

# Effect of accelerated rehabilitation surgery nursing on laparoscopic radical surgery for elderly patients with colorectal cancer

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## INTRODUCTION

Colorectal cancer is a common malignant tumor that seriously threatens human life and health, and its incidence rate ranks third in the world<sup>1</sup> and it is increasing at a rate of 2% per year. Most of the new cases are elderly patients<sup>2</sup>. With the continuous development of laparoscopic and other minimally invasive techniques, laparoscopic surgery has been more and more widely applied in clinic, which can effectively improve the prognosis of patients<sup>3</sup>, so laparoscopic surgery is the most ideal radical treatment approach for colorectal cancer<sup>4</sup>. However, elderly patients with colorectal cancer generally have the characteristics of long course of disease, more preoperative complications, and high incidence of postoperative complications. Accelerated rehabilitation surgery care is an important part of the accelerated rehabilitation surgery concept (enhanced recovery after surgery – ERAS). This concept has caused a great change in the clinical care model of many diseases<sup>5</sup>. This nursing model can utilize the perfect, scientific, and timely nursing methods to promote the early recovery of gastrointestinal function of patients after surgery to reduce the hospitalization time and complications<sup>6</sup>, thereby providing patients with high-quality, efficient, and safe nursing services. This study explored the effect of accelerated rehabilitation surgical nursing on the perioperative period of laparoscopic radical surgery for elderly patients with colorectal cancer.

## PATIENTS AND METHODS

### Patients

The elderly patients who underwent laparoscopic colorectal cancer radical surgery in our hospital between September

2018 and March 2020 were included in the study. Inclusion criteria were as follows:

1. all patients were diagnosed with colonoscopy colorectal (straight) bowel cancer and postoperative pathology confirmed as colorectal cancer.
2. Patients aged 60 years or older.
3. After examination, all patients were evaluated in accordance with the indications for surgical treatment and found no contraindications for surgery.
4. Patient signed informed consent.
5. Tumor infiltration depth was T1-T4.
6. After preoperative conversation and education, the patient agreed to perform accelerated rehabilitation surgical nursing.

Finally, a total of 60 patients were included and randomly divided into two groups as follows: accelerated rehabilitation surgery nursing group combined with laparoscopic colorectal cancer radical resection (n=30 cases) (experimental group) and routine nursing group combined with laparoscopic colorectal cancer radical resection (n=30 cases) (control group). This study was approved by the ethics committee of our hospital, and all participants signed the informed consent.

## METHODS

Surgery and nursing were performed by a medical team working in the Department of Oncology Surgery 1 (gastrointestinal) of our hospital. Surgical surgeon has more than 20 years of experience and is skilled in the diagnosis and treatment of colorectal cancer in elderly patients. After professional training, the surgeon can proficiently perform laparoscopic

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surgery for colorectal cancer. Likewise, the nurse team has more than 5 years of experience and is proficient in laparoscopic knots, rectal cancer radical surgery perioperative nursing, and received accelerated rehabilitation surgery nursing knowledge and skills training.

Experimental group:

1. after admission, a comprehensive evaluation and formulation of a nursing plan was conducted.
2. Preoperative education: one-on-one introduction of responsible nurses was made, and the health manuals for routine admission and education were distributed, including familiarization with the department environment, introduction of the medical team, and introduction of relevant systems, safety and protection education, ERAS nursing education, including purpose and significance, the main content of nursing implementation, and benefits and perioperative cooperation matters.
3. Psychological support: the psychological state of the patient was assessed, and patient's doubts were answered to enhance compliance.
4. Preoperative preparation: physical exercise was increased appropriately according to the patient's own situation, and cough training, deep breathing training, bed and toilet training were conducted, and patients were taught how to perform postoperative pain assessment and early bedtime activities; they were advised to quit smoking and alcohol before surgery; in general, mechanical bowel preparation is not recommended, and patients with no obstruction should be given oral laxatives after admission; if patients were preassessed for malnutrition, they should be given enteral nutrition powder or parenteral nutrition; they were allowed to eat solid food 6 h before surgery, and transparent liquid 2 h before surgery; 200 ml of routine oral carbohydrate electrolyte solution should be added before induction of anesthesia; diabetic patients were given the same amount of saline; appropriate elastic stockings were worn 2 h before surgery; gastric tube was not placed routinely before surgery.
5. Laparoscopic colorectal cancer radical surgery was performed.
6. Intraoperative care: specialists are relatively fixed in cooperation with the staff; there are standardized procedures for surgical cooperation; electric surgical adjustment beds, endoscopic and electrosurgical equipment, thermal insulation equipment, etc. have good performance; surgery posture safety management should be strengthened; the patient's core body temperature should be maintained at 36–37°C during operation to prevent intraoperative hypothermia; during the process of gastric bloating or fluid accumulation, the gastric tube was temporarily decompressed, and the gastric tube was removed at the end of the operation.
7. Postoperative care: the patient can leave the bed on the day of operation, 2 h of bedtime activities were recommended on the first day after the operation and 6 h of daily bedtime activities afterward; the urinary catheter can be removed for the first time after the bed, and patients with low rectal surgery can extend the time of indwelling catheter, usually 3–4 days after surgery; patients were encouraged to start oral feeding; after 6 h, they were allowed to eat clear liquid of 50 mL each time for every 4 h, and whether the patient has nausea and vomiting and reflux situation was observed; chewing gum was allowed to stimulate gastrointestinal peristalsis in order to prevent intestinal obstruction; assessment was done and work was recorded.
8. Postoperative pain care: 3 h after surgery, the first pain assessment was performed using a pain assessment ruler as follows:  $\geq 7$  points, every hour; between 3 and 7 points, every 4 h; and between 1 and 3 points, when measuring body temperature; on the basis of assessment, the patients were evaluated: for 3 points or higher, the responsible nurse conducted health education and psychological counseling, and for 4 points or higher, the doctor was notified to deal with it in time and make a record; the score was calculated up to the 10th day after the operation. In the process of accelerating the implementation of rehabilitation surgery nursing, the implementation plan was adjusted at any time according to the changes of the patient's condition.

