

Buying time yields a free lunch. The role of preoperative optimization in the management of frail elderly patients with complicated colorectal adenocarcinoma: a case report

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Abstract

The coexistence of advanced age and frailty represents a potentially explosive combination that is becoming increasingly prevalent across Western countries. Frail older patients face high perioperative risks, complications, and functional decline, thus affecting recovery and outcomes following emergency surgery. We report the case of a 78-year-old frail female (Performance Status - Eastern Cooperative Oncology Group [PS-ECOG] 3, Clinical Frailty Scale [CFS] 4, Charlson Comorbidity Index [CCI] 6) with subocclusive adenocarcinoma of the hepatic flexure to highlight the value of preoperative optimization and elective surgery. Through home nutritional support, prehabilitation, intravenous (IV) iron, and metabolic stabilization, she underwent elective surgery 14 days after initial evaluation. This case demonstrates that a proper preoperative assessment, even within a short optimization window, followed by tailored preoperative strategies can safely enable major elective surgery in frail elderly patients, reduce perioperative risk, and improve outcomes, thus avoiding emergency laparotomy and its potential complications. The integration of geriatric assessment and enhanced recovery principles may serve as a model for the surgical-geriatrics interface in managing complex oncogeriatric cases requiring timely and effective interventions.

Key words: colorectal cancer; elderly patients; comprehensive geriatric assessment; enhanced recovery after surgery; case report.

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Introduction

Colorectal cancer (CRC) is the third most common cancer by incidence and ranks second in terms of mortality.¹ Median age at diagnosis is approximately 70 years worldwide and 25% of CRC cases are diagnosed in subjects aged over 80 years.¹⁻³ Frailty, defined as diminished physiological reserve and reduced resistance to stressors, is increasingly recognized as an independent predictor of poor postoperative outcomes.⁴ Therefore, reducing surgical stress and its impact on organs with limited physiological reserve is particularly important in patients already compromised by both frailty and concomitant complicated diseases such as CRC with partial obstruction.^{5,6} Many studies have shown that frailty scores independently predict postoperative complications, length of hospital stay, and mortality.⁷ Other authors suggested that applying a comprehensive geriatric assessment in various medical settings can improve survival, reduce morbidity, and prevent functional decline and loss of independence.^{8,9} Moreover, the introduction of Enhanced Recovery After Surgery (ERAS) protocols has transformed perioperative care in colorectal surgery, reducing sur-

gical stress, maintaining physiological function and accelerating postoperative recovery.^{10,11} The combined implementation of such protocols following a holistic assessment of a frail elderly patient may therefore allow optimization of clinical conditions, ultimately leading to improved outcomes. Our experience suggests that these principles can also be applied in emergency settings, transforming urgent surgical procedures into elective ones and enabling the patient to undergo surgery in a better clinical condition than at the time of the initial assessment.

Case Report

A 78-year-old woman in a condition of frailty (Performance Status - Eastern Cooperative Oncology Group [PS-ECOG] 3, Clinical Frailty Scale [CFS] 4, Charlson Comorbidity Index [CCI] 6) was referred to our center, Humanitas San Pio X (Milan, Italy), in March 2025 for endoscopic assessment due to a positive fecal occult blood test performed because of unintentional weight loss of approximately 10 kg over the past 6 months (Malnutrition Universal Screening Tool [MUST] score 3) and the laboratory

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findings of microcytic anemia (Table 1).¹²⁻¹⁵ There was no family history of CRC. Her past medical history included early senile dementia, hypertension, dyslipidemia, bilateral hearing loss and two prior cesarean sections.

At presentation, the patient complained of bloating, although with regular passage of stools and flatus and nausea or vomiting. Abdominal examination revealed a palpable mass in the right flank, mobile in relation to the parietal plane. Body mass index was 18.37 kg/m² (weight 50 kg; height 1.65 m). The clinical and sociodemographic characteristics of the patient are summarized in Table 2, according to the health domains assessed in the comprehensive geriatric assessment.⁹

The colonoscopy revealed a stenotic and friable mass at the hepatic flexure that had an external diameter of 12 mm (Figure 1), causing a near-complete luminal obstruction.

