

Analysis of the Efficacy of Eras Combined with Evidence-Based Care after Partial Breast Reconstruction with Lateral Chest Wall Perforator Flap

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Abstract

Objective: To evaluate the effectiveness of enhanced recovery after surgery combined with evidence-based nursing practices (ERAS-EBNP) in the care of breast cancer patients who underwent partial breast reconstruction with lateral chest wall perforator flap (PBR-LCWPF).

Methods: From January 2023 to December 2023, 98 breast cancer patients at our centre underwent PBR-LCWPF. These patients were randomised into an intervention group (evidence-based nursing group, $n = 50$) and a control group (conventional care group, $n = 48$). The control group used conventional nursing methods, and the intervention group used ERAS-EBNP to compare the nursing outcomes of patients in the two groups.

Results: The postoperative hospitalisation time and the incidence of flap complications within 3 days after surgery were significantly lower in the observation group than in the control group ($P < 0.05$), and the psychological state score, quality of life score, and nursing care satisfaction were significantly better in the observation group than in the control group ($P < 0.05$).

Conclusion: ERAS-EBNP can significantly improve the quality of life of patients after PBR-LCWPF, improve the patient care effect, and is worthy of being popularized and applied.

Keywords: Enhanced Recovery after Surgery, Evidence-based Nursing Practices, Lateral Chest Wall Perforator Flap, Breast Cancer

1. Introduction

As medical technology advances and public awareness of cancer prevention improves, an increasing number of early-stage breast cancers are being diagnosed [1]. In addition, the use of breast-conserving surgery in breast cancer is increasing as patients' demand for breast aesthetics increases and surgical techniques and concepts improve [2]. Literature shows that breast-conserving surgery represented by PBR-LCWPF can not only obtain a similar survival rate as that of total mastectomy, but also greatly avoid the psychological barriers after breast loss, improve the quality of life

of patients and the long-term therapeutic effect of tumours, and reduce the incidence of surgical complications, and therefore, it has been widely used in the treatment of breast cancer [3,4].

PBR-LCWPF is suitable for Asian women with small breasts, and the donor tissue is derived from outside the breast, which will not further reduce the breast after surgery. However, PBR-LCWPF requires a high level of surgical technique, and complications such as flap necrosis often occur postoperatively due to the anatomical transfer of the designed flap [5,6]. Therefore, high-quality

postoperative care is particularly important for the outcome of breast cancer patients undergoing PBR-LCWPF.

Evidence-based nursing practice (EBNP) refers to clinical practice based on evidence-based science, which can provide patients with scientific, objective, personalized, and authoritative nursing practice [7,8]. Enhanced recovery after surgery (ERAS) is a multidisciplinary collaboration to optimize perioperative care pathways based on evidence provided by evidence-based medicine [9,10]. The fundamental aim of ERAS-EBNP is to reduce the stress of surgical trauma, thereby reducing postoperative complications and accelerating patient recovery. Our study is the first to use ERAS-EBN to care for breast cancer patients after PBR-LCWPF, thus exploring the effect of ERAS-EBN on the care of patients after PBR-LCWPF.

2. Methods

2.1 Ethics

The study was approved by the Ethics Committee of the General Hospital of the People's Liberation Army Northern War Area, written informed consent was obtained from each patient, and all data were used only for scientific research.

2.2 Patients

From January 2023 to December 2023, 100 consecutive patients with early-stage breast cancer underwent PBR-LCWPF at our center. After follow-up, 98 patients were finally included, these patients were randomized into two groups (observation group: received ERAS-EBN, n = 50, vs. control group: received usual care, n = 48). All patients met the diagnostic criteria for breast cancer¹¹ and were suitable for surgery. We statistically analyzed patients' satisfaction with care, psychological status, quality of life, and surgical outcomes.

2.3 Inclusion and Exclusion Criteria

Inclusion criteria were as follows: (1) pathologically confirmed diagnosis of breast cancer without systemic metastasis; (2) voluntary participation in this study; (3) successful PBR-LCWPF surgery; (4) age 18-80 years old. Exclusion criteria were as follows: (1) cardiac, pulmonary, hepatic, and renal insufficiency, unable to tolerate the surgery; (2) communication barriers or poor compliance; (3) loss of follow-up.

