Effect of Multivariate Management Pathway on Prevention of Upper Limb Lymphedema and Improvement of Self-Care Ability in Patients After Radical Mastectomy

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Abstract: To observe the effect of multivariate management pathway on postoperative upper limb lymphedema and self-care ability in patients undergoing radical mastectomy. A total of 76 patients undergoing radical mastectomy from March 2024 to October 2025 were selected and randomly divided into two groups using a random number table, with 38 cases in each group. The control group received routine postoperative nursing, while the observation group received multivariate management pathway nursing. The incidence of upper limb lymphedema, self-care ability and psychological resilience were compared between the two groups. The incidence of upper limb lymphedema in the observation group was lower than that in the control group (P<0.05). After nursing, the self-care ability in the observation group was higher than that in the control group (P<0.05). After nursing, the psychological resilience in the observation group was higher than that in the control group (P<0.05). The implementation of multivariate management pathway in patients undergoing radical mastectomy can reduce the incidence of upper limb lymphedema, improve patients' self-care ability and enhance their psychological resilience.

Keywords: Multivariate Management Pathway; Radical Mastectomy; Upper Limb Lymphedema; Prevention; Self-Care Ability

1. Introduction

Breast cancer is the most common type of gynecological cancer with certain occultness, and may even endanger patients' lives. Radical mastectomy is the main clinical treatment for these patients. However, due to lymphatic vessel injury and lymph node dissection during surgery, patients are prone to upper limb lymphedema after operation, which is not conducive to postoperative recovery[1-2]. Based on the characteristics of patients' conditions, multivariate management pathway comprehensively evaluates various conditions of patients undergoing radical mastectomy, and formulates a multi-dimensional nursing support plan to meet patients' multi-dimensional nursing needs during postoperative recovery and promote their recovery[3]. This study mainly analyzed the effect of multivariate management pathway nursing on the prevention of upper limb lymphedema and the improvement of self-care ability in patients after radical mastectomy.

2. Materials and Methods

2.1 General Data

A total of 76 patients undergoing radical mastectomy from March 2024 to October 2025 were selected and randomly divided into two groups using a random number table. The control group (38 cases) received routine postoperative nursing, and the observation group (38 cases) received multivariate management pathway nursing. In terms of patient composition, the age of the control group ranged from 26 to 55 years old, with an average of (35.85±1.45) years old. The body mass index was 21~24 kg/m², with an average of (22.68±1.25) kg/m². Among them, there were 20 cases of TNM stage I and 18 cases of stage II. The age of the observation group ranged from 27 to 54 years old, with an average of (35.85±1.78) years old. The body mass index was 21~24 kg/m², with an average of (23.05±1.15) kg/m². Among them, there were 18 cases of TNM stage I and 20 cases of stage II. There was no significant difference in basic data between the two groups (P>0.05).

2.2 Methods

In the control group, nurses provided routine

nursing during postoperative recovery, guided patients on matters needing attention during recovery, required patients to take medicine strictly according to the doctor's instructions, and maintain good behavioral habits. The observation group received multivariate management pathway nursing:

(1) Early postoperative activities. After the patients' various indicators were stable in the early postoperative period, they were guided to carry out activities, including active and passive activities of fingers and wrists, 15~20 minutes each time, and were instructed to appropriately increase the amount of activity according to their tolerance. Active and passive shoulder joint activities were guided 24 hours after surgery, 20 minutes each time, 3~4 times a day.

(2) Psychological guidance. During postoperative recovery, patients were prone to great psychological pressure due to worries about their recovery or concerns about disease improvement, which might even affect their early activities. Nurses should actively communicate with patients after surgery, give encouragement and support, relieve their psychological pressure, and help them face postoperative treatment with a positive attitude and participate in the prevention of postoperative upper limb lymphedema.

(3) Physical intervention. During postoperative recovery, accurately observe the changes of patients' upper limbs, and guide patients to wear low-elastic pressure sleeves for prevention. The daily wearing time should be kept at more than 12 hours as much as possible. At the same time, patients were instructed to actively carry out upper limb exercises, including stretching and full-range activities, or assisted activities with grip balls, about 30 minutes each time, 3 times a day.

