination and sonological findings one-day prior to surgery on the basis of Randhawa & Pujahari scoring system. Score up to 5 is defined as easy, 6-10 as difficult and 11-15 as very difficult. We preoperatively defined the level of difficulty such as easy, difficult and very difficult. Laparoscopic cholecystectomy is done using CO₂

pneumoperitoneum with 12-14 mm Hg pressure and using standard two 5 mm and two 10 mm ports. The timing was noted from the first port site incision till the last ports closure. All the intra operative events were recorded. The entire cases received standard postoperative care & follow up. The following operative parameters are going to be recorded for all the patients undergoing laparoscopic Cholecystectomy:

- Time taken for surgery
- Bile/stone spillage
- Injury to cystic duct or cystic artery
- Conversion to open cholecystectomy

Randhawa and Pujahari Scoring System

History			Max score
Age	< 50 (0)	>50 (1)	1
Sex	Female (0)	Male (1)	1
H/o hospitalization	No (0)	Yes (4)	1
Clinical			
BMI	<25	>25-27.5 (1) >27.5 (2)	2
Palpable GB	No (0)	Yes (1)	1
Abdominal scar	No (0)	Infraumbilical (1) Supraumbilical (2)	2
Sonography			
Wall thickness	Thin (0)	Thick >4 mm (2)	2
Impacted stones	No (0)	Yes (1)	1
Pericholecystic collection	No (0)	Yes (1)	1

Total maximum score -15

Easy/difficult criteria:

Factors	Easy	Difficult	Very difficult
Time taken (minutes)	<60 min.	60-120 min.	>120 min.
Bile / stone spillage	No	Yes	Yes
injury to duct or artery	No	Duct only	Both
Conversion to open	No	No	Yes

III. Results

AGE OF THE PATIENT

AGE IN YEARS	NO OF PATIENTS	PERCENTAGE
< 40	10	34%
41-50	9	30%
51-60	4	13%
> 60	7	23%

SEX	NO OF PATIENTS	PERCENTAGE
MALE	11	37%
FEMALE	19	63%

Majority of patients in my study were less than 40 years of age

PREVIOUS HOSPITALISATION	NO OF PATIENTS	PERCENTAGE
YES	8	27%
NO	22	73%

BMI	NO OF PATIENTS	PERCENTAGE
< 25	13	44%
25-27.5	10	33%
> 27.5	7	23%

Majority of patients were female in my study group

Majority of patients(73%) had no previous hospitalisation in my study

BMI of 44% of patients were <25.

ABDOMINAL SCAR	NO OF PATIENTS	PERCENTAGE
NO SCAR	15	50%
INFRA UMBILICAL	14	47%
SUPRAUMBILICAL	1	3%

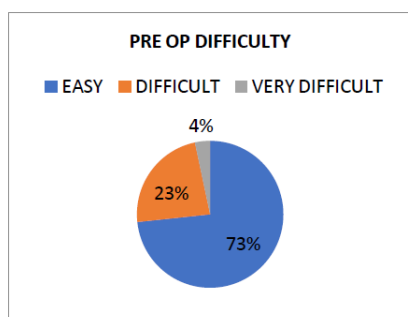
GB PALPABLE	NO OF PATIENTS	PERCENTAGE
YES	3	10%
NO	27	90%

Gall bladder was not palpable in 90% of individuals in my study.

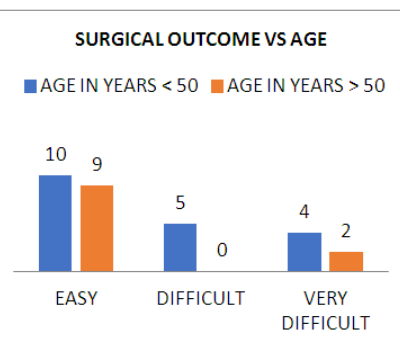
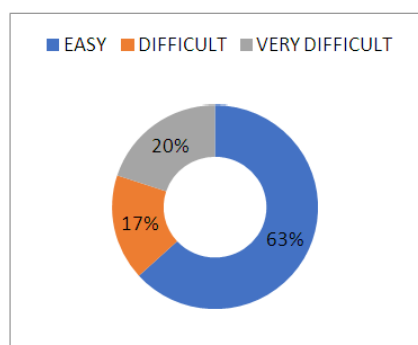
IMPACTED STONE	NO OF PATIENTS	PERCENTAGE
YES	4	12%
NIL	26	88%

Impacted gallstones were present in around 12% of individuals in my study

PERICHOLECYSTIC COLLECTION	NO OF PATIENTS	PERCENTAGE
YES	2	6%
NO	28	94%



Preoperative scoring predicted around cholecystectomy to be easy in 73%, Difficult in 23% and very difficult in 4% of patients



Surgical outcome came out to be easy in 63%, difficult in 17% and very difficult in 20% of patients

There is no statistical significance of age in predicting difficult laparoscopic cholecystectomy. (P value of 0.370)

SURGICAL OUTCOME	PREVIOUS HOSPITALISATION	
	YES	NO
EASY	1	18
DIFFICULT	3	2
VERY DIFFICULT	4	2
KRUSKAL WALLIS TEST		
P VALUE - 0.002		
SIGNIFICANT		

