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TO STUDY THE LIMITING FACTORS FOR DAY CARE LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Background: Laparoscopic cholecystectomy is the standard surgical treatment for symptomatic gallstone disease and is increasingly being performed as a day care procedure. However, successful same-day discharge depends on appropriate patient selection, uncomplicated surgery, adequate postoperative recovery, and suitable social support. Identification of limiting factors is important to improve patient safety, reduce unplanned admissions, and optimize hospital resources. **Aim:** To evaluate the limiting factors affecting the feasibility and successful completion of day care laparoscopic cholecystectomy in patients undergoing elective surgery at a tertiary care hospital.

Materials and Methods: This prospective observational study included 130 patients diagnosed with symptomatic gallstone disease and planned for elective day care laparoscopic cholecystectomy. Patients were assessed preoperatively for demographic profile, body mass index, comorbidities, American Society of Anesthesiologists grade, clinical presentation, ultrasonographic findings, and social suitability. Intraoperative parameters including adhesions, difficult Calot's triangle dissection, bile or stone spillage, bleeding, drain placement, operative duration, and conversion to open surgery were recorded. Postoperative factors such as pain, nausea, vomiting, delayed oral intake, delayed ambulation, urinary retention, residence distance, anxiety, and willingness for discharge were assessed. Data were analyzed using SPSS version 26.0, and a p value of less than 0.05 was considered statistically significant.

Results: Same-day discharge was successfully achieved in 112 patients (86.15%), while 18 patients (13.85%) required unplanned admission. Advanced age was significantly associated with failed discharge, with patients aged >60 years showing a lower discharge rate of 60.00% compared with 94.23% in patients aged ≤40 years. Obesity, ASA grade II, and comorbidities were significant patient-related limiting factors. Disease-related factors such as recurrent biliary attacks, gallbladder wall thickness >3 mm, and impacted stone at the gallbladder neck were significantly associated with unplanned admission. Important intraoperative limiting factors included dense adhesions, difficult Calot's triangle dissection, bile or stone spillage, bleeding, drain placement, operative time >60 minutes, and conversion to open surgery. Postoperative pain, nausea/vomiting, delayed oral intake, delayed ambulation, urinary retention, long distance from hospital, and patient anxiety also significantly affected same-day discharge.

Conclusion: Day care laparoscopic cholecystectomy is feasible and safe in properly selected patients. Careful selection, anticipation of difficult cases, effective postoperative care, and proper discharge planning can improve successful same-day discharge.

Keywords: Day care surgery; Laparoscopic cholecystectomy; Gallstone disease; Limiting factors; Same-day discharge.

INTRODUCTION

Gallstone disease is one of the commonest benign hepatobiliary disorders encountered in general surgical practice, and laparoscopic cholecystectomy is widely accepted as the preferred operative treatment for symptomatic gallbladder stones. The laparoscopic approach has replaced open cholecystectomy in most elective settings because it offers smaller wounds, reduced postoperative discomfort, earlier mobilization, shorter hospital stay, faster return to routine activity, and better patient acceptance. With the increasing pressure on hospital beds and the growing emphasis on cost-effective surgical care, elective laparoscopic cholecystectomy has progressively moved from inpatient admission to short-stay and day care models. In a day care pathway, the patient is admitted, operated, observed, and discharged on the same day, provided that predefined clinical and social criteria are fulfilled. Recent reviews have emphasized that day care laparoscopic cholecystectomy is a safe and practical option when supported by careful patient selection, standardized anaesthesia, effective postoperative pain and nausea control, and clear discharge planning.[1] The concept of day care laparoscopic cholecystectomy is based on the principle that many patients undergoing elective gallbladder surgery do not require overnight hospitalization if their perioperative course is uncomplicated. The approach is especially relevant in tertiary care hospitals, where surgical waiting lists, bed occupancy, and resource utilization are major concerns. A successful day care programme requires coordination between surgeons, anaesthetists, nursing staff, recovery-area personnel, and patients' attendants. It also requires a structured protocol beginning from outpatient assessment and continuing through preoperative counselling, intraoperative safety, postoperative monitoring, and follow-up after discharge. The objective is not merely early discharge, but safe discharge. Therefore, the assessment of limiting factors is essential before day care laparoscopic cholecystectomy can be recommended as a routine service.[1] Patient selection is one of the most important determinants of success in day care laparoscopic cholecystectomy. Suitable patients are generally those with symptomatic uncomplicated gallstone disease, acceptable anaesthetic risk, stable general condition, and adequate understanding of the procedure and postoperative instructions. Factors such as advanced age, high body mass index, higher American Society of Anesthesiologists grade, uncontrolled comorbid illness, poor functional reserve, previous upper abdominal surgery, and lack of responsible home support may reduce suitability for same-day discharge. Patient selection should not be rigidly based on one parameter alone; rather, it should be individualized according to medical fitness, expected operative difficulty, hospital facilities, distance from hospital, and the patient's willingness to return home on the day of surgery. Recent systematic review evidence has highlighted the absence of universal selection criteria and the need for institution-specific protocols adapted to available resources.[3] Disease-related factors also play an important role in limiting day care discharge. Although uncomplicated symptomatic cholelithiasis is well suited for a day care approach, certain preoperative findings may predict a difficult operation and increase the likelihood of prolonged observation. Recurrent biliary colic, repeated inflammatory episodes, thickened gallbladder wall, impacted stone at the neck of the gallbladder, contracted gallbladder, pericholecystic adhesions, and abnormal liver function tests may indicate greater operative complexity. In such patients, difficult Calot's triangle dissection, increased operative time, bleeding, bile spillage, drain placement, or conversion to open surgery may occur. These factors can convert an apparently straightforward elective case into one requiring inpatient monitoring. Therefore, ultrasonography, biochemical evaluation, clinical history, and surgeon judgement are important components of preoperative risk stratification.[4] Intraoperative safety is centra to any day care cholecystectomy protocol. The aim of early discharge should never compromise safe surgical practice. Laparoscopic cholecystectomy is considered the gold standard operation for gallstone disease, but bile duct injury, bleeding, difficult anatomy, and severe inflammation remain important concerns. When the anatomy is unclear, the surgeon must prioritize safe dissection, critical view of safety, bailout strategies, subtotal cholecystectomy, drain placement, or conversion whenever required. These intraoperative events may become limiting factors for day care discharge because they increase the need for postoperative observation, serial examination, analgesia, and monitoring for bile leak or bleeding. Guidelines on bile duct injury during cholecystectomy emphasize that prevention and early recognition of complications are fundamental to patient safety, particularly when early discharge is planned.[5] Postoperative recovery determines final eligibility for discharge. Even after an uncomplicated operation, patients may fail day care discharge because of pain, nausea, vomiting, dizziness, delayed oral intake, delayed ambulation, urinary retention, port-site bleeding, anxiety, or inadequate home support. Pain after laparoscopic cholecystectomy may arise from port sites, pneumoperitoneum-related shoulder tip pain, visceral manipulation, or drain placement. Nausea and vomiting are particularly important because they interfere with oral intake, delay mobilization, reduce patient confidence, and increase the risk of unplanned admission. Modern day care pathways therefore emphasize multimodal analgesia, opioid-sparing anaesthesia, antiemetic prophylaxis, early oral intake, early mobilization, and objective discharge criteria. Fourth consensus guidelines for postoperative nausea and vomiting recommend risk assessment and multimodal

