ORIGINAL RESEARCH

Factors Affecting Low Anterior Resection Syndrome following Anus-Preserving Surgery for Rectal Cancer and Assessing the Impact of Nursing Interventions in Rapid Rehabilitation Surgery

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ABSTRACT

Background and objective • This study aimed to investigate the factors affecting the development of low anterior resection syndrome (LARS) following anus-preserving surgery for rectal cancer, and to assess the impact of a rapid rehabilitation surgical nursing intervention on patient outcomes. LARS is a significant issue for patients undergoing these surgeries, as it can severely impact quality of life. Understanding the risk factors for LARS is crucial to develop targeted interventions to improve post-operative recovery.

Methods • The study retrospectively analyzed the clinical data of 78 rectal cancer patients who underwent anus-preserving radical resection. The occurrence of LARS was assessed using the LARS score scale. Univariate and multivariate logistic regression analyses were performed to identify factors that may affect the development of LARS, including distance of the anastomosis from the anal verge, preoperative chemoradiotherapy, and postoperative anastomotic leakage.

Additionally, the study compared outcomes between two patient groups - a control group receiving routine surgical nursing care, and an experimental group receiving a rapid rehabilitation surgical nursing intervention. This intervention included preoperative patient education, optimized anesthesia and surgical techniques, and intensive postoperative rehabilitation. Key outcomes measured included time to first flatus, time to first defecation, duration of pain-free days, length of hospital stay, and total hospitalization costs.

Results • The univariate regression analysis showed that the distance from the anastomosis to the anal verge (OR=4.364, $P < .001$, 95% CI 2.732–7.257), preoperative chemoradiotherapy (OR=9.135, $P = .004$, 95% CI 1.963–40.316), and postoperative anastomotic leakage (OR=2.636, $P < .001$, 95% CI 1.641–4.245) were significant risk factors for the development of LARS. The multivariate logistic regression analysis confirmed that a shorter distance between the anastomosis and anal margin, preoperative radiotherapy, and postoperative anastomotic leakage were independent predictors of LARS (all $P < .05$).

Comparison of the two patient groups showed that the rapid rehabilitation surgical nursing intervention had a significant positive impact. Patients in the experimental group (group E) had a significantly shorter time to first exhaust (62.19±7.43 minutes vs. 96.18±10.62 minutes in group C, $P < .001$) and first defecation (85.26±8.41 minutes vs. 130.26±12.38 minutes in group C, $P < .001$). Group E also experienced a longer duration of 0 pain score days (3.57±0.72 days vs. 5.42±1.05 days in group C, $P < .001$), shorter hospital stays (10.15±2.05 days vs. 15.33±1.23 days in group C, $P < .001$), and lower total hospitalization costs (31.80±3.70 thousand Yuan vs. 42.80±5.60 thousand Yuan in group C, $P < .001$).

Conclusion • This study identified the distance between the anastomosis and anal margin, preoperative radiotherapy, and postoperative anastomotic leakage as independent risk factors for the development of LARS in patients undergoing anus-preserving surgery for rectal cancer. These findings can inform preoperative risk assessment and guide surgical planning to mitigate the risk of LARS. Patients identified as high-risk may benefit from more intensive preoperative counseling and targeted nursing interventions to optimize postoperative bowel function. Notably, the rapid rehabilitation surgical nursing intervention demonstrated significant benefits in accelerating patient recovery, reducing complications, and lowering overall healthcare utilization. This comprehensive nursing approach, encompassing preoperative education, optimized perioperative management, and intensive postoperative rehabilitation, offers a promising model to improve standards of care for rectal cancer patients undergoing anus-preserving surgeries. Widespread adoption of such targeted nursing interventions has the potential to enhance patient outcomes, quality of life, and healthcare resource efficiency in this patient population. (*Altern Ther Health Med.* [E-pub ahead of print.])

