

SHORT-TERM OUTCOME OF EARLY LAPAROSCOPIC CHOLECYSTECTOMY

Muhammad Iftikhar,¹ Rashid Aslam,¹ Irfan ul Islam Nasir²

ABSTRACT

Background: Laparoscopic cholecystectomy is being used in increasing frequency for cholecystectomy. **Objective:** To evaluate the short-term outcome of early laparoscopic cholecystectomy in terms of length of hospital stay, complications and patient satisfaction. **Methodology:** After approval of the institute's research evaluation committee, this cross sectional study was conducted at the department of General and laparoscopic surgery, Hayatabad Medical Complex, Peshawar from 1st January to 31st December 2015. Clinical features, operative findings and postoperative outcome was recorded in terms of length of stay (LOS), complications and overall patient satisfaction. The data was entered and analyzed by using SPSS version 20. **Results:** Mean age was 48.31 years \pm 10.86 with 13 (24.1%) males and 41 (75.9%) females. The overall no to low satisfaction rate was 13(24.07%), while 7(12.96%) patients remained neutral. The rest of the 34(63%) patients rated their satisfaction as high or adequate. Significantly associated complications to open cholecystectomy included development of postoperative pyrexia ($p = 0.006$), wound infection ($p < 0.001$), and seroma formation ($p < 0.001$). The distributions of median satisfaction scores were statistically significantly different for the two groups of procedures ($p < 0.001$). **Conclusion:** laparoscopic cholecystectomy is a safe and effective choice for patients of gallstone disease with significantly shorter length of stay and higher overall satisfaction rates. **Keywords:** Acute cholecystitis, Early laparoscopic cholecystectomy, Complications, Satisfaction

JSZMC 2016;7(4):1088-1092

INTRODUCTION

Gallstones disease is common in both Western and our societies.¹ A majority of gallstones are asymptomatic and are discovered either incidentally or after they cause symptoms of acute cholecystitis. Surgical intervention is necessary for preventing complications of gallstones.^{2,3} Laparoscopic cholecystectomy (CL) revolutionised the treatment of gallstone disease by a significant decrease in postoperative morbidity and hospital stay.^{4,6}

The diagnosis and early management principles of acute cholecystitis were developed in a series of large multicentre Japanese studies and summarised the recommendations in the Tokyo guidelines, initially in 2007 (TG07)^{7, 8} and later in 2013 (TG13)⁹. These guidelines and numerous meta-analyses^{2,10} have recommended that early laparoscopic intervention is beneficial for acute gallstone cholecystitis and should be encouraged if the expertise is available.¹¹⁻¹⁴

We present our experience with early LC and show our short term outcome in terms of length of stay, complications and overall patient satisfaction. This will improve our understanding of the

benefits of early LC and consequently the outcomes of our patients.

METHODOLOGY

This was a cross sectional cohort study conducted from 1st January to 31st December 2015. The study was commenced after approval by the Institutes Ethical Review Committee at the Department of General and Laparoscopic Surgery Unit of Hayatabad Medical Complex Peshawar. All patients included were informed and verbal consent was taken. **Inclusion Criteria:** Patients with acute gallstone cholecystitis irrespective of their gender and with age range of 16 to 65 years. **Exclusion Criteria:** Complicated gallstone cholecystitis (pancreatitis, cholangitis, cholestatic jaundice) were excluded. Patients with acalculous cholecystitis, diagnosed cases of GB tumours and gangrene or abscess formation were excluded. Patients who were patients were not fit for LC due to bleeding problems, previous upper abdominal surgery or liver disease were also excluded.

Operative Procedure: Under GA and after aseptic measures, a nasogastric tube was passed to decompress the stomach. Pneumoperitoneum was

1. General Surgery, Peshawar Institute of Medical Sciences Hayatabad Peshawar, Khyber Pakhtunkhwa, Pakistan.

2. Shaukat Khanum Hospital Lahore, Pakistan.

Correspondence: Dr. Muhammad Iftikhar, Department: General Surgery, Peshawar Institute of Medical Sciences Hayatabad Peshawar, KPK, Pakistan.