SURGICAL OUTCOME	BODY MASS INDEX		
	< 25	25-27.5	>27.5
EASY	11	5	3
DIFFICULT	2	2	1
VERY DIFFICULT	0	3	3
KRUSKAL WALLIS TEST			
P VALUE - 0.031			
SIGNIFICANT			

SURGICAL OUTCOME	OLD SCAR		
	NO SCAR	INFRA UMBILICAL	SUPRA UMBILICAL
EASY	11	8	0
DIFFICULT	3	2	0

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VERY DIFFICULT	1	4	1
KRUSKAL WALLIS TEST			
P VALUE - 0.177			
NON SIGNIFICANT			

SURGICAL OUTCOME	PALPABLE GB	
	YES	NO
EASY	0	19
DIFFICULT	0	5
VERY DIFFICULT	3	3
KRUSKAL WALLIS TEST		
P VALUE - 0.001		
SIGNIFICANT		

There is no statistical significance when comparing surgical outcome in patients with old scar
 The surgical outcome was difficult in patients with palpable gallbladder (p value 0.001). Hence the data is statistically significant

SURGICAL OUTCOME	PRE OP CLASSIFICATION		
	EASY	DIFFICULT	VERY DIFFICULT
EASY	18	1	0
DIFFICULT	2	3	0
VERY DIFFICULT	2	3	1
KRUSKAL WALLIS TEST			
P VALUE - 0.370			
NON SIGNIFICANT			

Pre op scoring is not statistically significant in predicting the surgical outcome

PARAMETERS	EASY	DIFFICULT
SENSITIVITY	94.70%	63.64%
SPECIFICITY	63.64%	94.70%
POSITIVE PREDICTIVE VALUE	81.82%	87.50%
NEGATIVE PREDICTIVE VALUE	87.50%	81.82%
ACCURACY	83.33%	83.33%

The scoring system is useful as it predicts very difficult surgical outcome requiring conversion with a sensitivity of 63.64% and a specificity of 94.70%. Also the positive predictive value is 87.50%. This scoring system predicts difficult surgical outcomes requiring conversion with an accuracy of 83.33%.

IV. Discussion

In this study, out of 30 patients - 11 patients were above the age of 50 years. Overall female and male ratio is 1.72. Gall stone disease is found to be more common in females as compared to males in this study. Age and sex was not significant in this study as compared to that done by Randhawa and pujhari et al. In this study, 8 patients were found to have history of previous hospitalization for the treatment of acute cholecystitis. Out of those 8 patients, the surgical outcome was very difficult in 4 patients who underwent conversion to open cholecystectomy. According to this study history of previous hospitalization was found to be significant. BMI has been found to be a significant factor, resulting in very difficult surgical outcome in this study. Out of 30 patients, 7 patients had BMI > 27.5, out of which 3 patients had very difficult surgical outcome resulting in conversion to open cholecystectomy.

Palpable gall bladder found to be a significant factor in this study. Out of 30 patients, 3 patients had palpable gall bladder. All the 3 patients had difficult surgical outcome resulting in conversion. Out of 30 patients,

15 patients had visible scar in abdominal wall, giving indication of previous surgery. Out of which, 14 patients had infraumbilical scar and one patient had supraumbilical scar. Only 4 patients with old scar had difficult surgical outcome requiring conversion. In this study old scar versus difficult surgical outcome is not significant. 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, 2 patients had thickened gall bladder wall. Out of which 1 patient had difficult surgical outcome and the other patient had very difficult surgical outcome requiring conversion. Thickened Gall bladder is a significant factor in this study. On the other hand, factors such as Pericholecystic collection and impacted stone was found to be insignificant. Preoperative scoring versus surgical outcome was found to be not significant according to this study & it is match with Randhawa & Pujahari original study. This may be due to high surgical experience of the operating surgeon. However the scoring system is useful as it predicts very difficult surgical outcome requiring conversion with a sensitivity of 63.64% and a specificity of 94.70%. Also the positive predictive value is 87.50%. This scoring system predicts difficult surgical outcomes requiring conversion with an accuracy of 83.33%. Hence this scoring system is an useful parameter which can be used to predict very difficult surgical outcome which would result in conversion of laparoscopic cholecystectomy to open cholecystectomy.

V. Conclusion

Laparoscopic cholecystectomy is a safe procedure for management of gallstone diseases.

From our study we can conclude the following

- Gall stone disease found to be more common in females than in males. However it has no significant effect on the surgical outcome of laparoscopic cholecystectomy. No specific age distribution found to be difficult for laparoscopic cholecystectomy.
- BMI is an important indicator for prediction of surgical outcome. Patients with high BMI found to have increased risk of developing gallstone disease and also they have high chances of conversion of laparoscopic to open cholecystectomy due to difficult surgical outcome.
- Difficult gall stone disease found to have an association with patients with previous history of cholecystitis. However no association found between difficult gall stone disease and previous abdominal surgeries.
- Palpable Gall bladder is also an important indicator for difficult laparoscopic cholecystectomy which results in conversion.
- Amongst USG findings, only gall bladder wall thickness found to be an important indicator for prediction of difficult surgical outcome requiring conversion. Pericholecystic collection and impacted stone does not affect the surgical outcome according to this study.
- Overall Randhawa & Pujahari scoring system is useful for preoperative assessment of a patient with gall stone disease and planned for laparoscopic cholecystectomy as it helps to assess the probability of difficulty and the need for conversion to open cholecystectomy.

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