



STUDY OF FACTORS RESPONSIBLE FOR DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY

General Surgery

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ABSTRACT

Introduction: Cholecystectomy remains the most effective treatment for gallbladder disease when symptomatic. Since the introduction of laparoscopic cholecystectomy, this approach has replaced the traditional open cholecystectomy. Laparoscopic Cholecystectomy was first reported in Germany (1985) and France (1987). Although not immediately universally adopted, laparoscopic cholecystectomy has revolutionized minimally invasive surgery. Now Laparoscopic cholecystectomy has rapidly become the procedure of choice for gallbladder disease patients and is currently the most commonly performed major abdominal procedure worldwide. **Aims:** The aim of this study is to assess the preoperative and intraoperative predictors of difficult laparoscopic cholecystectomy. **Materials and method:** This Study was conducted for one and a half year at Department of General Surgery, AIMSR, Bathinda. 100 patients were included in this study. **Result:** The study showed that, most of the patients had no Conversion to open [93 (93.0%)] it was statistically significant ($p < .00001$). ($Z = 12.1622$) and we also found that, higher number of patients had POD2 Drain removal [60 (60.0%)] it was statistically significant ($p < .00001$). ($Z = 5.0064$). **Conclusion:** In this study, most of the patients had E Lap cholecystectomy. However, D Lap cholecystectomy followed by VD Lap cholecystectomy and lower number of patients had Conversion to open which was statistically significant.

KEYWORDS

laparoscopic cholecystectomy, gallbladder disease and pancreatitis and BMI.

INTRODUCTION

Cholecystectomy remains the most effective treatment for gallbladder disease when symptomatic. Since the introduction of laparoscopic cholecystectomy, this approach has replaced the traditional open cholecystectomy. Laparoscopic Cholecystectomy was first reported in Germany (1985) and France (1987)¹. Although not immediately universally adopted, laparoscopic cholecystectomy has revolutionized minimally invasive surgery. Now, laparoscopic cholecystectomy is the most popular major abdominal treatment performed worldwide and is quickly rising in popularity among patients with gallbladder disease. When compared to open cholecystectomy, laparoscopic surgery is safer and more productive. Laparoscopic cholecystectomy has advantages over open cholecystectomy, including shorter hospital stays (leading to an earlier return to normal activity and work), quicker recovery times, quicker resumption of bowel function, better cosmetic results, lower overall costs, and minor surgical trauma².

Symptomatic cholelithiasis, with or without complications, and asymptomatic cholelithiasis in individuals who are at elevated risk for gallbladder cancer or gallstone complications are among the indications for laparoscopic cholecystectomy, which are the same as those for open cholecystectomy.

When LC becomes challenging or takes longer than anticipated to complete, conversion to an open cholecystectomy may be necessary to ensure patient safety. Although challenging GB surgery is not unusual, the conversion rate has reduced throughout the previous ten years.

It can be challenging to predict the degree of difficulty, but it is crucial to do so in order for the surgeon to be prepared to handle a challenging case and for the patient to be told about the likelihood of conversion and get enough justification.

The surgeon's experience and the level of difficulties encountered during surgery affect the conversion rate and LC complications. Hemorrhage, subhepatic collection, bile leak, iatrogenic bile duct injury, bowel injury, reoperations, and mortality are intraoperative complications experienced during complicated LC³. Various centers have reported conversion to open operating rates that range from 1.5% to 6%³.

Definition:

Difficult cholecystectomy corresponds to a procedure with an increased surgical risk compared to standard cholecystectomies and has been reported with an incidence up to 26% in large series⁴. It is

usually associated with male gender, old age, obesity, higher BMI, previous surgery, previous episodes of cholecystitis, pancreatitis, cholangitis.

AIM & OBJECTIVE

AIM:

The aim of this study is to assess the preoperative and intraoperative predictors of difficult laparoscopic cholecystectomy.

OBJECTIVE

Primary objective:

To determine the factors responsible for difficult laparoscopic cholecystectomy.

- To assess the preoperative difficult finding in laparoscopic cholecystectomy.
- To assess the operative difficult finding in laparoscopic cholecystectomy.
- To assess the post operative complication in difficult laparoscopic cholecystectomy.
- To assess the factors responsible for conversion of laparoscopic cholecystectomy to open cholecystectomy.

