

Clinicoradiological Predictive Factors for Difficult Cholecystectomy

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Abstract

Laparoscopic cholecystectomy is benchmark for all laparoscopic surgery in terms of efficacy, safety, patient acceptance, and market penetration. Like any surgery, cholecystectomy can be difficult to perform in the diseased state, due to anatomical abnormalities or due to patient or surgeon factors. These factors can make laparoscopic surgery difficult and increase the chances of complications. Higher conversions and iatrogenic injuries are associated with difficult gallbladder operations. Conversion rates ranging from under 5% to 30% have been reported.

Key words: Cholecystectomy, Laparoscopy, Surgery

INTRODUCTION

Laparoscopic cholecystectomy is the flagship of laparoscopic surgery and the benchmark for all laparoscopic surgery in terms of efficacy, safety, patient acceptance, and market penetration. It is the foundation of laparoscopic surgery. Like any surgery, cholecystectomy can be difficult to perform in the diseased state, due to anatomical abnormalities or due to patient or surgeon factors. These factors can make laparoscopic surgery difficult and increase the chances of complications.^[1-3]

Higher conversions and iatrogenic injuries are associated with difficult gallbladder operations. Conversion rates ranging from under 5% to 30% have been reported. Commonly encountered difficulties are peri-GB adhesions and mass formation, difficult entry and access to peritoneal cavity, distended and friable gall bladder with difficulty in holding, and adhesions around Calot's triangle, during Gall bladder dissection from Liver bed, while extracting the Gall bladder.^[4-6]

Aims and Objectives

The objectives of the study are as follows:

- To determine the clinicoradiological predictive factors

- for difficult laparoscopic cholecystectomy
- To study the clinical presentation of cholelithiasis.

MATERIALS AND METHODS

This study was conducted in the Department of General Surgery, Civil hospital, Ahmedabad, 100 cases of elective cholecystectomies done from May 2019 to August 2021, that fell in inclusive criteria. Patients were followed from the time of admission, perioperative period, till the time of discharge, with pre-operative routine blood investigations and imaging (USG and CECT when required).

Study Period

The study period was from May 2019 to August 2021.

Study Type

This was a prospective study.

Study Design

The patients were initially evaluated and routine worked up in the outpatient department including ultrasound abdomen and then admitted for surgery.

Cases Were Selected on the Basis of Following Criteria Inclusion criteria

The following criteria were included in the study:

1. Patients undergoing laparoscopic cholecystectomy for gall stone disease
2. Age >18 years
3. Patient giving consent and willing to participate in the study.

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Exclusion criteria

The following criteria were excluded from the study:

1. Age <18 years
2. Patients who are unfit for general anesthesia ASA Grade 4 or more
3. Patients not willing to participate in the study.

OBSERVATIONS AND RESULTS

A prospective study was carried out from May 2019 to August 2021 in the Department of general surgery in 100 patients undergoing laparoscopic cholecystectomy. Complete observation and analysis of all the parameters of the study are as follow.

Age Incidence

The mean age in this study was 44.7 years. The age group of the patients in this study ranged from 17 years to 81 years. The highest incidence is seen in the age group of 31–45 years.

Sex Distribution

In 100 cases, 23 were males and 77 were females the ratio of male to female 1:3. The data given below show that gall stone diseases have higher incidence in females than male.

Among male patients difficulties were found in 52.17% of patients and among female patients difficulties were found in 49.35% of patients.

Among total of 23 male patients, two were converted (16.67%) whereas among 77 female patients, three were converted (7.89%).

DISCUSSION

- Age is a risk factor for difficult surgery. In the present series, the age was equally distributed with 56% patients who were below 45 years of age and 44% patients were above 45 years of age. In the present study, we found no correlation between age and difficult surgery
 - Male sex has been described to be associated with difficult LC. In the present surgery, out of 23 males, 12 patients had difficult surgery and out of 77 female 38 had difficult surgery; thus sex had no correlation with difficult surgery in our study
 - However, conversion to open surgery rate is higher in male patients in our study (16.67% for males compared to 7.89% in females)
- Obesity poses a great challenge to safe and timely completion of the procedure due to various factors in the form of abdominal access and dissection of fatty calot. In the present study, 4 patients (4%) were obese

