

Laparoscopic Cholecystectomy in cases of acute cholecystitis: An experience in Bahawal Victoria Hospital, Bahawalpur

Sheikh Atiq-ur-Rehman, Muhammad Ishaq Khan, Shahid Hussain, Muhammad Armughan, Umair Masood, Safdar Ali

Abstract

Objective: The aim of this study was to assess the safety of laparoscopic cholecystectomy surgery in cases of acute cholecystitis performed in Bahawal Victoria Hospital, Bahawalpur.

Study design: Prospective clinical practice audit.

Setting and duration: Surgical department, Bahawal Victoria Hospital, Bahawalpur, from 1st August 2018 to 31st October 2019.

Material and Methods: 130 patients presenting with signs and symptoms suggestive of acute or acute on chronic cholecystitis of any age group and of both gender undergoing laparoscopic cholecystectomy were included. All the data was recorded on a standardized proforma. Bias and confounders in the study were controlled by strictly following the exclusion criteria. The data collected included patient bio-data, operative findings, operative time, and conversion rate, length of hospital stay, wound infection or intra-abdominal infection and mortality.

Results: 130 patients underwent laparoscopic cholecystectomy during the study period.

The mean age of all the patients undergoing laparoscopic cholecystectomy was 40±13 years.

Females were 81.5% while males were 18.5%. The overall rate of conversion from laparoscopic to open cholecystectomy was 2.3% due to dense adhesions, difficult anatomy & bleeding while doing dissection of Calot's triangle. Gall bladder perforation & spillage of gall stones during the laparoscopic cholecystectomy occurred in 13.84% cases. 95 (73%) patients have not developed early or late post-operative complications. Umbilical port site infection was observed in 26 (20%) cases. The average operative time was 46±9 minutes. 90% of the patients were discharged 48 hours after the surgery. No mortality was observed during the study period.

Conclusion: Laparoscopic cholecystectomy is a safe and effective procedure, in the hands of experienced laparoscopic surgeon, in most of the patients with less morbidity and mortality.

Keywords: laparoscopic cholecystectomy, conversion to open cholecystectomy, acute cholecystitis, complications of laparoscopic cholecystectomy, Calot's triangle.

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Quaid-e-Azam Medical
College/Bahawal
Victoria Hospital
Bahawalpur
SA Rehman
MI Khan
S Hussain

Bahawal Victoria
Hospital (BVH)
Bahawalpur
M Armughan
S Ali

DHQ Hospital,
Bahawalnagar
U Masood

Correspondence:

Dr. Sheikh Atiq-ur-Rehman
Associate Professor,
Department of Surgery,
House no: 9/A, Block
'X' Model Town C,
Bahawalpur.
Cell No: +92 300-6808500
email: dratiq2002@gmail.com

Introduction:

Gall bladder stones is the most common disease of the hepato-biliary system with incidence of 10-15%.¹ The lifetime risk of developing complications due to gall stone is of about 35%.¹ Gall stone is a common surgical condition causing significant morbidity to patients, and burden on surgical practices worldwide.² Classically, the standard treatment for symptomatic gall stones was open cholecystectomy through abdominal incisions to remove the gall bladder. After sig-

nificant improvements in the design and optics of the laparoscopes in the late 1980s, now laparoscopic cholecystectomy (LC) is one of the most commonly performed procedures in general Surgery with more than 600,000 laparoscopic cholecystectomy performed annually.³ Presently, more than 80% of cholecystectomies worldwide are carried out laparoscopically.⁴

Laparoscopic cholecystectomy has become the gold standard treatment of symptomatic gall

stones.⁵ Small incisions, reduced post-operative pain, recovery time, duration of hospitalization and improved cosmetic results are time tested advantages of laparoscopic cholecystectomy.⁶ This new technique offers many benefits of minimal invasive surgery (MIS) to these patients, which has been reported in many series over the past two decades.⁷ However, newer, less invasive techniques, such as natural orifice transluminal endoscopic surgery (NOTES) and single incision laparoscopic surgery (SILS), are currently being investigated as alternatives to the traditional 3 or 4-port laparoscopic surgery.^{7,8}

Laparoscopic cholecystectomy is a commonly performed procedure at Bahawal Victoria Hospital, Bahawalpur. Elective laparoscopic cholecystectomy is established as the treatment of choice for symptomatic gall stone. It is now the proposed treatment for the patients with acute cholecystitis as well.⁹ We initiated the present study in order to clarify the question of safety of this procedure in the presence of an inflamed gall bladder. The aim of this research is to assess the safety of laparoscopic cholecystectomy performed for acute cholecystitis in Bahawal Victoria hospital, Bahawalpur.

