Outcomes of Laparoscopic Cholecystectomy at a THQ Hospital Lahore, Pakistan

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Abstract

Background: Laparoscopic Cholecystectomy is frequently performed surgery with its own benefits and risks as compared to open cholecystectomy.

Objective: To evaluate the short-term outcomes of laparoscopic cholecystectomy performed at a Public Sector Hospital in Lahore, Pakistan.

Methodology: A descriptive study with retrospective analysis of 239 patients with gallbladder disease who underwent laparoscopic cholecystectomy between May 2021 and September 2023 at Government THQ Hospital Sabzazar was conducted. Procedures were performed by a single consultant surgeon using standardized techniques, including the triangle of safety methodology and a four-port approach. Data on demographic characteristics, operative details, and postoperative outcomes were collected and analyzed by using SPSS 22.

Results: Mean patient age was 46.8±8 years, with a female predominance (91.2%) with a male-to-female ratio 1:10). Mean BMI was 33.5±3.9 kg/m², and 88.28% had prior abdominal surgery. The most common indications for surgery were interval cholecystectomy (26.77%) and biliary colic (23.43%). Mean operative time, hospital stay, and drain duration were 57.06 ± 18.10 minutes, 2.01 ± 1.10 days, and 3.69 ± 2.34 days, respectively. No cases of biliary, vascular, or visceral injury, bile leak, surgical site infection, or mortality were observed. Overall complication rates ranged from 0.41% (port-site hemorrhage) to 9 (3.76%) (conversion to open cholecystectomy).

Conclusion: Adherence to standardized surgical protocols, including meticulous dissection, strict application of the triangle of safety methodology, and four-port technique, contributes to low complication rates and favorable short-term outcomes in laparoscopic cholecystectomy, even in resource-limited settings.

Keywords: Laparoscopic cholecystectomy, Outcome, Cholecystitis

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Introduction

Laparoscopic Cholecystectomy is performed almost in every hospital all over the world.[1,2] Prevalence of cholelithiasis is reported 10.2% in Pakistan.[3-5] Patients, these days, are well aware of the benefits of laparoscopic cholecystectomy i.e. less postoperative pain, shorter hospital stay and early return to full activity, as compared to open cholecystectomy.[5]

In the past, bile duct injury was a frightening complication for all surgeons and because of this fearsome concern, patients were reluctant and sometimes used to refuse to get their cholecystectomies being performed via laparoscope. However, after introduction of critical view of safety methodology, bile duct injuries are reduced to 0.3%-0.8%.[6-8] But other issues including port site injuries and infection, biliary leakage, spillage of stones, still affect the patient expectation from laparoscopic cholecystectomy i.e. early recovery.[9,10]

Though, outcomes of laparoscopic cholecystectomy are being reported by several surgeons in literature but these results are capricious. Incidence of bile leak after laparoscopic cholecystectomy was reported low i.e. 0.3% by Ali A[11] et al, in a prospective observational study. However, Ahmed N,[12] reported a high incidence of bile leakage i.e.10.4% after laparoscopic cholecystectomy. Duodenal injury during laparoscopic cholecystectomy was reported in 1% and 3.1% patients by Dholia KM[13] et al, and Olajide T[14] et al, respectively. Low rate of conversion to open cholecystectomy i.e. 2.0% was reported by Sayyar M[15] et al, in a descriptive study however, in a case series by Dholia KM[13] et al, a high conversion rate i.e. 8% was reported. Kumar R[16] et al, in a prospective study, observed port site infection in 4% patients however, Dholia KM[13] et al, reported 8% port site infection after laparoscopic cholecystectomy.

