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A STUDY ON THE PREOPERATIVE SCORING SYSTEM TO PREDICT DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Background: Gall stone disease is a common problem affecting human being. Laparoscopic cholecystectomy (LC) has become gold standard for the surgical treatment of gallbladder disease over the past two decades. Preoperative prediction of the risk of conversion or difficulty of operation is an important aspect of planning laparoscopic surgery. Various scoring methodologies have been suggested using different criteria from time to time, which have also increased the controversy regarding the application of different scoring systems. The aim of our study was to establish the validity of the scoring system devised by Randhawa et al in our hospital scenario. Material and Methods: - This study was conducted in DHQ Hospital Mirpur. A total of 37 patients were enrolled in the study from February 2024 to August 2024. Patients were assessed on the scoring system that was designed by Randhawa and Pujahari. Later all the scores were added up in order to get a total score. Finally, patients were categorized into risks-based scoring system into no risk, moderate risk and high-risk categories. Ethical review committee approval was obtained before conducting the study. Chi square test was performed to evaluate the significant relationship between preoperative scores and pre-operative outcomes'-value of <0.05 was taken as statistically significant.

Results: - A total of 37 patients were enrolled in the study from February 2024 to August 2024. Ethical review committee approval was obtained before conducting the study. There was significant association was found between previous abdominal scar and difficult laparoscopic surgery with p-value of 0.02. Twenty-three patients scored easy (62.2%) and only fourteen (37.8%) scored difficult while no patient scored very difficult in our study. Prediction came true in 71.4% for easy and 50% difficult cases; there were no cases with a score above 10.

Conclusion: - Previous abdominal scar is an important finding and was found to be statistically significant in predicting difficult laparoscopic surgeries. However, study with large sample size could provide us better understanding and good assessment of other factors associated with difficult laparoscopic surgeries.

INTRODUCTION

Gall stone disease is a common problem affecting human being., laparoscopic cholecystectomy (LC) has become gold standard for the surgical treatment of gallbladder disease over the past two decades (1). All over the world, the most common procedure being performed by general surgeons is Laparoscopic cholecystectomy(LC) (2). Preoperative prediction of the risk of conversion or complexity of operation is an important aspect of planning laparoscopic surgery(3). The term difficult cholecystectomy refers to several technical intra-operative difficulties that increases the risk of complications and significantly prolongs operation time(4). With the help of accurate prediction, high risk patients may be informed beforehand and they may have a chance to make arrangements(5). Laparoscopic cholecystectomy can be achieved using four ports, three port and single incision laparoscopic surgery (SILS). In four ports LC there will be two 10 mm ports and two 5mm ports. In three port LC there will be two 10 mm ports and one 5 mm port. SILS contains only one port of 20 mm size(6). Various scoring methodologies have been suggested using different criteria from time to time, which have also increased the controversy regarding the application of different scoring systems (7). The aim of our study was to establish the validity of the scoring system devised by Randhawa et al in our hospital scenario (8,9).

MATERIAL AND METHODS

This study was conducted in DHQ Hospital Mirpur. A total of 37 patients were enrolled in the study from February 2024 to August 2024. Ethical review committee approval was obtained before conducting the study. The inclusion criteria were to enrolled all patients with symptomatic gall stone disease and unfit for anesthesia. However, all those patients who were admitted with current attack of acute cholecystitis and laparoscopic to open cholecystectomy conversion will be excluded from the study. The sample technique that used was non-probability consecutive sampling. Patients were assessed on the scoring system that was designed by Randhawa and Pujahari (Table 1). Later all the scores were added up in order to get a total score. Finally, patients were categorized into risks-based scoring system into no risk, moderate risk and high-risk categories (Table 2).

Table 1. Scoring Factors Used for Grading the Patient Parameters (By Randhawa and Pujahari)

Scoring Factors	Minimum	Maximum	Total
History Age Sex History of hospitalization for acute cholecystitis	<50 years (0) Female (0) No (0)	>50 years (1) Male (1) Yes (4)	1 1 4
Clinical Parameters BMI weight (kg)/height (m ²) Abdominal Scar Palpable GB	<25(0) No (0) No (0)	25.0- 27.5(1) >27.5(2) Infra-umblical (1) Supra-umblical (2) Yes (1)	2 1 2 1
Sonography Wall thickness Pero cholecystic collection Impacted stone Table - 2	Thin (0) No (0) No (0)	Thick >4 mm (2) Yes (1) Yes (1)	2 1 1
Risk	Scores		
No Risk	0-5		
Moderate Risk	6-10		
High Risk	11-15		
Surgery was executed by using CO ₂ pneur	noperitoneum with	10 mm Hg pressure as	well as

Surgery was executed by using CO2 pneumoperitoneum with 10 mm Hg pressure as well as using standard two ports of 5 mm and two 10 mm respectively. Then, the timing was recorded right from the first port site incision until the last port closure. Later than operative parameters were recorded for all the patients undergoing LC were mentioned in the table below in table 3.