Material and Methods:

This prospective study was conducted in Surgical Department of Bahawal Victoria Hospital, Bahawalpur from 1st August 2018 to 31st October 2019. In this study, a total of 130 consecutive patients presenting through outpatient department (OPD) or emergency department with signs and symptoms suggestive of acute or acute on chronic cholecystitis of any age group, of both gender and American Society of Anesthesiologists (ASA) class I or II were registered. Patients with evidence of common bile duct pathology on clinical, bio-chemical or ultrasound abdomen, bleeding disorders, previously undergone abdominal operations, ASA grade III or IV or immuno-suppressed were excluded from the study. All the patients were selected through non-probability consecutive technique. All the patients of acute cholecystitis who required cholecystectomy were offered laparoscopic cholecystectomy. Patients were included in the

study after taking informed and written consent. Complete history, thorough clinical examination, laboratory investigations, abdominal ultrasound and pre anesthetic evaluation was done. Laparoscopic cholecystectomy was performed using four port technique.⁹ In all cases, antibiotics (third generation cephalosporin) were administered at the induction of anesthesia. The laparoscope was introduced into the peritoneal cavity through an umbilical incision after establishing a pneumoperitoneum with an open technique.¹⁰ Under laparoscopic vision, three working ports were inserted in the upper abdomen. Retrograde dissection was utilized to identify the cystic artery and cystic duct. The structures were individually clipped and then dissection of the gall bladder from the liver bed. Cavity was washed with normal saline. Drain was placed through lower right side port in some selected patients.

Three doses of injectable antibiotics were given post-operatively. Parenteral opioid analgesia was administered on demand. Patients were discharged once diet was tolerated and followed up in the outpatient clinic setting for three weeks. All the data was recorded on a standardized performa.

Bias and confounders in the study were controlled by strictly following the exclusion criteria. The surgery was performed by specialist surgeon has a post-fellowship experience < 1yr, 1-3yr or 3-5yr or >5yrs. The data collected included patient demographics, operative findings, operative time, and conversion rate, length of hospital stay after operation, wound infection, intra-abdominal infection and mortality. The data was analyzed with the help of computer software SPSS for windows version 23.0. For categorical variables, frequencies were calculated while for continuous variables, mean and standard deviation were calculated.

Results:

The study was conducted in Bahawal Victoria Hospital, Bahawalpur. A total of 130 patients were included in this study, out of which 106 (81.5%) were female and 24 (18.5%) were male.

Table 1: USG abdomen findings

USG findings	No. of patients	%age
1 Thick gall bladder wall with stones	62	47.7
2 Pericholecystic fluid	30	23.1
3 Impacted stone at the neck of GB	24	18.5
4 All above findings	12	9.2
5 Acalculuscholecystitis	2	1.5

Table 2: Post-operative complications

S. No	Complications	No of patients	%age
1	Umbilical wound infection	26	20
2	Other port site infection	2	1.5
3	Collection in RHC or other spaces of abdomen	7	5.4
4	No complication	95	73.1

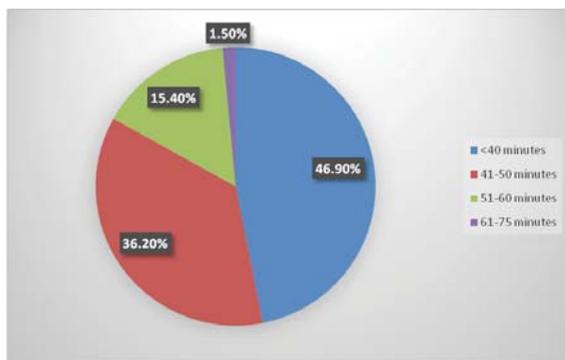


Figure 1: Operating time

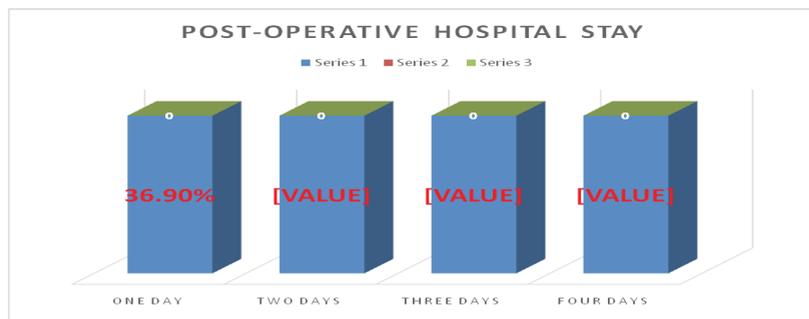


Figure 2: Hospital stay after operation

76.9% of the patient in this study were from the age 26 to 45 years. 79.2% of the patients were admitted to surgical ward by outpatient department (OPD) and the remaining 20.8% got admission through emergency. 75.4% of the patients admitted for laparoscopic cholecystectomy have no co-morbid disease, diabetes mellitus was present in 10% patients, hypertension in 8.5% patients, COPD & asthma in 2.3% and