Control group:

1. the patients underwent routine nursing education and psychological nursing.
2. Routine fasting for 24 h and drinking for 4 h were recommended before surgery.
3. Intestinal preparation was performed 3 days before operation using enema.
4. Indwelling gastric tube was inserted before operation.
5. During the operation, no heat preservation measures, and measures for preventing deep vein thrombosis were taken.

6. Indwelling gastric tube and urinary tube were inserted after operation.
7. After the first exhaust, the liquid food was gradually transition to semi-liquid food, i.e., general food.
8. Patient was encouraged to perform bed activity or assist passive activity.
9. Analgesics were applied when the patient had pain.

### Observation indicators

1. Comparison of postoperative conditions:
  - ① time after bed (h);
  - ② exhaust time (h);
  - ③ postoperative pain score (0–10 points);
  - ④ average hospital stay (days);
  - ⑤ hospitalization costs (days) (in Chinese Yuan);
2. Comparison of postoperative complications:
  - ① anastomotic leakage;
  - ② intestinal obstruction;
  - ③ infection, including incision infection, urinary tract infection, and lung infection.
3. Discharge criteria:
  - ① normal body temperature;
  - ② pain can be controlled by oral pain killers;
  - ③ patients have smooth exhaust and defecation;
  - ④ patients can move freely.

### Statistical Methods

Statistical analysis was performed using the SPSS version 26.0 software. Age, height, BMI, and weight were tested by Student's t-test; gender, ethnicity, and postoperative complications were assessed by chi-square test. Postoperative conditions were tested by rank-sum test. A p-value <0.05 was considered statistical significant.

## RESULTS

### Basic characteristics of all participants

The mean age was 62±10 years for experimental group and 63±9 years for control group, with no significant difference ( $p=0.573$ ). Han people accounted for 76.7% in experimental group and 86.7% in control group ( $p=0.317$ ). The comparison of general information between the two groups showed no significant differences ( $p>0.05$ ), and the data of two groups were comparable (Table 1).

### Comparison of postoperative data

Two groups of patients underwent laparoscopic radical surgery for colorectal cancer. The first postoperative exhaust time was 19.50 h (9–72) in the experimental group and 40 h (11–192) in control group, with a significant difference ( $p=0.026$ ); the pain score was 3.63 (1–5) points in the experimental group and 4.5 (2–6) points in control group ( $p=0.004$ ); the total number of hospitalization days and postoperative hospitalization days between two groups showed a significant difference ( $p<0.05$ ); the average hospitalization cost was 60775.87 Chinese Yuan for experimental group and 77180.17 for control group, with a significant difference between them ( $p=0.001$ ) (Table 2).

### Comparison of complications

Comparison of the occurrence of postoperative complications between the two groups of patients showed that there was one anastomotic leakage in experimental group and six in control group ( $p=0.044$ ), and two with lung infection in experimental group and nine in the control group, with a statistical difference ( $p=0.020$ ). The complications of intestinal obstruction, incision infection, and urinary tract infection did not differ significantly between the two groups (Table 3).

**Table 1.** Comparison of age, sex, weight, height, BMI, and ethnicity of the two groups of patients.

	Experimental group	Control group	t/z/ $\chi^2$	p
	n=30	N=30		
Age	63.70 (38–76)	62.13 (47–80)	-0.620	0.573
Gender				
Male (%)	20 (66.7)	17 (56.7)	0.635	0.426
Female (%)	10 (33.3)	13 (43.3)		
Weight (kg)	64.57 (42–90.5)	63.47 (43–82)	-0.385	0.702
Height (cm)	165.53 (150–177)	164.73 (150–180)	-0.435	0.665
BMI	23.50 (16.82–33.30)	23.38 (15.79–29.69)	-0.140	0.889
Nationality				
Han (%)	23 (76.7)	26 (86.7)	1.002	0.317
Others (%)	7 (23.3)	4 (13.3)		

**Table 2.** Comparison of the time of getting out of bed, time of first exhaustion, pain score, total days of hospitalization, and total hospitalization costs.