E-mail: iffi_khattak@hotmail.com

Mobile: +92-3339177399

Received: 01-01-2016

Accepted: 27-06-2016

created after insertion of Veress needle. Intraabdominal pressure was kept between 8 to 12 mm Hg. Four ports were used, while the umbilical 10 mm port was used for optical telescope insertion. Epigastric port was used for suction and irrigation. The 5 mm trocars in right flank and right upper quadrant were used for dissection and grasping. Once the adhesions were removed, the gallbladder was decompressed. Calot's triangle was identified and gallbladder was dissected away from its fossa. Liga-clips were used for cystic duct and artery ligation. Gallbladder was retrieved using retrieval bag method. Haemostasis was ensured and pneumoperitoneum was released.

In case of severe bleeding or major injury to the CBD, or dense adhesions in the vicinity of gallbladder, the procedure was converted to open. A right upper quadrant Kocher's incision was made and the gallbladder dissection was done using monopolar diathermy. Drains were used if significant bleed or leak were encountered during the surgery.

Data collection was done for clinical features, laboratory findings, intraoperative complications, procedure time and length of stay. During the postoperative follow-up, data was collected about development of complications. At 3-month follow-up, patients were presented with 5-items Likert scale regarding their satisfaction with the surgical intervention

IBM SPSS Statistics version 22.0 was used for data analysis. Chi-square test was used for association between dichotomous categorical variables, Mann-Whitney U test was used for determining statistical significance of patient satisfaction. Spearman rank correlations were determined for correlation of various factors with each other.

RESULTS

A total of 54 patients were operated during the study period. Out of these 13 (24.1%) were males and 41 (75.9%) were females. Mean age was 48.31 ± 10.86 years. The mean duration of onset of symptoms was 11.78 ± 10.11 days. The descriptive statistics including total leukocyte counts and liver function tests are summarised in Table I.

Right upper quadrant (RUQ) pain was present in 47(87%) which was followed in frequency by nausea and vomiting 36 (66.7%) and dyspepsia 19(35.2%). Intra-operative complications were bleeding 10(18.5%), difficult anatomy 7(13%) or intraoperative bile leak due to CBD injury 4 (7.4%). (Table II)

The overall no to low satisfaction rate was 13(24.07%), while 7(12.96%) patients remained neutral. The rest of the 34(63%) patients rated their satisfaction as high or satisfied. It was noted that 9(16%) of patients who were converted to open rated their experience as not satisfying while only 2(3.7%) scored as satisfied or highly satisfied. (Table III)

No mortality was recorded in our study. Seroma formation 16(29.6%) and chest infection 14 (25.9%) were the commonest complications observed in this study. (Table II) Significantly associated complications with conversion to open cholecystectomy included development of postoperative pyrexia ($p = 0.006$), wound infection ($p < 0.001$), and seroma formation ($p < 0.001$).

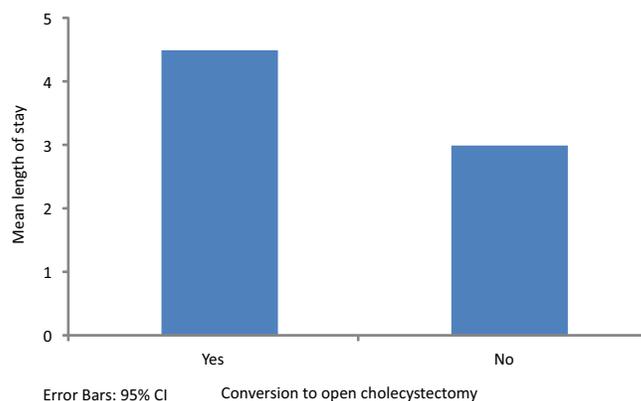
The differences in satisfaction scores for the laparoscopic group and those who were converted to open procedure, were statistically significantly different for the two groups of procedures ($p < 0.001$) (Table III). The distribution of median scores for length of stay was also statistically significantly different for the two groups of procedures ($p < 0.001$). (Figure I)