3.8% patients has both diabetes & hypertension. Acute cholecystitis due to gallstone on USG abdomen was present in 128 patients and acalculous cholecystitis was present in 2 patients. USG abdomen findings in these patients were given in the table I. The most common operative finding was adhesions of the gall bladder with the omentum, duodenum and transverse colon, which was present in 49.2% of patients. In this study laparoscopic cholecystectomy was done in 127 (97.7%) patients and 3 (2.3%) patients need conversion to open procedure. This was due to dense adhesion, difficulty in identification of anatomy and bleeding. The mean operating time was 46±9 minutes. Operating time was less than 40 minutes in 61 (46.9%) patients, between 41-50 minutes in 47 (36.2%) patients, between 51-60 minutes in 20 (15.4%) and between 61-75 minutes in 2 (1.5%) patients (figure no I). 32 patients were operated by the consultant with a post-fellowship experience of > 5 years, 35 patients were operated by the consultant with a post-fellowship experience between 3-5 years, 39 patients were operated by the consultant with a post-fellowship experience between 1-3 years, 24 patients were operated by the consultant with a post-fellowship experience < 1 year. 18(13.84%) patients has gall bladder perforation & spillage of stones during laparoscopic cholecystectomy. 95(73%) patients have not developed early or late post-operative complications. The most common post-operative complication in this study was umbilical wound infection 26 (20%) patients. The frequency of other post-operative complications were shown in table no II. The mean hospital stay after the operation was 1.75±0.70 days. 49 (36.9%) patients were discharged on the first post-operative day. 70 (53.8%) patients were discharged on the second post-operative day. 8 patients were discharged on the third post-operative day and 4 patients were discharged on the fourth post-operative day (figure no: II).

Discussion:

Laparoscopic cholecystectomy can be performed safely and is the treatment of choice for the patients having symptomatic gall stones.¹¹

Initially, laparoscopic cholecystectomy was believed to be relative contraindicated in patients of acute cholecystitis.¹² As the surgeons gained experience, familiarity with the procedure and facility with procedure, its use was expanded to acute cholecystitis patients as well.¹³ There is acceptable conversion to open procedure and low complications rates.² The laparoscopic cholecystectomy performed successfully in a cases of acute cholecystitis, the post-operative course is superior to those of open cholecystectomy.¹⁴ The post-operative course is similar to that of open cholecystectomy if the laparoscopic procedure is converted to open procedure.^{3,15} According to this study, male sex, acute cholecystitis with small shrunken gall bladder and diabetes mellitus were be the predictor of complications.

There was female predominance (81.5%) in this study that is similar to literature¹⁶ and it is evident that the disease is more common in female¹⁴ & female to male ratio was 4.40:1. The age range in this study was 18-59 years but 93.8% patient's age ranged from 26-55 years. These findings were consistent with the literature & with the work of other authors.^{17,18} The best investigation to diagnose acute cholecystitis is USG abdomen.¹⁹ All patient in this has done USG abdomen & the findings of acute cholecystitis like thick wall gall bladder, inflammatory edema & pericholecystic fluid. 128-pateints has acute cholecystitis due to gall stone and 2-patients has a calculus cholecystitis on USG abdomen.⁹

Long operating time in cases of acute cholecystitis was the main draw back and might be a reason of relative contraindication for laparoscopic cholecystectomy.^{3,4} There was lengthy procedure due to initial stage learning curve, shorter duration of operating time was reported in literature.^{20,21} In our study the operating time was between 30-50 minutes in 83.1% of the patients and remaining 16.9% of the patients the operating time was 60 minutes or more. Our mean operating time was 46±9 minutes, so we spent more time in doing laparoscopic cholecystectomy as compared with the literature.^{7,11}

The decision of converting laparoscopic to open

cholecystectomy should be considered as sign of surgical maturity rather than a failure of the surgeon.²² Most of the conversion was decided early in the procedure after inspection, minimum or a difficult dissection rather than after happening a complication.²² In this study 3 (2.3%) operation required conversion to open cholecystectomy. The most frequent cause of conversion in our study was dense adhesion at calot's triangle, difficult anatomy and male sex. In literature the acceptable conversion rate in large series.^{23,24}

