

# Frequency and Causes of Conversion of Laparoscopic Cholecystectomy into Open Cholecystectomy

1. Shabab Hussain 2. Viqar Aslam 3. Muhammad Sherose Khan 4. Waheed Alam  
5. Sajjad Muhammad Khan 6. Waqar Alam Jan

1. Registrar, 2. Asstt. Prof., 3. House Surgeon, 4. PG Trainee, 5. Prof., 6. Assoc. Prof., Dept. of General Surgery, Lady Reading Hospital, Peshawar

## ABSTRACT

**Objective:** To determine the frequency and causes of conversion of laparoscopic cholecystectomy into open cholecystectomy.

**Study Design:** Cross-sectional (descriptive) study

**Place and Duration of Study:** This study was carried out at Surgical Unit of Postgraduate Medical Institute, Lady Reading Hospital, Peshawar for 14 months, from 1-11-2010 to 31-12-2011.

**Patients and Methods:** A total of 126 patients of symptomatic gallstones disease fulfilling the inclusion criteria were subjected to laparoscopic cholecystectomy and were followed through out the procedure to see for any conversion and its cause.

**Results:** The mean age of patients was  $40.65 \pm 10.35$  with range of 20-65 years. The total no of cases converted to open cholecystectomy were 11 out of 126. Thus frequency of conversion was 11 equal to 8.7%, with commonest cause being adhesions 9 out of 11 converted cases followed by hemorrhage 2 out of 11 conversions. Moreover conversion was more in male patients. 20.8% as compared to 5.9% in females.

**Conclusion:** Laparoscopic cholecystectomy is the gold standard treatment modality in the management of symptomatic gallstones disease. Its one disadvantage is the conversion into open procedure. But conversion should not be considered as complication of the procedure rather it is mature decision by the surgeons to avoid unnecessary lengthening the duration of surgery once they encounter any difficulty or interoperative complication.

**Key Words:** Laparoscopic cholecystectomy, Gall stones, Conversion, Cholelithiasis

**Citation of article:** Hussain S, Aslam V, Khan MS, Alam W, Khan SM, Jan WA. Frequency and Causes of Conversion of Laparoscopic Cholecystectomy into Open Cholecystectomy. Med Forum 2015;26(5):13-16.

## INTRODUCTION

Cholelithiasis is a common disease with a prevalence of 10-15% in the USA and about 16% in Pakistan.<sup>1,2</sup> Patients mostly remain asymptomatic but symptoms appear when any complication develops.<sup>3</sup> Ultrasonography is most useful investigation for diagnosing the gall stones or its complications like cholecystitis.<sup>4</sup> Symptomatic gall stone disease can end up with its complications without prompt surgical intervention. Carl-Langenbuch performed 1<sup>st</sup> successful cholecystectomy by open technique which remained the goal standard for the management of gall stones for about a century.<sup>5</sup> Then Philippe Moret brought a new advancement in its management by performing first successful cholecystectomy through laparoscopic technique.<sup>6</sup> It has become the most common major abdominal procedure performed in Western countries.<sup>7</sup>

Laparoscopic cholecystectomy is preferable over open cholecystectomy for its lesser duration of hospital stay, lesser mortality and morbidity, early return to work and better cosmetic results.<sup>8</sup> It is also considered for management of acute cholecystitis now a days.<sup>9</sup> Laparoscopic cholecystectomy (LC) remains an extremely safe procedure with a mortality rate of 0.22-0.4%. Major morbidity occurs in approximately 5% of patients.<sup>10</sup> Laparoscopic cholecystectomy is having certain disadvantages like its conversion into open cholecystectomy. According to some studies its conversion rate is 16-18%.<sup>11,12</sup> Common causes for conversion mentioned in literature are dense adhesions 66.6%, common bile duct injury 22.3%, gut injury 11.1%<sup>13</sup> and haemorrhage 50%.<sup>14</sup>

The rationale of this study was that it will provided our local statistical data about frequency and common causes of conversion of laparoscopic cholecystectomy into open cholecystectomy, where adequate expertise is in the phase of development. By this study we have come to know that our results are comparable with national and international studies, which has reflected the level of our expertise in the field of laparoscopic surgery

