ORIGINAL ARTICLE

Fast Track Protocol after Colorectal Surgery

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Abstract

Background: ***Optimal dietary support is crucial for the successful management of postoperative patients. These supports increase wound healing and immunological response. Reduced muscle performance, respiratory function, immunological function, wound healing impairment, and increased postoperative wound complications are all linked to an inadequate nutritional condition following surgery.***

Aim and objectives: ***To identify the importance of fast-track procedures in clinical outcomes after colorectal surgery.***

Patients and methods: ***Forty individuals enrolled in this prospective cohort research between December 2023 and August 2024 at hospitals affiliated with Al-Azhar University. They were split into two groups at random: Twenty individuals were enrolled in the expedited program in Group A. Twenty patients were enrolled in the traditional rehabilitation treatment in Group B.***

Results: ***In terms of colorectal disease type, colonic preparation, and anastomosis type, there was no statistically significant difference between the two groups. Group A exhibited considerably longer periods of time spent out of bed and greater walking distances compared to group B on days 1, 2, 3, 4, and 5 (P-value <0.001). In group A, the duration of hospital stays was much shorter compared to group B (P value <0.001).***

Conclusion: ***Patients undergoing colon cancer resection benefit greatly from a fast-track rehabilitation program, which helps them regain gastrointestinal function more quickly, has fewer postoperative problems, and requires less time in the hospital.***

Keywords: Fast-track rehabilitation; Colorectal surgery

1. Introduction

Neuroendocrine, hemodynamic, metabolic, and immune system changes are among the many physiological systems impacted by the surgical stress response in postoperative patients.[1]

It's no secret that many hospitals have begun using fast-track surgery (FTS) techniques in an effort to speed up patients' recoveries following surgical procedures.[2]

Proponents of expedited surgery argue that, with the advancements in perioperative management, the surgical stress response is unnecessary to restore homeostasis by providing enough fluid, temperature, and glycemic support, if needed.[1]

FTS integrates a number of patient care strategies, such as intensive postoperative rehabilitation with early enteral feeding and ambulation, and optimal pain control. These methods work together to lessen the body's stress response and dysfunctional organs, which drastically cuts down on the amount of time needed for a full recovery.[3]

Essential preconditions for hospital release planning include postoperative pain control, ambulation, and full recovery of gastrointestinal and urinary bladder function.[4]

The purpose of this research was to determine whether fast-track procedures for colorectal surgery had a significant impact on patient outcomes.

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2. Patients and methods

Forty participants were enrolled in this prospective cohort study that ran from December 2023 to August 2024 at hospitals affiliated with Al-Azhar University.

Inclusion criteria.

Patients with colorectal cancer treated by excision, ages 20–75, with potential for curative treatment, and informed consent.

Exclusion Criteria.

This study's exclusion criteria were as follows: Patients who are not eligible for this procedure include those who are 75 years old or older, those with uncompensated cardiopulmonary disease, inflammatory bowel diseases (e.g., Crohn's disease, ulcerative colitis, and indeterminate colitis), immunological disorders (e.g., SLE, sarcoidosis, and patients on immunosuppressive therapy for any reason), patients with advanced or disseminated cancer, obstructed cases, patients without the ability to return to the hospital in case of emergency, patients with conditions that prohibit regional anesthesia (e.g., coagulopathy, aortic stenosis, and nearby infections in the back), patients with conditions that prohibit the use of nonsteroidal anti-inflammatory drugs (NSAIDs), and patients with conditions that prohibit their use (e.g., low platelet count, B□.

Drop-out criteria:

Non-curative resection diagnosed upon surgical exploration, reoperation within 24 hours, combined resection (except for gall bladder), and refusal to complete participation.

Discharge criteria:

Vitally stable, open bowel, and dry wound.

Methods:

All patients were subjected to the following: CBC, serum urea and creatinine, CRP, coagulation profile (PT, PTT, and INR), serum ferritin, and liver enzymes (ALT, AST, and ALP).

Sample Size:

Forty patients with benign and malignant etiologies undergoing colon surgery were randomly divided into two groups for this study:

Twenty patients involved in colorectal procedures with various forms of anastomoses (hand-operated or stapler-assisted) were included in Group A, which was submitted to the Fast-track protocol. Twenty patients in Group B were treated using more conventional methods during their rehabilitation.