For intraoperative localization, the lesion was tattooed with India ink about 3 cm distal to its distal margin. Multiple biopsies were obtained from the abnormal area, and the histopathological evaluation confirmed the malignant nature of the lesion. A thoraco-abdominal contrast-enhanced CT scan was then performed, showing an abnormal thickening of the right colonic wall at the hepatic flexure, measuring up to 15 mm in thickness and extending longitudinally for approximately 7 cm, with evidence of initial intussusception. Proximal colonic dilation was observed, with the cecum measuring 6.9 cm in diameter (Figure 2), along with dilation of the ileal loops, which contained air-fluid levels. Clinical Tumor, Nodes, Metastasis (TNM) stage was T4N+M0, according to the 8th edition of the American Joint Committee on Cancer

(AJCC) staging system, and the multidisciplinary team indicated that surgical treatment was required.¹⁶ The patient then underwent a comprehensive pre-operative assessment, including routine blood tests, electrocardiogram, and dedicated cardiological and anesthesiological workup. In the meantime, a low-fiber diet (1400 kcal) with maltodextrin (20 g of maltodextrin diluted in 200 mL,

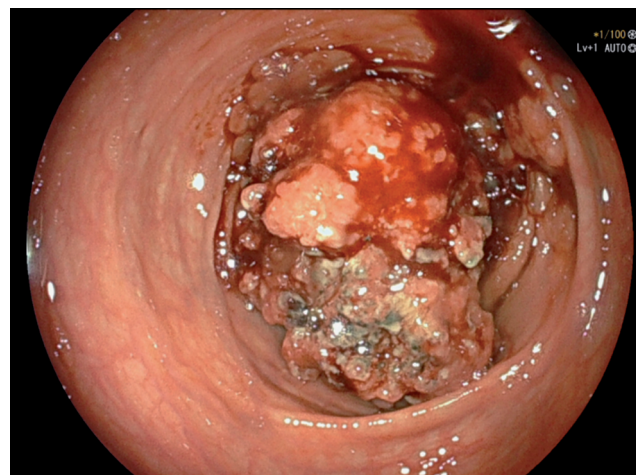


Figure 1. Hepatic flexure mass in colonoscopy.

Table 1. Blood tests results at the time of diagnosis and during the perioperative period.

	Diagnosis	Preoperative	POD-1	POD-3
Hemoglobin (g/dL)	9.1	10.2	9.9	9.8
Hematocrit (%)	28.6	32.1	31.3	30.9
White blood cells (×10 ⁹ /L)	8.55	7.07	13.29	8.77
Platelets (×10 ⁹ /L)	429	355	319	370
Serum iron (mcg/dL)	14			
Transferrin saturation (%)	5			
Albumin (g/L)	25.4			
Creatinine (mg/dL)	0.88	0.83	0.97	0.97
Sodium (mmol/L)		136	139	141
Potassium (mmol/L)		4.1	4.7	4.4
Calcium (mg/dL)		8.44	8.77	8.45

POD, postoperative day.

Table 2. Domains of health related to the comprehensive geriatric assessment.

Domains of health	Description	Score
Physical medical conditions	Hypertension, dyslipidemia, bilateral hearing loss, CRC Weight loss (10 kg); anorexia due to abdominal bloating	CCI 6 MUST score 3
Mental health conditions	Early senile dementia; cognition: mild cognitive impairment; no mood disorder or anxiety	MMSE 24
Functioning	Occasional urinary incontinence; needs help for bed to chair transfers; needs help for stair climbing; normal sleep pattern	Barthel Index 85
Social circumstances	Widowed; retired; two caregivers (sons)	Not applicable
Environment	Living in a urban area; requires support for transportation and access to amenities/facilities; no potential use of telehealth technologies	Not applicable

CRC, colorectal cancer; CCI, Charlson Comorbidity Index; MUST, Malnutrition Universal Screening Tool; MMSE, Mini-Mental State Examination.

