ORIGINAL RESEARCH

Predictive factors evaluating conversion to open cholecystectomy in patients undergoing laparoscopic cholecystectomy

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ABSTRACT

Background: Gallstones are one of the most frequent causes of stomach pain. The only effective treatment for gallstones that cause symptoms is cholecystectomy. The present study was conducted to assess predictive factors determining conversion to open cholecystectomy in patients undergoing laparoscopic cholecystectomy. **Materials & Methods:** 70 patients with acute cholecystitis of both genderswere subjected to ultrasonography. The percentage of conversions to open cholecystectomy, and the cause of the conversions was recorded. **Results:** Out of 70 patients, males were 30 and females were 40. Out of 70 cases, 10 were converted to open cholecystectomy. Causes were post ERCP status in 1, bile duct injury in 1, extensive intra-abdominal adhesions in 2, frozen/Inflamed Calot's triangle in 4 and cholecystoduodenal/colic fistula in 2 cases. The difference was non- significant (P< 0.05). Age group (years)<60 comprised of 36 in LC and 6 in OC group and >60 years had 24 in LC and 4 in OC group. There were 23 male and 7 females in LC group and 37 male and 3 females in OC group. Gall bladder wall thickness > 5mm was seen in 3 in LC and 5 in OC group, previous acute cholecystitis was seen in 2 in LC and 2 in OC group. The difference was significant (P< 0.05). **Conclusion:** Male gender, gall bladder wall thickness greater than 5 mm, and the existence of past episodes of acute cholecystitis were independent predictors of the decision to switch from laparoscopic to open cholecystectomy.

Key words: Acute cholecystitis, Gall bladder, Laparoscopic cholecystectomy

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INTRODUCTION

Gallstones are one of the most frequent causes of stomach pain. The only effective treatment for gallstones that cause symptoms is cholecystectomy. Laparoscopic cholecystectomy (LC) has largely taken the place of open cholecystectomy (OC).¹ The gold standard of care for treating symptomatic gallbladder disease is laparoscopic cholecystectomy. Compared to open cholecystectomy, laparoscopic cholecystectomy improves cosmesis, reduces postoperative pain, permits earlier oral intake, shortens hospital stay, and increases earlier return to regular activity. There aren't many reasons why a laparoscopic cholecystectomy can't be performed for symptomatic cholelithiasis, according to growing laparoscopic experience.² But for a variety of reasons, between 2% and 15% of patients need to convert to open surgery. It is well

recognized that conversion lengthens hospital stays, increases perioperative times, and raises hospital ${\rm costs.}^3$

Determining the risk factors for conversion is therefore crucial in order to enable safer operations and improved surgical planning.⁴ Failure of the equipment, surgeon variables, and patient characteristics could all be contributing factors to the conversion.⁵ Despite the longer operating duration, longer hospital stay, and higher morbidity associated with the conversion from laparoscopic to open surgery, this treatment is not a failure but rather a necessary precaution to avoid catastrophic biliovascular problems.6The present study was conducted to assess predictive factors determining conversion to open cholecystectomy in patients undergoing laparoscopic cholecystectomy.

MATERIALS & METHODS

The present study consisted of 70 patients with acute cholecystitis of both genders. All patients gave their written consent for the participation in the study.

Data such as name, age, gender etc. was recorded. All were subjected to ultrasonography. Skilled laparoscopic surgeons carried out the laparoscopic cholecystectomies. A four-port, standardized approach was used to accomplish the procedure. A number of variables were noted, including the need for LC, liver function tests before to surgery, the percentage of conversions to open cholecystectomy, and the cause of the conversions.Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS Table I Distribution of patients

Total- 70					
Gender	Males	Females			
Number	30	40			

Table I shows that out of 70 patients, males were 30 and females were 40.

Table II Etiology of conversion to open cholecystectomyfrom laparoscopiccholecystectomy

Etiology	Number	P value
Post ERCP status	1	0.17
Bile duct injury	1	
Extensive intra-abdominal adhesions	2	
Frozen/Inflamed Calot's triangle	4	
Cholecystoduodenal/colic fistula	2	

Table II shows that out of 70 cases, 10 were converted to open cholecystectomy. Causes were post ERCP status in 1, bile duct injury in 1, extensive intra-abdominal adhesions in 2, frozen/Inflamed Calot's trianglein 4 and cholecystoduodenal/colic fistula in 2 cases. The difference was non- significant (P < 0.05).