Preoperative colonic preparation:

Group A (fast preparation):

The patient was admitted one day before the procedure, remained on clear liquid only one day before the procedure, took preoperative medication on the day before surgery, and fasted from liquids for 6 hours before surgery.

Group B (Traditional preparation):

The patient was admitted 3 days before the procedure, and received mechanical and chemical bowel preparation, including enemas and oral neomycin and/or metronidazole.

Postoperative management:

Group A:

Early ambulation, oral feeding 24-48 hours after surgery, full oral diet after 3 days, and removal of drains (if present) early.

Group B:

Oral feeding in cases of Rt colon ic surgery, 4-5 days, Lt colonic surgery, 5-7 days, and late removal of drains

The following data have been monitored postoperatively:

Using the Visual Analog Pain Scale (VAS), where 0 indicates no pain and 5 is the greatest possible agony, the intensity of postoperative pain is measured every 6 hours with the aim of achieving a VAS <3. I need to get out of bed and walk around on my own by a certain time. Elapsed time till initial bowel function is restored. The duration until solid foods and fluids can be consumed orally. The frequency of adverse symptoms, such as postoperative nausea and vomiting (PONV), tremors, vertigo, and exhaustion. Fistulas, wound infections, cardiorespiratory problems, and other surgical complications; lastly, the duration of hospitalization and length of stay in the HDU.

Objectives and endpoints

The total hospital stay (THS), which includes both the number of days spent in the hospital following surgery and any extra days needed for readmission within 30 days, was considered the main outcome.

In both therapy groups, the following were considered discharge requirements: (1) using oral medication to appropriately control postoperative pain (VAS < 4), (2) being able to move around and be out of bed for more than 6 hours per day, (3) having normal bowel function and the capacity to eat solid food without feeling sick, and (4) having no hospital-treated problems.

Secondary outcomes were post-hospitalization symptoms (PHS), death, major or minor morbidity, readmission rate, and health-related quality of life (HRQoL). Preoperatively, throughout surgery, and every day thereafter till release, data were documented. The study could not begin until the definitions of complications were finalized. Human Resources Quality of Life was evaluated with the use of the 15D instrument, a validated, standardized, self-administered health state

descriptive questionnaire that may be utilized as both a profile and a single index score measure.

Ethical Consideration:

The fieldwork could not begin until the institutional review board gave their approval. Everyone who wanted to take part in the study could opt out if they wanted to. Confidentiality of the participants' data was maintained. All participants gave their informed consent. Patients are free to discontinue participation in the trial at any moment without providing a reason; doing so will result in their exclusion from future participation.

Statistical analysis

SPSS v26 (IBM Inc., Armonk, NY, USA) performed statistical analysis. Shapiro-Wilks and histograms assessed data normality. Mean and SD were used to evaluate quantitative data using the unpaired Student's t-test. Qualitative data were provided as frequency and percentage (%) and evaluated using Chi-square or Fisher's exact tests. A two-tailed P-value ≤0.05 indicated significance.

3. Results

Table 1. Demographic data of the studied groups.

		GROUP A (N = 20)	GROUP B (N = 20)	P-VALUE
AGE (YEARS)	Mean ± SD	44.5 ± 12.92	43.05 ± 12.25	0.718
	Range	24 - 67	24 - 63	
SEX	Male	10 (50%)	8 (40%)	0.525
	Female	10 (50%)	12 (60%)	
BMI (KG/M^2)	Mean ± SD	27.9 ± 5.54	27.27 ± 4.98	0.704
	Range	18.9 - 39.04	17.82 - 36.57	

BMI: body mass index

Age, sex, and BMI were insignificantly different between the studied groups (Table 1; Figure-3).

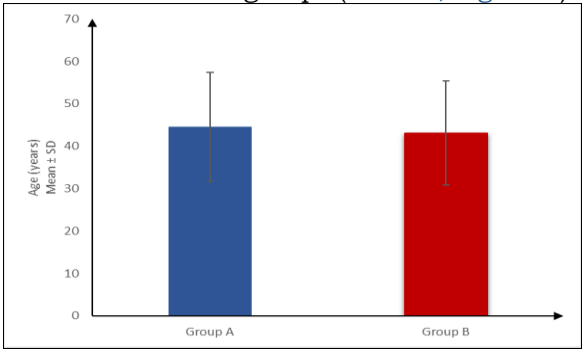


Figure 1. Age of the studied groups.

