

Original article

Factors influencing the conversion of Laparoscopic to Open Cholecystectomy

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Abstract:

Introduction: The laparoscopic cholecystectomy provides advantages of less postoperative pain, shorter length of hospital stay, earlier return to routine activity, and decreases overall cost. However, a number of patients may require conversion to an open cholecystectomy for the safe completion of the procedure. The present study was commenced to identify the factors that contributes to conversion of laparoscopic cholecystectomy into open cholecystectomy which is important for the surgeon to understand for safety of the patient and successful completion of the procedure.

Material and Methods: This retrospective study was carried out on 100 patients who underwent a laparoscopic cholecystectomy for acute cholecystitis in our institute. Patients who underwent laparoscopic cholecystectomy and were required to conversion to open cholecystectomy were compared according to demographic details and ultrasound findings. Data so obtained was analyzed using SPSS Version-16 data analysis software. Chi square test was used for the analysis and a p-value of less than or equal to 0.05 was considered statistically significant.

Results: 27% patients had a chronically inflamed gallbladder and 73% patients had symptomatic gallstones but no obvious inflammation. Conversion to open cholecystectomy was seen in 28% patients, 19 male and 9 female (p value was significant with $p < 0.05$) which includes 23% patients with chronic inflammation and 5% for patients with no inflammation. The reasons for conversion were revealed that inability to correctly identify anatomy (19%), increased thickness of gallbladder (11%), delayed surgeries after 78 hours (9%), biliary tract injuries (8%), fibrosis of liver parenchyma (5%) and dense adhesions to neighboring organs (3%).

Conclusion: Demographic details of the patient, ultrasonographic findings and operative data of patients who underwent laparoscopic cholecystectomy are important factors affecting conversion to open surgery and identifying these risk factors will help the surgeon to plan and counsel the patient for surgery accordingly.

Keywords: Cholelithiasis; Laparoscopic cholecystectomy

Introduction

Open cholecystectomy (OC) enjoyed the status of gold standard treatment for cholelithiasis till the late 1980s, when Philip Mouret from France performed the first human laparoscopic cholecystectomy (LC) in 1987. Just after 2 years of its introduction, the first LC was carried out in India by T. E. Udawadia in 1989.¹ The laparoscopic cholecystectomy provides advantages of less postoperative pain, shorter length of hospital stay, earlier return to routine activity, and decreases overall cost.² However, a number of patients may require conversion to an open cholecystectomy for the safe completion of the procedure.³ The present study was commenced to identify the factors that contribute to conversion of laparoscopic cholecystectomy into open cholecystectomy which is important for the surgeon to understand for safety of the patient and successful completion of the procedure.

Material and Methods

This retrospective study was carried out on prospective data obtained from 100 patients

who underwent a laparoscopic cholecystectomy for acute cholecystitis in our institute. Ethical approval was taken from the concerned authority for the commencement of study. Patients who underwent laparoscopic cholecystectomy and were required to conversion to open cholecystectomy were compared according to demographic details that includes age, sex, BMI, fever, laboratory findings, co morbid diseases, history of previous acute attacks, time of surgery after symptom begin, ultrasound findings, complications and duration of hospital stay. Cholecystectomies were performed by experienced surgeons. All patients were placed on intravenous antibiotics upon admission which was continued after surgery. Data so obtained was analyzed using SPSS Version-16 data analysis software. Chi square test was used for the analysis and a p-value of less than or equal to 0.05 was considered statistically significant.

Results:

Total 100 patients with acute cholecystitis, 36 male and 64 female patients, with a mean age of 49.6 years (range 20 to 78 years) were included in the study. Laproscopic surgery was carried out and all the operations were carried out or assisted by the same surgeons. 27% patients had a chronically inflamed gallbladder and 73% patients had symptomatic gallstones but no obvious inflammation. Conversion to open cholecystectomy was seen in 28% patients, 19 male and 9 female (p value was significant with $p < 0.05$) which includes 23% patients with chronic inflammation and 5% for patients with no inflammation (table 1). Thus, the conversion rate in the presence of inflammation was significant as compared to cases without inflammation.