Table I: Descriptive Statistics of patients

	Age of patient	Duration of symptoms	TLC	Total Bilirubin	ALT	Alkaline Phos	Procedure time	Length of stay
Mean	48.31	11.78	10927.41	1.154	45.07	205.56	73.85	3.50
Median	49.00	9.00	11100.00	1.100	45.00	204.00	67.50	3.00
Mode	48	4	12300	.8	45	210	65	3
Std. Deviation	10.859	10.106	2178.564	.2661	5.511	17.776	21.399	1.095
Minimum	25	1	5600	.8	34	175	36	2
Maximum	70	36	15000	1.6	56	245	120	6

Table II: Clinical variables and their frequency distributions

Clinical variable	Frequency (n)	% age
Gender		
Male	13	24.1%
Female	41	75.9%
Clinical features		
RUQ Pain	47	87.0%
Nausea	25	46.3%
Vomiting	11	20.4%
Fever	8	14.8%
Dyspepsia	19	35.2%
Ultrasonographic findings		
Distended GB	27	50.0%
Thickened GB	22	40.7%
Pericholecystic fluid	19	35.2%
Murphy's Sign	47	87.0%
Intraoperative complications		
Difficult anatomy	7	13.1%
Bleed	10	18.5%
Leak	4	7.4%
Conversion to Open	15	27.8%
Postoperative Complications		
Pyrexia	11	20.4%
Wound infection	5	9.5%
Chest Infection	14	25.9%
Bile leak	02	3.7%
Bleeding from wound	02	7.4%
Seroma	16	29.6%

Figure I: Mean length of study in hospital in laparoscopic versus conversion to open cholecystectomy

DISCUSSION

Gallstone disease is a serious disorder considering its sequelae in the form of pancreatitis, CBD obstruction and gallstone ileus.¹⁵ Although dependent upon the expertise of the surgeon and the occurrence of adverse events, overall morbidity due to this disorder have improved by the introduction and widespread use of laparoscopic cholecystectomy, such that, LC has become the standard of treatment for gallstone disease as was predicted more than 20 years ago.^{5,16} Although the debate still continues about quantifying the benefits of early cholecystectomy from earlier intervention in acute cholecystitis.^{17,18}

The demographic features of our subset of patients in this study are generally in agreement with other studies,^{9,20} with abundance of female patients (75.9%), of young to middle age groups (mean: 48.31 years). In a recent study by Oskardes AB et al,²¹ mean age was 58.03 years with 66.7% females, mean duration of 5.57 days and 20% cases with concomitant comorbidity. They encountered 13.3% conversion to open cholecystectomy with a mean procedure time of 67 minutes.²¹ Chandio A et al²² have described the factors which could lead to conversion to open cholecystectomy and they found

Table III: Satisfaction levels in both groups

Groups	Satisfaction Levels					Total No (%)
	0	3	6	15	15	
Laparoscopic procedure (n)	0 (0.0%)	3 (7.69%)	6 (11.11%)	15 (27.7%)	15 (27.7%)	39 (72.2%)
Open Procedure (n)	9 (16.6%)	1 (1.9%)	1 (1.9%)	2 (3.7%)	2 (3.7%)	15 (27.7%)
Total no. of patients	9 (16.7%)	4 (7.4%)	7 (13%)	17 (31.5%)	17 (31.5%)	54 (100%)

increasing age, obesity, acute cholecystitis, previous abdominal surgery, gallstones, and CBD stones as the factors which significantly affect conversion of a laparoscopic cholecystectomy to open procedure.²² We could not find a significant association ($p = 0.93$) between age and conversion to open procedure, probably due to lower age of the patients in our patients as compared to the above cited studies. Chandio A et al,²² has also found a 67% conversion rate for LC performed in acute cholecystitis which is quite high as compared to our conversion rates (27%).