prophylaxis for susceptible patients, which is highly relevant for ambulatory procedures.[6]

MATERIALS AND METHODS

This was a prospective observational study conducted at a tertiary care hospital. The study was designed to evaluate the limiting factors affecting the feasibility and successful completion of day care laparoscopic cholecystectomy. All patients included in the study were planned for elective laparoscopic cholecystectomy under a day care surgical protocol, with careful preoperative assessment, standardized perioperative care, and postoperative monitoring before discharge. A total of 130 patients diagnosed with symptomatic gallstone disease and scheduled for elective laparoscopic cholecystectomy were included in the study. Patients were selected after detailed clinical evaluation, relevant laboratory investigations, and imaging confirmation of gallbladder pathology. The study population consisted of adult patients who were considered suitable candidates for day care surgery based on clinical fitness, anesthetic evaluation, and social support for postoperative care at home.

Inclusion Criteria

Patients aged 18 years and above with symptomatic cholelithiasis, chronic calculous cholecystitis, biliary colic, or gallbladder polyp requiring elective laparoscopic cholecystectomy were included in the study. Only patients with American Society of Anesthesiologists physical status grade I or II, stable comorbid conditions, and willingness to undergo day care surgery were enrolled. Patients who had adequate home support, easy access to the hospital in case of emergency, and gave informed consent for participation were also included.

Exclusion Criteria

Patients with acute cholecystitis, obstructive jaundice, choledocholithiasis, pancreatitis, suspected gallbladder malignancy, severe cardiopulmonary disease, uncontrolled diabetes mellitus, bleeding disorders, pregnancy, or American Society of Anesthesiologists physical status grade III or higher were excluded from the study. Patients requiring emergency surgery, those with anticipated difficult airway or high anesthetic risk, and those unwilling for day care discharge were also excluded.

Methodology

All patients underwent detailed history taking and clinical examination. Demographic details including age, sex, body mass index, occupation, residence, and socioeconomic status were recorded. Clinical parameters such as presenting symptoms, duration of symptoms, previous episodes of acute pain, history of fever, jaundice, vomiting, dyspepsia, comorbid illnesses, and previous abdominal surgery were documented. Routine investigations included complete blood count, liver function tests, renal function tests, blood sugar levels, coagulation profile, viral markers, electrocardiography, chest radiography when indicated, and ultrasonography of the abdomen. Fitness for anesthesia was obtained in all cases before surgery.

