

Nursing Experience of Applying Phased Nursing Intervention Model to Prevent Low Anterior Resection Syndrome in One Patient with Ultra-Low Rectal Cancer

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Abstract

This paper summarizes the experience of staged nursing intervention for preventing low anterior resection syndrome (LARS) in a 40-year-old female patient with ultra-low rectal cancer after sphincter-preserving surgery. Key nursing measures include establishing a multidisciplinary LARS management team and dividing the nursing process into three stages according to disease progression and rehabilitation needs: preoperative stage (unfamiliar → familiar), first postoperative stage (prevention and control of intestinal dysfunction), and post-stoma reversal stage (incontinence → controllable). Targeted interventions were implemented in each stage, including education on LARS and stoma care, systematic pelvic floor muscle training, nutritional support, anal sensory awakening training, simulated defecation coordination training, bowel preparation before stoma reversal, multi-position Kegel exercises, defecation habit reconstruction, dietary and medication guidance, and continuous nursing management. After continuous intervention in the three stages, the patient's LARS score and Wexner score decreased significantly at 2 months after stoma reversal, pelvic floor muscle strength recovered, anxiety and depression were completely relieved, and quality of life was greatly improved.

Keywords

Rectal Neoplasms, Ultra-Low Rectal Cancer, Low Anterior Resection Syndrome, Stages Nursing, Pelvic Floor Muscle Training, Ileostomy, Case Report

1. Introduction

Colorectal cancer is one of the common malignant gastrointestinal tumors in China, with 517,100 new cases in 2022, ranking second among all malignant tumors. Rectal cancer accounts for 57.6% of colorectal cancer, low rectal cancer (within 5 cm from the dentate line) accounts for about 50.0%, and ultra-low rectal cancer is defined as within 3 cm from the dentate line [1]. With the advancement of sphincter-preserving concepts and surgical techniques, an increasing number of patients with low rectal cancer have preserved anal function. However, sphincter preservation does not equal normal defecation function. Low anterior resection syndrome (LARS) is one of the most common complications after sphincter-preserving surgery for rectal cancer, mainly characterized by a series of intestinal dysfunction symptoms such as increased defecation frequency, difficult defecation, urgency, fecal soiling, and fecal incontinence, with an incidence rate as high as 62.3% - 82.6%. Among them, 3.5% - 5.0% of patients eventually require permanent enterostomy due to intolerable LARS symptoms [2]. LARS not only causes toilet dependence, defecation fear and emotional abnormalities in patients, but also leads to reduced social activities and decreased quality of life. The Chinese Expert Consensus on the Diagnosis and Treatment of Low Anterior Resection Syndrome (2025 Edition) proposes that LARS treatment should follow a stepped grading model. First-line treatment includes dietary adjustment, medication, pelvic floor rehabilitation, transanal irrigation, etc., and second-line treatment includes sacral neuromodulation, enterostomy, etc. [3]. The staged nursing intervention model divides the nursing cycle according to disease progression and rehabilitation stages, providing a standardized, targeted and continuous nursing plan, with the core advantages of pertinence, efficiency, continuity and predictability. On January 13, 2025, our department admitted a young female patient with ultra-low rectal cancer and high LARS risk. The staged nursing intervention model was applied for full-course nursing. After continuous intervention in three stages (preoperative, first postoperative and post-stoma reversal), the patient's LARS symptoms were effectively controlled and quality of life was significantly improved. The report is as follows.

2. Case Presentation

Patient, Guo, female, 40 years old, married with children, bachelor's degree. Diagnosed with ultra-low rectal cancer in July 2024 (tumor 3 cm from anus); completed 7 cycles of chemotherapy from August 2024 to December 2024; admitted on foot on January 13, 2025, underwent robot-assisted anterior rectal resection + ileostomy on January 15, 2025, and stoma reversal on June 6, 2026. Preoperative advanced health assessment: stable vital signs (T 36.5°C, P 77 beats/min, R 20 breaths/min, BP 114/73 mmHg); Pittsburgh Sleep Quality Index 8 points, acceptable sleep quality; PHQ-9 depression screening 7 points (mild depression), GAD-7 anxiety score 8 points (mild anxiety); albumin 38.7 - 39.4 g/L, total protein 57.7 - 72.5 g/L, hemoglobin 106 g/L, mild anemia. Height 158 cm, weight 37.9 kg, body

