Laparoscopic Cholecystectomy: A Retrospective Four-Year Study

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1. Background

Open cholecystectomy surgery was considered as the gold standard treatment for cholecystectomy, which is mainly due to improved results of laparoscopic surgery compared to the open surgery, and its cosmetic benefits. Today, laparoscopic cholecystectomy is considered as the gold standard treatment for cholecystectomy, which is mainly due to improved results of laparoscopic surgery compared to the open surgery, and its cosmetic benefits. Recently, with improvements in medical technology, there is a tendency to perform minimally invasive surgeries. For example, Csikesz et al. compared the results of open and laparoscopic cholecystectomy in a retrospective study in approximately one million patients with acute cholecystitis during 2000 - 2005 and concluded that laparoscopic cholecystectomy has lower morbidity and mortality even in circumstances of acute cholecystitis (6). Early laparoscopic cholecystectomy is suggested as a safe procedure during acute phase of cholecystitis (7, 8).

2. Objectives

To our knowledge there are a few studies evaluating the complications of laparoscopic cholecystectomy in our region, so we performed this study to review and analyze the results of this procedure in our institution.

3. Patients and Methods

This is a retrospective cross-sectional descriptive study.
We reviewed the medical records of 500 patients undergoing laparoscopic cholecystectomies with diagnosis of symptomatic cholelithiasis and acute calculus cholecystitis from 2004 to 2008 in three educational hospitals of Mashhad university of medical sciences.

They ranged in age from 20 to 86 years and had no evidence of biliary obstruction or dilatation of the bile duct. Patients with gallstone complications (cholecystitis associated with jaundice or pancreatitis), history of previous abdominal surgery, and symptoms of bile duct stone in physical examination or paraclinic studies were excluded from the study.

Collected data included age, sex, operative time, hospitalization time, postoperative complications and mortality rate. The interval between insertion of the first trocar and repair of the last trocar was considered as the operative time. All patients underwent four-port laparoscopic cholecystectomy.

For statistical analysis, descriptive statistics was used and data was analyzed using SPSS software version 21.0. To evaluate the association between the variables and sex, the Chi-square and the Fisher’s exact test were used. P ≤ 0.05 was considered statistically significant.

4. Results

Out of 500 patients, 391 patients (78.2%) were women and 109 (21.8%) were men with the mean age of 47 ± 10 (range of 20 - 86) years. Most patients (24.6%) were in the sixth decade of life. All procedures were done by the same surgical team.

The mean operative time was 70 ± 8 minutes. The length of hospital stay was less than two days in 430 patients (86%) and more than two days in 70 (14%) of patients (mean of 1.6 ± 1.8 days).

Eighteen patients (3.6%) had complications related to biliary system including two cases (11.1%) of choledochal injury, which were treated with hepaticojejunostomy and 16 cases (88.9%) of bile leakage from the cystic duct stump, which were improved by endoscopic retrograde cholangiopancreatography and sphincterotomy. Surgical site bleeding occurred in 11 patients (2.2%), which was controlled by laparoscopic procedure in nine (81.8%) and led to conversion to laparotomy in two cases (18.2%). For the management of these complications, 15 patients (3.0%) required laparotomy. Surgical site infection occurred in 17 patients (3.4%), which was treated with percutaneous drainage or antibiotic therapy (Table 1).

In a three-year follow-up period, six patients (1.2%) developed incisional hernia in the trocar site, and two patients (0.4%) died because of sepsis and cholangitis. Fifty-two patients (10.4%) had postoperative complications.

Table 1. Frequency and Distribution of Complications a

<table>
<thead>
<tr>
<th>Complications</th>
<th>Percent in Complications</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choledochal Injury</td>
<td>2 (3.85)</td>
<td>Laparotomy</td>
</tr>
<tr>
<td>Bile Leakage</td>
<td>16 (30.77)</td>
<td>Laparotomy-ERCP</td>
</tr>
<tr>
<td>Bleeding</td>
<td>11 (21.15)</td>
<td>Laparoscopic control-Laparotomy</td>
</tr>
<tr>
<td>Surgical Site Infection</td>
<td>17 (32.69)</td>
<td>Percutaneous Drainage</td>
</tr>
<tr>
<td>Hernia</td>
<td>6 (11.54)</td>
<td>Hernia Repair</td>
</tr>
<tr>
<td>52</td>
<td>Total percent = 10.40</td>
<td></td>
</tr>
</tbody>
</table>

a Data are presented as No. (%).

5. Discussion

Laparoscopic cholecystectomy is the method of choice for treatment of symptomatic gallstone disease. Although there are many documented advantages for laparoscopic surgery in different studies, but there are still concerns about its possible complications. However, in comparison to open surgery, laparoscopic surgery accounts for less morbidity and mortality (4).

