Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 03, 2023

Preoperative Prediction of Difficult Elective Laparoscopic Cholecystectomy Using a Scoring System in a Tertiary Center

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Abstract

Introduction

Laparoscopic cholecystectomy is gold standard for gall stone disease. For a successful surgery, need a good patient selection. We Have observed numbers of situations where conversion to open surgery occurred, this is probably due to operation in a compromised vision, difficulty in holding structure and lack of tectile sensation. Conversion rates varies from 5-10% in different centers. So, if one can preoperatively predict the difficult gall stone disease, the comorbidity, iatrogenic injury and cost of treatment will be definitely decrease.

Methods

A retrospective study was carried out in department of general surgery, VIMSAR, Burla. All patients who have underwent elective laparoscopic cholecystectomy irrespective of age between Jan 2018 to Jan 2022 were included in this study. Exclusion criteria - Patients with acute cholecystitis, CBD stone, dilated CBD(>6mm) are excluded from this study. Bed head tickets of all operated patient are retrieved from the store office and after thorough study of the notes, the preoperative score according to Randhawa and Pujahari scoring system done. The following parameters were recorded from the operative notes —time taken for surgery, bile/ stone spillage, injury to cystic duct or cystic artery, conversion to open cholecystectomy. After analyzing all the parameters, we defined the surgical procedure as easy, difficult and very difficult.

Results:

Hundred patients were included in our study and out of them male 24 and female 76. 73 patients were in the age group of < 50yrs and 37 patients were > 50 yrs. BMI < 25 in 47 patients, 34 in 25.1 - 27.5 and 19 in > 27.5. 43 patients have previous history of surgery and among them tubectomy (24), lower (uterine) segment cesarean section (11) and duodenal perforation (8). Except 3 patients (who have supraumbilical scar) rest have infra umbilical scar. 30 patients have previous history of hospitalization and among them acute cholecystitis (no patients have h/o jaundice) or biliary colic.

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 03, 2023

Gall bladder was palpable in 20 patients. GB wall thickened in 21 patients. Impacted stone noted in 19 patients.

Conclusion:

In our hundred cases, we found that sex, BMI, previous history of hospitalisation, palpable GB and thickened GB wall were found statistically significant in predicting difficult laparoscopic cholecystectomy and among them previous history of hospitalisation and GB wall thickness have statistically highly significant. Laparoscopic surgeons may use this scoring system for pre-operative prediction of difficult LC. To know the accurate accuracy of the scoring system, large sample operated by preferably single expert surgeon is needed.

Keyword: Laparoscopic Cholecystectomy, Open Cholecystectomy, Gall bladder,

Abstract

Introduction

Laparoscopic cholecystectomy is gold standard for gall stone disease [1]. For a successful surgery, need a good patient selection. We Have observed numbers of situations where conversion to open surgery occurred, this is probably due to operation in a compromised vision, difficulty in holding structure and lack of tectile sensation . Conversion rates varies from 5-10% in different centers [2]. So, if one can preoperatively predict the difficult gall stone disease, the comorbidity, iatrogenic injury and cost of treatment will be definitely decrease.

Objective

1) Primary objective - To study the efficiency of this scoring system in predicting the difficult gall stone disease preoperatively.

2) Secondary objective — To assess which risk factors are associated the most in difficult cholecystectomy

Methods

A retrospective study was carried out in department of general surgery, VIMSAR, Burla. All patients who have undergone elective laparoscopic cholecystectomy irrespective of age between Jan 2018 to Jan 2022 were included in this study.

Exclusion criteria - Patients with acute cholecystitis, CBD stone, dilated CBD(>6mm) are excluded from this study.

Data collection methods

Bed head tickets of all operated patient are retrieved from the store office and after thorough study of the notes, the preoperative score according to Randhawa and Pujahari scoring system done [table - 1].