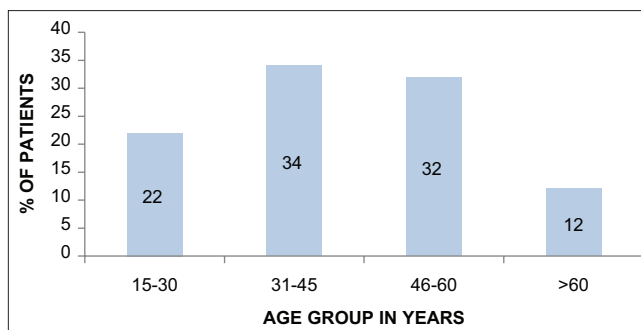


Figure 1: Age distribution of patients according to age-group in years

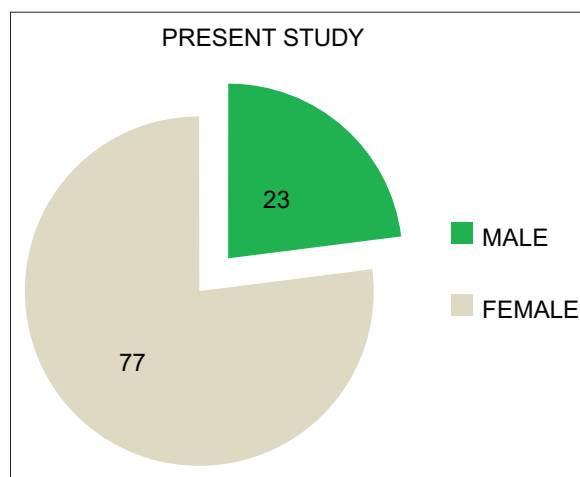


Figure 2: Sex distribution in different studies

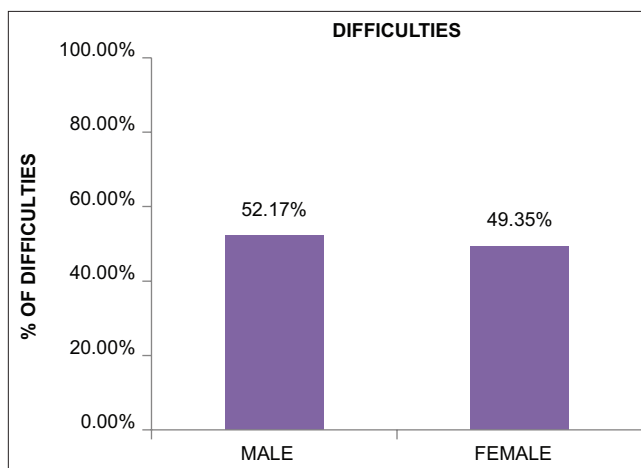


Figure 3: % of difficulties in males and females

with BMI >27 and we found difficulty in port entry in all four patients.

- About 8% of patients in the present study had history of hospitalization due to episodes of acute cholecystitis. In all these (100%) patients, intraoperatively, some difficulty was encountered. This factor was the most significant predictor of difficult laparoscopic cholecystectomy. Acute cholecystitis