In this study, we investigated the results of laparoscopic cholecystectomy in 500 cases of cholelithiasis. Our results showed that most patients were women, with female/male ratio of 3.6, which is consistent with the results of other studies (2.5 to 5.25) (9-12).

In our study, mean age of the patients was 47 years, which is relatively similar to other studies (7, 10, 11, 13). However, some studies reported a range of 35 - 40 years (14).

Although it is recommended that patients be supervised for at least 24 hours postoperatively to observe early possible complications, some studies showed that laparoscopic surgery can safely be performed as one-day surgery, if there is no evidence of peri-operative compli-
cations (15, 16). In this study the mean length of hospitalization was 1.6 days, which was comparable with the similar studies (1 - 4 days) (6, 7, 11-13, 17-19). Some factors can influence the operative time, such as acute phase of cholecystitis, higher BMI level, previous upper abdominal surgery, male gender, and surgical expertise. In this study, the mean operative time was 70 minutes, which was fair compared with other studies. Similar studies have reported different mean operative time ranging from 61 minutes to 149 minutes (7, 12, 18, 20).

The prevalence of common bile duct injury following laparoscopic surgery is higher than open cholecystectomy and can result to catastrophic postoperative morbidity and mortality.

This complication is related to several factors, such as misidentification of biliary anatomy, complicated cholelithiasis, and lower experience of laparoscopic techniques (21).

In our study, bile duct injury in form of choledochal transection occurred in two patients (0.4%), which was treated with hepaticojejunostomy. These results were similar to results of other studies (0.16 to 1%) (11, 22-29).

There is a low risk of surgical site infection in laparoscopic cholecystectomy, because of smaller wound size and less tissue trauma. Similar to other studies, we had a surgical site infection rate of about 3.4% in our patients. Some conditions, such as gallbladder perforation or using suction drain in circumstances of complicated cholecystitis, and decreasing the conversions to open (21).

Uncontrolled bleeding, intra-operative bile duct injury, bile leakage, and dense adhesions are the main causes of conversion to open surgery. In our study, most of intra-operative arterial injuries were managed laparoscopically and there was rare need to convert to open surgery because of severe uncontrolled bleeding (2 cases, 0.4%).

In overall, we had to perform laparotomy for management of complications in 15 patients (3%), which seemed to be acceptable compared with other results reported by similar studies (1.95 - 13%) (6, 7, 11, 25, 30).

There is a low risk of surgical site infection in laparoscopic cholecystectomy, because of smaller wound size and less tissue trauma. Similar to other studies, we had a surgical site infection rate of about 3.4% in our patients. Some conditions, such as gallbladder perforation or using suction drain in circumstances of acute cholecystitis or doing endoscopic retrograde cholangiopancreatography can increase the risk of postoperative infection (31, 32).

Totally, complications occurred in 52 (10.4%) of our patients. In different studies, it is reported between 5 to 12% (11, 13, 18, 25).

Regarding mortality, in this series there were two (0.4%) cases of deaths because of cholangitis and sepsis. Similar studies have reported mortality rate of 0 to 1% (7, 11, 24, 27, 33, 34).

Our study showed that laparoscopic cholecystectomy, as a minimally invasive technique, is associated with favorable results for patients, high success rate, less postoperative pain and ileus, shorter hospitalization time, improved cosmetics, and faster return to normal life compared to open surgery. Of course, if this technique is performed by more experienced surgeons and appropriate patient selection, the rate of morbidity and mortality may decrease in patients undergoing this procedure. We recommend performing further studies on methods of controlling complications of laparoscopic cholecystectomy.

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Authors’ Contributions
Study concept and design: Mohammad Taghi Rajabi Mashhadi, Abbas Abdollahi, and Reza Rezaee. Acquisition of data and Statistical analysis: Mohammad Taghi Rajabi Mashhadi, Abbas Abdollahi, and Alireza Tavassoli. Analysis and interpretation of data: Mohammad Taghi Rajabi Mashhadi, Azadeh Jabbari Nooghabi and Reza Rezaee. Drafting of the manuscript: Mohammad Taghi Rajabi Mashhadi, Abbas Abdollahi, Azadeh Jabbari Nooghabi and Reza Rezaee. Critical revision of the manuscript for important intellectual content: Mohammad Taghi Rajabi Mashhadi, Abbas Abdollahi, Alireza Tavassoli, Azadeh Jabbari Nooghabi and Reza Rezaee. Administrative, technical, and material support: Mohammad Taghi Rajabi Mashhadi Study supervision: Abbas Abdollahi.

References