The following parameters were recorded from the operative notes —time taken for surgery, bile/ stone spillage, injury to cystic duct or cystic artery, conversion to open cholecystectomy [table - 2].

After analyzing all the parameters, we defined the surgical procedure as easy, difficult and very difficult [table - 3].

Results:

Hundred patients were included in our study and out of them male 24 and female 76. 73 patients were in the age group of < 50yrs and 37 patients were > 50yrs. BMI < 25 in 47 patients, 34 in

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Gall bladder was palpable in 20 patients. GB wall thickened in 21 patients. Impacted stone noted in 19 patients. No patient has pericholecystic collection. Hypertension detected in 11, diabetes in 6, hypothyroidism in 15 (all are female). Conversion to open cholecystectomy done in 5 (4 male, 1 female). All are predicted pre-operatively in difficult category. Malignancy detected in none. 73 patients were scored easy, 26 were difficult and none in very difficult group.

We observed a positive predictive value of 80.80% for our scoring system for cases predicted to be easy. For cases predicted to be difficult we found a positive predictive value of 73.07% for the scoring system [table - 4].

Post-operative outcome was correlated with the various factors included in the scoring system and data analysed to assess the significance of each factor. From our data, we observed that sex, BMI, previous h/o hospitalisation, palpable GB and thickened GB wall were found statistically significant associated factors causing difficulties in laparoscopic cholecystectomy.

Discussion:

Difficult cholecystectomy prediction will help the surgeon to counsel regarding conversion to OC to the patient and his relatives. There is a correlation between increase in score and chances of increase in conversion rate [3]. Conversion to open cholecystectomy occurs due to strong adhesions and difficult calot's dissection, variations in anatomy, close proximity and strong adhesions between CBD and GB, which were not able to detect on USG [9].

Age more than 60 years is a risk factor for LC conversion to open cholecystectomy [5]. In our study we found age as a non-significant risk factor for difficult cholecystectomy. Male gender is associated with difficult surgery and conversion to OC [8,15]. Our study shows male sex is significant risk factor with p-value 0.3343.

Thickened GB wall found on USG linked to conversion due to difficult dissection and manipulation of GB [9,12,13]. All twenty-one patients whom the GB wall was found thickened on ultrasound have difficulty in cholecystectomy.

Unwanted adhesion around the umbilicus and peri-gall bladder area due to previous surgery especially at upper abdomen poses difficulty in surgery [8,14]. In our study 8 patients have supraumbilical scar and all patients have difficulty in surgery.

Morbid obese patients with chronic cholecystitis more likely to require conversion [6]. From our study, we have observed that as the BMI goes on increasing the frequency of difficult surgery increases.

Impacted stone at Hartman's pouch or neck of GB maybe significant risk factor difficult surgery in emergency cholecystectomy, but we found it as not significant in elective surgery.

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 03, 2023

Diabetes, hypertension and cardiovascular diseases have an increased risk difficultly in surgery and conversion to open both in the acute and chronic cholecystitis groups [9,10]. But in our study no such patients have undergone conversion to open cholecystectomy. Previous history of surgery may be a risk factor for difficult cholecystectomy but in our study, we found it not significant. This is because we have not encountered scarred abdomen patients in elective cases.

We couldn't find any cases with pericholecystic collection. This is because pericholecystic collection only found in acute cholecystitis, whereas in our study we have included elective cases only.

Conclusion:

In our hundred cases, we found that sex, BMI, previous history of hospitalisation, palpable GB and thickened GB wall were found statistically significant in predicting difficult laparoscopic cholecystectomy and among them previous history of hospitalisation and GB wall thickness have statistically highly significant. Laparoscopic surgeons may use this scoring system for pre-operative prediction of difficult LC. To know the accurate accuracy of the scoring system, large sample operated by preferably single expert surgeon is needed.

Conflict of interest - none declared

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ISSN:0975 -3583,0976-2833 VOL14, ISSUE 03, 2023

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