

## Operative outcomes of Laparoscopic Cholecystectomy

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### Abstract

**Background:** Laparoscopic cholecystectomy is the most commonly performed operation of the digestive tract. It is considered as the gold standard treatment for cholelithiasis.

**Aim:** To evaluate the outcome of it regarding length of hospital stay, complications, morbidity and mortality at a secondary hospital.

**Materials and Methods:** Data were collected by retrospective record review method from 200 patients who underwent laparoscopic cholecystectomy. Patients' demographics, co-morbid diseases, previous abdominal surgery, conversion to open cholecystectomy, operative time, postoperative complications, and hospital stay were collected and analyzed.

**Results:** Out of 200 patients, 165 (82.5%) were females and 35 (17.5%) males. The mean age of the patients was 49.35±8.68 years. Mean operative time was 65.94±11.52 min. Five cases (2.5%) were converted to open surgery, one due to obscure anatomy (0.5%) 2 due to acute cholecystitis and oedematous gall bladder (1.0%) and one by bleeding (0.5%) one for bile duct injury. Two (1.0%) cases had biliary leakage. Mean hospital stay was 2.6±1.5 days. Sixteen (8.0%) developed wound infection. There was no case of port site hernia, bowel injury or spilled gallstones. There was no mortality recorded in this series.

**Conclusions:** Laparoscopic cholecystectomy is a safe and effective line for management of gallstone disease that can be performed with acceptable morbidity at a secondary hospital.

**Keywords:** Cholecystectomy, Laparoscopy, Cholelithiasis, Complications.

### Introduction

Laparoscopic cholecystectomy (LC) represents a significant change in the management of gallbladder disease and it is the most commonly performed operation of the digestive tract. It is considered as the gold standard

treatment for cholelithiasis.<sup>1,2</sup> It replaced open cholecystectomy as the first choice of treatment for gallstones and inflammation of the gallbladder. It was made for the first time in 1987 by Muret. Despite many modified methods (natural orifice transluminal endoscopic surgery-NOTES, single-incision laparoscopic surgery), LC is still the gold standard for symptomatic gallstone disease.<sup>4</sup> The risk of intraoperative injury during laparoscopic cholecystectomy is higher than in open cholecystectomy.<sup>3,4</sup> It has been anticipated that this will diminish with increasing surgeon experience in the use of LC.<sup>3</sup> In USA approximately one million patients are newly diagnosed annually with gall stone disease and approximately 600,000 operations are performed a year more than 75% of them by laparoscopy.<sup>5</sup>

Laparoscopic cholecystectomy offers the patients the advantages of minimal invasive surgery. However with the widespread acceptance of LC the spectrum of complications in gallstone surgery has changed. The intraoperative complications of LC like bowel and vascular injury (trocar site), biliary leak and bile duct injuries decrease with the passage of time, because of increased experience of the surgeons, popularity of the procedure and introduction of new instruments.<sup>5</sup> This study was the exploration of laparoscopic cholecystectomy with the aim to evaluate the complications of laparoscopic cholecystectomy in cholelithiasis, both in symptomatic and asymptomatic patients, including co-morbidity and conversion of laparoscopic to open cholecystectomy.

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## Methodology

This retrospective record review was carried out in Prime Medical College, Rangpur and Islamic Bank Community Hospital, Faridpur, a period of 2.5 years from 1 Dec 2014 to 30<sup>th</sup> June 2017. All patients of both genders and of those above the age of 12 years who underwent LC irrespective of its indications were included in this study. While the patients with cholelithiasis and choledocolithiasis, deferred by the anesthetist or undergoing open surgery were excluded from the study.

The variables under consideration were age, gender, body mass index ( $\text{kg}/\text{m}^2$ ), mode of admission (elective or emergency), indication for LC, co-morbid disease, diagnostic investigations, duration of the procedure, hospital stay, and complications.

Patient selection for surgery was made preoperatively based on history, physical, and laboratory diagnostic evidence of gall bladder disease. Routine ultrasonogram was performed to confirm clinical diagnosis. Admitted patients were required to undergo the standard pre-operative tests for general anaesthesia, including liver function test, renal function tests, screening for hepatitis.

LC was performed using the standard four-port technique advocated by the pneumo-peritoneum was created by the introduction of umbilical port, and diathermy of the gallbladder was performed with the monopolar electro-surgical hook in all cases.

### Data processing and analysis:

Collected data were analyzed using the statistical package for social sciences (*SPSS, version 16.0*). Categorical data were expressed in frequency and percentage; numerical data were expressed in mean, and standard deviations. The qualitative data were analyzed using the Chi-square test and quantitative data by the Student *t* test. P value <0.05 was considered statistically significant.

### Ethical considerations:

Data confidentiality was maintained during all phases of data collection and analysis.

## Results

This study was carried out during the period 2014 to 2017, females represented nearly 82.5% of cases (female to male ratio of 4.7:1), the age of the included patients ranged from 12 to 75 years (mean  $32.9 \pm 12.7$  years). Those in the age group of 20 to 50 years represented the main bulk of patients who underwent LC (Table 1).

