

A study of predictive factors determining difficult laparoscopic cholecystectomy

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Abstract

Aim: Aim and objective of this study are to determine the predictive factors for difficult laparoscopic cholecystectomy, to study the clinical presentation of chole lithiasis, to study the surgical mode of management, to study the complications of laparoscopic cholecystectomy.

Material and Methods: This study was conducted between October 2022 – December 2022. We prospective observational study of total 60 cases who applied to the department of General Surgery Alluri Sitaram Raju academy of medical sciences & Hospital. The method of the study included a screening of patients

who presented with upper abdominal pain, vomiting or dyspepsia, or jaundice. Following evaluation, the patient was subjected to laparoscopic cholecystectomy and time taken, biliary / stone spillage, injury to duct/ artery or conversion were noted

Results: In the present study, Prior Hospitalization (for ERCP and abdominal surgeries), BMI > 27.5, Palpable Gall Bladder, Thick GB Wall, Impacted Stone and Peri-Cholecystic Collection were significant predictors of difficult laparoscopic cholecystectomy. The positive predictive value for easy prediction was 94.7% and for difficult prediction was 100%. The conversion rate from

laparoscopic cholecystectomy to open cholecystectomy was 10%.

Conclusion: The following risk factors were considered- age > 50 years, male sex, H/ O prior hospitalization for acute cholecystitis/ biliary pancreatitis, ERCP, BMI 25-27.5 and >27.5, abdominal scar, palpable GB, wall thickening, impacted stone, and peri cholecystic collection. Out of this BMI >27.5, H/O prior hospitalization for acute cholecystitis/ acute pancreatitis, ERCP, palpable GB, wall thickening, impacted stone, and peri cholecystic collection were significant predictors of difficult laparoscopic cholecystectomy, as per present study.

Introduction

Gallstones are present in 10 to 15% of the general population and asymptomatic in the majority (>80%). In India it is estimated to be around 4%. An epidemiological study restricted to railroad workers showed that north Indians have 7 times higher occurrence of gall stones as compared to south Indians.

Approximately 1-2% of asymptomatic patients will develop symptoms requiring cholecystectomy per year. 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

The advantages of laparoscopic cholecystectomy over open cholecystectomy are earlier return to bowel functions, less postoperative pain, improved cosmesis, shorter length of hospital stay, earlier return to full activity, and decreased overall cost, decreased infection.

The rate of conversion from laparoscopic cholecystec to my to open cholecystectomy is 5 to 10%. Hence it is necessary to study the predictive factors for difficult laparoscopic cholecystectomy. Therefore, this study was under taken.

Aim and objective of this study are

- To determine the predictive factors for difficult laparoscopic cholecystectomy.
- To study the clinical presentation of cholelithiasis.
- To study the surgical mode of management.
- To study the complications of laparoscopic cholecystec to my

Material and Methods

This study was conducted between October 2022 – December 2022. We prospective observational analyzed a total of 60 cases who applied to the department of General Surgery Alluri Sitaram Raju academy of medical sciences & Hospital. The method of the study included a screening of patients who presented with upper abdominal pain, vomiting or dyspepsia, or jaundice.

Ultra sound abdomen was done in all patients. Routine hematological and biochemical investigations were done. LFT and PT-INR were done in all patients.

The patients confirmed by USG examination were evaluated with following factors: age, sex, h/o previous hospitalization, BMI wt. (kg)/ ht. (mt²), abdominal scar-supraumbilical or infraumbilical, palpable gall bladder, Sonographic findings- wall thickness, Pericholecystic collection, impacted stone.

Following evaluation, the patient was subjected to laparoscopic chole cystectomy and time taken, biliary / stone spillage, injury to duct/ artery or conversion were noted.

Statistical analysis

The data analysis was performed using SPSS (Statistical package for social sciences) Windows 11.5 package program. The quantitative data were compared using descriptive statistics (mean, standard deviation, Medi

an) in addition to the Kruskal-Wallis H and Mann-Whitney U tests.

Results

Age distribution

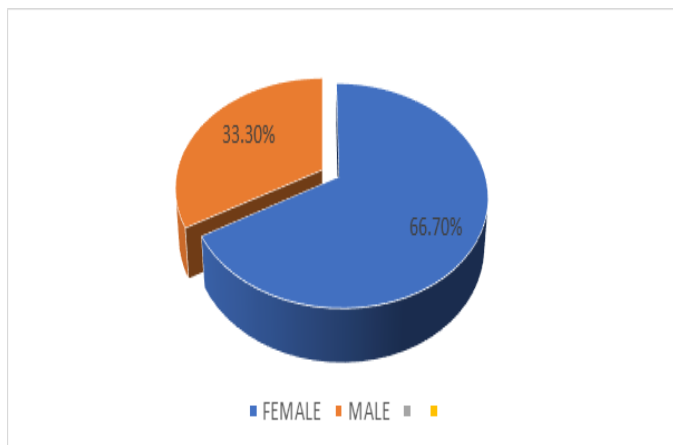
In the present series the youngest patient was 18 years of age and the oldest was 70 years of age. Majority of the patients in the present series were in the age group of 31-40 years of age. (Table-1)

Sex distribution

Out of 60 patients 40 were females and 20 were male patients. The male: female ratio is 1:2.