(4) Upper limb skin management. Patients were guided to properly manage upper limb skin during postoperative recovery to avoid upper limb skin injury caused by external operations. Small wounds should be treated in a timely manner. In daily life, try to wear loose and soft clothes to reduce irritation to upper limb skin.

2.3 Observation Indicators

(1) Statistics of the incidence of upper limb lymphedema.

(2) Comparison of psychological resilience. The psychological resilience of patients before and after nursing was evaluated by the Connor-Davidson Psychological Resilience Scale, and the score was positively correlated with patients' psychological resilience.

(3) Comparison of self-care ability. The self-care ability of patients during postoperative recovery was analyzed according to the Exercise of Self-Care Agency Scale (ESCA). Patients were instructed to answer the questions in the scale according to their specific conditions, and the higher the score, the better the self-care ability.

2.4 Statistical Methods

SPSS 26.0 was used to analyze the data in the study. Measurement data (including ESCA level, etc.) were expressed as mean ± standard deviation, and t-test was used. Count data were expressed as percentage, and chi-square test was used. $P<0.05$ indicated statistical significance.

3. Results

3.1 Statistics of Upper Limb Lymphedema

Upper limb lymphedema occurred in 2 cases in the observation group and 6 cases in the control group, with chi-square = 8.883 and P = 0.001.

3.2 Comparison of Psychological Resilience Scores

After nursing, the psychological resilience score of the observation group was higher than that of the control group ($P<0.05$), as shown in Table 1.

3.3 Comparison of Self-Care Ability

After nursing, the self-care ability of the observation group was higher than that of the control group ($P<0.05$), as shown in Table 2.

Table 1. Comparison of Psychological Resilience Between the Two Groups ($\bar{x}\pm s$)

Group	Number of Cases	Tenacity		Self-improvement		Optimism	
		Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Observation	38	17.52±1.58	25.45±2.05	16.85±1.68	22.35±1.34	4.05±0.23	6.11±0.23
Control	38	17.75±1.67	20.67±1.99	16.98±1.74	17.68±1.26	4.11±0.31	5.07±0.15
t	-	0.345	16.378	0.358	17.348	1.678	10.713
P	-	0.365	<0.001	0.726	<0.001	0.211	<0.001

Table 2. Comparison of Psychological Resilience Between the Two Groups ($\bar{x}\pm s$)

Group	Number of Cases	Self-concept		Sense of self-care responsibility		Self-care skills		Health knowledge level	
		Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing	Before Nursing	After Nursing
Observation	38	18.65±1.45	26.45±1.35	14.05±1.45	20.74±1.35	30.45±1.15	42.05±1.34	40.15±1.67	53.05±1.35
Control	38	18.74±1.52	22.68±1.45	14.15±1.26	17.15±1.15	30.36±1.26	35.15±1.25	40.23±1.75	47.45±1.26
t	-	0.345	18.345	0.472	18.345	0.728	26.409	0.459	23.588
P	-	0.634	<0.001	0.638	<0.001	0.345	<0.001	0.647	<0.001

4. Discussion

During the treatment of breast cancer patients with radical mastectomy, lymph node dissection and other operations are easy to cause varying degrees of damage to the upper limb lymphatic system, resulting in blockage of lymphatic reflux channels. A large amount of lymph fluid accumulates in the interstitial space of patients' upper limbs, leading to upper limb lymphedema. Upper limb lymphedema can cause symptoms such as swelling and pain in patients, and even affect the normal activities of upper limbs, which is not conducive to patients' recovery and even increases the psychological burden of patients after surgery.

Multivariate management pathway nursing optimizes postoperative nursing measures based on the characteristics of these patients. Guiding patients to carry out early activities after surgery can promote upper limb blood circulation and prevent upper limb lymphedema. Timely attention to patients' psychological changes and psychological support can help patients build confidence in rehabilitation[4-5]. Physical intervention and guidance on upper limb skin management can also prevent and manage upper limb lymphedema, which is conducive to patients' recovery. According to the observation, multivariate management pathway can improve the psychological resilience and self-care ability of patients during postoperative recovery, help patients master measures to improve upper limb lymphedema, effectively prevent upper limb lymphedema, reduce the incidence rate, and promote postoperative recovery of patients.

In conclusion, multivariate management pathway nursing can be implemented in the nursing of patients undergoing radical mastectomy to reduce the incidence of upper limb lymphedema and improve patients' self-care ability.

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