

## “A CLINICAL STUDY ON FACTORS CAUSING CONVERSION OF LAPAROSCOPIC TO OPEN CHOLECYSTECTOMY”

Dr. P. Chandra Mohan., Dr. SV. Umadevi, Dr. B. Sindhuja

MS, Associate Professor of Surgery, ACSR Medical College, Nellore

MD, Associate Professor of Anesthesiology, ACSR Medical College, Nellore

MS, Assistant Professor of Surgery, ACSR Medical College, Nellore

Corresponding Author: Dr. G. Sarada.

### Abstract:

**Background:** Laparoscopic cholecystectomy has become the standard operative procedure for cholelithiasis, but there are still some patients requiring conversion to open cholecystectomy mainly because of technical difficulty. **Our aim** was to determine the risk factors for the conversion. **Methods:** Preoperative clinical, laboratory, and radiologic parameters of 50 patients who underwent laparoscopic cholecystectomy were analyzed for their effect on conversion rates. Sixteen characteristics were evaluated including the following main characteristics for statistical analysis: Age, Sex, Body mass index, Pre-operative diagnosis, Total leucocyte count, Serum alkaline phosphatase, Serum albumin, Gall bladder wall thickness, Pericholecystic fluid, Per-operative indication for conversion. A constant and coefficients for these variables were calculated and formed the risk score. **Results:** On Multivariate Analysis female gender, elevated WBC Count, Ultrasound findings of pericholecystic fluid and thickened Gallbladder, and the presence of diabetes were independent predictors of conversion. All 5 factors were more frequently identified in patients who had a diagnosis of Acute Cholecystitis. **Conclusions:** Conversion risk can be predicted easily by assessing the risk factors. Patients having high risk may be informed and scheduled appropriately. An experienced surgeon has to operate on these patients, and he or she has to make an early decision to convert in case of difficulty.

**Key Words:** Cholelithiasis, Laparoscopic Cholecystectomy, Open Cholecystectomy, Risk Factors

### INTRODUCTION:

Gallstone disease is a common gastrointestinal condition that commonly necessitates hospitalisation in the general population. The prevalence ranges from 11% to 36%. Laparoscopic cholecystectomy is the therapy of choice for patients with symptomatic cholelithiasis. Previously, open cholecystectomy was common, but this has given place to a laparoscopic method. The benefits of laparoscopic cholecystectomy include avoiding major incisions, a shorter hospital stay, and faster healing.

Conversion decisions might be influenced by the patient's condition, the surgeon's level of experience, and technical issues. Conversion is most commonly caused by an inability to characterise the anatomy and difficult dissection, followed by secondary issues such as haemorrhage. The conversion rate for elective laparoscopic cholecystectomy is roughly 5%, whereas it is around 30% in the case of complications such as acute cholecystitis.

The purpose of this study was to establish the conversion rate and identify the factors related for laparoscopic cholecystectomy to open cholecystectomy conversion. As a result of these discoveries, we will be able to: Determine a patient's risk of conversion based on

preoperative data, resulting in more meaningful and accurate preoperative counselling, Improved scheduling and efficiency in the operation room, Increase patient safety by reducing conversion time.

**AIMS AND OBJECTIVES:** To identify the risk factors predictive of conversion of laparoscopic cholecystectomy to open surgery.

**PATIENTS AND METHODS:**

This was a Prospective Observational Study done in 50 cases of Elective Laparoscopic Cholecystectomy cases in the Department of General Surgery, in ACSR for a period of 17 months from May 2022 to October 2023.

Patients with evidence of concomitant Common Bile Duct Stones and those admitted for electives open cholecystectomy were excluded from the study pre-operatively.

The following materials were evaluated in each patient before surgery: Clinical data, laboratory data, Ultrasonographic parameters. The following materials were evaluated for the patients who had a conversion from laparoscopic cholecystectomy to open surgery on the operating table.