During the laparoscopic cholecystectomy perforation of gall bladder and spillage of stones were the important complication.¹⁰ It increased the time of the procedure because it is important to retrieve all stone and irrigate the cavity with saline to suck and clear the bile from the cavity.¹⁶ In our study 18(13.84%) patients has gall bladder perforation & spillage of stones during laparoscopic cholecystectomy. In literature the spillage of gall stone and perforation of gall bladder was reported 1.5-17% cases of laparoscopic cholecystectomy.²⁵

Umbilical wound infection was the commonest post-operative complication in this study and it was present in 26 (20%) patients. This port site infection rate was high because in this study all cases had acute cholecystitis and the gall bladder was removed from the body through umbilical wound. It was treated by daily antiseptic dressing and antibiotics. No post-operative complication in 95 (73%) patients and smooth recovery. Intra-abdominal collection developed in 7 patients, the condition was diagnosed by USG abdomen and a drain placed under USG guidance. The main benefit of laparoscopic surgery is minimal surgical site infection, the rate is 2% versus 8% in open cholecystectomy.²⁶ In another study in literature the infection rate is 1.4% in laparoscopic surgeries and 14.8% in open surgeries.²⁷

A short hospital stay & early return to job are the important benefits of laparoscopic surgery.^{15,17} In our study, 90.8% of patients discharged after 48 hours of operation and mean hospital stay was 1.75±0.70 days. The hospital stay in this study was comparable with the previously con-

ducted studies.²¹ The mortality rate²⁸ reported in the literature is 1% and in our study there was no death.

In minimal assess surgery, the most important predictor of intra-operative & post-operative complications is the experience of the surgeon doing the procedure.² Therefore the surgeons must acquire the necessary surgical skills before performing any laparoscopic or minimal assess surgery.⁴

Conclusion:

Laparoscopic cholecystectomy is technically achievable in the majority of patients with acute cholecystitis. The conversion rate is low. Post-operative recovery is more rapid than that after open surgery. However, the method carries a higher incidence of complications in less experienced surgeon and should be attempted only by experienced surgeons.

As the diagnosis of acute cholecystitis is established then laparoscopic cholecystectomy should be done immediately. If the surgery is delayed, it allows inflammation to become more intense, thus increasing the technical difficulty of laparoscopic cholecystectomy.

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Role and contribution of authors:

Dr. Sheikh Atiq-ur-Rehman, collected the data, references and wrote the article.

Dr. Muhammad Ishaq Khan, helped in collecting the data, discussion and result writing.

Dr. Shahid Hussain, collected the references and helped in introduction writing.

Dr. Muhammad Armughan, collected the data, references and did the introduction writing.

Dr. Umair Masood, collected the data, references and did the interpretation of data.

Dr. Safdar Ali, collected the references and

helped in discussion and result writing.

References:

