Feasibility and safety of day surgery laparoscopic cholecystectomy in a university hospital using a standard clinical pathway

Chang S K Y, Tan W B

ABSTRACT

Introduction: Laparoscopic cholecystectomy is currently the treatment of choice for symptomatic gallstone disease. In recent years, there has been a trend towards outpatient cholecystectomy. The aim of our study was to report on our experience with day surgery laparoscopic cholecystectomy and to assess its feasibility and safety.

Methods: Data on all the patients who underwent day surgery laparoscopic cholecystectomy between February 2006 and December 2006 were collected. They all had symptomatic cholelithiasis proven on imaging or had previous history of biliary pancreatitis or cholangitis with normalisation of liver function test and imagery clearance of the common duct. The patients' biographical data (age, gender, American Society of Anaesthesiology [ASA] status, medical comorbidities) and surgical outcomes were then obtained. The success rate of day surgery laparoscopic cholecystectomy, reasons for overnight admission and re-admission rate were evaluated.

Results: A total of 50 patients were included in our study. The success rate for day surgery laparoscopic cholecystectomy was 92 percent. The patients who failed day surgery procedure are mostly of an older age group with high ASA grading. Reasons for admission for these patients included persistent abdominal pain and postoperative emesis. Our re-admission rate was four percent.

Conclusion: Day surgery laparoscopic cholecystectomy is both safe and feasible in local settings. Careful patient selection is essential in ensuring a high success rate.

Keywords: ambulatory surgery, day surgery, discharge planning, laparoscopic cholecystectomy, patient safety

Singapore Med J 2008; 49(5): 397-399

INTRODUCTION

First performed in 1985 by Mühe in Germany,[1] laparoscopic cholecystectomy (LC) is now the treatment of choice for symptomatic gallstone diseases. As with other laparoscopic procedures, LC is associated with less postoperative pain, smaller scars, shorter hospitalisation duration and earlier return to routine activities as compared to open surgical techniques.[2] And as expertise in laparoscopic surgery improves, there is now a trend towards performing LC as a day surgery (DS) procedure because of its potential economic benefits. In many places, it has been found that this can be both safe and acceptable.[3-5] However, there has not been any review on DS LC done locally. The aim of this retrospective study was to report on our experience with DS LC and to assess its feasibility and safety.

METHODS

Following a promising initial experience since November 2006, we prospectively studied the outcomes of 50 consecutive patients treated with DS LC by a single surgeon at our institution, where the cases were accrued over a period of ten months from February 2006 to December 2006. The inclusive criterion for DS LC was patients who were discharged before 8 pm on the day of surgery. All the patients on this pathway had symptomatic cholelithiasis proven on imaging or had previous history of biliary pancreatitis or cholangitis with normalisation of the liver function test. The later patients with possible common bile obstruction had confirmation of clearance of their common bile duct either through endoscopic retrograde cholangio-pancreaticography, endoscopic ultrasonography or magnetic resonance imaging.

These patients were briefed on the administrative procedure of conducting the surgery in the DS fashion following a standard care pathway protocol: they were to report to the Day Surgery Centre in the morning of their surgery after fasting from 12 midnight the night before. The surgery will commence before 3 pm. The LC was done via a standard four-port technique using three 5-mm instrument ports for dissection and the umbilical

Department of Surgery, National University Hospital, 5 Lower Kent Ridge Road, Singapore 119074

Chang SKY, MBBS, MMed, FRCSE
Consultant

Tan WB, MBBS
Medical Officer

Correspondence to:
Dr Stephen Kin Yong Chang
Tel: (65) 9152 4236
Fax: (65) 6773 4913
Email: surv7@nus.edu.sg

