Original Article

Assessment Of Predictive Factors Determining Conversion To Open Cholecystectomy In Patients Undergoing Laparoscopic Cholecystectomy

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Abstract

Background: Laparoscopic cholecystectomy is the standard of care for the treatment of symptomatic gallbladder disease. The present study was conducted to assess predictive factors determining conversion to open cholecystectomy in patients undergoing laparoscopic cholecystectomy.

Materials & Methods: 84 patients with symptomatic gallstones and acute cholecystitis of both genders underwent laparoscopic cholecystectomies were performed by experienced laparoscopic surgeons. Rate of conversion to open cholecystectomy and reason for conversion were recorded.

Results: Out of 84 patients, males were 50 and females were 34.14 were converted to open cholecystectomy. Causes were extensive intra-abdominal adhesions in 2 cases, frozen/Inflamed Calot's triangle in 8, post ERCP status in 2, bile duct injury in 1 and cholecystoduodenal/colic fistula in 1 case. The difference was significant (P< 0.05). There were 40 male and 30 females in LC group and 10 male and 4 females in OC group. Age group (years) <60 comprised of 42 in LC and 8 in OC group and >60 years had 28 in LC and 6 in OC group. Post ERCP status was seen in 8 in LC and 2 in OC group. Previous abdominal surgery was seen in 7 in LC and 2 in OC group. Gall bladder wall thickness > 5mm was seen in 5 in LC and 7 in OC group and previous acute cholecystitis was seen in 3 in LC and 8 in OC group. The difference was significant (P< 0.05). Factors such as gender, gall bladder wall thickness > 5mm and previous acute cholecystitis was associated with open cholecystectomy.

Conclusion: Presence of history of acute cholecystitis, gall bladder wall thickness >5mm and male gender were independent predictor factors for conversion from laparoscopic to open cholecystectomy.

Key words: Acute cholecystitis, Gall bladder wall thickness, intra-abdominal adhesions

INTRODUCTION

One of the most common causes of abdominal pain is the presence of gallstones. Cholecystectomy is the only effective management of symptomatic gallstones. Open cholecystectomy (OC) has been widely replaced by laparoscopic cholecystectomy (LC).[1]Laparoscopic cholecystectomy is the standard of care for the treatment of symptomatic gallbladder disease. Laparoscopic cholecystectomy decreases postoperative pain, allows earlier oral intake, shortens hospital stay, enhances earlier return to normal activity, and improves cosmesis over open cholecystectomy.[2]

With increasing laparoscopic experience, there are few contraindications to laparoscopic cholecystectomy for symptomatic cholelithiasis.[3] However, approximately 2% to 15% of patients require conversion to open surgery for various reasons.Conversion is known to increase perioperative time, complication rates, the length of hospital stay, and hospital expenses.[4] It is, therefore, essential to identify risk factors for conversion to allow for safer procedures and better surgical planning. The cause for conversion may be related to patient factors, surgeon factors and equipment failure.[5] Though the conversion of the procedure from laparoscopic to open is associated with an increased operating time, hospital stay, and morbidity, it shouldn't be regarded as a failure but rather as a necessary measure to prevent disastrous biliovascular complications.[6]The present study was conducted to assess predictive factors determining conversion to open cholecystectomy in patients undergoing laparoscopic cholecystectomy.

MATERIALS & METHODS

The present study comprised of 84 patients with symptomatic gallstones and acute cholecystitis of both genders. All gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. All patients underwent ultrasonography. The laparoscopic cholecystectomies were performed by experienced laparoscopic surgeons. The surgery was performed using a standardized technique with four ports. Factors such as indication for LC, preoperative liver function tests, rate of conversion to open cholecystectomyand reason for conversion were recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 84		
Gender	**Males**	**Females**
Number	50	34

Table I shows that out of 84 patients, males were 50 and females were 34.

Table II Cause for conversion from laparoscopic to open cholecystectomy

Cause	Number	P value
Extensive intra-abdominal adhesions	2	0.04
Frozen/Inflammed Calot's triangle	8	
Post ERCP status	2	
Bile duct injury	1	
Cholecystoduodenal/colic fistula	1	

Table II shows that out of 84 cases, 14 were converted to open cholecystectomy. Causes were extensive intra-abdominal adhesions in 2 cases, frozen/Inflammed Calot's triangle in 8, post ERCP status in 2, bile duct injury in 1 and Cholecystoduodenal /colic fistula in 1 case. The difference was significant (P< 0.05).

Table III Risk factors for conversion from laparoscopic (LC) to open cholecystectomy (OC)

Parameters	Variables	LC (70)	OC (14)	P value
Gender	Male	40	10	0.02
	Female	30	4	
Age group (years)	<60	42	8	0.04
	>60	28	6	
Post ERCP status		8	2	0.01
Previousabdominal surgery		7	2	0.01
Gall bladder wallthickness > 5mm		5	7	0.92
Previous acutecholecystitis		3	8	0.05

Table III, graph I shows that there were 40 male and 30 females in LC group and 10 male and 4 females in OC group. Age group (years) <60 comprised of 42 in LC and 8 in OC group and >60 years had 28 in LC and 6 in OC group. Post ERCP status was seen in 8 in LC and 2 in OC group. Previous abdominal surgery was seen in 7 in LC and 2 in OC group. Gall bladder wall thickness > 5mm was seen in 5 in LC and 7 in OC group and previous acute cholecystitis was seen in 3 in LC and 8 in OC group. The difference was significant (P< 0.05).

