International Surgery Journal
Hanif S. Int Surg J. 2026 Jun;13(6):936-940
https://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20261563

Original Research Article

Comparative analysis of day-surgery versus conventional overnight stay surgery for laparoscopic cholecystectomy

Sameeah Hanif*

Department of Surgery, BBST Hospital, Abbottabad, Pakistan

Received: 03 April 2026
Accepted: 06 May 2026

***Correspondence:**
Dr. Sameeah Hanif,
E-mail: dr.sameeahhanif@gmail.com

ABSTRACT

Background: There is growing momentum toward performing laparoscopic cholecystectomy as a day-case procedure for suitable patients. Nonetheless, surgeons still report barriers to same-day discharge. The purpose of this study was to compare day-case laparoscopic cholecystectomy with conventional overnight-stay laparoscopic cholecystectomy in selected patients with gallbladder stones.
Methods: A prospective comparative observational study was conducted in the Department of Surgery, DHQ Abbottabad, from June 2024 to July 2025. Seventy ASA I patients aged 20–50 years with uncomplicated gallstone disease were allocated to day-case discharge within 12 hours (Group 1, n=35) or discharge after 24 hours (Group 2, n=35). Outcomes included operating time, VAS pain at 6 hours, postoperative nausea and vomiting, complications, readmission, time to return to normal home activities and satisfaction.
Results: Baseline age and BMI were comparable between groups. Mean operating time was 40.43±4.42 minutes in Group 1 versus 40.57±4.05 minutes in Group 2 (p=0.888). VAS pain at 6 hours was 3.23±0.84 versus 3.14±0.91 (p=0.684). Return to normal activities was 4.94±1.76 days versus 4.49±1.80 days (p=0.288). Nausea and vomiting occurred in 8.57% versus 5.71%, readmission in 5.71% versus 2.86% and satisfaction in 97.14% versus 100%.
Conclusions: Day-case laparoscopic cholecystectomy showed comparable short-term outcomes to overnight stay in this setting, with high satisfaction and low event rates under strict selection and discharge criteria.

Keywords: Cholelithiasis, Conventional, Day case surgery, Laparoscopic cholecystectomy

INTRODUCTION

Diseases of the biliary tract encompass varied conditions, most prominent are gallstone disease, cholecystitis and biliary dyskinesia. The gallbladder is the main site where gallstones occur, although they may also develop in the bile ducts inside and outside the liver.[1] Most patients with cholelithiasis do not exhibit symptoms, but symptomatic patients often present with dyspepsia or biliary colic related to cystic duct obstruction.[2] Gallstones can lead to complications such as cholecystitis, pancreatitis and cholangitis.[3] In modern times, the incidence of cholelithiasis has escalated and gallstones remain a common clinical problem.[4] The primary surgical treatment for symptomatic gallstone disease is cholecystectomy and laparoscopic cholecystectomy provides safe and effective treatment for most patients while reducing pain and disability compared with open surgery.[5]

The first elective operation on a human gallbladder was performed by John Stough Bobbs in 1867 and Carl Langenbuch performed the first cholecystectomy on July 15, 1882.[6] The first laparoscopic cholecystectomy was performed in 1987, which accelerated the transition toward laparoscopy in routine gallbladder surgery.[7] Major guidance statements later endorsed laparoscopic cholecystectomy as the preferred approach for many patients with symptomatic gallstones.[8] There is growing momentum toward performing laparoscopic

cholecystectomy as a day-case procedure for suitable patients.[9] Nonetheless, surgeons still report barriers to same-day discharge and evidence syntheses continue to evaluate safety, feasibility and drivers of unexpected admission and readmission.[10] The paramount concern surrounding day-case laparoscopic cholecystectomy pertains to patient safety, particularly the potential for delayed recognition of significant post-operative complications and inadequate symptom control after discharge.[11] Bile duct injury is uncommon but high impact, which reinforces the need for consistent operative standards and systems that support early detection and management when complications occur.[12]

This study compared day-case laparoscopic cholecystectomy with conventional overnight-stay laparoscopic cholecystectomy in a district level hospital setting. It assessed post-operative pain, post-operative nausea and vomiting, return to normal home activities, readmissions and patient satisfaction using the same eligibility criteria applied locally. The analysis showed that day-case discharge was feasible with comparable short-term outcomes and it highlighted the outcome domains that most influenced safe same-day discharge in this context.

