

# Revisiting Factors Predicting Conversion to Open Cholecystectomy

Syed Sheeraz ur Rahman<sup>1</sup>, Zahid Habib<sup>1</sup>, Rufina Soomro<sup>1</sup> and Omer Bin Khalid<sup>2</sup>

## ABSTRACT

**Objective:** To identify peri-operative risk factors leading to conversion in patients undergoing laparoscopic cholecystectomy.

**Study Design:** Observational / descriptive study.

**Place and Duration of Study:** This study was conducted at the Liaquat National Hospital & Medical College, in Karachi from Jan 2009 to Dec 2011.

**Materials and Methods:** The Study was started after formal approval of General Surgery faculty. Theater records of all patients who underwent Laparoscopic to open conversion admitted to the department, Liaquat National Hospital & Medical College, from January 2009 to December 2011 were retrieved & reviewed. All data was entered into a designated proforma and SPSS ver 19.0 was used for statistical analysis.

**Results:** During the period from January 2009 to December 2011 (3 years), total 1281 patients admitted for cholecystectomies. Out of which 156 patients had planned open cholecystectomies and were therefore excluded from the study. 1125 patients underwent laparoscopic cholecystectomies out of which 45 were converted to open cholecystectomies with the conversion rate of 4%. In our series, males were 20 and females were 25 with mean age of  $48.20 \pm 13.048$ . 36 patients were admitted through the OPD with the mean hospital stay was  $8.56 \pm 5.294$  days. Pre-surgery 28 of the patients had acute symptoms and 31 patients had normal liver function tests at the time of admission. 33 patients did not show any ultrasound evidence of acute cholecystitis. All patients were operated in direct supervision of the consultant with minimum experience of performing > 500 laparoscopic cholecystectomies. Intraoperative causes leading to conversion were difficult anatomy in 44 patients, empyema in 17, perforated gall bladder in 5, bleeding in 4 and instrument failure in 1. 17 of the patients required per-operative cholangiogram (POC) for deranged LFTS and for delineation of difficult anatomy.

**Conclusion:** Laparoscopic cholecystectomy in a tertiary care hospital has acceptable conversion rates as compared to local and international standards. In our series, patients with difficult per-operative anatomy and empyema gallbladder were significant risk factors for conversion.

**Key Words:** Open conversion, laparoscopic cholecystectomy, risk factors

**Citation of article:** Rahman SS, Habib Z, Soomro R, Khalid OB. Revisiting Factors Predicting Conversion to Open Cholecystectomy. Med Forum 2017;28(1):92-95.

## INTRODUCTION

Laparoscopic Cholecystectomy is the standard care for symptomatic gallstones since 2 decades but open conversion or classical open cholecystectomy can at times be inevitable as required for complicated or difficult gallbladders. Many consider conversion to be morbidity or a failure on part of the surgeon as technical error but should be taken as an accepted surgical practice<sup>1,2</sup>. This is in the best interest of the patient and operating surgeon with the sole intent to do no harm to the patient.

Different studies have shown various predictors and risk factors<sup>3</sup> that can lead to conversions in their setup which include age, gender, presentation<sup>4</sup>, surgeons experience<sup>5,6</sup>, center volume and timing of surgery<sup>7,8</sup> technical difficulties in terms of identifying biliary anatomy to power breakdowns.

Every center should have the understanding of its own conversion rate and peri-operative risk factors of conversion. Knowing own conversion will greatly help in patient counseling and comparison of existing practices with the available literature. Incorporating this routine into an audit also helps to control such factors and improve surgical care.

Therefore the purpose of the study is to identify peri-operative risk factors leading to conversion in patients undergoing laparoscopic cholecystectomy at our hospital.

## MATERIALS AND METHODS

This observational / descriptive study was conducted in January 2009 to December 2011. All patients admitting to Department of General Surgery, Liaquat National

<sup>1</sup>. Department of Surgery, Liaquat National Hospital & Medical College, Karachi.

<sup>2</sup>. Aga Khan University Hospital, Karachi.

Correspondence: Dr. Syed Sheeraz Ur Rahman, Asst. Prof. of Surgery/Consultant General Surgeon, Department of Surgery, Liaquat National Hospital & Medical College, Karachi.

Contact No: 0333-2163969

Email: drsheeraz@gmail.com

Received: November 10, 2016; Accepted: December 27, 2016

hospital & Medical College with symptomatic gallstones either through out patient or emergency.

#### Inclusion Criteria:

1. All adults between the ages of 18-70 years of age
2. ASA  $\leq$  3
3. Patients having laparoscopic to open conversions

#### Exclusion Criteria:

1. Patients having planned open cholecystectomies
2. ASA  $\geq$  4
3. Consent for laparoscopy not given

The Study was started after formal approval of General Surgery faculty, Liaquat National Hospital & Medical College. Theater records of all patients who underwent Laparoscopic to open conversion admitted to the department, Liaquat National Hospital & Medical College, from January 2009 to December 2011 were retrieved & reviewed. All data was entered into a designated proforma and SPSS ver 19.0 was used for statistical analysis.

