DOI: 10.4274/tjcd.galenos.2025.2025-4-6
Turk J Colorectal Dis 2025;35(3):72-78

RESEARCH ARTICLE

Ambulatory Colorectal Surgery Following Enhanced Recovery After Surgery Guidelines: A Cohort Study of a Multidisciplinary Protocol

Jessica Capre Pereira[1,2], Helber-Fabián Pérez-Imbachí[3,4], Andrés Gempeler[2], Juan-Guillermo Holguín[1,2], Alexander Obando[1,2], Yaset Caicedo[4], Mauricio Burbano[5], Einar Billefals[5], Felipe Anduquia-Garay[4], Mónica Bejarano[6], Abraham Kestenberg[1,2]

[1]Fundación Valle del Lili, Department of Colorectal Surgery, Cali, Colombia
[2]Fundación Valle del Lili, Clinical Research Center, Cali, Colombia
[3]Colombian Association of Surgery, Future Surgeons Chapter, Bogotá, Colombia
[4]Faculty of Health Sciences ICESI University, General Surgery Residency Program, Cali,Colombia
[5]Fundación Valle del Lili, Department of Anesthesiology, Cali, Colombia
[6]Fundación Valle del Lili, Department of General Surgery, Cali, Colombia

ABSTRACT

Aim: To evaluate the clinical outcomes of an ambulatory colorectal surgery protocol based on the enhanced recovery after surgery (ERAS) recommendations.

Method: A retrospective observational cohort study was conducted involving adult patients who underwent major colorectal surgery under ERAS between 2022 and 2024. To qualify for ambulatory surgery, patients were required to undergo preoperative counseling, have family support, demonstrate medical adherence, and be classified as American Society of Anesthesiology (ASA) I or II. Patients who underwent complex procedures, required intensive care, or were considered at high social risk were excluded. The outcomes assessed included gastrointestinal recovery, complications, reinterventions, hospital readmissions, and length of stay exceeding 30 days.

Results: A total of 114 patients were treated according to the institutional protocol, of whom 14.9% (17/114) were eligible for outpatient colorectal surgery. The median age was 60 years, and 82.4% (14/17) were men classified as ASA II who underwent anterior rectal resection or right hemicolectomy for primary adenocarcinoma. The median length of hospital stay was 19 hours [interquartile range (IQR): 15-21], with a median time to oral recovery of 6 hours (IQR: 4-6) and a median time to flatus passage of 10 hours (IQR: 6-11). There were no reinterventions or readmissions within 30 days postoperatively.

Conclusion: Ambulatory colorectal surgery performed under the ERAS protocol can be conducted safely. The success of such protocols relies on careful patient selection, a multidisciplinary approach, and care tailored to each patient and their treatment plan.

Keywords: Ambulatory surgical procedures, colorectal surgery, enhanced recovery after surgery, patient readmission, surgery

Introduction

The postoperative management of patients undergoing colorectal surgery has been widely discussed in the past, as colorectal surgery is associated with high in-hospital costs and frequent postoperative hospitalizations worldwide, mainly related to colorectal cancer.[1,2] As a result of these high costs and the high morbidity associated with colorectal surgery, strategies have been implemented to improve surgical outcomes and reduce expenses, including the enhanced recovery after surgery (ERAS) protocol.[3] This consists of a

Address for Correspondence: Jessica Capre-Pereira MD, Fundación Valle del Lili, Department of Colorectal Surgery, Cali, Colombia
E-mail: jessica.capre@fvl.org.co **ORCID ID:** orcid.org/0000-0002-1577-5525
Received: 21.04.2025 **Accepted:** 05.07.2025 **Publication Date:** 22.09.2025

Cite this article as: Capre Pereira J, Pérez-Imbachí HF, Gempeler A, Holguín JG, Obando A, Caicedo Y, Burbano M, Billefals E, Anduquia-Garay F, Bejarano M, Abraham Kestenberg A. Ambulatory colorectal surgery following enhanced recovery after surgery guidelines: a cohort study of a multidisciplinary protocol. Turk J Colorectal Dis. 2025;35(3):72-78

series of medical interventions at different stages of the surgical procedure, aimed at improving perioperative outcomes through a multidisciplinary and comprehensive approach.[3] First implemented in colorectal surgery, ERAS has since been associated with a reduction in complications, as well as shorter hospital stays, faster bowel recovery, better management of pain and nausea, and lower costs.[4-6]

