

Outcomes of Laparoscopic Cholecystectomy in Octogenarians

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ABSTRACT

Background and Objectives: Extremely elderly patients usually present with complicated gallstone disease and are less likely to undergo definitive treatment. The purpose of this study was to evaluate the results of laparoscopic cholecystectomy in octogenarians, with an interest in patients presenting initially with complicated gallstone disease and pancreatitis who underwent laparoscopic cholecystectomy during the same hospitalization.

Methods: Data for 42 patients ≥ 80 years who underwent an elective laparoscopic cholecystectomy between January 2007 and August 2011 were retrospectively reviewed. Indications for the procedure were stratified into 2 groups: Outpatients, who were admitted electively to undergo cholecystectomy, and Inpatients, who came to our Emergency Room due to complicated biliary diseases. Data analysis included age, sex, ASA score, conversion to open surgery, time spent under general anesthesia, and length of hospital stay.

Results: Mean age was 83.9 years; 19 (45.2%) were men. Thirteen patients (30.9%) were in the outpatient group, and 13 (30.9%) had a preoperative ASA of 3. Fourteen patients (33.3%) needed ICU. Two patients (4.8%) had their surgery converted. There were 7 (16.7%) postoperative complications, all of them classified as Dindo-Clavien I or II. No differences were noted between groups regarding conversion rates or complications. We had no mortalities in this series. There was no difference in hospital length of stay between the groups.

Conclusion: Laparoscopic cholecystectomy in the extremely elderly is safe, with acceptable morbidity. Patients with complicated gallstone disease seem not to have worse postoperative outcomes once the initial diagnosis is

properly treated and would benefit from definitive therapy during the same hospitalization.

Key Words: Laparoscopic cholecystectomy, Elderly, Gallstone disease, Octogenarians.

INTRODUCTION

Gallstone disease is the most common indication for abdominal surgery in the United States (US). The prevalence of gallstones increases with age in nearly all populations and in both sexes with related prevalence of gallstones among older persons from 20% to 30%, reaching 80% for institutionalized patients older than 90.¹⁻³ The population is steadily aging in Western countries, and the most rapidly growing segment of the US society is composed of individuals older than 65 years of age. Census estimates suggest that the percentage of elderly persons in the US will rise from 12.8% in 1995 to 16.5% over the next 25 years.⁴ Although they currently comprise only one-eighth of the population, the elderly already account for nearly one-third of surgical patients.⁵

Several studies have indicated that gallbladder disease in elderly patients often has a high risk of acute cholecystitis, biliary tract disease, increased mortality, and a longer hospital stay, compared with the disease in younger patients.^{6,7}

The majority of studies concerning elderly patients included individuals over 65 or 70 years of age; however, the population at greatest risk for adverse surgical outcomes is the extremely elderly, or those individuals age 80 years and older.⁸⁻¹⁰

It is well documented that elderly patients are less likely to be treated than their younger counterparts. Up to 30% of older patients do not undergo any therapeutic intervention, and many surgeons tend to be more conservative when managing older patients.^{11,12} Adherence to current recommendations for the management of mild gallstone pancreatitis is low in older patients, and a recent study suggests that more than 40% of geriatric patients who did not undergo cholecystectomy would have benefited from

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early definitive therapy.^{13,14} Moreover, some recent studies demonstrate age as a predictor of functional changes but not complications,^{15,16} although it was recently found to be an independent predictive factor for conversion.¹⁷ The purpose of this study, therefore, was to evaluate the results of programmed laparoscopic cholecystectomy in octogenarians, with special interest in patients presenting initially with complicated gallstone disease and pancreatitis who underwent laparoscopic cholecystectomy during the same hospitalization.

METHODS

Between January 2007 and August 2011, we performed 1138 laparoscopic cholecystectomies (LC). Forty-eight patients (4.2%) were 80 years or older. Six patients were excluded because cholecystectomy was indicated as urgent. Data from these 42 patients who underwent an elective laparoscopic cholecystectomy were reviewed retrospectively in medical charts and constitute the scope of this study.

Indications for the procedure were stratified into 2 groups: Outpatients, who were admitted electively to undergo LC, and Inpatients, who came to our Emergency Room due to complicated biliary diseases (recurrent colic and obstructive jaundice), or acute biliary pancreatitis. The second group of patients had their initial condition properly investigated and/or treated and then underwent LC during the same hospitalization.

The following patient data were recorded: age, sex, American Society of Anesthesiologists (ASA) classification, cardiopulmonary comorbidities, and the surgical indication. We documented the number and rates of conversions to open surgery, length of time spent under general anesthesia, postoperative length of stay in an Intensive Care Unit (ICU), and length of hospital stay. No deaths occurred in this series, and postoperative complications were classified based on Clavien and Dindo classification.¹⁸

Preoperative endoscopic retrograde cholangiopancreatography (ERCP) was done in all patients with a diagnosis of common bile duct stones confirmed by magnetic resonance cholangiopancreatography. Intraoperative cholangiography (IOC) was performed if the patient had a history of complicated biliary disease, acute pancreatitis, or laboratory findings suggesting common bile duct stones. LC was performed using a standard 4-port technique by the senior resident always under the supervision of an experienced surgeon. Differences between groups for categorical variables were

determined by χ^2 and Fisher's exact tests, and ordinal variables were compared using the Student *t* test. Statistical significance was considered $P < .05$.