Sixteen characteristics were evaluated including the following main characteristics for statistical analysis: Age, Sex, Body mass index, Pre-operative diagnosis, Total leucocyte count, Serum alkaline phosphatase, Serum albumin, Gall bladder wall thickness, Pericholecystic fluid, Per-operative indication for conversion.

**RESULTS**

**Table No 1: Sex Distribution**

Sex	Frequency	Percent
Male	11	22
Female	39	88

**Table No 2: Age Distribution**

Age in years	Frequency	Percent
Up to 50	38	76
Above 50	12	24
Age group Range 13 to 73 years		
Mean Age 42.98 Years		

**Table No 3: Distribution of Variables**

Variable	Frequency	Percentage
Female	39	88
Mean age	42.98	$\pm 20.02$
Age >50 yrs	38	76
Obese	9	18
<b>Pre-operative diagnosis</b>		

Chronic Cholecystitis	37	74
Acute Cholecystitis	8	16
Low Albumin	1	2
Elevated WBC count	2	4
Elevated Alkaline Phosphatase	1	2
Elevated Bilirubin	2	4
Pericholecystic fluid on USG	2	4
<b>Co-morbidity</b>		
Diabetes Mellitus	9	18
Previous Abdominal Surgery	11	22
Thickened Gallbladder	6	12

Conversion Rate 5 (10%) patients underwent conversion of laparoscopic cholecystectomy to open cholecystectomy due to several indication.

**Table No 4: Bivariate Analysis**

Factor	Laparoscopic	Converted
Female	34 (87%)	5 (13%)
Age >50 Yrs	10 (83%)	2(17%)
Diabetes Mellitus	7 (77%)	2 (23%)
Acute Cholecystitis	7(87%)	1(13%)
Elevated ALP	0	1
Low Albumin	0	1
Thickened Gallbladder	5 (83%)	1(17%)
Elevated WBC	2	2(100%)
Elevated Total Bilirubin	2	0
Pericholecystic Fluid	1	1(50%)

On Multivariate Analysis female gender, elevated WBC Count, Ultrasound findings of pericholecystic fluid and thickened Gallbladder, and the presence of diabetes were independent predictors of conversion. All 5 factors were more frequently identified in patients who had a diagnosis of Acute Cholecystitis.

**Causes of Conversion:** Five patients (10%) required conversion to open cholecystectomy. The most frequent reasons for conversion were adhesions inflammation and unclear anatomy. Intraoperative complications occurred in one patient, which was common bile duct injury and converted to open cholecystectomy. No patients died of those had laparoscopic cholecystectomy but one patient died who had conversion. Death was due to infection in that patient. No deaths occurred as a result of intraoperative complications.

**Discussion:**

Conversion from laparoscopic to open cholecystectomy is required when safe completion of the laparoscopic procedure cannot be ensured. The identification of parameters predicting conversion improves preoperative patient counseling, provides for better

perioperative planning, optimizes operating room efficiency, and helps to avoid laparoscopic-associated complications by performing an open operation when appropriate.

As per a study done by Livingston E et al Three quarters of all cholecystectomies are performed laparoscopically, and the national conversion rate is 5% to 10%. Cholecystitis, choledocholithiasis, male sex, and obesity are major predictors for conversion.<sup>1</sup> Alponat A et al in their study concluded that Conversion was required in 58 (7.4%) patients, of which 48 (83%) were elective and 10 (17%) emergency. Factors evaluated were age, sex, obesity, duration of gallstone disease, co-morbid factors, indication for surgery, previous abdominal surgery, fever, physical examination findings, white blood cell (WBC) count, liver function tests, ultrasound findings, and the experience of the surgeon. Acute cholecystitis, rigidity in the right upper abdomen, fever, thickened gallbladder wall on ultrasonography, elevated alkaline phosphatase (ALP), liver transaminases and the WBC count were significant predictors of conversion in the univariate analysis. Multivariate logistic regression analysis on these significant predictors showed that acute cholecystitis [odds ratio (OR) = 3.12], thickened gallbladder wall on ultrasonography (OR = 3.75), elevated ALP (OR = 2.23), and WBC count (OR = 3.69) were jointly significant.<sup>2</sup>