mass index (BMI) 15.2 kg/m², ideal body weight 53 kg, actual body weight 15 kg lower than ideal; appetite score 6 points, NRS-2002 score 4 points, severe malnutrition. Bristol stool type 6, defecation 13 times per day, pelvic floor muscle strength grade 4. Preoperative LARS score 23 points (mild), Wexner fecal incontinence score 5 points (mild), POLARS predicted high risk of intestinal dysfunction. High risk of deep vein thrombosis, low risk of falls, activities of daily living (ADL) score 100 points. The patient lacked knowledge of pelvic floor muscle exercise, enterostomy care and LARS prevention. According to the patient's high LARS risk characteristics, a multidisciplinary LARS management team was established, including attending physician, head nurse, senior rehabilitation specialist nurse, gastrointestinal specialist nurse, nutrition specialist nurse, psychological liaison, stoma therapist and bed-side nurse, to jointly formulate a stepped and staged nursing intervention plan.

2.1. Clinical Timeline

- Diagnosis date: July 2024.
- Neoadjuvant therapy: August 2024 - December 2024.
- Anterior rectal resection + ileostomy: January 15, 2025.
- Stoma reversal: June 2025.
- Preoperative baseline assessment: January 13, 2025.
- Assessment at 1 month after first surgery: February 2025.
- Assessment at 1 month after stoma reversal: July 2025.
- Assessment at 2 months after stoma reversal: August 2025.

2.2. Specific Values of Assessment Indicators at Each Stage

Assessment Time	LARS Score	Wexner Score	Pelvic Floor Muscle Strength	PHQ-9	GAD-7	Weight (kg)	BMI
Preoperative baseline	23	5	Grade 4	7	8	37.9	15.2
1 month after first surgery	29	8	Grade 3	3	4	38.8	15.5
1 month after stoma reversal	31	8	Grade 3	0	0	40.2	16.1
2months after stoma reversal	15	3	Grade 4	0	0	43	17.2

This study has obtained the patient's written informed consent to publish this case report and relevant research data. All personally identifiable information has been anonymized to protect patient privacy.

3. Nursing Care

3.1. Stage 1: Preoperative Nursing (from Unfamiliarity to Familiarity)

The core nursing problems in this stage include lack of knowledge (related to pelvic floor muscle exercise, colostomy care, and LARS prevention), nutritional imbalance (less than body requirements), and risk of impaired skin integrity (related

to 13 times of diarrhea daily). The main nursing goal is to help the patient transition from unfamiliarity with the disease and surgery to familiarity and acceptance, laying a foundation for surgery and postoperative rehabilitation.

3.1.1. Health Education on LARS and Stoma

The patient had no understanding of LARS prevention, had undergone pelvic floor muscle exercise twice during childbirth but mastered it incompletely, strongly demanded sphincter preservation, refused stoma, and could not accept the impact of stoma on appearance and anal function. Studies have shown that patients with colostomy are prone to negative emotions such as stigma and social alienation due to changes in body image and defecation methods after surgery, which seriously affects postoperative rehabilitation and increases the risk of postoperative complications [4]. Based on the patient's bachelor's degree, good comprehension ability, and familiarity with self-media, a health education plan was formulated after knowledge assessment. LARS knowledge popularization was carried out through popular science lectures, illustrated manuals, multimedia materials, bulletin boards and other channels, and the patient's knowledge mastery was re-evaluated preoperatively. At the same time, colostomy simulation training was moved forward, with stoma care experience, demonstration operation, and complication education carried out preoperatively. Combined with stoma rehabilitation volunteers for peer education, a "one-to-many" care group was established, and stoma beautification guidance and sharing meetings were carried out to alleviate the patient's resistance to stoma.

3.1.2. Systematic Pelvic Floor Muscle Training

The *Expert Consensus on the Management of Low Anterior Resection Syndrome in Patients After Rectal Cancer Surgery* [5] recommends that pelvic floor muscle exercise should be initiated as early as possible and run through the entire perioperative period to enhance the structural support, contraction strength and coordination of pelvic floor muscles, and improve defecation control ability. A personalized pelvic floor muscle training plan was formulated by specialist nurses, emphasizing that earlier preoperative exercise leads to better results. The specific methods include: 1) Anal contraction exercise: inhale deeply, clamp and lift the anus, hold for 5 s, exhale and relax for 10 s, 3 times daily, 50 times per group; 2) Supine pelvic floor muscle training: lift the levator ani and coccygeus muscles inward and upward, 5 slow contractions lasting 5 - 10 s each, then 5 fast contractions lasting 1 s each, 2 times daily, 30 min each time; 3) Bridge pelvic floor muscle training: lie flat with knees bent at 90°, 2 times daily, 10 - 20 times per group. Meanwhile, a stepwise training course was formulated, including 3 s slow muscle foundation, 3 s slow muscle strengthening, 5 s slow muscle foundation, 5 s slow muscle strengthening, 10 s slow muscle improvement, fast muscle training, and mixed fast and slow muscle training, with specialist nurses providing bedside guidance for implementation.