Graph I Risk factors for conversion from laparoscopic to open cholecystectomy

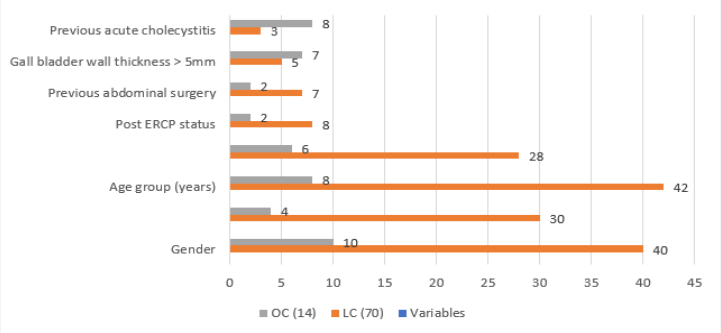

Table IV Univariate analyses in relation to conversion to open cholecystectomy

Parameters	HR	P value
Age	0.91	0.09
Gender	1.4	0.05
Post ERCP status	0.643	0.13
Previous abdominal surgery	0.942	0.91
Gall bladder wall thickness > 5mm	4.56	0.02
Previous acutecholecystitis	4.69	0.01

Table IV shows that factors such as gender, gall bladder wall thickness > 5mm and previous acute cholecystitis was associated with open cholecystectomy.

DISCUSSION

Laparoscopic cholecystectomy (LC) is the gold standard for treatment of symptomatic gallstones, owing to the lower morbidity, less post operative pain and hospital stay, better cosmesis and earlier return to regular activities.[7,8]The causes for conversion reported in literature are: unclear anatomy of the Calot's triangle due to inflammation or adhesions, bleeding during dissection, contracted gallbladder, biliovascular injuries, cholecystoenteric fistula, gallbladder cancer, Mirizzi syndrome, technical issues, and bowel injury.[9]The present study was conducted to assess predictive factors determining conversion to open cholecystectomy in patients undergoing laparoscopic cholecystectomy.

We found that out of 84 patients, males were 50 and females were 34.14 were converted to open cholecystectomy. Causes were extensive intra-abdominal adhesions in 2 cases, frozen/Inflammed Calot's triangle in 8, post ERCP status in 2, bile duct injury in 1 and cholecystoduodenal/colic fistula in 1 case. Liu et al[10] found that age (>65 years), obesity, interval elective laparoscopic cholecystectomy for acute cholecystitis, and a thickened gallbladder wall predicted conversion. Furthermore, they noted that cholecystectomies performed during the early learning curve and surgeries performed by senior surgeons had increased rates of conversion.

We observed that there were 40 male and 30 females in LC group and 10 male and 4 females in OC group. Age group (years) <60 comprised of 42 in LC and 8 in OC group and >60 years had 28 in LC and 6 in OC group. Post ERCP status was seen in 8 in LC and 2 in OC group. Previous abdominal surgery was seen in 7 in LC and 2 in OC group. Gall bladder wall thickness > 5mm was seen in 5 in LC and 7 in OC group and previous acute cholecystitis was seen in 3 in LC and 8 in OC group. Sanabria et al[11] examined risk factors predicting conversion in an elective cholecystectomy.These authors found that in 628 elective laparoscopic cholecystectomies elderly patients (65 years or older), males, and patients with multiple attacks (more than 10) of biliary colic, or a documented history of acute cholecystitis were more likely to require conversion.

We found that factors such as gender, gall bladder wall thickness > 5mm and previous acute cholecystitis was associated with open cholecystectomy. Sharma et al[12] in their study 546 patients underwent laparoscopic cholecystectomy. 333 were females (60.9%) and 213 (39.1%) males, with a mean age of 44.6 years. The most common indication for surgery was symptomatic cholelithiasis. Conversion to open cholecystectomy occurred in 48 cases (8.8%) and the most common reason for conversion was inability to define the Calot's triangle anatomy due to inflammation/adhesions. Univariate and multivariate analyses of various variables demonstrated that male gender, gall bladder wall thickness >5 mm and presence of previous documented acute cholecystitis had statistically significant co-relation with higher rates of conversion.

Rosen et al[13] identified risk factors that may predict conversion from a laparoscopic to an open procedure. A total of 1,347 laparoscopic cholecystectomies were performed. Multivariate analysis revealed that for all cases, a white blood cell count >9 and a gallbladder wall thickness >0.4 cm predicted conversion to open cholecystectomy. However, when patients with acute cholecystitis were evaluated only a body mass index >30 kg/m2 predicted conversion. For patients undergoing elective cholecystectomy, a body mass index >40 kg/m2 and a wall thickness >0.4 cm predicted conversion.
The limitation the study is small sample size.

CONCLUSION

Authors found that presence of history of acute cholecystitis, gall bladder wall thickness >5mm and male gender were independent predictor factors for conversion from laparoscopic to open cholecystectomy.

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