Cheng Y et al,²³ in their retrospective data analysis of early LC have concluded that early LC is a safe and effective choice for patients during acute cholecystitis even in the elderly population and have not found an impact of age on the occurrence of adverse events.²³ These observations are compounded by Lo C et al,²⁴ findings of no significant incidence of conversion rates or major complications, although, they have noted that a successful completion of the procedure requires more time (mean; 137.2 minutes). In our study, the mean operation time was 73.85 minutes, and though it was significantly shorter than the open procedure, we could not compare it to those patients who undergo elective LC.

In our study the LC group had a mean length of stay 3.03 ± 0.67 days while those who were converted to OC had a mean LOS of 4.73 ± 1.03 days. Similarly, high postoperative complication rates and low overall satisfaction scores were associated with OC patients as compared to LC group. Similar findings are noted by Ciftci F et al,²⁵ who has described a significantly longer LOS and higher complication rates. They have concluded that increased GB wall thickness, male gender, pericholecystic collection on ultrasonography and gangrenous cholecystitis were significantly associated with conversion to OC.²⁵

Saber A et al,²⁶ have evaluated the early LC to delayed LC in terms of readmission rates and overall patient satisfaction. Their results showed that readmissions were significantly higher in the delayed LC group while for early LC the overall satisfaction scores were 92.66 as compared to delayed LC (75.34).²⁶ These findings are in agreement with our study where we found high satisfaction scores for more than 85% of our early LC patients. However, in patients who unfortunately were converted to OC, majority of them were not satisfied and had prolonged

hospital stay. This study is limited by shorter follow-up period as in our set up the loss to follow is increasingly high due to multiple reasons. Smaller sample size is another weakness of this study which could be alleviated by designing large prospective randomised studies. Since we did not have a comparative group from either the delayed LC or elective OC, this weakness could be removed by designing randomised comparative studies in future.

CONCLUSION

Early cholecystectomy is a safe choice for patients with acute cholecystitis where shorter morbidity and lower complication rates makes it very favourable in the current healthcare system which is already overburdened. Conversion rates for early LC are comparable to elective LC and associated with low rates of complications and higher patient satisfaction.

REFERENCES

1. Brandon JC, Velez MA, Teplick SK, Mueller PR, Rattner DW, Broadwater JR, Jr., et al Laparoscopic cholecystectomy: Evolution, early results, and impact on nonsurgical gallstone therapies. *AJR Am J Roentgenol.* 1991;157(2):235-9.
2. Sondenaa K. Evidence-based treatment of gallstone disease. *J Gastrointest Surg.* 2013;17(12):2183-4.
3. Chuang SC, Hsi E, Lee KT. Genetics of gallstone disease. *Adv Clin Chem.* 2013;60:143-85.
4. Rock JA, Warshaw JR. The history and future of operative laparoscopy. *Am J Obstet Gynecol.* 1994;170(1 Pt 1):7-11.
5. Cooperman AM. Laparoscopic cholecystectomy: results of an early experience. *Am J Gastroenterol.* 1991;86(6):694-6.
6. Saia M, Mantoan D, Buja A, Bertoncetto C, Baldovin T, Callegaro G, et al. Time trend and variability of open versus laparoscopic cholecystectomy in patients with symptomatic gallstone disease. *Surg Endosc.* 2013;27(9):3254-61.
7. Hirota M, Takada T, Kawarada Y, Nimura Y, Miura F, Hirata K, et al. Diagnostic criteria and severity assessment of acute cholecystitis:Tokyo Guidelines. *J Hepatobiliary Pancreat Surg* 2007;14(1):78-82.
8. Kimura Y, Takada T, Kawarada Y, Nimura Y, Hirata K, Sekimoto M, et al. Definitions, pathophysiology, and epidemiology of acute cholangitis and cholecystitis: Tokyo Guidelines. *J Hepatobiliary Pancreat Surg.* 2007;14(1):15-26.
9. Takada T, Strasberg SM, Solomkin JS, Pitt HA, Gomi H, Yoshida M, et al. TG13: Updated Tokyo Guidelines for the management of acute cholangitis and cholecystitis. *J Hepatobiliary Pancreat Sci.* 2013;20(1):1-7.
10. Nair R. Early laparoscopic cholecystectomy for acute cholecystitis: is it safe for patients? *South Med J.* 2015;108(2):135-40.
11. Nishino T, Hamano T, Mitsunaga Y, Shirato I, Shirato M,