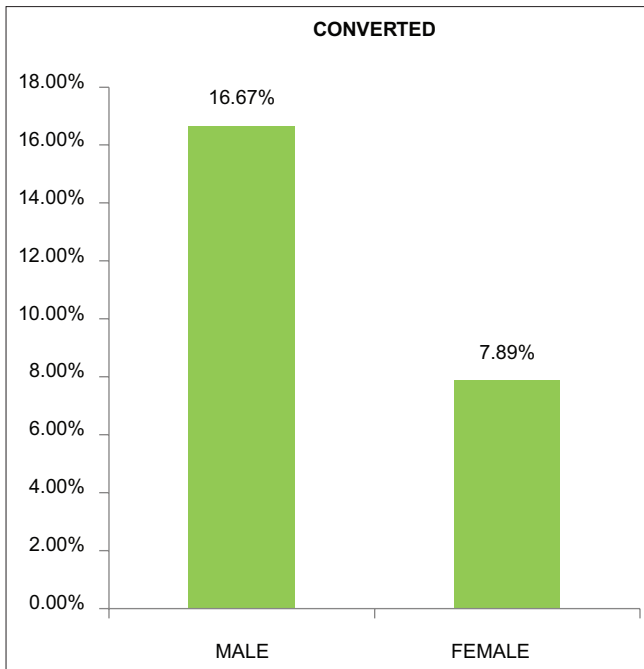


Figure 4: % of male and female patients converted to open surgery

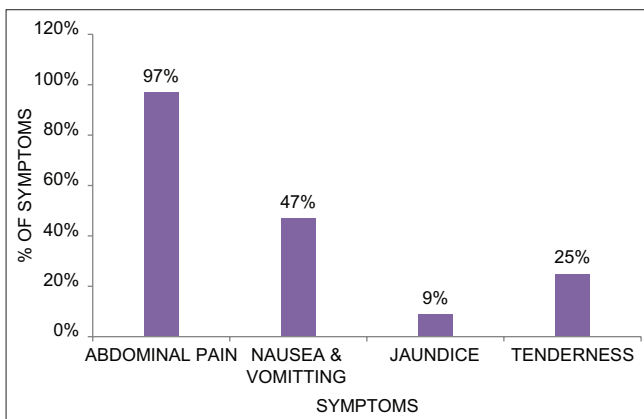


Figure 5: % of symptoms in patients of gall stone disease

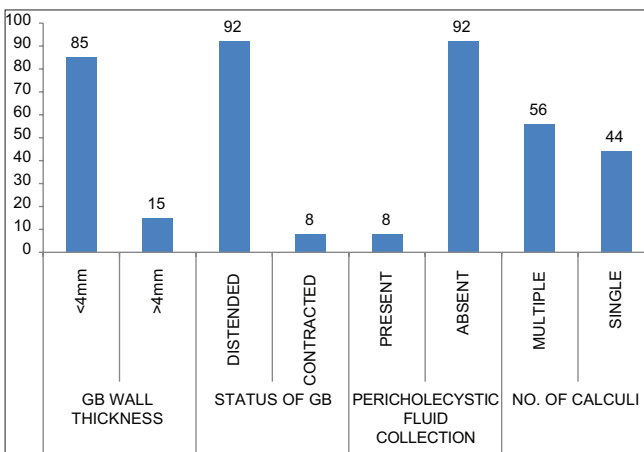


Figure 6: Radiological factor prevalence

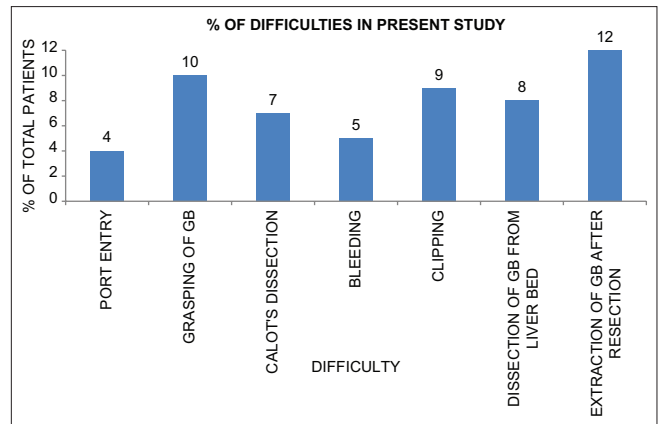


Figure 7: % of various difficulties encountered in the present study

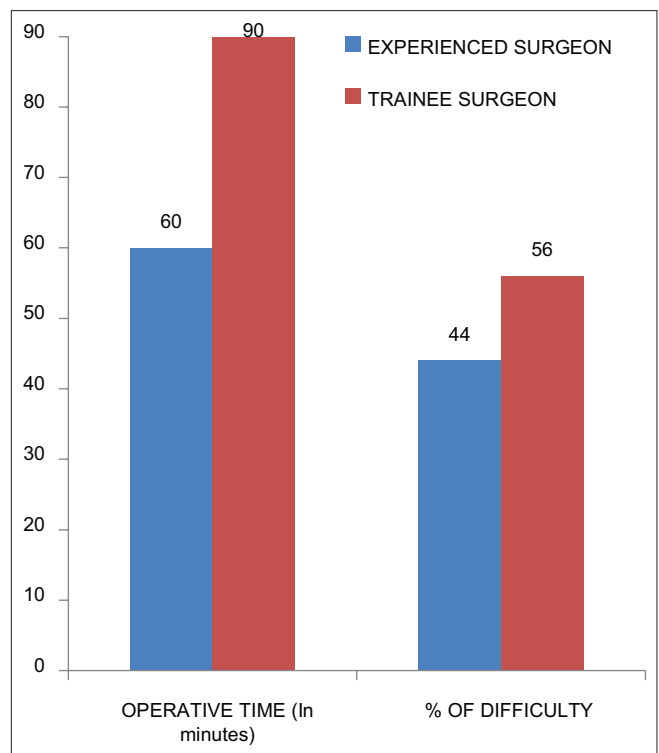


Figure 8: % of difficulty and operative time according to surgeon's experience

may lead to increased gall bladder wall thickness and cause scarring and fibrosis in and around gall bladder, making subsequent surgery difficult. This assumption is supported by the findings. In the present study, we tried to correlate predictive factor with type of intraoperative difficulty. The previous history of acute cholecystitis caused significant difficulty in calot's dissection and difficulty in dissection of gall bladder from liver bed.