**Table 1:** Basic and clinical preoperative patient characteristics

Characteristics	Year		Total (N=200) No. (%)
	2014-2015 (N=133) No. (%)	2016-2017 (N=67) No. (%)	
<b>Gender</b>			
Male	108 (81.2)	57 (85.0)	165 (82.5)
Female	25 (18.7)	10 (14.9)	35 (17.5)
<b>Age group</b>			
<20	5 (3.7)	4 (5.9)	9 (4.5)
20-50	103 (77.4)	53(79.1)	156 (78.0)
>50	25 (18.7)	8 (11.9)	33 (16.5)
<b>Co-morbidities</b>			
Diabetes	8 (6.0)	4 (5.9)	12 (6.0)
Hypertension	10 (7.5)	6 (8.9)	16 (8.0)
Respiratory problems	3 (2.2)	2 (2.9)	5 (2.5)
Previous abdominal surgery	3 (2.2)	2 (2.9)	5 (2.5)
<b>Body mass index</b>			
Desirable (BMI <25)	94 (70.6)	44 (65.6)	138 (69.0)
Over weight (BMI 25-30)/ Obese BMI >30	39 (29.3)	23(34.3)	62 (31.0)
<b>Gall bladder stones</b>			
Single	31 (23.3)	17 (25.3)	48 (24.0)
Multiple	102 (76.6)	50 (74.6)	152 (76.0)

**Table 2:** Peri-operative status of the gall bladder and encountered complications following laparoscopic cholecystectomy

Variables	Year		Total (N=200) No. (%)
	2014-2015 (N=133) No. (%)	2016-2017 (N=67) No. (%)	
<b>Peri-operative status</b>			
Adhesions	51 (38.3)	25 (37.3)	76 (38.0)
<b>Gall bladder status</b>			
Acute inflammation	9 (6.7)	6 (8.9)	15 (7.5)
Chronic inflammation	56 (42.1)	28 (41.7)	84 (42.0)
Mucocele	4 (3.0)	2 (2.9)	6 (3.0)
Normal	62 (46.6)	31 (46.2)	93(46.5)
<b>Operative time (minutes)</b>			
< 60	12 (9.0)	8 (11.9)	20 (10.0)
60 - < 120	94 (70.6)	46 (68.6)	140(70.0)
>120	27 (20.3)	13 (19.4)	40 (20.0)*
<b>Post-operative complications</b>			
Minor			
Wound hematoma	2 (1.5)	1 (1.4)	3 (1.5)
Atelectasis	1 (0.7)	1 (1.4)	2 (1.0)
Wound infections	3 (2.2)	1 (1.4)	4 (2.0)*
Port site hernia	00	00	00 (0.0)
Major			
Bile leak	2 (1.5)	00	2 (1.0)
Conversion to open	3 (2.2)	2 (2.9)	5 (2.5)
Total cases with complications	11 (8.2)	5 (7.4)	16 (8.0)
Hospital length of stay median (range) in days	2 (1-13)	2 (1-5)	2 (1-13)

\*Statistically significant Chi-square for trend

Table 2 shows the pre-operative status of the gall bladder and complications encountered following LC. Intra-operatively in 76(38.0%) patients, there was flimsy adhesion of the gallbladder. In 84(42.0%), gallbladder wall was found to be thickened (chronic cases), whereas in another 15(7.5%) cases gallbladder wall was inflamed (acute cholecystitis).

Distended gallbladders with mucocele were found in 6 (3.0%) patients which were decompressed laparoscopically.

Conversion from laparoscopic to open cholecystectomy was necessary in five cases. The reasons for conversion to open cholecystectomy were due to acutely inflamed and edematous gallbladder in two cases, bleeding from cystic artery in one case, one patient due to unclear anatomy of the

operative field and another due to transection of bile duct because of too short cystic duct. All the patients were managed properly with good recovery.

Postoperative bile leakage occurred in two patients (1.5%). All these patients had drains placed at the time of surgery. In one patient, leakage stopped on the fifth postoperative day spontaneously, and another patient who continued to drain bile upto 12<sup>th</sup> post operative day then spontaneously stopped. The follow up period ranged from 6 months to 40 months (median 18 months), and no late complications were detected.

## Discussion

LC is one of the most commonly undertaken procedures in general surgery since its inception in the early 1990s with low morbidity and mortality.<sup>7</sup> Large series of LC were reported with few complications.

In this study, pre-operative co-morbidities were found in 38 patients (19.0%). Type 2 diabetes were 12 (6.0%); diabetes and hypertension were reported in 28 (14.0%), hypertension alone in 16 patients, respiratory problems in the form of chronic asthma in 3 patients, and obstructive diseases were also reported. This is similar to that reported by others.<sup>8,9</sup>

Out of the 200 patients included, 62 patients (31.0%) were either overweight or obese based on their calculated body mass index (BMI), females constituted 67.1% of them. Obesity had no influence on the outcome of LC in this study, and this result is comparable to other studies that show no influence of BMI on the complications of LC.<sup>8-10</sup>

In this study displays pre-operative status of gall bladder and the frequency of encountered complications, during the period of study. Among patients, multiple gall bladder stones were common (76.0%) than single stone. Obscure anatomy and adhesions were found in 38.0% of cases, acute cholecystitis in 7.5% of cases.

Wound infections and hematoma were the most common complications encountered post-operatively. The complication rate was 8.0% (16 patients) with insignificant trend in relation to year of operation. The 2.5% overall conversion rate among the study patients is similar to that reported by others.<sup>10,11</sup>

The operative time in minutes ranged from 45 to 180 min (median 85 min) and showed a significant trend over time as improvement was noticed in the shortening of operative time from year 2016 to 2017 ( $P=0.047$ ).

Hospital length of stay ranged from 1 to 13 days (for non-complicated cases a median of 2 days with a range of 1 to 3 days), while for complicated cases a minimum of four and maximum of 13 days were reported.

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## Conclusion

The results of this study confirm that LC at a secondary level of care is a safe and effective intervention in selected patients with symptomatic gallstones. Most of the complications are due to lack of experience or knowledge of typical error. It has several advantages compared with open cholecystectomy; however, when there is a major complication a multidisciplinary approach should be performed at a tertiary hospital.

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