

Preoperative Prediction of Difficult Laparoscopic Cholecystectomy – A Scoring System

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Abstract: Laparoscopic cholecystectomy is now accepted as the new gold standard for the treatment of symptomatic gall bladder disease. The present study was conducted to look for some preoperative predictor factors that can give surgeon some idea about the potential difficulties and complications that can be encountered during the course of laparoscopic cholecystectomy that may require conversion to open cholecystectomy. The number of cases predicted to be difficult/ Very Difficult on preoperative evaluation were 22(44%) patients out of which 18(36%) were difficult/Very difficult on surgery.

Keywords: Preoperative Prediction, Laparoscopy Cholecystectomy.

1. Introduction

Preoperative predictor factors are a useful screening investigation in candidates undergoing laparoscopic cholecystectomy. Apart from the usual diagnostic information, operative difficulties can be well predicted by these factors in more than 50% of cases. In these patients, surgeons can take up appropriate measures for adequate assistance in the operating room. On preoperative predictor factors findings, surgeons can be aware of the potential problems during laparoscopic cholecystectomy and maintain a reasonable threshold of conversion if technical problems arise.

2. Materials and Methods

The present study was done on 50 patients of gall bladder disease requiring elective laparoscopic cholecystectomy in the Department of General Surgery, Mahatma Gandhi Medical College, Jaipur from October 2014 to November 2016.

The criteria for selection was as follows:

2.1 Patient Selection

Inclusion Criteria

All patients with symptomatic gall bladder disease, Patients of all ages and both sexes were included in the study.

Exclusion criteria

Patients with Carcinoma of gall bladder, Jaundice or abnormal liver function tests, Cirrhosis, Common bile duct stones (CBD stones), Empyema gall bladder, Acute pancreatitis, History of more than 2 abdominal surgeries, Portal hypertension, Cholangitis, Pregnancy.

Due approval was taken from Institutional Ethical Committee before undertaking the study. The selected patients were then informed about the procedure and written informed consent was taken. Patients were also informed about the possible conversion to open cholecystectomy preoperatively.

A predesigned questionnaire was used to collect basic information like Age, sex, H/o Hospitalization.

Following investigations of all patients were done:

Haemogram, Blood sugar, Renal function tests, Liver function tests- (serum bilirubin, serum alkaline phosphatase, SGOT, SGPT and prothrombin time), Serum amylase and lipase, Chest X ray.

2.2 Following parameters were used along with the score given to each parameter:

Table 1: Scoring System

History			Max. Score
Age	<50 yrs (0)	>50 yrs (1)	1
Sex	Female (0)	Male (1)	1
H/o Hospitalization	N(0)	Y(4)	4
Clinical			
BMI wt (kg)/ht (m ²)	<25(0)	25-27.5 (1)>27.5 (2)	2
Abdominal scar	N(0)	Infra-umbilical (1) supra-umbilical (2)	2
Palpable gall bladder	N(0)	Y(1)	1
Sonography			
Wall thickness	Thin (0)	Thick >4mm (2)	2
Pericholecystic collection	N(0)	Y(1)	1
Impacted Stone	N(0)	Y(1)	1
H/o = History of, N=No, Y=Yes, Total Maximum Score=15			

2.3 Preoperative prediction of difficulty level as per the scoring system is as follows.

Table 2: Scoring

Score	Difficulty level
0-5	Easy
6-10	Difficult
11-15	Very Difficult

2.4 Various intraoperative parameters were taken to decide the actual difficulty which was faced while doing Laparoscopic Cholecystectomy:

Table 3: Intra-operative Scoring Factors

Easy	Time Taken <60 min; No bile spillage; No injury to duct, artery
Difficult	Time taken 60-120 min; Bile/ stone spillage; Injury to duct; No conversion
Very Difficult	Time Taken >120 min; conversion

3. Results

A total of 50 patients who underwent laparoscopy cholecystectomy were assessed.

