

Original Research Article

Safety, cost effectiveness and experience of day care laparoscopic cholecystectomy: a report from a tertiary care center

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ABSTRACT

Background: Laparoscopic cholecystectomy is the recommended standard of care for symptomatic gall stone disease. Report the experience of day care laparoscopic cholecystectomy (DCLC) in terms of safety, feasibility and cost factor.

Methods: A retrospective analysis was performed on data collected from June 2014 to December 2018 from a single unit at PGIMER, Chandigarh, India. Patients who were graded I and II on the ASA score, accompanied by at least one attendant and able to come to hospital by their own arrangements in case of any problem were selected for DCLC.

Results: Out of 1054, 826 (78.4%) were female and 228 (21.6%) were male patients. Mean age of the study cohort was 43.3 years with minimum and maximum age being 13 and 80 years respectively. GSD with chronic cholecystitis were present in maximum number of patients (875, 83.01%) and GSD with chronic liver disease in minimum number of patients (5, 0.47%). There was no common bile duct injury. A total of 9 (0.85%) patients got converted to open surgery requiring admission. There was no mortality. On evaluating the cost factor, cost saving of Rs. 8200/- was found between DCLC group and private ward patients while of Rs. 365/- between DCLC group and general ward patients.

Conclusion: DCLC is safe in carefully selected patients and has the advantage of cost factor. This will help us in increasing patient turnover and thus reducing waiting time for wait listed patients.

Keywords: Day care, Laparoscopic cholecystectomy, Safety, Cost factor

INTRODUCTION

Laparoscopic cholecystectomy first introduced by Muhe, has now evolved to the point where it has replaced the open technique in many medical centers around the world.¹ Today, laparoscopic cholecystectomy, rather than the open technique, is considered as the treatment of choice for gallstone disease.² Ability to provide high quality and cost-effective care has made day care laparoscopic cholecystectomy one of the fastest growing area in the health care system. Primary aim of day care surgery is to provide convenience to the patients by

avoiding hospitalization but without compromising the patient's safety. Rapid recovery after laparoscopic cholecystectomy and increasing experience with its postoperative course has led to progressively shorter postoperative stay and recent trend of day care laparoscopic cholecystectomy without an overnight admission. The feasibility of day care laparoscopic cholecystectomy is very much dependent on the post-operative course of the patient. An uneventful post-operative period is essential for the patient to gain confidence for the discharge. The main emphasis in day care laparoscopic cholecystectomy surgery is on pain

management and relief from nausea and vomiting. Post-operative pain is unpredictable, which explains the need for adequate prevention of pain before the patient wakes up from anesthesia. Therefore, pain relief and patient comfort during the early post-operative period becomes essentially important, as the need for analgesics may delay discharge. The concept of day care surgery is very beneficial for a developing country because it not only leads to cost containment but also better utilization of the health care resources. This study was done to analyze the safety, success and cost-effectiveness of day care laparoscopic cholecystectomy in a tertiary care center of North India.

METHODS

This is a retrospective analysis of data from June 2014 to December 2018 from a single unit in a tertiary care center in north India. A total of 1054 patients were analyzed over this period. The cost of daycare, general ward and private ward patients was constant for each group although differing in amount. Therefore, no standard deviation could be calculated and no test of significance was feasible as per statistical analysis.

Ultrasonography was the mainstay for pre-operative diagnosis of gall stone disease. Patients who met the inclusion criteria: ASA score I and II, accompanied by at least one attendant, able to come to hospital by their own arrangements in case of any problem were selected for DCLC. Consent taken and pre-operative instructions were given in the outpatient department (OPD), a day prior to surgery. All patients were instructed to be nil per oral (NPO)-6 hours for solid food and 2 hours for liquids, hair removal from nipple to groin by clipping, to have chlorhexidine scrub bath at 6 AM, on day of surgery and report to operating room on the given time. Pre-operative medications included tablet ranitidine hydrochloride 150 mg and tablet alprazolam 0.25 mg at 10 PM, day prior to surgery and 6 AM on day of surgery for all patients. Injection cefazolin 1 gm slow IV was administered after test dose as prophylactic antibiotic 30 minutes prior to incision.