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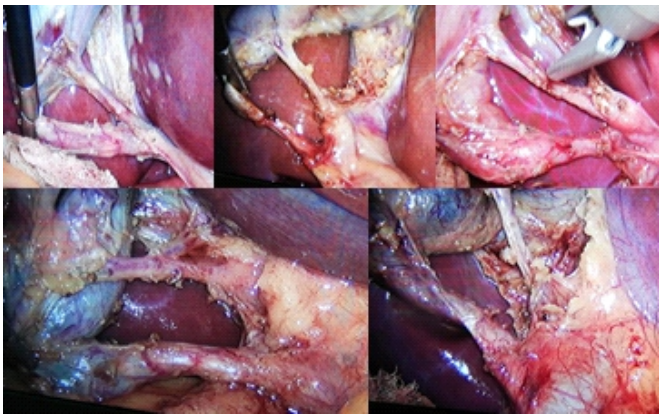
The aim of this study was to report the short term outcomes of laparoscopic cholecystectomy, performed by a single surgeon at a THQ hospital Lahore in order to recognize the safety of this procedure in a health care facility with limited resources. Though, critical view of safety achieves protection of bile ducts but other measures to make laparoscopic cholecystectomy totally safe and harmless are still need attention in order to avoid prolonged morbidity and delayed recovery, hence to fulfil the purpose of laparoscopic cholecystectomy i.e. early recovery.

Methodology

This descriptive study was conducted at Government THQ Hospital Sabzazar, Lahore form May 2021 to September 2023. This study included 239 patients with cholecystitis of both gender, BMI $\leq$ 40 Kg/m^2 and between 18 to 80 years of age. Patient with ASA (American Society of Anesthesiologists) score III & IV, asthma, Ischemic heart disease, Jaundice, Bleeding disorders (Deranged coagulation profile), hepatitis C and Choledocholithiasis or perforated gall bladder or GB wall thickness > 3mm on USG were excluded from the study. The study was approved from Ethical Review committee (Ref. No. IHHN_IRB_2023_10_01, Dated: 10-05-2021) as per institutional guidelines. All laparoscopic cholecystectomies were performed by single surgeon with four ports, 30^O laparoscope and triangle of safety methodology (Figure 1). Primary port (camera port) was introduced via open technique and gall bladder was extracted in a surgical glove pouch through epigastric port. Outcome in terms of bile leakage, port site hemorrhage, conversion to open, surgical site infections, postoperative jaundice, mortality and ERCP required after procedure or on follow up visits (4 weeks postoperatively) were recorded.

All the collected data was entered into SPSS version 22 and analyzed. Quantitative data like age, BMI, operative time, drain output, duration of drain and length of hospital stay, was presented as means and standard deviations. The qualitative data like gender, DM, HTN, previous history of abdominal surgery and acute pancreatitis, diagnosis and outcome, was presented as frequency and percentage.

Figure I: Triangle of safety achieved in different cases



Results

Characteristics of patients and disease are shown in Table I. Operative and postoperative outcome of laparoscopic cholecystectomy are shown in table II.

Table I: Characteristics of patients and disease (n=239)

Variables			No. of patients (%)
Age (years)	Mean±SD		46.89±8.48
	Range		15-71
Gender	Male		21 (8.78%)
	Female		218 (91.21%)
	M:F		1:10
BMI	Mean±SD		33.51 ±3.94 Kg/m^2
Co-morbidity	Diabetes mellitus		63 (26.35%)
	Hypertension		173 (72.38%)
Previous history of abdominal surgery	Cesarean section		187 (78.24%)
	Lower midline laparotomy		24 (10.04%)
Indication of surgery	Biliary colic		56 (23.43%)
	Acute cholecystitis		29 (12.13%)
	Chronic cholecystitis		44 (18.41%)
	Mucocele		31 (12.97%)
	Empyema		9 (3.76%)
	Gall bladder polyp		6 (2.51%)
	Interval cholecystectomy	Acute cholecystitis	60 (25.10%)
		Biliary pancreatitis	4 (1.67%)
GB USG findings	Distended gall bladder		59 (24.68%)
	Pericholecystic fluid		0 (0.0%)
	Impacted neck stones		51 (21.33%)
	GB stones	Solitary	92 (38.49%)
		Multiple	141 (58.99%)

Table II: Operative and postoperative outcome of laparoscopic cholecystectomy (n=239)