port for the laparoscopic telescope and for retrieval of the gallbladder using a plastic bag. The four ports were infiltrated with local anaesthetic before incision and placement of ports to minimise postoperative wound pain. After the surgery, all patients were monitored first in the recovery ward and subsequently in the Day Surgery Observation Ward. Hourly parameters, including pulse rate, blood pressure monitoring, conscious level and pain score, were recorded. A senior staff reviewed all patients at the end of the day, between 6 pm and 8 pm, before they were discharged. Criteria for discharge include stable parameters, ability to retain feeds, ability to ambulate with minimal assistance and discomfort, and being accompanied home by a capable caregiver. The possibility of admission postsurgery was explained to them. This may happen if any unusual events, such as conversion to open surgery or unsatisfactory recovery from anesthesia, occur. All patients were briefed on the unusual signs to look out for and were aided with an "alert list". The symptoms on the alert list include increasing abdominal pain, excessive blood oozing from port sites through the dressings, and worsening giddiness, nausea or vomiting. They were also given an emergency number to call if they had any queries after their surgery, and prescribed with a five-day course of paracetamol to be taken strictly. They were then reviewed in the outpatient clinic within two weeks of their surgery.

In this study, patients' biographic data (age, gender, American Society of Anaesthesiology [ASA] status, medical comorbidities) and outcomes were collected. The success rate of DS LC, reasons for overnight admission, and re-admission rate were evaluated. The study was approved by the institutional review board.

RESULTS

A total of 50 patients were planned for DS LC during the ten-month period (Table I). In the same period, the surgeon had a total number of 132 laparoscopic cholecystectomies performed, giving a inclusion rate of 37.9% for DS LS. There were 20 men and 30 women, with a mean age of 48 (range 28–78) years. The majority of them were classified as ASA grade I (22 patients) or II (24 patients). There were three with ASA grade III and one patient with ASA grade IV status. 13 of them had comorbidities, such as diabetes mellitus, hypertension and coronary artery diseases, but these were well-stabilised during the time of surgery. The mean operating time was 71 (range 30–210) minutes. Of these, 46 patients (92%) were discharged by 8 pm of the same day as the surgery itself.

Only four patients (8%) (three men and one woman) failed to be discharged on the same day (Table II). One of them was admitted for a near-syncope episode three hours postoperation while attempting to ambulate, with no obvious cause ascertained after investigations. Two patients had to be admitted due to persistent postoperative pain, as the surgeon felt they should be warded for an overnight observation. The last case was admitted because of persistent nausea and vomiting even at 8 pm in the evening. All four patients were discharged the next day. Based on our limited number of four patients who failed the DS procedure, it can be seen that the majority of them were of ASA status III or more, above 65 years of age, and had other medical problems, such as hypertension. However, how these conditions relate to their reasons for the failed DS pathway is unclear.

Table I. Characteristics of patients who underwent DS LC.

Characteristics	No. of patients
Mean age (range) (years)	48 (28–78)
Gender	
Male	20
Female	30
ASA score:	
I	22
II	24
III	3
IV	1
Mean operative time (range) (min)	71 (30–210)

Two of the patients (4%) who underwent DS LC successfully were readmitted on a later date. One was due to a minor wound infection at the umbilical port three weeks postoperation. The other patient presented with jaundice one week postoperation 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. She was treated endoscopically.

DISCUSSION

Most authors agree that DS LC offers many advantages as compared with inpatient LC. It allows the patient to recuperate at home and reduce hospitalisation cost. In our hospital, costs for inpatient management can add up to a substantial amount. This ranges from S$50 (75% government subsidy) to S$500 (full paying) for an overnight admission, depending on the class of admission and the amount of consumables used during the stay. DS LC is also beneficial for the hospital as this means that more inpatient beds are available for emergency cases. In addition, DS LC frees up operating spaces in major operating rooms, which can then be better utilised.

In many institutions, an intermediate form of postoperative care is adopted, where patients are not admitted, but are lodged in an overnight recovery ward for less than 24 hours. This has been termed "ambulatory LC", which had been shown to be safe and feasible. However, this still requires an additional establishment

Table II. Data on patients who failed DS LC.