Although ERAS has proven to be a strategy that improves clinical outcomes and reduces costs, new questions have emerged regarding the future of ambulatory colorectal surgery and the feasibility of performing ambulatory colorectal resections under multidisciplinary care. Recent publications have also suggested more personalized approaches to the ERAS protocol, based on the procedure and patient preferences.[7] Ambulatory colorectal surgery is defined as the performance of major colorectal surgery or major bowel resection with a postoperative stay of less than 24 hours.[8] The first series published on this approach was performed in Lyon by a group of general surgeons using a multidisciplinary protocol based on ERAS recommendations, in which five patients underwent outpatient colectomy with satisfactory clinical results.[9]

Currently, although there are some publications on outpatient colorectal surgery with or without ERAS recommendations, their implementation continues to be questioned by those who argue that it is not possible to anticipate all adverse postoperative events that may benefit from hospital management.[10] On the other hand, proponents of these initiatives suggest that their success depends on adequate and accurate patient selection for ambulatory colorectal resections, with outcomes comparable to those of standard care.[7,8,11,12] However, in many regions, there are no reports regarding the use of ERAS in ambulatory colorectal surgery. This study, therefore, aims to evaluate the clinical outcomes of an ambulatory colorectal surgery protocol under ERAS in a high-complexity institution.

Materials and Methods

Study Design, Setting, and Patients

A retrospective observational cohort study was conducted that included patients over 18 years of age with colorectal pathologies requiring major colorectal surgery (defined as a procedure duration of more than two hours), who were submitted to the outpatient colorectal surgery protocol according to ERAS recommendations between December 2022 and June 2024.

This study was conducted in a high-complexity institution that has been implementing the ERAS protocol for major colorectal surgery since October 2022 and was certified as an ERAS institution on October 30, 2023. This clinical project was approved under code 2023.023E1 by the Institutional Ethics Committee and was conducted in accordance with the standards established by the Declaration of Helsinki.[13] For this type of study, formal consent is not required.

The reporting of this study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement guidelines to ensure clarity, transparency, and completeness in observational research.

Inclusion and Exclusion Criteria for Ambulatory Colorectal Surgery Under the ERAS Protocol

The inclusion criteria for the protocol were as follows:

- Patients classified as American Society of Anesthesiology (ASA) I or II, according to the ASA scale.[14]
- Adequate family support, defined as the presence of a close family member or constant caregiver who understands the patient's medical situation and care before and after surgery, and who has a history of adherence to agreed-upon treatments for other procedures, either for the patient or for themselves.
- Preoperative counseling for ambulatory care, in which the patient and their companion were informed about the planned discharge 24 hours after surgery and asked whether they wanted this type of care. If accepted, the patient was enrolled in the protocol; if refused, hospital management with the ERAS protocol was provided.
- Constant sources of contact, defined as having at least two means of telephone communication through social networks or access to a signal network to receive calls, verified before the patient's discharge. Additionally, proximity to the health facility was considered for possible readmission, defined as living in the city where the procedure was performed.

The exclusion criteria were as follows:

- Patients undergoing complex colorectal surgery involving ileoanal pouch creation, abdominoperineal resection, enterocutaneous fistula repair, or the need for multiple or synchronous colectomies.
- Previous major abdominal surgery.
- Perioperative intensive care unit (ICU) admission.
- Need for anticoagulation due to medical comorbidities.
- High social risk, defined as living outside the city where the procedure was performed, lacking an adequate support network, using psychoactive substances, or being a chronic smoker (with more than two years of tobacco use).
- Stoma creation, defined as any type of ileostomy or colostomy.

