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## Original Articles

### Case Series on Difficult Laparoscopic Cholecystectomy

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#### ABSTRACT

Since its introduction, the laparoscopic cholecystectomy procedure has evolved progressively due to improvements in optics and instrumentation. Miniaturization of instruments and thus trocar sites has continued. This prospective study was conducted at the department of General Surgery, Civil hospital, Ahmedabad, all 25 cases of elective cholecystectomies done that fell in inclusive criteria. In my study, out of 25 cases, Calot's triangle dissection was difficult due to adhesions, fibrosis & inflammation in 04 patients, 02 out of these got converted to open Cholecystectomy. Empyema of Gall bladder was present in 03 patients, 01 of these were converted to open surgery. Bleeding from Gall bladder fossa was present in 01 patient controlled later on, difficulty in applying Clip to cystic duct was present in 01 patient due to short cystic duct, gall bladder extraction was difficult in 01 patients because of multiple stones in gall bladder, one patient had port-site bleeding. In present study 2 patients (08%) converted to conventional open cholecystectomy with 02 patients having bile leak as a complication.

#### INTRODUCTION

In 1985, Eric Muhe in Boblingen, Germany, and in 1987 Philippe Mouret in Lyon, France, performed the first laparoscopic cholecystectomies (LC) in the world.<sup>[1]</sup> Since its introduction, the laparoscopic cholecystectomy procedure has evolved progressively due to improvements in optics and instrumentation. It is now possible to perform a straightforward elective laparoscopic cholecystectomy using one 10- or 12-mm port and two or three ports as small as 2.0 to 3.5 mm.<sup>[1]</sup>

Aim of this study was to study the incidence of intra operative complications, post-operative complications, operating time and conversion rate, intra-operative feasibility of port site insertion in lean and obese patient and safety, post-operative pain, surgical site infection, requirement of post-operative analgesia and hospital stay. 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. 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. Unless there are specific indications a routine cholangiogram is not performed.<sup>[2]</sup>

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 & mass formation, difficult entry and access to peritoneal cavity, distended and friable gall bladder with difficulty in holding, adhesions around calot's triangle, during Gall bladder dissection from Liver bed, while extracting the Gall bladder.<sup>[3]</sup>

#### MATERIALS AND METHODOLOGY

This study was conducted at the department of General Surgery, Civil hospital, Ahmedabad, all 25 cases of elective cholecystectomies that fell in inclusive criteria. Patients were followed from the time of admission, perioperative period, till the time of discharge, with Complete blood counts, Renal Function Tests, Liver Function Tests, Prothrombin Time, activated Partial Prothrombin Time blood investigations, imaging (USG, CECT when required). Detailed proforma was developed to record information on demographic data, admission details, present history findings, past medical history. The operating details like circumstances of conversion, reasons of conversion were recorded.

**Study Duration :** 18 months

The patients were initially evaluated in the out-patient department including ultrasound abdomen and then

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admitted for surgery. All patients were screened and those who were not fit for general anaesthesia ASA Grade IV, patients with significant portal hypertension, acute pancreatitis, uncorrectable coagulopathies, suspected / proven malignancy and choledocholithiasis were excluded from the study group.

- Anaesthesia with a standard protocol was given. Prophylactic dose of antibiotic was given just prior to induction. RT insertion with appropriate sized Foley's catheterisation was done after shifting the patient on table.

- In case of method of laparoscopic cholecystectomy, Primary 10mm mbilical (camera) port placement was done by open method as well as veress needle, Second 10mm (main working port) was inserted in epigastrium; third 5mm (accessory working) port placed in the midclavicular line just below the right costal margin. Fourth port 5mm was inserted in Right mid-axillary line to retract gall bladder with holding fundus.

- An abdominal drain (Ryle's tube NO.20) was inserted in cases of bile/stone spillage. The outcomes were measured in terms of operating time, conversion rate, intra-operative complications, immediate postoperative complications, difficulties encountered, pain score, analgesic requirement and hospital stay, Conversion rate include conversion to open cholecystectomy.

### SUBJECT SELECTION

#### INCLUSION CRITERIA :

1. Patients undergoing laparoscopic cholecystectomy
2. Patients with Age > 18 years
3. Patients willing to participate in study and giving informed and written consent.
4. Symptomatic gallbladder disease.

#### EXCLUSION CRITERIA :

1. Paediatric patients
2. Patients with ASA Grade 4 or more
3. Patients not willing to participate in study and giving informed and written consent.

**Table 1 : USG (single/multiple stones)**

USG: GB Stone	Present Study	
	No. of Patients (n=25)	Percentage
Single	8	32%
Multiple	17	68%

**Table 2 : Difficulties encountered during operation**

Difficulties Encountered	Number of Patients
Umbilical port entry	02
Calot's triangle dissection	04
Bleeding from GB Fossa	01
Duct clipping	01
Artery Clipping	—
Difficulty in extraction of gall bladder	01
difficult dissection of the gallbladder wall from the hepatic bed	01
Port-Site Bleeding	01
Pyocele	03
Total	14

**Table 3 : Conversion rate**

PROCEDURE	TOTAL LAPAROSCOPY ATTEMPTED	SUCCESSFUL LAPAROSCOPY	CASES CONVERTED	CONVERSION RATE
NUMBER OF PATIENTS	25	23	2	0.8%

Reason for conversion were peri-GB adhesions in 1 patient and difficult dissection of cystic artery & cystic duct in 1 patient. Difficult Laparoscopic dissection at Calot's triangle is most common cause of conversion.

