

Postoperative Port Site Early Complications of Laparoscopic Cholecystectomy

Sadia Paras,^{1*} Abdul Ghafoor Dalwani,¹ Sohail Ahmed,¹ Ghulam Akbar Khaskheli,¹
Nawaz Ali Dal,¹ Ghashia Khan¹

ABSTRACT

Objective To determine the frequency of port-site postoperative early complications of laparoscopic cholecystectomy.

Study design Cross-sectional study.

Place & Duration of study Department of Surgery at Liaquat University Hospital (LUH) Jamshoro, from August 2019 to February 2020.

Methodology Patients who underwent laparoscopic cholecystectomy for symptomatic gallstones diagnosed on ultrasound were included in this study. A four-port procedure was performed. The drain was placed through the right-sided lumbar port. The average operation time was noted. Patients were mobilized on the same day and discharged on the next day. All patients were advised follow-up visits at first and second week after surgery.

Results A total of 71 patients underwent laparoscopic cholecystectomy. The mean age of the patients was 39.87±6.12 year. There were 66 (84.5%) females in this study. Port-site infection was the most common complication noted in 11 (14.1%) patients, pain in 6 (8.5%), abscess formation in 3 (4.2%), bleeding, hematoma and port-site hernia in one (1.4%) patient each. There was no significant difference in the overall complication rate between genders and different age groups. However, a significant difference was observed in the complication rate according to the duration of surgery ($p<0.001$).

Conclusions Laparoscopic cholecystectomy was associated with number of early port-site postoperative complications most common of which was infection and pain. Complication rate was significantly increased with increased duration of surgery. Infra-umbilical port-site was mostly infected.

Key words Laparoscopic cholecystectomy, Port-site infection, Port-site hernia, Gallstone.

INTRODUCTION:

Cholecystectomy is a preferred procedure for symptomatic cholelithiasis.¹ In the management of gallbladder diseases, laparoscopic approach is preferred over open surgery.^{2,3} The risk of intraoperative injuries during laparoscopic cholecystectomy (LC) decreases in the hands of

experienced surgeons.^{4,5} Most of the surgical procedures on gall bladder nowadays are performed using laparoscopy all over the world.⁶ LC associated intraoperative complications also decreased over the years.⁷

Number of complications in relation to the port-site has been reported with a frequency of around 21 per 0.1 million cases. It relates more to the trocar and port-site incision size.⁸ These may add to the morbidity and increase the cost of treatment and discharge from hospital may be delayed. This study was conducted to assess the postoperative complications related to the port-site following LC so as to identify potential reasons for such occurrence.

¹ Department of Surgery LUMHS Jamshoro

Correspondence:

Dr. Abdul Ghafoor Dalwani^{1*}

Department of Surgery

LUMHS Jamshoro

E mail: surgeondalwani@hotmail.com

METHODOLOGY:

This cross sectional study was conducted in the Department of General Surgery at LUH Jamshoro after the approval of the ethical committee. Written and informed consent was taken. The study was conducted from August 2019 to February 2020. The sample size of 71 was calculated by using the Raosoft® software.⁹ Nonprobability purposive sampling technique was used to collect data that were entered in a pre-designed form.

Patients of both gender aged between 18 years and 60 years who underwent four-port laparoscopic cholecystectomy for gallstones diagnosed on ultrasound, were included. Patients with acute cholecystitis, gallbladder carcinoma, gangrenous gallbladder, those not willing to participate in the study, asymptomatic patients, acalculous cholecystitis, and those with severe co-morbid like uncontrolled diabetes mellitus, uncontrolled hypertension etc were excluded from the study.

