Comparison of Early Outcomes in Patients Undergoing Open versus Laparoscopic Cholecystectomy

BILAL MEHMOOD, SIDRA ANWAR WAQAR, HAFIZ MUHAMMAD NAEEM

ABSTRACT

Aim: To compare early post-operative outcome in patients undergoing open and laparoscopic cholecystectomy.

Methods: This randomized clinical trial was conducted in Holy Family Hospital Rawalpindi. We included 50 patients in this study from Jan-2017 to May-2017. We made two equal groups of patients. Group I (n=25) was allotted for open cholecystectomy (OC), Group II (n=25); was allotted for Laparoscopic cholecystectomy (LC). Development of surgical wound infection and hospital stay was recorded in all patients.

Results: Mean age of study participants was 41.0±12.93 years in open cholecystectomy (OC) group and 42.52±2.04 years in laparoscopic cholecystectomy group (LC). There was female dominance, with 68% females in OC group and 72% in LC group. Surgical site infections occurred in 3(12%) patients in OC group and there was no incidence of infection in LC group (p-value 0.07). Hospital stay was also prolonged in OC group as compared to LC group. Hospital stay was 6.44±3.76 days in OC group and 3.48±2.06 in LC group (p-value 0.001).

Conclusion: Clinical outcomes (in terms of post-operative hospital stay and post-operative wound infection) is better in patients treated with laparoscopic cholecystectomy as compared to the patients treated with open cholecystectomy.

Keywords: Cholecystitis, open cholecystectomy, laparoscopic cholecystectomy.

INTRODUCTION

Gall stones is a common biliary disease, it is found predominantly in female population all over the world. Prevalence of this disease varies from 15 to 25% in USA, UK and Australia to only 1% in African population. The prevalence of gall stone disease in Pakistani population is about 15 percent.

Cholecystectomy is the treatment of choice for symptomatic gallstones because it removes the organ responsible for the formation of gallstones and the complications that arise from it. Open or Laparoscopic Cholecystectomy is used for the surgical removal of gallstones. The 1st open cholecystectomy was performed by Carl August Langerbatch in 1882, after that it remained the treatment of choice for up to 100 years until the laparoscopic cholecystectomy technique was developed in 1990. Since the introduction of laparoscopy in general practice the treatment of gallstones has shifted from open cholecystectomy to laparoscopic cholecystectomy.

Laparoscopic cholecystectomy has many advantages over open cholecystectomy both clinically and financially and now has become a popular treatment of choice over open cholecystectomy because of its short operative time, low morbidity, and shorter hospital stay and hence reduced cost. Many researchers have shown clear benefits of laparoscopic cholecystectomy over open cholecystectomy regarding intra-operative, and post-operative morbidity.

However both these procedures are well tolerated by the patients but wound infection has remained the commonest post-operative complication in both of these procedures. It not only increases the hospital stay but also increases the cost of treatment and can led to the development of septicemia and in the long run development of incisional hernia. Talpur et al found shorter hospital stay time 3.02±1.75 days in patients who underwent laparoscopic cholecystectomy as compared to patients who underwent open cholecystectomy 5.56±2.98 days. In this study the incidence of wound infection was 6.5% in open cholecystectomy group and 0.00% in laparoscopic cholecystectomy group.

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wound infections and hospital stay in patients undergoing surgical removal of gallstones in a tertiary care hospital.

The objective of the study was to compare early post-operative outcome in patients undergoing open and laparoscopic cholecystectomy.

**METHODS**

This randomized clinical trial was conducted in Holy Family Hospital Rawalpindi. We included 50 patients in this study from Jan-2017 to May-2017. All patients with diagnosis of symptomatic gallstones, having duration of cholelithiasis ≤1 years, age 20-60 years, both male and female were included in this study. Patients having previous history of cholecystectomy, pregnant females, who have underwent other major abdominal procedures e.g. surgeries involving liver, kidney or stomach were excluded from study. We made two equal groups of patients. Group I (n=25): was allotted for open cholecystectomy (OC), Group II (n=25): was allotted for laparoscopic cholecystectomy (LC). Sample size for this study was calculated by taking mean duration of hospital stay 5.56±2.98 days in open cholecystectomy versus 3.02±1.75 days in laparoscopic cholecystectomy group, and taking α 0.05 and power of the test 95%. The calculated sample size was 36 patients. Nevertheless, we included 50 patients in this study.

Both procedures were performed according to departmental protocols in supervision of senior consultant. I.V ceftriaxone was given to all patients thirty minutes before surgery. Antibiotic cover was also given for 5 days after surgery. Development of surgical wound infection and hospital stay was recorded. The development of purulent discharge at the surgical incision site (detected on routine post-operative examination) either from the superficial incisional or deep incisional surgical site after surgery within the hospital stay period or within seven days after surgery was considered as surgical wound infection. The time from the day of surgery to the day of discharge of patients from the hospital will be taken as hospital stay time.

Data analysis was carried out using SPSS v20.0. Independent sample t-test was used for comparison of hospital stay. While Chi square test was used for the comparison of surgical wound infections between the groups.