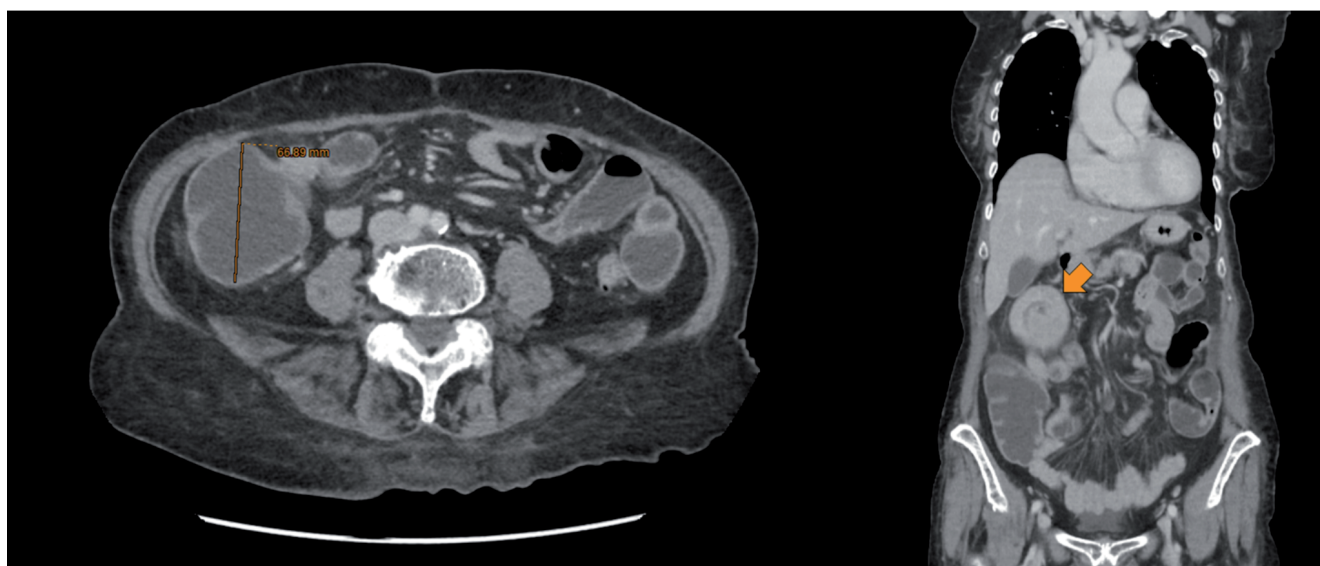


Figure 2. CT scan of the cecal dilation and the colonic mass located at the hepatic flexure with initial intussusception.

providing a total of 100 kcal per day) and protein supplement (4.4 g) was initiated at home and 1 g of ferric carboxymaltose was administered to treat the iron deficiency anemia (Table 1).

The patient was admitted 14 days after the first surgical evaluation due to a worsening subocclusive syndrome, presenting with increasing belching and decreased caloric intake at home. The abdominal examination showed moderate abdominal distension with mild abdominal tenderness in the lower right quadrant, and a negative Blumberg's sign. On admission, intravenous fluid support (ringer acetate 1000 mL/day), with albumin supplementation (20 g/day), was initiated while continuing the maltodextrin administration (40 g of maltodextrins diluted in 400 mL, providing a total of 200 kcal per day) and the initiation of a low-regimen mechanical bowel preparation (1 L of polyethylene glycol/day). After 4 days of hospitalization, an elective laparoscopic right hemicolectomy was performed, with side-to-side anastomosis, viscerolysis, and cholecystectomy. Specimen histopathological examination confirmed the presence of a low-grade adenocarcinoma (G2), according to the 2019 World Health Organization classification, and revealed one positive lymph node out of 22 harvested (1/22). The tumor was definitively staged as IIIB (pT3 N1a) with an R0 resection, according to the AJCC 8th edition.¹⁶

The postoperative course was uneventful, with adherence to Enhanced Recovery After Surgery (ERAS) protocols: early mobilization, fluid discontinuation within 6 hours, early diet advancement, no intra-abdominal drainage, and intraoperative nasogastric tube removal. The patient was discharged without complications on postoperative day 4. The 1-year follow-up revealed no signs of late surgical complications or recurrence. The patient reported her satisfaction with the therapeutic pathway. Figure 3 summarizes the timeline of events.

Discussion

This case report highlights the feasibility and positive outcomes that can be associated with a tailored preoperative strategy for the management of complicated CRC in severely frail elderly patients. The surgical decision-making process is frequently not driven by a comprehensive assessment of the patient, but rather by clinical intuition and the clinical focus on the resolution of the bowel obstruction, often overemphasizing chronological age and the generally shorter life expectancies associated with older individuals.⁴⁻⁶ However, the optimization of treatment plans based on

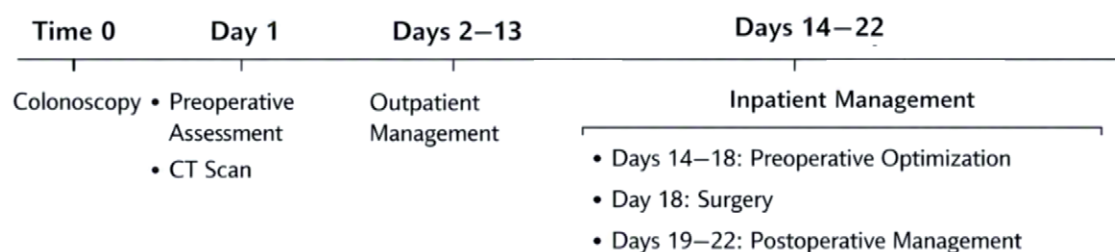


Figure 3. Timeline summarizing the clinical pathway from diagnosis to hospital discharge.

