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Assessment of predictive factors for difficult laparoscopic cholecystectomy

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Abstract
Background: The present study was conducted to assess predictive factors for difficult laparoscopic cholecystectomy.
Materials & Methods: 84 patients having symptomatic gallstone disease were included. After the surgery, patients were group into 2 groups those who had a successful laparoscopic cholecystectomy and those cases who had conversion to open cholecystectomy.
Results: Total 6 cases underwent conversion. Out of 15 patients with age >50 years, 3 underwent conversion and out of 69 patients with age <50 years, 3 underwent conversion. The difference was significant ($P< 0.05$). Out of 46 female patients, 4 underwent conversion and out of 38 male patients, 2 underwent conversion. The difference was significant ($P< 0.05$).
Conclusion: Authors found that female gender and age >50 years were predictive factors for conversion.

Keywords: laparoscopic cholecystectomy, open surgery, female

Introduction

Laparoscopic cholecystectomy has gained widespread popularity for treatment of symptomatic cholelithiasis. First laparoscopic cholecystectomy was performed by Dr Erich Miuhe in the year 1985 for removal of gall stones. Cholelithiasis is a common ailment and affects about 10 to 15% of general population [1]. Laparoscopic cholecystectomy is one of the most common surgeries performed and has replaced open cholecystectomy. About 1-2% of asymptomatic patients will develop symptoms requiring cholecystectomy per year, making cholecystectomy one of the most common operation performed by general surgeons [2]. Cholelithiasis is rare in the first two decades. Incidence gradually increases after 21 years and reaches its peak in 5th and 6th decade. Women are more affected than men in the ratio of 4:1. Various major and minor complications are associated with it. Cholecystectomy has been widely used. It is not that this procedure is not associated with complications. Some risks are more with laparoscopic cholecystectomy as compared to open cholecystectomy [3].

Various parameters like age, sex, body mass index (BMI), history of previous abdominal surgery, ultrasonography findings of gall bladder wall thickness, contracted gall bladder, peri-cholecystic fluid, size of stone and haematological findings like raise total leucocytes count, alkaline phosphatase; liver enzymes were added in recent studies to predict difficult laparoscopic cholecystectomy [4]. These predictors are important because if chances of conversion can be accurately predicted pre-operatively, then the surgeon can prepare for a possible longer and more difficult surgery and patient can also be forewarned about the possibility of conversion [5]. The present study was conducted to assess predictive factors for difficult laparoscopic cholecystectomy.

Materials & Methods

The present study was conducted among 84 patients having symptomatic gallstone disease of both genders. The study was approved from institutional ethical committee. All were well informed and their written consent was obtained.

Data such as name, age, gender etc. was recorded. A thorough clinical examination was performed. Total leukocyte count (TLC), alkaline phosphatase (ALP), serum bilirubin, liver enzymes and ultrasonography of the abdomen was done. In all patients, elective surgery was performed. The decision to convert was taken by the operating surgeon and factors such as

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adhesions, bleeding, common bile duct injury etc were recorded at the end of the surgery. After the surgery, patients were group into 2 groups those who had a successful laparoscopic cholecystectomy and those cases who had conversion to open cholecystectomy. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Age wise distribution of patients

Age group (Years)	Number	P value
20-40	30	
40-50	39	0.027
>50	15	

Table I shows that age group 20-40 years had 30, 40-50 years had 39 and >50 years had 15 patients. The difference was significant ($P< 0.05$).

Table II: Age wise cases underwent conversion

Age (Years)	Prediction		Total	P value
	Laparoscopic	Conversion		
>50	12	3	15	
<50	66	3	69	0.015
Total	78	6	84	

Table II, graph I shows that out of 15 patients with age >50 years, 3 underwent conversion and out of 69 patients with age <50 years, 3 underwent conversion. Total 6 cases underwent conversion. The difference was significant ($P< 0.05$).
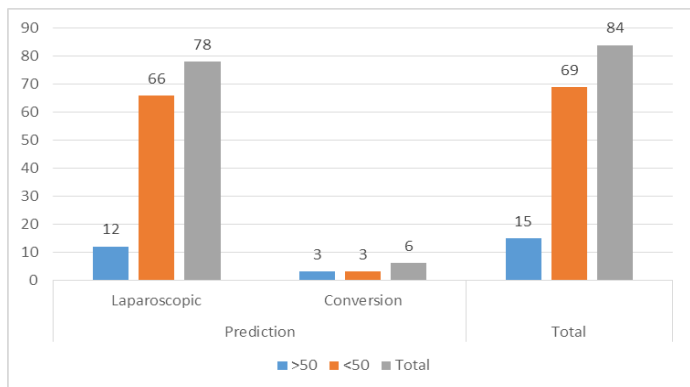
Graph I: Cases based on conversion

**Table III:** Gender wise cases underwent conversion

Age (Years)	Prediction		Total	P value
	Laparoscopic	Conversion		
Female	42	4	46	
Male	36	2	38	0.02
Total	78	6	84	

Table II, graph I shows that out of 46 female patients, 4 underwent conversion and out of 38 male patients, 2 underwent conversion. The difference was significant ($P< 0.05$).

