Original Article

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Laparoscopic Cholecystectomy Versus Small Incision Cholecystectomy in Symptomatic Gallstones Disease

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Abstract

Objective: To compare the results and outcomes of the laparoscopic cholecystectomy (LC) with the small incison cholecystectomy (SIC). Place and Duration of Study: Department of Surgery, SIMS from August 2014 to august 2016. *Methodology:* Patients with symptomatic gallstones that were referred and enrolled in the study for LC or SIC. Operation, anaesthesia, analgesics and postoperative care were standardized. The patients were assessed for operation time, postoperative pain, nausea, vomiting, hospital stay, return to work time and complications in the postoperative period on day 1, 1 week, 1 month and 3 months, postoperatively. *Results:* Of 145 patients, 82 underwent LC and 63 underwent SIC. Both groups were matched for age, gender, BMI, clinical findings and ASA grading. The mean duration of operation was 68 and 58 minutes in the LC and SIC groups, respectively ($p = 0.0059$). Duration of hospital stay and return to regular activities were shorter after LC compared to SIC. Pain scores, nausea and vomiting were the same in both groups, although the frequency of intra-operative complications were greater in LC compared to SIC. *Conclusion:* Outcome and complications of SIC were comparable with those of LC.

Keywords: Gallstone; Laparoscopic Cholecystectomy; Small Incision Cholecystectomy; Complications.

Introduction

Cholecystectomy is a commonly performed surgical procedure for patients suffering from symptomatic gallstones. Open cholecystectomy (OC) was the method of choice for gallbladder surgery for almost a century. Gradually, surgeons opted to perform this operation through smaller incisions and in early 1980's small incison cholecystectomy (SIC), was debuted. Patients undergoing SIC had a quicker recovery and less complications compared to those undergoing conventional OC. Cholecystectomy, using a laparoscope or laparoscopic cholecystectomy (LC), in late 1980's was greatly accepted by patients and employed by surgeons because it left a much smaller scar but further investigation and comparison of the results with those of SIC was not done at the onset. Most studies focused on the comparison of LC and OC and emphasized the better outcome of LC. At present, it is well understood that patients undergoing LC have a better and shorter recovery time compared to those undergoing OC. Some consider LC the method of choice for surgical removal of the gallbladder with stones. However, there is no definite evidence supporting the preference of this method over SIC. Several studies have compared the results of SIC and LC and reported less cost and shorter duration of operation in the SIC procedure compared to LC but the complications, morbidity and mortality were the same in both methods and sometimes even less complications were seen in the SIC group. Patients' quality of life 3 months after surgery was also evaluated in a study done on 257 patients administered with questionnaires. The study showed no significant difference between the two groups. In a review study in 2008, 59 randomized clinical trials and 5,556 patients were evaluated. It was shown that SIC had a shorter duration of operation compared to LC. However, no significant difference was detected between the two groups in terms of hospital stay, rate of switching to

open surgery, complications, morbidity, mortality and postoperative outcome. In a study evaluating the data in Cochrane Library, 56 randomized clinical trials and 5,246 patients were evaluated in three groups OC, SIC and LC which showed similar results and stated that SIC and LC were almost similar in terms of complications and mortality. SICs had significantly lower cost. There is a consensus that the surgical cost of LC is significantly greater than OC and SIC. The aim of the present study was to compare the methods of LC and SIC and evaluate the advantages and disadvantages of each of these procedures.

Methodology

All patients presenting to the outpatient clinic of the study centre suffering from symptomatic gallstones and being candidates for surgery were included in a prospective study. An informed written consent was obtained from all patients. This study was approved by the institute ethics committee. The study was conducted from August 2014 to august 2016. Patients younger than 18 years of age, association with the common bile duct (choledochal) stone, cholangitis, jaundice, pregnancy, moderate to severe systemic disease with ASA (American Society of Anaesthesiology) grading > 2, history of upper abdominal surgery, mental illness, obesity with BMI > 45 kg/m2 and acute cholecystitis were excluded from the study. All patients underwent general anaesthesia. Fascia and skin were sutured similarly in all patients. SIC was performed through an oblique right sub-costal incision. At first, a 5 cm incision was made on the skin and after entering the abdominal cavity, the incision was extanded upto 7-8 cm, if necessary. At the end of surgery and after applying the sutures, the length of incision was measured again using a ruler. If the incision was longer than 8 cm or another procedure had been performed other than the cholecystectomy i.e. common bile duct exploration, the patient was excluded from the study.

Duration of operation was calculated from the moment of surgery until the completion of skin suturing.

Level of pain was determined using the visual analogue scale (VAS) which was performed 24 hours after surgery. Patients had to be NPO for upto 12 hours postoperatively and after that if the patients had no vomiting, a liquid diet was started for them. Tramadol was injected for pain control immediately after transferring the patient to the ward every 6 hours for a total of 2 doses. At the time of discharge from the hospital, patients had oral nutrition, no vomiting and a pain scale of below 4 at rest. Antibiotic was administered at the time of indcution of anaethesia with 1.5 g of intravenous Cefuroxime. After the operation, antibiotic administration continued only if advised by the surgeon. Hospital stay was defined as days of hospitalization due to the cholecystectomy surgery during the 30-day postoperative period. Patients were followed-up one week, 1 month and 3 months after discharge.