Patients with abnormal liver function test and leukocyte count showed higher rate of conversion to open surgery (value was significantly higher with $p < 0.05$). Thirty-nine patients had >35 BMI and were considered obese, out of which 16 were converted to open surgery, 61 patients had < 35 BMI and were considered non-obese, out of which 12 were converted to open surgery (p-value was non-significant with $p > 0.05$). The reasons for conversion were revealed that inability to correctly identify anatomy (19%), increased thickness of gallbladder (11%), delayed surgeries after 78 hours (9%), biliary tract injuries (8%), fibrosis of liver parenchyma (5%) and dense adhesions to neighbouring organs (3%) (table 2).

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Table 1: Patient findings and their relation to conversion laproscopiccholecystectomy to open surgery

Risk Factors for conversion of LaproscopicCholecystectomy to open surgery	Number of patients in which LaproscopicCholecystectomy was converted to open surgery= 28	p -value
Male patients	19	<0.05
Female patients	9	
Chronic inflammation	23	<0.05
Abnormal liver function test	12	<0.05
Abnormal leukocyte count	27	<0.05
Obese patients	16	>0.05

Table 2: Reasons for conversion to open surgery

Reasons for conversion to open surgery	Number
Inability to correctly identify anatomy	19%
Increased thickness of gallbladder	11%
Biliary tract injuries	8%
Delayed surgery after 72 hour of gall bladder inflammation	9%
Fibrosis of liver parenchyma	5%
Dense adhesions to neighbouring organs	3%

Discussion

Conversion rate was found significantly higher in patients with history of fever, older age, abnormal leukocyte count, delayed surgery after symptoms and history of previous acute attacks. The most common reason for conversion is the disability to correctly identify the anatomy of Calot's triangle. Cox MR et al⁴ prospectively assessed the results of laparoscopic cholecystectomy in patients with acute inflammation of the gallbladder and revealed that patients require conversion to open operation compared to those with no obvious inflammation and suggested that once this diagnosis is made, excessive time should not be spent in laparoscopic trial dissection before converting to an open operation. Bingener-Casey J et al³ investigated about how the etiology and incidence of conversion from laparoscopic to open cholecystectomy has changed over time and reported that 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. Eldar S et al⁵ determined the indications for and the optimal timing of laparoscopic cholecystectomy following the onset of acute cholecystitis, 28% needed conversion

to open cholecystectomy and found that patients over 65 years of age, with a history of biliary disease, a nonpalpable gallbladder, WBC count over 13,000/cc, and acute gangrenous cholecystitis were independently associated with a high LC conversion rate. Ibrahim S et al⁶ determined risk factors for conversion to open surgery in patients undergoing laparoscopic cholecystectomy and found that the significant risk factors for conversion were male gender, advanced age (> 60 years), higher body weight > 65 kg, acute cholecystitis, previous upper abdominal surgery, junior surgeons, and diabetes associated with HbA1c > 6. Kanaan SA et al⁷ identified risk factors associated with conversion of LC to OC and reported that risk factors such as older men, presence of cardiovascular disease, male gender, acute cholecystitis, and severe inflammation are determined preoperatively, permitting the surgeon to better inform patients about the conversion risk from LC to OC. Simopoulos C et al⁸ reported male gender, age older than 60 years, previous upper abdominal surgery, diabetes, and severity of inflammation were all significantly correlated with an increased conversion rate to laparotomy

Conclusion

Demographic details of the patient, ultrasonographic findings and operative data of patients who underwent laparoscopic cholecystectomy are important factors

affecting conversion to open surgery and identifying these risk factors will help the surgeon to plan and counsel the patient for surgery accordingly.

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