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# What predisposes conversion to open cholecystectomy? – An analysis in a tertiary care set up

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#### ABSTRACT

Increased surgical experience and technical innovations have extended the indications for the laparoscopic approach to patients with complicated disease processes. Still, there are a number of patients who will require conversion to an open cholecystectomy for the safe completion of the surgical procedure. Although there are several studies reporting various rates of the causes of this worldwide medical problem, every institution must have a thorough understanding of the rate and causes of conversion to open surgery based on culture and geography, in addition to an understanding of conversion within the institution. We retrospectively review in our series the conversion rate at our institution and to compare our results with those reported in the literature. A total of 75 patients who underwent open cholecystectomy after planned for laparascopic surgery at our institute were included in the study. Preoperative data, including patient demographics, mode of admission (elective or emergency), indications for cholecystectomy, concomitant disease (diabetes mellitus, obesity, hematological disorder, cardiovascular disease, or respiratory disease), and the existence of previous upper abdominal incisions, were collected. The conversion rate to Open Cholecystectomy, the underlying reasons, and postoperative complications were recorded. Results were charted and analysed and discussed. We conclude that conversion to open surgery should not be considered a technical failure but, rather, accepted as a better surgical practice by the patient and surgeon when indicated.

Keywords: NIL

### **INTRODUCTION**

Laparoscopic cholecystectomy has developed from an elective surgical procedure for selected patients to the "gold standard" operation for all patients with gallstone disease. [1] Increased surgical experience and technical innovations have extended the indications for the laparoscopic approach to patients with complicated disease processes. Still, there are a number of patients who will require conversion to an open cholecystectomy for the safe completion of the surgical procedure.[2] To assess the factors that contribute to the need for conversion from a laparoscopic to an open approach, we investigated how the etiology and incidence of conversion from laparoscopic to open cholecystectomy has changed over time in a university teaching program.

Several complications related to anaesthesia, peritoneal access, pneumoperitoneum, surgical exploration, and thermocoagulation have been reported during LC, and these complications and several other factors can necessitate the conversion from LC to open cholecystectomy (OC)[3]. Although there are several studies reporting various rates of the causes of this worldwide medical problem, every institution must have a thorough understanding of the rate and causes of conversion to open surgery based

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on culture and geography, in addition to an understanding of conversion within the institution. We retrospectively review in our series the conversion rate at our institution and to compare our results with those reported in the literature.

## Methodology:

A total of 75 patients who underwent open cholecystectomy after planned for laparascopic surgery at our institute were included in the study. We evaluated the medical records of patients with gallstone disease who underwent surgery during the study period.

Preoperative data, including patient demographics, mode of admission (elective or emergency), indications for cholecystectomy, concomitant disease (diabetes mellitus, obesity, hematological disorder, cardiovascular disease, or respiratory disease), and the existence of previous upper abdominal incisions, were collected. The conversion rate to Open Cholecystectomy, the underlying reasons, and postoperative complications were recorded. Patients with pathologically detected malignancies or gallbladder polyps were excluded from the study.

Establishment of pneumoperitoneum : One of the critical components is establish to Pneumoperitoneum in Cardiopulmonary high risk patients. In our study Pneumoperitoneum was established in every patient with some specific considerations with slow rate of insufflation at rate of 3-4 Liter/minute. low average pressure pneumoperitoneum (PP) in range of 10-12 mmHg, minimising the time of pneumoperitoneum and Desufflation intermittent if time of pneumoperitoneum gets prolonged.

**Conversion to open cholecystectomy**: When required the conversion to open cholecystectomy was made on instant basis without prolonging operative time. The reasons for conversion, as stated in the operative report and database entry, were compiled. Causes for conversion were stratified into the following categories: adhesion in calot's triangle, intolerance to pneumoperitoneum, bleeding and acute inflammatory changes.

Statistical analyses were performed using SPSS (Statistical Packages for Social Sciences) software.

### **Results:**

Total of 75 patients were enrolled for laparoscopic cholecystectomy and had to undergo open cholycestectomy. There were 46 females (61.3%) and 29 males (38.7%) in the study group. Majority of patients belonged to age group of 40-60year (51.5%) in the study group. The rate of comorbid diseases in the converted group was higher. Most of our patients belonged to ASA III and ASA IV categories in the study group.