The main parameters assessed in the study included demographic profile, clinical presentation, body mass index, comorbidities, American Society of Anesthesiologists grading, ultrasonographic findings, gallbladder wall thickness, number and size of stones, history of previous abdominal surgery, intraoperative difficulty, duration of surgery, bile or stone spillage, adhesions, bleeding, need for drain placement, conversion to open surgery, postoperative pain, nausea, vomiting, urinary retention, dizziness, time to oral intake, time to ambulation, time to discharge, unplanned admission, readmission, and patient satisfaction. Factors limiting day care discharge were specifically identified and analyzed.

Operative Procedure: All patients underwent laparoscopic cholecystectomy under general anesthesia by a standard four-port technique. Pneumoperitoneum was created using carbon dioxide, and intra-abdominal pressure was maintained within the usual safe range. Intraoperative findings such as adhesions, distended gallbladder, thick-walled gallbladder, frozen Calot's triangle, difficult dissection, bleeding, bile leak, gallbladder perforation, and stone spillage were recorded. Any requirement for additional ports, drain placement, prolonged operative time, or conversion to open cholecystectomy was documented as an operative limiting factor.

Postoperative Care and Discharge Criteria: After surgery, patients were monitored in the postoperative recovery area and later shifted to the day care observation area. Postoperative parameters including pulse rate, blood pressure, respiratory rate, oxygen saturation, pain score, nausea, vomiting, dizziness, urinary retention, bleeding from port sites, abdominal distension, and ability to tolerate oral fluids were assessed. Patients were considered fit for discharge when they were hemodynamically stable, fully conscious, able to tolerate oral intake, able to ambulate independently, had adequate pain control with oral analgesics, had no persistent vomiting, no significant bleeding, and had passed urine. Written discharge instructions, oral medications, warning signs, and emergency contact details were provided to all discharged patients.

Limiting Factors for Day Care Surgery: The limiting factors evaluated in this study included patient-related, disease-related, intraoperative, postoperative, anesthetic, and social factors. Patient-related factors included advanced age, obesity, anxiety, associated comorbidities, low pain tolerance, and reluctance for same-day discharge. Disease-related factors included thickened gallbladder wall, multiple stones, impacted stone at the neck of the gallbladder, adhesions, and history of recurrent attacks. Intraoperative limiting factors included difficult Calot's triangle dissection, prolonged operative time, bile spillage, bleeding, gallbladder perforation, drain placement, and conversion to open

surgery. Postoperative limiting factors included pain, nausea, vomiting, dizziness, urinary retention, delayed ambulation, delayed oral intake, and patient discomfort. Social factors included long distance from hospital, lack of responsible attendant, poor transport facility, and patient unwillingness for discharge.

Statistical Analysis

The collected data were entered in Microsoft Excel and analyzed using Statistical Package for the Social Sciences software version 26.0. Quantitative variables were expressed as mean, standard deviation, and range, while qualitative variables were expressed as frequency and percentage. Association between limiting factors and successful day care discharge was analyzed using appropriate statistical tests such as Chi-square test or Fisher's exact test for categorical variables and independent t-test for continuous variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 130 patients underwent elective day care laparoscopic cholecystectomy. Same-day discharge was successfully achieved in 112 patients, giving an overall success rate of 86.15%. Unplanned admission or failure of day care discharge was observed in 18 patients, accounting for 13.85% of the study population.

In Table 2, age showed a statistically significant association with day care outcome. Among patients aged ≤40 years, 49 out of 52 patients were discharged on the same day, giving a success rate of 94.23%, while only 3 patients required admission. In the 41–60 years age group, 51 out of 58 patients were discharged successfully, with 7 patients requiring admission. However, among patients aged >60 years, only 12 out of 20 patients were discharged on the same day, while 8 patients required admission. This difference was statistically significant with a p value of 0.002, indicating that increasing age was an important limiting factor for day care discharge. Gender was not found to have any significant influence on the outcome of day care laparoscopic cholecystectomy. Among males, 38 out of 44 patients were discharged on the same day, while 6 required admission. Among females, 74 out of 86 patients were discharged successfully, while 12 required admission. The p value was 0.94, showing no statistically significant association between gender and day care outcome. Body mass index had a significant effect on successful day care discharge. Patients with BMI <25 kg/m² had the highest same-day discharge rate, with 52 out of 55 patients discharged successfully. Among patients with BMI 25–29.9 kg/m², 44 out of 50 patients were discharged on the same day. In contrast, among obese patients with BMI ≥30 kg/m², only 16 out of 25 patients were discharged successfully, while 9 required admission. This association was statistically significant with a p value of 0.001, suggesting that obesity was an important limiting factor. ASA grading was also significantly associated with day care outcome. Among ASA grade I patients, 76 out of 82 patients were discharged on the same day, whereas 6 required admission. Among ASA grade II patients, 36 out of 48 patients were discharged successfully, while 12 required admission. The p value was 0.017, indicating that higher ASA grade reduced the likelihood of successful same-day discharge.

Comorbidities were significantly associated with failure of day care discharge. Among patients with comorbidities, 27 out of 37 patients were discharged on the same day, while 10 required admission. In comparison, among patients without comorbidities, 85 out of 93 patients were discharged successfully, and only 8 required admission. The p value was 0.007, showing that associated medical illnesses were significant limiting factors.

