

## Outcomes of laparoscopic cholecystectomy: Experience of a tertiary care center from a developing country

Syed Shamsuddin, Inayatullah Baig, Aabid Ali, Shabbir Hussain, Masood Shah, Bina Akbar

### Abstract:

**Objective:** The purpose of this study is to evaluate the outcomes and complications of laparoscopic cholecystectomies at a tertiary care center from Pakistan.

**Study design:** Retrospective cross-sectional study.

**Setting and duration:** General Surgery Department of Federal Government Polyclinic Hospital, Islamabad. Data was collected retrospectively from the records, between 1<sup>st</sup> January 2017 and 31<sup>st</sup> July 2018.

**Material and Methods:** A retrospective cross-sectional study was performed on all the outcomes of laparoscopic cholecystectomies, done over a period of 1.5 year in a single hospital.

**Results:** A total of 238 patients were included in this study out of which 215 (90.3%) were female. Mean age of the study participants was 40.3±11.05 years. Overall the complication rate seen in the current study ranged from 0.4% to 2.9% with conversion to open cholecystectomy being the most common complication.

**Discussion:** To avoid complications during laparoscopic cholecystectomy proper training and anatomical knowledge is essential.

**Conclusion:** Laparoscopic cholecystectomy appears to be a safe and effective procedure to perform in a developing country setup with minimal complications.

**Keywords:** Laparoscopic cholecystectomy, complications, conversion to open cholecystectomy

### Introduction:

Gall bladder diseases represent a diverse spectrum of conditions affecting the hepato-biliary system with a wide range of clinical presentations and varying degrees of morbidity.<sup>1</sup> Cholelithiasis is the most frequently encountered gall bladder disease, affecting approximately 5% to 25% of the adult population in Western countries.<sup>2</sup> The disease burden of cholelithiasis is expected to rise in parallel with a rising prevalence of obesity.<sup>3</sup> Cholelithiasis, biliary pancreatitis, biliary dyskinesia, gall bladder polyps and neoplasms are all gall bladder diseases documented in both pediatric and adult populations which warrant surgical intervention.<sup>4-6</sup>

The advent of laparoscopic cholecystectomy (LC) has revolutionized the management of

gall bladder diseases worldwide.<sup>7</sup> Laparoscopic cholecystectomy is one of the most commonly performed surgical procedures in the United States and is the current gold standard for treatment of cholelithiasis in the elective setting.<sup>8-10</sup> Laparoscopic cholecystectomy has been associated with lower rates of morbidity, mortality and post-operative infections as compared to open cholecystectomy.<sup>11,12</sup>

Current evidence from developed nations adequately reflects the success and safety of laparoscopic cholecystectomy, including its outcomes as a day care procedure.<sup>13</sup> Laparoscopic cholecystectomy requires specialized equipment and training. Initially the benefits of laparoscopic cholecystectomy had been largely unavailable to people from developing countries.<sup>14</sup> More re-

### Received

Date: 7th January, 2019

### Accepted

Date: 6th June, 2019

### Federal Government Polyclinic (FGPC) Hospital, Islamabad.

S Shamsuddin

I Baig

A Ali

S Hussain

M Shah

BAkbar

### Correspondence:

Dr Syed Shamsuddin  
Assistant Professor and  
Head of Department,  
Federal Government  
Polyclinic Hospital, G-6/2,  
Islamabad.

Cell No: +92 321-5310386

email: drshamsfgpc@

gmail.com

Table 1: Indications for laparoscopic cholecystectomy

Indications for laparoscopic cholecystectomy	N (%)
Symptomatic cholelithiasis	210 (88.2)
Biliary pancreatitis – interval cholecystectomy	6 (2.5)
Acute cholecystitis – interval cholecystectomy	19 (8.0)
Acute cholecystitis – same admission	1 (0.4)
Gall bladder polyp	2 (0.8)

Table 2: Complications of laparoscopic cholecystectomy

Complications	N (%)
Conversion to open cholecystectomy	7 (2.9)
Bile leakage	4 (1.7)
CBD injury	1 (0.4)
GB perforation	3 (1.3)
Vascular injury to liver bed	4 (1.7)
Sepsis	0 (0)
Mortality	0 (0)

cently, a study from Afghanistan reported a high rate of previously unrecognized intra-operative complications occurring during laparoscopic cholecystectomy. The authors highlighted the potential issues that developing countries could face in making laparoscopic cholecystectomy a safe procedure to perform.<sup>15</sup> While this study received mixed responses at an international level, data from developing countries still remains limited.<sup>16</sup> Therefore we aim to report the outcomes and complications of laparoscopic cholecystectomy at a tertiary care center from Pakistan.