A single dose of prophylactic 3rd generation cephalosporin was given preoperatively while three doses were administered postoperatively. Diclofenac sodium suppository was given at the time of induction along with local bupivacaine infiltration at wound site after closure. Postoperative analgesics were given according to the intensity of pain. Standard 4-port laparoscopic cholecystectomy was performed and site of different ports were at infra-umbilical port (10 mm port for pneumoperitoneum and telescope)¹⁰, epigastrium/sub-xiphoid (10 mm working port for surgeon; sub-xiphoid port was just lateral to the falciform ligament at the level of lower edge of liver), right hypochondrium (5 mm working port for

surgeon); and right lumbar (5 mm port for traction of fundus of gallbladder). Gallbladder was removed through infraumbilical port. The drain was placed at the subhepatic space through the right-sided lumbar port in all cases having perforation of gall bladder during laparoscopic cholecystectomy and/or bleeding. The average operation time was noted. Patients were mobilized on the same day and discharged next day. They were advised to visit OPD on 7th and 15th day after surgery and evaluated for any port-site complication.

SPSS version 22 software was used to analyze the data. The quantitative data like age, duration of operation were presented as mean ± S.D. Frequency and the percentages were computed for the gender, an indication of cholecystectomy and complications at the port-site (pain, bleeding, hematoma, infection, abscess, port-site hernia). Stratification was done according to the gender and operative time. Chi square test and Fisher’s exact test were applied and p-value <0.05 was considered as significant.

RESULTS:

Total of 71 patients underwent laparoscopic cholecystectomy with a mean age of 39.9±6.1 years. The age was from 22 years to 70 years. There were 11 (15.5%) males and 60 (84.5%) females in this study. Most of the patients (n=66 -93.0%) underwent cholecystectomy due to symptomatic cholelithiasis. Port-site infection was the most common complication noted in 10 (14.1%) patients. Infraumbilical site was the most common location where complication noted (n= 19 - 26.7%). This is given in table I.

Table I: Distribution of Complication and Port-site Involved

Variables	Categories	Frequency (n)	Percentage
Port-site involved in complications	Infraumbilical	19	26.7%
	Epigastric/sub-xiphoid	1	1.4%
	Right hypochondrium	0	00%
	Right lumbar	2	2.8%
Complications	Infection	10	14.1%
	Pain	6	8.5%
	Abscess	3	4.2%
	Bleeding	1	1.4%
	Hematoma	1	1.4%
	Port-site hernia	1	1.4%
	Overall complication rate	22	31.0%

Table II: Relationship of Complications With Gender and Duration of Surgery

Variables	Pain	Bleeding	Hematoma	Infection	Abscess	Port-site hernia	Overall rate	p-value
Gender								
Male (n=11)	1 (9.1%)	1 (9.1%)	0 (0%)	1 (9.1%)	2 (18.2%)	1 (9.1%)	6 (54.5%)	0.084
Female (n=60)	5 (8.3%)	0 (0%)						
Duration of surgery								
1 hour (n=25)	0 (0%)	0 (0%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)	1 (4.0%)	< 0.001
2 hour (n=42)	6 (14.3%)	0 (0%)	1 (2.4%)	8 (19%)	3 (7.1%)	0 (0%)	18 (42.9%)	
3 hour (n=4)	1 (25%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)	1 (25%)	3 (75.0%)	
Indication								
Symptomatic cholelithiasis (n=66)	6 (9.1%)	0 (0%)	1 (1.5%)	8 (12.1%)	3 (7.1%)	1 (1.5%)	18 (28.8%)	0.169
Chronic cholecystitis (n=5)	0 (0%)	1 (20%)	0 (0%)	2 (40%)	0 (0%)	0 (0%)	3 (60.0%)	

The infection was higher among females as compared to males but this difference was insignificant (table II). There was no significant difference in the overall complication rate between both genders. There was no significant difference in complications at port-site according to the age groups. However, a significant difference was observed in the complication rate according to the duration of surgery and the complication rate was increased with increased duration of the procedure.

