



## Original Article

# SAFETY AND EFFECTIVENESS OF DAY CASE LAPAROSCOPIC CHOLECYSTECTOMY IN A TEACHING HOSPITAL.

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### Abstract

**Background:** Evaluation of the safety and efficacy of day case laparoscopic cholecystectomy in a teaching hospital may influence the rationale of this practice to gain widespread acceptance.

**Method:** Day case laparoscopic cholecystectomy was offered to patients during a two and a half year period (Jan 2010 – July 2012) in Minimally Invasive Surgery unit in BSMMU who met the following established inclusion criteria: ASA (American Society of Anesthesiology) physical status classification classes I and II; age: 18 - 70 years; body mass index (BMI) < 30 kg/m<sup>2</sup>; patient acceptance and cooperation (informed consent). Acute cholecystitis was considered as an exclusion criterion. Follow-up was done by clinical examination on an outpatient basis one week and 3 months after operation. Evaluation was done about success rates, postoperative outcome (complications, readmissions, morbidity and mortality) and patient's overall satisfaction.

**Results:** 40 consecutive patients, predominantly female (62.5%) and ASA II (75%) with a mean age 44 ± 13.3 years underwent cholecystectomy. 85% patients had symptomatic gallstone disease. Mean operating time was 45±15.1 minutes and no conversion was needed. 25% cases experienced post operative nausea and vomiting and all patients were discharged in the following morning. 20% developed minor complications that resolved spontaneously. 1 case was readmitted and overall patient satisfaction rate was 90%.

**Conclusions:** This study suggested that day case laparoscopic cholecystectomy is clinically effective and can be performed safely in a teaching hospital by competent surgeon.

**Key words:** Outpatient Surgery, Laparoscopic cholecystectomy.

### Introduction

Laparoscopic cholecystectomy (LC) has become the standard approach for managing symptomatic cholelithiasis in recent years and is thus accepted as the "gold standard" surgical technique<sup>1,2</sup>. With improvements in anesthesia and perioperative care

LC was attempted as an outpatient cost-effective procedure, despite several concerns about patient safety which initially halted its worldwide acceptance<sup>3-8</sup>. Besides clinical effectiveness and cost saving several complications, such as bleeding and bile duct injuries, postoperative nausea and vomiting (PONV) as well as pain are regarded as key factors influencing outcome and several methods have been implicated to reduce them<sup>9-14</sup>. In Bangladesh, outpatient cholecystectomy is gradually gaining acceptance from surgeons and patients. The aim of this study was to evaluate the outcome of day case laparoscopic

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cholecystectomy in a teaching university hospital, confirming the safety of performing this procedure.

### Method

This study was performed during a two and a half year period (Jan 2010 – July 2012) in Minimally Invasive Surgery unit in BSMMU. Patients undergoing elective laparoscopic cholecystectomy as day case surgery prospectively evaluated. It was offered to patients with ultrasound-documented cholelithiasis who met the following inclusion criteria: ASA (American Society of Anesthesiology) physical status classification classes I and II; age: 18 - 70 years; body mass index (BMI) < 30 kg/m<sup>2</sup>; patient acceptance and co-operation (informed consent). Acute cholecystitis was considered as an exclusion criterion, due to the possible need of increased hospital stay and also due to possibility of a higher conversion rate. Prior upper abdominal surgery, patients with jaundice or dilated bile ducts on ultrasonography were excluded and offered further diagnostic work-up.

Surgery was done under general anesthesia with endotracheal intubation. Port site local anesthesia using 2% lignocaine was given in all patient before recovery from anesthesia and NSAIDs either injectable or suppositories were used in early post operative period to reduce pain. Narcotics like injectable pethidine were used in very few cases. Following discharge criteria were used for all patients: awake, oriented, mobilized and tolerating oral fluids; passage of urine; no postoperative pain, nausea or vomiting and stable general condition in the following morning evaluated. Follow-up was done by clinical examination and investigations on an outpatient basis one week and 3 months after operation. Evaluation was done about success rates, postoperative outcome (complications, readmissions, morbidity and mortality) and patient's overall satisfaction.

### Results:

The patients demography and perioperative data are presented in Table-I.