#### Materials and Methods:

This is a single center, cross-sectional study conducted at Federal Government Polyclinic (FGPC), Islamabad. Data was collected retrospectively from the records of eligible patients between 1<sup>st</sup> January 2017 and 31<sup>st</sup> July 2018.

Patients who underwent laparoscopic cholecystectomy at FGPC during the study duration and did not have any of the co-morbidities specified as our exclusion criteria were included in the study. We excluded patients who had undergone previous abdominal surgery or midline laparotomy where dense adhesions would be expected; patients with Ejection Fraction less than 30% and those diagnosed with any malignancy involving the hepatobiliary system. Addition-

ally we also excluded patients who were HBV or HCV positive, diagnosed as reactive HbsAg or reactive anti-HCV antibodies respectively, by ICT method within 6-months prior to laparoscopic cholecystectomy, and also patients having coagulation abnormalities.

All patients were admitted one day prior to laparoscopic cholecystectomy, received a single dose of IV third generation cephalosporin pre-operatively and underwent 4-port laparoscopic cholecystectomy under general anaesthesia. laparoscopic cholecystectomy was performed by various consultants who were assisted by surgical residents.

A standardized proforma was developed to collect data retrospectively from the medical records of patients included in the study. The primary outcomes were to report the complications of laparoscopic cholecystectomy including conversion to open cholecystectomy, bile leakage and common bile duct (CBD) injury whereas the secondary outcomes were to describe the demographic characteristics, indications and intra-operative findings of patients undergoing laparoscopic cholecystectomy.

IBM statistical package for social sciences (SPSS) Version 19 was used for data analysis. The study protocol and data collection proforma were approved by the ethics review committee (ERC) of FGPC prior to the commencement of the study. As this is a retrospective study all information collected from the previous notes of the patients. Patient's information was given a serial number and no personal identifiers were recorded. Data confidentiality has been maintained at all times.

#### Results:

A total of 238 patients who met the eligibility criteria were included in this study out of which 215 (90.3%) were female. Mean age of the study participants was 40.3±11.05 years. Hypertension was a co-morbidity in 52 (21.8%) of the patients and 17(7.1%) were diabetic. Pre-operatively, ultrasound abdomen showed cholelithiasis in 236(99.2%) of the patients whereas

gall bladder polyps were visualized in 2(0.8%) patients. The indications for laparoscopic cholecystectomy in our study population was shown in table-1.

Overall the complication rate seen in the current study ranged from 0.4% to 2.9% with conversion to open cholecystectomy being the most common complication. (table-2) Difficult anatomy in the form of dense adhesions was the reason for conversion to open cholecystectomy in 5-out of the 7-cases whereas gall bladder empyema was found in the remaining 2-cases.

Drain was placed in 98 (41.1%) of the total cases and kept post-operatively for 1 day in 81 (82.6%) patients, for 2 days in 12(12.2%) patients and more than 2 days in 5(5.1%) cases. Mean length of total hospital stay was  $2.15 \pm 0.74$  days, but mean post-operative stay was  $1.1 \pm 0.6$  days. There were no mortalities in our study population.

#### **Discussion:**

Laparoscopic cholecystectomy complications result, in part, from patient selection, surgeon inexperience, and technical constraints, all of which will lead to increased morbidity and mortality.<sup>17</sup> Major biliary and vascular complications are life threatening, while minor complications cause patient discomfort and prolongation of the hospital stay. It is important recognizing intraoperative complications during the surgery so they are taken care of in a timely manner during the surgical intervention.<sup>18</sup> Intoday's era of laparoscopic surgery, decreased post-operative pain and early recovery are main goals to achieve better patient care.<sup>19</sup>

Our study was a retrospective analysis of the outcomes of laparoscopic cholecystectomy at a tertiary care center in a developing country. We observed complication rates ranging from 0.4% to 2.9% for the various complications under consideration.