DISCUSSION:

Laparoscopic surgery offers several benefits in comparison to conventional surgery including, smaller scar, less pain, less blood loss, and quick recovery.¹⁰ The other significant observation is decreased rate of surgical site infection. Short hospital stay is another advantage.¹¹⁻¹³ This study however showed that many complications can still occur. The mean age in present study was 39.87±6.12 years which is comparable to other studies.^{14,15}

In the current study LC was performed more frequently on females. This is in conformity with overall increased incidence of gallstone disease in this gender.^{14,16} However, there was no statistically significant difference in the overall complication rate between the genders. Similar results were found in a study that showed the female gender was predominantly involved with a female-male ratio of

about 80:20.¹ Females of any age are two times more likely to experience cholesterol cholelithiasis than males, from puberty across years of childbearing age until tapering off, demonstrating the possible impact of progesterone and estrogen.¹⁷

In the present study port-site infection was the most common complication followed by pain. In a study Sohu et al reported that hemorrhage (3.18%) was the most common complication after laparoscopic cholecystectomy followed by wound infection (1.6%) at subumbilical port, and ileus (1.3%).¹⁸ Husnain et al observed that pain was present in 80 % of the patients.¹⁹ The frequency of wound infection and abscess may be decreased by the use of endo-bag and strict adherence to aseptic measures with the use of antibiotics.^{13,14} Bleeding and hematoma may be prevented by taking care of anatomy and securing hemostasis. Proper closure of fascial defect at infraumbilical port-site decreases the incidence of port-site hernia.²⁰ Preoperative analgesia along with postoperative pain management can reduce this annoying experience as well.²¹

The infraumbilical port-site was the most common location of complications. This was noted in 26.7% of patients operated in this series. Similar results were found in a study done by Karthik et al in which overall complication rate was high at umbilical port.⁸ The possible explanation is that umbilical/

infraumbilical port is of 10 mm size and is made by open Hassan technique. Secondly umbilical site may not be clean area as it is a pit in anterior abdominal wall. Complications rate may be reduced by adopting the close technique, strict adherence to aseptic measures and proper closure of fascial sheath. In the present study no significant complications were noted in relation to the port-site however duration of surgery was statistically significant variable. The complication rate increased with increased duration of the procedure however type of clinical condition was insignificant.

CONCLUSIONS:

Laparoscopic cholecystectomy was associated with fewer early port-site postoperative complications which included infection and pain. Complication rate was significantly increased with increased duration of surgery but there was no significant difference in complication rate among both genders and different age groups. The infraumbilical port-site was most frequently involved.

REFERENCES:

1. Taj MN, Iqbal Y, Akbar Z. Frequency and prevention of laparoscopic port site infection. *J Ayub Med Coll Abbottabad*. 2012;24:197-9.
2. Ros A, Carlsson P, Rahmqvist M, Bachman K, Nilsson E. Nonrandomized patients in a cholecystectomy trial: characteristics, procedure, and outcomes. *BMC Surg*. 2006;6:17. doi: 10.1186/1471-2482-6-17.
3. Ji W, Li LT, Li JS. Role of Laparoscopic subtotal cholecystectomy in the treatment of complicated cholecystitis. *Hepatobiliary Pancreat Dis Int* 2006;5:584-9.
4. Hobbs MS, Mai Q, Knuimam MW. Surgeon experience and trends in intraoperative complications in laparoscopic cholecystectomy. *Br J Surg*. 2006;93:844-53.
5. Hasl DM, Ruiz OR, Baumert J, Gerace C. A prospective study of bile leaks after laparoscopic cholecystectomy. *Surg Endosc*. 2001;15:1299-300.
6. Shamiyeh A, Wanyand W. Laparoscopic cholecystectomy: early and late complication and their treatment, *Langenbecks Arch Surg*. 2004;389:164-7.
7. Rothman JP, Burcharth J, Pommergaard HC, Bardram L, Liljekvist MS, Rosenberg J. The quality of cholecystectomy in Denmark has improved over 6-year period. *Langenbeck's Arch Surg*. 2015;400:735-40.
8. Karthik S, Augustine AJ, Shibumon MM, Pai MV. Analysis of laparoscopic port site complications: A descriptive study. *J Minim Access Surg*. 2013;9:59-64.
9. Sharma D, Patel K, Anchalia MM. Study of cases of complications at port site. *Int J Sci Res*. 2013;2:2319-7064.
10. Haribhakti SP, Mistry JH. Techniques of laparoscopic cholecystectomy: Nomenclature and selection. *J Minim Access Surg*. 2015;11:113-8.
11. Lujan JA, Parrilla P, Robles R, Marin P, Torralba JA, Garcia-Ayllon J. Laparoscopic cholecystectomy vs open cholecystectomy in the treatment of acute cholecystitis: a prospective study. *Arch Surg*. 1998;133:173-5.
12. Cao AM, Eslick GD, Cox MR. Early laparoscopic cholecystectomy is superior to delayed acute cholecystitis: a meta-analysis of case-control studies. *Surg Endosc*. 2016;30:1172-82.
13. La Regina D, Mongelli F, Cafarotti S, Saporito A, Ceppi M, Di Giuseppe M, et al. Use of retrieval bag in the prevention of wound infection in elective laparoscopic cholecystectomy: is it evidence-based? A meta-analysis. *BMC Surg*. 2018 ;18(1):1-7.
14. ur Rehman H, Siddiqa M, UI Munam A, Khan S. Frequency of port site wound infection after Gall Bladder removal with or without retrieval bag in laparoscopic cholecystectomy. *J Pak Med Assoc*. 2020;70:1533-7.
15. Amin A, Haider MI, Aamir IS, Khan MS, Choudry UK, Amir M, et al. Preoperative and operative risk factors for conversion of laparoscopic cholecystectomy to open cholecystectomy in Pakistan. *Cureus*. 2019;11(8): e5446.

