

Comparison of perioperative outcomes in patients with uncomplicated and complicated cholelithiasis

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Abstract

Background: Cholelithiasis is a common disease managed by surgeons. The patient may present with asymptomatic incidentally detected cholelithiasis, uncomplicated symptomatic cholelithiasis or complicated symptomatic cholelithiasis. The perioperative outcome varies in patients with symptomatic uncomplicated and complicated disease.

Objectives: To compare the perioperative outcomes between patients with uncomplicated and complicated cholelithiasis.

Methodology: A prospective analytical study was conducted among all the patients undergoing elective laparoscopic cholecystectomy during the study period. The patients were categorized into two groups, uncomplicated and complicated. The comparison was done among these groups in terms of length of hospital stay, operative duration, and post-operative complications.

Results: Total of 107 patients 22(20.56%) males and 85(79.43%) females were included in the study. 83(77.57%) were uncomplicated and 24(22.42%) were complicated cases. The average length of the hospital was 2.33 vs 6 days (p-value <0.01), mean operative duration 42.23 vs 70.17 minutes (p-value <0.00) and postoperative complication were 0 vs 6 in uncomplicated and complicated group respectively.

Conclusion: Patients operated for uncomplicated cholelithiasis had a better perioperative outcome in terms of operative duration, post-operative hospital stay and complications rate as compared to patients operated for complicated cholelithiasis.

Key words: Cholelithiasis; Cholecystectomy; Complications; Gallstone disease

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INTRODUCTION

Cholelithiasis is one of the most common surgical problem. Patients may present with symptomatic cholelithiasis, complicated cholelithiasis and sometimes with incidentally detected asymptomatic cholelithiasis which is detected during the investigation for unrelated symptoms. Laparoscopic cholecystectomy is the gold standard for symptomatic and complicated cholelithiasis. The postoperative outcome varies according to the presentation. Literature suggests that symptomatic uncomplicated patients have a lower incidence of complications, better perioperative outcome and lower cost of treatment when compared to complicated patients¹⁻⁵.

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We frequently operate patients with both uncomplicated and complicated cholelithiasis. However, we do not have own data regarding the frequency of complicated cholelithiasis, different types of complications and their perioperative outcomes.

Hence, we conducted a prospective study to look at the different types of presentations of patients with cholelithiasis and compare perioperative outcomes of symptomatic uncomplicated and complicated patients.

METHODOLOGY

This is a prospective analytical study. Patients undergoing cholecystectomy in surgery unit I, Department of Surgery, Kathmandu Medical College Teaching Hospital, Sinamangal, Kathmandu were included in the study from April 2017 to November 2017. Patients undergoing additional abdominal procedure along with laparoscopic cholecystectomy were excluded from the study.

Similarly, patients who underwent conversion because of equipment failure and anesthetic complications, patients who did not give consent, patients with severe cardiopulmonary disease for e.g. severe Obstructive airway disease, dilated cardiomyopathy, pulmonary hypertension, coronary artery disease, cirrhosis of liver etc. were also excluded from the study.

Patients were enrolled using consecutive sampling technique. Sample size was calculated by the using the scientific equation as such:

$$N = Z^2pq/e^2 = 95.42$$

Z = 1.96 for 95% confidence interval,
 p (proportion of disease) = 46 %
 q = 1-p = 54% e (Error) = Error = 10%
 Sample Size = 95

Applying the equation as such the minimum sample size was calculated as 95.

Patient's demographic variables were collected on a case sheet. The variables included were age, sex, haemoglobin, white blood counts, total bilirubin, direct bilirubin, aspartate transaminase, alanine transaminase and alkaline phosphatase. Gallbladder wall thickness, pericholecystic collection, impacted stone at the neck of gallbladder, contracted gallbladder, operative time, bile spillage, biliary injury, conversion to open procedure, post-operative complications, length of hospital stay were also recorded.

The patients were considered as complicated if they presented with any of the complications of gallstone disease or had a history of complications such as acute cholecystitis, chronic cholecystitis, empyema of the gallbladder, acute pancreatitis, mucocele, perforation, biliary obstruction, acute cholangitis, intestinal obstruction (gallstone ileus).

Informed written consent was taken from the patients. Approval was taken from Institutional Review Committee

of Kathmandu Medical College Teaching Hospital for the study.

RESULTS

One hundred and twenty patients underwent laparoscopic cholecystectomy during the study period. Thirteen patients were excluded from the study. Four procedures were performed by residents under supervision, five patients had single stage endoscopic retrograde cholangiopancreatography and laparoscopic cholecystectomy for cholelithiasis and choledocholithiasis, two had severe chronic obstructive pulmonary disease, and two patients had cirrhosis of liver.

The total patients included in the study were 107. Out of the 107 patients, 85 (79.4%) were female. Eighty-three (77.57%) patients had uncomplicated disease whereas 24(22.42%) patients had the complicated disease. The various complications the patients presented with and its frequency are as shown in the table (Table 1).

Table 1: Presentation of complicated cholelithiasis

Complication	Number	Percentage (out of 107)
CBD Stone	3	2.8%
Pancreatitis	5	4.6%
Empyema	2	1.8%
Cholecystoduodenal Fistula	1	0.9%
Acute Cholecystitis	10	9.3%
Mirizzi Syndrome	1	0.9%
Mucocele	2	1.8%
Total	24	22.4%

Mean age was less in uncomplicated group (39.98±13.918 Vs 52.04±15.928 years, p <0.001). Gender and co-morbidities were comparable between two groups (Table 2).