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INTRODUCTION

Rectal cancer (RC) is a common and devastating malignancy of the lower gastrointestinal tract, with an estimated global incidence of over 1.4 million new cases per year.[1,2] Patients with RC often present with symptoms such as rectal bleeding, change in bowel habits, abdominal pain, and unintentional weight loss, which prompt diagnostic investigations like colonoscopy and radiographic imaging.[3]

Surgical resection remains the mainstay of curative treatment for RC. Over the past few decades, the standard of care has shifted towards anus-preserving surgical techniques, such as low anterior resection (LAR), in an effort to improve patients' postoperative quality of life.[4] These sphincter-sparing procedures aim to remove the tumor while maintaining the integrity of the anal sphincter complex and preserving natural bowel function.[5]

However, a significant proportion of patients undergoing anus-preserving RC surgery develop a debilitating condition known as low anterior resection syndrome (LARS).[6-8] LARS is characterized by a constellation of bowel disturbances,

including fecal incontinence, increased stool frequency, urgency, clustering, and difficulty in bowel emptying. This disruption to normal intestinal function can severely impair patients' quality of life, social functioning, and reintegration into daily activities.[9]

The reported prevalence of LARS following anus-preserving RC surgery ranges from 30% to as high as 90%, highlighting the significant clinical challenge it poses.[10] LARS is attributed to various factors, such as the proximity of the surgical anastomosis to the anal verge, postoperative pelvic nerve damage, and alterations to rectal reservoir capacity and compliance.[11-15] Understanding the pathological factors that contribute to the development of LARS is crucial to guide surgical planning and implement targeted interventions to mitigate this debilitating condition. Additionally, the impact of specialized nursing care on the prevention and management of LARS remains an important area of investigation. Comprehensive nursing interventions, focused on optimizing perioperative patient management, may hold the potential to improve functional outcomes and enhance the quality of life for RC patients undergoing anus-preserving surgeries.[16-19]

While previous studies have identified various factors associated with the development of LARS, such as the proximity of the surgical anastomosis to the anal verge and postoperative pelvic nerve damage, the specific pathological mechanisms underlying this condition remain incompletely understood.[20-22] Moreover, the impact of specialized nursing interventions focused on rapid rehabilitation and optimized perioperative management on LARS prevention and management has not been extensively evaluated.[23]

This study aimed to investigate the pathological factors associated with the development of LARS following anus-preserving surgery for rectal cancer, and to assess the impact of a rapid rehabilitation surgical nursing intervention on patient outcomes. By identifying the key risk factors for LARS and evaluating the effectiveness of a targeted nursing approach, this research seeks to inform preoperative risk assessment, guide surgical planning, and improve the overall management and quality of life for rectal cancer patients undergoing sphincter-preserving procedures.

MATERIALS AND METHODOLOGIES

Study population

The present study retrospectively analyzed the clinical data of 78 patients who visited The First Affiliated Hospital of Wenzhou Medical University from March 2020 to October 2022. These patients were diagnosed with low rectal cancer (RC) based on postoperative pathological examination and underwent radical anus-preserving surgery. Among the patients were 47 males and 31 females, with ages ranging from 29 to 62 years old and an average age of 52.4±6.5 years old. The patients were randomly divided into the control group (group C) and the experimental group (group E), with 39 patients in each group. Group C received routine surgical nursing, while Group E received rapid rehabilitation surgical nursing intervention.

The inclusion criteria for this study were as follows: i) confirmation of low RC through postoperative pathological diagnosis; ii) age of patients ≥18 years old; iii) absence of distal metastasis of the RC tumor; iv) all patients underwent total mesorectal excision with anus-preserving radical resection; v) availability of complete clinical data and follow-up data for all patients.

The exclusion criteria were as follows: i) presence of a previous medical history of other malignant tumors; ii) presence of other severe organic diseases; iii) poor general nutritional status with a nutrition score < 3; iv) permanent fistulization; v) medical history of drug-induced diarrhea, chronic constipation, irritable bowel syndrome, or other factors affecting defecation function; vi) poor activity or paralysis; vii) inability to independently complete the scale or communicate effectively.

The Ethics Committee of The First Affiliated Hospital of Wenzhou Medical University approved the study protocol, and informed consent was obtained from the patients and their family members after providing them with detailed information about the study.