Parameters	Easy	Difficult	Very difficult
Time taken for	<60 mins	60-120 mins	>120 mins
surgery			
Bile /stone spillage	No	Yes	-
Injury to duct or	No	Yes	-
artery			
Conversion to open	No	No	Yes
cholecystectomy			

Results were analyzed by senior resident which again was checked by consultant before putting the data onto Performa. Later on, after completing the data of the required sample, a data base was developed on SPSS for windows version 22.0 for data analysis procedure. Chi square test was performed to evaluate the significant relationship between preoperative scores and pre-operative outcomes'-value of < 0.05 was taken as statistically significant.

RESULTS

37 patients enrolled in this study, 13 were male and 24 were females which constitute about 35.13 % and 64.87% respectively. The majority of patient were > 50 years of age (23 patients) while only 14 patients were found to have age <50 years. 6 out of 37 patients had history of hospitalization for acute cholecystitis which constitutes about 16.21 % of total patients. With respect to clinical assessment, 16 patients had BMI of < 25, 12 had BMI of 25-27.5 and only 9 patients had BMI of >27.5 kg/m² respectively. Moreover, abdominal scar was found in 20 out of 37 patients, which constitute about 54.05% respectively. All 20 patients had infraumbilical scar. Furthermore, 11 out of 37 patients had palpable gallbladder on clinical assessment (Table -4). Sonographic evaluation was also done. Thickness of gallbladder wall (>4mm) was seen in 13 cases while 24 patients had normal thickness. While only 4 patients were found to have pericholecystic collection constituting only 10.8% of total patients. Further, impacted stone was also found in 11 out of 37 patients. Twenty-three patients scored easy (62.2%) and only fourteen (37.8%) scored difficult while no patient scored very difficult in our study (Table -5). Postoperative outcome was correlated with the various factors included in the scoring system, and data analyzed to assess the significance of each factor. From our data, we observed that abdominal scar was significant associated factors causing difficulties in laparoscopic cholecystectomy (Table -4). Table -4

Scoring Factors		Number (out of 37)	Percentage	P- value
History Age	<50 years >50 years	14 23	37.83% 62.16%	0.52
Sex	Female Male	24 13	64.86% 35.13%	0.13
History of hospitalization for acute cholecystitis	Yes No	6 31	16.21% 83.78%	0.80
Clinical Parameters BMI weight (kg)/height (m ²)	<25(0) 25.0-27.5 >27.5	16 12 09	43.24% 32.43% 24.32%	0.92
Abdominal Scar	(Yes) Infraumblical 2.Supra-umblical	20 20 00	54.05%	*0.02
	(No)	17	45.94%	
Palpable GB	Yes No	11 26	29.72% 70.27%	0.53

Sonography Wall thickness	Thin Thick >4 mm	24 13	64.86% 35.13%	0.44
Perocholecystic collection	Yes No	04 33	10.81% 89.18%	0.59
Impacted stone	Yes No	11 26	29.72% 70.27%	0.53

We observed a positive predictive value of 71.42% for our scoring system for cases predicted to be easy. For cases predicted to be difficult we registered a positive predictive value of 50% for the scoring system.

Tal	ole	-5

Preoperative Scores	Easy %	Difficult %	Very difficult	Total
No risk (0-5)	15 (71.42%)	6 (28.57%)	-	21
Moderate risk (6-10)	8 (50%)	8 (50%)	-	16
High risk (11-15)	-	-	-	
Total	23(62.16%)	14 (37.83%)	-	37

DISCUSSION

Age is one of the important risk factors in difficult gallbladder surgery. In our study majority of patients were > 50 years of age. Compare to study conducted by Nikhil Agrawal et al (8), most patient had age <50 years (10). Moreover, in our study, there was no significant relationship found between age and difficult level of surgery. This could due to discrepancy in distribution of gender, 13 out of 37 was male in our study (11). Though, smaller sample size could be a factor for insignificant relationship between age and difficult level of surgery. Obesity also plays a significant role in surgeries. In our study 9 out of 37 patients were obese, in which only 3 had difficult surgery (12). However, no significant relationship was found between difficult level of surgery and obesity. Similar results were found in study conducted by Asish et al (9). This could be due to surgical expertise and experience of surgeons in our study (13). In our study, significant relationship was found between abdominal scar and difficult level of surgery. Compare to studies conducted by Nikhil Gupta et al (3) and most of the other studies, in which no significant relationship was found between these two (14). The reason for this is unknown however these patients might have shown complication of previous surgeries. All other factor in our study was found to have insignificant association with difficult level of laparoscopic surgery like history of hospitalization for acute cholecystitis, palpable gallbladder and sonographic findings such as gallbladder wall thickness, impacted stones and pericholecystic collection (15). Compare to other studies like Nikhil et al in which previous history of hospitalization, clinically palpable gallbladder (GB), impacted GB stone (16), pericholecystic collection showed significant association with difficult laparoscopic surgeries. This could be due to other factors such as gender distribution (17), age presentations and associated symptoms that are different in our study comparable to other studies.

CONCLUSION

Previous abdominal scar is an important finding and was found to be statistically significant in predicting difficult laparoscopic surgeries. However, study with large sample size could provide us better understanding and good assessment of other factors associated with difficult laparoscopic surgeries.

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