The patients who came with the gallstone disease had various co-morbidities. Hypertension was the most

Table 2: Comparisons of age, sex and comorbidity distribution between uncomplicated and complicated group

Variable	Uncomplicated group (n=83)	Complicated group (n=24)	P-value
Mean age in years	39.98±13.918	52.04±15.928	<0.001*
Sex	Male	16	0.571#
	Female	67	
Comorbidities Present	19	8	0.300#

*t test, # chi-square test

common condition and was seen in 14(13.08%) patients. Other common co-morbid illnesses were chronic obstructive pulmonary disease and diabetes.

After operation 14 (13.08%) patient required drain placement. Six patients had post-operative complications. All six patients who developed complications belonged to the complicated disease group. Respiratory complication was the most common postoperative complication (Table 3). One patient in the complicated group required conversion to open cholecystectomy due to unclear anatomy. One patient in complicated group developed post-operative bile leak which improved with conservative management.

Table 3: Post-operative complications

	Number	Percentage
None	101	94.3%
Bile Leak	1	0.9%
Respiratory complications	4	3.7%
Port site infection	1	0.9%

The mean post-operative hospital stay in the uncomplicated group was 2.33 days whereas in the complicated group was six days. The mean operative time was 43.23 minutes in the uncomplicated group, whereas it was 70.17 minutes in the complicated group. None of the patients in the uncomplicated group developed post-operative complication (Table: 4).

DISCUSSION

Cholelithiasis is one of the most common diseases in our part of the world. Presentation of the patients varies from incidental disease, symptomatic uncomplicated to complicated disease. Most patients with incidental cholelithiasis remain asymptomatic⁶. Ten percent of patients in five years and 20 % in 10 years develop symptoms at a rate of 1 % to 2 % per year⁷. Once the patients are symptomatic the chance of recurrent symptoms and complications increases⁸. About 20% to 40% of patients have recurrent biliary symptoms after initial biliary colic³. About 14% of patients develop acute cholecystitis, 5% develop biliary pancreatitis and

5% develop common bile duct stones^{5,9,10}. Complicated cholelithiasis usually requires emergency admission and has a longer hospital stay, longer operative time, higher chance of complications and has a higher cost of treatment^{11,12}. The gold standard treatment for both symptomatic and complicated cholelithiasis is laparoscopic cholecystectomy¹¹.

In a study done in India up to 46.1% of patients, who were operated in their institute for cholelithiasis, during the study period, had complicated gallstone disease. Patients included in the same study who had uncomplicated disease were admitted electively (98.1% vs 16.10%), most of them were managed laparoscopically(97.2% vs 62.3%), they had lower incidence of post-operative complications(2.75% vs 16.12%), had shorter length of hospital stay (2 ± 1 vs 9 ± 2 days) and required lower treatment cost(\$77.25 vs. \$192.39)².

In a study done at the University of California, out of 248 patients treated during study period 44% had complications related to cholelithiasis. Patients undergoing cholecystectomy for uncomplicated cholelithiasis had shorter hospital stay (2.1 ± 0.45 vs 5.6 ± 0.59 days) and lesser hospital cost (\$16187±208 vs \$22824±242) as compared to complicated cholelithiasis¹.

In this study, 22.4% of patients presented with complicated cholelithiasis during the study period as compared to 46.1% and 44% in above studies^{1,2}. A mean Post-operative hospital stay of 6 days in the complicated group is comparable to above two studies^{1,2}. Similarly longer mean operative time of 70.17 minutes in our study was comparable to 69 +/- 27 minutes & 81 +/- 32 minutes in other studies^{1,2}.

The post-operative complication rate was found to be 5.6 % (6 in 107 cases) in our study. All cases with postoperative complication belonged to the complicated group. This is comparable to study comparing elective laparoscopic cholecystectomy group with interval cholecystectomy, cholecystectomy during acute cholecystitis and cholecystectomy following percutaneous drainage where complications rates were significantly different among groups¹².

Table 4: Comparisons of Post-operative outcomes between uncomplicated and complicated group

Outcomes	Uncomplicated Cholelithiasis	Complicated Cholelithiasis	p
Post-operative hospital stay (in days)	2.33 ±0.977	6.0±3.923	<0.001*
Operative Time (in minutes)	43.23±17.010	70.17±40.703	<0.001*
Post-operative complications	0	6	-----

*t test

This study did not look into the cost factors associated with uncomplicated and complicated cholelithiasis. However, it can be inferred that the cost of treatment would be higher as seen in other studies in the complicated group because complicated patients had longer operative time, longer hospital stay and higher complication rate.

Early cholecystectomy after biliary colic before any complications of cholelithiasis develops, may be beneficial to the patients because uncomplicated patients have a better outcome in terms of hospital stay, operative time, and complication rate and cost as well.

This study has certain limitations. This is a single center study. The findings of this study may not be generalized. As the researchers are not blinded in this study, performance bias cannot be ruled out.

CONCLUSION

Patients operated for uncomplicated cholelithiasis had a better perioperative outcome in terms of operative duration, post-operative hospital stay and complications rate as compared to patients operated for complicated cholelithiasis.

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