Secondary objective:

- To determine prevalence of difficult laparoscopic cholecystectomy

MATERIALS AND METHODS

Study Design: Observational Study

Setting:

The present study was carried out in the Department of General Surgery, AIMSR, Bathinda

Duration:

One and a half year (after approval from AIMSR research committee and institutional ethics committee)

Subjects:

Patients coming in to the General Surgery Outpatient Department/emergency with diagnosed case of cholelithiasis.

Sample Size: 100 patients

Place: Department of General Surgery, Adesh Institute of Medical Sciences and Research, Bathinda.

Patients were counseled and written informed consent was obtained from all participants prior to entry into the study.

The patients with signs and symptoms of cholelithiasis and diagnosed by ultrasound of the abdomen planned for laparoscopic cholecystectomy were included.

A specially designed Proforma was used to collect the data of patients which included demographic data, detailed history of patient including present complaints, personal history, past history for episodes of cholecystitis, pancreatitis episode, hepatitis, acute gastritis, GERD or various other episodes of hospital admission, history of comorbidities like diabetes mellitus, liver disease, chronic infection, thrombocytopenia, cardiovascular disease like ischemic heart disease, bypass surgery, myocardial stenting, Congestive heart failure was taken.

A detail of Clinical examination of all cases was recorded, including BMI, abdominal scars of previous operations and whether GB is palpable or not. An USG abdomen finding was noted in each case.

Surgical procedure was categorized postoperatively into easy, difficult and very difficult procedure based on operative time, bile/stone spillage bile duct injury and need for conversion to open cholecystectomy according to the criteria by Randhawa and Reference.

Inclusion Criteria

- Patients found to have cholelithiasis on abdominal USG planned for laparoscopic surgery.
- Patients consenting for study.

Exclusion Criteria:

- Malignant gallbladder disease
- Dilated Common bile duct
- Common bile duct Calculi or where Common bile duct exploration is needed
- Obstructive jaundice
- Patients not fit for laparoscopic surgery

RESULT AND DISCUSSION

This Study was conducted one and a half year at Department of General Surgery, AIMS, Bathinda. 100 patients were included in this study.

Dhanke PS et al⁵ (2014) found that the most prevalent biliary pathology, with a prevalence of 10-15%, is cholelithiasis. Laparoscopic cholecystectomy is the preferred treatment for cholelithiasis, according to a 1992 National Institute of Health consensus development report. It "provides a safe and effective treatment for most patients with symptomatic gallstones." The following risk factors were used in their evaluation: age over 50, male gender, BMI of 25.1-27.5 and >27.5, and history of surgery.

In our present study, most of the patients were 41-50 years of age [34 (34.0%)]. Rest of 26 (26.0%) patients were 31-40 years of age, 20 (20.0%) patients were 61-70 years of age, 15 (15.0%) patients were 51-60 years of age, 7 (7.0%) patients were ≥71 years of age and 6 (6.0%) patients were ≤30 years of age but this was statistically significant ($p < 0.0001$). ($Z = 4.9497$). The mean age of patients was [47.8900 ± 47.8900].

Ghazanfar R et al⁶ (2017) found that the laparoscopic cholecystectomy has emerged as the preferred method of treating gallstones. Compared to the female patients, the male patients were noticeably older. Patients with raised baseline total leukocyte count and alanine aminotransferase had a greater conversion rate ($P < 0.05$). Male patients under the age of 50 had a considerably greater conversion rate ($P < 0.05$).

We found that, female population [70 (70.0%)] was higher than male population [30 (30.0%)] which was statistically significant ($p < 0.0001$). ($Z = 5.6569$)

Kulkarni SV et al⁷ (2018) examined that although laparoscopic cholecystectomy (LC), the gold standard for treating gallstone disease, is a frequently done procedure, it can occasionally be difficult to accomplish. The 15 days of pain leading up to the surgery and the

presence of diabetes mellitus both lengthened the surgical procedure. Body mass index (BMI) increases operation time and conversion rate, both of which were raised (7.69% in patients with BMI >30Kg/m²). It was found that, most of the patients had RHC [82 (82.0%)] followed by EPG [18 (18.0%)] and we also found that, most of the patients had Colicky Pain [71 (71.0%)] which was statistically significant ($p < .00001$).