METHODS

Study design and setting

This prospective comparative observational study was undertaken in the Department of Surgery at DHQ Abbottabad after approval from the hospital ethical committee. The study period extended from June 2024 to July 2025. Written informed consent was obtained from all participants before enrolment.

Participants

Patients who underwent uncomplicated laparoscopic cholecystectomy secondary to gallbladder stones were included from both genders between 20 to 50 years with ASA grade 1.[13] Patients with acute cholecystitis, mucocele, empyema, acute pancreatitis or previous history of abdominal surgery were excluded.

Preoperative assessment

Preoperative imaging used was ultrasound. Patients incorporated in study had gallbladder stone with normal wall thickness with no evidence of pericholecystic fluid.

Group allocation and definitions

Day case surgery is elucidated as being discharge within 12 hours of admission and in case of conventional discharge occurring 24 hours after admission. Patients were allocated into two groups and all surgeries were performed by experienced consultant surgeon. Group A underwent day case laparoscopic cholecystectomy and Group B underwent conventional laparoscopic cholecystectomy.

Outcome measures and follow-up

Time to recommencement of home duties was calculated in days from hospital admission to the return to normal daily routines. Patients qualified for return to household chores when they were free of postoperative complications, self-reliant, had no drain, with barely noticeable pain and tolerated oral intake. Postoperative pain was assessed 6 hours after the procedure using the visual analogue scale (VAS).[14] Postoperative nausea and vomiting was also measured. Return to normal home activities was recorded at follow-up on the 10th day. Contact details were collected to facilitate follow-up and data accuracy.

Surgical technique

perioperative care: Under general anesthesia, the patient was placed supine. The abdomen was accessed through an infraumbilical 10 mm trocar using the Hasson technique, followed by carbon dioxide insufflation. Three additional ports were inserted and the patient was positioned in reverse Trendelenburg.[14] After gallbladder visualization, Calot's triangle was dissected. Critical view of safety was achieved with identification of two structures entering the gallbladder, the cystic duct and cystic artery, then both were clipped and divided. The gallbladder was freed from the bed using electrocautery and retrieved. Hemostasis was ensured, desufflation performed and trocars removed.[15]

Postoperatively: patients received analgesia according to suitability with ondansetron and an intravenous proton pump inhibitor. Discharge for day care patients occurred once mobilized with oral intake allowed and minimal pain. Patients were discharged with a responsible adult at home, with explanation of complications and when to return to hospital, limited to those living within a 30 hours drive from the hospital.

Statistical analysis

Data were entered in Microsoft Excel and analyzed using SPSS. Continuous variables including age, BMI, operating time, VAS score and days to return to normal activities were presented as mean±standard deviation. The two groups were compared for continuous variables using the independent samples t test. Categorical variables including sex, postoperative nausea and vomiting, complications, readmission and satisfaction were presented as frequency and percentage. Group comparisons for categorical variables were performed using the chi square test and Fisher's exact test was used when expected cell counts were small. Postoperative analgesic use was compared between groups using a chi square test for the overall distribution. A p value below 0.05 was taken as statistically significant.

RESULTS

Participants and baseline characteristics

A total of 70 patients were allocated equally into group 1 day-case and group 2 conventional overnight stay. Baseline characteristics are summarized in Table 1.

Operative and postoperative outcomes

Group 1 had 2 readmissions (5.71%) and group 2 had 1 readmission (2.86%). One minor postoperative complication occurred in group 1 and no complication occurred in group 2. Postoperative nausea and vomiting occurred in 3 patients (8.57%) in group 1 and 2 patients (5.71%) in group 2. Continuous and categorical outcomes are summarized in Table 2.

Postoperative analgesic use

Similar between the two groups. Diclofenac was the most commonly used agent in both groups. Group 2 had a higher proportion receiving diclofenac, while group 1 had a higher proportion receiving tramadol. Use of paracetamol and ibuprofen was identical across groups. Overall analgesic distribution did not differ significantly (p=0.885).

Table 1: Baseline characteristics.

Variable	Group 1 day-case (n=35)	Group 2 conventional (n=35)	P value
Age (in years)	35.31±6.08	35.69±6.09	0.799
Body mass index (kg/m²)	26.20±2.32	26.40±2.37	0.722
Sex (%)	Female 29 (82.86%)	Female 27 (77.14%)	0.766
	Male 6 (17.14%)	Male 8 (22.86%)	

Table 2: Operative and postoperative outcomes.

