ORIGINAL ARTICLE

Comparison of open versus laparoscopic cholecystectomy for gall stone disease: Our experience at Hayatabad Medical Complex

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Abstract

Objective of study: To compare the "Outcomes of open versus laparoscopic cholecystectomy: Our experinece at Hayatabad medical complex, Peshawar" in the management of gall stone disease

Material and Methods: A randomized clinical trial study performed for the comparison of open and laparoscopic cholecystectomy at department of surgery, Hayatabad Medical Complex (HMC), Peshawar. We recruited 80-patients above the age of 40-years with gall stone disease. Patients were randomised into 2-treatment groups. For all the patients intra-operative cholangiography was done. Operating time, post-operative complications, and length of hospital stay were reported. All the data were entered and analyzed through SPSS version 20. Post-stratification the chi-square test was applied and p-value ≤0.05 considered as significant.

Results: A total of 80-patients were selected for the study, who presented with gall stone disease and were suitable candidates for cholecystectomy. Mean age of group-A was noted 48±2.5 years and group-B reported 51±3.4 years. Gender distribution was found as: group-A contains 22 (55%) male participants and 18 female participant and group-B contains 24 (60%) male participants and 16 female participants. The mean operative time was 75 minutes for Open Cholecystectomy and 86 minutes for Laparoscopic Cholecystectomy, which is statistically significant difference i.e. P<0.001. The statistically significant difference also found in the hospital stay between the group P<.001.

Conclusion: We conclude that laparoscopic cholecystectomy is safer and valid alternate procedure to open cholecystectomy for patients with gall stone disease. Laparoscopic cholecystectomy has low complications rate, shorter hospital stay and provide more comfortable post-operative period as compare to open cholecystectomy.

Keywords: Open cholecystectomy, Laparoscopic cholecystectomy, Chololelithiasis.

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Introduction:

Gall stone disease is very common in world wide and should be treated early to avoid complications like obstructive jaunce, acute pancreatitis, cholangitis and Cancer gall bladder.

Cholecystectomy is always the last resort to treat gall bladder diseases. Indications includes acute cholecyctitis, biliary dyskinesia, gallstones, complications related to common bile duct stones etc. Removing gall bladder from the body requires the procedure to be safe and effective both in terms of treatment and cost.

In old times, cholecystectomy was done by open procedure using two techniques: anterograde or retrograde. It was overthrown by laparoscopic cholecystectomy in late 1980s after a German doctor Prof Dr Med Erich Mühe of Böblingen performed the first laparoscopic cholecystectomy. This Lap cholecyctectomy uses three basic instruments namely, hemoclip, laparoscope, and pistol grip scissors. Small incision, less hospital stay and advanced technology of the procedure made it quickly accepted and applied procedure. Many surgeons still prefer open cholecystectomy over Laparoscopic one in certain conditions.

Different studies have reported less operating time and fewer complications in LC as compared to OC. But they have also shown controversy in situations where LC was converted to OC during the procedure. Studies have also highlighted complications with early or delayed LC. Disparity in data was seen with post-operative morbidity and mortality using LC.

Laparoscopic cholecystectomy is a gold standard treatment for gallbladder diseases. But importance of open cholecystectomy cannot be ignored as different studies have shown conversion of LC to OC for the safe completion of procedure in their studies.

This study aims to compare the effectiveness and efficiency of laparoscopic cholecystectomy with open cholecystetomy for gall stone diseases.

Material and Methods:

The clinical study of 8-months (from January 2019 to August 2019) was performed in department of surgery, Hayatabad Medical Complex (HMC), Peshawar for which the patients were randomized into two groups. Total number of 80-patients was selected and randomization list was produced by computer. The treatment groups were developed, 50% in the open cholecystectomy group and 50% in the laparoscopic cholecystectomy group i.e. 40-patients each group. Based on 0.7 power to recognize a significant difference (P = 0.05).

The selected participants were above the age of 40-years and were suffering from biliary stone disease. Two groups were maded each group contains 40-patients. One group was submitted for open cholecystectomy and one for Laparoscopic cholecytectomy. Informd consent were taken from all patients.

The prophylaxis of antibiotic and anti-thrombotic agent was performed before surgery and also continued for 24 to 48 hours after surgery. Sub-costal incision technique was performed in the patients for open cholecystectomy. Laparoscopic cholecystectomy, the procedure was performed using four port technique.[15] For all the patients intraoperative cholangiography was done. Operating time, post-operative complications, and length of hospital stay were reported.