Table 4: Comparison of Pre-operative evaluation with difficulty in performing laparoscopic cholecystectomy

	Intraoperatively difficult/ Very difficult cases (n%)	Intraoperatively easy cases	Total
Preoperatively difficult/ Very difficult cases.	18(36%)	4(8%)	22(44%)
Preoperatively easy cases	3(6%)	25(50%)	28(56%)
Total	21(42%)	29(58%)	50(100%)

The number of cases predicted to be difficult/ Very Difficult on preoperative evaluation were 22(44%) patients out of which 18(36%) were difficult/Very difficult on surgery, while 4(8%) cases were easy. The cases predicted to be easy on preoperative evaluation were 28 out of which 25 cases were actually easy while 3 cases turned out to be difficult/Very difficult on surgery as shown in Table.

Comparison of Preoperative Evaluation with Conversion to open procedure

Table 5: Comparison of Preoperative Evaluation with Conversion to open procedure

	Number of cases converted to open procedure (n%)	Number of cases not required to be converted to open procedure(n%)	Total (n%)
Number of cases predicted to be difficult/ very difficult on preoperative evaluation	2(4%)	20(40%)	22(44%)
Number of cases predicted to be easy on preoperative evaluation	1(2%)	27(54%)	28(56%)
Total	3(6%)	47(94%)	50(100%)

Out of the 22 cases found to be difficult / very difficult on preoperative evaluation, 2 cases were conversion to open. And out of 28 cases which were easy on preoperative evaluation, 1 case was needed to be converted to open.

Comparison between preoperative evaluation with intraoperative findings

Table 6: Comparison between preoperative evaluation with intraoperative findings

	Number of cases easy on surgery (n%)	Number of cases difficult/ very difficult on surgery (n%)	Chi square (df)	P value
Number of cases easy on preoperative evaluation	25(50%)	3(6%)	25.6(1)	0.000
Number of cases	4(8%)	18(36%)		

difficult/very difficult on preoperative evaluation				
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The chi Square value came out to be 25.6- which is highly significant.

4. Discussion

Laparoscopic cholecystectomy is an operative procedure that has spread widely and rapidly through the surgical community. In large part this has been driven by patient demand. Several recent studies have demonstrated the safety of this procedure and it is now believed by many to be the treatment of choice for symptomatic cholelithiasis. Laparoscopic cholecystectomy offers advantages of decreased post operative pain, decreased hospital stay and an earlier return to normal activity. Improved pulmonary functions in immediate postoperative period with laparoscopic cholecystectomy compared to conventional cholecystectomy have been well demonstrated.

In our study, a strong statistical correlation was found between preoperative evaluation prediction and difficult laparoscopic cholecystectomy. Out of 22 patients (44%), predicted to be difficult/ very difficult on preoperative evaluation, 18 (36%) cases were actually found difficult on surgery, and out of these 18 difficult cases, 2 cases (4%) were converted to open procedure, giving a **positive prediction value of 81.81%** for difficult cases on laparoscopic cholecystectomy, which is in agreement with earlier studies.

In our study 3 cases were needed to be converted to open. The various reasons for the conversion were:

- Dense adhesions in Calot's triangle in one case (2%).
- Common bile duct injury in one case (2%).
- Cholecystoenteric fistula in one case (2%).

So the factors included in our study had combined impact to predict difficult laparoscopic cholecystectomy preoperatively.

The Chi Square was 25.6 (which is greater than 18.467) which denotes the highly statistically significant relation between preoperative score and intraoperative score of laparoscopic cholecystectomy patients. The patients with easy preoperative score had easy intraoperative score as well.

The various surgical parameters taken for assessing the operative technical difficulty namely the time taken for surgery more than 120 minutes. The laparoscopic cholecystectomy in expert hands should not take more than 45 to 50 minutes. The tear of gall bladder and spillage of stones occurs in laparoscopic cholecystectomy in which there are dense adhesions with the surrounding structures and usually the tear occurs during dissection. Since these surgeries were done by surgeons experienced in laparoscopic surgery of our institution therefore the learning curve statistics do not apply to this study.

5. Conclusion

The study shows that the preoperative evaluation can predict operative difficulty for laparoscopic cholecystectomy to a good extent and the patient counselled pre operatively. The impaction of stone at the neck of the gall bladder followed by the increased gall bladder wall thickness and history of supraumbilical operation were the most accurate predictors of the potential operative difficulty and conversion to open procedure.

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