2.4 Research Methodology

2.4.1 Control Group

Given routine care, mainly including: observation of vital signs, urination; postoperative lying down for 6h, while the head is tilted to the side to prevent aspiration; observation of the blood circulation on the affected side; chest compression bandage care; drainage tube care and affected limb care, etc.

2.4.2 Observation Group

Apply ERAS-EBN based on routine nursing care. Firstly, the issue of evidence-based nursing in this study should be confirmed,

and after that, relevant literature should be consulted and clinical experience should be synthesized to form the ERAS-EBN program. The ERAS concept is used as the framework in the nursing process, while the specific problems therein are analyzed and solved using evidence-based medicine evidence. The specific methods are as follows:

2.4.2.1 Preoperative Education

Pictures or videos are used to show patients the comparison of the operative area before and after the operation, to facilitate patients' understanding. Briefly explain the diagnosis and treatment process of breast cancer and the prognosis of survival data, etc., to ease the patient's anxiety. The relief of anxiety can avoid vasospasms caused by sympathetic overexcitation, thus reducing the chance of flap complications, and at the same time making the follow-up communication between doctors and patients smoother.

2.4.2.2 Preoperative Smoking Cessation

Tobacco significantly affects the oxygenation capacity of tissue cells, increases the risk of vasospasm, and at the same time increases the incidence of postoperative incision infection, lower extremity venous thrombosis, and other complications. It is recommended that patients quit smoking for 4 weeks before surgery and abstain from smoking after surgery to reduce the incidence of postoperative flap complications.

2.4.2.3 Preoperative Prehabilitation Training

Adjust the patient's physical and mental state, to reduce the impact of surgical trauma on the patient. It is mainly carried out through the following three aspects: 1) preoperative exercise, assessing the patient's exercise tolerance, and better formulating the postoperative exercise program; 2) preoperative psychological assessment, using the anxiety and depression scale to fully investigate the patient's psychological state, to determine whether psychological intervention is needed; 3) preoperative cognitive state assessment: for the patients who are too old and accompanied by low cognitive function, the risk of postoperative complications will be greatly increased, and the use of a simple intelligence state assessment scale can effectively assess the cognitive state for subsequent communication. A simple Intellectual Status Assessment Scale can effectively assess the cognitive status for subsequent communication.

2.4.2.4 Preoperative Nutritional Support

The patient's preoperative nutritional reserve will greatly affect the speed of postoperative recovery and outcome. Nutritional status is assessed using the Nutritional Risk Screening Scale to ensure a minimum daily intake of 1.2 grams of protein per kilogram of body weight. Improvement of the patient's nutritional status will help reduce the probability of postoperative flap complications.

2.4.2.5 Prophylactic Antithrombotic Therapy

Risk factors for venous thromboembolism include advanced age, malignant tumors, surgery time >3 hours, and prolonged bed rest.

All of these factors are frequently seen in patients undergoing breast cancer surgery. For patients with risk factors, it is recommended to intervene by including instructing patients to wear medical compression stockings for the lower extremities during the perioperative period, encouraging lower extremity exercise, and prophylactic antithrombotic therapy with low molecular heparin calcium.

2.4.2.6 Preoperative Water Fasting and Resumption of Postoperative Diet

Based on evidence-based evidence, we shortened the preoperative fasting time from the conventional 12 h to 6 h and the water fasting time from 6 h to 2 h. The shortening of the fasting time can greatly reduce the patient's preoperative irritability, and at the same time, it is conducive to controlling blood glucose in a relatively stable state, which is conducive to postoperative skin flap survival. Except for the case of intolerance of enteral nutrition, a nasogastric tube is used, and the patient should be fed as early as possible on the premise of tolerance.

2.4.2.7 Perioperative Glycemic Control

Perioperative glycemic control is critical; excessive blood glucose will affect microcirculation and increase the rate of flap graft failure. To maximize the patient's blood glucose, preoperative glycated hemoglobin should be controlled below 7% and postoperative blood glucose monitoring should be carried out for timely intervention.

2.4.2.8 Postoperative Flap Care

Postoperative flap care is embodied in two aspects, one is to provide an environment that avoids vasospasm of the flap, including appropriate temperature, smoke-free, and effective analgesia. The second is to recognize the occurrence of vascular crisis in time, give medication to antispasmodic, loosen the dressing, remove the interval suture, change the position, and other treatments.