All the data were entered and analyzed through SPSS version 20. The quantitative variables like age, weight, and post-operative pain score were presented as mean & standard deviation. The qualitative variable like gender, post-operative inflamation and post-operative fever and infection were presented as frequency and percentage. Both groups were compared and P-value<0.05 was considered as significant. Data were stratified for age, gender to see the impact of these on outcome in both groups. Post-stratification the chi-square test was applied and p-value ≤0.05 considered as significant.

Results:

A total of 80-patients were selected for the study, who presented with long term biliary stone diseases and were suitable candidates for open cholecystectomy and laparoscopic cholecystectomy. All of the patints underwent open or laparoscopic cholecystectomy were enrolled and randomly allocated to two treatment groups. The patients included in group-A were operated via open cholecystectomy, while the patients included in group-B, were operated via laparoscopic cholecystectomy. Baseline characteristics were similar in both groups. Mean age of group-A was noted 48±2.5 years and group-B reported 51±3.4 years. Gender distribution was found as: group-A contained 22 (55%) male participants and 18 female participant and group-B contained 24 (60%) male participants and 16 female participants.

The following graph-1 show the mean surgical time in minutes for the procedures

As the graph shows that the mean surgical time was reported 75 mints for Open Cholecystectomy and 86 mints for Laparoscopic Cholecystectomy. The operating time for Open Cholecystectomy ranges from 30 to 160 minutes and for Laparoscpic Cholecystectomy ranges from 30 to

Table 1: *Basic characteristics and operative findings of patients*

Post-operative complications	Cholecystectomy group		χ2	P-value
	LC	OC		
Present	06 (15%)	10 (25%)	6.635	0.01
Absent	34 (85%)	30 (75%)		
Total (80)	40	40		

Table 2:

Post-operative Complication	Open Cholecystectomy group	Laparoscopic Cholecystectomy group
Adynamic ileus	2	1
Biliary fistula	0	1
Pulmonary complications	1	0
Phlebitis	2	2
Allergy	1	0
Foreign body	1	0
Wound infection	1	1
Intra abdominal infection	0	0
Diarrhea	1	1
Intra abdominal bleeding	1	0

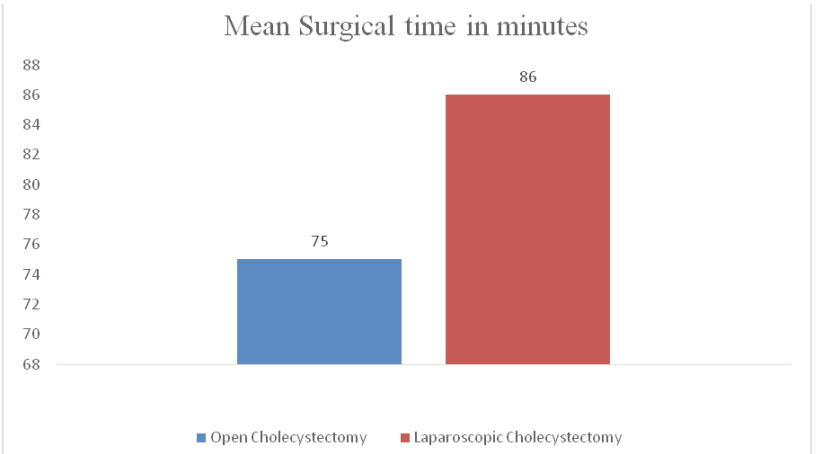

Figure 1: *Mean operation duration in minutes for the procedures*

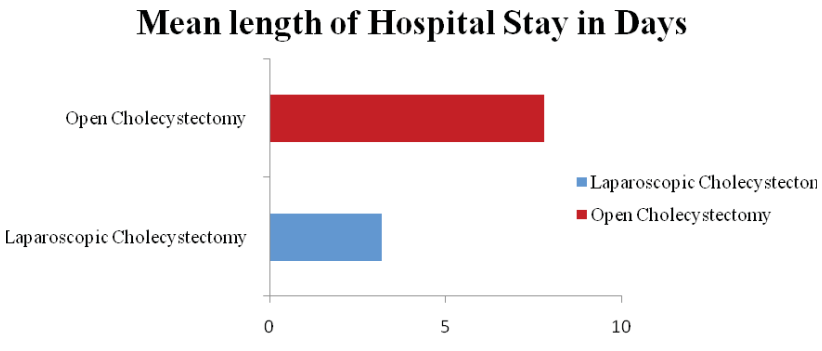

Figure 2: *Mean length of hospital stay for both groups*

175 minutes so the statistical significant difference was reported between the two groups i.e. P<0.001.