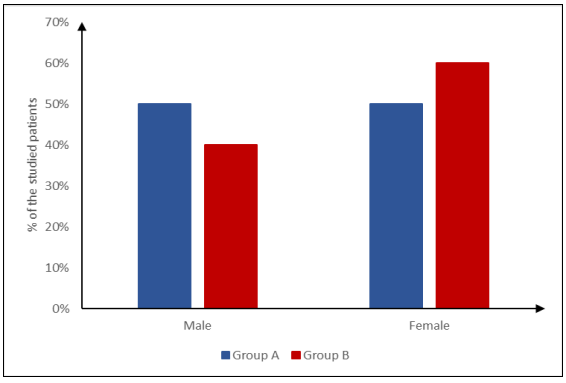


Figure 2.Sex of the studied groups.

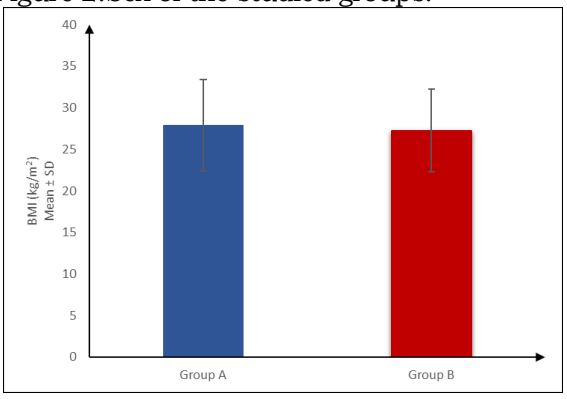


Figure 3. BMI of the studied groups.

Table 2. Comorbidities of the studied groups.

	GROUP A (N = 20)	GROUP B (N = 20)	P-VALUE
SMOKING	8 (40%)	9 (45%)	0.749
DM	3 (15%)	5 (25%)	0.695
HTN	10 (50%)	7 (35%)	0.337
IHD	3 (15%)	1 (5%)	0.605

DM: diabetes mellitus, HTN: hypertension, IHD: ischemic heart disease

Smoking, DM, HTN, and IHD were insignificantly different between the studied groups (Table 2; Figure).

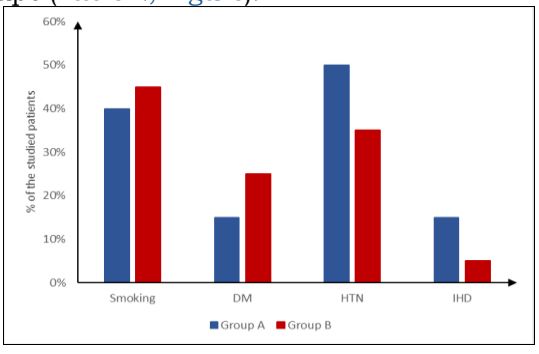


Figure 4. Comorbidities of the studied groups.

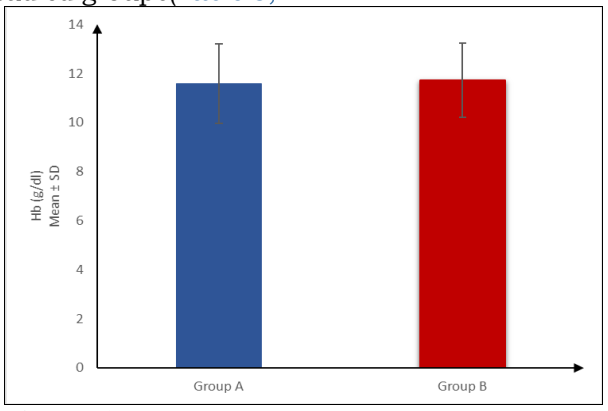
Table 3. Laboratory investigations of the studied groups.