3.1.3. Nutritional Intervention and Skin Protection

The patient's BMI was only 15.2 kg/m². Body composition analyzer measurement

indicated deficiencies in protein, inorganic salts, body fat, and muscle mass, with a target weight of 52.4 kg and a need to gain 14.4 kg. Evidence-based nutritional support plans can significantly improve the nutritional status of tumor patients during chemoradiotherapy, reduce adverse reactions, and enhance quality of life [6]. A 3-day 24-hour dietary recall method was used to assess diet, and a high-energy balanced diet + high-protein diet plan was formulated. The patient's actual daily intake was 1,170 kcal of heat, 25.3 g of protein, 39.5 g of fat, and 158 g of carbohydrates, while the recommended intake based on standard weight was 1,590 kcal of heat, 79.5 g of protein, 53 g of fat, and 123.7 g of carbohydrates. On the basis of maintaining the existing diet, increase the intake of fish, shrimp and meat products, add high-protein and high-energy enteral nutrition solution, ensure more than 1,500 mL of daily water intake to maintain water and electrolyte balance, and specifically supplement nutritional gaps. For the problem of 13 times of diarrhea daily and Bristol stool scale type 6, triple protection measures were taken: 1) Dietary adjustment: low-residue, low-fiber, high-protein diet, drink plenty of water to prevent electrolyte imbalance; 2) Medication: administer anti-diarrheal drugs, Bifidobacterium quadruple viable tablets and other probiotics as prescribed; 3) Skin care: clean gently with soft wet wipes, avoid alkaline cleaners, dry thoroughly after cleaning, and use petroleum jelly, cream and other skin protectants to prevent perianal skin damage. After preoperative nursing intervention, the patient accepted the surgical plan, mastered basic LARS knowledge and independent pelvic floor muscle exercise methods, gained weight, had intact perianal skin without damage, and initially improved anxiety and depression.

3.2. Stage 2: The First Postoperative Nursing (Prevention and Control of Intestinal Dysfunction)

One month after surgery assessment: stable vital signs, PHQ-9 score of 3 points, GAD-7 score of 4 points, no anxiety or depression; improved nutritional indicators, intact stoma skin, able to independently complete stoma care; pelvic floor muscle strength grade 3, good anastomotic healing; LARS score of 29 points (mild), Wexner fecal incontinence score of 8 points (mild), still high risk of PO-LARS, higher risk of intestinal dysfunction than preoperatively. The core nursing problem in this stage is high risk of intestinal dysfunction (related to surgery), and the nursing focus is to prevent and control the occurrence and aggravation of intestinal dysfunction.

3.2.1. Anal Sensation Awakening Training

The patient had undergone ileostomy, the anus was in a disused state, and neuromuscular awareness training needed to be initiated to avoid "anal disuse" and promote pelvic anatomical structure healing. Studies have confirmed that multimodal enhanced recovery after surgery (ERAS) nursing intervention can significantly improve the postoperative recovery process, psychological resilience and quality of life of patients undergoing robot-assisted radical resection of colorectal cancer and stoma surgery [7]. Specific training methods include: 1) Gas perception train-

ing: guide the patient to consciously perceive and try to control anal exhaust several times daily; simple perception can stimulate the nerve reflex arc; 2) Warm water sitz bath: sitz bath with 39 - 41 °C warm water 1 - 2 times daily, 15 min each time, to maintain cleanliness and perianal local sensation and blood circulation.

