



Original research

Is day-surgery laparoscopic cholecystectomy contraindicated in the elderly? Results from a retrospective study and literature review



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ABSTRACT

Background and aim: Ideally, day-surgery laparoscopic cholecystectomy (DLC) combines patient satisfaction with cost-effectiveness. However, DLC has not yet been widely applied in the elderly. Thus, to challenge the current perception of DLC as a contraindication, several parameters were investigated for the feasibility of DLC within the general and elderly population. A retrospective study was conducted to analyse age, along with other relevant patient characteristics, as factors leading to successful 24-h discharge.

Methods: Data were collected from 207 patients who underwent laparoscopic cholecystectomy (LC) between 2010 and 2013. Of these patients, 154 were aged <75 years and 53 > 75 years, with a median age of 59.3 years. Comparisons of the length of post-surgical hospital stay were made. Further, the parameters influencing the surgeon's decision to discharge patients within a 24-h period were investigated: demographic data; patient characteristics such as age, sex and concomitant diseases; disease presentation; surgical experience; intraoperative complications; and post-operative course. The numbers of hospital readmissions and reoperations were established as parameters of failure.

Results: Forty-five (21.7%) patients remained hospitalized up to 24 h. The majority of them had no comorbidities, low American Society of Anesthesiologists (ASA) grades, adenomas and uncomplicated gallstone disease. Eleven patients were aged >75 years. None of the patients died, whereas one patient was readmitted following DLC.

Considerations: Age itself did not prove to be a contraindication for DLC. The patient's general health, disease presentation and the surgeon's attitude were the main factors favouring early discharge. Patient selection and patient-care facilities were crucial for successful outcomes. Some problems due to the logistical organization of the hospital and the surgical approach, which may impede DLC acceptance, are described herein.

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1. Introduction

Laparoscopic cholecystectomy (LC) has emerged as the global gold-standard treatment for biliary lithiasis due to its excellent outcomes. Based on their initial experiences with LC, surgeons have become increasingly confident of discharging patients of all ages

early, which saves considerable financial and human resources and allows faster patient recovery. Minimally invasive surgery is ideal for day-case procedures as the reduced trauma facilitates faster patient recovery with minimal nursing assistance. Ambulatory LC has spontaneously evolved as the next step of patient management. Surgeons and hospital administrators prefer LC as it combines patient satisfaction with cost-effectiveness [1–4]. Amongst the factors influencing successful outcomes of day-surgery laparoscopic cholecystectomy (DLC), we focus on patient age, based on our experience and because of the current longer life expectancy and improved outcomes of geriatric surgery.

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2. Materials and methods

A total of 207 LC patients operated on from January 2010 to December 2013 were retrospectively analysed. The clinical data were compiled from clinical records. Patients who underwent open cholecystectomy, minilaparotomy, single-incision laparoscopic surgery (SILS) or other procedures, including hernioplasty and appendectomy, associated with LC were excluded from our study. All surgeons adopted a standard four-port technique with open cannulation using a 10-mm port through a sub-umbilical incision and three further ports (one 10-mm port and two 5-mm ports). This was performed under laparoscopic vision using French, American or our own modified techniques [5]. The intra-abdominal pressure was maintained below 12 mmHg. Careful saline lavage and suction were performed at the end of each procedure.

The length of hospital stay was compared between patients. In particular, the following specific parameters influencing the surgeon's decision to discharge the patient within 24 h were studied:

- Patient profile: age; sex; gallbladder disease including adenomas, gallstones, complicated gallstones (acute cholecystitis and acute pancreatitis) and gallstones in the bile duct; presence of co-morbidities; American Society of Anesthesiologists (ASA) grade; receptiveness to early discharge; and patients' travel distance (<or >50 km from the hospital or living on an island)
- Surgeon: trainee or experienced (>100 LCs already performed)
- Intraoperative complications: vascular lesions, biliary injuries, injuries from trocars and conversion to laparotomy.

The parameters of patients discharged <24 h and >24 h following LC were compared. Statistical analyses were performed using a specialized software package (StataIC11, Excel, PHStats vers. 3.5). Data were analysed using analysis of variance (ANOVA) for categorical (polytomous) variables and z-test for binary variables, adjusted chi-squared test and the Tukey–Kramer test for multiple comparisons, with the significance level set at p -value ≤ 0.05 .

At discharge, either the patients themselves or their relatives were given the telephone numbers of the clinic if they needed to contact a specialized nurse or surgeon. The first follow-up visit was scheduled on the second, and then sixth or seventh day, from discharge.