2.4.2.9 Postoperative Pain Management and Prevention of Nausea and Vomiting

Postoperative pain and severe nausea and vomiting not only increase the patient's anxiety and depression and affect sleep but also keep the body in a state of stress, a variety of cytokines will be released into the bloodstream, inducing vasospasm, which can lead to vascular crisis and lead to flap necrosis. For this reason, we provide a clean and pleasant environment for patients to recuperate, avoiding noise and playing soft music to soothe their emotions according to their needs. At the same time, preventive application of painkillers and antiemetic drugs can help the patients to maximize the protection from the postoperative side effects, get rid of the stress as soon as possible, and return to the normal state of the body.

2.4.2.10 Postoperative Activities

Early postoperative activities are conducive to the prevention of pulmonary complications, pressure sores, and lower extremity

venous thrombosis. Given that most of the current anesthesia methods are intubation general anesthesia, there is no need to intentionally prevent headaches caused by cerebrospinal fluid leakage, we suggest that the semi-recumbent position can be used after waking up for 6 hours without decubitus, and personalized daily exercise goals can be set for the patients according to the results of the preoperative measurement of exercise tolerance.

2.5 Evaluation Indicators

2.5.1 Postoperative Hospitalization Time

2.5.2 Flap Complication Rate within 3 days after Operation

Mainly including events such as flap blood supply and infection.

2.5.3 Nursing SATISFACTION score

Adopting a self-made rating scale, assessing from a multi-dimension mainly including professional skills, psychological guidance, work efficiency, work attitude, etc., taking the average score, ≥ 80 is satisfied; < 80 is not satisfied.

2.5.4 Psychological State Score

One week after the operation, the Self-Rating Anxiety Scale (SAS) was used to reflect the psychological state of the patients, which consisted of 20 items, including 15 positive scores and 5 negative scores, with the following scoring criteria: none; some of the time; most of the time; always, corresponding to the positive scores of 1, 2, 3, and 4, and the negative scores of 4, 3, 2, and 1, respectively. The higher the score, the higher the level of anxiety.

2.5.5 Quality of Life Score

Six months after discharge from the hospital, the quality of life of patients with breast cancer is reflected by the Functional assessment of cancer therapy-breast (FACT-B), which consists of 7 items, 49 items, each scoring 0-4 points. The final score was positively correlated with quality of life.

2.6 Statistical Analysis

The data of the two groups during their hospitalization were analyzed using the SPSS 27.0 software (SPSS Inc., Chicago, IL, United States). Continuous variables are presented as mean \pm standard deviation (SD) and compared using Student's t-test. Categorical variables are presented as numbers or percentages and compared using the Person χ^2 test. P-values < 0.05 (two-tailed) were considered statistically significant.

3. Results

The observational indexes of the control and observation groups are shown in Table 1.

There was no significant difference in age (49.35 ± 15.99 vs. 51.50 ± 16.2 , $P = 0.512$) and histologic staging between the observation and control groups ($P > 0.05$).

The observation group had a shorter hospital stay (8.50 ± 1.22 vs. 7.56 ± 1.67 , $P < 0.05$) and a lower rate of flap complications (27.08% vs. 8.00% , $P < 0.05$) than the control group.

The observation group demonstrated significantly higher nursing satisfaction rates (94.00% compared to 79.17%, $P < 0.05$) and quality of life scores (112.20 ± 22.34 versus 99.81 ± 18.36 , $P <$

0.05). Additionally, they had lower psychological state scores (43.58 ± 8.67 compared to 47.90 ± 8.13 , $P < 0.05$) than the control group.

	Control group (n=48)	Observation group (n=50)	P-vale
Age (years)	49.35±15.99	51.50±16.25	0.512
Histological grading			0.760
I	13(27.08%)	11(22.00%)	
II	31(64.58%)	36(72.00%)	
III	4(8.33%)	3(6.00%)	
Hospitalization time (days)	8.50±1.22	7.56±1.67	0.002
Flap complication, yes. (%)	13(27.08%)	4(8.00%)	0.013
blood supply obstruction	11(22.92%)	4(8.00%)	
Infection	2(4.17%)	0	
Nursing satisfaction, yes. (%)	38(79.17%)	47(94.00%)	0.030
SAS score	47.90±8.13	43.58±8.67	0.013
FACT-B score	99.81±18.36	112.20±22.34	0.004

Statistically significant results are shown in bold.