Rakesh Chandru K et al⁸ (2015) examined that to find the indicators of a challenging laparoscopic cholecystectomy. Screening of patients who reported upper stomach pain, vomiting, or dyspepsia was one of the study's approaches.

Our study showed that, higher number of patients had no Pain radiation and no Vomiting [73 (73.0%)], [69 (69.0%)] which was statistically significant ($p < .00001$). ($Z = 6.5054$) and we also showed that, lower number of patients had Fever [11 (11.0%)], Dyspepsia [23 (23.0%)] and Jaundice [3 (3.0%)] which was statistically significant ($p < .00001$). ($Z = 13.2936$).

LAL P et al⁹ (2013) examined that to Prior to surgery, assess the risk factors for a difficult laparoscopic cholecystectomy. All patients who met the inclusion criteria were assessed using the following criteria: age, gender, BMI, history of prior abdominal surgery, concomitant conditions, painful RHC, palpable gallbladder, and ultrasonographic findings of gall bladder wall thickness.

Acharya A et al¹⁰ (2012) examined that the less invasive laparoscopic cholecystectomy (LC), which causes less pain and requires a quicker recovery, has replaced open surgery as the preferred method for treating symptomatic gallstone disease. All patients were again divided into easy and difficult groups: easy if surgery was under 60 minutes, there was no injury to the common bile duct, and no conversion; difficult if surgery was above 60 minutes, there was conversion to OC, and there was injury to the common bile duct.

We observed that, most of the patients had [70 (70.0%)] no Surgery. However, H/O [14 (14.0%)] followed by Appendix Surgery [6 (6.0%)] was this was not statistically significant and majority number of patients had [80 (80.0%)] no Comorbidities which was not statistically significant ($p = .18024$). ($Z = 1.3423$).

Shah RS et al¹¹ (2014) examined that one of the most frequent surgical issues worldwide is gallstones. Overweight patients with BMI greater than 30 kg/m² had an increased risk of difficult laparoscopic cholecystectomy, and conversion was also more common in this group. We found that, lower numbers of patients were Alcoholic [6 (6.0%)] which was statistically significant ($p < .00001$). ($Z = 12.4451$).

Agrawal N et al¹² (2015) observed that the preferred method for treating symptomatic gallstone disease is laparoscopic cholecystectomy (LC). The statistical significance of the following characteristics in predicting problematic LC was determined to be $P = 0.004$, clinically palpable gallbladder (GB), $P = 0.009$, impacted gallbladder stone, $P = 0.001$, pericholecystic collection, $P = 0.04$, and abdominal scar from prior abdominal surgery, $P = 0.009$. With a sensitivity of 76.47% and a specificity of 100%, the suggested scoring system is trustworthy.

In our study, majority number of patients had NAD Scar PA Inspection [67 (67.0%)] followed by Scar+ PA Inspection 33 (33.0%) and most of the patients had RHC in Palpation Tenderness [82 (82.0%)] though it was statistically significant ($p < .00001$). ($Z = 9.4795$). We found that, lower number of patients had Palpation Mass [9 (9.0%)] and Palpation Murphy's [23 (23.0%)] which was statistically significant ($p < .00001$). ($Z = 7.6368$).

Licciardello A et al¹³ (2014) found that Symptomatic gallstones are now typically treated with laparoscopic cholecystectomy. Age, acute cholecystitis, comorbidities, an elevated white blood cell count, and elevated levels of aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, gamma glutamyl transpeptidase, C-reactive protein, and fibrinogen were all identified as risk factors for conversion by univariate analysis.

It was found that, majority number of patients had O +ve Blood group [34 (34.0%)] but this was not statistically significant ($p = .11876$).

($Z=1.5583$) and most of the patients MC in USG No of calculi [70 (70.0%)] and it was statistically significant ($p<.00001$). ($Z=7.5595$).

Rakesh Chandru K et al⁸(2015) examined that to find the indicators of a challenging laparoscopic cholecystectomy. Age, sex, BMI (>30), past hospitalizations, abdominal operations, and acute cholecystitis or pancreatitis are assessed for individuals whose conditions were confirmed by USG examination. Sonographic results.

Our study showed that, lower number of patients had USG GB wall thickening [33 (33.0%)], USG cholecystitis [10 (10.0%)] which was statistically significant ($p<.00001$)³.