40 consecutive patients, predominantly female (62.5%) and ASA II (75%) with a mean age 44 ± 13.3 years underwent cholecystectomy. 85% patients had symptomatic gallstone disease. Mean operating time was 45±15.1 minutes and no conversion was needed. 25% cases experienced post operative nausea and vomiting and all patients were discharged in the following morning. 20% developed minor complications

that resolved spontaneously. 1 case was readmitted and overall patient satisfaction rate was 90%.

**Table-I**

*Patients demography and perioperative data.*

Age (years)	44±13.3
Female	25/(62.5)
Male	15/(37.5)
ASA Grade	
ASA-I	10/(25)
ASA-II	30/(75)
Indication for OLC	
Symptomatic gallstones	34/(85)
Gallbladder polyp	1/(2.5)
Asymptomatic gallstone	5/(12.5)
Mean Operating time (Minute)	45±15.1
Conversion Rate	0%
Drains Used	5(12.5%)
Successful Discharge within 24 hours	36(90%)
Postoperative follow up till following morning	
<i>Nausea &amp; vomiting</i>	<b>10(25%)</b>
Postoperative Complications	
Serosanguinous discharge from umbilical trocar site	3(7.5%)
Shoulder tip and wound pain	4(10%)
Abnormal LFT	1(2.5%)
Bile leakage	0(0%)
Readmission rate	1(2.5%)
Causes of readmission	
Retained stone in CBD	1(2.5%)
Patients satisfaction at 1 week follow-up	36(90%)

### Discussion

Improvements in anesthetic and surgical techniques have prompted surgeons to perform laparoscopic cholecystectomy as an elective outpatient procedure. Recent systematic reviews and meta-analyses have shown the safety and effectiveness of this method in elected patients, with reduced cost and high level of patient satisfaction<sup>15-18</sup>. Current available literature strongly suggests implementation of standard criteria for selection of patients for increasing success rates of day case laparoscopic cholecystectomy.<sup>18</sup> In our

study, using these criteria with the addition of age (18-70 years) and BMI (< 30 kg/m<sup>2</sup>) was associated with a successful discharge in the following morning .

40 patients were selected for day case laparoscopic cholecystectomy during the period when a total number of 200 laparoscopic cholecystectomies were performed, giving an inclusion rate of 20% for day surgery. 62.5% patients were female. Mean age of the sample was 44±13.3 (range 24–68) years. Mean operative time was 45±15.1 minutes that correlates very well with other studies.<sup>19-27</sup>

No conversion to open cholecystectomy was done and there was no preoperative major complications. Implementation of standard criteria for selection of patients significantly reduces conversion rate.<sup>18</sup>

Drains were selectively inserted in 5 patients (12.5%) according to the attending surgeon's judgment (due to peri-cholecystic adhesion in 4 cases and accidental gallbladder injury during dissecting from the liver bed in 1 case) and in all cases were removed in the following morning as there was minimal collection.

Serious complications of laparoscopic cholecystectomy include bleeding and bile duct injuries. In our series, no patient developed postoperative bleeding or bile leakage. Minor complaints included serous discharge from the umbilical trocar site in 3 patients, shoulder tip pain in 4 patients and abnormal liver function tests in 1 female patient one week after discharge, which subsided gradually within 3 weeks using appropriate antibiotic, analgesics and followup. Though readmission rate was found to be around 2% in several studies<sup>14,19,20</sup> readmission was needed for 1(2.5%) patients. One patient presented with jaundice one week postoperatively 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.

Postoperative nausea and vomiting is considered to be a major concern in cases of day case laparoscopic cholecystectomy, studied thoroughly in several randomized controlled studies, without however any agreement or specific consensus in premedications and anesthetic drug regimens<sup>21-24</sup>. PONV associated with ambulatory surgery accounts for 0.1 - 0.2% of unanticipated admissions<sup>25</sup>. In our study high rate of PONV was noted. 25% (10/40) patient's experienced postoperative nausea and vomiting and a single dose

of ondansetron I/V during postoperative stay was sufficient. Marinis et al.<sup>21</sup> in their prospective study of 110 day cases of day case laparoscopic cholecystectomy found no patient suffering from PONV. This success was attributed to administration of propofol for induction, avoidance of nitrous oxide, prophylactic intravenous administration of 4 mg Ondansetron at the end of the procedure and adequate patient hydration. Such anesthetic protocol might be tried to reduce PONV.