Outcome	Group 1 day-case (n=35)	Group 2 conventional (n=35)	P value
Mean operating time (in minutes)	40.43±4.42	40.57±4.05	0.888
VAS pain score at 6 hours	3.23±0.84	3.14±0.91	0.684
Days to return to normal home activities	4.94±1.76	4.49±1.80	0.288
Postoperative nausea and vomiting, N (%)	3 (8.57%)	2 (5.71%)	1.000
Postoperative complications, N (%)	1 (2.86%)	0 (0.00%)	1.000
Readmission, N (%)	2 (5.71%)	1 (2.86%)	1.000
Patient satisfaction, N (%)	34 (97.14%)	35 (100.00%)	1.000

Table 3: Postoperative analgesic use.

Analgesic	Group 1 day-case (n=35)	Group 2 conventional (n=35)	P value
	N (%)	**N (%)**	
Diclofenac	16 (45.71)	20 (57.14)	0.885
Tramadol	9 (25.71)	6 (17.14)	
Paracetamol	2 (5.71)	2 (5.71)	
Ibuprofen	3 (8.57)	3 (8.57)	
Ketorolac	5 (14.29)	4 (11.43)	
Overall comparison			

DISCUSSION

Laparoscopic cholecystectomy is still commonly managed with overnight admission, yet day-case laparoscopic cholecystectomy is feasible in selected patients when discharge is driven by pain control, nausea and vomiting control, mobility and safe home support. In this study, operative time was similar between groups at 40.43±4.42 minutes in the day-case group versus 40.57±4.05 minutes in the overnight group (p=0.888). Early pain also remained comparable at 6 hours with VAS 3.23±0.84 versus 3.14±0.91 (p=0.684). Return to normal home activities was 4.94±1.76 days versus 4.49±1.80 days (p=0.288). These findings fit the practical discharge standards used in established day-surgery pathways.[16] Postoperative outcomes remained acceptable in both arms. Postoperative nausea and vomiting occurred in 3 patients (8.57%) in the day-case group and 2 patients (5.71%) in the overnight group. Readmission occurred in 2 patients (5.71%) versus 1 patient (2.86%). One minor complication was recorded in the day-case group and none in the overnight group. This pattern is consistent with randomized evidence and pooled analyses showing that day-case laparoscopic cholecystectomy achieves similar morbidity, pain scores and readmission rates to overnight stay in appropriately selected patients.[17] Systematic review evidence comparing day surgery with overnight stay also reports no clinically important

differences across key short-term outcomes when discharge criteria and selection are applied consistently.[18]

The practical barriers described in the literature mirror what matters clinically after surgery. Surgeons often hesitate because some complications may present after discharge and because uncontrolled pain or nausea and vomiting can delay discharge or drive unplanned contact. In this study, pain and postoperative nausea and vomiting stayed low and did not worsen with same-day discharge, which supports the view that pathway success depends more on selection, symptom control, timing and clear post-discharge access than on operative duration alone.[19]

Postoperative nausea and vomiting remains a recurring issue after laparoscopic cholecystectomy in broader cohorts, so structured prophylaxis and early rescue treatment remain central to day-case reliability.[20] This also aligns with enhanced recovery approaches in laparoscopic cholecystectomy that focus on predictable analgesia, nausea prevention, early oral intake, early mobilization and discharge once criteria are met.[21]

From a service perspective, satisfaction remained high at 97.14% in the day-case group and 100% in the overnight group. Analgesic use was similar overall between groups and the distribution did not differ (p=0.885), with diclofenac most commonly used in both arms. Taken together, the findings support adoption of a structured day-case pathway for eligible patients in this setting, with close attention to selection, scheduling early on the list and consistent discharge thresholds. This direction matches national benchmarking work where increasing day-case rates has been linked with safe restoration of elective laparoscopic cholecystectomy activity at scale.[22]

Limitations

Single center, small sample size. ASA I only with age limited to 20–50 years. Follow-up focused on short-term outcomes, so uncommon or late complications may be missed.