The numbers of hospital readmissions and reoperations were established as parameters of failure.

3. Results

3.1. Overall series

Of the 207 patients (75 men and 132 women) included in the study, 154 were aged <75 years and 53 > 75 years, with a median age of 59.3 years (range 19–84). LC was performed for various conditions affecting the gallbladder, predominantly gallstones causing pain (122 patients, 58.9%) followed by complicated diseases (60, 28.9%), adenomas (9) and concomitant main biliary duct stones (16). Forty-eight patients (23.2%) had no co-morbidities, but 69 (33.3%) and 90 (43.5%) patients presented one or more concomitant disease. The ASA grades were as follows: 51 patients with ASA I, 87 with II and 67 with III. Only two LCs were performed in patients with ASA IV grade. The travel distance to clinics was <50 km for almost all patients, except for 19 patients, who lived >50 km away or on a surrounding island.

A total of 189 LCs were performed by experienced surgeons and 18 LCs by surgical trainees. Four out of 207 patients (1.9%) developed major intraoperative complications: two with biliary lesions and two with haemorrhage from the port sites. Conversion was

performed in six patients (2.9%): two to open surgery for biliary lesions, two due to technical difficulties with the dissection or identification of the elements and the rest to laparotomy due to respiratory failure after induction of the pneumoperitoneum and the presence of a gangrenous perforated gallbladder with diffuse biliary peritonitis. No mortality was reported.

Three patients (1.4%) were readmitted. Of these, two presented with pain and vomiting and were successfully treated. The third patient presented with biliary peritonitis on the fourth day after LC as the clips had slipped off the cystic duct stump. The patient was readmitted for a laparotomy.

3.2. DLC series

Out of 207 (21.7%) patients, 45 patients (15 men and 30 women, with a median age of 52.8 years (range 19–79)) were discharged within 24 h. Further, 34 out of 154 patients (21.7%) and 11 out of 53 patients (20.7%) were aged <75 and >75 years, respectively.

Eight out of nine (88.8%) patients with adenomas were discharged within 24 h. Uncomplicated gallstone disease allowed early discharge in 37 out of 122 patients (30.3%). DLC was not performed in patients with an acute presentation and/or lithiasis of the main biliary duct. The majority of patients who underwent DLC (35 out of 45, 77.7%) had no co-morbidities, who accounted for 72.9% of all 48 patients without concomitant diseases. DLC was performed in 10 (14.5%) out of 69 patients with one or more co-morbidities. The patients undergoing DLC also presented lower ASA grades: 36 with ASA I and 9 with ASA II. Forty-four out of 45 DLCs were performed by experienced surgeons. Nine patients refused to be discharged within 24 h from surgery because they did not have an adult caregiver at home or due to general fears of post-surgical complications. The comparison of these parameters between patients discharged <24 h and >24 h is summarized in Table 1.

No difference in gender and sex was noted, whereas the ASA grades ($p < 0.0001$), absence of concomitant diseases ($p < 0.0001$), disease presentation (adenomyomas and uncomplicated gallstone disease) ($p < 0.0001$) and distance from the hospital ($p < 0.0001$) differed significantly. Patients with intraoperative complications were not discharged within 24 h. All DLC patients living within 50 km or on an island were discharged within 24 h.

Only one patient discharged within 24 h returned to the hospital because of abdominal pain on the second day from discharge. Investigations were unremarkable, and no abnormalities were found in the ultrasound and laboratory tests during readmission. The readmitted patient stayed only 2 days in the hospital.

4. Discussion

LC has been accepted by surgeons and patients the world over as a standard procedure. Based on their initial experiences with LC, surgeons have become increasingly confident of discharging patients early, with a median total hospital stay of 8.8 days reported for open cholecystectomy versus 2.7 days for LC [6,7]. Following the first report of ambulatory LC by Reddick and Olsen in 1990 [8], the number of patients opting for DLC has increased exponentially. In England, the Royal College of Surgeons recommended the following selection criteria for DLC at the preliminary outpatient visit [9]: age <70 years, ASA grades I/II, body mass index (BMI) <35, biliary colic, no history of jaundice, and high patient motivation. Since then, the outcomes of geriatric surgery have improved significantly; moreover, this has also led to a change in the perceived age limit for DLC.

The medical literature cites various terms used to describe DLC procedure, including ambulatory surgery, day surgery, day case, same-day surgery, one-day surgery, office-based ambulatory

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