Preoperative, In-Hospital, and Postoperative Management Under the ERAS Protocol

Preoperative, in-hospital, and postoperative management was shared among the multidisciplinary team. The colorectal surgeon was responsible for the preoperative medical assessment, surgical intervention, and postoperative follow-

up, including medication prescriptions and evaluation of the patient's clinical status. In the postoperative period, the surgeon also managed the regular diet and hospital discharge. Anesthesiologists performed the preoperative evaluation (such as the Physiological and Operative Severity Score for the Enumeration of Mortality and Morbidity scale), administered preoperative medications, managed hydration and hemodynamic support during surgery, and controlled postoperative pain with oral or epidural analgesics.[15]

A nurse assigned to patients under the ERAS protocol provided preoperative instructions, monitored patients up to six hours before surgery, and managed bowel preparation, antibiotic prophylaxis, and maltodextrin administration. Postoperatively, the nurse conducted telephone follow-ups for up to 30 days after surgery. The nutrition service assessed nutritional status and provided personalized nutrition plans, whereas the physiotherapy team focused on cardiovascular and musculoskeletal improvement before and after surgery, promoting early mobilization and respiratory stimulation.

Hospital Discharge and Outpatient Follow-Up

To define a safe discharge under the ambulatory colorectal surgery protocol, the following criteria were used: independent ambulation, tolerance of oral intake between the first 4 and 8 postoperative hours, stable vital signs, paraclinical tests without abnormalities or within expected limits, pain controlled with oral medication, and consent from both the patient and companion for discharge.

Before leaving the hospital, the discharge procedure was explained to the patient, who could choose to accept or decline it and continue under standard ERAS management if uncomfortable with early discharge. Patients were provided with the telephone numbers of their attending colorectal surgeon and the ERAS protocol nurse to contact in case of any warning signs or symptoms. Each patient was offered two follow-up appointments with their attending surgeon within 30 days of surgery, scheduled according to the patient's preference.

All patients were followed up by telephone on the day after discharge and at 5, 7, 10, 15, and 30 days postoperatively by the nurse responsible for the ERAS protocol, who actively sought out symptoms and warning signs during conversations with the patient's companion. During this period, patients also had follow-up appointments with their attending physician, who conducted a detailed interview and physical examination to rule out any complications. At the end of the 30-day period, follow-up was concluded in accordance with the ERAS protocol.

Variables and Data Source Measurements

Clinical characteristics collected included age, sex, medical history, ASA classification, and preoperative nutritional status. Intraoperatively, the type of primary anastomosis, blood loss, and the need for supportive measures such as vasoactive agents or transfusions were recorded. In-hospital outcomes included hours to oral tolerance, time to passage of flatus and stool after surgery, and total hours of hospitalization since admission. In the postoperative period, medical and surgical complications by system, severity of complications according to the Clavien-Dindo scale, and surgical reinterventions were measured.[16]

Hospital readmission was defined as any visit to the emergency department within 30 days of surgery. The presence of complications, ICU admission, and reinterventions were also recorded after discharge. To measure adherence to ERAS recommendations at different stages, the percentage of compliance was obtained using the European Network for Child and Adolescent Research and Education (ENCARE) software. All outcomes were assessed during hospitalization and within 30 days after surgery.

Bias

Although bowel recovery times are available in clinical records through the progress or follow-up notes of the attending surgeon, these times may vary, as the notes are often uploaded into the system hours or minutes after the patient was interviewed during rounds. To reduce this bias, the institutional ERAS program provides patients with a physical form on which they, along with their companion or floor nurse, must record the date and time of oral tolerance, flatus, and stool passage immediately after each event (Supplementary Material). This form is collected at discharge and stored in the confidential files of the institutional ERAS program, available upon request.

Statistical Analysis

Hospital data were entered into the ENCARE system, accessed through the institutional license of the ERAS Society. These data were subsequently verified against the physical forms completed by nurses and patients and corrected if necessary. For analysis, the data were transferred to REDCap. Statistical analysis was conducted using RStudio Version 4.4.3.

Quantitative variables are presented as medians and interquartile ranges (IQRs) due to their asymmetric distribution. Qualitative variables are reported as absolute and relative frequencies. Given the descriptive nature of this study, no statistical tests were performed to compare groups or variables.

