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Research Article

A Comparative Study between Open Cholecystectomy versus Laparoscopic Cholecystectomy among Patients at a Tertiary Care Centre in North Kashmir

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ABSTRACT
Background: Gall stones are one of the major causes of morbidity and mortality all over the world and cholecystectomy has become a universal standard for treatment of symptomatic cholelithiasis.
Objective: To compare the duration of surgery, complication rates, analgesic use and post-operative hospital stay in laparoscopic cholecystectomy versus open cholecystectomy.
Methods: We retrospectively viewed medical records of 320 cholecystectomised patients (160 Group A patients having undergone laparoscopic cholecystectomy and 160 patients in Group B with open cholecystectomy) who had been operated during a 5 year period from January 2021 to December 2025 in the Department of General Surgery, Govt Medical College Baramulla. The two groups were compared on the basis of duration of surgery, intra and post-operative complications, duration of analgesic use and hospital stay and conclusions were drawn.
Results: Group A patients had a significantly less duration of surgery compared to Group B patients ($p<0.0001$), a significantly lower rate of intra and post-operative complications ($p=0.006$), lower first post-operative day drain output ($p<0.001$) lesser analgesic requirement ($p<0.001$) and lower post-operative hospital stay ($p<0.0001$).
Conclusion: Laparoscopic cholecystectomy is safer and efficacious compared to open cholecystectomy and should be an available option for all patients requiring elective cholecystectomy.

Keywords: Bile Duct Injuries, Open Cholecystectomy, Laparoscopic Cholecystectomy, Cholecystitits.

INTRODUCTION

Cholelithiasis is the commonest biliary pathology affecting females predominantly all over the world[1]. The prevalence of disease varies from 15-25% in U.K, U.S.A and Australia whereas it is rare in Africa involving less than 1% of population[2]. Cholecystectomy (open or laparoscopic) is one of the common operations performed for surgery of such patients. Open cholecystectomy was the gold standard operation for past 100 years and now laparoscopic cholecystectomy is considered as the first option for cholelithiasis[3]. Traditional biliary surgery has thus undergone changes from conventional open one since the introduction of laparoscopy into general practice in 1990 and elective laparoscopic cholecystectomy has almost replaced the open procedure[4].

About 70-80% of cholecystectomies are done laparoscopically whereas 20-30% are still completed by open cholecystectomy; often performed in elderly patients, cardiopulmonary compromised patients and those with complicated gallstones where laparoscopic procedure is not feasible [5]. Laparoscpic cholecystectomy may offer a better option because of the magnification and availability of

newer instrument like Ligasure and Ultrasonic Shears [6-7]. Clinically and financially laparoscopic cholecystectomy has advantages over open cholecystectomy and has become popular alternative to open procedure due to many advantages including shorter operative time, early recovery, short hospital stay, low morbidity, and low cost [8].

This study compared various intra operative and postoperative parameters of the two procedures in 320 patients who have undergone cholecystectomy from January 2021 to December 2025 in Department of General Surgery, Govt. Medical College Baramulla; 160 patients by open cholecystectomy method and 160 by laparoscopic method, in order to assess the better surgical option for patients with cholelithiasis. The criteria to be assessed were intra operative and postoperative complications and duration of hospital stay in 2 groups.

METHODS

This retrospective study was conducted in Department of General Surgery, Govt. Medical College Baramulla from January 2021 to December 2025. We retrospectively viewed medical records of those patients who underwent cholecystectomy during the study period. Among them patients who matched with our inclusion criteria were selected for our study and those having any of the exclusion criteria were rejected. Incomplete and missed data were also removed from analysis. The study population was then divided into two groups named Group A and Group B. Patients subjected to Laparoscopic Cholecystectomy (LC) were grouped in Group A and those subjected to Open Cholecystectomy (OC) were kept in Group B. By this method we selected 320 patients, of which 160 patients underwent laparoscopic cholecystectomy and were placed in Group A, while remaining 160 patients underwent open cholecystectomy and were placed in Group B.

Inclusion Criteria

- Chronic cholecystitis.
- Cholelithiasis
- Mucocoele and empyema of gall bladder.

Exclusion Criteria

- Choledocholithiasis.
- Carcinoma of gall bladder.
- Perforated gall bladder.
- Gangrenous gall bladder.

Data collected for our study population were age, gender, diagnosis, duration of surgery, intra and post-operaive complications, post-operative pain and analgesic use, drain output on 1st post-op day and duration of hospital stay.

Statistical Analysis

Data was presented as actual numbers and percentages, p <0.05 was considered as significant.