		GROUP A (N = 20)	GROUP B (N = 20)	P-VALUE
HB (G/DL)	Mean ± SD	11.59 ± 1.61	11.72 ± 1.52	0.794
	Range	9.6 - 15	9 - 14.6	
TLC (X109/L)	Mean ± SD	7.83 ± 2.18	8.17 ± 1.8	0.594
	Range	4.7 - 10.9	4.7 - 10.6	
PLATELETS (X109/L)	Mean ± SD	292.75 ± 87.11	301.2 ± 94.44	0.770
	Range	154 - 435	154 - 436	
CREATININE (MG/DL)	Mean ± SD	0.91 ± 0.16	0.93 ± 0.16	0.699
	Range	0.6 - 1.2	0.6 - 1.2	
BUN (MG/DL)	Mean ± SD	12.6 ± 4.63	11.75 ± 4.1	0.542
	Range	5 - 20	5 - 18	
AST (U/L)	Mean ± SD	25.2 ± 8.45	25.9 ± 9.3	0.805
	Range	10 - 38	11- 40	
ALT (U/L)	Mean ± SD	22.4 ± 8.87	19 ± 7.06	0.188
	Range	7 - 35	9 - 31	

Hb: hemoglobin, TLC: total leucocyte count, BUN: blood urea nitrogen, AST: aspartate aminotransferase,

ALT: alanine aminotransferase

Hb, TLC, platelets, creatinine, BUN, AST, and ALT were insignificantly different between the studied groups(Table 3;



Figure,6).

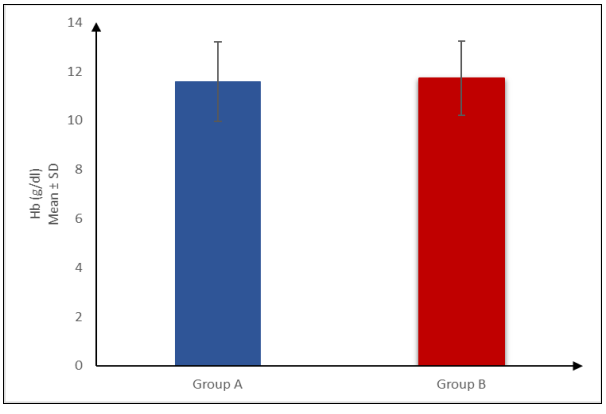


Figure 5. Hb of the studied groups.

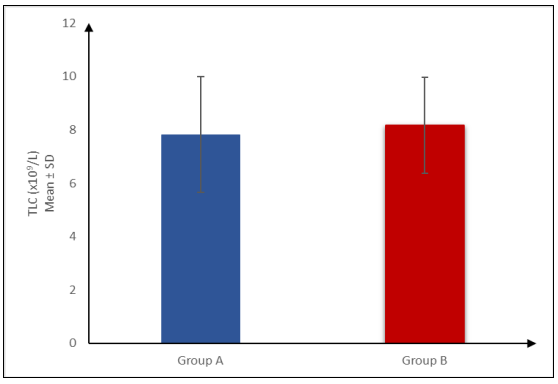


Figure 6. TLC of the studied groups.

Table 4. Nature of colorectal disease of the studied groups

	GROUP A (N = 20)	GROUP B (N = 20)	P-VALUE
BENIGN	5 (25%)	7 (35%)	0.490
MALIGNANT	15 (75%)	13 (65%)	

The nature of colorectal disease was insignificantly different between the studied groups (Table 4; Figure).

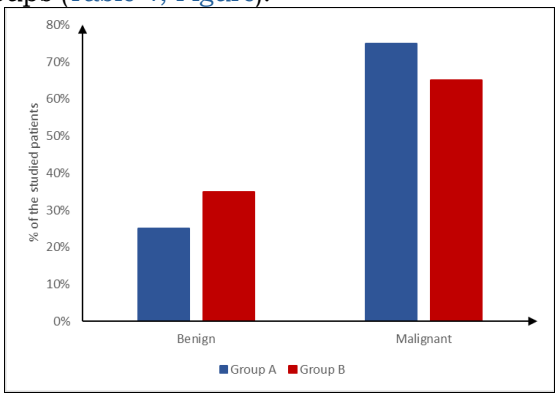


Figure 7. Nature of colorectal disease of the studied groups.

Table 5. Colonic preparation the studied groups.

	GROUP A (N = 20)	GROUP B (N = 20)	P-VALUE
ELECTIVE	17 (85%)	18 (90%)	1.000
URGENT	3 (15%)	2 (10%)	

The colonic preparation was insignificantly different between the studied groups (Table 5; Figure).