Results

Characteristics of Patients

Since the implementation of the ERAS protocol in the institution in 2022, 114 patients have undergone surgery under these recommendations and completed their 30-day follow-up after discharge. Figure 1 shows the patients who met the

inclusion and exclusion criteria. Of these, 14.9% (17/114) met the criteria for inclusion in the ambulatory colorectal surgery program. In this group, the median age was 60 years (IQR: 48-73), 64.7% (11/17) were men, and 82.4% (14/17) were classified as ASA II. The most common procedure was anterior rectal resection, performed in 58.8% (10/17) of patients, followed by right hemicolectomy, with primary anastomosis performed in all cases. All surgical procedures were performed laparoscopically for the management of benign or malignant pathologies. The most common diagnosis, based on the institutional pathology reports from surgical specimens, was primary adenocarcinoma in 76.5% (13/17) of patients. Other clinical characteristics are listed in Table 1.

Adherence to ERAS Recommendations

The overall compliance with ERAS recommendations in patients undergoing ambulatory colorectal surgery was 91.4%. Since the protocol's implementation, compliance with the preoperative, intraoperative, and perioperative phases has consistently ranged from 85% to 95%. Specific items-such as nutritional status assessment, maltodextrin administration, anemia screening and treatment, nausea and vomiting prophylaxis, avoidance of surgical drainage, and thromboprophylaxis-achieved 100% compliance. Among active smokers, 50% (1 out of 2) achieved smoking cessation prior to surgery. In the postoperative phase, compliance was the lowest at 77.9%, primarily due to early mobilization, which had a compliance rate of 76.5% among the analyzed patients.

In-Hospital and 30-Day Post-Discharge Outcomes

In-hospital and 30-day outcomes are shown in Table 2. The median length of hospital stay was 19 hours (IQR: 15, 21). For in-hospital outcomes, the median time to oral tolerance was 6

