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Original Article

Outcomes of Laparoscopic Cholecystectomy in Geriatric Population☆

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SUMMARY

Background: Cholelithiasis is one of the most common surgical diseases associated with aging. Although laparoscopic cholecystectomy (LC) is the best treatment modality for the symptomatic cholelithiasis, its safety in geriatric population is still controversial. The aim was to evaluate the outcomes of LC in geriatric patients, in comparison to youngers.

Methods: A total of 1298 patients who underwent elective or emergent LC for gallbladder stone were included in this study. Patients were divided into two main groups: Group 1 (18–64 years old) and Group 2 (≥65 years old). The outcomes of LC between the age groups was compared with each other.

Results: There were 1027 (79.1%) patients in Group 1 and 271 patients (20.9%) in Group 2. Older age group had higher Charlson comorbidity index (CCI) score ($p < 0.001$), higher ASA scores ($p < 0.001$), longer operating time ($p = 0.007$), and longer hospitalization time ($p < 0.001$) than youngers. The majority of patients (86%) were discharged within the first two postoperative days. Age ≥65 years ($p < 0.001$), CCI score ($p = 0.004$), ASA score ($p = 0.024$), and postoperative complication ($p < 0.001$) were independent factors of prolonged hospitalization (≥3 days). Conversion rates were similar between the groups. Presence of acute cholecystitis ($p < 0.001$) and intraoperative complication ($p < 0.001$) were found to be independent factors of conversion.

Conclusion: This study showed that LC can be safely performed in elderly patients, without any significant increase in perioperative morbidity. Presence of acute cholecystitis is the main factor of conversion in all ages. Therefore, surgeons should be more careful in such patients.

1. Introduction

The ratio of elderly individuals among whole population has an increasing trend in Turkey, as observed in most parts of the world. This rapid increase in life expectancy also leads to several social, cultural, and economic problems. It is well known that most of health problems are directly associated with aging. Cholelithiasis is one of the best known diseases among those, and its incidence reaches up to 20% in elderly[1,2]. It is fact that all surgical interventions are believed to be more frequently related to increased perioperative morbidity and mortality rates in elderly individuals than in younger population, due to several reasons such as limited functional reserves and accompanying chronic diseases. Besides, laparoscopic procedures also carry additional risks to this population because of its negatively effects on respiratory and circulatory systems[3]. Although laparoscopic cholecystectomy (LC) is the best treatment modality for the symptomatic cholelithiasis, its safety in geriatric population is still a controversial issue.

In this study, we aimed to evaluate the outcomes of LC in patients aged 65 and over, in comparison to younger patients.

2. Materials and methods

2.1. Patients and study design

A total of 1298 patients who underwent elective or emergent LC for gallbladder stone between January 2011 and August 2016 were included in this study. Ethical approval and informed consent were not required due to the retrospective nature of the study. Patients were divided into two groups: Group 1 (patients aged 18 to 64 years) and Group 2 (patients aged ≥65 years).

☆ Conflict of interest: The authors declare that there is no potential financial or non-financial conflicts of interest.

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The following parameters were obtained from the medical records of the patients: age, gender, coexisting chronic diseases, The American Society of Anesthesiologists (ASA) score, elective (gallstones without acute inflammation) or emergency (acute cholecystitis) surgery, operating time, conversion to open cholecystectomy, intraoperative complications (abdominal haemmorrhagia, common bile duct injury, and adjacent organ injury), postoperative complications (atelectasis, pneumonia, postoperative ichterus, intraabdominal abscess, intraabdominal bleeding, angina pectoris, arrhythmia, acute renal failure, and pulmonary emboli), and duration of hospitalization (from operation to discharge). Patients who had simultaneous common bile duct stone detected by preoperative imaging methods and those who had elevated serum levels of bilirubin or other obstructive hepatic enzymes were excluded from the study.

Comorbidity was evaluated using Charlson comorbidity Index (CCI)[4]. All postoperative complications were determined according to the Clavien-Dindo classification, and complications graded as III to V were defined as major[5].

Results obtained from groups were compared amongst each other. A standard four-port technique was used in all patients. All operations were performed by the same surgical team.

2.2. Statistical analysis

The Statistical package for social science (SPSS 23.0 IL-Chicago-USA) was used for data analyses. The results were presented as mean ± SD/percentages for continuous variables and number/percentage for categorical variables. Differences between the groups were determined by Chi-square ($\chi 2$) test, Fisher's Exact test and Mann Whitney U test. Multivariate analysis (Binary logistic regression test) was used to determine independent factors of conversion. Significance level was accepted as $p < 0.05$.