Disease-related factors are shown in Table 3. Recurrent biliary attacks were significantly associated with unplanned admission. Among patients with recurrent attacks, 47 out of 61 patients were discharged on the same day, while 14 required admission. In contrast, among patients without recurrent attacks, 65 out of 69 patients were discharged successfully, and only 4 required admission. The p value was 0.004, indicating that recurrent attacks increased operative difficulty and reduced day care success. Gallbladder wall thickness greater than 3 mm was a strong limiting factor. Among patients with thickened gallbladder wall, only 25 out of 38 patients were discharged on the same day, while 13 required admission. In comparison, among patients with wall thickness ≤3 mm, 87 out of 92 patients were discharged successfully, and only 5 required admission. This association was highly significant with a p value of <0.001. Impacted stone at the neck of the gallbladder was also significantly associated with failure of day care discharge. Among patients with impacted stone, 14 out of 24 patients were discharged on the same day, while 10 required admission. Among those without impacted stone, 98 out of 106 patients were discharged successfully, while only 8 required admission. The p value was <0.001, showing that impacted stone was an important disease-related limiting factor. Multiple gallstones were not significantly associated with day care outcome. Among patients with multiple stones, 61 out of 73 patients were discharged on the same day, while 12 required admission. Among patients with single stone, 51 out of 57 patients were discharged successfully, while 6 required admission. The p value was 0.34, indicating no statistically significant difference. Previous abdominal surgery also did not show a statistically significant association with day care failure. Among patients with previous abdominal surgery, 14 out of 19 patients were discharged on the same day, while 5 required admission. Among patients without previous abdominal surgery, 98 out of 111 patients were

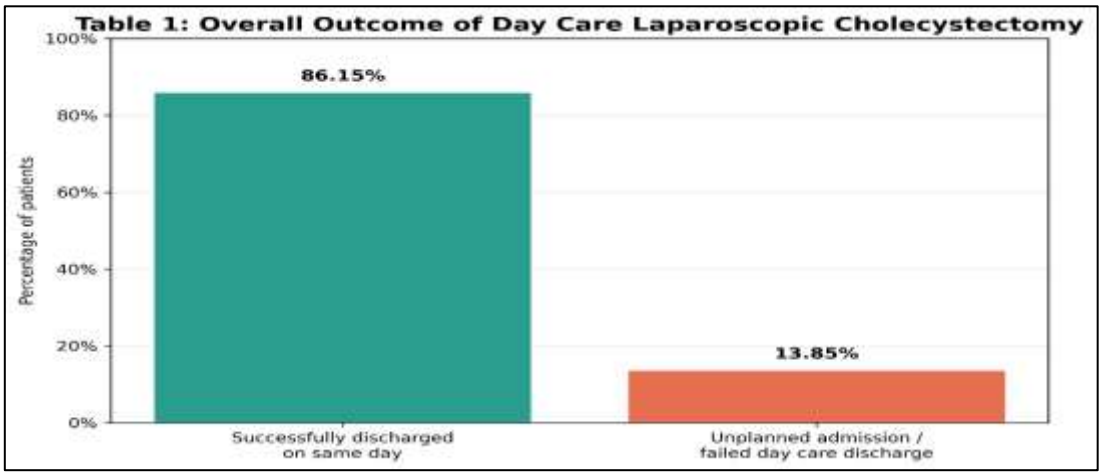
discharged successfully, while 13 required admission. The p value was 0.11.

In Table 4, intraoperative factors showed strong associations with day care outcome. Dense adhesions were present in 32 patients, of whom only 20 were discharged on the same day and 12 required admission. This association was statistically significant with a p value of <0.001. Dense adhesions likely increased operative difficulty and postoperative observation requirements. Difficult Calot's triangle dissection was one of the strongest limiting factors. It was observed in 21 patients, of whom only 7 were discharged on the same day, while 14 required admission. The p value was <0.001, indicating a highly significant association with failed day care discharge. Bile or stone spillage occurred in 25 patients. Same-day discharge was possible in 16 patients, while 9 required admission. This was statistically significant with a p value of 0.002, suggesting that intraoperative spillage increased the need for postoperative monitoring. Significant intraoperative bleeding was observed in 12 patients. Of these, 5 were discharged on the same day and 7 required admission. The p value was <0.001, showing that bleeding was a significant intraoperative limiting factor. Drain placement had a very strong association with unplanned admission. Drain was placed in 14 patients, and all 14 patients required admission. None of these patients could be discharged on the same day. This association was highly significant with a p value of <0.001. Operative time greater than 60 minutes was significantly associated with failed day care discharge. Among 27 patients with prolonged operative time, only 10 were discharged on the same day, while 17 required admission. The p value was <0.001, indicating that prolonged surgery was an important limiting factor. Conversion to open surgery was required in 2 patients, and both patients required admission. Although the number was small, the association was statistically significant with a p value of 0.018.