In our study the most common complication was conversion to open cholecystectomy in 7(2.9%) cases. When compared to international data, a

recent systematic review conducted by Pucher et al in 2018 found conversion rates between 4.2% to 6.2% from the pooled meta analysis of 150-studies.<sup>20</sup> Interestingly, the authors found that higher conversion rates were reported from developed countries as compared to developing countries although there was a greater degree of reporting bias in these studies.

Bile leakage occurred in 4(1.7%) of our cases, was recognized intra-operatively and controlled. A study from Afghanistan which questioned the safety of laparoscopic cholecystectomy to be performed in developing countries reported that from their 102 cases, bile leakage occurred in 3 (2.9%) patients but was not recognized intra-operatively in any of these cases. These bile leakages were detected 3 to 10 days post-operatively when their patients presented due to abdominal pain and subhepatic collections consistent with biloma were found on ultrasound.<sup>15</sup>

There were no peri-operative mortalities in our study. This is consistent with data from other countries which have found low rates of mortality during laparoscopic cholecystectomy, ranging from 0.1% to 0.5%.<sup>21,22</sup> For complications to be minimal in laparoscopic cholecystectomy proper training and anatomical knowledge is essential.

The mean length of hospital stay was  $2.15 \pm 0.74$  days in our study with a range of 2 to 12 days. The average length of stay for patients undergoing laparoscopic cholecystectomy is somewhat longer in our study as compared to other studies. Many centers are now performing laparoscopic cholecystectomy as a day care procedure and have found this approach to be safe and effective.<sup>23,24</sup> This approach has not been used at our center so far and needs evaluation. Our post operative stay was  $1.1 \pm 0.6$  days that was comparable to developed world, if patients traveling and stay issues can be resolved day care laparoscopic cholecystectomy can be attempted.

This descriptive study supports the safety and success of laparoscopic cholecystectomy in a developing country setup. However, large, mul-

ticenter studies with a greater sample size would be needed to verify our results.

### Conclusion:

Laparoscopic cholecystectomy appears to be a safe and effective procedure to perform in a developing country setup with minimal complications.

**Conflict of interest:** None

**Funding source:** None

### Role and contribution of authors:

Dr Syed Shamsuddin, collected the data, references and did the initial writeup

Dr Inayatullah Baig, collected the data and helped in introduction writing.

Dr Aabid Ali, collected the references and helped in discussion writing.

Dr Shabbir Hussain, collected the data and references and also helped in interpretation of data.

Dr Masood Shah, collected the data and references and also helped in interpretation of data.

Dr Bina Akbar, MBBS, collected the data and references and helped in result interpretation.