**Correspondence:** Dr. Shabab Hussain,  
Registrar, Department of General Surgery,  
Lady Reading Hospital, Peshawar  
Cell No. 03339619411  
E-mail: shababdr@gmail.com

## MATERIALS AND METHODS

This cross-sectional (descriptive) study was conducted in Surgical Unit of Postgraduate Medical Institute, Lady Reading Hospital, Peshawar over a period of 14 months from 01-11-2010 to 31-12-2011. All patients aged  $\geq 14$  years (because patients  $< 14$  years of age are being dealt in paediatric surgery unit) and cholelithiasis undergoing laparoscopic cholecystectomy were included. Patients who have choledocholithiasis, empyema gall bladder, previous abdominal surgery, cirrhosis liver and gall bladder mass were excluded from the study. The cholelithiasis was diagnosed on the bases of episodes of pain and tenderness at right hypochondrium aggravated by taking fatty meal and ultrasound abdomen suggestive of gall bladder stones. All the patients with diagnosis of cholelithiasis fulfilling the inclusion criteria were admitted either through OPD or casualty. After taking informed consent for study and surgery, detailed history was taken and clinical examination was performed. Preoperative investigations included full blood count, random blood sugar, viral serology, blood urea and serum creatinine, chest x ray, ECG. Ultrasound scan abdomen and liver function tests were performed in all cases in order to confirm the diagnoses and rule out associated complications. Then all the patients were kept nil by mouth from 12:00 mid night before surgery. Pre operative antibiotics were given at the time of induction of anesthesia and patients were followed throughout the procedure to look for conversion if any and its cause such as adhesions, common bile duct injury, hemorrhage & gall injury. All the information and other demographic features of the patients were recorded in a pre designed proforma. Laparoscopic cholecystectomies were performed by the same surgeon with 5 years experience of laparoscopic surgery blinded from the details and inclusion of the patients in the study.

## RESULTS

Out of 126 patients, 102 (81%) were women and 24 (19.3%) were men. The mean age was  $40.65 \pm 10.35$  yrs and age range of 20-65 yrs. Study population largely comprised of female patients of relatively younger age group. Eleven 11 (8.7%) patients required conversion to open procedure. Thus the rate of conversion was 8.7%. Commonest cause being adhesions 9 out of 11 (7.1%) converted cases followed by haemorrhage 2 out of 11 (1.6%) conversions. Moreover conversions were more in male patients 20.8% as compared to 5.9% in females (Tables 1-2).

**Table No.1: Conversion of laparoscopic cholecystectomy into open cholecystectomy**

Conversion	No.	%
Yes	11	8.7
No	115	91.3
Total	126	100.0

**Table No.2: Gender-wise distribution of patients (n=126)**

Gender	Conversion	No.	%
Male	Yes	5	20.8
	No	19	79.2
	Total	24	100.0
Female	Yes	6	5.9
	No	96	94.1
	Total	102	100.0

## DISCUSSION

Symptomatic gall stone disease can end up with its complications without prompt surgical intervention. Cholecystectomy was performed by open technique for management of gall stones disease which remained the goal standard for the management of gall stones for about a century.<sup>5,15</sup> But now this is the era of minimally invasive or key hole surgery and performing laparoscopic cholecystectomy for GBS has revolutionized its management.<sup>16,17</sup>

Laparoscopic cholecystectomy became an attractive treatment modality for cholelithiasis because of less scarring, shortened hospital stays, earlier return to usual activities.<sup>18</sup> Despite the fact that laparoscopic cholecystectomy has got many advantages but its conversion into open cholecystectomy is disappointing not only for patient but for surgeon as well. But conversion should not be considered as complication of the procedure rather it is mature decision by the surgeons to avoid unnecessary lengthening the duration of surgery once they encounter any difficulty or intraoperative complication.

The factors leading to conversion of laparoscopic cholecystectomy into open cholecystectomy have been addressed by different studies in literature and those identified so far range from age of the patient, gender, obesity, acute cholecystitis, inexperience. The conversion rate of 3.6% to 13.9% is reported in literature.<sup>23,24</sup> The frequency of conversion in this study being presented is 11 equal to 8.7%, which is according to that mentioned in literature. Our study population was younger, mean age  $40.65 \pm 10.35$  years. Daradkeh<sup>24</sup> reported mean age of 47.2 years, whereas Bingener et al<sup>23</sup> 40 years.