In our study, more number of patients had no Lap Cholecystectomy Adhesions [57 (57.0%)] though it was statistically significant ($p<.00001$).

We observed that, lower number of patients had BS Spillage [18 (18.0%)] and Injuries [3 (3.0%)] which was statistically significant ($p<.00001$). ($Z=13.2936$).

The result found that, lower number of patients had Conversion to open [7 (7.0%)] it was statistically significant ($p<.00001$). ($Z=12.1622$) and we found that, most of the patients had POD2 in Drain removal [60 (60.0%)]. However, POD3 [25 (25.0%)] in Drain removal followed by POD4 [7 (7.0%)] which was statistically significant ($p<.00001$).

In present study, lower number of patients had WI [4 (4.0%)] but this was statistically significant ($p<.00001$). ($Z=8.6479$). We found that, most of the patients had E Lap cholecystectomy [77 (77.0%)]. However, D Lap cholecystectomy [16 (16.0%)] followed by VD Lap cholecystectomy [7 (7.0%)] which was statistically significant [$<.00001$].

Goyal V et al¹⁴(2017) observed that for symptomatic cholelithiasis, laparoscopic cholecystectomy was first introduced in the middle of the 1980s. For each patient, the following factors were evaluated. Age, gender, BMI, TLC level, and alkaline phosphatase were among them. We found that, the mean Pain Duration in month of patients was [8.4600± 7.7439.], BMI GPE of patients was [24.1431± 3.6357.], Hb% of patients was [10.9300± .7357.], SGOT of patients was [22.0900± 9.8382.], SGPT of patients was [22.3800± 9.9390.], BIL (T) of patients was [.7390± .3525.], BIL(C) of patients was [.1890± .0875.], ALK PHOS of patients was [59.4800± 25.0428.], Total Protein of patients was [6.9460± .6400.], Albumin of patients was [4.2680± .5224.], Globulin of patients was [2.3980± .6108.], PT-INR of patients was [1.0613± .0783.], Lap Cholecystectomy Time taken (In Minutes) of patients was [50.4301± 8.8972.] and Predictive score of patients was [2.8800± 2.8294].

SUMMARY AND CONCLUSION

- In present study, most of the patients were 41-50 years of age. The mean Age of patients was [51.2300± 13.9239.].
- We found that, female population was higher than male population and female: male ratio was 2.33:1.
- It was found that, most of the patients had RHC followed by EPG and we also found that, most of the patients had Colicky Pain which was statistically significant.
- We observed that, lower number of patients had BS Spillage and Injuries which was statistically significant.
- We found that, lower number of patients had Conversion to open it was statistically significant
- We found that, most of the patients had POD2 in Drain removal. However, POD3 in Drain removal followed by POD4 which was statistically significant.
- In our study, lower number of patients had WI but this was statistically significant.
- We found that, most of the patients had E Lap cholecystectomy. However, D Lap cholecystectomy followed by VD Lap cholecystectomy which was statistically significant.
- We found that, the mean Pain Duration in month of patients was [8.4600± 7.7439.], BMI GPE of patients was [24.1431± 3.6357.], Hb% of patients was [10.9300± .7357.], SGOT of patients was [22.0900± 9.8382.], SGPT of patients was [22.3800± 9.9390.], BIL (T) of patients was [.7390± .3525.], BIL(C) of patients was [.1890± .0875.], ALK PHOS of patients was [59.4800± 25.0428.], Total Protein of patients was [6.9460± .6400.], Albumin of patients was [4.2680± .5224.], Globulin of patients was

[2.3980±.6108.], PT-INR of patients was [1.0613± .0783.], Lap Cholecystectomy Time taken (In Minutes) of patients was [50.4301± 8.8972.] and Predictive score of patients was [2.8800± 2.8294].

Table: Distribution by Lap cholecystectomy Adhesions

Lap Cholecystectomy Adhesions	Frequency	Percent
Aberrant anatomy	5	5.0%
CBD dilated	1	1.0%
No	57	57.0%
Yes	37	37.0%
Total	100	100.0%

Table: Distribution by Palpation Murphy's

Palpation Murphy's	Frequency	Percent
No	77	77.0%
Yes	23	23.0%
Total	100	100.0%

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