



Difficult Laparoscopic Cholecystectomy: A Prospective Study of Predictive Factors

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Abstract

Background: Laparoscopic cholecystectomy is now the widely practised surgical procedure for patients with gall stones. But like any surgery, many difficulties can be encountered during this procedure which can occur anywhere from during port placement to extraction of gall bladder.

Method: A prospective study was carried out on 166 patients who had to undergo laparoscopic cholecystectomy and their data was evaluated on the basis of patients' characteristics, history, haematological and radiological parameters.

Conclusion: Increased age, high body mass index, contracted fibrosed gall bladder and large sized stones were found to have a positive association in predicting difficulty of the procedure while sex and raised total leucocyte count had no significant role.

Keywords: Gall stones, Laparoscopic cholecystectomy, difficult laparoscopic cholecystectomy.

Introduction

Gall stone disease is one of the most common problems affecting the digestive tract. Cholecystectomy is indicated in all symptomatic patients and in some asymptomatic patients such as elderly, diabetics, patients with porcelain gall bladder and patients at increased risk of carcinoma.

With the advent of technology, laparoscopic cholecystectomy has become the cholecystectomy of choice with its great benefits like reduced hospitalisation, reduced post-operative pain and

improved cosmesis. The first successful laparoscopic cholecystectomy was performed by Mouret in 1987 in France. Many difficulties can be encountered during this procedure like during port placement, in creating pneumoperitoneum, identifying Calot's anatomy, grasping of thick and friable gall bladder, removing adhesions and in extraction of gall bladder.

No consensus is found among surgeons on how to manage difficult laparoscopic cholecystectomy.⁽¹⁾

Vivek et al. conducted a bidirectional prospective study demonstrating that a scoring system

predicting the difficulty is feasible. It considers age, sex, previous surgery, post ERCP status, BMI>30, multiple stones, cirrhotic liver on USG, adhesions, contracted or distended gall bladder, arterial and ductal anomalies, deranged LFT, etc.⁽²⁾ Major goal of the study of Orhan Bat was to classify difficult laparoscopic cholecystectomy cases according to the operation findings⁽³⁾ whilst other studies have reported a variable assembly of different preoperative and operative risk factors associated with difficult LC and conversion to open cholecystectomy⁽⁴⁻⁹⁾. Such studies may help in selection of appropriate procedure for patients.

Methods

A prospective study was carried out on 166 patients who were candidates for laparoscopic cholecystectomy from July 2016 to November 2018 in GSVM Medical College, Kanpur after proper informed consent. Evaluation was done on the basis of patients’ characteristics, history, haematological and radiological parameters.

Statistical Analysis

Univariate analysis by Student’s ‘t’ test, Chi square test and Z test was done to find out the correlation of different variables and multivariate stepwise logistic regression analysis was done to study the combined effect of different variables on difficulty of the procedure.

Results

Of the 166 patients who underwent laparoscopic cholecystectomy, around 16% were males and the rest females with overall mean age of 37 years; mean age was significantly higher for males. Duration of surgery was less than one hour in all patients <20 years and more than an hour in 73.5% of patients of >40 years.

In asymptomatic patients, all were having easy dissection with duration less than an hour while 64.3% of patients with acute cholecystitis as diagnosis and 44.8% with diagnosis of chronic cholecystitis had duration more than an hour. Around 8% of cases had to undergo conversion to

open of which two were male (14.3%). Rate of conversion was seen more in older age groups.

Conversion	Total Patients	Males	Females
Creation of Pneumoperitoneum			
*Inadequate Space For Dissection	2	0	2
*Intolerance To Pneumoperitoneum	2	0	2
Excessive Adhesions	6	0	6
Uncontrolled Bleeding	4	2	2
Total	14	2	12

In normal weight patients, only around 35% presented with difficulty in dissection while in patients with BMI>25, 56.4% had difficult dissection and 61.5% had duration >60 minutes.

31.5% of patients with normal thickness gall bladder had difficult dissection and 32.7% had duration >60 minutes. In patients with increased gall bladder wall thickness, 75% had >60 minute duration of surgery and 74.1% offered difficult dissection. Around 89% of patients with contracted gall bladder presented with difficulty in dissection and had duration of surgery more than an hour.

Difficult extraction was a problem in around 90% of patients with radiological stone size>1 cm which was managed by either increase in port size, facial dilatation or crushing of stones while around 49% with multiple stones also presented with difficulty in extraction.



Image 1 Showing Laparoscopic Aspiration of Distended Gall Bladder



Image 2 Showing Dissection of Short Cystic Duct

Discussion

Duration of surgery and thus difficulty of the procedure was significantly associated with age, body mass index, gall bladder wall thickness and dimensions. Difficulty in extraction was found to be significantly associated with size of the largest stone. Difficulty of the procedure was not found significantly associated with the sex, clinical diagnosis, duration of symptoms and total leucocyte count. Causes of conversion included excessive adhesions, uncontrolled bleeding during dissection and difficulty in creation of pneumoperitoneum due to previous abdominal surgeries.

Conclusion

Increased age, high body mass index, contracted and fibrosed gall bladder with large sized stones on ultrasonography are predictors of increased duration and difficulty of the procedure while sex and raised total leucocyte count have no significant role. We conclude that clinical and ultrasonographic factors can pre-operatively help us to predict difficult laparoscopic cholecystectomy and also the likelihood of conversion to open surgery and that these difficulties can be well managed with sufficient experience and skill.

Declaration

Conflicts of Interest: None

Funding: None

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