RESULTS

Forty-two patients older than 80 years underwent LC for all diagnoses other than acute cholecystitis. Mean age was 83.9 years (range, 80 to 90); there were 19 (45.2%) men and 23 women. Thirteen patients (30.9%) were in the outpatient group (**Table 1**). According to ASA classification, 2 (4.8%) were ASA I, 27 (64.3%) were ASA II, and 13 (30.9%) were ASA III patients. Cardiopulmonary comorbidities were present in 31 (73.8%) patients. Time spent under general anesthesia ranged from 25 minutes to 240 minutes, with a mean of 114.2 minutes. Although the outpatient group had a shorter operating time (109 ± 34 minutes vs. 117 ± 23 minutes), it had no statistical difference ($P = .70$). IOC was performed in 24 (57.1%) patients and was responsible for a significant increase on the duration of the procedures (133 ± 23 minutes vs. 89.6 ± 23.3 minutes, $P = .01$). Two patients underwent cholecystectomy and another surgical procedure due to associated pathologies. The first one was an 85-year-old woman presenting with symptomatic alkaline gastritis due to a previous gastrectomy with Billroth II gastrojejunal anastomosis (operating time of 240 minutes, uneventful postoperative period, discharged home on the fifth postoperative day). The second patient had a large squamous cell carcinoma of the superior lip and underwent resection with simultaneous reparative surgery (operating time of 155 minutes, uneventful postoperative period, discharged home on the first postoperative day).

Fourteen patients (33.3%) needed ICU, 10 of them were in the inpatient group ($P = .27$). Median length of stay in the ICU for the entire series was 1.35 days (range, 1 to 4), and there was no difference between groups (**Table 2**). Two patients (4.8%) from group 2 had their surgery converted

Table 1.
Patients' Diagnoses

Preoperative Diagnosis	No.	%
Outpatients		
Cholelithiasis	13	30.9%
Inpatients		
Recurrent Biliary Colic	4	9.5%
Choledocolithiasis	10	23.8%
Treated Biliary Acute Pancreatitis	15	35.7%

from LC to open procedures (P=.65). Reason for conversion in both patients was the surgeon's preference to perform an open choledoco-duodenostomy once ICO demonstrated multiple common bile duct stones associated with common bile duct dilatation >1.8cm.

There were 7 (16.7%) postoperative complications, all of them classified as Dindo-Clavien I or II. Two patients had cardiac complications (atrial fibrillation and bradycardia), and 1 patient presented with biliary leakage in the first postoperative day that spontaneously closed. Other complications were vomiting (2 patients), high arterial hypertension needing medication, and umbilical-trocar site infection. Complications were not related to indications (P=.35) or ASA category. We had no deaths in this series of patients during the study period. Comparative results

between inpatient and outpatient groups are summarized in **Table 2**. Finally, there was no difference in hospital length of stay between inpatients and outpatients, 2.8±0.7 vs 1.9±1.1 (P=.19).

DISCUSSION

Biliary tract disorders are one of the most common reasons for surgery in older patients. Fifty percent of women and 16% of men >70 years of age have been shown to have gallbladder disease.^{19,20} As the average age of the population continues to rise, the number of elderly patients with symptomatic gallstones is likely to increase.^{4,5} Advanced age is frequently associated with significant comorbidity and limited functional reserve, which may be related to a higher rate of complications, and longer hospital length of stay. Among elderly patients, those who are ≥80 years (usually called extremely elderly) have the worst outcomes and may be seen as a different group. Kuy et al¹ have shown that patients aged ≥80 years were >3 times more likely to need blood transfusions and to require continuous mechanical ventilation and >5 times more likely to develop aspiration pneumonitis.

The incidence of choledocholithiasis rises with age, with rates as high as 43% in patients older than 80 years.⁷ The extremely elderly frequently present with several biliary diagnoses and complicated gallstone disease, which explains the higher rates of conversion, complications, and mortality usually seen in this group^{6,7,16,19-22} (**Table 3**). A previous randomized controlled trial comparing open cholecystectomy with endoscopic management of symptomatic choledocholithiasis supported operative interven-

Table 2.