The operation was performed with the standard four-port technique, using carbon dioxide for peritoneal cavity insufflation. Pneumoperitoneum was obtained by Veress technique in 765 (72.5 %) and by open Hasson technique in 289 (27.4%). Calot's triangle dissection, cystic duct and artery were clipped and divided after critical view of safety is obtained, and gall bladder was dissected off the gallbladder fossa. All resected specimens were examined to see mucosa, wall thickness, size, number and pattern of gallstones. Patients were shifted to postoperative recovery room and maintained on intravenous fluids for 4 hours post-surgery. A member of the surgical team and attending nurse for post-operative complaints and vital signs assessed patients at regular interval. Analgesic drugs like diclofenac sodium or tramadol and antiemetic like ondansetron were given for pain and nausea or

vomiting if required. After 4 hours, operating surgeon and anesthesiologist evaluated the patient for pain, nausea, vomiting, consciousness level and vital parameters. They were encouraged to sit up, drink, ambulate and go to the washroom under supervision. Patients were discharged 6 to 8 hours after surgery with a discharge card and postoperative instructions. Discharge criteria included: hemodynamic stability, able to understand instructions and can ambulate, relieved of nausea, vomiting and pain, able to tolerate liquids and voided urine and no bleeding from surgical sites.

Patients undergoing DCLC were admitted if conversion to open cholecystectomy and discharge criteria were not satisfied. Unexpected medical problem attributed to the surgery. Patients were given tablet diclofenac sodium 50 mg orally three times daily for 3 days, tablet pantoprazole 40 mg once before breakfast for 3 days, a multivitamin tablet for 7 days and tablet ondansetron 4 mg orally on SOS basis. Patients were provided phone number of the resident in charge and advised to contact if required or to report to the 24 hours emergency services if necessary. They were advised to do port site dressings, to take bath daily and follow up in OPD 7 days after the surgery with histopathology report.

RESULTS

A total of 1054 patients were included in the study. Out of 1054, 826 (78.4%) were female and 228 (21.6%) were male patients. Minimum and maximum age was 13 years and 80 years respectively with mean age being 43.3 years (Table 1). Gall stone disease (GSD) with chronic cholecystitis constituted the maximum no of patients 875 (83.01%) and GSD with chronic liver disease (CLD) and cirrhosis constituted the minimum no. of patients 5 (0.47%) (Table 2). There was no trocar, bowel or common bile duct injury (Table 3). Gall bladder perforation occurred in 94 (8.91%) patients. Bile spillage and stone slippage happened in 83 (7.87%) and 78 (7.4%) patients respectively. A total of 9 (0.85%) patients got converted to open surgery (Table 4). There was no mortality. On considering the cost factor, it was found that there was reasonable difference in cost saving (Rs. 8200/-) between DCLC and private ward paying patients. DCLC group and general ward patients group showed cost saving of Rs. 365/- only. List of surgical items to be purchased by day care, general ward and private ward patients was same hence not taken into consideration. The main cost saving was in room charges for general or private ward and operative charges. The operative charges were same for day care and general ward patients while different for private ward patients. Because of limited numbers of general ward beds and overcrowding of chronic and malignancy patients, the general ward beds are rarely available to gall stone disease patients. Availability of private ward is also limited because of constant number and long waiting queue. Affordability for private ward is always a matter of concern for patients

belonging to low socioeconomic status. Therefore, most of the GSD patients undergo surgery on day care basis.

Table 1: Age distribution with numbers of patients.

Age (Years)	Number of patients	Percentage (%)
13-20	29	2.7
21-30	184	17.4
31-40	253	24
41-50	272	25.8
51-60	195	18.5
61-70	100	9.4
>70	21	1.9

Table 2: Diagnosis with numbers of patients.