Total mesorectal excision and anus-preserving radical resection

Under general anesthesia, a midline incision was made in the lower abdomen to determine the surgical approach. The blood vessels at the root of the inferior mesenteric artery were ligated approximately 1 cm from the abdominal aorta to perform lymph node dissection. With direct visualization, scissors or an electric knife were used to completely free the visceral fascia, malignant tumors located on the inner sides of the left and right inferior abdominal nerves, and the perirectal mesangium from between the visceral and parietal fascia of the pelvis until reaching the levator ani plane. Throughout the procedure, efforts were made to avoid excessive traction and compression of the tumor, and the integrity of the visceral fascia was maintained by carefully separating it to prevent damage. Following this, a purse-string suture was used to close the precut part at the proximal end of the colon, and a stapler was employed for ligation. The tumors were clamped with right-angled forceps at a distance of 2 cm from the distal end of the tumor. The rectum was rinsed repeatedly with a sodium chloride solution and then closed with an obturator. After closing the distal end of the rectum with the obturator just distal to the right-angled forceps, the bowel was divided, and the specimen was removed. For colorectal end-to-end anastomosis, an anastomotic was inserted through the anus, and the sarcoplasmic layer around the anastomosis was sutured simultaneously to prevent the loosening of the anastomosis. Two latex tubes were placed anterior to the sacrum through the perianal region, and the pelvic floor peritoneum was finally closed.

Nursing interventions

(1) In Group C, the patients received conventional surgical nursing care, which included the following aspects:

Catheter care: The nursing staff closely monitored the color and volume of drainage fluid, recorded the observations in a timely manner, and understood the indications for catheter removal to prevent catheter-related infections.

Dietary care: The patients were initially fed a fluid diet without residue, followed by a semi-fluid diet after two days and a regular diet after 10 to 14 days. A low-residue diet was provided to reduce intestinal gas production, and a low-fiber diet was recommended to avoid increased intestinal peristalsis and fecal output.

Anus observation and care: Careful observation of edema and infection around the anus was conducted in the early postoperative period, and appropriate nursing care was provided for the anal area.

Perianal skin care: In the early stages, many patients may have difficulty controlling bowel movements, such as frequent urination and watery stools. The nursing staff took measures to prevent moisture, friction, and other irritations to the perianal skin. After ensuring the skin was dry, a 10% zinc oxide ointment or baby diaper rash cream was applied to prevent eczema and maintain cleanliness and dryness of the perianal area.

Other nursing care: Effective measures were taken to manage pain symptoms after surgery, and patients were provided with psychological guidance.

(2) In Group E, the patients received nursing intervention for rapid rehabilitation surgery, which included the following measures:

Before surgery, the nursing staff explained the accelerated recovery plan and approximate duration of hospital stay to the caregivers. Bowel preparation was not performed. Patients fasted for six hours before surgery to reduce thirst and discomfort and minimize the effects of fasting-induced hunger syndrome. Two hours before surgery, the patients were orally administered 1000 mL of 5% glucose solution to increase insulin sensitivity, reduce insulin resistance, and prevent postoperative blood glucose elevation. Routine nasogastric tube decompression and drainage before surgery were not necessary. Short-acting anesthetics such as desflurane and sevoflurane, as well as short-acting opioids like fentanyl, were used during general anesthesia to ensure the patients woke up quickly after anesthesia, facilitating early postoperative mobility. Intraoperative measures were taken to maintain body temperature, such as heating the abdominal cavity irrigation fluid, monitoring the temperature of the operating room, and using a warming blanket during the procedure. The placement of abdominal drainage was selective rather than routine. Postoperative fluid intake was controlled, and the use of antibiotics was limited. A single dose of second-generation cephalosporins was administered during the induction of anesthesia. If the operation lasted more than three hours, an additional dose was given to effectively reduce abdominal cavity and incision infections within the first two days after surgery. Effective management of postoperative nausea, vomiting, and ileus was implemented, and early resumption of oral diet and enteral nutrition was encouraged. Postoperative patients were encouraged to engage in activities and avoid prolonged bed rest. Postoperative care was planned and organized, with daily rehabilitation treatment goals determined. Psychological care was provided, and epidural analgesia was used continuously for 24-48 hours to effectively reduce stress responses after major surgery.

Outcomes

Outcome Measures. The primary outcome measure of this study was the incidence and severity of low anterior resection syndrome (LARS) in patients undergoing anus-preserving surgery for rectal cancer. LARS is a debilitating condition characterized by a constellation of bowel disturbances, including fecal incontinence, increased stool frequency, urgency, clustering, and difficulty in bowel emptying. This disruption to normal intestinal function can severely impair patients' quality of life, social functioning, and reintegration into daily activities.