Operative outcomes			No. of patients (%)
Intra-operative findings	Visceral injury		0 (0.0%)
	Blood vessel injury		0 (0.0%)
	Gall bladder adherent to surrounding viscera		106 (44.35%)
	Bile duct injury		0 (0.0%)
	Frozen calot's triangle		9 (3.76%)
	GB perforation (iatrogenic)		3 (1.25%)
	Spillage of GB stone		2 (0.8%)
Perioperative data	Mean operative time (min.)		57.06±18.10
	Mean hospital stay (days)		2.01± 1.10
	Mean Drain output (ml)		36.98±20.56
	Mean Duration of drain (days)		3.69±2.34
Outcome	Bile leakage		0 (0.0%)
	Port site hemorrhage		1 (0.41%)
	Conversion to open		9 (3.76%)
	Surgical site infections	Port site	0 (0.0%)
		Sub-hepatic abscess	0 (0.0%)
	Postoperative jaundice		0 (0.0%)
	ERCP required		0 (0.0%)
	Mortality		0 (0.0%)

Discussion

Laparoscopic cholecystectomy is all time favorite subject of surgeons. Achieving the triangle of safety helps surgeon to get out of the fear of biliary injury. Though, reduction in frequency of biliary injuries definitely declines the morbidity of patients but certain other issues e.g. SSI and conversion to open cholecystectomy still needs to lessen to get true benefits i.e. early recovery, of laparoscopic cholecystectomy. Our study reported the short term outcome of laparoscopic cholecystectomy at a THQ hospital, executed by a single surgeon.

Similar to the studies by Shamsuddin S[1] et al, Ali A[11] et al, Ahmed N[12], Sayyar M[15] et al, Kumar R[16] et al, middle aged patients with gall bladder disease were observed in our study and range of age i.e.15-71 years, was comparable to case series by Dholia KM[13] et al. Analogous to our study, female majority was also found in retrospective cross-sectional study by Shamsuddin S[1] et al i.e. 90.3% and descriptive Study by Sayyar M[15] et al, i.e. 90.7%. Obese patients with a mean BMI of 33.51±3.94 Kg/m^2 were noticed in our study. Previous history of abdominal surgery (cesarean section) were found in 78.24% patients in our study. Middle age group, female gender, obesity and fertility stamp the renowned risk factors for cholelithiasis i.e. Forty, Female, Fat, Fertile, which has already been mentioned in literature.[1,11-16]

Commonest indication of surgery, in our study, was interval cholecystectomy for acute cholecystitis (25.10%). However, symptomatic cholelithiasis was the commonest reason of surgery i.e. 88.2% in a study by Shamsuddin S[1] et al. Interval cholecystectomy for biliary pancreatitis was lower in our set up as compared to study by Shamsuddin S[1] et al, i.e. 1.67% and 2.5%, respectively because our study conducted in a THQ hospital, a limited medical facility (opioids and CT scan unavailability), where patients with acute pancreatitis could not be treated as per protocol and patients usually get themselves booked for interval cholecystectomy where there they were got treatment for acute pancreatitis.

Mean operative time i.e. 57.06±18.10 min, in our study was equivalent to case series by Dholia KM[13] et al, i.e. 60 min (range 30-120 min.). There were two main reasons of shorter operative time in our study. Firstly, majority of cases were uncomplicated i.e. interval cholecystectomy (resolved inflammation), biliary colic and gall bladder polyp (non-inflammatory) and acute cholecystitis within same admission (early stage of inflammation, so didn't require much time for dissection and didn't need drain placement. Secondly, four port technique was utilized to perform laparoscopic cholecystectomy and this helped in frustration-free dissection by appropriate retraction of gall bladder. In a Prospective study by Kumar R[16] et al, mean operative time was more in GB stone spillage cases as compared to non-spillage cases (73.20 vs. 40.08, $p<0.001$). Mean hospital stay, in our study, was lower i.e. 2.01± 1.10 days, as compared to Ahmed N[12] i.e. 3.44±1.2 days. The reason of lower hospital stay is that higher number of cases of uncomplicated cases i.e. 64.85% while Ahmed N[12] performed laparoscopic cholecystectomy in acute cholecystitis cases i.e. 85.4%.