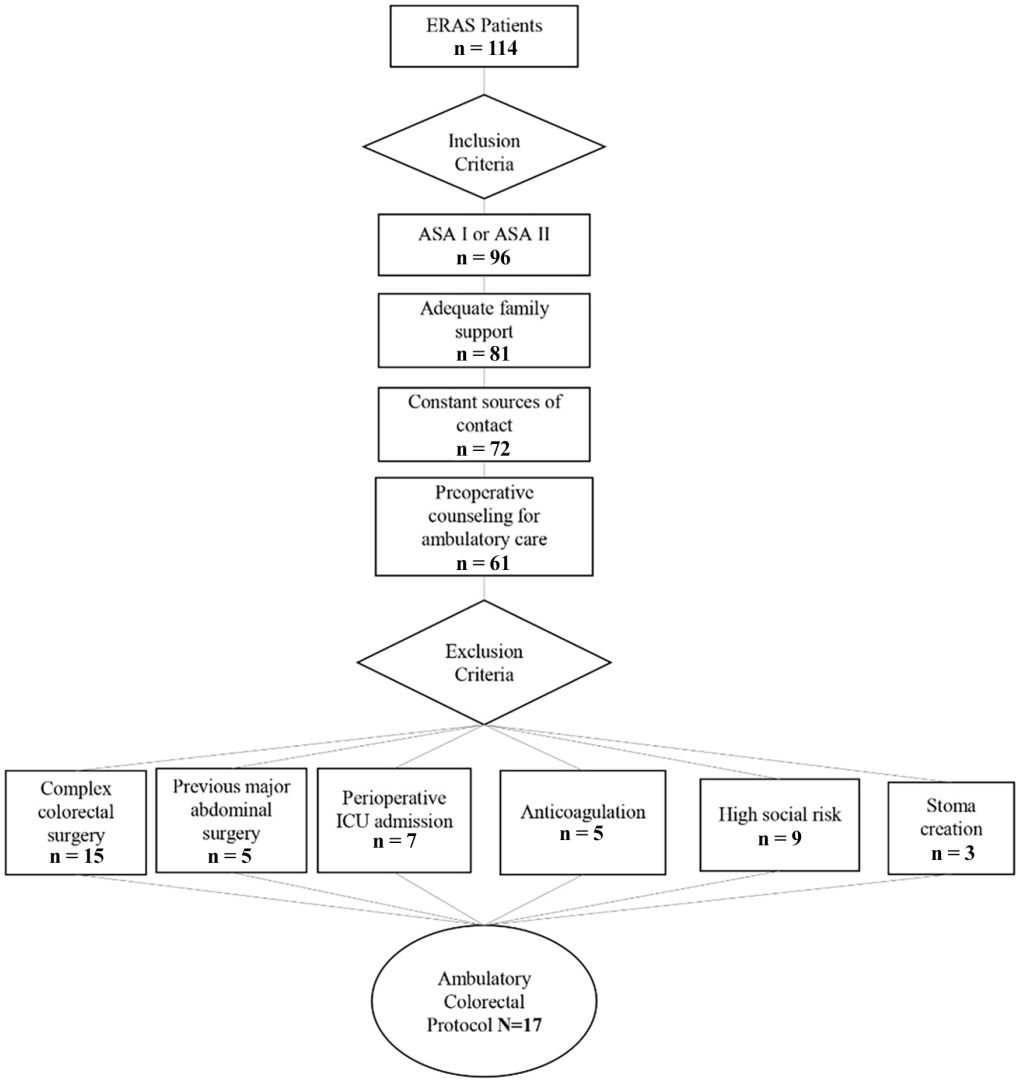

Figure 1. Selection of patients undergoing ambulatory colorectal surgery
ERAS: Enhanced recovery after surgery, ASA: American Society of Anesthesiology, ICU: Intensive care unit

hours (IQR: 4, 6), the median time to flatus passage was 10 hours (IQR: 6, 11), and the median time to first postoperative bowel movement was 12 hours (IQR: 9.75, 15.25). Prior to discharge, the median white blood cell count was 6.43 x 10^9/L (IQR: 5.22, 12.20), whereas the median hemoglobin level was 13 g/dL (IQR: 11.8, 13.97).

Complications occurred in 5.9% (1/17) of patients undergoing the outpatient colorectal surgery protocol. This involved a patient who presented with an episode of vomiting after ingesting clear liquids one hour after the procedure. A dose of metoclopramide was administered, and the oral route was reattempted with clear liquids, which were fully tolerated by 7 hours postoperatively. Given the tolerance of the oral route and the passage of flatus and stool without issue, the patient was discharged 22 hours after the procedure. In non-ambulatory ERAS patients, the most common in-hospital complication was postoperative ileus (9/24), followed by gastrointestinal bleeding (4/24) and postoperative nausea and vomiting (3/24) (deleted).

During the subsequent 30 days of follow-up, the median time to the in-person postoperative visit was 30 days (IQR: 13, 30), with the remainder of follow-up conducted by telephone with the attending physician and the ERAS nurse on the established postoperative days. At the end of follow-up, none of the patients who underwent the ERAS-recommended outpatient colorectal surgery protocol experienced readmissions, re-interventions, or other complications.

Table 1. Sociodemographic and clinical characteristics of patients undergoing ambulatory colorectal surgery under ERAS

Variable	Patients in the ambulatory ERAS group (n=17)
Age, median [IQR]	60 [48, 73]
Gender, (%)	
Men	11 (64.7)
Women	6 (35.3)
BMI, median [IQR]	24.68 [21.30, 28.64]
Smoker, (%)	2 (11.8)
Diabetes mellitus, (%)	1 (5.9)
Pulmonary or heart disease, (%)	1 (5.9)
Preoperative chemotherapy, (%)	2 (11.8)
Preoperative radiotherapy, (%)	1 (5.9)
Procedure performed, (%)	
Right hemicolectomy	5 (29.4)
Left hemicolectomy	1 (5.9)
Anterior rectal resection	10 (58.8)
Hartmann colostomy closure with rectal stump remodeling	1 (5.9)
ASA classification, (%)	
ASA I	3 (17.6)
ASA II	14 (82.4)
Final diagnosis	
Primary adenocarcinoma or other malignant neoplasm	13 (76.5)
Diverticular disease	2 (11.8)
Mild non-specific sigmoiditis	1 (5.9)
Other benign disorders or benign neoplasms	1 (5.9)

ERAS: Enhanced recovery after surgery, IQR: Interquartile range, BMI: body mass index, ASA: American Society of Anesthesiology