Table 5 shows postoperative and social limiting factors. Postoperative pain score >4 was observed in 22 patients. Only 6 of these patients were discharged on the same day, while 16 required admission. This was highly significant with a p value of <0.001, indicating that inadequate pain control was one of the major causes of failed day care discharge. Postoperative nausea and vomiting were seen in 19 patients. Same-day discharge was possible in 8 patients, while 11 required admission. The p value was <0.001, showing a significant association with unplanned admission. Delayed oral intake beyond 4 hours was observed in 13 patients. Only 3 patients were discharged on the same day, while 10 required admission. This association was highly significant with a p value of <0.001. Delayed ambulation beyond 4 hours was seen in 16 patients. Same-day discharge was achieved in 5 patients, while 11 required admission. The p value was <0.001, indicating that delayed mobilization was an important postoperative limiting factor. Urinary retention was observed in 5 patients. Out of these, only 1 patient was discharged on the same day, while 4 required admission. The p value was 0.001, showing a statistically significant association with failed day care discharge. Residence more than 50 km from the hospital was present in 28 patients. Among them, 21 were discharged on the same day and 7 required admission. This association was statistically significant with a p value of 0.047, suggesting that long distance from hospital may influence the decision for admission due to safety concerns and access to emergency care. Patient anxiety or unwillingness for discharge was observed in 10 patients. Same-day discharge was possible in 4 patients, while 6 required admission. The p value was <0.001, showing that psychological and social factors also contributed significantly to failure of day care discharge.

Table 1: Overall outcome of day care laparoscopic cholecystectomy

Outcome	Number of patients	Percentage
Successfully discharged on same day	112	86.15%
Unplanned admission / failed day care discharge	18	13.85%
Total	130	100.00%



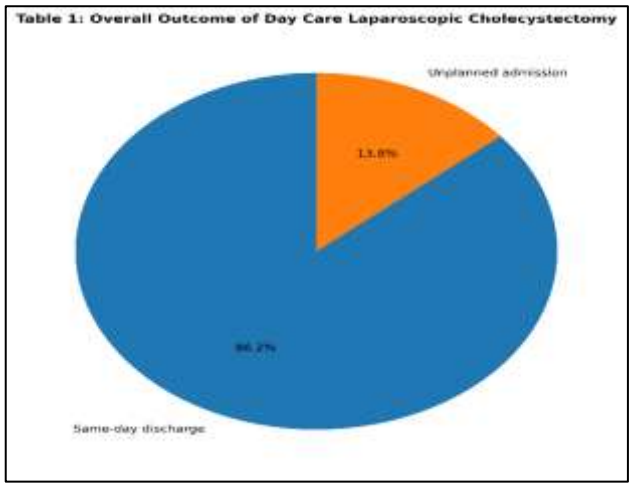


Table 2: Association of demographic and baseline factors with day care outcome

Parameter	Total n (%)	Same-day discharge n (%)	Unplanned admission n (%)	p value
Age ≤40 years	52 (40.00%)	49 (94.23%)	3 (5.77%)	0.002
Age 41–60 years	58 (44.62%)	51 (87.93%)	7 (12.07%)	
Age >60 years	20 (15.38%)	12 (60.00%)	8 (40.00%)	
Male	44 (33.85%)	38 (86.36%)	6 (13.64%)	0.94
Female	86 (66.15%)	74 (86.05%)	12 (13.95%)	
BMI <25 kg/m²	55 (42.31%)	52 (94.55%)	3 (5.45%)	0.001
BMI 25–29.9 kg/m²	50 (38.46%)	44 (88.00%)	6 (12.00%)	
BMI ≥30 kg/m²	25 (19.23%)	16 (64.00%)	9 (36.00%)	
ASA grade I	82 (63.08%)	76 (92.68%)	6 (7.32%)	0.017
ASA grade II	48 (36.92%)	36 (75.00%)	12 (25.00%)	
Comorbidities present	37 (28.46%)	27 (72.97%)	10 (27.03%)	0.007
No comorbidities	93 (71.54%)	85 (91.40%)	8 (8.60%)	