In a similar manner, postoperative pain may increase hospital stay in the ambulatory setting<sup>26</sup>. Various drug regimens and other methods have been reported and proposed to prevent and reduce postoperative pain, which is a significant factor for early patient mobilization and increased satisfaction for the outpatient procedure<sup>27-29</sup>. Pre-incisional infiltration of portal sites as well as intraperitoneal infusion of local anesthetics, pethidine and normal saline have been reported as effective and reasonable options for pain control<sup>14,6,10-12,30,31</sup>. In our study port site local anesthesia using 2% lignocaine was given in all patient before recovery from anesthesia and NSAIDs either injectable or suppositories were used in early post operative period to reduce pain. Narcotics like injectable Pethidine at 1-2mg/kg body weight were used in very few cases..

Satisfaction rate following day case laparoscopic cholecystectomy remains between 85%-90% in several studies whereas patient satisfaction rate reached 90% in our series and remains one of the most significant components of success of day surgery.

## Conclusion

This study recommends the recently appreciated advantages of laparoscopic cholecystectomy as day case surgery concerning patient safety and clinical effectiveness. Careful patient selection, standardized protocols, advanced surgical technique and appropriate perioperative care are necessary prerequisites for the successful implementation of outpatient laparoscopic cholecystectomy in our country.

## References

1. Périssat J, Collet D, Belliard R, Desplantez J, Magne E: Laparoscopic cholecystectomy: the state of the art. A report on 700 consecutive cases. *World J Surg* 1992, 16:1074-1082.

2. Soper NJ, Stockmann PT, Dunnegan DL, Ashley SW: Laparoscopic cholecystectomy. The new 'gold standard'? *Arch Surg* 1992, 127:917-923.
3. Keulemans Y, Eshuis J, de Haes H, de Wit LT, Gouma DJ: Laparoscopic cholecystectomy: day-care versus clinical observation. *Ann Surg* 1998, 228:734-740.
4. Johansson M, Thune A, Nelvin L, Lundell L: Randomized clinical trial of day care versus overnight-stay laparoscopic cholecystectomy. *Br J Surg* 2006, 93:40-45.
5. Wenner DE, Whitwam P, Turner D, Chadha A, Degani J: Laparoscopic cholecystectomy and management of biliary tract stones in a freestanding ambulatory surgery center. *JLS* 2006, 10:47-51.
6. Baschnagel B, Hansen M, Aanning HL: Outpatient laparoscopic cholecystectomy: experience of a nonovernight surgicenter. *J Laparoendosc Adv Surg Tech* 2000, 10:305-307.
7. Reddick EJ, Olsen DO: Outpatient laparoscopic laser cholecystectomy. *Ann J Surg* 1990, 160:485-489.
8. 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, 30:1690-1697.
9. Shamiyeh A, Wayand W: Laparoscopic cholecystectomy: early and late complications and their treatment. *Langenbecks Arch Surg* 2004, 389:164-171.
10. Pappas-Gogos G, Tsimogiannis KE, Zikos N, Nikas K, Manataki A, Tsimoyiannis EC: Preincisional and intraperitoneal ropivacaine plus normal saline infusion for postoperative pain relief after laparoscopic cholecystectomy: a randomized double-blind controlled trial. *Surg Endosc* 2008, 22:2036-2045.
11. Tsimoyiannis EC, Glantzounis G, Lekkas ET, Siakas P, Jabarin M, Tzourou H: Intraperitoneal normal saline and bupivacaine infusion for reduction of postoperative pain after laparoscopic cholecystectomy. *Surg Laparosc Endosc* 1998, 8:416-420.
12. Tsimoyiannis EC, Siakas P, Tassis A, Lekkas ET, Tzourou H, Kambili M: Intraperitoneal normal saline infusion for postoperative pain after laparoscopic cholecystectomy. *World J Surg* 1998, 22:824-828.
13. Lepner U, Goroshina J, Samarütel J: Postoperative pain relief after laparoscopic cholecystectomy: a randomised prospective double-blind clinical trial. *Scand J Surg* 2003, 92:121-124.
14. Hollington P, Toogood GJ, Padbury RT: A prospective randomized trial of day-stay only versus overnight-stay laparoscopic cholecystectomy. *Aust N Z J Surg* 1999, 69:841-843.
15. Sharma A, Hayden JD, Reese RA, Sedman PC, Royston CMS, O'Boyle CJ: Prospective comparison of ambulatory with inpatient laparoscopic cholecystectomy: outcome, patient preference and satisfaction. *Ambulatory Surgery* 2004, 11:23-6.
16. Paquette IM, Smink D, Finlayson SR: Outpatient cholecystectomy at hospitals versus freestanding ambulatory surgical centers. *J Am Coll Surg* 2008, 206:301-305.
17. Ahmad NZ, Byrnes G, Naqvi SA: A meta-analysis of ambulatory versus inpatient laparoscopic cholecystectomy. *Surg Endosc* 2008, 22:1928-1934.
18. Gurusamy KS, Junnarkar S, Farouk M, Davidson BR: Day-case versus overnight stay for laparoscopic cholecystectomy. *Cochrane Database Syst Rev* 2008, 16:CD006798.
19. Gurusamy K, Junnarkar S, Farouk M, Davidson BR: Meta-analysis of randomized controlled trials on the safety and effectiveness of day-case laparoscopic cholecystectomy. *Br J Surg* 2008, 95:161-168.
20. Dirksen CD, Schmitz RF, Hans KM, Nieman FH, Hoogenboom LJ, Go PM: Ambulatory laparoscopic cholecystectomy is as effective as hospitalization and from a social perspective less expensive: a randomized study. *Ned Tijdschr Geneesk* 2001, 145:2434-2439.
21. Yang H, Choi PT, McChesney J, Buckley N: Induction with sevofluranremifentanil is comparable to propofol-fentanyl-rocuronium in PONV after laparoscopic surgery. *Can J Anaesth* 2004, 51:660-7.