Contrary to our study, CBD injury was reported by Shamsuddin S[1] et al, Sayyar M[15] et al, and Dholia KM[13] et al, i.e. 0.4%, 0.7% and 1%, respectively. In order to avoid bile duct injury, we utilized Triangle of safety method and escaped flush ligation of cystic duct. Differing to our study, bile leakage postoperatively was reported in studies by Sayyar

M[15] et al, Shamsuddin S[1] et al, Dholia KM[13] et al, and Ahmed N[12] i.e. 0.7%, 1.7%, 4% and 10.4%, respectively. In order to avoid bile leak postoperativelyin our study, calots triangle was being dissected with L-hook (hook, look and cook technique) to identify any accessory biliary duct, clips or extracorporeal knot was firmly secured over the cystic duct stump to avoid displacement or slippage, and stump and gall bladder bed were inspected for any bile leak at the end of procedure. Shamsuddin S[1] et al, reported vascular injury to liver bed in 1.7% patient, however in our study there was no major blood vessel injury and port site hemorrhage was observed in 0.41% patient. In one patient of our study, epigastric port was extended to extract gall bladder specimen which led to bleed and hemostasis was secured with cauterization of bleeding vessels. Contrary to our study, duodenal perforation i.e. 1% was reported in a cases series by Dholia KM[13] et al. camera port was introduced via open access technique and enteric adhesion to gall bladder were dealt with non-energized instrument in our study, these facilitated to circumvent visceral perforation. Lower rate of GB perforation i.e. 1.25% in our study was due to surgery on uncomplicated cases, similary Shamsuddin S[1] et al, in a retrospective cross-sectional study reported a lower rate of GB perforation i.e. 1.3%.

Surgical site infection was not reported in any case (0.0%) in our study, however a higher port site infection i.e. 8% was observed in a case series by Dholia KM[13] et al and Ahmed N[12] reported sub-hepatic collections in 6.2% patients. Reason of low SSI in our study was firstly, omental adhesion were dealt with energized instrument to avoid any postoperative collection due to oozing from omental bleeders, secondly GB extraction via glove made endobag through epigastric port to avoid contact of bile with port site, thirdly thorough irrigation and painstaking suction of bile and extraction of all dropped GB stones in case of GB perforation and stone spillage. Rate of conversion to open cholecystectomy was 3.76% in our study. A lower rate of conversion i.e. 2.9% was reported by Shamsuddin S[1] et al, and a higher conversion rate was reported by Dholia KM[13] et al and Ali A[11] et al, i.e. 8% and 4.5%, respectively. Reason of conversion in our study was frozen calot`s triangle and subtotal cholecystectomy was planned which could not be accomplished laparoscopically because of lack of expertise for intracorporeal suturing. Similar to the studies by Shamsuddin S[1] et al and Ahmed N[12], mortality was not observed in any (0.0%) patient in our study. None of our patients (0.0%) scheduled for redo surgery.

Intra-operative complications rate ranges from 0.8% to 1.25% and this comprises gall bladder perforation and spillage of GB stone. Vascular, visceral and bile duct injury was not observed in any patient (0.0%) in our study. Sayyar M[15] et al, reported intraoperative complication in 1.4% patients which included CBD injury and leak from GB bed. Overall complication rate ranges from 0.41% to 3.76% and this takes in port site hemorrhage and conversion to open cholecystectomy. Similar to the study by Shamsuddin S[1] et al, conversion to open cholecystectomy is the commonest complication in our study.

In the present study, there was no major complication i.e. biliary, vascular or visceral injury. Clarification of major complication-free surgery is that the open primary port access, meticulous dissection of calots` triangle & GB bed, strict adherence to triangle of safety methodology and operative field lavage & drainage where required. Conversion to open cholecystectomy can be diminished by learning the intracorporeal suturing.

This study has certain limitations. It was conducted at a healthcare facility with limited resources and there was lack of intracorporeal suturing expertise.

Conclusion

From the present study, it is concluded that the crucial points to attain early recovery purpose of laparoscopic cholecystectomy are open primary port access, 4 port technique, meticulous dissection of calots` triangle & GB bed, strict adherence to triangle of safety methodology, operative field lavage & drainage where required and utilization of intracorporeal suturing expertise for subtotal cholecystectomy in cases of frozen calots`s triangle.

Authors Contribution: SDM: Conception of work and Drafting. **MSF:** Design of work and revising. **NS:** Interpretation of data and revising. **MRS:** Analysis of data and drafting. **FM:** Acquisition and analysis of data and revising.