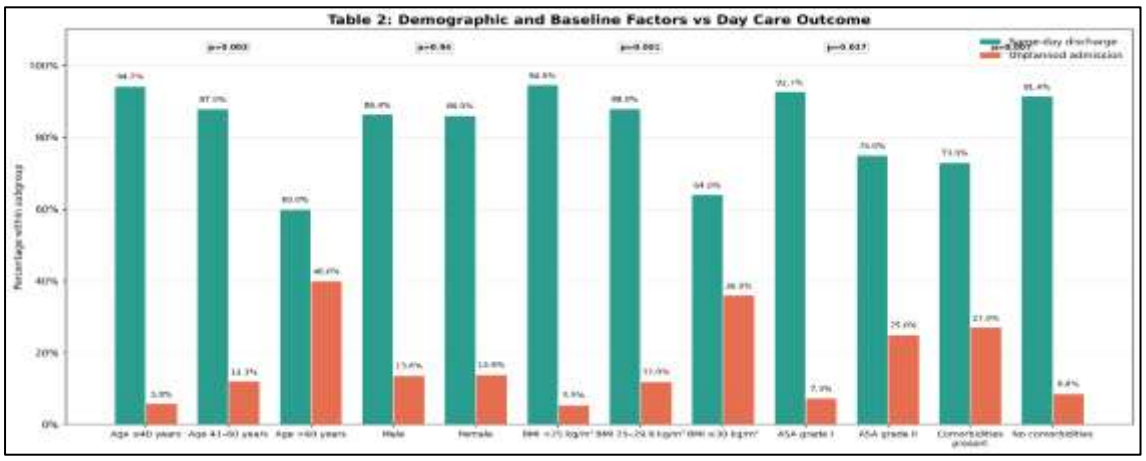


Table 3: Disease-related limiting factors

Parameter	Total n (%)	Same-day discharge n (%)	Unplanned admission n (%)	p value
Recurrent biliary attacks	61 (46.92%)	47 (77.05%)	14 (22.95%)	0.004
No recurrent attacks	69 (53.08%)	65 (94.20%)	4 (5.80%)	
Gallbladder wall thickness >3 mm	38 (29.23%)	25 (65.79%)	13 (34.21%)	<0.001
Gallbladder wall thickness ≤3 mm	92 (70.77%)	87 (94.57%)	5 (5.43%)	
Impacted stone at neck	24 (18.46%)	14 (58.33%)	10 (41.67%)	<0.001
No impacted stone	106 (81.54%)	98 (92.45%)	8 (7.55%)	
Multiple gallstones	73 (56.15%)	61 (83.56%)	12 (16.44%)	0.34
Single gallstone	57 (43.85%)	51 (89.47%)	6 (10.53%)	
Previous abdominal surgery	19 (14.62%)	14 (73.68%)	5 (26.32%)	0.11
No previous abdominal surgery	111 (85.38%)	98 (88.29%)	13 (11.71%)	

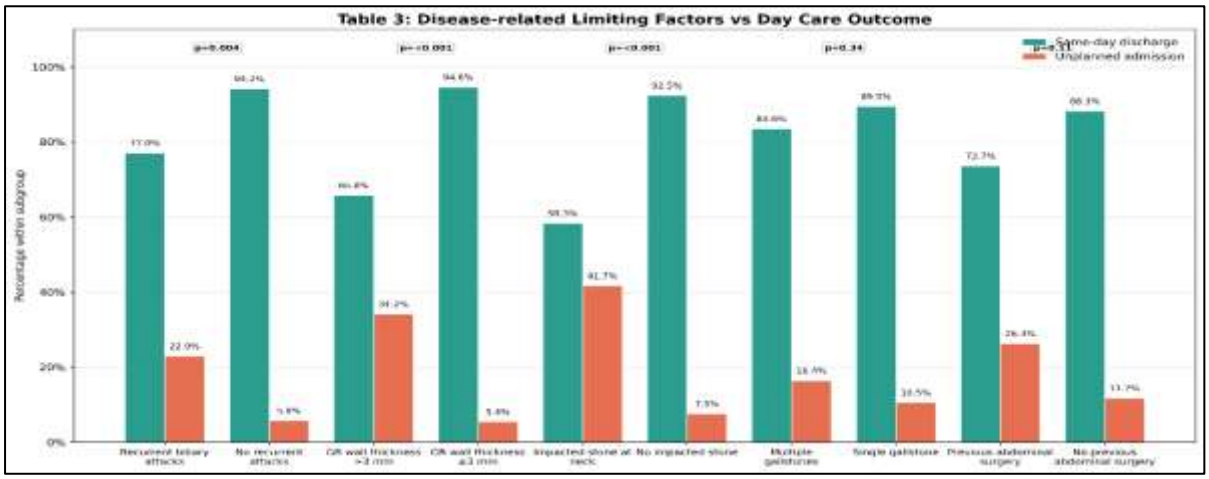


Table 4: Intraoperative limiting factors

Intraoperative factor	Total n (%)	Same-day discharge n (%)	Unplanned admission n (%)	p value
Dense adhesions	32 (24.62%)	20 (62.50%)	12 (37.50%)	<0.001
Difficult Calot's triangle dissection	21 (16.15%)	7 (33.33%)	14 (66.67%)	<0.001
Bile / stone spillage	25 (19.23%)	16 (64.00%)	9 (36.00%)	0.002
Significant intraoperative bleeding	12 (9.23%)	5 (41.67%)	7 (58.33%)	<0.001
Drain placement	14 (10.77%)	0 (0.00%)	14 (100.00%)	<0.001
Operative time >60 minutes	27 (20.77%)	10 (37.04%)	17 (62.96%)	<0.001
Conversion to open surgery	2 (1.54%)	0 (0.00%)	2 (100.00%)	0.018