Age in years	No. Of cases	%
0-10	0	0
11-20	2	3.3%
21-30	14	23.4%
31-40	18	30%
41-50	15	25%
51-60	10	16.7%
>60	1	1.6%

Table 1: Showing Age wise distribution of cholelithiasis.



Graph 1: Pie diagram showing Sex wise distribution.

Presenting symptoms and signs

Pain was the predominant symptom seen in all 60 patients. Vomiting was present in 40% (19) of the patients with pain. 1 patient had jaundice and 22% had dyspepsia.

Tenderness in the right hypochondrium was present in 40(80%) patients, guarding in 11 patients and a mass was palpable in 2 patients.

Ultrasonography

All the 60 patients had stones in the gallbladder, 20 patients had wall thickening and 2 had a pericholecystic collection. 37 patients had multiple calculi, 15 had solitary calculi and 8 had solitary impacted calculi.

Symptoms	No. of cases	%
Pain	60	100%
Vomiting	24	40%
Fever	7	12%
Jaundice	2	3.5%
Dyspepsia	13	22%

Table 2:

Symptoms	No. Of cases	%
Pain	60	100%
Vomiting	24	40%
Fever	7	12%
Jaundice	2	3.5%
Dyspepsia	13	22%

Table 3:

Correlation of pre-op score and the outcome

Out of the 5 patients in whom laparoscopy was converted to open, 3 had dilated CBD and 2 had aberrant

anatomy. Therefore these 5 patients were excluded from the study. One out of the 3 patients with dilated CBD required CBD exploration with T tube insertion.

Post-operative complication

Only 2 patients had an infection of the umbilical port site which required about 2 to 3 dressings.

Histopathological examination

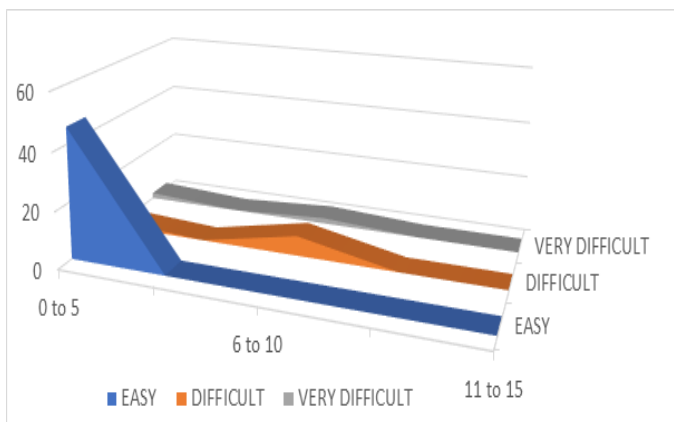
57 cases were reported as chronic cholecystitis, while one was reported as acute cholecystitis. No case of malignancy of the GB was detected.

History			Max. score
Age	<50(0)	>50(1)	1
Sex	Female (0)	MALE (1)	1
H/O Hospitalisation	NO (0)	YES (4)	4
Clinical			
BMI Wt(kg)/Ht(m2)	<25(0)	25-27.5(1) >27.5(2)	2
Abdominal scar	NO (0)	Infraumbilical (1) Supraumbilical (2)	1
Palpable gb	NO (0)	YES (1)	1
Sonography			
Wall thickness	THIN (0)	THICK>4mm (2)	2
Pericholecystic collection	NO (0)	YES (1)	1
Impacted stone	NO (0)	YES (1)	1

Table 4: showing Scoring factors.

Pre-op score	Easy	Difficult	Very difficult	Total
0-5	46	2	2	50
6-10	0	7	2	9
11-15	0	0	1	1
TOTAL	46	9	5	60

Table 5: showing correlation of pre-op score and outcomes.



Graph 2:

Discussion

Cholelithiasis is the most common biliary pathology. Gall stones are present in 10 to 15% of the general population and asymptomatic in the majority of them, of about >80%.

Approximately 1-2% of asymptomatic patients will develop symptoms requiring cholecystectomy every year, making it one of the most common operations performed.

The highest incidence of gallstone in present series is in the age group of 30 to 40 years, which is closely followed by 21-30 years and 41-50 years. Whereas in Herman's series and Hanif series highest incidence were in the age group of 51-60y and 41-50 y respectively.

In the present series, out of 60 patients 40 were females and 20 were male patients. The sex ratio (Female: Male) is 1:2.