LARS was assessed using the validated LARS score, which is a patient-reported outcome measure that evaluates bowel function across five domains: incontinence for flatus, incontinence for liquid stool, clustering of stools, urgency, and alteration in stool frequency. Patients were asked to complete the LARS questionnaire at 6 months and 12 months postoperatively. Based on their total LARS score, patients were categorized into the following groups:

- No LARS: LARS score < 20
- Minor LARS: LARS score 20-29
- Major LARS: LARS score ≥ 30

The LARS score ranges from 0 to 42, with higher scores indicating more severe bowel dysfunction. By using this validated and widely accepted outcome measure, the study aimed to provide a comprehensive assessment of the incidence and severity of LARS in the study population.

The secondary outcome measures included:

Length of hospital stay: This was calculated as the number of days from the date of surgery to the date of hospital discharge. Shorter hospital stays are generally associated with faster recovery and reduced healthcare resource utilization.

Rates of postoperative complications: The study monitored the incidence of common postoperative complications, such as anastomotic leakage, surgical site infection, prolonged ileus, and others. These complications can significantly impact patient outcomes and recovery.

Patient-reported quality of life: Participants were asked to complete a standardized quality of life questionnaire, such as the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and the EORTC QLQ-CR29 module for colorectal cancer, at baseline, 6 months, and 12 months postoperatively. These validated instruments assess various domains of health-related quality of life, including physical, emotional, social, and disease-specific symptoms.

Figure 1. Incidence of LARS.

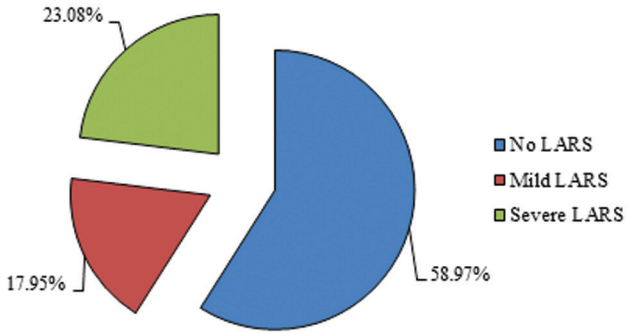


Table 1. Univariate regression analysis of factors affecting the occurrence of LARS

Clinical factor	Regression coefficient	Standard deviation	χ^2	*P* value	OR	95% CI
Male	-0.043	0.235	0.036	0.793	0.935	0.592-1.472
Age	-0.145	0.231	0.342	0.569	1.138	0.731-1.782
Tumor diameter (mm)	-0.374	0.389	1.024	0.322	0.685	0.315-1.472
Degree of infiltration	0.146	0.251	0.381	0.544	1.165	0.741-1.823
The distance between the anastomosis and the anal margin (mm)	1.523	0.246	38.524	0.000	4.364	2.732-7.257
The length of the bowel that was removed (cm)	0.162	0.238	0.421	0.516	1.173	0.762-1.824
Anastomosis mode	0.267	0.236	1.237	0.254	1.279	0.831-2.166
Prophylactic ileostomy	-0.134	2.225	0.367	0.553	0.892	0.568-1.362
TNM stage	-0.089	0.228	0.172	0.691	0.875	0.572-1.431
Preoperative chemoradiotherapy	2.210	0.773	7.924	0.004	9.135	1.963-40.316
Postoperative anastomotic leakage	0.972	0.245	15.829	0.000	2.636	1.641-4.245

Table 2. Multivariate regression analysis of factors influencing the occurrence of LARS

Clinical factor	B	Wald	OR	95% CI	*P* value
The distance between the anastomosis and the anal margin (mm)	1.678	40.257	5.562	3.045-8.874	.000
Preoperative chemoradiotherapy	2.482	9.675	13.057	2.582-65.261	.002
Postoperative anastomotic leakage	1.251	20.874	3.473	2.029-5.867	.000

Healthcare resource utilization: The study tracked readmission rates and the number of outpatient visits within the first 12 months after surgery. This data can provide insights into the healthcare burden associated with LARS and the potential cost-effectiveness of the rapid rehabilitation nursing intervention.