RESULTS

The mean age of our study population was 43.42±10.25 years with a range of 23 years to 70 years, median age being 42 years. Mean age of group A was 42.78±12.90, ranged from 23 years to 70 years, median 39 yrs; while mean age of group B was 42.02± 11.67 years with a range between 23 years to 69 years, median 40 years. In group A, 98(61.25%) patients were in age group of 20 to 40 years, 48 patients
(30%) in 41 to 60 years, 56 patients (35%) in 41 to 60 years age group and 18 (11.25%) patients were above 9 years.

Table 1. Time Taken for Surgery in two Study Groups.

Duration of surgery (Minutes)	Group A Number (%)	Group B Number (%)
<60	48 (30.00)	4 (2.50)
60-90	106 (66.25)	20 (12.50)
91-120	6 (3.75	112 (70.00)
>120	0 (0.00)	24 (15.00)
Total	160 (100.00)	160 (100.00)

Table 01 shows that the mean duration of surgery in group A (69.25±14.78 minutes) is significantly less than that of group B (106.18±15.18 minutes).
Among the study population 100 patients (31.25%) were males and 220(68.75%) were females; in group A 52 (32.50%) were males and 108(67.50%) females and in Group B it was 48(30%) males and 112(70%) females.

Table 2. Intra Operative Complications in Two Study Groups.

Complication	Group A Number (%)	Group B Number (%)
Bleeding	6 (3.75)	12 (7.50)
CBD Injury	2 (1.25)	4 (2.50)
Gall Stone Spillage	10 (6.25)	8 (5.00)

In Table 02 we can see that intra operative complications were more in Group B (15%) compared to that in Group A (11.25%), but this is not statistically significant.

Table 3. Post-Operative Complications in Two Study Groups

Complication	Group A Number (%)	Group B Number (%)
Wound Infection	4 (2.5)	16 (10)
Chest Infection	2 (1.25)	8 (5)
Post-operative ileus	4 (2.5)	12 (7.5)

In Table 03 we can see that post-operative complications are more in Group B (22.5%) compared to that in Group A(6.25%), which is statistically significant.

Table 4. First Post-Operative Day Drainage in Two Study Groups

Group	Mean ± SB (ml)	Range (ml)	Median (ml)
A (n=160)	28.47±22.40	0-100	20
B (n=160)	64.95±44.55	0-150	50

Table 04 shows mean drain output on 1st post-operative day in Group A(28.47±22.40ml) is less than that in Group B (64.95±44.55ml) which is statistically significant.

Table 5. Pain Score In Two Study Groups

Pain Score	Group A	Group B
VAS (Grade 0-5)	Grade 2	Grade 4
Range	0-3	1-5

P value<0.001
Table 05 shows average pain score in Group B patients (Grade III) is more than in Group A patients (Grade II) which is statistically significant.

Table 6. Number of Days of Analgesic Use in Two Groups

Duration of Analgesic use	Group A Number (%)	Group B Number (%)
1-2 days	138 (86.25)	14 (8.75)
3-4 days	20(12.50)	96(60.00)
5-7 days	2(1.25)	40(25.00)
>7 days	0(0.00)	10(6.25)
Total	160(100.00)	160(100.00)

Table 06 shows mean duration of analgesic use after operation was much more in Group B(4.37±1.76days) compared to that in Group A(1.63±0.28 days) and this was found to be statistically significant.

Table 7. Duration of Hospital Stay in Two Groups.

Post-operative hospital stay	Group A Number (%)	Group B Number (%)
1 to 3 days	130 (81.25)	0(0.00)
4 to 7 days	30 (18.75)	118(73.75)
More than 7 days	0 (0.00)	42(26.25)
Total	160(100.00)	160(100.00)

Table 07 shows that duration of hospital stay in maximum number (81.25%) of patients in Group A was between 1-3 days and that in majority (73.75%) of patients in Group B was between 4-7days which is a statistically significant difference.

DISCUSSION

Cholelithiasis is a common disease entity. Frequent occurrence and serious complications of cholelithiasis have made this disease as one of the most important surgically correctable diseases [9] .Laproscopic cholescystectomy has significantly changed the treatment of gallstone disease. Although this new technique has been adopted by many practising surgeons, concerns about the incidence of major complications still exist [10]. The morbidity and mortality associated with laparoscopic cholecystectomy should be comparable to open cholecystectomy before it is accepted as a treatment of choice for gallstone disease. Several large published series have reported their experience with laparoscopic cholecystectomy [11-14].

The main sufferers of gall bladder disease in our study were females as compared to males. Out of total 320 cases, 100 cases were males and 220 were females and our findings are similar to those observed by Fraze et al [15] and U. Berggren et al[16]. The reason for the high incidence of cholelithiasis among females could be that pregnancy and child birth have a definitive influence on biliary tract disease, acting by causing biliary stasis as well as weight gain and consequent hypercholesterolemia. Another reason could be the effect of female hormones especially progesterone acting on the gallbladder and reducing motility, causing stasis and thereby promoting gallstone formation.