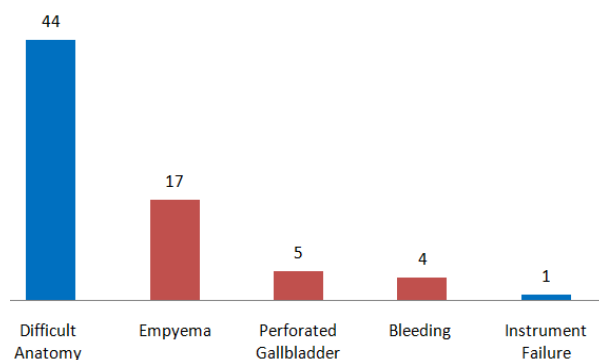
Cases were reviewed in terms of age, gender, total hospital stay, symptoms, ultrasound findings, pre-operative LFTS, and reasons of conversion using descriptive statistics.

## RESULTS

During the period from January 2009 to December 2011 (3 years), total 1281 patients admitted for cholecystectomies. Out of which 156 patients had planned open cholecystectomies and were therefore excluded from the study.

**Table No.1: Comparison of Patient Volume to Conversion rate**

Ser no.	Study	Patient Volume /year	Conversion rate
1.	Genc V et al <sup>10</sup> , CLINICS 2011.	>400 cases	3.16 %
2.	Sakpal, S. et al. JSLS 2010.	>400 cases	4.9 %
3.	Our study	>350 cases	4%
4.	R. Azmi et al, J Postgrad Med 2005.	<300 cases	7.5%
5.	Pervaiz Iqbal et al, Pak J Surg 2008.	<100 cases per year	9.4 %
6.	Rashid T et al <sup>9</sup> . J Ayub Medical College, Abbottabad, 2016	<100 cases per year	7 %



**Graph No.1: Intraoperative Causes of Open Conversion**

1125 patients underwent laparoscopic cholecystectomies out of which 45 were converted to open with the conversion rate of 4%. In our series, males were 20 and females were 25 with mean age of  $48.20 \pm 13.048$ . 36 patients were admitted through the OPD with the mean hospital stay was  $8.56 \pm 5.294$  days. Pre-surgery 28 patients had acute symptoms and 31 patients had normal liver function tests at the time of admission. 33 patients did not show any ultrasound evidence of acute cholecystitis. All patients were operated under direct supervision of the consultant with minimum experience of performing > 500 laparoscopic cholecystectomies. Most common cause of conversion was difficult anatomy (44 patients) which was associated with empyema in 17, perforated gall bladder in 5, bleeding in 4 and instrument failure in 1. 17 patients required per-operative cholangiogram (POC) for deranged LFTS and difficult anatomy.

## DISCUSSION

Laparoscopic cholecystectomy (LC) is the treatment of choice for symptomatic gallstones, but possibility of unexpected operative findings and complicated preoperative course in some cases induces necessity of conversion<sup>10,11</sup>. Knowledge of the rate and impact of the underlying reasons for conversion could help surgeons during preoperative assessment and improve the informed consent of patients. The need for conversion is not the failure of operating surgeon but an attempt to avoid complications which might ensue if expeditious surgery is performed<sup>12</sup>.

The conversion rates according to the studies do show geographical variations from 1-19%<sup>13-16</sup> and some have shown increase propensity towards male gender<sup>1</sup> however in our series, females were predominant with P value 0.106. The main reasons for conversion in our series were difficult per-operative anatomy, empyema gallbladder, and hemorrhage<sup>17</sup> as shown in Graph 1.

In our study, rate of conversion was 4% which is comparable with the international literature and one of the lowest among the local literature. It is also observed that centers with high volume surgeries (>400 cases per

year) have a conversion rate of about <5% as opposed to those with lower volume<sup>5</sup>. Hence centers with high volumes are able to maintain a reasonable low level of conversion. Comparison of volume on conversion rate is shown in table 1.

Pervaiz et al<sup>18</sup> in his study showed presence of adhesions as a sequel of repeated previous attacks as the leading cause of conversion among empyema gall bladder and instrument failure. In our study, it was observed that there were no pre-operative significant risk factors leading to conversion in fact majority of the patients did not show any evidence of the acute cholecystitis as evident by peri-cholecystitic fluid, impaction of stone at the neck of gall bladder and increased wall thickness.

In Tayeb et al<sup>19</sup>, they evaluated the pre-operative risk factors esp. age and the per-op ultrasound findings in predicting the conversion. In their study by using regression analysis, it was observed that age > 60 years and pre-operative ultrasound findings features suggestive of acute cholecystitis and gall bladder thickness > 3mm were the independent risk factors leading to conversion. In our series, the mean ages of the patients were 48.7 years  $\pm$  2.7.

In our series, neither the pre-op ultrasound nor the lfts helped in predicting the conversion. In our series, 33.3% of the patients required additional POC to confirm the anatomy. There were no reported bile duct injuries in our series. Kumar et al<sup>20</sup> in his study noted to have <1% of patients had conversion leading to instrument failure while Pervaiz et al had 2.94%.