22. Coloma M, White PF, Markowitz SD, Whitten CW, Macaluso AR, Berrisford SB, Thornton KC: Dexamethasone in combination with dolasetron for prophylaxis in the ambulatory setting: effect on outcome after laparoscopic cholecystectomy. *Anesthesiology* 2002, 96:1346-1350.
23. Liberman MA, Howe S, Lane M: Ondansetron versus placebo for prophylaxis of nausea and vomiting in patients undergoing ambulatory laparoscopic cholecystectomy. *Ann J Surg* 2000, 179:60-62.
24. Parlow JL, Meikle AT, van Vlymen J, Avery N: Post discharge nausea and vomiting after ambulatory laparoscopy is not reduced by promethazine prophylaxis. *Can J Anaesth* 1999, 46:719-724.
25. Gan TJ, Meyer TA, Apfel CC, Chung F, Davis PJ, Habib AS, Hooper VD, Kovac AL, Kranke P, Myles P, Philip BK, Samsa G, Sessler DI, Temo J, Tramèr MR, Vander Kolk C, Watcha M, Society for Ambulatory Anesthesia: Society for Ambulatory Anesthesia guidelines for the management of postoperative nausea and vomiting. *Anesth Analg* 2007, 105:1615-1628.
26. McGrath B, Elgendy H, Chung F, Kamming D, Curti B, King S: Thirty percent of patients have moderate to severe pain 24 hr after ambulatory surgery: a survey of 5,703 patients. *Can J Anaesth* 2004, 51:886-891.
27. Chung F, Tong D, Miceli PC, Reiz J, Harsanyi Z, Darke AC, Payne LW: Controlled-release codeine is equivalent to acetaminophen plus codeine for post-cholecystectomy analgesia. *Can J Anaesth* 2004, 51:216-221.
28. Michaloliakou C, Chung F, Sharma S: Preoperative multimodal analgesia facilitates recovery after ambulatory laparoscopic cholecystectomy. *Anesth Analg* 1996, 82:44-51.
29. Wilson YG, Rhodes M, Ahmed R, Daugherty M, Cawthorn SJ, Armstrong CP: Intramuscular diclofenac sodium for postoperative analgesia after laparoscopic cholecystectomy: a randomised, controlled trial. *Surg Laparosc Endosc* 1994, 4:340-344.
30. Hazinedaroglu SM, Kayaoglu HA, Ates Y, Ertürk S, Butuner C, Turkcapar AG: Intraperitoneal bupivacaine for postoperative pain relief after laparoscopic cholecystectomy. *Pain Med* 2006, 7:539-541.
31. O'Hanlon DM, Colbert S, Ragheb J, McEntee GP, Chambers F, Moriarty DC: Intraperitoneal pethidine versus intramuscular pethidine for the relief of pain after laparoscopic cholecystectomy: randomized trial. *World J Surg* 2002, 26:1432-1436.