3.2.2. Strengthened Pelvic Floor Muscle Exercise and Simulated Defecation Coordination Training

Continue the preoperative stepwise training course and carry out multi-position training: supine core exercise, supine pelvic tilt exercise, supine knee flexion rotation, sitting arm lift, sitting knee lift, standing back and forth swing, sitting hand support stand-up, etc. Establish a patient group for daily supervision and clock-in, guide the patient to record a pelvic floor muscle function training diary, and ensure the continuity and effectiveness of training. Pelvic floor muscle exercise combined with hydrotherapy can effectively improve patients' defecation function, reduce the incidence of incontinence dermatitis, and improve quality of life [8]. At the same time, carry out simulated defecation coordination training to train abdominal-pelvic coordination during defecation and prevent obstructive LARS in the future: adopt "balloon blowing" training, take a deep breath and slowly exert downward abdominal pressure to simulate defecation abdominal pressure while relaxing pelvic floor muscles and anus; guide correct defecation posture, use a footstool to make knees higher than hips, simulate squatting posture to optimize rectal angle.

3.2.3. Stoma Care and Intestinal Preparation before Closure

Patients with ileostomy have intestinal disuse, which may aggravate postoperative defecation dysfunction. The nutritional status of patients with preventive ileostomy is affected by many factors, and attention should be paid to nutritional management and intestinal function maintenance during the stoma period [9]. At the same time, strictly implement stoma care in accordance with the *Guidelines for Adult Colostomy Care* [10], standardize the whole process from preoperative nursing, perioperative nursing, rehabilitation nursing to colostomy and peristomal skin complication nursing, and prevent colostomy and peristomal skin complications. One month before stoma closure, guide the patient to perform distal stoma enema at home daily to reduce intestinal disuse time, strengthen pelvic floor muscle training, promote nutrient absorption, and alleviate the risk of postoperative LARS from the source. After nursing in this stage, the patient fully mastered pelvic floor muscle function training skills, could complete phased training daily, could independently change stoma bags, had no peristomal dermatitis, stenosis, prolapse and other complications, had high compliance with stoma enema, and had good intestinal function reserve.

3.3. Stage 3: Stoma Closure Postoperative Nursing (from Incontinence to Control)

One month after closure assessment: stable vital signs, no anxiety or depression, continuously improved nutritional indicators; Bristol stool scale type 6, defecation

4 - 7 times daily; pelvic floor muscle contractility grade 3; LARS score of 31 points (severe), Wexner fecal incontinence score of 8 points (mild fecal incontinence), with severe LARS symptoms, and intestinal dysfunction as the core problem. This problem is caused by changes in intestinal physiological structure and neuromuscular function damage. The nursing focus is to help the patient transition from fecal incontinence to control.

3.3.1. Multi-Position Kegel Exercises and Reestablishment of Defecation Habits

Initiate multi-position Kegel exercises 1 week after surgery, including: 1) Bridge Kegel: inhale to contract and lift pelvic floor, lift hips and hold for 10 s, relax and rest for 10 s, 5 times per group, 3 - 4 groups daily; 2) Four-point support Kegel: support with hands, knees together, repeat 20 times per group, 3 - 4 groups daily; 3) Supine flat Kegel: contract pelvic floor for 5 s, relax for 10 s, 10 times per group, 3 - 4 groups daily; 4) Half-squat wall leaning Kegel: lean against the wall, inhale to contract pelvic floor, hold for 10 s and stand up to relax, 5 times per group, 3 - 4 groups daily. Factors influencing LARS in patients after ileostomy closure for rectal cancer include age, BMI, distance from tumor to anal margin, neoadjuvant therapy, etc. Individualized defecation function rehabilitation intervention should be implemented for high-risk patients [11]. For reestablishment of defecation habits: defecate regularly morning and evening, defecate half an hour after meals to form muscle memory; warm water sitz bath at 39 - 41°C for 15 - 20 min every night to relax muscles and improve local blood circulation; guide the patient to record a defecation diary to dynamically monitor defecation frequency, traits and control status; carry out defecation reflex training, defecate regularly after three meals regardless of defecation urge, contract anus for 10 s when there is an urge to defecate, and train defecation control ability.

3.3.2. Dietary and Medication Guidance and Perianal Skin Care

In terms of diet, increase high-fiber foods such as vegetables and whole grains to promote gastrointestinal mucosal repair and peristalsis recovery; eat slowly and avoid eating 2 hours before bedtime; follow the principles of low salt, low fat, low sugar and high protein to adapt to hyperthyroidism and postoperative rehabilitation needs. In terms of medication, when defecation frequency increases and feces are thin, administer loperamide and Bifidobacterium quadruple viable tablets as prescribed to control defecation less than 5 times daily: 1 tablet orally for 5 - 10 times, 2 - 3 tablets daily for >10 times, combined with traditional Chinese medicine conditioning. In terms of perianal skin care, clean with warm water or wet toilet paper after defecation to avoid mechanical friction; keep perianal skin dry, use skin protection powder, protective film, buttock cream or hydrocolloid dressing to prevent skin damage and infection.