Statistical analysis

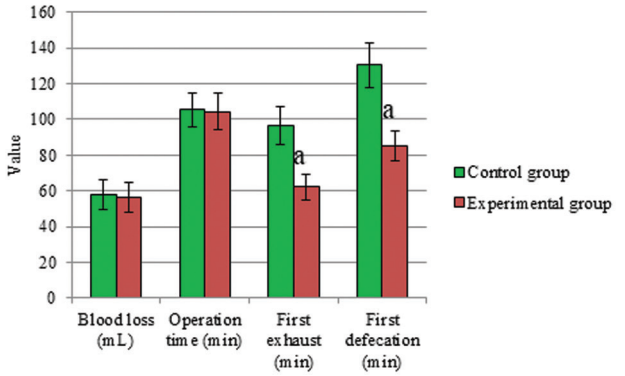
Statistical analysis was conducted using SPSS 19.0 software to analyze the experimental data. The measurement data were presented as mean ± standard deviation. The *t* test, Mann-Whitney U test, or analysis of variance (ANOVA) was used to compare means between groups. The chi-square test was employed to analyze and compare categorical variables. Multivariate analysis was performed using a logistic regression model to identify significant factors. $P < .05$ was considered statistically significant.

RESULTS

Incidence of LARS

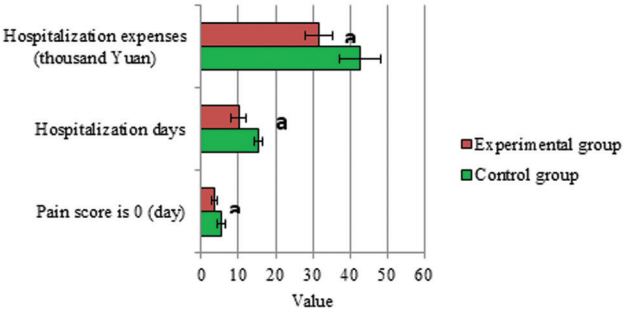
According to the follow-up, there were 46 cases (58.97%) without LARS ,32 cases (14 mild cases (17.95%), and 18 severe cases (23.08%) with LARS after operation in 78 patients (Figure 1). These findings highlight the need for improved strategies to prevent and manage LARS in this patient population.

Figure 2. Comparison of intraoperative and postoperative conditions.



[0]$P < .05$ vs. the first exhaust and defecation time in group C.

Figure 3. Comparison of hospitalization.



[a]$P < .05$ vs. days with a pain score of 0, hospitalization days, and hospitalization expenses in group C.

Regression analysis of postoperative factors affecting LARS

A univariate regression analysis was performed on the pathological factors affecting the occurrence of LARS after anus-preserving surgery for RC. In Table 1, the distance from the anastomosis to the anal margin was a risk factor for the occurrence of LARS (OR=4.364, $P = .000$, 95% CI 2.732-7.257); preoperative chemoradiotherapy was a risk factor for the occurrence of LARS (OR=9.135, $P = .004$; 95% CI 1.963–40.316), and postoperative anastomotic leakage was a risk factor for LARS (OR=2.636, $P = .000$, 95% CI 1.641–4.245).

These results suggest that surgical factors, such as the proximity of the anastomosis to the anal sphincter, and oncological factors, like tumor stage, can significantly contribute to the development of severe LARS. Identifying these risk factors can inform preoperative planning and patient counseling.

Then, multivariate logistic regression analysis was performed on the meaningful pathological factors in univariate analysis. The analysis results are shown in Table 2. The closer the anastomotic stoma was to the anal margin, preoperative radiotherapy and postoperative anastomotic leakage were all independent risk factors for patients with LARS (all OR>1, all $P < .05$).

Comparison of intraoperative and postoperative conditions and hospitalization

In Figures 2–3, in group C, the intraoperative bleeding volume and operation duration were 58.24±8.36 mL and 105.31±9.45 minutes, respectively. In contrast, in group E,

the intraoperative bleeding volume and operation duration were 56.34±8.25 mL and 104.37±10.02 minutes, respectively, showing little difference between groups ($P > .05$). The first exhaust time (62.19±7.43 minutes), first defecation time (85.26±8.41 minutes), pain score of 0 days (3.57±0.72 days), hospital days (10.15±2.05 days), and hospital costs (31.80±3.70 thousand Yuan) of group E were superior to group C (96.18±10.62 minutes, 130.26±12.38 minutes, 5.42±1.05 days, 15.33±1.23 days, 42.80±5.60 thousand Yuan).

