

## Feasibility of Day Care Laparoscopic Cholecystectomy in District Hospital

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### Abstract

**Aim:** Laparoscopic cholecystectomy (LC) is the most common minimally invasive surgery. However, Day case LC is not a common practice. The aim of this study was to evaluate the safety, feasibility, benefits (advantage of cost effectiveness) and safety of laparoscopic cholecystectomy as a day case procedure in our hospital.

**Method:** Patients less than 65 years who were graded I and II on the American Society of Anaesthesiologists physical status score, living within 15 km, and willing to return to hospital in case of problems were selected for DCL. 80 Patients who had received laparoscopic cholecystectomy for gallbladder stones were included in this study. Standard four port Laparoscopic cholecystectomies were performed by an experienced surgeon under general anaesthesia. They were admitted and operated on in the morning hours and discharged after 6 to 8 hours. Follow up was done by patients calling the hospital the morning after surgery. Prerequisites for same-day discharge after 6-8 hours of monitoring were: ability to tolerate oral feeds; ability to pass urine spontaneously; and ability to ambulate.

**Result:** Three hundred laparoscopic cholecystectomies were performed in day care surgery from January 2010 to December 2015. Of eighty patients were selected for day care surgery, out of which 65 (81.25%) were female & 15(18.75%) male with mean age of 37.9 yrs. Seventy Five (93.75) patients were discharged on the same day whereas 5(6.25%) stayed overnight, there were no readmissions. No significant perioperative complications were noted. Unplanned admission and readmission rate was 12 (15%), respectively. All twelve patients (15%) were discharged the next day. 5 of the patients (6.25%) who underwent DS LC successfully were readmitted on a later date. They were successfully treated. Causes of overnight stay included excessive post operative nausea & vomiting in 5(6.25%). Analysis of results showed that the inclusion and discharge criteria were valid and that the readmission and complication rates as well as the ease and accuracy of follow up were comparable to published data. DCLC reduced waiting times and increased patient turnover and may have a positive impact on resident training.

**Conclusion:** These results suggest that laparoscopic cholecystectomy can be routinely performed as a day-case procedure. DCLC is safe, feasible, and has potential benefits for a developing country. Each surgical service needs to develop their own guidelines based on local patient demography.

**Keywords:** Cholecystectomy; Postoperative nausea and vomiting; Day Care Laparoscopic Cholecystectomy (DCLC); Day-care surgery; Laparoscopic Surgery (LC)

## Introduction

Primary aim of day care surgery is to provide convenience to the patients by avoiding hospitalization without compromising the patient's safety [1]. Patient satisfaction and cost effectiveness were highly attractive to surgeons [2, 3]. Several published studies have testified to the safety and feasibility of day care laparoscopic cholecystectomy (DCLC) [4, 5].

In United-States or Canada the concept of day-case laparoscopic cholecystectomy has already been widely acknowledged, with recent reports focusing less on feasibility but rather on the possibility to apply wider patients inclusion criteria. But in Europe, the treatment of symptomatic cholelithiasis on an outpatient basis is still infrequent. The reported safety of laparoscopic cholecystectomy cannot therefore be generally extrapolated to surgical practice everywhere [6]. Surgeons in developing countries have usually been unenthusiastic to advocate day care surgery because of major resource disparity and inequity in quality of health care delivery. There have been only few attempts either to study the feasibility and safety of DCLC in these countries or to define practicable recruitment criteria and determinants of acceptable outcomes of day care surgery. Consequently, there have been only few attempts to study the feasibility and safety of DCLC in these countries. This study was conducted to describe the practice of developing DCLC in a district health care hospital of a developing country without a free standing facility or department for day care surgery and its successful incorporation into the regular surgical services.

## Materials and Methods

From January 2010 to December 2015, day-case cholecystectomy was performed for symptomatic gallbladder stone diseases. Besides a physical examination, investigation included complete blood counts, liver function tests (gamma-glutamyl transferase, alkaline phosphatase, and transaminases), ultrasonography of the gallbladder and the bile ducts. Inclusion criterion were, age 65 years, American Society of Anaesthesiologists (ASA) physical status score 9 grade I and II (patients with good control of their diabetes, chronic bronchitis, and hypertension were included), patients residing within 15 km of the hospital,

ability to understand instructions (this necessarily included the post-surgery primary care giver, patients who agreed to the procedure offered, patients living with a responsible adult.

All the patients included in the study were admitted one hour before surgery and operated on the morning list. Surgeries were performed by an experienced surgeon through four trocars. Operations were performed under general anaesthesia. Patients were given ceftriaxone 1g intravenously at the start of the procedure. The patients were anaesthetized with fentanyl 0.1-0.2 µg/kg and thiopentone 5 mg/kg or propofol 2.5 mg/kg. Intraoperative analgesia was maintained with boluses of fentanyl (0.25-0.5 µg/kg). All the ports were infiltrated with local anaesthetic to minimise postoperative wound pain.

Having adequate pain control, passed urine, and oral feeding was started with a liquid diet. Patients were encouraged to get up 4-6 h after surgery. Analgesia included acetaminophen 500 mg, and oxycodone HCL 5 mg for 3 days. In case of postoperative nausea and/or vomiting 0.5 mg/kg of metoclopramide or 4 mg ondansetron for persisting symptoms.