Multiple factors have resulted in conversion of LC to open cholecystectomy. Most of factors were patient related, some technical factors and other anaesthesia related factors. Most common reason being adhesion in calot's triangle in 56 (75%) of patients. Prolonged pneumoperitoneum (PP) or intolerance to pneumoperitoneum (PP) complicates 31 (41.6%) followed by bleeding and acute inflammatory changes around gall bladder. When complications arising during the creation of pneumoperitoneum were analyzed, colon perforation caused by trocar injury occurred in only 1 case. Apart from this case, no other major complication requiring conversion to OC was encountered during trocar insertion.

When compared to laparascopic group, the converted group patients had prolonged hospital stay, higher VAS Scores in early post operative period and more hospital cost. When the postoperative complications were examined in patients requiring conversion to Open Cholecystectomy, the overall postoperative morbidity rate was found to be 13.3% (10 patients); morbidity included suppuration at the umbilical trocar site in 2 cases, intraabdominal abscess in 1 case, atelectasis in 4 cases, incisional hernia in 2 cases, and deep venous thrombosis in 1 case.

### **Discussion:**

Currently, the majority of cholecystectomies are performed laparoscopically. The conversion from LC to OC results in a significant change in outcome for the patient because of the higher rate of postoperative complications and the longer hospital stay.<sup>[4]</sup> The conversion rate and complications associated with LC depend on the experience of the surgeon and the degree of difficulty faced during surgery, which can be affected by factors such as a history of previous abdominal surgery, recurrent attacks of cholecystitis, AC, advanced age of the patient, or male gender.<sup>[4-7]</sup> Despite better training for surgeons, better laparoscopic endoscopic tools. and camera 

equipment, the conversion rate has remained relatively stable over time. Conversion should not be viewed as a complication. The true complications of LC are hemorrhage, gallbladder perforation, bile leakage, bile duct injury, perihepatic collection, and visceral injury. Conversion may be required in certain situations and could help prevent these possible complications. Furthermore, some rare complications including external biliary fistula, wound sepsis, hematoma, foreign body inclusions, and adhesions have also been reported.<sup>[8-11]</sup>

There are many studies in the literature concerning the conversion rate for LC and the reasons for conversion. According to published studies in recent years, the conversion rates vary widely (range: 2.6% to 7.7%) [12-14] In this study, the conversion rate was determined to be 3.16%, which compares favorably with the rates reported in the literature. It appears that previous history and/or new inflammation (i.e., AC) are two of the most frequent situations carrying an increased operative risk and are the main reasons for conversion to the open procedure, as was also shown in the present study. Pericholecystitis makes laparoscopy challenging, changes the local anatomy, and increases the difficulty of identifying the Calot's triangle and common bile duct. Pericholecystitis can also predispose the patient to hemorrhage more easily from the gallbladder bed or cystic artery, and it causes an increased risk of gallbladder perforation and, thus, spillage of gallstones into the peritoneal cavity during dissection of the gallbladder.<sup>[15]</sup> Thus, conversion rates in cases with AC were reported in the literature to reach up to 27.7%. <sup>[16]</sup> Other situations associated with increased difficulty of cholecystectomy are adhesions caused by previous operations, cirrhosis, obesity, cholecystoduodenal fistula, stones in the common bile duct, buried gallbladder, and a thickened gallbladder wall. We found the main reason for conversion to be the failure of anatomical identification of Calot's triangle structures because of severe inflammation caused either by AC or by dense adhesions caused by recurrent attacks of cholecystitis. Nevertheless, we determined bile duct injuries that and cholecystoduodenal fistula were important factors that lead to conversion, but there was no significant difference related to adhesions, fibrosis of Calot's

triangle, or intraoperative hemorrhage between the converted and laparoscopic groups.

Previous abdominal operations, even in the upper abdomen, are not a contraindication to a safe LC. However, previous upper abdominal surgery is associated with an increased need for adhesiolysis and a higher open conversion rate. Although unclear anatomy secondary to inflammation remains the most common reason for conversion, the impact of acute cholecystitis on the operative outcome has decreased with time.

#### **Conclusion:**

The identification of the parameters as age, high risk comorbidities, American Society of Anaesthesiologist's status and others helps in predicting the conversion rate and counselling the patient about postoperative complications. Among the intraoperative findings that resulted in conversion adhesions dominated the scene fallowed by acute inflammatory changes and bleeding. Moreover, surgeons should lower their threshold for conversion to open cholecystectomy in these high-risk patients when laparoscopic difficulty begins to compromise safety, especially in patients patient with cardiopulmonary dysfunction. Conversion should not be considered a technical failure but, rather, accepted as a better surgical practice by the patient and surgeon when indicated.

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