Table 1: Basic Information of two groups

4. Discussion

Breast cancer is the most common malignant tumour in women and one of the top five causes of cancer-related deaths¹². The incidence of breast cancer is still on the rise due to changes in breastfeeding habits, lifestyle, hormone levels and environment [11,12]. In developing countries, the incidence of breast cancer among women of childbearing age with a need for breast conservation is 50% [13,14].

Radical mastectomy has been commonly used for the treatment of breast cancer in the past; however, postoperative breast loss is a difficult problem for patients to face. In recent years, PBR-LCWPF, which can be used to obtain a greater chance of breast conservation through volume replacement techniques, has been increasingly used in the treatment of breast cancer patients. However, PBR-LCWPF requires high surgical skills from the surgeon, and the higher complication rate is also a challenge for postoperative care³. In addition, perioperative stress and anxiety will greatly affect patients' treatment compliance, outcome, and quality of life [15,16].

With the development of the economy and medical technology, patients' concepts of healthcare services in recent years tend to emphasize high-quality physical care and mental support [17]. Based on the problems found in the previous nursing care and to care for these patients more appropriately, I decided to optimize the traditional nursing process by introducing the ERAS-EBNP model of care, which aims to improve patient outcomes through multifaceted surgical care, whereas the EBNP can solve the existing

problems by using authoritative experimental data summarized by previous researchers [18,19]. The core of ERAS-EBNP lies in the formulation of evidence-based problems that need to be solved, and through retrieval, analysis, and generalization, a personalized care process for patients is formed.

In this study, ERAS-EBNP was implemented in 50 patients in the observation group, while 48 patients in the control group were given conventional nursing interventions. For the patients in the observation group, based on evidence-based nursing evidence, we fully mobilized the nursing staff's thinking by analyzing the data, to summarize and improve the level of knowledge, and ultimately formed clinical thinking that integrated personal experience with the guidance of the cutting-edge literature, which avoided the single-dependence of individuals on experience. The results showed that the postoperative hospitalization time and the incidence of flap complications within 3 days after surgery were significantly lower in the observation group ($P < 0.05$), indicating that ERAS-EBNP could effectively accelerate the recovery and reduce the incidence of flap complications compared with the conventional nursing model. In addition, the psychological status score, quality of life score, and nursing satisfaction of the observation group were better than those of the control group ($P < 0.05$). This shows that ERAS-EBNP can provide better nursing practice for patients, and at the same time, it is easier to obtain patients' recognition of nursing work. ERAS-EBNP combines practical work, theoretical research results, and individual patient situation, and guides the work with the results summarized in practice to formulate scientific and personalized nursing programs, which helps to improve the quality

of nursing care.

Limitations

The sample size of this study was not large enough and it was a single-center study; future multicenter randomized trials with large sample sizes are needed to validate the effect of ERAS-EBNP on the care of breast cancer patients after PBR-LCWPF. In addition, this study did not count the long-term outcomes of patients, and the questionnaire may lead to a large subjective bias.

5. Conclusion

ERAS-EBNP is an effective nursing practice for breast cancer patients after PBR-LCWPF. ERAS-EBNP can improve patients' depression and quality of life during hospitalization, as well as reduce the rate of flap complications and length of hospital stay, and it is a safe and scientific nursing practice. ERAS-EBNP provides a simple and convenient non-pharmacological treatment in the clinic, which has a broad application prospect. Patient satisfaction appears to be high in early follow-up.

Declarations

Ethics approval and consent to participate
The study complied with the Declaration of Helsinki and has been approved by the Ethics Committee of General Hospital of the People's Liberation Army Northern War Area, written informed consent was obtained from each patient, and all data were used only for scientific research. All authors have read the manuscript and agreed to its publication and have no objections to the list of authors.

Consent for publication

The manuscript has been read and approved by the author.

Availability of data and materials

The datasets used and analyzed during the current study are available from the author upon reasonable request.

Competing interests

The author has declared that no competing interest exists.

Authors' contributions

Yuqing Li designed the study, collected and analyzed the data, and drafted the manuscript.

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