### DISCUSSION

- In the present study symptomatology distribution of patients shows abdominal pain as a most common symptom While others are Belching, bloating, Vomiting. Uncommon symptoms are nausea & flatulence. Difficulties encountered in this study were difficult identification of anatomical structures, and intra operative haemorrhage, adhesions and pericyclic clumps (32%) and acute inflammatory changes in the form of extensive inflammatory infiltration, cholecystocele or empyema of the gallbladder<sup>(4)</sup> difficult Calot's Triangle dissection, difficult access to peritoneal cavity and GB Extraction and other factors were higher Body Mass Index, previous multiple Hospitalizations, Palpable Gall bladder.

- In current study, post-operative complications were bile leak in 2 laparoscopic to open converted cases & 01 non-converted, wound infections in 02 patients, incisional

hernia in one converted patients. Epigastric port-site sinus developed in one patient.

- In my study, multiple gall stones were found in 68 %, while in GUPTA et al it is 82 % and in GUPTAAK et al it is 90 % so higher the number of gall stones are there higher the chances of difficult dissection. The majority of the population in this study was young to middle-aged group with the majority of patients falling under the 40-60 year age group and Present study statistics did not show age as significant factors for difficult laparoscopic cholecystectomy which is similar with study done by BUNKER S K et al.<sup>(5)</sup> This study showed gall bladder thickness as a significant factor for difficult laparoscopic cholecystectomy which is supported by other studies.<sup>(5)</sup>

**Table 4 : Comparison with other series**

**Preoperative prediction of difficult laparoscopic cholecystectomy: by Jaskiran S. Randhawa. Aswini K. Pujahari comparing two studies with following points<sup>(6)</sup>.**

Easy/difficult – criteria

Easy	Time taken <60 min no bile spillage, no injury to duct, artery
Difficult	Time taken 60–120 min bile/stone spillage, injury to duct no conversion
Very difficult	Time taken >120 min conversion

**Table : 5**

	PRESENT STUDY	Randhawa et al
Easy	32 %	78 %
Difficult	48 %	21.9 %
Very difficult	20 %	--

In my study, 48 % patients were scored difficult Laparoscopic Cholecystectomy while 20 % were very difficult while in Randhawa et al, nil in the very difficulty group.

One case was converted to the open procedure within 60 minutes of starting the laparoscopic procedure as there was difficult to approach gall bladder safely due to adhesions & fibrosis. In one case, procedure was converted to open after 60 minutes.

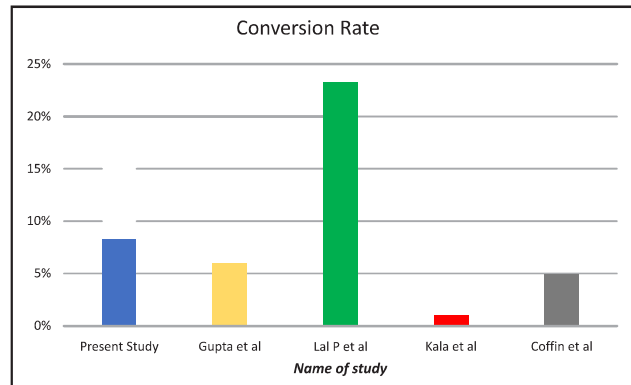
In these series of 25 patients, mean operative time was 84.24 minutes, reason for longer duration are difficult access to peritoneal cavity, difficult dissection around calot's triangle & difficult extraction of gall bladder.

As Shown in above figure, in comparison to other studies, my study has higher conversion rates apart from Lal P et al which has 23.3 % conversion rate.<sup>(8)</sup>

**Table 6 : Conversion Rates**

Present Study	Gupta et al <sup>(7)</sup>	Lal P et al <sup>(8)</sup>	Kala et al <sup>(9)</sup>	Coffin et al <sup>(10)</sup>
0.8%	6%	23.3%	0.98%	4.95%

**Figure : 1**



**CONCLUSION**

- In my study, most common difficulties encountered are
  - stone impacted at the neck or Hartman's pouch is that it hinders holding of the gallbladder during dissection and also due to impacted stone, the gallbladder is distended.
  - The thickened and contracted gallbladder was difficult to dissect because it had dense adhesions with the surrounding structures and in Calot's triangle.
  - difficulty in GB extraction was there due to multiple stones.
  - Emphyema of GB.
- In my study, Laparoscopic cholecystectomy conversion rate is 0.8% a bit higher so pre-operatively factors should be assessed like clinically scar over upper abdomen and Palpable Gall Bladder, peri-cholecystic fluid collection and impacted stone.
- A high predicted risk of conversion may allow the surgeon to take an early decision to convert to Open Cholecystectomy when difficulty is encountered during dissection; this may shorten the duration of surgery and decrease the associated morbidity. This requires meticulousness in dissection, special Care to avoid intra-operative complications and experience on part of surgeon to deal with difficulty and Complete the laparoscopic cholecystectomy safely. The key, as in open surgery, is the identification and safe dissection of Calot's triangle<sup>(11)</sup>

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