- Tagata T, et al. Clinical evaluation of the Tokyo Guidelines 2013 for severity assessment of acute cholangitis. *J Hepatobiliary Pancreat Sci.* 2014;21(12):841-9.
12. Morris S, Gurusamy KS, Patel N, Davidson BR. Cost-effectiveness of early laparoscopic cholecystectomy for mild acute gallstone pancreatitis. *Br J Surg.* 2014;101(7):828-35.
 13. Gurusamy K. Early laparoscopic cholecystectomy appears better than delayed laparoscopic cholecystectomy for patients with acute cholecystitis. *Evid Based Med.* 2015:150-60
 14. Haltmeier T, Benjamin E, Inaba K, Lam L, Demetriades D. Early versus delayed same-admission laparoscopic cholecystectomy for acute cholecystitis in elderly patients with comorbidities. *J Trauma Acute Care Surg.* 2015;78(4):801-7.
 15. Chen L, Peng YT, Chen FL, Tung TH. Epidemiology, management, and economic evaluation of screening of gallstone disease among type 2 diabetics: A systematic review. *World J Clin Cases.* 2015;3(7):599-606.
 16. Beal KL, Dues GA. Intraoperative advances: 1 aparoscopic cholecystectomy. *Semin Perioper Nurs.* 1992;1(4):196-202.
 17. Agrawal R, Sood KC, Agarwal B. Evaluation of Early versus Delayed Laparoscopic Cholecystectomy in Acute Cholecystitis. *Surg Res Pract.* 2015;2015:3498-01.
 18. Noda T, Hatano H, Dono K, Shimizu J, Oshima K, Tanida T, et al. Safety of early laparoscopic cholecystectomy for patients with acute cholecystitis undergoing antiplatelet or anticoagulation therapy: a single-institution experience. *Heptogastroenterology* 2014;61(134):1501-6.
 19. Ozsan I, Yoldas O, Karabuga T, Yildirim UM, Cetin HY, Alpdogan O, et al. Early laparoscopic cholecystectomy with continuous pressurized irrigation and dissection in acute cholecystitis. *Gastroenterol Res Pract.* 2015;2(7)4927-35.
 20. Panagiotopoulou IG, Carter N, Lewis MC, Rao S. Early laparoscopic cholecystectomy in a district general hospital: is it safe and feasible? *Int J Evid Based Healthc.* 2012;10(2):112-6.
 21. Ozkardes AB, Tokac M, Dumlu EG, Bozkurt B, Ciftci AB, Yetisir F, et al. Early versus delayed laparoscopic cholecystectomy for acute cholecystitis: a prospective, randomized study. *Int Surg.* 2014;99(1):56-61.
 22. Chandio A, Timmons S, Majeed A, Twomey A, Aftab F. Factors influencing the successful completion of laparoscopic cholecystectomy. *JLS : Journal of the Society of Laparoendoscopic Surgeons.* 2009;13(4):581-6.
 23. Cheng Y, Leng J, Tan J, Chen K, Dong J. Proper surgical technique approved for early laparoscopic cholecystectomy for non-critically ill elderly patients with acute cholecystitis. *Hepatogastroenterology.* 2013;60(124):688-91.
 24. Lo CM, Liu CL, Lai EC, Fan ST, Wong J. Early versus delayed laparoscopic cholecystectomy for treatment of acute cholecystitis. *Ann Surg.* 1996;223(1):37-42.
 25. Ciftci F, Abdurrahman I, Girgin S. The outcome of early laparoscopic surgery to treat acute cholecystitis: a single-center experience. *Int J Clin Exp Med.* 2015;8(3):4563-8.
 26. Saber A, Hokkam EN. Operative outcome and patient satisfaction in early and delayed laparoscopic cholecystectomy for acute cholecystitis. *Minim Invasive Surg.* 2014;(1)626-40.