This clearly shows female preponderance which is same all over the world. Endogenous estrogen and progesterin are attributed to this phenomenon.

Pain was the predominant symptom seen in all (100%) the patients. All the 60 patients presented with chronic recurring pain. In 82% (49) of patients, pain was in the right hypochondrium.

Of the 41 patients, 72% (35) patients had colicky type of pain, 28 % (14) patients had gripping type of pain and

18% (9) patients had dull aching type of pain. In 18% (9) patients, pain was in epigastrium predominantly. Radiation of pain to back was seen in 28%.

Vomiting was present in 40% of the patients with pain. Dyspepsia was present in 22% of the patients and fever in 12% of them.

Tenderness in the right hypochondrium was present in 80% of the patients, while guarding and mass were present in 4 and 10% respectively.

Ultrasound is the most accurate and sensitive investigation for diagnosis of cholelithiasis of the 60 patients, all had stones in the gall bladder, 20 patients had wall thickening and 2 had peri - cholecystic collection.

The incidence of CBD stones is 4%. 1 patient had obstructive jaundice for which he had undergone ERCP previously while another patient was detected to have CBD stone pre-operatively.

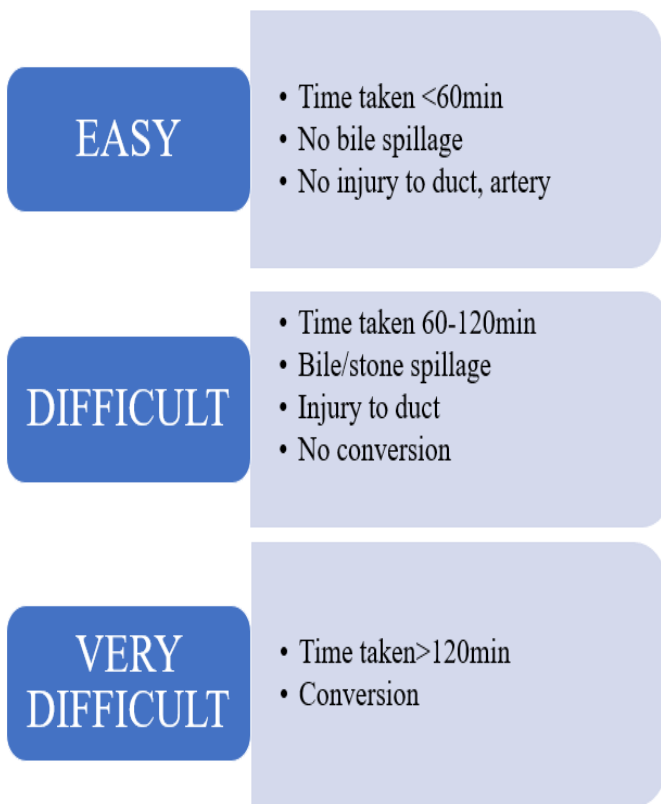
In the present study, Prior Hospitalization (for ERCP and abdominal surgeries), BMI > 27.5, Palpable Gall Bladder, Thick GB Wall, Impacted Stone and Peri-Cholecystic Collection were significant predictors of difficult laparoscopic cholecystectomy.

The positive predictive value for easy prediction was 94.7% and for difficult prediction was 100%. The conversion rate from laparoscopic cholecystectomy to open cholecystectomy was 10%.

The incidence of port site infections was 4% and, in both cases, there was biliary spillage.

The incidence of complications due to bile stone spillage is 2.3% as per the study by T Santhosh Kumar et al.

His to pathological examination revealed chronic cholecystitis in 98% of cases and acute cholecystitis in 2%.



Graph 3:

Conclusion

The highest incidence of gallstone in present series is in the age group of 30 to 40 years, which is closely followed by 21-30 years and 41-50 years. The sex ratio (Female: Male) is 1:2.

Pain was the predominant symptom seen in all (100%) the patients. Vomiting was present in 40% of the patients with pain. Dyspepsia was present in 22% of the patients and fever in 12% of them.

Tenderness in the right hypochondrium was present in 80% of the patients, while guarding and mass were present in 4 and 10% respectively.

Ultra sound is the most accurate and sensitive investigation for diagnosis of cholelithiasis

The following risk factors were considered- age>50 years, male sex, H/O prior hospitalization for acute cholecystitis/ biliary pancreatitis, ERCP, BMI 25-27.5 and > 27.5, abdominal scar, palpable GB, wall

thickening, impacted stone, and pericholecystic collection.

Out of this BMI >27.5, H/O prior hospitalization for acute cholecystitis/ acute pancreatitis, ERCP, palpable GB, wall thickening, impacted stone, and pericholecystic collection were significant predictors of difficult laparoscopic cholecystectomy, as per present study.

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