The statistically significant difference was noted between the groups after the analysis of post-operative complication as shown in the table 1.

The mean length of hospital stay was also reported between the groups and found as for Laparoscopic Cholecystectomy group it ranged from 1 to 12-days (mean=3.2 days) and for open cholecystectomy group it ranged from 5 to 20 days which mean= 7.8 days. The statistically significant difference also found in the hospital stay between the group P<.001.

The detail of complications of the groups was also noted for the Laparoscopic cholecystectomy and open cholecystectomy as shown in table-2.

Discussion:

This article describes the protocol of a randomized trial of comparing the laparoscopic cholecystectomy and open cholecystectomy for surgical management of gall stone disease.

Laparoscopic cholecystectomy is generally considered a clear alternative of open cholecystectomy for gall stone disease.

The general conses is that laparoscopic cholecystectomy is a better alternative in the management of biliary lithiasis.[16-18]

The operation time noted in this study was significantly longer for the Laparoscopic Cholecystectomy patients P<.01. The reason may be the long learning curve Laparoscopic cholecystectomy needs more technical staff. The complications incidence of this study noted greater in Open Cholecystectomy as compare to Laparoscopic Cholecystectomy.

The study show that the laparoscopic cholecystectomy would be consider safe, valid replacement of open cholecystectomy because it

reported a low rate of complications, required a short hospital stay and provide an individual a more comfortable post-operative time than open cholecystectomy. While another point also noted that the chance of conversion to open cholecystectomy reported low hence it also minimize the complications rate.

The Carl Langenbuch, pioneer of open cholecystectomy reported a very famous statement that "gall bladder should be removed not because it contain stones, but because it forms them".[20] So the purpose of the surgical procedure either open cholecystectomy or laparoscopic cholecystectomy to give relief to the patient through safe and valid procedure. The indications for the surgery are same for both laparoscopic cholecystectomy and open cholecystectomy so the decision can be taken upon the patient comfort, expenses of stay at hospital, better post-operative results and less complications and the expertise of the surgeon. Due to better cosmetic results and reduction of main and early mobilization period most of the patients and surgeons prefer the laparoscopic cholecystectomy as better procedure for management of gall stone disease.[21, 22]

The pain is consider to be an invisible outcome for every surgery and the primary goal of treatment is the early relief from pain. The early relief from pain after surgery was reported in laparoscopic cholecystectomy group as compare to open cholecystectomy which contrast with a study of Shukla A et al, who reported a double longer duration of post-operative pain in open cholecystectomy group as compare to laparoscopic cholecystectomy.[23] Another study also reported that patient treated with open cholecystectomy procedure required more analgesia as compare to laparoscopic cholecystectomy patient.[24] So Laparoscopic procedure requires less analgesia and early mobilitation of the patient that is why it is preferred method by the patient.

The post-operative hospital stay was also access in both procedures. We found less post-operative hospital stay in Laparoscopic Cholecystectomy as compared to Open Cholecystectomy. Our results are comparebale to the results of a study by Karim T et al, who reported that the mean post-operative stay was reported 5.46-days for open cholecystectomy and 3.7 days for laparoscopic cholecystectomy group.[25]

Conclusion:
We conclude that laparoscopic cholecystectomy is safer and valid alternate procedure to open cholecystectomy for patients with gall stone disease. Laparoscopic cholecystectomy has fewer complications, and shorter hospital stay and provide more comfortable post-operative period as compare to open cholecystectomy.

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Role and contribution of authors:
Dr. Saeed Khan, collected the data, references and did initial writeup

Dr. Bakhtiar Ullah, collected the data and helped in discussion writing

Dr. Siddique Ahmad, collected the data and helped in introduction writing

Dr Rizwan Ahmed Khan, collected the data, references and helped in introduction and discussion writing

Dr Muhammad Mussadiq Jafri collected the references and data analysis

Dr. Amir Zeb, critically review the article and made final changes:

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