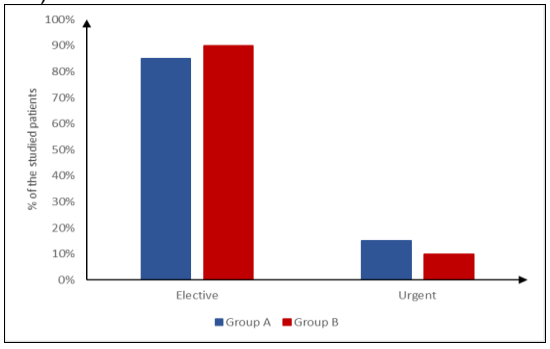


Figure 8. Colonic preparation of the studied groups.

Table 6. Type of anastomosis the studied groups.

	GROUP A (N = 20)	GROUP B (N = 20)	P-VALUE
HANDMADE	11 (55%)	12 (60%)	0.749
WITH STEPPLER	9 (45%)	8 (40%)	

The type of anastomosis was insignificantly different between the studied groups (Table 6; Figure).

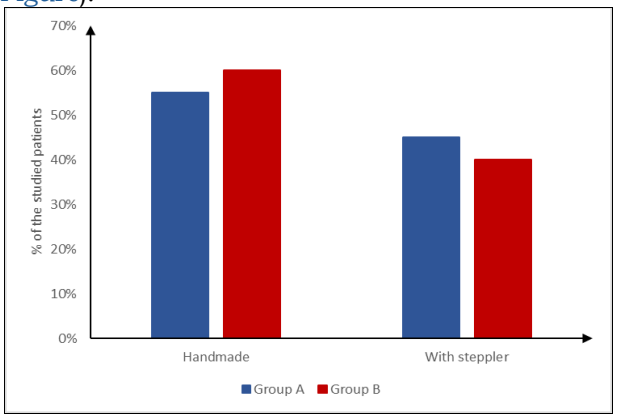


Figure 9. Type of anastomosis of the studied groups.

Table 7. Nutrition of the studied groups

		GROUP A (N = 20)	GROUP B (N = 20)	P-VALUE
DAY 0	NPO	0 (0%)	20 (100%)	<0.001*
	Oral liquid diet	20 (100%)	0 (0%)	
	Full liquid diet	0 (0%)	0 (0%)	
	Regular diet	0 (0%)	0 (0%)	
DAY 1	NPO	0 (0%)	20 (100%)	<0.001*
	Oral liquid diet	0 (0%)	0 (0%)	
	Full liquid diet	20 (100%)	0 (0%)	
	Regular diet	0 (0%)	0 (0%)	
DAY 2	NPO	0 (0%)	20 (100%)	<0.001*
	Oral liquid diet	0 (0%)	0 (0%)	
	Full liquid diet	3 (15%)	0 (0%)	
	Regular diet	17 (85%)	0 (0%)	
DAY 3	NPO	0(0%)	12 (60%)	<0.001*
	Oral liquid diet	0 (0%)	8 (40%)	
	Full liquid diet	1 (5%)	0 (0%)	
	Regular diet	19 (95%)	0 (0%)	
DAY 4	NPO	0 (0%)	3 (15%)	<0.001*
	Oral liquid diet	0 (0%)	12 (60%)	
	Full liquid diet	0 (0%)	5 (25%)	
	Regular diet	20 (100%)	0 (0%)	
DAY 5	NPO	---	0 (0%)	
	Oral liquid diet	---	3 (15%)	
	Full liquid diet	---	14 (70%)	
	Regular diet	---	3 (15%)	
DAY 6	NPO	---	0 (0%)	
	Oral liquid diet	---	0 (0%)	
	Full liquid diet	---	3 (15%)	
	Regular diet	---	17 (85%)	
DAY 7	NPO	---	0 (0%)	
	Oral liquid diet	---	0 (0%)	
	Full liquid diet	---	0 (0%)	
	Regular diet	---	20 (100%)	

NPO: nothing per mouth, *: significant as P-value≤ 0.05

Day 0 oral liquid diet intake was substantially higher in group A compared to group B (P-value<0.001). Group A had a considerably higher intake of full liquid diet on day 1 compared to group B (P-value<0.001). Regular diet intake was considerably higher in group A compared to group B at days 2, 3, and 4 (P-value < 0.001), (Table 7).

4. Discussion

There was no statistically significant difference in age, sex, or body mass index (BMI) across the groups that were considered in this investigation. The groups that were evaluated did not differ significantly with respect to smoking, diabetes, hypertension, and IHD.