- It is presumed that the previous abdominal surgery, especially upper abdominal surgery, may cause

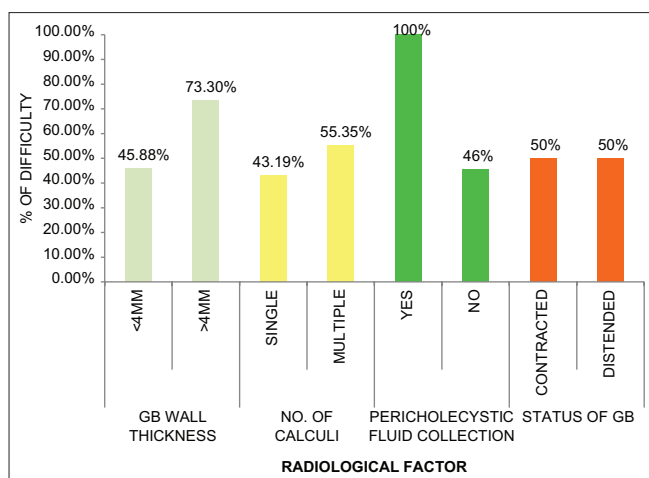


Figure 9: Radiological factors and its association with difficulties in % in the present study

difficulty due to periumbilical and perigall bladder adhesions. In the present study, also no statistically significant correlation between the previous history of abdominal surgery and intraoperative difficulty was found. In the present study, nine patients had history of abdominal surgery and difficulty was found in three out of nine patients, but it was attributed to other factors that were associated

- In the present study, 15% patients had thickened gall bladder wall (>4mm) on pre-operative USG. We encountered difficulty in 73.3% of patients with wall thickness >4 mm, while in 26.7% patients with wall thickness >4mm laparoscopic cholecystectomy was easy. In most of these patients, we encountered difficulty in grasping of gall bladder. We did not find any significant correlation between small/contracted gall bladder or distended gall bladder on pre-operative ultrasonography and difficult surgery. In 96 patients, distended gall bladder was present and in four patients, contracted gall bladder was present. We found no correlation between contracted or distended gall bladder and difficult surgery
- Large calculus at neck region is associated with distension of gall bladder and multiple stones are associated with difficulty in gall bladder extraction through small incision of LC and hence may lead to perforation of gall bladder with spillage of stones and bile. We encountered difficult delivery of gall bladder after resection in 12 out of 100 patients and out of those 12 patients in 11 patients, we found multiple calculi and distended gall bladder. We found significant association between pericholecystic fluid collection and difficult LC. In our study, eight out of 100 patients had pericholecystic fluid collection and in 100% patients, we encountered difficulty in the form of difficult dissection of gall bladder

from liver bed and calot's triangle dissection and bleeding [Figures 1-9].^[7-10]

CONCLUSION AND RECOMMENDATION

- In the present study of 100 patients has shown that gall stone diseases were more common in females than to males with ratio of 1:3 (23% were male and 77% were females)
- The most common age of presentation of gall stone diseases is 31–45 years
- Most of the patients (97%) presented with pain abdomen as the chief complaint
- Ultrasonography is the most economical, simplest, easiest, and an initial tool for the evaluation of gallstone diseases
- Thickened gall bladder (wall thickness >4mm) and pericholecystic fluid collection are significant predictors of difficult laparoscopic cholecystectomy
- History of acute cholecystitis and BMI of >27 were also significant predictors of difficult laparoscopic cholecystectomy
- About 5% of patients were converted to open surgery and main reason being bleeding and difficult calot's dissection
- Laparoscopic cholecystectomy is a safe and reliable surgery. With growing experience by the surgeons in laparoscopic technique, complication and conversion rate can be brought down to a minimum
- However, if the factors that are mentioned above such as past history of cholecystitis, BMI of >27, USG finding of thickened gall bladder wall and pericholecystic fluid collection are if present; senior experienced surgeon should remain present during surgery and patient should also be explained about the risks and consent for open cholecystectomy should be taken beforehand.

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