CONCLUSION

Day-case laparoscopic cholecystectomy was feasible and safe in selected ASA I patients aged 20–50 years in this district hospital. Operative time, early pain at 6 hours and time to return to normal home activities were comparable to conventional overnight stay. Postoperative nausea and vomiting, complications and readmissions remained low and patient satisfaction was high in both groups. These findings support routine use of a structured day-case pathway with strict selection, consistent discharge criteria and reliable post-discharge access.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Liepert AE, Ancheta M, Williamson E. Management of gallstone disease. Surg Clin. 2024;104(6):1159-73.
2. Bansal R, Jain PK, Babu A, Kasmalkar VS, Mahajan S. Choledocholithiasis: then vs. now. upper gastrointestinal surgery-contemporary techniques and training. Contemp Techn Train. 2025;6:65.
3. National Institute for Health and Care Excellence (NICE). Gallstone disease: diagnosis and management. NICE guideline CG188. London: NICE. 2014. Available at: https://www.nice.org.uk/guidance. Accessed on 21 October 2025.
4. Gutt C, Schlafer S, Lammert F. The treatment of gallstone disease. Dtsch Arztebl Int. 2020;117(9):148-58.
5. Gollan JL, Bulkley GB, Diehl AM. Gallstones and laparoscopic cholecystectomy. JAMA. 1993;269(8):1018-24.
6. Traverso LW. Carl Langenbuch and the first cholecystectomy. Am J Surg. 1976;132(1):81-2.
7. Reynolds W Jr. The first laparoscopic cholecystectomy. JSLS. 2001;5(1):89-94.
8. Overby DW, Apelgren KN, Richardson W, Fanelli R. SAGES guidelines for the clinical application of laparoscopic biliary tract surgery. Surg Endos. 2010;24(10):2368-86.
9. Smith I, British Association of Day Surgery (BADS). Day Case Laparoscopic Cholecystectomy. 4th ed. BADS. 2024. Available at: https://bads.co.uk/media/qsvj42pr/laparoscopic-cholecystectomy-fouth-edition.pdf. Accessed on 21 December 2025.
10. Tang H, Dong A, Yan L. Day surgery versus overnight stay laparoscopic cholecystectomy: a systematic review and meta-analysis. Dig Liver Dis. 2015;47(7):556-61.
11. Abuahmed M. Day-case laparoscopic cholecystectomy in the management of symptomatic gallstone disease: current evidence and future directions. Langenbecks Arch Surg. 2024.
12. de'Angelis N, Catena F. 2020 WSES guidelines for the detection and management of bile duct injury during cholecystectomy. World J Emerg Surg. 2021;16:30.
13. Shivali S, Thiagarajan P. A practical guide to the American Society of Anesthesiologists-physical status classification (ASA-PS). Indian J Anaes. 2022;66(4):299-300.
14. Hasson HM. A modified instrument and method for laparoscopy. Am J Obstet Gynecol. 1971;110(6):886-7
15. Strasberg SM, Hertl M, Soper NJ. An analysis of the problem of biliary injury during laparoscopic cholecystectomy. J Am Coll Surg. 1995;180(1):101-25.
16. Balciscueta I, Barberà F, Lorenzo J, Martínez S, Sebastián M, Balciscueta Z. Ambulatory

laparoscopic cholecystectomy: systematic review and meta-analysis of predictors of failure. Surgery. 2021;170:373-82.
17. Xiong W. The safety of laparoscopic cholecystectomy in the day surgery unit comparing with that in the inpatient unit: a systematic review and meta-analysis. Biomed Res Int. 2020;2:1924134.
18. Ayyaz FM, Joyner J. Association of day-case rates with post COVID-19 recovery of elective laparoscopic cholecystectomy activity across England. Ann R Coll Surg Engl. 2024;2:46.
19. Bailey CR. Guidelines for day-case surgery. Anaesthesia. 2019;4:857.
20. Jamtsho P, Dorjey Y, Dorji N. Factors associated with postoperative nausea and vomiting after laparoscopic cholecystectomy at the National Referral Hospital, Bhutan: a cross-sectional study. BMC Anesthesiol. 2024;24:248.
21. Istrate AM, Serban D, Doran H. Enhanced Recovery After Surgery in Laparoscopic Cholecystectomy - A Systematic Review. Chirurgia (Bucur). 2024;119(3):318-29.
22. Dhakal R, Upadhya PS. Incidence and predictors of postoperative nausea and vomiting after laparoscopic cholecystectomy: a prospective observational study in Nepal. J Minim Invasive Surg. 2025;28(3):130-6.

Cite this article as: Hanif S. Comparative analysis of day-surgery versus conventional overnight stay surgery for laparoscopic cholecystectomy. Int Surg J 2026;13:936-40.