Table IV: Assessment of clinical symptoms

Clinical symptoms	Number	P value
Pain	59	
Vomiting	42	
Jaundice	37	0.04
Fever	12	
Dyspepsia	10	

Table IV, graph II shows that common clinical symptoms were pain in 59, vomiting in 42, jaundice in 37, fever in 12 and dyspepsia in 10 patients. The difference was significant ($P< 0.05$).
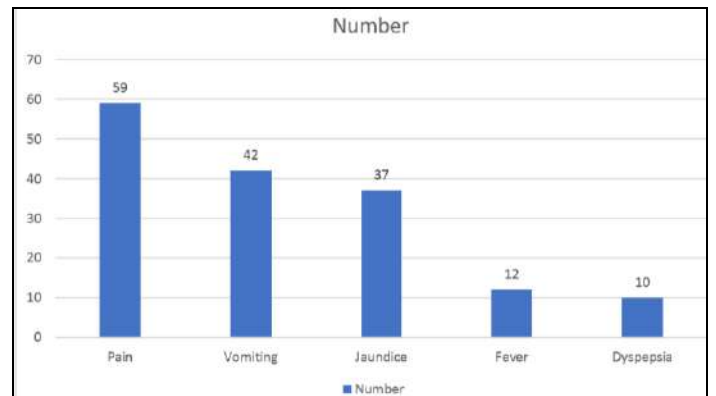
Graph II: Clinical symptoms

Discussion

Laparoscopic cholecystectomy is one of the routinely performed procedures of choice for cholelithiasis. Laparoscopy is done whenever cholecystectomy needs to be performed. 10 It has its own set of advantages and disadvantages [6]. The various advantages offered by this technique are minimal hospital stay, minimum pain, rapid recovery and early return to work. Various risk factors predispose to the complications of this procedure [7]. These include age, male predominance, presence of systematic diseases, increased thickness of the bladder wall, gall bladder empyema, all these predispose to the post- operative complications [8]. The present study was conducted to assess predictive factors for difficult laparoscopic cholecystectomy.

In present study age group 20-40 years had 30, 40-50 years had 39 and >50 years had 15 patients. Out of 15 patients with age >50 years, 3 underwent conversion and out of 69 patients with age <50 years, 3 underwent conversion. Total 6 cases underwent conversion. Sarda *et al*. [9] found that for laparoscopic cholecystectomy, a total of records of 230 patients were analyzed. All the patients were aged between 30-65 years. There was a male predominance in our study. The mean age group was 40.21+/-1.13 years. Majority of cases were of Chronic calculous cholecystitis (64.3%). There were 20% cases (n=46) of acute cholecystitis. There were 12 cases of leakage of bile, out of them 6 were managed conservatively, 4 underwent minimal invasive surgery and 2 underwent open surgery.

We found that out of 46 female patients, 4 underwent conversion and out of 38 male patients, 2 underwent conversion. The common clinical symptoms were pain in 59, vomiting in 42, jaundice in 37, fever in 12 and dyspepsia in 10 patients. Bansal *et al*. [10] found that the maximum numbers of cases were in the age group of 51-60 years (28.36%), with female dominance (68.66%) Chronic recurring pain was the main symptom seen in all 67 patients. The rate of conversion from laproscopic cholecystectomy to open cholecystectomy was 8.96%. BMI, H/O acute cholecystitis, thick wall, impacted stone and Pericholecystic collection showed statistical significant association with pre- operative score. The preoperative scoring is statistically and clinically a good test for predicting the operative outcome in laparoscopic cholecystectomy.

Agrawal *et al*. [11] evaluated a scoring method to predict 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 predicted easy,

6–10 difficult and >10 are very difficult. Prediction came true in 76.4% for easy and 100% 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. The proposed scoring system is reliable with a sensitivity of 76.47% and specificity of 100%.

Joshi *et al*. [12] conducted a study to develop and validate a scoring system to predict difficult LC preoperatively. 100 patients undergoing LC were included and preoperative scores were calculated preoperatively to predict difficult LC which was compared with operative assessment. Sensitivity and specificity of the preoperative scoring for difficult case was 53.8 % and 89.2 % respectively with PPV of 63.64 % and NPV of 84.62%. The shortcoming of the study is small sample size.

Conclusion
Reliable predictive factors for conversion of laparoscopic cholecystectomy is useful in planning of admission for patients with symptomatic cholelithiasis. Authors found that female gender and age >50 years were predictive factors for conversion.

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