Fried G et al in the study concluded that Conversion to OC was required in 90 of 1,676 (5.4%) patients. Significant preoperative predictors of conversion were acute cholecystitis, increasing age, male sex, obesity, and thickened gallbladder wall found by ultrasound. Non obese women younger than age 65 years with symptoms of biliary colic and normal gallbladder wall thickness found by preoperative ultrasound required conversion only 1.9% of the time.<sup>3</sup>

Kama N et al studied Preoperative clinical, laboratory, and radiologic parameters of 1,000 patients who underwent laparoscopic cholecystectomy for their effect on conversion rates. Six parameters (male sex, abdominal tenderness, previous upper abdominal operation, sonographically thickened gallbladder wall, age over 60 years, preoperative diagnosis of acute cholecystitis) were found to have significant effect in multivariate analysis. These patients had significantly higher scores (mean 6.9 versus -7.2,  $P < 0.001$ ). Increasing scores resulted with significant increases in conversion rates and probabilities ( $P < 0.001$ ). Ideal cut-off point for this score was -3; conversion rate was 1.6% under -3, but 11.4% over this value ( $P < 0.001$ ).<sup>4</sup>

Our results demonstrate that female gender, elevated WBC, ultrasound findings of pericholecystic fluid and Thickened gallbladder are associated with conversion to open cholecystectomy. No subjective variables were included in an effort to improve the predictive value of our results. Conversion rates did not decline significantly during the study period. Our analysis was performed during a "steady state" of laparoscopic cholecystectomy. Preoperative and intraoperative factors that predict or contribute to conversion have been evaluated previously, but no consensus has emerged.

A recent review by Tang and Cuschieri<sup>5</sup> identified 109 publications addressing this issue over 15 years. Among these studies, 4 scoring systems have been developed to predict conversion to open cholecystectomy. These scoring systems have demonstrated variable and conflicting results and are affected by a small number of factors evaluated, inclusion of subjective variables, and collection of data early in the experience of laparoscopic cholecystectomy. None of these systems has been widely incorporated into surgical practice. Furthermore, the only study to be validated prospectively had a negative predictive value of 100%, but the positive predictive value was only 43%.

## **CONCLUSION**

Our results demonstrate that an accurate and easily derived estimation of risk for conversion from laparoscopic to open cholecystectomy can be done preoperatively. When such increased risk patients are noted Lap to open conversion would improve appropriate allocation of resources in the operating room, may increase safety by limiting delay in conversion to open cholecystectomy. If validated, this prediction system may improve patient outcomes by reducing unnecessary injuries related to laparoscopy that is unlikely to succeed.

## **REFERENCES:**

1. Livingston E, Rege R. A nationwide study of conversion from laparoscopic to open cholecystectomy. *AmJSurg* 2004;188:205-11.
2. Alponat A, Kum C, Koh B, Rajnakova A, Goh P. Predictive factors for conversion of laparoscopic cholecystectomy. *WorldJSurg*1997;21:629-33.
3. Fried G, Barkun J, Sigman H, Joseph L, Clas D, Garzon J, et al. Factors determining conversion to laparotomy in patients undergoing laparoscopic cholecystectomy. *Am JSurg*1994;167:35-9.
4. Kama N, Kologlu M, Doganay M, Reis E, Atli M, Dolapci M. A risk score for conversion from laparoscopic to open cholecystectomy. *Am J Surg*2001;181:520-5.
5. Tang B, Cuschieri A. Conversions during laparoscopic cholecystectomy: risk factors and effects on patient outcome. *J Gastrointest Surg*2006;10:1081-91.