### References:

- Mazlum M, Dilek FH, Yener AN, Tokyol C, Aktepe F, Dilek ON. Profile of gallbladder diseases diagnosed at AfyonKocatepe University: a retrospective study. *Turk Patoloji Derg*. 2011 Jan;27(Suppl 1):23-30.
- Gurusamy KS, Davidson BR. Gallstones. *BMJ: British Medical Journal (Online)*. 2014 Apr 22;348.
- Tucker JJ, Grim R, Bell T, Martin J, Ahuja V. Changing demographics in laparoscopic cholecystectomy performed in the United States: hospitalizations from 1998 to 2010. *The American surgeon*. 2014 Jul 1;80(7):652-8.
- Walker SK, Maki AC, Cannon RM, Foley DS, Wilson KM, Galganski LA, Wiesenauer CA, Bond SJ. Etiology and incidence of pediatric gallbladder disease. *Surgery*. 2013 Oct 1;154(4):927-33.
- Stinton LM, Shaffer EA. Epidemiology of gallbladder disease: cholelithiasis and cancer. *Gut and liver*. 2012 Apr;6(2):172.
- Gurusamy KS, Nagendran M, Davidson BR. Early versus delayed laparoscopic cholecystectomy for acute gallstone pancreatitis. *Cochrane Database Syst Rev*. 2013 Jan 1;9.
- Antoniou SA, Antoniou GA, Koch OO, Pointner R, Granderath FA. Meta-analysis of laparoscopic vs open cholecystectomy in elderly patients. *World Journal of Gastroenterology: WJG*. 2014 Dec 14;20(46):17626.
- Shaffer EA. Epidemiology of gallbladder stone disease. *Best Practice & Research Clinical Gastroenterology*. 2006 Jan 1;20(6):981-96.
- Agresta F, Campanile FC, Vettoreto N, Silecchia G, Bergamini C, Maida P, Lombardi P, Narilli P, Marchi D, Carrara A, Esposito MG. Laparoscopic cholecystectomy: consensus conference-based guidelines. *Langenbeck's archives of surgery*. 2015 May 1;400(4):429-53.
- Alexander HC, Bartlett AS, Wells CI, Hannam JA, Moore MR, Poole GH, et al. Reporting of complications after laparoscopic cholecystectomy: a systematic review. *HPB*. 2018;20(9):786-94.
- Ayub S, Ali A, Ata-ur-Rehman U-u-I, Jawaid A. Laparoscopic Cholecystectomy in septuagenarians and above: a comparative analysis from Pakistani population. *Pak J Surg*. 2019;35(2):98-101.
- Coccolini F, Catena F, Pisano M, Gheza F, Fagiuoli S, Di Saverio S, Leandro G, Montori G, Ceresoli M, Corbella D, Sartelli M. Open versus laparoscopic cholecystectomy in acute cholecystitis. Systematic review and meta-analysis. *International journal of surgery*. 2015 Jun 1;18:196-204.
- Kaman L, Verma GR, Sanyal S, Bhukal I. Relevance of day care laparoscopic cholecystectomy in a developing nation. *Tropical gastroenterology: official journal of the Digestive Diseases Foundation*. 2005;26(2):95-7.
- Wells KM, Lee YJ, Erdene S, Erdene S, Sanchin U, Sergelen O, Presson A, Zhang C, Rodriguez B, Price R. Expansion of laparoscopic cholecystectomy in a resource limited setting, Mongolia: a 9-year cross-sectional retrospective review. *The Lancet*. 2015 Apr 27;385:338.
- Manning RG, Aziz AQ. Should laparoscopic cholecystectomy be practiced in the developing world?: the experience of the first training program in Afghanistan. *Annals of surgery*. 2009 May 1;249(5):794-8.
- Contini S, Taqdeer A, Gosselin RA. Should laparoscopic cholecystectomy be practiced in the developing world? The experience of the first training program in Afghanistan. *Annals of surgery*. 2010 Mar 1;251(3):574.
- Taha BM, El-Sadig M. Laparoscopic Cholecystectomy Complications in a Tertiary Hospital, Oman. *Sudan Medical Journal*. 2017;11(5563):1-6.
- Radunovic M, Lazovic R, Popovic N, Magdelinic M, Bulajic M, Radunovic L, et al. Complications of laparoscopic cholecystectomy: our experience from a retrospective analysis. *Open access Macedonian journal of medical sciences*. 2016;4(4):641.
- Usmani F, Wasim M, Sheikh A, Shafiqatullah SM, Anwar A. Modified Laparoscopic Cholecystectomy; a prospective study focusing on the complications and association in comparison to umbilical port diameter. *Pak J Surg*. 2018;34(4):290-5.
- Pucher PH, Brunt LM, Davies N, Linsk A, Munshi A, Rodriguez HA, Fingerhut A, Fanelli RD, Asbun H, Aggarwal R. Outcome trends and safety measures after 30 years of laparoscopic cholecystectomy: a systematic review and pooled data analysis. *Surgical endoscopy*. 2018 May:1-9.
- Duca S, Bala O, Al-Hajjar N, Iancu C, Puia IC, Munteanu D, Graur F. Laparoscopic cholecystectomy: incidents and complications. A retrospective analysis of 9542 consecutive laparoscopic operations. *Hpb*. 2003 Aug;5(3):152-8.
- Kanakala V, Borowski DW, Pellen MG, Dronamraju SS, Woodcock SA, Seymour K, Attwood SE, Horgan LF. Risk factors in laparoscopic cholecystectomy: a multivariate analysis. *International Journal of Surgery*. 2011 Jan 1;9(4):318-23.
- Kaman L, Iqbal J, Bukhal I, Dahiya D, Singh R. Day care laparoscopic cholecystectomy: Next standard of care for gall stone disease. *Gastroenterology research*. 2011 Dec;4(6):257.
- Al-Qahtani HH, Alam MK, Asalamah S, Akeely M, Ibrar M. Day-case laparoscopic cholecystectomy. *Saudi Medical Journal*. 2015;36(1):46.