## CONCLUSION

Laparoscopic cholecystectomy in a tertiary care hospital has acceptable conversion rates as compared to local and international standards. In our series, patients with difficult per-operative anatomy and empyema gallbladder were significant risk factors for conversion.

**Acknowledgement:** Would like to thank the faculty of General Surgery, LNH especially Prof. Turab Pishori for their valuable guidance in writing this paper.

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

## REFERENCES

- Genc V, Sulaimanov M, Cipe G, Basceken SI, Erverdi N, Gurel M, et al. What necessitates the conversion to open cholecystectomy? A retrospective analysis of 5164 consecutive laparoscopic operations. *Clinics (Sao Paulo)*. 2011; 66(3):417-20.
- Lengyel BI, Azagury D, Varban O, Panizales MT, Steinberg J, Brooks DC, et al. Laparoscopic cholecystectomy after a quarter century: why do we still convert? *Surg Endosc* 2012;26(2):508-13.
- Nidoni R, Udachan TV, Sasnur P, Baloorkar R, Sindgikar V, Narasangi B. Predicting Difficult Laparoscopic Cholecystectomy Based on Clinicoradiological Assessment. *J Clin Diagn Res*. 2015;9(12):PC09-12.
- Teixeira J, Ribeiro C, Moreira LM, de Sousa F, Pinho A, Graça L, et al. Laparoscopic cholecystectomy and open cholecystectomy in acute cholecystitis: critical analysis of 520 cases. *Acta Med Port* 2014;27(6):685-91.
- Abelson JS, Afaneh C, Rich BS, Dakin G, Zarnegar R, Fahey TJ, et al. Advanced laparoscopic fellowship training decreases conversion rates during laparoscopic cholecystectomy for acute biliary diseases: a retrospective cohort study. *Int J Surg* 2015;13: 221-6.
- Donkervoort SC, Dijkman LM, de Nes LC, Versluis PG, Derksen J, Gerhards MF. Outcome of laparoscopic cholecystectomy conversion: is the surgeon's selection needed? *Surg Endosc* 2012; 26(8):2360-6.
- Yerkin G, Ucedag M, Oba S, Citgez B, Paksoy I. Laparoscopic cholecystectomy in elderly patients. *JSLs* 2009;13(4):587-91.
- Al-Mulhim AA. Timing of early laparoscopic cholecystectomy for acute cholecystitis. *JSLs* 2008;12(3):282-7.
- Semenisina G, Rosenberg J, Gögenur I. Laparoscopic subtotal cholecystectomy for complicated gallstone conditions. *Ugeskr Laeger*. 2010;172(32):2168-72.
- Licciardello A, Arena M, Nicosia A, Di Stefano B, Cali G, Arena G, Minutolo V. Preoperative risk factors for conversion from laparoscopic to open cholecystectomy. *Eur Rev Med Pharmacol Sci* 2014;18(2 Suppl):60-8.
- Shamim M, Memon SA, Bhutto AA, Dahri MM. Reasons of conversion of laparoscopic to open cholecystectomy in a tertiary care institution. *JPMA* 2009;59:456.
- Sakpal SV, bindra SS, chamberlain RS. Laparoscopic cholecystectomy conversion rates two decades later *Jsls* 2010;14(4):476-483.
- Genc V, Sulaimanov M, Cipe G, Basceken SI, Erverdi N, Gurel M, Aras N, Hazinedaroglu sm what necessitates the conversion to open cholecystectomy? A retrospective Analysis of 5164 consecutive laparoscopic operations. *Clinics (sao paulo)* 2011;66(3):417-20.
- Kais H, Hershkovitz Y, Abu-Snina Y, Chikman B, Halevy A. Different setups oflaparoscopic cholecystectomy: conversion and complication rates: a retrospective cohort study. *Int J Surg* 2014;12(12):1258-61.

15. Malla BR, Shrestha RK. Laparoscopic cholecystectomy complication and conversion rate. Kathmandu Univ Med J (KUMJ) 2010;8(32):367-3369.
16. Singh K, Ohri A. Laparoscopic cholecystectomy - is there a need to convert?. J Minim Access Surg 2005;1(2):59-62.
17. Rashid T, Naheed A, Farooq U, Iqbal M, Barkat N. Conversion Of Laparoscopic Cholecystectomy Into Open Cholecystectomy: An Experience In 300 Cases. J Ayub Med Coll Abbottabad 2016; 28(1):116-9.
18. Iqbal P, Saddique M, Baloch TA. Factors leading to conversion in Laparoscopic Cholecystectomy. Pak J Surg Jan ;24(1):9-11.
19. Tayeb M, Raza SA, Khan MR, Azami R. Conversion from laparoscopic to open cholecystectomy: Multivariate analysis of preoperative risk factors. J Postgrad Med 2005; 51:17-20
20. Kumar A, Thombare MM, Sikora SS et al. Morbidity and mortality of laparoscopic cholecystectomy in an institutional set up. J Laparoendosc Surg 1996;6: 393-97.

Electronic Copy