The reported conversion rates for acute cholecystitis range from 12% to 37.5%.<sup>25</sup> However, the rate of conversion is high amongst studies from the Asian countries as compared to those from western world. In most cases, dense adhesion around the gall bladder and uncontrolled bleeding were the main reasons for conversion to the open procedure.<sup>11</sup> Also in this study commonest cause being adhesions 9 out of 11 converted cases followed by haemorrhage 2 out of 11 conversions. Moreover conversions were more in male patients. 20.8% as compared to 5.9% in females. This was similar to Ibrahim et al<sup>15</sup>, Brodsky et al<sup>26</sup> and Al

Salamah<sup>27</sup> also found male gender as a most significant determinant for conversion to open cholecystectomy. Gharaibeh et al<sup>28</sup> reported 24% conversion rate in males vs. 4% in females, whereas Lim et al<sup>29</sup> reported 16.6% conversions in males vs 8.2% in females. Male gender is thought to be a risk factor for conversion because of either behavioral differences<sup>30</sup> or differences in anatomy and physiology such as volume of abdomen, hormones and fats distribution. According to some studies age is also a risk factor for conversion but in this current study age is not a risk factor for conversion, which is according to a study by Shamim et al.<sup>31</sup> Most conversions happened after a simple inspection or a minimum dissection, and the decision to convert should be considered as a sign of surgical maturity rather than a failure. Conversion should be opted for in the beginning and at the time of recognition of a difficult dissection rather than after the occurrence of complication.<sup>15,16</sup>

## CONCLUSION

Laparoscopic cholecystectomy is the gold standard treatment modality in the management of symptomatic gallstones disease. Most of the laparoscopic cholecystectomy performed fall in relatively younger age group female in this study our conversion rate is comparable with national and international literature, commonest cause of conversion was adhesions. Male gender was also risk factor for conversion. On the basis of our results we may recommend laparoscopic cholecystectomy for management of symptomatic gall stone disease in our setup where adequate expertise are in the phase of development.

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

## REFERENCES

- Schirmer BD, Winters XL, Edlich RF. Cholelithiasis and cholecystitis. *J Longterm Eff Med Implants* 2005;15(3):329-38.
- Alam SN, Rehman S, Raza SM, Manzir SM. Audit of general surgical unit: need for self evaluation. *Pak J Surg* 2007;23(2):141-4.
- Rosing DK, de Virgilio C, Yaghoobian A. Early cholecystectomy for mild to moderate gallstone pancreatitis shortens hospital stay. *J Am Coll Surg* 2007;205(6):762-6.
- Browning JD, Sreenarasimhaiah J. Gallstone disease. In: M Feldman, editor. *Sleisenger and Fordtran's Gastrointestinal and Liver Disease*. 8th ed. Philadelphia: Saunders Elsevier; 2006.p.1387-418.
- Shaikh R, Pohani MR, Ayub, Asghar A, Malik KA, Rehman S. Bile duct injuries: during open & laproscopic cholecystectomy – management and outcome. *Pak J Med Sci* 2009; 25(3): 496-9.