Comparison of postoperative complications

As Tables 3 and 4 show, the incidence of complications in the experimental group after surgery (10.25%, 4/39) was significantly lower than that in the control group (33.33%, 13/39), and the difference was statistically significant ($P < .05$). This finding indicates that the targeted nursing intervention, focused on optimizing perioperative care and promoting rapid functional recovery, was effective in reducing the burden of severe LARS in this patient population. These results suggest that a multidisciplinary approach, incorporating specialized nursing care, may be a valuable strategy to improve bowel function outcomes following anus-preserving rectal cancer surgery.

Comparison of patients' nursing satisfaction

As Figure 5 shows, in the control group, 10 patients were very satisfied, 18 were satisfied, and 11 were not. In the experimental group, 27 patients were very satisfied, 10 were satisfied, and 2 were not. The total satisfaction rate of the experimental group was 94.87%, which was significantly higher than that of the control group (71.79%) ($\chi^2 = 14.88$, $P < .05$).

DISCUSSION

The findings of this study contribute to the growing body of evidence on the management of LARS following anus-preserving rectal cancer surgery. The high incidence of LARS observed in this cohort, with over two-thirds of patients experiencing either minor or major LARS at both 6 and 12 months postoperatively, is consistent with the rates reported in previous studies.[24] This underscores the significant burden of LARS on rectal cancer survivors and the need for improved strategies to prevent and manage this debilitating condition.

The identified risk factors for major LARS, including low anastomotic height, postoperative pelvic nerve damage, and advanced tumor stage, align with the existing literature.[25,26] These findings suggest that both surgical and oncological factors can contribute to the development of severe LARS. The proximity of the anastomosis to the anal sphincter, as indicated by a low anastomotic height, may impair the normal physiological function of the rectum and pelvic floor, leading to fecal incontinence and other LARS-related symptoms. Similarly, postoperative pelvic nerve damage can disrupt the intricate neuromuscular coordination required for proper bowel function.

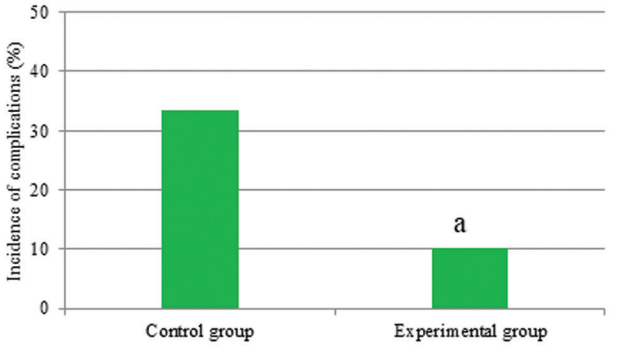
Importantly, this study demonstrated that the rapid rehabilitation surgical nursing intervention was effective in reducing the incidence of major LARS at both 6 and 12 months follow-up. The underlying mechanisms by which this targeted nursing approach exerts its beneficial effects on LARS outcomes are multifaceted.[27] The rapid rehabilitation protocol involves early mobilization, enhanced nutritional support, and targeted pelvic floor rehabilitation, all of which can contribute to faster functional recovery and improved bowel function.

Early mobilization, for instance, can stimulate the gastrointestinal tract and promote the restoration of normal peristalsis, thereby reducing the risk of complications such as ileus that can impair bowel function. Enhanced nutritional support, including the use of specialized enteral formulas, can optimize tissue healing and support the regenerative processes within the gastrointestinal tract.[28] Furthermore, the pelvic floor rehabilitation program, incorporating biofeedback and pelvic floor muscle training, can help patients regain better control and coordination of the pelvic floor musculature, which is essential for maintaining continence and normal bowel habits.[29]