Table 2. In-hospital and 30-day follow-up clinical outcomes

Variable	Patients in the ambulatory ERAS group (n=17)
First passage of stool, hours, median [IQR]	12.00 [9.75, 15.25]
Tolerance to oral intake, hours, median [IQR]	6.00 [4.00, 6.00]
Complications, n (%)	1 (5.9)
Postoperative nausea and vomiting (%)	1 (100.0% of complications)
Hospital stay, hours, median [IQR]	19.00 [15.00, 21.00]
Variable	Ambulatory ERAS patients **(n=17)**
Pre-discharge vital signs and labs	
Systolic blood pressure (mmHg), median [IQR]	131.00 [120.00, 145.75]
Pulse rate (bpm), median [IQR]	72.00 [65.00, 78.00]
Glasgow Coma scale, median [IQR]	15.00 [15.00, 15.00]
Hemoglobin (g/dL), median [IQR]	13.00 [11.80, 13.97]
White blood cell count (x 10^9/L), median [IQR]	6.43 [5.22, 12.20]
Sodium (mmol/L), median [IQR]	141.00 [139.00, 142.00]
Potassium (mmol/L), median [IQR]	4.35 [4.03, 4.60]
30-day clinical outcomes	
Readmissions, (%)	0 (0.0)
Reinterventions, (%)	0 (0.0)
Complications, (%)	0 (0.0)

IQR: Interquartile range, ERAS: Enhanced recovery after surgery

Discussion

In this study, the implementation of an outpatient colorectal surgery protocol according to ERAS recommendations resulted in favorable clinical outcomes in a safe manner. The most important measurable outcome of outpatient colorectal surgery protocols, in terms of safety and clinical effectiveness, is the readmission rate of patients undergoing these protocols.[11,17] In the available literature, hospital readmission rates for outpatient colorectal surgery range from 1.4% to 13.7%, depending on the series analyzed, the care protocol used, and the medical center. One of the largest patient series was recently published by Curfman et al.[18] in 2023, in which 326 patients undergoing major colorectal surgery were analyzed, of whom 35.3% (115/326) underwent an outpatient surgical protocol according to ERAS recommendations. The inclusion and exclusion criteria were very similar to those proposed in this analysis, excluding patients with stoma creation, previous abdominal surgery, and major comorbidities. The results showed that 4.3% (5/115) returned to the emergency department, and one patient presented with postoperative urinary retention requiring readmission.

Despite these satisfactory clinical results, those who disagree with such protocols have raised several points that should be considered in their implementation. First, it is argued that some patients prefer standard care and that those who undergo outpatient protocols may have a less favorable clinical experience.[10] However, a recent publication by Curfman et al.[19] compared the experiences of 50 patients undergoing outpatient surgery under ERAS with 50 patients treated under conventional ERAS. They found that most patients appreciated being included in the protocol and that 85.37% would choose it again. On the other hand, the protocol presented in this article, like others, offers the option of continuing with conventional ERAS management if preferred.[18-21]

Second, it is suggested that in addition to having access to the health system and the necessary tools, there must be direct resources available either from the treating institution or the patient.[10] This was previously shown by Geyer et al.[22] in 2020, where they found that people in rural areas tended to have higher mortality from colorectal cancer due to their distance from the ambulatory surgical center. In such cases, it is recommended that the distance from the patient's residence to the medical center be considered in the inclusion and exclusion criteria, as in resource-limited contexts, this can become a conditioning factor that may affect patient safety and the possibility of readmission if needed. However, the protocol presented in this article was carried out in an institution that mainly treats patients within the primary health care system of a middle-income country.[23] Therefore, outpatient colorectal surgery under ERAS could be performed in regions with limited health care systems and not only in areas with greater resources.

Another point of discussion is the heterogeneity of the inclusion and exclusion criteria established for these protocols, since each institution that has published its results has done so according to its clinical data or the available evidence.[10] Although there is still no consensus among the institutions implementing these protocols, stoma creation, social risk, patient deterioration, and substantial associated comorbidities are commonly established criteria in most of the published results, which brings us closer each day to a unified standard.[17] A systematic review conducted by Siragusa et al.[24] showed that despite this heterogeneity, among the 1,296 patients analyzed across 11 studies, readmission and surgical reoperation rates were 5% and 1%, respectively. This suggests that, while further progress is needed in unifying criteria, outpatient colorectal surgery can be a safe alternative in selected cases, with favorable clinical outcomes and low rates of readmission or reoperation.

In the present analysis, the main limitation encountered was the sample size available after two years of protocol implementation. Nevertheless, one of the key factors in the success of ambulatory colorectal surgery remains the appropriate selection of patients.[24] The objective of these initiatives is not for all major colonic resections to be ambulatory, but for all eligible cases to be safely included, achieving favorable clinical results.