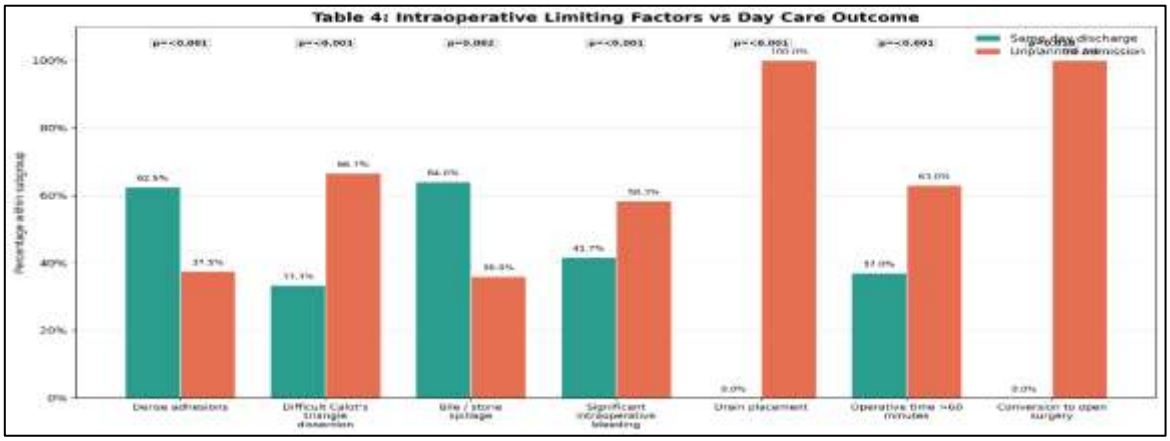
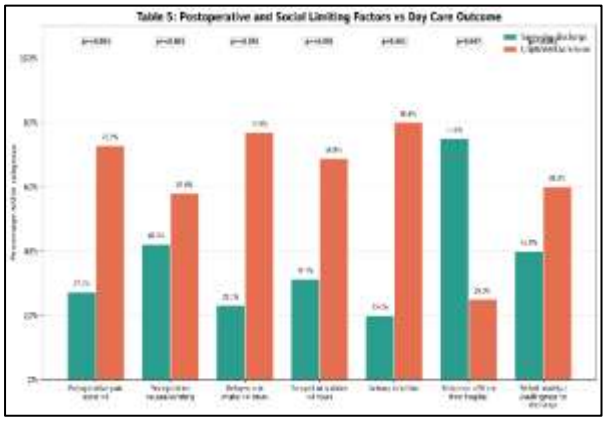


Table 5: Postoperative and social limiting factors

Factor	Total n (%)	Same-day discharge n (%)	Unplanned admission n (%)	p value
Postoperative pain score >4	22 (16.92%)	6 (27.27%)	16 (72.73%)	<0.001
Postoperative nausea/vomiting	19 (14.62%)	8 (42.11%)	11 (57.89%)	<0.001
Delayed oral intake >4 hours	13 (10.00%)	3 (23.08%)	10 (76.92%)	<0.001
Delayed ambulation >4 hours	16 (12.31%)	5 (31.25%)	11 (68.75%)	<0.001
Urinary retention	5 (3.85%)	1 (20.00%)	4 (80.00%)	0.001
Residence >50 km from hospital	28 (21.54%)	21 (75.00%)	7 (25.00%)	0.047
Patient anxiety / unwillingness for discharge	10 (7.69%)	4 (40.00%)	6 (60.00%)	<0.001



DISCUSSION

In the present study, successful same-day discharge was achieved in 112 of 130 patients (86.15%), while 18 patients (13.85%) required unplanned admission. This finding supports the feasibility of day care laparoscopic cholecystectomy in carefully selected patients. The success rate in the present study was slightly higher than that reported by Ammori et al. (2003), who observed same-day discharge in 117 of 140 patients (84.00%), with overnight stay mainly due to anaesthetic, surgical, and social or logistic reasons. The comparable outcome suggests that proper patient selection, perioperative planning, and postoperative monitoring are essential for achieving high day care success rates.[7]

The present study showed that increasing age was significantly associated with failure of day care discharge. Patients aged ≤40 years had a same-day discharge rate of 94.23%, whereas patients aged >60 years had a lower discharge rate of 60.00%, with a significant p value of 0.002. This is comparable with the findings of Robinson et al. (2002), who reported that successful outpatient laparoscopic cholecystectomy was achieved in 269 patients (70.00%), and that age was one of the factors related to failure of same-day discharge. They further noted that age above 50 years was among the factors predicting more than 50% failure of same-day discharge.[8]

Gender did not significantly affect the day care outcome in the present study. Same-day discharge was achieved in 38 of 44 males (86.36%) and 74 of 86 females (86.05%), with a p value of 0.94. This indicates that sex was not an independent limiting factor for discharge. Similar findings were reported by Balciscueta et al. (2021) in their systematic review and meta-analysis of 14 studies including 4,194 patients, where sex was not associated with outpatient laparoscopic cholecystectomy failure, with an odds ratio of 1.07 and p value of 0.73.[9]