Comparison Between Inpatient and Outpatient Groups

	Inpatient	Outpatient	
ASA			P=.28
1-2	20 (68.9%)	9 (69.2%)	
≥3	9 (31.1%)	4 (30.8%)	
Operating Time (minutes)	117 ±23	109 ±34	P=.70
Conversion	2 (6.9%)	0 (0%)	P=.65
PO in Intensive Care Unit	10 (34.5%)	4 (30.8%)	P=.55
ICU Stay (days)	1.5 ±0.6	1	P=.34
Postoperative hospital stay (days)	2.8 ±0.7	1.9 ±1.1	P=.19
Postoperative complications	5 (17.2%)	2 (15.4%)	P=0.35

Table 3.

Comparative Results from Published Reports

Author/year	N° patients	Male (%)	ASA ≥3 (%)	Complicated gallstone disease (%)	Acute cholecystitis (%)	Conversion rate (%)	Complication	Mortality
Brunt, 2001 ⁷	70	36%	61%	19%	7.1%	15.7%	29%	2.8%
Bingener, 2003 ¹⁹	49	63%	–	22%	9.5%	10.2%	17.3%	2.0%
Hazzan, 2003 ²⁰	67	46%	57%	34.3%	22%	7.4%	18%	0%
Tambyraja, 2004 ²¹	117	32.5%	–	23%	24%	5%	22%	0.8%
Pavlidis, 2008 ⁶	21	42.8%	52.4%	28.6%	8.1%	19%	14.3%	0%
Kim, 2009 ¹⁶	35	37.1%	20%	11.4%	–	5.7%	5.7%	0%
Yetkin, 2009 ²²	11	55.5%	81.8%	–	45.5%	27.2%	36.4%	0%
Kuy, 2011 ^{1, *}	–	38.5%	–	25.3%	–	12.3%	38.3%	3.2%
Current study	42	45.2%	30.9%	69%	0%	4.8%	16.7%	0%

*Administrative database.

tion in high-risk patients.²³ In a randomized controlled trial comparing an expectant policy with LC following endoscopic clearance of bile duct stones, 47% of patients in the expectantly managed cohort developed at least one recurrent biliary event during follow-up.²⁴

Recent studies have confirmed the reluctance to operate on extremely elderly patients,²⁵ probably due to a greater percentage of complicated diseases,^{20–22} and a greater comorbid disease burden.^{6,20,22} However, the implications of this conservative behavior in the management of gallstone disease in the extremely elderly may not benefit patients. Trust et al¹⁴ recently demonstrated that recurrent gallstone pancreatitis was the reason for readmission in 48% of 3689 elderly patients who did not undergo definitive therapy after an episode of mild acute gallstone pancreatitis; 33% required subsequent cholecystectomy, and most of the time surgery was performed during hospital readmission for gallstone-related complications, which was associated with a higher mortality (2.4% vs 0.9%). Moreover, because perioperative outcomes in the elderly seem to be influenced by the severity of gallbladder disease instead of chronological age, because LC after mild acute gallstone pancreatitis performed during the same hospitalization is not associated with worse outcomes, and because cholecystectomy provides the only definitive therapy, reducing the risk of recurrent gallstone pancreatitis to almost zero,^{26,27} our data support the idea that during the management of gallstone pancreatitis in the elderly definitive treatment during the same hospitalization must be the goal to be achieved.

Although some authors have shown respiratory complications as the most common postoperative morbidity in elderly patients undergoing LC²¹ and it has been reported that the use of low-pressure insufflation may further preserve respiratory function,²⁸ we had a low rate of complications despite the fact that patients spent a long time under general anesthesia. This can be partially explained by the fact that as a teaching hospital the senior resident performed all surgeries and the absence in our service of a low-pressure pneumoperitoneum policy in high-risk patients. These results are consistent with those of previous works that did not show additional risks in high-risk patients when pneumoperitoneum was induced with 10mm Hg to 12mm Hg pressure in patients with ASA 3 or 4, and it seems to be true even for >1-hour long procedures.^{22,29}

Our study has shown a lower conversion rate (4.8%) compared to previously published studies (**Table 3**). It may be partially explained by the fact that we did not

include cholecystectomies performed for acute cholecystitis. However, as a teaching hospital, all surgeries were performed by the senior resident under supervision, and this fact seems not to have changed outcomes and corroborates what has been demonstrated by others.³⁰ Similarly, we had a shorter postoperative length of stay for both groups (inpatient: 2.8 ± 0.7 vs 1.9 ± 1.1 , $P = .19$), which can be explained by our low complication rate (16.7%) and the absence in this series of complications classified as Clavien-Dindo ≥ 3 . Our data reinforce that the management of gallstone disease in octogenarians should not be different from current guidelines for the management of acute gallstone pancreatitis or complicated biliary disease, which means that elderly patients would benefit from definitive therapy during the same hospitalization to prevent recurrent episodes.

CONCLUSION

LC in the extremely elderly is safe, with acceptable morbidity. Additional support for the benefit of the laparoscopic approach is demonstrated in the decreased length of hospital stay. Patients with complicated gallstone disease seem not to have worse postoperative outcomes once the initial diagnosis is properly treated would benefit from definitive therapy during the same hospitalization.

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