3. Results

Among the 1334 patients who had undergone LC, 36 cases were excluded from the study due to lack of regular medical records, thus data of 1298 patients (mean age 48.6 ± 15.9 years, range 18–89) were analyzed. Of those patients, 1027 (79.1%) were between ages 18 and 64, with a mean age of 42. 8 years (Group 1) whereas 271 patients (20.9%) were 65 or older, with a mean age of 70.4 years (Group 2). There were 918 (70.7%) females and 380 (29.3%) males. Eighty-nine (6.9%) patients had at least one co-existing systemic disease. The majority of operations (89.2%) were performed on an elective basis whereas 10.8% of the operations were performed for acute cholecystitis.

Eighteen (1.5%) patients developed intraoperative complication, of whom 10 had intraperitoneal bleeding, 4 had bile duct injury, and 4 had adjacent organ injury. Postoperative complication was found in 56 (4.2%) cases. Atelectasis (17 cases) was the most common postoperative complication. The others were postoperative jaundice (11 cases), bile leakage (9 cases), intraperitoneal bleeding (7 cases), intraabdominal fluid collection/abscess (4 cases), urine retantion (4 cases), pneumonia (2 cases), and angina pectoris (1 case), acute renal failure (1 case), and pulmonary embolism (1 case). Intraoperative cholangiography was performed in two patients who had enlarged common bile duct intraoperatively. Those cholangiographies were normal. Of the 11 patients with postoperative jaundice two were in older age group, and ERCP was performed for those. Among other nine patients, only two underwent ERCP. Bilirubin levels returned to normal values within a few days in the remaining 7 patients. Postoperative pancreatitis was not observed in any patient. No mortality was observed during the postoperative period. Gallbladder adenocarcinoma was detected in two patients (one in younger group and one in older group). The other patients had benign pathological findings.

The two groups were compared with each other in terms of all clinical and operative characteristics (Table 1). The patients in Group 2 had higher CCI score ($p < 0.001$) and higher ASA score ($p < 0.001$) than those in Group 1. Operating time was also higher in older age group than in youngers ($p = 0.007$). There were no significant differences in sex distribution, elective/emergency setting, conversion rate, and intra-and postoperative complications between the two groups.

Duration of hospitalization was significantly longer in patients of Group 2 compared with patients in Group 1 ($p < 0.001$). The majority of patients were discharged on the 1st (59%) or 2nd (27%) postoperative day. Univariate analysis showed that age ≥65 years ($p < 0.001$), presence of acute cholecystitis ($p < 0.001$), CCI score ($p < 0.001$), ASA score ($p < 0.001$), operating time ($p = 0.037$), intraoperative complication ($p = 0.002$), postoperative

Table 1
The comparison of clinical and operative findings between patients <65 and ≥ 65 years.

Characteristics	Group 1 (n = 1027)	Group 2 (n = 271)	p
Gender			0.063
Female	746 (72.6%)	172 (63.5%)	
Male	281 (27.4%)	99 (36.5%)	
CCI score	0.48 ± 0.6 (0–3)	2.8 ± 0.8 (2–6)	**<0.001**
Type of surgery			0.136
Emergeny	104 (10.1%)	36 (13.3%)	
Elective	923 (89.9%)	235 (86.7%)	
ASA score			**<0.001**
ASA 1–2	998 (97.2%)	206 (76%)	
ASA 3–4	29 (2.8%)	65 (24%)	
Operating time (min)	63.15 ± 29.1 (15–305)	66.6 ± 25.9 (25–210)	**0.007**
Intraoperative complication			0.469
Absent	1013 (98.7%)	266 (98.2%)	
Present	13 (1.3%)	5 (1.8%)	
Conversion to open surgery	30 (2.9%)	7 (2.6%)	0.766
Postoperative complication*			0.921
Minor	29 (65.9%)	8 (70%)	
Major	15 (34.1%)	4 (30%)	
Hospitalization time (d)	1.5 ± 1.7 (1–29)	3.3 ± 2.8 (1–24)	**<0.001**

Operating time, Charlson comorbidity index, and hospitalization time were presented as mean ± standard deviation (minimum-maximum); other variables were presented as number (%). CCI: Charlson comorbidity index, min: minute, d: day.
Bold values indicate $p < 0.05$.
*Postoperative complications classified as minör and major according to the Clavien-Dindo Classification.

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