- Jenkins PJ, Paterson HM, Parks RW, Garden OJ. Open cholecystectomy in the laparoscopic era. *Br J Surg* 2007;94:1382-5.
- Litwin DE, Cahan MA. Laparoscopic cholecystectomy. *Surg Clin North Am* 2008;88(6): 1295-313.
- Iqbal M, Sattar I, Rasheed K, Khan N, Khan A. Complications of laparoscopic cholecystectomy: a learning curve. *J Surg Pak* 2006;11(4):170-1.
- Bhattacharya D, Ammori BJ. Contemporary minimally invasive approaches to the management of acute cholecystitis: a review and appraisal. *Surg Laparosc Endosc Percutan Tech* 2005;15:1-8.
- Csikesz N, Ricciardi R, Tseng JF, Shah SA. Current status of surgical management of acute cholecystitis in the United States. *World J Surg* 2008;32(10):2230-6
- Tarcoveanu E, Niculesce D, Georgescu S, Bradea C, Epure O. Conversion in laparoscopic cholecystectomy. *Chirurgia* 2005;100(5):437-44.
- Veen EJ, Bik M, Jansen-Heijnen MLG, De Jongh M, Roukema L. Outcome measurement in laparoscopic cholecystectomy by using a prospective complication registry: results of an audit. *Int J Qual Health Care* 2008;20(2):144-51.
- Memon W, Khanzada TW, Samad A, Laghari MH. Laparoscopic cholecystectomy: conversion rate and its causes. *Rawal Med J* 2008;33(2): 59-61.
- Ali M, Gondal SH, Rana HN, Ali M. Early conversion is a safe option to avoid complications in laparoscopic cholecystectomy for the beginners. *Ann King Edward Med Coll J* 2006;12(1):15-7.
- Ibrahim S, Hean TK, Ho LS, Ravintharan T, Chye TN, Chee CH. Risk factors for conversion to open surgery in patients undergoing laparoscopic cholecystectomy. *World J Surg* 2006;30: 1698-704.
- Keus F, de Jong JA, Gooszen HG, van Laarhoven CJ. Laparoscopic versus open cholecystectomy for patients with symptomatic cholecystolithiasis. *Cochrane Database Syst Rev* 2006;18(4):39-43.
- Livingston EH, Rege RV. A nationwide study of conversion from laparoscopic to open cholecystectomy. *Am J Surg*. 2004;188: 205-211.
- Shea JA, Healey MJ, Berlin JA, Clarke JR, Malet PF, Staroscik RN, et al. Mortality & complications associated with laparoscopic cholecystectomy. A meta-analysis. *Ann Surg* 1996; 224: 609-20.
- Vecchio R, Macfadyen BV, Latteri S. Laparoscopic cholecystectomy: Analysis of 114,005 cases of United States series. *Int Surg* 1998;83:215-9.
- Guraya SY, Khairy GEA, Murshid KR. Audit of laparoscopic Cholecystectomy: 5 years experience in a University Hospital. *Ann King Edward Med Coll* 2004;10:9-10.

21. Dholia KM, Memon AA, Sheikh MS. Laproscopic cholecystectomy: Experience of 100 cases at a teaching hospital of Sindh. *J Liaquat Univ Med Health Sci* 2005;4:105-8.
22. Butt AU, Sadiq I. Conversion of laparoscopic to open cholecystectomy-six years experience at Shalamar Hospital , Lahore. *Ann King Edward Med Coll* 2006;12:536-8.
23. Bingener-Casey J, Richards ML, Strodel WE, Schwesinger WH, Sirinek KR. Reasons for conversion from laparoscopic to open cholecystectomy: a 10-year review. *J Gastrointest Surg* 2002; 6: 800-5.
24. Daradkeh S. Laparoscopic cholecystectomy: analytical study of 1208 cases. *Hepatogastroenterol* 2005; 52: 1011-4.
25. Nizamuddin S, Ashraf S, Ul-islam U. Factors responsible for conversion of laparoscopic cholecystectomy. *Pak J Surg* 2009;25(2):132-35.
26. Brodsky A, Matter I, Sabo E, Cohen A, Abrahamson J, Eldar S. Laparoscopic cholecystectomy for acute cholecystitis: can the need for conversion and the probability of complications be predicted? A prospective study. *Surg Endosc* 2000; 14: 755-60.
27. Al Salamah SM. Outcome of laparoscopic cholecystectomy in acute cholecystitis. *J Coll Physicians Surg Pak* 2005;15:400-3.
28. Gharaibeh KI, Qasameh GR, Al-Heiss H, Ammari F, Bani-Hani K, Al-Jaberi TM, et al. Effect of timing of surgery, type of inflammation, and sex on outcome of laparoscopic cholecystectomy for acute cholecystitis. *J Laparoendosc Adv Surg Tech A* 2002; 12: 193-8.
29. Lim SH, Salleh I, Poh BK, Tay KH. Laparoscopic cholecystectomy: an audit of our training programme. *ANZ J Surg* 2005;75:231-3.
30. Simon E, Thesbjerg, Kirstine M, Harboe, Linda Bardram, Jacob Rosenberg. Sex differences in laparoscopic cholecystectomy. *Surg Endosc.* 2010; 24(12):3068-72.
31. Shamim M, Memon AS, Bhutto AA, Dahri MM. Reasons of conversion of laparoscopic to open cholecystectomy in a tertiary care institution. *J Pak Med Assoc* 2009; 59(7):456-9.

Electronic Copy