- Schirmer BD, Winters KL, Edlich RF. Cholelithiasis and cholecystitis. *J Long Term Eff Med Implants*. 2005;15(3):329-38.
- Shahzad K, Mian MA, Rehman J. Early complications of laparoscopic cholecystectomy for calculous cholecystitis. *Pak Armed Forces Med J* 2007; 57: 289-94.
- Iwashita Y, Ohyama T, Honda G, Hibi T, Yoshida M, Miura F, et al. What are the appropriate indicators of surgical difficulty during laparoscopic cholecystectomy? Results from a japan korea- taiwan multinational survey. *J HepatobiliaryPancreat Sci*.2016; 23:533-47.
- Duca S, Bălă O, al-Hajjar N, Puia IC, Iancu C, Bodea M. Laparoscopic cholecystectomy: incidents and complications. Analysis of 8002 consecutive cholecystectomies performed at the Surgical Clinic III Cluj-Napoca. *Chirurgia (Bucur)*. 2000; 95:523-30.
- Prakash K, Jacob G, Lekha V, Venugopal B, Ramesh H, Laparoscopic cholecystectomy in acute cholecystitis. *Surg-Endosc*. 2002;16: 180-3.
- Cawich SO, Mathew AT, Mohanty SK, Huizinga WK. Laparoscopic cholecystectomy: a retrospective audit from the caymanislands. *Int J Surg*. 2008: 15
- Khan S, Oonwala ZG. An audit of laparoscopic cholecystectomy. *Pak J Surg*. 2007;23(2): 100-3.
- Ros A, Gustafsson L, Krook H, Nordgren CE, Thorell A, Wallin G, et al. Laparoscopic cholecystectomy versus mini-laparotomy cholecystectomy: a prospective, randomized, single blind study. *Ann Surg*. 2001;234:741-9.
- Tanovic H, Mesihovic R. Differences in the postoperative course and treatment in patients after laparoscopic and standard cholecystectomy. *Med Arh*.2003; 57:219-222
- Johansson M, Thune A, Blomqvist A, Nelvin L, Lundell L. Management of acute cholecystitis in the laparoscopic era: results of a prospective, randomized clinical trial. *J Gastrointest Surg*. 2003; 7:642-645.
- Litwin DE, Cahan MA. Laparoscopic cholecystectomy. *Surg-Clin North Am*. 2008; 88: 1295-1313
- Roesch-Dietlen F, Pérez-Morales AG, Martínez-Fernández S, Díaz-Roesch F, Gómez-Delgado JA, Remes-Troche JM. Safety of laparoscopic subtotal cholecystectomy in acute cholecystitis. Experience in Southeast Mexico. *Rev Gastroenterol Mex*. 2019; 84(4):461-466.
- Zafar S.N, Obirizeze A, Adesibikan B. Optimal time for early laparoscopic cholecystectomy for acute cholecystitis. *JAMA Surg*. 2015; 150: 129-136
- de Mestral C, Rotstein OD, Laupacis A, Hoch JS, Zagorski B, Alali AS, et al. Comparative operative outcomes of early and delayed cholecystectomy for acute cholecystitis: a population based propensity score analysis. *Ann Surg*. 2014; 259:10-15.
- Cao AM, Eslick GD, Cox MR. Early cholecystectomy is superior to delayed cholecystectomy for acute cholecystitis: a metaanalysis. *J Gastrointest Surg*. 2015; 19:848-57.
- Bagla P, Sarria JC, Riall TS. Management of acute cholecystitis. *Curr Opin Infect Dis*. 2016; 29(5):508-13
- Thangavelu A, Rosenbaum S, Thangavelu D. Timing of Cholecystectomy in Acute Cholecystitis. *J Emerg Med*. 2018; 54(6):892-897.
- Suyapto DR, Neo EL, Leong PS. Prospective audit of laparoscopic cholecystectomy experience at a secondary referral center in South Australia. *ANZ J Surg* 2006; 76: 335-8.
- Ozkardeş A.B, Tokaç M, Dumlu E.G. Early versus delayed laparoscopic cholecystectomy for acute cholecystitis: a prospective, randomized study. *Int Surg*. 2014; 99: 56-61
- Mohammad S, Hinduja T, Fatima S. Complications of laparoscopic cholecystectomy in acute cholecystitis. *J Surg Pak*. 2008; 13:59-61.
- Tan JT, Suyapto DR, Neo EL, Leong PS. Prospective audit of

- laparoscopic cholecystectomy experience at a secondary referral center in South Australia. *ANZ J Surg* 2006; 76: 335-8.
22. Philip Rothman J, Burcharth J, Pommergaard HC, Viereck S, Rosenberg J. Preoperative risk factors for conversion of laparoscopic cholecystectomy to open surgery – a systematic review and meta-analysis of observational studies. *Dig Surg*. 2016; 33:414–23.
 23. Tayab M, Ahsan RS, Khan MR, Azami R. Conversion from laparoscopic to open cholecystectomy. Multivariate analysis of preoperative risk factors. *J Postgrad Med* 2005; 51:17–20.
 24. Imran A, Gul T, Sahar S, Ali M. Laparoscopic Cholecystectomy: An early experience in Mardan Medical Complex. *Pak J Surg*. 2018; 34(3): 200-204
 25. Miyasaka Y, Nakamura M, Wakabayashi G. Pioneers in laparoscopic hepato-biliary-pancreatic surgery. *J HepatobiliaryPancreat Sci*. 2018; 25:109–11.
 26. Mufti TS, Ahmad S, Naveed D, Akbar M, Zafar A. Laparoscopic cholecystectomy: an early experience at Ayub Teaching Hospital Abbott abad. *J AyubMedColl Abbott abad*. 2007; 19:42–44.
 27. Boni L, Benevento A, Rovera F, Dionigi G. Infective complications in Laparoscopic surgery. *Surg Infect (Larchmet)*. 2006; 7 (2):5109-11.
 28. Chuang SC, Lee KT, Chang WT, Wand SN. Risk factors for wound infection after cholecystectomy. *J Formos Med Asso* 2004; 103(8):47-49.