**RESULTS**

Mean age of study participants was 41.0±12.93 years in open cholecystectomy (OC) group and 42.52±2.04 years in laparoscopic cholecystectomy group (LC). There was female dominance, with 68.0% females in OC group and 72% in LC group. In OC group, 36% patients were presented with acute cholecystitis and 64% presented with chronic cholecystitis. In LC group, 28.0% patients presented with acute cholecystitis and 72% with chronic cholecystitis (Table 1).

Surgical site infections occurred in 3 (12%) patients in OC group and there was no incidence of infection in LC group (p-value 0.07). Hospital stay was also prolonged in OC group as compared to LC group. Hospital stay was 6.44±3.76 days in OC group and 3.48±2.06 in LC group (p-value 0.001).

**Table 1: Baseline Characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Open Cholecystectomy (OC)</th>
<th>Laparoscopic Cholecystectomy (LC)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>41.0±12.93</td>
<td>42.52±2.04</td>
<td>0.41</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8 (32.0%)</td>
<td>7 (28.0%)</td>
<td>0.76</td>
</tr>
<tr>
<td>Female</td>
<td>17 (68.0%)</td>
<td>18 (72.0%)</td>
<td></td>
</tr>
<tr>
<td><strong>Clinical Presentation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Cholecystitis</td>
<td>9 (36.0%)</td>
<td>7 (28.0%)</td>
<td>0.54</td>
</tr>
<tr>
<td>Chronic Cholecystitis</td>
<td>16 (64.0%)</td>
<td>18 (72.0%)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Comparison of Surgical Wound infections and Hospital Stay.**

<table>
<thead>
<tr>
<th></th>
<th>Open Cholecystectomy (OC)</th>
<th>Laparoscopic Cholecystectomy (LC)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surgical Wound Infection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (12.0%)</td>
<td>0 (0.0%)</td>
<td>0.07</td>
</tr>
<tr>
<td>No</td>
<td>22 (88.0%)</td>
<td>25 (100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Hospital Stay</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>6.44</td>
<td>3.48</td>
<td>0.001</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>3.76</td>
<td>2.06</td>
<td></td>
</tr>
</tbody>
</table>

P-value<0.05 is significant.
DISCUSSION

Choledolithiasis has now become a common disease, its frequent incident and adverse complications have made it one of the most common surgically treated diseases. Laparoscopic cholecystectomy has considerably improved the treatment of gallstones. Although many practicing surgeons have adopted LC, however concern about the incidence of major complications associated with LC still exists. The complication rate of LC should be comparable to OC to adopt it as a preferred treatment for choledolithiasis.

In our study were female number was high as compared to males. Out of total 50 cases, 35(70%) cases were females, this rate is comparable to those observed by Frazeet al. and Berggren et al. Ahmed et al. and Talpur et al. also found female predominance in patients who were treated for gallstones. The reason for high incidence of choledolithiasis in females could be that pregnancy and labor affect biliary tract illness, acting by causal stasis and in addition weight pick up and resulting hypercholesterolemia. Another reason could be the impact of female hormones i.e., estrogen and progesterone, particularly progesterone following up on the gallbladder and diminishing motility, causing stasis and accordingly advancing gallstone arrangement.

Post-surgery wound infection is a noteworthy entanglement after surgery of gallstones either by OC or by LC. Patients with wound contamination present with fluctuating degrees of stomach pain, with or without indications of peritoneal aggravation, nausea, retching, or anorexia and sometimes with empyema or non-recuperating fistulae. In view of the non-particular nature of side effects, these manifestations present side effects of other more typical pathologies that are difficult to diagnose by history and physical examination alone. Abcess formation has been accounted to occur within 4 days to upto 10 years after LC surgery. Hematoma associated with a large incision can act as a culture media for infection thereby leading to wound contamination and its accompanying complications e.g., wound dehiscence, delayed wound healing or incisional hernia.

In our study, wound infection occurred in 12% patients in OC group and in 0.0% patients in LC group. In the study of Ahmed et al post-operative wound infection was found in 6.0% patients in LC and in OC group wound infection was found in 22% patients. Siddiqui et al. observed wound infection 2.0% and 6% patients respectively in LC and OC. El-Hieronymos et al. also found wound infection 1.8% and 18.2% respectively in OC and groups. In another study by Williams et al. post-operative chest infection and wound infection was found in 12% and 7% patients in open cholecystectomy. Solanki et al. reported post-operative wound infection rate of 5.5% and 13.5% in laparoscopic versus open cholecystectomy group respectively. El-Awad et al. found wound infection 1.8% in LC group and 18.2% OC group.

The total period of hospital stay in our study was around 3.5 days for the laparoscopic cholecystectomy group and around 6.5 days in the open group. Early discharge of a patient from the hospital has encouraging effects on the patient as it decreases the recovery period and also supports in early return to work and avoids nosocomial infections. Early discharge also minimizes the hospital costs. Studies by Barkun et al. Assiaiet al. Majeed et al. and Kivilvoto et al. have showed a much shorter hospital stay in both groups in patients who underwent laparoscopic cholecystectomy as compared to the open cholecystectomy group.

CONCLUSION

Clinical outcomes (in terms of post-operative hospital stay and post-operative wound infection) is better in patients treated with laparoscopic cholecystectomy as compared to the patients treated with open cholecystectomy.

REFERENCES

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