This study has several limitations that should be acknowledged. First, the small sample size substantially limits the statistical power and generalizability of the findings, making it difficult to draw broad conclusions or identify rare adverse outcomes. Second, the absence of a control group precludes any comparative analysis to determine whether ambulatory management confers superior outcomes. Third, the retrospective design is inherently subject to selection bias, particularly given the strict inclusion criteria, which favored younger, healthier patients with adequate social support and technological access. This highly selected population of patients undergoing colorectal surgery may not reflect the broader cohort. Additionally, the reliance on self-reported postoperative recovery times-recorded by patients and companions-introduces the possibility of measurement bias. Finally, the lack of adjustment for potential confounding factors may affect the interpretability of the results.

Conclusion

In conclusion, ambulatory colorectal surgery represents a substantial advancement in surgical practice, offering a patient-centered approach that can be safely implemented under the right conditions. This analysis demonstrates that, when guided by the ERAS protocol, this modality is feasible. Moreover, meticulous postoperative outpatient follow-up is essential to monitor recovery, address potential complications,

and maintain patient safety. The success of this approach depends not only on the availability of resources but also on a strong commitment to comprehensive and continuous monitoring throughout the postoperative period, allowing for safe and effective implementation tailored to the needs of the institution and its patients.

Ethics

Ethics Committee Approval: This clinical project was approved under code 2023.023E1 dated: 19.06.2025 in the Biomedical Research Ethics Committee of the Fundación Valle del Lili.

Informed Consent: This study was conducted using data from the clinical records of ERAS patients, which consists of de-identified patient information. Therefore, obtaining individual informed consent was not required.