Patient	1	2	3	4
Reason	near syncope	abdominal pain	abdominal pain	nausea and vomiting
Age (years)	30	75	68	78
Gender	M	F	M	M
ASA status	I	III	IV	III
Comorbidities	nil	hypertension	diabetes mellitus, hypertension and coronary artery disease	nil
Duration of operation (mins)	50	30	170	110

complete with the staff to accompany these patients overnight, when they could be better taken care of by their immediate relatives in the comfort of their own home. In Singapore, the proximity and easy accessibility of patients to major hospitals means that in the rare event that urgent medical care is required, the care will not be delayed much. In some countries, one of the selection criteria for ambulatory LC is the distance of the patient's residence from the hospital.[5,6]

The success rate (92%) and re-admission rate (4%) in our study are comparable to that of other studies which performed DS LC or ambulatory LS,[3,7,8] with a success rate of 86%–95% and re-admission rate of 1.5%–8%. This suggests that an overnight stay does not add value to the level of medical care and monitoring. As for the two cases of re-admission, even inpatient management would not have prevented it since the complications appeared much later. It is important to maintain a high success rate for patients planned for DS LS, failure of which means additional administrative costs not only to the patient but also to the institution since the patient would have to pay for both the DS observation ward charges as well as the inpatient ward charges. In addition, there will be more inconvenience encountered by the caregiver and the rest of the family members.

Many authors have suggested that careful patient selection helps to increase the success rate of DS LC.[7,9] Some of the factors include age of the patient, ASA status and the presence of other comorbidities. Based on our limited number of four patients who failed the DS procedure, it can be seen that the majority of them are of ASA status III or more, above 65 years of age, and have other medical problems such as hypertension. However, how these conditions relate to their reasons for the failed DS pathway is unclear.

DS LC is a safe and feasible procedure, which is likely to show increasing popularity among both patients and surgeons in view of its practical benefits. However, careful patient selection and adequate perioperative education of the patients following a clinical pathway is necessary to ensure a high success rate. Our suggested inclusion criteria for DS LC include age of less than 65 years and ASA status of II or less. As a follow-up to this preliminary study, we suggest that a prospective study be conducted to look into factors which can increase the likelihood of same day discharge in patients scheduled for DS LC. This may include methods to reduce postoperative pain and emesis, such as selecting the most appropriate anaesthetics, analgesics and perioperative anti-emetics.

REFERENCES

1. Reynolds W Jr. The first laparoscopic cholecystectomy. JSLS 2001; 5:89-94.
2. Hendolin HI, Pääkonen ME, Alhava EM, et al. Laparoscopic or open cholecystectomy: a prospective randomised trial to compare postoperative pain, pulmonary function, and stress response. Eur J Surg 2000; 166:394-9.
3. Chok KS, Yuen WK, Lau H, Lee F, Fan ST. Outpatient laparoscopic cholecystectomy in Hong Kong Chinese - an outcome analysis. Asian J Surg 2004; 27:313-6.
4. Leeder PC, Matthews T, Krzeminska K, Dehn TC. Routine day-case laparoscopic cholecystectomy. Br J Surg 2004; 91:312-6.
5. Chauhan A, Mehrotra M, Bhatia PK, Baj B, Gupta AK. Day care laparoscopic cholecystectomy: a feasibility study in a public health service hospital in a developing country. World J Surg 2006; 30:1690-5.
6. Kaman L, Verma GR, Sanyal S, Bhukal I. Relevance of day care laparoscopic cholecystectomy in a developing nation. Trop Gastroenterol 2005; 26:95-7.
7. Ammori BJ, Davides D, Vezakia A, et al. Day case laparoscopic cholecystectomy: a prospective evaluation of a 6-year experience. J Hepatobiliary Pancreat Surg 2003; 10:303-8.
8. Jain PK, Hayden JD, Sedman PC, Royston CM, O'Boyle CJ. A prospective study of ambulatory laparoscopic cholecystectomy: training economic, and patient benefits. Surg Endosc 2005; 19:1082-5.
9. Vuilleumier H, Halkic N. Laparoscopic cholecystectomy as a day surgery procedure: implementation and audit of 136 consecutive cases in a university hospital. World J Surg 2004; 28:737-40.