We also observed that gall bladder disease is more common in third and fourth decade with a mean age of 43.42±10.25 years. Several authors in their studies have come across more or less with similar findings e.g. Dhaigude et al [14] in their study found a mean age of 39.03 years in open and 33.13 years in laparoscopic cholecystectomy with a male: female ratio of 1:0.96 while study by Parambil SM et al[15] revealed mean age as 44±13.33 years and male to female ratio of 1:2.

Our study revealed a shorter mean duration of surgery in patients undergone laparoscopic cholecystectomy i.e Group A (69.25±14.78 minutes) compared to patients who were subjected to open cholecystectomy i.e Group B (106.18±15.18 minutes) and the difference was statistically significant. Study by Waldner H et al[16] revealed that there was no significant difference in duration of surgery in laparoscopic and open cholecystectomy, while studies by Pramod Singh et al[17] (44.7 min versus 72.4 min), Pessaux P et al (103.3 min vs. 149.7 min) Doke A. et al[19] and Jaswant Jain et al[20] found a shorter duration of surgery in laparoscopic cholecystectomy compared to open cholecystectomy which was in agreement with our study. Contrarily studies by Porte RJ et al [21] (75 min vs 55 min) and Lujan JA et al[22] (88 min vs 77 min) have reported a longer duration for laparoscopic compared to open cholecystectomy. This was probably due to surgeons being more conversant with laparoscopic operations (by training, retraining and performing more numbers of laparoscopic surgeries on a daily basis) generally require less time for performing such operations as observed in former group.

Our study revealed that intra-operative and post-operative complications are both more in Group B (15% and 22.5%) compared to that in Group A (11.25% and 6.25%). While this association was found statistically significant (p=0.006) in case of post-operative complications, it was non-significant (p=0.320) in intra-operative group. In case of intra-operative complications, we found out of 18 patients having complication in Group A, 10 had gall stone spillage, 6 had bleeding and two patients had a CBD injury. Post-operative complications were noted in 10 patients of Group A of which 2 had chest infection, 4 had wound infection and 4 had post-operative ileus while 36 patients of Group B had post-operative complications of which 8 patients had chest infection, 16 patients had wound infection and 12 patients had post-operative ileus. These findings can be explained from the fact that a sub costal incision was used in open group presence of which with associated pain inhibits respiratory movements leading to atelectasis and pulmonary infection and hematoma associated with such incision can act as nidus for infection leading to wound infection.

Similar to our study several authors such as Ajay Ganji et al,[23] and Lujan JA et al[22] showed a higher rate of complication in open cholecystectomy group compared to laparoscopic group. Though Lujanja et al[22] found that the association of lesser complications in laparoscopic cholecystectomy

group was not statistically significant (p=0.06) but other authors such as Medeiros AC et al[23] found a statistically significant (p<0.05) lower rate of complications in laparoscopic group compared to open group. Doke A et al[19] showed in their study 28% complication rate in open group compared to 16% in laparoscopic group while Medeiros AC et al[23] found 2.9% complication in laparoscopy group and 5.13% in open group

In this study, the mean drain output on first post-operative day compared among both the groups i.e. Group A and Group B was found to be significantly more in Group B(64.95±44055ml) compared to that in Group A (28.47±22.40ml).

Our study revealed that the mean duration of analgesic use after operation was significantly more in Group B (4.37±1.76 days) compared to that in Group A(1.63±0.82 days). It is further to be noted that 86.25% patients in Group A needed analgesic for only 1 to 2 days.

In our study we also found that post-operative hospital stay was significantly longer in Group B (5.91±1.84 days) compared to that in Group A (2.46±1.36 days) and 81.25% patients in Group A were discharged within 3 days.

Similar to our study results Hardy KJ et al[25] in their study revealed a significantly longer mean hospital stay of 6.5±0.3 days in open cholecystectomy group compared to laparoscopic cholecystectomy group (2±0.2 days). Chan HS et al[26] recorded that laparoscopic cholecystectomy patients require significantly less analgesia (p<0.01) and significantly shorter mean post-operative hospital stay (3.5 days vs 5.9 days). Several other authors like Hendolin HI and Anmol N et al[27- 28] had similar observations.

CONCLUSION

The results of our study support the view that laparoscopic cholecystectomy is a safe and justified replacement for open cholecystectomy. There is a definite learning curve for surgeons who are newly exposed. The complication rates are reduced as the surgeons become more experienced in this procedure to a level comparable with that of open cholecystectomy. The study supports the view that laparoscopic cholecystectomy is safer and efficacious and offers definitive advantages over open cholecystectomy and should be an available option for all patients requiring elective cholecystectomy. Laparoscopic cholecystectomy can be considered the gold standard against which other procedures have to be compared.

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