Before discharge, all patients were given 50 mg diclofenac intramuscularly. Telephone numbers of the ward, the resident on call. It was mandatory for the patient to attend the OPD on next morning for examination and removal of drain if present.

## Results

A total of 80 pts were included in this study. Sixty Five (81.25%) were female & 15(18.75%) male with mean age of 37.9yrs age range 19-60 years. Total number of Symptomatic gallstones was 70 (87.5%) and asymptomatic gallstones were 10 (12.5%). Among these 80 patients there were 60 (75%) ASA- I patients and 20 (25% were ASA-II risk. The mean waiting times for Cholecystectomy procedure was 29 days (SD 7.6, range 7-59 days). There were no conversions to open cholecystectomy or any operative complications. Of the 80 patients, 55 (68.75%) patients were discharged within 2-6 hours of the operation (median 5 hours).

Remaining patients were discharged within next 3-4 hours. All the 80 patients had personal cell phones at home. The mean operative time was  $25 \pm 14.5$  SD min. Five patients (6.25%) were readmitted three to five days later with pain and abdominal distension. All the five patients responded to conservative management and were discharged 12-72 hours after readmission.

In the postoperative follow-up at one week, one patient presented with jaundice. And was subsequently diagnosed to have a retained stone in the common bile duct, although her preoperative liver function test and imaging did not suggest any ductal obstruction. Stone was treated endoscopically.

Twenty seven (33.75%) patients telephoned the hospital for what they thought was nonspecific pain. The symptoms in all the cases were assessed as not serious by the surgeon who took the call. All the patients were well at follow up.

## Discussion

Day care surgery means economy in any health care system [7, 8]. Day case LC has now become routine practice in the USA as well as many centres in Europe [8]. Extrapolation of the same published experience is potentially unsafe because poor and unacceptable outcomes have been reported [10, 11]. This practice may be difficult to implement in economically deprived countries due to low literacy rates, lack of reliable and efficient transport, absence of organised referral patterns, underdeveloped primary health care services, and absence of community nursing. DCLS is now considered safe and feasible procedure, as demonstrated in our study which is likely to show increasing popularity among both patients and surgeons. Most authors agree that DC LS offers many advantages as compared with inpatient LC especially in a country with very limited resources.

All the eighty patients met the criteria for eligibility in our study. In a study by Bal et al. [14] Eighty two percent of patients met the criteria for eligibility. As we conducted this study in a district hospital where most people live in about 15-20 km area. There have been only few studies on assessing the feasibility and safety of day-care laparoscopic surgery at district level hospitals. Absence of safe guidelines and little published experience of day care surgery from developing countries until recently have been the main reasons for not formulating guidelines of day care laparoscopic cholecystectomy. Existing experience relates to practice in private health care centres where facilities are in accordance with published western guidelines [12]. Pilot studies have demonstrated a 4 to 6 hours observation interval to be sufficient to detect early complications [13]. Day case LC was advocated to have a high success rate of 95% in selected patients. Young patients without biliary complications were usually selected to receive day case LC. A centre without much infrastructure and prior experience

and to support major day care surgery needs to evolve logical guidelines [14]. All the eighty selected patients were successfully discharged thus supposedly validating our enrolment criteria. Our results are comparable with those reported by authors like Lille Moe, and Stephenson et al. [15] ninety two percent of patients were successfully discharged [15] thus superficially validating our recruitment criteria. And with the experience reported in the literature [4, 5].

Many authors like Ammori et al. [16] and Vuilleumier et al. [17] have suggested that careful patient selection helps to increase the success rate of day care surgery [16, 17]. The central aspect in the development of safe day case surgery program is the criteria for patient's selection in terms of ASA status, biliary anatomy, operative time, intra and post - operative pain control. Robinsons et al. [18] reported their experience in a public academic institution have achieved outpatient LC in 70% of an unselected patients and they have identified [18]. ASA classification, procedural duration and surgery start time as factor associated with failure of outpatient management.

Some authors like Reddick et al. [19] and Mandhan et al. [20] have come to the conclusion that appropriate patients selection lowers failure rate and patients most likely to fulfil the criteria of day care LC, who have an anesthetic preoperative classification of ASA grade I or II, with no previous abdominal surgery no history of acute cholecystitis and a procedural duration of shorter than 90 min [21, 22]. Our univariate analysis results confirmed that patients with age less than 60 years, ASA class 2 or below, and uncomplicated gallstones were suitable for outpatient LC.

The success rate (100%) in our study is more than reported by Chok and Ammori [23, 24] with a success rate of 86%-95% and re-admission rate of 1.5%-8%. Postoperative nausea and vomiting (PONV) remained a frequent reason for unplanned admission after ambulatory LC [25]. Best possible control of postoperative pain, nausea or vomiting is key to enhancing the outcome of day care LC. This requires of standard protocols to diminish postoperative symptoms of pain, nausea or vomiting. Avoiding the use of volatile anaesthetic agents and the under use of opioids in the postoperative period minimises the post operative nausea and vomiting (PONV). Ondansetron and cyclizine were chose as effective antiemetic in reducing postoperative nausea or vomiting [26].

To conclude patient selection has a major impact on the success rate of a day-case LC program. Our results confirmed that LC as a day care procedure is safe with high success rate in carefully selected patients with uncomplicated symptomatic gallbladder disease. It has the advantage of cost effectiveness and decreases the bed occupancy rate in hospital with limited resources. Better management of PONV and postoperative pain could further improve the success rate.

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