biological age, aiming to prevent both undertreatment in fit patients and an excessive therapeutic burden in frails, requires a tailored assessment, as chronological age alone is not a reliable predictor of postoperative complications.^{3,9} In the surgical setting, the introduction of the ERAS pathway has demonstrated excellent outcomes, significantly reducing postoperative complications and hospital length of stay in patients undergoing elective colorectal surgery.^{10,11} Importantly, these findings have been demonstrated to be applicable even to frail and elderly patients.^{8,9} The fundamental objective of the ERAS pathway is to optimize the physiological status of the patient before surgery, maximizing their capacity to withstand surgical stress.¹⁷⁻¹⁹ However, when ERAS protocols are extended to urgent surgical settings and elderly patients, the use of a comprehensive assessment becomes essential to determine feasibility and to maximize their clinical impact. Our pre-operative assessment, comprehensive of validated geriatric and functional scores (CFS, CCI, PS-ECOG) framed the patient's specific physiological, behavioral and social deficits. This evaluation provided the framework to individualize our interventions, recognizing the patient's needs as those of an elderly, frail individual, thereby enabling a tailored application of the preoperative ERAS components, such as nutritional care, metabolic optimization, and anemia management.

Moreover, assessing the patient's sociodemographic background guided the implementation of targeted supportive interventions at home.

While the ERAS-guided optimization was of paramount importance, our management was challenged by the time constraints imposed by the progressive subtotal obstruction caused by the neoplasm. The onset of obstructive symptoms imposed a shift in strategy: the patient was transferred from home care to hospital admission to decrease the risk of developing complications related to underlying near-complete obstruction. Despite the urgent situation, the focus on metabolic prehabilitation was maintained in the days prior to surgery. During the perioperative period, ferric carboxymaltose was administered to treat anemia, and fluid support was provided only when oral intake was compromised by the underlying bowel obstruction. In this way, all ERAS pathway items related to the preoperative period were successfully implemented, including preoperative optimization, preoperative nutritional care, anemia management, appropriate preoperative fluid and electrolyte therapy aimed at maintaining euolemia, as well as preoperative fasting and carbohydrate loading.¹⁰ This targeted implementation of the ERAS protocols facilitated favorable mid-term surgical outcomes and enabled the performance of the procedure using a minimally invasive technique. Nevertheless, the feasibility and effectiveness of an ERAS-based, tailored preoperative optimization may not be reproducible in all clinical settings. Moreover, despite the use of validated geriatric and functional scores, frailty remains a dynamic and multifactorial condition that cannot be entirely captured by standardized tools alone, potentially leading to residual confounding in risk stratification.^{6,9} Our report has several limitations, mainly related to its single-case design, which limits the generalizability of the findings and prevents definitive conclusions regarding the effectiveness of this management strategy. The possibility of selection bias must also be considered, as this approach may only apply to carefully selected frail patients who remain clinically stable during the optimization period. Indeed, not all frail elderly patients with obstructive CRC will tolerate delayed surgery, and some may deteriorate despite optimization efforts, requiring urgent or emergency intervention.

Finally, while favorable mid-term outcomes were observed in this case, the lack of a comparator group prevents assessment of whether the favorable outcome was attributable to the tailored preoperative optimization pathway or to other patient- or disease-related factors. Therefore, further studies are needed to evaluate whether the use of a tailored approach translates into sustained benefits in larger cohorts of frail elderly patients.

Conclusions

Frail elderly patients with malignancy may be referred for surgical treatment at an advanced stage, with complications and comorbidities that can negatively impact the postoperative outcomes. In these cases, the preoperative optimization strategy seems to have contributed to reducing the operative risks associated with frailty, and therefore it is mandatory, first, to identify any potential frailties; second, when clinical conditions allow, to postpone the surgical procedure; and finally, to implement enhanced recovery treatments, to be adjusted over time according to the patient's clinical evolution. This approach, prioritizing the patient's biological status over the clinical presentation, could serve as a model for managing complex oncogeriatric patients requiring major abdominal surgery.

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Conflict of interest: all authors declare that they have no competing interests.

Ethics approval and consent to participate: this case report does not include any interaction or intervention with human subjects and does not include any access to identifiable private information. For this reason, no ethical approval was needed. The patient provided written informed consent to participate.

Consent for publication: written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the signed consent form is available from the corresponding author upon reasonable request.

Availability of data and materials: data that support the findings of this study are available on request from the corresponding author.

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