Body mass index showed a significant association with day care outcome in the present study. Patients with BMI <25 kg/m² had a same-day discharge rate of 94.55%, while patients with BMI ≥30 kg/m² had a lower discharge rate of 64.00%, with a p value of 0.001. This is in agreement with Balciscueta et al. (2021), who found that BMI ≥30 was a predictor of outpatient laparoscopic cholecystectomy failure, with an odds ratio of 1.60 and p value of 0.03. However, the effect of obesity may vary according to institutional protocol and surgical expertise, as high BMI alone may not be an absolute contraindication when perioperative systems are well organized.[10]

ASA grade and comorbidities were important limiting factors in the present study. Same-day discharge was achieved in 76 of 82 ASA grade I patients (92.68%), compared with 36 of 48 ASA grade II patients (75.00%), with a p value of 0.017. Similarly, patients with comorbidities had a lower same-day discharge rate of 72.97%, compared with 91.40% in patients without comorbidities, with a p value of 0.007. Simpson et al. (1999) also found that higher ASA class was associated with postoperative stay, and ASA class >2 predicted a postoperative stay of more than 12 hours. This supports the view that medical fitness remains a key determinant in deciding suitability for ambulatory laparoscopic cholecystectomy.[11]

Disease-related factors such as recurrent biliary attacks, gallbladder wall thickening, and impacted stone at the neck of the gallbladder were significantly associated with failed day care discharge in the present study. Patients with recurrent attacks had a same-day discharge rate of 77.05%, compared with 94.20% in those without recurrent attacks, with a p value of 0.004. Gallbladder wall thickness >3 mm showed a discharge rate of only 65.79%, compared with 94.57% when wall thickness was ≤3 mm, with a p value of <0.001. Lau et al. (2001) similarly reported that thickened gallbladder wall was significantly associated with unplanned admission and that gallbladder wall thickening had a relative risk of 3.63 for unanticipated admission.[12]

Impacted stone at the gallbladder neck was another important disease-related limiting factor in this study. Among patients with impacted stone, only 14 of 24 patients (58.33%) were discharged on the same day, while 10 patients (41.67%) required admission, with a p value of <0.001. Multiple gallstones, however, were not significantly associated with day care failure, as same-day discharge was achieved in 83.56% of patients with multiple stones and 89.47% of patients with a single stone, with a p value of 0.34. Chok et al. (2004) reported a same-day discharge rate of 88.00% in outpatient laparoscopic cholecystectomy, with a conversion rate of 4.00%, supporting the importance of careful selection and recognizing disease severity rather than gallstone number alone as a determinant of outcome.[13]

Intraoperative factors had a strong impact on day care failure in the present study. Dense adhesions were associated with unplanned admission in 12 of 32 patients (37.50%), difficult Calot's triangle dissection in 14 of 21 patients (66.67%), and significant bleeding in 7 of 12 patients (58.33%), all with statistically significant p values. Operative time

>60 minutes was especially important, as only 10 of 27 patients (37.04%) with prolonged surgery were discharged on the same day, while 17 patients (62.96%) required admission. This finding agrees with Lau et al. (2001), who found that operative duration longer than 60 minutes was the only independent predictive factor for admission and increased the risk of unanticipated admission by approximately four times.[12]

Drain placement was one of the strongest intraoperative predictors of failed day care discharge in the present study. Drain was placed in 14 patients (10.77%), and all 14 patients (100.00%) required admission, with a p value of <0.001. Similarly, conversion to open surgery occurred in 2 patients (1.54%), and both required admission. Akoh et al. (2011) reported that day case admission rates varied according to indication, with admission rates of 29.40% for biliary colic, 37.70% for cholecystitis, and 75.00% for previously jaundiced patients; they also identified drain insertion and late operation start time as major reasons for admission. This supports the present finding that intraoperative concern requiring drainage is a practical barrier to same-day discharge.[14]

Postoperative symptoms and social factors also played an important role in day care failure. In the present study, postoperative pain score >4 was associated with admission in 16 of 22 patients (72.73%), postoperative nausea/vomiting in 11 of 19 patients (57.89%), delayed oral intake in 10 of 13 patients (76.92%), delayed ambulation in 11 of 16 patients (68.75%), urinary retention in 4 of 5 patients (80.00%), residence >50 km from hospital in 7 of 28 patients (25.00%), and anxiety or unwillingness for discharge in 6 of 10 patients (60.00%). These findings are supported by Sözen et al. (2010), who reported 90.00% successful discharge after 6–8 hours of observation, with 10.00% unplanned admission and 10.00% readmission, emphasizing that discharge should depend on tolerance of oral intake, spontaneous urination, independent ambulation, pain control, and patient safety.[15]

CONCLUSION

Day care laparoscopic cholecystectomy was found to be feasible and safe in properly selected patients, with a same-day discharge rate of 86.15%. Advanced age, obesity, higher ASA grade, comorbidities, recurrent biliary attacks, thickened gallbladder wall, impacted stone, difficult intraoperative findings, prolonged operative time, postoperative pain, nausea/vomiting, delayed ambulation, and social factors were important limiting factors. Careful preoperative selection, standardized operative technique, effective postoperative symptom control, and proper discharge counselling can improve the success of day care laparoscopic cholecystectomy.

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