All authors critically revised and approve its final version.

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References

1. Shamsuddin S, Baig I, Ali A, Hussain S, Shah M, Akbar B. Outcomes of laparoscopic cholecystectomy: Experience of a tertiary care center from a developing country. Pak J Surg. 2020;36(3):204-7.
2. Reitano E, De'Angelis N, Schembari E, Carrà MC, Francone E, Gentilli S, La Greca G. Learning curve for laparoscopic cholecystectomy has not been defined: a systematic review. ANZ J Surg. 2021;91(9):554-60.
3. Alam R, Rai L, Kazim E, Jamali AH, Masood U, Saleem M. Distribution of gall stone disease by sex, age groups & severity in population of Nawabshah, Pakistan. Gomal J Med Sci. 2022;20(3):142-6.
4. Sgaramella LI, Gurrado A, Pasculli A, de Angelis N, Memeo R, Prete FP, Berti S, Ceccarelli G, Rigamonti M, Badessi FG, Solari N. The critical view of safety during laparoscopic cholecystectomy: Strasberg Yes or No? An Italian Multicentre study. Surg Endosc. 2021;35:3698-708.
5. Uygunovich NA. Effectiveness Mininvasive Laparoscopic Cholecystectomy during the Complication of Acute Cholecystitis. Res J Trauma Disabil Stud. 2022;1(11):20-8.
6. Gavriilidis P, Catena F, de'Angelis G, de'Angelis N. Consequences of the spilled gallstones during laparoscopic cholecystectomy: a systematic review. World J Emerg Surg. 2022;17(1):1-5.
7. Manatakis DK, Antonopoulou MI, Tasis N, Agalianos C, Tsouknidas I, Korkolis DP, Dervenis C. Critical view of safety in laparoscopic cholecystectomy: A systematic review of current evidence and future perspectives. World J Surg. 2023;47(3):640-8.
8. Evans L, Sams E, Naguib A, Hajibandeh S, Hajibandeh S. Iatrogenic gallbladder perforation during laparoscopic cholecystectomy and outcomes: a systematic review and meta-analysis. Langenbeck's Arch Surg. 2022;407(3):937-46.
9. Hanashe RF, Essa HT, Razaq MA. Outcome of Perforated Gallbadder during Laparoscopic Cholecystectomy. Al-Kindy Col Med J. 2021;17(1):26-30.
10. Mori T, Endo H, Misawa T, Yamaguchi S, Sakamoto Y, Inomata M, Sakai Y, Kakeji Y, Miyata H, Kitagawa Y, Watanabe M. Involvement of a skill-qualified surgeon favorably influences outcomes of laparoscopic cholecystectomy performed for acute cholecystitis. Surg Endosc. 2022;36(8):5956-63.
11. Ali A, Syed MH, Ashraf T, Aslam F, Ahmad G, Akbar A. Outcomes of laparoscopic cholecystectomy in different grades of gall bladder inflammation a tertiary care centre experience. Pak Armed Forces Med J. 2021;71(4):1252-55
12. Ahmed N. Clinical outcome of laparoscopic partial cholecystectomy: experience in a tertiary care hospital setting. J Med Sci. 2020;28(4):327-30.
13. Dholia KM, Memon AA, Shaikh MS, Shaikh SA. Laparoscopic Cholecystectomy: Experience of 100 cases at a teaching hospital of Sindh. J Liaquat Univ Med Health Sci. 2005;4(3):105-8.
14. Olajide T, Osinowo A, Balogun O, Afolayan M, Bode C, Atoyebi O. Experience with laparoscopic cholecystectomy in a tertiary hospital in Lagos, Nigeria. J Clin Sci. 2020;17(1):1-4.
15. Sayyar M, Jan Y, Hussain S. Outcome of laparoscopic cholecystectomy in terms of intraoperative complications in a tertiary care hospital. Professional Med J. 2022;29(01):19-25.
16. Kumar R, Kataria R, Bangar SS, Attri A, Singh H, Jassal A. Outcome of laparoscopic cholecystectomy-spillage of gall stones: A prospective study. Int J Surg Med. 2022;8(6):32-7.