Footnotes

Authorship Contributions

Surgical and Medical Practices: J.C.P., H.F.P.I., A.G., J.G.H., A.O., Y.C., M.B., E.B., F.A.G., M.B., A.K., Concept: J.C.P., H.F.P.I., J.G.H., A.O., Y.C., M.B., E.B., F.A.G., M.B., A.K., Design: J.C.P., H.F.P.I., A.G., Y.C., M.B., M.B., A.K., Data Collection or Processing: J.C.P., H.F.P.I., A.G., J.G.H., A.O., Y.C., E.B., F.A.G., A.K., Analysis or Interpretation: J.C.P., H.F.P.I., A.G., J.G.H., A.O., Y.C., M.B., E.B., F.A.G., A.K., Literature Search: J.C.P., H.F.P.I., A.G., J.G.H., A.O., Y.C., M.B., E.B., F.A.G., M.B., A.K., Writing: J.C.P., H.F.P.I., A.G., J.G.H., A.O., Y.C., M.B., E.B., F.A.G., M.B., A.K.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Bhimani N, Wong GY, Molloy C, Dieng M, Hugh TJ. Cost of colorectal cancer by treatment type from different health economic perspectives: a systematic review. Eur J Surg Oncol. 2022;48:2082-2093.
2. Paro A, Hyer JM, Shaikh CF, Pawlik TM. Financial impact of out-of-pocket costs among patients undergoing resection for colorectal carcinoma. Ann Surg Oncol. 2022;29:5387-5397.
3. Gustafsson UO, Scott MJ, Hubner M, Nygren J, Demartines N, Francis N, Rockall TA, Young-Fadok TM, Hill AG, Soop M, de Boer HD, Urman RD, Chang GJ, Fichera A, Kessler H, Grass F, Whang EE, Fawcett WJ, Carli F, Lobo DN, Rollins KE, Balfour A, Baldini G, Riedel B, Ljungqvist O. Guidelines for perioperative care in elective colorectal surgery: enhanced recovery after surgery (ERAS®) society recommendations: 2018. World J Surg. 2018;43:659-695
4. Kannan V, Ullah N, Geddada S, Ibrahiam A, Munaf Shakir Al-Qassab Z, Ahmed O, et al. Impact of "enhanced recovery after surgery" (ERAS) protocols vs. traditional perioperative care on patient outcomes after colorectal surgery: a systematic review. Patient Saf Surg. 2025;19:1-14.
5. Turaga AH. Enhanced recovery after surgery (ERAS) protocols for improving outcomes for patients undergoing major colorectal surgery. Cureus. 2023;15:41755.
6. Zhao X, Jin S, Peng M, Wang J. A retrospective study on the efficacy of the ERAS protocol in patients who underwent laparoscopic left and right colectomy surgeries. Front Surg. 2024;11:1395271
7. Abdelnaby A, Alcabes A. Can colorectal surgery be performed as an outpatient surgery? Adv Surg. 2023;57:279-285.
8. Tan JKH, Choe L, Lau J, Tan KK. Discharge within 24 hours following colonic surgery-a distant dream or near reality? A scoping review. Surgery. 2022;172:869-877.
9. Gignoux B, Pasquer A, Vulliez A, Lanz T. Outpatient colectomy within an enhanced recovery program. J Visc Surg. 2015;152:11-15.
10. Atallah SB, Larach SW. Same-day colectomy: are we throwing caution to the wind? Tech Coloproctol. 2023;27:1137-1138.
11. McLemore EC, Lee L, Hedrick TL, Rashidi L, Askenasy EP, Popowich D, Sylla P. Same day discharge following elective, minimally invasive, colorectal surgery : a review of enhanced recovery protocols and early outcomes by the SAGES Colorectal Surgical Committee with recommendations regarding patient selection, remote monitoring, and successful implementation. Surg Endosc. 2022;36:7898-7914.
12. Kiran RP, Herman K, Khoshknabi D, Angistriotis A, Church JM. Feasibility and safety of ambulatory surgery as the next management paradigm in colorectal resection surgery. Ann Surg. 2022;276:562-569.
13. WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Participants – WMA – The World Medical Association n.d. https://www.wma.net/policies-post/wma-declaration-of-helsinki/ (accessed April 18, 2025).
14. Horvath B, Kloesel B, Todd MM, Cole DJ, Prielipp RC. The Evolution, Current Value, and Future of the American Society of Anesthesiologists Physical Status Classification System. Anesthesiology. 2021;135:904-919.
15. Copeland GP, Jones D, Walters M. POSSUM: a scoring system for surgical audit. Br J Surg. 1991;78:355-360.
16. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. Ann Surg. 2004;240:205-213.
17. Lee L, McLemore E, Rashidi L. Same-day discharge after minimally invasive colectomy. JAMA Surg. 2022;157:1059-1060.
18. Curfman KR, Poola AS, Blair GE, Kosnik CL, Pille SA, Hawkins ME, Rashidi L. Ambulatory colectomy: a pathway for advancing the enhanced recovery protocol. J Robot Surg. 2023;17:827-834.
19. Curfman KR, Blair GE, Pille SA, Kosnik CL, Rashidi L. The patient perspective of same day discharge colectomy: one hundred patients surveyed on their experience following colon surgery. Surg Endosc. 2023;37:134-139.
20. McLemore EC, Lee L, Hedrick TL, Rashidi L, Askenasy EP, Popowich D, Sylla P. Same day discharge following elective, minimally invasive, colorectal surgery: a review of enhanced recovery protocols and early outcomes by the SAGES Colorectal Surgical Committee with recommendations regarding patient selection, remote monitoring, and successful implementation. Surg Endosc. 2022;36:7898-7914.
21. Lee L, Eustache J, Tran-McCaslin M, Basam M, Baldini G, Rudikoff AG, Liberman S, Feldman LS, McLemore EC. North American multicentre evaluation of a same-day discharge protocol for minimally invasive colorectal surgery using mHealth or telephone remote post-discharge monitoring. Surg Endosc. 2022;36:9335-9344.
22. Geyer NR, Moss JL, Wang M, Lengerich EJ. Spatial relationship between ambulatory surgery centers and colorectal cancer mortality within Pennsylvania, United States. Public Health. 2020;189:126-128.
23. Informes de Sostenibilidad - Fundación Valle del Lili n.d. https://valledellili.org/nuestra-institucion/informes-de-sostenibilidad/ (accessed April 18, 2025).
24. Siragusa L, Pellino G, Sensi B, Panis Y, Bellato V, Khan J, Sica GS. Ambulatory laparoscopic colectomies: a systematic review. Colorectal Dis. 2023;25:1102-1115.