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Parameters	Variables	LC (60)	OC (10)	P value
Age group (years)	<60	36	6	0.02
	>60	24	4	
Gender	Male	23	7	0.04
	Female	37	3	
Gall bladder wallthickness > 5mm		3	5	0.16
Previous acutecholecystitis		2	5	0.05
Post ERCP status		5	1	0.03
Previousabdominal surgery		4	2	0.05

Table III, graph I shows that age group (years)<60 comprised of 36 in LC and 6 in OC group and >60 years had 24 in LC and 4 in OC group. There were 23 male and 7 females in LC group and 37 male and 3 females in OC group. Gall bladder wall thickness > 5mm was seen in 3 in LC and 5 in OC group, previous acute cholecystitis was seen in 2 in LC and 5 in OC group, Post ERCP status was seen in 5 in LC and 1 in OC group and previous abdominal surgery was seen in 4 in LC and 2 in OC group. The difference was significant (P< 0.05).



Graph I Risk factors for conversion to open cholecystectomy from laparoscopic

DISCUSSION

Because laparoscopic cholecystectomy (LC) has a reduced morbidity, requires less post-operative pain and hospital stay, improves cosmesis, and allows patients to resume routine activities sooner, it is the gold standard for treating symptomatic gallstones.^{7,8} The causes of conversion that have been documented in the literature include: bowel injury, biliovascular injuries, contracted gallbladder, cholecystoenteric fistula, gallbladder cancer, Mirizzi syndrome, unclear anatomy of the Calot's triangle due to inflammation or adhesions, bleeding during dissection, and other conditions.9,10 The present study was conducted to assess predictive factors determining conversion to cholecystectomy in patients undergoing open laparoscopic cholecystectomy.

We found that out of 70 patients, males were 30 and females were 40.Risk indicators that could indicate a conversion from a laparoscopic to an open surgery were found by Rosen et al.¹¹ 1,347 laparoscopic cholecystectomies were carried out in total. A white blood cell count >9 and a gallbladder wall thickness >0.4 cm were found to be predictive of conversion to open cholecystectomy in all instances, according to multivariate analysis. All patients with acute cholecystitis were projected to convert, but only if their body mass index was greater than 30 kg/m2. A predicted conversion for individuals receiving elective cholecystectomy was a body mass index greater than 40 kg/m2 and a wall thickness greater than 0.4 cm.

We found that out of 70 cases, 10 were converted to open cholecystectomy. Causes were post ERCP status in 1, bile duct injury in 1, extensive intra-abdominal adhesions in 2, frozen/Inflamed Calot's triangle in 4 and cholecystoduodenal/colic fistula in 2 cases. According to Liu et al¹², conversion was predicted by age (>65 years), obesity, interval elective laparoscopic cholecystectomy for acute cholecystitis, and a thicker gallbladder wall. They also observed higher rates of conversion for cholecystectomies carried out by senior surgeons and during the early learning curve. We found that age group (years)<60 comprised of 36 in LC and 6 in OC group and >60 years had 24 in LC and 4 in OC group. There were 23 male and 7 females in LC group and 37 male and 3 females in OC group. Gall bladder wall thickness > 5mm was seen in 3 in LC and 5 in OC group, previous acute cholecystitis was seen in 2 in LC and 5 in OC group, Post ERCP status was seen in 5 in LC and 1 in OC group and previous abdominal surgery was seen in 4 in LC and 2 in OC group. Risk factors for conversion in an elective cholecystectomy were studied by Sanabria et al.¹³ These authors discovered that older patients (65 years or older), men, patients with multiple incidents (more than 10) of biliary colic, and patients with a history of acute cholecystitis were more likely to need conversion in 628 elective laparoscopic cholecystectomies.

The limitation of the study is small sample size.

CONCLUSION

Authors found that male gender, gall bladder wall thickness greater than 5 mm, and the existence of past episodes of acute cholecystitis were independent predictors of the decision to switch from laparoscopic to open cholecystectomy.

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