16. Nagi GS, Arora R. Incidence of various types of gallstones in patients of cholelithiasis in north India. *J Evolut Med Dental Sci.* 2015;4:16213-5. Received for publication: 30-01-2021
Accepted after revision: 18-09-2021
17. Lammert F, Gurusamy K, Ko CW, Miquel JF, Méndez-Sánchez N, Portincasa P, et al. Gallstones. *Nat Rev Dis Primers.* 2016; 2(1):1-7. doi: 10.1038/nrdp.2016.24. Author's Contributions:
Sadia Paras. Concept of study, collection and interpretation of data, writing manuscript, final approval of the draft.
Abdul Ghafoor Dalwani. Concept of study, collection and interpretation of data, writing manuscript, final approval of the draft.
18. Sohu KM, Shah AA, Solangi RA, Arshad S, Jamal MR, Hussain R. Complications of laparoscopic cholecystectomy: a study of 1100 cases at Sukkur, Pakistan. *Rawal Med J.* 2012;37:399-402. Sohail Ahmed. Data collection, analysis, major contribution to writing manuscript and final approval of draft.
Ghulam Akbar Khaskheli. Manuscript writing.
Nawaz Ali Dal. Manuscript writing, data collection and final approval of the draft.
Ghashia Khan. Data collection, data analysis and final approval of draft.
19. Husnain SS, Feroze F, Rizvi ST, Kashif MM, Kaleem MM, Khan A. Comparison of patients' response in laparoscopic versus open cholecystectomy. *Pakistan Armed Forces Med J.* 2020;70:230-35. Ethical statement: Institutional review board permission was obtained prior to the study and informed consent taken.
20. Nofal MN, Yousef AJ, Hamdan FF, Oudat AH. Characteristics of trocar site hernia after laparoscopic cholecystectomy. *Sci Rep.* 2020;10: 18;10(1):2868. doi: 10.1038/s41598-020-59721-w. Competing Interest:
The authors declare that they have no competing interest.
21. Ahiskalioglu EO, Ahiskalioglu A, Aydin P, Yayik AM, Temiz A. Effects of single-dose preemptive intravenous ibuprofen on postoperative opioid consumption and acute pain after laparoscopic cholecystectomy. *Medicine (Baltimore).* 2017;96(8):e6200. doi: 10.1097/MD.00000000000006200. Source of Funding: None
- How to cite this article:
Paras S, Dalwani AG, Ahmed S, Khaskheli GA, Dal NA, Khan Ghashia. Postoperative port site early complications of laparoscopic cholecystectomy. *J Surg Pakistan.* 2021;26 (2):79-83. Doi:10.21699/jsp.26.2.9.