	Experimental group	Control group	t/z/ $\chi^2$	p
	n=30	n=30		
Time of getting out of bed (h)	46.2 (8-120)	36.77 (9-136)	-1.524	0.127
First exhaust time (h)	19.50 (9-72)	40 (11-192)	-2.227	0.026
Pain score	3.63 (1-5)	4.5 (2-6)	-2.878	0.004
Total days of hospitalization (days)	23.83 (9-44)	30.70 (13-59)	-2.561	0.010
Postoperative hospital stay (days)	8.5 (5-16)	12.83 (7-30)	-2.748	0.006
Total hospitalization expenses (Chinese Yuan)	60775.87	77180.17	3.668	0.001

**Table 3.** Comparison of the postoperative anastomotic leakage, intestinal obstruction, incision infection, urinary tract infection, lung infection, and complications.

	Experimental group	Control group	t/z/ $\chi^2$	p
	n=30	n=30		
Anastomotic fistula (%)	1 (3.3)	6 (20.0)	4.043	0.044
Intestinal obstruction (%)	1 (3.3)	1 (3.3)	0.000	1.000
Incisional infection (%)	3 (10)	7 (23.3)	1.920	0.166
Urinary tract infection (%)	1 (3.3)	4 (13.3)	1.964	0.161
Lung infection (%)	2 (6.7)	9 (30)	5.455	0.020

## DISCUSSION

The nursing team is the most solid force in the implementation of ERAS and has undertaken the most tedious work<sup>7</sup>. Compared with traditional nursing methods, accelerated rehabilitation surgery nursing is more humanized and individualized and focuses on the perioperative evaluation and rehabilitation of patients. The clinical application effect has been confirmed by several studies<sup>8-11</sup>. Through preoperative education and psychological care, patients had the relevant knowledge of laparoscopic surgery and can overcome psychological fear. A volume of 200 mL of oral carbohydrate electrolyte solution before surgery avoids the occurrence of hypoglycemia in elderly patients and avoids clean enema before surgery to prevent the occurrence of dehydration in elderly patients. Maintaining the patient's body temperature during surgery effectively reduced the incidence of surgical infection, intraoperative bleeding, and postoperative complications.

Since laparoscopic surgery has the advantages of avoiding large wounds and decreasing blood loss than ordinary surgery, patients are encouraged to get out of bed on the day of surgery after adequate pain relief and no indwelling of the catheter. Chewing gum and eating from the mouth as soon as possible after surgery are suggested to stimulate gastrointestinal motility, promote early exhaust, and prevent intestinal obstruction. The use of elastic stockings effectively prevents the occurrence of deep vein thrombosis in elderly patients. The unconventional use of urinary catheters

and the removal of urinary catheters 24 h after surgery effectively prevented infections. The application of pain assessment ruler effectively relieved the patient's pain. The implementation of standardized work processes and individualized nursing programs has effectively promoted the rehabilitation of elderly patients after laparoscopic radical resection of colorectal cancer patients and has also significantly improved the quality of care, reduced the length of hospitalization, and saved medical costs.

As accelerated rehabilitation surgery nursing involves three nursing links before, during, and after the operation, the patient needs comprehensive nursing such as physical, psychological, and rehabilitation, combined with the characteristics of laparoscopic surgery and the unique features of the elderly. Physiological and psychological changes require nurses to have good professional qualities and abilities in accelerated rehabilitation surgery.

The management team is well constructed, united, and cooperative, so the professional training of nurses and teams needs to be further strengthened. With time, it is necessary to stimulate the enthusiasm of the patients and their family to improve their cooperation in order to achieve the best treatment and care effectiveness.

## CONCLUSION

The accelerated rehabilitation surgery nursing measures have high-value application in laparoscopic colorectal cancer

radical surgery for elderly patients and are beneficial of clinical application.

### Ethics approval and consent to participate

The study was approved by the Qinghai University Affiliated Hospital Science Research Ethics Committee (P-SL-2018074). Informed consent was obtained.

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### AUTHORS' CONTRIBUTIONS

**CXS:** Conceptualization, Data curation, Formal Analysis, Writing – original draft, Writing – review & editing. **BJC:** Conceptualization, Formal Analysis, Writing – review & editing. **XH:** Conceptualization, Formal Analysis, Writing – original draft. **JFH:** Conceptualization, Data curation, Formal Analysis, Writing – original draft, Writing – review & editing.