Diagnosis	No. of cases	Percentage (%)
GSD	1054	100
GSD with acute cholecystitis	53	5.02
GSD with chronic cholecystitis	875	83.01
GSD post ERCP and CBD clearance	152	14.42
GSD with CBD stent in situ	85	8.06
GSD status post Pancreatitis	21	1.99
GSD with CLD and Cirrhosis	5	0.47

Table 3: Intraoperative events.

Event	No. of cases	Percentage (%)
Trocar injury	0	0
CBD injury	0	0
Bleeding	3	0.28
Bowel injury	0	0
GB perforation	94	8.91
Bile spillage	83	7.87
Stone slippage	78	7.4
Bradycardia	56	5.31
Arrhythmias	15	1.4

Table 4: Indication for conversion to open cholecystectomy.

Indication for conversion	Total no.	Percentage (%)
Dense adhesions at Calot's triangle	2	0.18
Bleeding	1	0.09
Contracted gall bladder	1	0.09
Acutely inflamed gall bladder	1	0.09
Previous upper abdominal surgery	2	0.18
Cholecystogastric fistula	1	0.09
Cholecystoduodenal fistula	1	0.09
Total	9	0.85

DISCUSSION

Today, laparoscopic cholecystectomy is considered as the treatment of choice for gallstone disease. Initially it was applied to healthy patients with uncomplicated disease but as time advanced and experience gained it was also offered to patients with more complicated biliary disease, such as acute cholecystitis, history of pancreatitis and choledocholithiasis after clearance of common bile duct stones by ERCP. The low rate of adverse events or complications during the intraoperative or immediate postoperative periods further justifies the rapid growth of DCL surgery in developed and developing nations.³⁻⁶

Kaman et al from the same center showed in their previous study that a total of 602 laparoscopic cholecystectomies were performed over a period of 6 years.⁷ Among them 309 (51.32%) were operated on day care basis. In the current study 1054 patients were operated over 4.5 years on day care basis, which itself is self-explanatory in recognizing the increased numbers of patients over shorter span of time and importance of day care surgery for gall stones disease patients. In the earlier study 2.91% patients had conversion to open procedure while in the present study 0.85% patients had conversion rate, which might be contributed to the experience gained in minimally invasive surgery.

Bal et al evaluated 383 patients of gallstones and found 313 suitable for DCLC.⁸ These 313 patients, 290 patients (92%) were discharged within 2-8 hours of the operation (median 4 hours). In this study 1039 (98.5%) patients got discharged within 6-8 hours of surgery. Fifteen (1.42%) patients required overnight observation. Of these 15 patients, 9 were who converted to open surgery, 3 were having nausea and vomiting and 2 patients could not be discharged because surgery got delayed in the afternoon hours due to unpredicted prolongation of surgery timings in the earlier cases in the list.

Pujahari et al conducted a study in which a total of 1029 out of 1042 patients were included over a period of 10 years. Only 0.8% had real day care surgery.⁹ A total of 95.7% had overnight stay even after fulfilling all the criteria. They concluded that patients would like to stay overnight in the hospital even if found fit for DCLC. Overnight stay makes them happy, psycho-socially confident in developing nation and best suited for all patients including co-morbidity. But this type of approach may not be feasible in centers where patient's turnover is high; waiting time is long and where there is already established role of DCLC like ours. Ali et al reported successful day care laparoscopic cholecystectomy in 92% of patients. Reported 98.5% successful DCLC.¹⁰

Wound infection, usually involving the umbilical cannulation site through which the gallbladder is extracted, occurs in 0.3-1% of cases.¹¹⁻¹⁴ Practice is to take out the gall bladder through epigastric port. Surgical site infection was seen in 6 (0.56%) of our patients, and

all were treated successfully with aseptic sterile dressings and antibiotics.

Limitations

Study being retrospective, single center, no feasibility of statistical tests and no involvement of long-term complications like port site incisional hernia constitutes some of the limitations of the study.

CONCLUSION

DCLC is safe, convenient and feasible in carefully selected patients and has the advantage of cost effectiveness. This will help in better utilization of hospital beds and thus reducing waiting time for surgery.

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