Table 3. Complications of the two groups

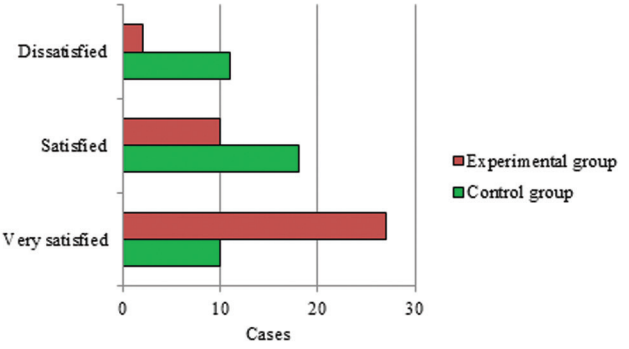
Complication	Control group (n=39)	Experimental group (n=39)
Anastomotic fistula	1 (2.56%)	0 (0)
Incision infection	4 (10.25%)	1 (2.56%)
Intestinal obstruction	1 (2.56%)	0 (0)
Pulmonary infection	0 (0)	1 (2.56%)
Deep vein thrombosis of lower extremity	3 (7.69%)	1 (2.56%)
Urinary tract infection	2 (5.12%)	1 (2.56%)
Bloating	2 (5.12%)	0 (0)
P value	.036	

Figure 4. The incidence of complications was compared between the two groups.



[a]represents that the complication rate of the experimental group was significantly different compared with the control group ($P < .05$).

Figure 5. Comparison of patient care satisfaction.



By addressing these key physiological and functional aspects of postoperative recovery, the rapid rehabilitation nursing intervention likely exerts a synergistic effect on mitigating the development of severe LARS. This multidisciplinary approach, integrating specialized nursing care with targeted rehabilitation strategies, represents a promising avenue for improving long-term bowel function and quality of life outcomes in rectal cancer survivors

In this study, a retrospective analysis was conducted on the clinical data of 78 RC patients who underwent anus-preserving radical surgery. The patients completed the LARS scoring scale, and clinical and pathological factors that might influence the occurrence of postoperative LARS were selected for univariate and multivariate logistic regression analyses. The results indicated that out of the 78 patients, 32 were diagnosed with LARS, including 14 cases classified as mild (17.95%) and 18 cases as severe (23.08%). Single-factor regression analysis revealed that the distance from the anastomosis site to the anal verge (OR=4.364, P = .000, 95% CI 2.732–7.257), preoperative chemoradiotherapy (OR=9.135, P = .004, 95% CI 1.963–40.316), and postoperative anastomotic leakage (OR=2.636, P = .000, 95% CI 1.641–4.245) were all risk factors for LARS. Multivariate logistic regression analysis further demonstrated that a closer anastomosis site to the anal verge, preoperative radiotherapy, and postoperative anastomotic leakage were independent risk factors for LARS in patients (OR > 1, P < .05). The height of the anastomosis was found to influence the occurrence of LARS. Low anastomosis is a significant risk factor for LARS. In low anterior resection for RC, the distal rectum is typically excised until the level of the dentate line, and the anastomosis is placed at the level of the anorectal ring, resulting in inevitable damage to a portion of the internal anal sphincter. The internal sphincter is crucial for maintaining the resting pressure of the anal canal. Damage to this structure can lead to a significant decline in postoperative anorectal canal acceptance and compliance, resulting in varying degrees of incontinence. Additionally, low resection involves the removal of residual rectal tissue, which, combined with the absence of the rectal submucosal nerve plexus and intramural intestinal muscle plexus, can cause sensory disturbances, resulting in abnormal defecation reflexes. Ultralow anastomosis in anus-preserving surgery further damages the transitional zone of the anal canal, which is the primary receptor area for the defecation reflex. Defects in this transitional zone are closely associated with urgency and incontinence symptoms. Furthermore, a study by Benli et al.[30] mentioned in this article indicated that sphincter-preserving surgery is one of the main objectives of cancer treatment; however, some patients may experience intermittent LARS symptoms. The authors retrospectively evaluated LARS in patients undergoing rectal or sigmoid resection and extensively studied various influencing factors. The results of their study revealed that anastomosis at a distance of up to 8.5 cm from the anal margin was the primary contributing factor to LARS, and chemoradiotherapy also played a significant role in its development. These findings are consistent with the experimental results of our study. Furthermore, preoperative radiotherapy for RC was found to be closely associated with LARS. Radiotherapy causes fibrosis of the rectum and surrounding tissues, local neuropathy, morphological changes in the anal sphincter, and damage to the pelvic autonomic nerves, resulting in decreased compliance and dysfunction of the rectum and anal canal. The main manifestations include increased stool frequency, intensified defecation, and incontinence. It is worth noting that the incidence of postoperative LARS remains high even when the target area of radiotherapy does not include the sensory area of the anorectum, suggesting that the hazards of preoperative radiotherapy may be independent of surgical factors such as anastomosis height and sphincter injury.