Yılmaz et al.,5 participated in a comparison study with 91 patients diagnosed with colon cancer. The patients were split into two groups: one receiving conventional treatment (20 males and 15 females) and another receiving fast-track surgery (37 males and 19 females). The findings revealed that the patients' average age was 61.2 ± 13.9 years, with a range of 25-90 years. As far as age, sex, and co-morbidities (such as diabetes, hypertension, chronic obstructive pulmonary disease, congestive heart failure, coronary artery disease, and other conditions) were concerned, there was no discernible difference between the two sets of data.

Colorectal disease type, colonic preparation, and anastomosis type were determined to be statistically insignificant among the groups analyzed in this study.

Yılmaz et al.,[5] revealed that out of the total number of patients, two (2.2%) were considered to be in stage 0, 26 (28.5%) in stage 1, 13 (14.3%) in stage 2, 34 (37.3%) in stage 3, and 16 (17.6%) in stage 4. Right colon cancers were seen in the majority of individuals (32;35.1%). 27.4 percent of patients had sigmoid colon tumors, and 27.5 percent had left colon tumors. Nine more patients, or 10.1%, had cancers that went beyond the colon.

Results showed that on days 0, 1, and 3, participants in group A consumed considerably more oral liquids than participants in group B. There was a substantial decrease in the length of hospital stay in group A compared to group B (P-value < 0.001).

Previous research using this multimodal FTS regimen found that early enteral feeding, postoperative ileus, and required movement with sisaprid and laxative use decreased hospital stays and improved outcomes.[3]

Patients undergoing FTS had a significantly shorter hospital stay (5 days vs. 9 days) and a lower rate of morbidity (21% vs. 49%) after open colorectal surgery compared to patients undergoing conventional treatment.[6]

Yılmaz et al.,5 demonstrated that Groups 1 and 2 had an average hospital stay of 15.6 ± 14.4 days and 8.4 ± 7.1 days, respectively. Group 2 had a noticeably shorter hospital stay compared to Group 1 (p < 0.001).

This study's findings suggest that patients undergoing colon cancer resection can benefit from a fast-track rehabilitation program, which can shorten their hospital stays, decrease the risk

of postoperative problems, and hasten the restoration of gastrointestinal function. Important predictors for patients' rehabilitation following colon cancer resection were preoperative patient education, epidural or regional anesthesia, early ambulation, and early postoperative oral feeding, according to this study's data.[7]

A key component of expedited recovery is patient education prior to surgery. Patients need to know the specifics of their treatment plan, the steps involved in fast-track rehabilitation programs, and what they can do to help themselves recover so that they can appreciate the significance of these programs. Rapid rehabilitation methods can be more effective if patients work together more closely. In general, solid meals take 6 hours, and liquids take 2 hours to empty from the stomach.[8]

It is recommended that patients consume a liquid meal two hours prior to the operation rather than fasting. Safe and effective complication reduction is possible with preoperative oral carbohydrate.[9]

Compared to standard treatment, patients undergoing colorectal cancer resection benefit more from fast-track rehabilitation programs in terms of symptom improvement following surgery, anesthesia, pain management, physical therapy, and social work. Preoperative patient education to clarify the overall goal and the purpose of each stage is the mainstay of fast-track rehabilitation programs. Therefore, it is critical to get the support of nurses, who must act in a professional and courteous manner while on the job. Although there must be many challenges in fast-track rehabilitation programs, testing new regulations and standards is an inherent part of the process.

Patients undergoing laparoscopic surgery for colorectal or early gastric cancer have reported less postoperative pain and a quicker recovery time. There was less postoperative morbidity and readmission, and patients stayed in the hospital for shorter periods of time following laparoscopic surgery. However, this research didn't look at how laparoscopic surgery stacked up against fast-track rehabilitation programs; they just compared open and laparoscopic surgeries. Colorectal cancer resection patients had a better chance of a full recovery with laparoscopic surgery and expedited rehabilitation programs.[10,11]

After colon cancer resection, we think patients will benefit greatly from laparoscopic surgery along with expedited rehabilitation programs.

4. Conclusion

Patients undergoing colon cancer resection benefit greatly from a fast-track rehabilitation program, which helps them regain gastrointestinal function more quickly, has fewer postoperative problems, and requires less time in the hospital.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

All authors have a substantial contribution to the article

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Conflicts of interest

There are no conflicts of interest.

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