3.3.3. Psychological Support and Continuous Nursing Management

Patients with rectal cancer, especially young and young female patients, have a high incidence of psychological problems due to changes in disease, surgery and

defecation function, which have a great impact. Acceptance and commitment therapy can effectively alleviate negative emotions in patients after rectal cancer surgery and improve psychological flexibility and social adaptability [12]. Meanwhile, “Internet + continuous nursing” is an effective model to improve patient prognosis, optimize medical resource allocation and ensure nursing continuity [13]. In this case, systematic rehabilitation guidance was provided relying on the enhanced recovery clinic, which is open on Monday afternoon and Tuesday afternoon (13:30 - 16:00), providing characteristic services such as perioperative optimization, stoma irrigation, psychological care and rehabilitation training; carry out home nursing, intelligent rehabilitation and bed reservation through the continuous management platform and Internet hospital, conduct regular follow-up at 1, 3 and 6 months after surgery, and the platform regularly pushes LARS assessment questionnaires. When the questionnaire indicates abnormality, the management nurse is prompted at the terminal to urge the patient to return for follow-up and adjust the individualized rehabilitation plan. Two months after stoma closure, the patient’s LARS score and fecal incontinence score decreased significantly compared with one month after closure, pelvic floor muscle strength gradually recovered; psychological state was completely improved, preoperative mild depression and anxiety were completely relieved; high risk of intestinal dysfunction changed to no intestinal dysfunction; fully mastered rehabilitation skills such as pelvic floor muscle exercise, defecation control and perianal care, and quality of life was significantly improved.

4. Discussion

Rationale for Selection of Assessment Scales

In this study, three scales (LARS, Wexner and POLARS) were selected, all of which are recommended by domestic and international guidelines for evaluating intestinal function after rectal cancer surgery. The LARS scale is the core standard for diagnosing low anterior resection syndrome. Preoperative LARS score can reflect the patient’s baseline intestinal function and provide a control for intervention effect. After staged nursing, the patient’s score continued to improve and finally returned to normal, which can objectively confirm the rationality of the transformation from “high risk” to “no intestinal dysfunction”. The Wexner scale is used to quantify the degree of anal incontinence, and the POLARS scale is used to comprehensively predict the risk of intestinal dysfunction. The combined use of the three can achieve multi-dimensional and comprehensive evaluation and ensure true and reliable results.

5. Limitations

This study has the following limitations: first, this is a single case report, and the extrapolation of the results is limited; second, the patient’s functional improvement is the combined effect of surgery, tumor treatment and nursing intervention, and it is difficult to distinguish the independent effect of a single measure; third,

the follow-up time after stoma reversal is short, and long-term intestinal function changes still need continuous observation.

6. Summary

LARS is the most common complication after sphincter-preserving surgery for rectal cancer, especially in patients with ultra-low rectal cancer, neoadjuvant therapy, female and young patients. This case is a 40-year-old young female, with a tumor only 3 cm from the anus, and experienced neoadjuvant therapy and two surgeries, a typical high-risk population for LARS. Preventing LARS does not depend on a single nursing measure, but a systematic nursing process that is interlocking and continuous throughout the whole course. In this case, a multidisciplinary LARS management team was established, and the nursing process was divided into three stages: preoperative, first postoperative and post-stoma reversal, with the core goals of “unfamiliar → familiar”, “prevention and control of intestinal dysfunction” and “incontinence → controllable” respectively. Targeted interventions were implemented for the prominent problems in each stage. Preoperative focus was on LARS and stoma knowledge education, systematic pelvic floor muscle training, nutritional support and skin protection; first postoperative focus was on anal sensory awakening, simulated defecation coordination training and bowel preparation before stoma reversal; post-reversal focus was on multi-position Kegel exercises, defecation habit reconstruction, dietary and medication management and continuous nursing. The staged nursing intervention model has the core advantages of pertinence, efficiency, continuity and predictability, and can provide practical reference for standardized nursing of LARS during perioperative period in patients with ultra-low rectal cancer. The deficiency of this case is that psychological problems of patients with ultra-low rectal cancer need key attention. In the future, the application of staged nursing intervention model in the management of psychological problems of patients can be further explored to achieve physical and mental synchronous rehabilitation.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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