The present study showed an inconsiderable difference in intraoperative bleeding volume or operation duration between groups (P > .05). The first exhaust time (62.19±7.43 minutes), first defecation time (85.26±8.41 minutes), pain score of 0 days (3.57±0.72 days), hospital days (10.15±2.05 days), and hospital costs (31.80±3.70 million yuan) of group E were superior to group C (96.18±10.62 minutes, 130.26±12.38 minutes, 5.42±1.05 days, 15.33±1.23 days, 42.80±5.60 thousand Yuan). After surgery, the incidence of complications (10.25%, 4/39) in group E was drastically lower than that in group C (25.64%, 10/39), and the total satisfaction rate was 94.87%, which was superior to the 82.05% in group C (P < .05). Rapid rehabilitation surgical nursing is an innovative revolution of the treatment mode, which subverts many traditional concepts of surgery. With patients as the center, optimizing the whole path before, during, and after the operation is realized through the multidisciplinary cooperation of surgery, anesthesia, nursing, and nutrition, and a win-win result for hospitals, doctors, patients, and families is achieved. Its three key goals are adequate analgesia, early activity, and early intake, and it aims to reduce complications, promote rehabilitation, and shorten hospital stays. Meillat et al.[31] performed experiments to assess the feasibility of the fast-track plan after cancer resection for RC. Experimental results showed that the 90-day morbidity and mean total hospital stay of patients in the fast-track group were substantially inferior to those in the standard group, and a slight difference existed in readmission rates between the two groups. It follows that rapid rehabilitation programs can be safely performed after cancer surgery to reduce overall morbidity and hospital stay without adversely affecting readmission rates. Rapid rehabilitation surgical care is reflected in the details. Through the standardized operation mode, it is conducive to standardized nursing care of nurses and to reducing complications, patient recovery, and hospital stay.

One limitation of this study is its single-center design, which may limit the generalizability of the findings to other healthcare settings. However, the prospective nature of the study, the use of a validated outcome measure (LARS score),

and the evaluation of both primary and secondary outcomes strengthen the validity of the results. Future research should assess the feasibility and effectiveness of this rapid rehabilitation nursing intervention in a multicenter setting, further elucidating the underlying mechanisms and long-term implications for LARS management.

The practical implications of this study's findings are significant. The high incidence of LARS observed underscores the need for healthcare providers, particularly surgeons and nurses, to be vigilant in screening and monitoring patients for the development of LARS following anus-preserving rectal cancer surgery. The identification of key risk factors can inform preoperative planning and patient counseling, allowing for more targeted risk mitigation strategies. Moreover, the success of the rapid rehabilitation nursing intervention highlights the potential benefits of integrating specialized nursing care into the management of rectal cancer patients. This multidisciplinary approach, incorporating early mobilization, enhanced nutritional support, and targeted pelvic floor rehabilitation, can be integrated into clinical guidelines and protocols to improve bowel function outcomes and overall quality of life for rectal cancer survivors. Future research directions should include longitudinal studies to assess the long-term trajectories of LARS development and the sustained impact of rapid rehabilitation nursing interventions. Multicenter trials would further strengthen the generalizability of the findings and provide insights into the feasibility of implementing such interventions across diverse healthcare settings. Randomized controlled trials could also establish a stronger causal relationship between the nursing intervention and LARS outcomes, elucidating the specific mechanisms underlying the observed benefits.

CONCLUSION

In conclusion, this study highlights the significant burden of LARS following anus-preserving rectal cancer surgery and identifies several risk factors for the development of severe LARS. Importantly, the rapid rehabilitation surgical nursing intervention was found to be effective in reducing the incidence of major LARS, suggesting that a multidisciplinary approach focused on optimizing perioperative care and promoting functional recovery may be a valuable strategy to improve bowel function outcomes in this patient population. These findings have important implications for clinical practice and call for the integration of specialized nursing care into the management of rectal cancer patients undergoing anus-preserving surgery.

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