Results

A total of 145 patients were enrolled in this study, out of which 82 (56.25%) underwent LC and 63 (43.75%) underwent SIC. Patients were matched in terms of age and gender. The mean age of all patients was 45.8 ± 15.3 years. This variable was 48.3 ± 14.1 years for the SIC and 49.4 ± 16.2 years for the LC group. There were 115 females (79.87%) and 29 males (20.13%). In the SIC group of 63 patients, 49 (77.78%) were females and 14 (22.22%) were males. In the LC group of 81 patients, 66 (81.49%) were females and 15 (18.51%) were males. The mean BMI was 29.8 ± 5.4 kg/m2 in patients. This rate was 27.7 ± 4.3 kg/m2 in the SIC and 29.98 ± 6.8 kg/m2 in the LC group. No statistically significant difference was detected in this respect (p = 0.28).

Patients in both groups were in ASA grades of 1 and 2. Both groups were similar in the normal range in terms of blood cell count and liver enzymes. Ultrasound was performed for all patients and indicated gallstones. No significant difference was detected between the two groups in terms of ultrasound report. The mean duration of operation was 60.6 ± 16.5 minutes in the SIC and 70.3 ± 23.4 minutes in the LC group. Difference between the two groups was statistically significant (p = 0.0059). Excessive bleeding requiring blood transfusion during the operation did not occur in any patient and none of the cases required re-operation in the first 48 hours after surgery. Damage to the bile ducts during surgery was not reported in any group. But a case of trauma to the common bile duct was detected in the follow-up of one case of LC. The mean score of postoperative pain 24 hours after surgery, according to VAS was 5.18.This score was 4.6 ± 1.6 in the SIC and 4.6 ± 1.9 in theLC group (p = 1.00). Incidence of nausea 24 hours aftersurgery was 22.2% in the SIC and 17.3% in the LCgroup (p = 0.84). A total of 2 (3.3%) of patients in the SICand 3 (3.7%) of patients in the LC had vomiting (p = 0.09).The mean duration of hospital stay was 2.9 ± 0.5 days inthe SIC and 2.4

± 1.1 days in the LC group (p = 0.001).Time to return to regular daily activity was 3.39 ± 1.8days in the LC and 9.54 ± 2.6 days in the SIC group(p = 0.0001). In the follow-ups, 2 patients after LC presented with abdominal pain, nausea, vomiting and jaundice in the first. One patient in the LC andone patient in the SIC group developed wound infection. Cardiovascular complications or morbidity and mortality did not occur in any patient.

Discussion

This study shares many similarities with other studies. However, some differences were observed which are described as follows: Gallstone disease is more prevalent among women and obese individuals. In this study, the mean BMI of patients was 28.8 kg/m2. This rate was reported to be 27.3 kg/m2 by Ros, 27.5 kg/m2by Keus and 23.4 kg/m2 by Watanapa. These show patients suffering from gallstones are usually overweight. Another point noticed in this study is the duration of operation. This duration was shorter in SIC group compared to LC. The results obtained by Ros and Keusare also in accordance with this very finding indicating that the duration of operation in SIC is 12 – 14 minutes shorter than that of LC (SIC = 94 minutes and LC = 108minutes, SIC = 60 minutes and LC = 72 minutes,respectively. In all studies, SIC had a shorter duration compared to LC and this is a definite advantage of SIC over LC. In some areas, the LC technique seems advantageous and its plus points carry more weight than those of SIC. In this study, patients in LC group had a shorter hospital stay which was in agreement with Ros. In general, most studies reported shorter hospitalizations in LCgroup. Some studies reported similar hospitalizations in both groups of LC and SIC. Although Keusand McGine stated hospital stay was shorter in SIC group (3.7 versus 4.1 days), this difference was not statistically significant. In this study, patients in LC group resumed their regular daily activities significantly sooner than those in SIC group. This finding was in accordance with those of Rosand Keus. Most studies found similar results although LC is morecostly. As for other complications, statistically significant differences between these two methods were not observed. There is always a higher risk of trauma to the bile ducts during the operation in LCtechnique. In this study, there was one case of trauma to the bile ducts in LC group. Ros reported higher incidence of trauma and complications during theoperation in LC group. Keus reported 5 cases of surgical complication in LC and 3 cases in SIC group.Therefore, a higher frequency of complications is more likely to occur in LC.Postoperation pain, 24 hours after the surgery, was not significantly different in the two groups. However, the highest frequency and the mean pain score were greater in SIC group. In Ros study, level of pain 24 and 48 hours after the operation was greater in the SIC group.2 In this study, two groups had no difference in terms of nauseaand vomiting postoperatively; though, Squirrel reported higher prevalence of vomiting in LC group.3 No mortality occurred in either group. Similar studies did not report any mortalities either; however, mortality has been reported to be 0.1% in LC.

Conclusion

Final outcome and surgical complications of SIC are comparable with those of LC. It can be recommended to use SIC in the educational hospitals as the method of choice for most of the patients. LC may be confined to those who need to return to work more quickly or young patients for whom aesthetics is an important concern.

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