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Observation of Curative Effect of Surgical Nursing in Patients with Grade III Hand-Foot Syndrome

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Abstract

Objective: To investigate the effect of surgical nursing on grade III Hand-Foot Syndrome (HFS) induced by Doxorubicin hydrochloride liposome chemotherapy after breast cancer surgery. **Method:** From January 2019 to December 2019, 10 patients with HFS grade III caused by Doxorubicin hydrochloride liposome chemotherapy after breast cancer surgery in the Breast Department of Cancer Prevention and Treatment Center of Sun Yat-sen University were selected, and surgical nursing methods were used to intervene and observe the therapeutic effects of the patients. **Results:** One patient was cured within 7 days, the cure rate was 10% in 7 days, 8 patients were cured within 10 days, the cure rate was 80% in 10 days, 10 patients were cured within 15 days, the cure rate was 100% in 15 days. **Conclusion:** The surgical nursing method is effective for patients with grade III HFS caused by Doxorubicin hydrochloride liposome chemotherapy after breast cancer surgery, shortening the treatment time of HFS, and is worthy of clinical promotion.

Keywords

Surgical Nursing Methods, Breast Cancer, Chemotherapy, Grade III Hand-Foot Syndrome

1. Introduction

Breast cancer is one of the most common malignant tumors, the number of cases and deaths ranked first in the global female malignant tumors [1]. At present,

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the clinical treatment of breast cancer is mainly surgical treatment, combined chemotherapy, radiotherapy, endocrine therapy and targeted drug therapy, among which chemotherapy is the most important adjuvant therapy for breast cancer. Doxorubicin hydrochloride liposome is a commonly used chemotherapy drug in the clinical treatment of breast cancer. Doxorubicin hydrochloride liposome is a doxorubicin coated with polyethylene glycol liposome, which is characterized by long blood circulation time and can pass through tumor neovascularization. Doxorubicin hydrochloride liposomes can significantly reduce the incidence of cardiac toxicity, hematological toxicity, alopecia, fatigue and other adverse events, but can increase the incidence of HFS [2]. HFS, also known as palm-foot red pain syndrome, is a toxic reaction of local tissue damage caused by the accumulation and exudation of certain specific chemotherapy drugs in the capillaries of the extremities [3] [4]. The main clinical manifestations are redness, swelling, tingling, rash and other symptoms of the skin on the hands and (or) feet [5]. HFS can be divided into grade I, grade II and grade III according to the grading criteria for acute and subacute toxic reactions of antitumor drugs formulated by the National Cancer Institute (NCI) [6], of which grade III manifestations are as follows: ulcerative dermatitis or skin changes with severe pain and marked tissue destruction (e.g., desquamation, blisters, bleeding, edema) that seriously interfere with daily life. Yap *et al*. [7] found that HFS could affect the chemotherapy duration and dosage of patients and reduce the clinical therapeutic effect. As for the efficacy of surgical nursing methods for grade III HFS, there has been no research report. In this study, surgical nursing methods were adopted to intervene in patients with grade III HFS caused by Doxorubicin hydrochloride liposome chemotherapy after breast cancer surgery in our department, so as to explore the clinical efficacy of surgical nursing methods and provide clinical basis for the treatment and nursing of clinical HFS. The report is as follows.

2. Data and Methods

2.1. General Information

Ten patients with grade III HFS induced by Doxorubicin hydrochloride liposome chemotherapy after breast cancer treatment in our hospital from January to December 2019 were selected as the study objects. All patients were female, aged 32 to 60 years old, with an average age of 46 years old. Inclusion criteria: pathological diagnosis of breast cancer; After breast cancer surgery, 8 times of ACT-T chemotherapy were performed, that is, 4 courses of doxorubicin hydrochloride liposome + cyclophosphamide chemotherapy were followed by 4 courses of paclitaxel liposome chemotherapy. The dosage of doxorubicin hydrochloride liposome was calculated according to the patient's body surface area, that is, 30 - 40 mg/m^2, and the dosage of doxorubicin hydrochloride liposome was 60 mg for 5 patients. 40 mg in 5 patients; Chemotherapy was administered intravenously at infusion port. Informed consent and cooperation with research.

Exclusion criteria: combined with other malignant tumors; Combined with acute stage disease; Disturbance of consciousness.

2.2. Methods

All subjects were treated with surgical nursing for Hand-Foot Syndrome. After sterile scissors were used to remove loose yellow and black scab, the wound was cleaned with 3% hydrogen peroxide, the wound was thoroughly rinsed with normal saline, and then sterile gauze was used to dry the wound and surrounding skin water, erythromycin ointment was applied to the wound surface, and finally sterile gauze was wrapped and fixed with a bandage. Change the dressing once a day for the first 3 days and then once every 2 days. All patients were taking Celebrex and vitamin B6 [8].

2.3. Criterion for Judging Curative Effect

The evaluation standard of wound effectiveness is divided into 4 levels [9]. Cure: complete repair of local damaged tissue; Obvious effect: the wound scabs, the seepage becomes less, the wound site shrinks to 1/2 of the original; Effective: the wound area was reduced, but less than 1/2 of the original; Ineffective: after the above treatment and care, there was no significant change in the wound site of the patient. Total effective rate = cure rate + significant efficiency + effective rate.

HFS treatment time: divided into 7-day cure rate, 10-day cure rate, 15-day cure rate, > 15-day cure rate.

3. Results

HFS treatment effect 1 patient was cured within 7 days, the cure rate of 7 days was 10%, 8 patients were cured within 10 days, the cure rate of 10 days was 80%, 10 patients were cured within 15 days, the cure rate of 15 days was 100%.

4. Discussion

Surgical nursing method for the effect of doxorubicin hydrochloride liposome chemotherapy on grade III HFS after breast cancer surgery: In this study, the surgical nursing method was applied to the patients with grade III HFS caused by doxorubicin hydrochloride liposome chemotherapy after breast cancer surgery. The effective rate was 100% in 15 days, and the effective rate was high. At present, there is no unified conclusion on the mechanism of HFS. It is clinically believed that cytotoxic effects and inflammatory reactions brought by chemotherapy drugs are important causes of skin injury. However, the stratum corneum of hands and feet is thick and sweat glands are abundant, thus becoming the anatomical basis of HFS. Although HFS is not enough to threaten the life of patients, the symptoms such as skin pain and ulceration make patients feel more painful, and bring a lot of inconvenience to normal life. Patients' activities are limited, their self-care ability is reduced, their image is damaged, and they

are easy to produce negative emotions such as irritability, tension and anxiety, which affect the treatment effect. Clinically, the main therapeutic methods for HFS are drug therapy, such as glucocorticoids, B vitamins, local softeners, COX-2 specific inhibitors, neurotrophic drugs, etc., but the efficacy is poor and it is easy to relapse after treatment [10]. In recent years, there have been studies on the use of traditional Chinese medicine in the treatment of HFS, but its efficacy is uncertain and side effects need to be considered [11].

The surgical care method of this study includes several important parts: 1) Hydrogen peroxide: it can make microbial proteins denaturate and die. During surgical operations, common bacteria such as *Staphylococcus aureus*, coagulase-negative *Staphylococcus*, *Enterococcus* and *Escherichia coli* can cause wound infection, and the survival rate after rinsing with hydrogen peroxide is greatly reduced, which can reduce the infection rate [12] [13]. A zebrafish model study by Niethammer *et al*. [14] found that a large number of white blood cells could be migrated to the tissue injury site through the gradient mediated by hydrogen peroxide, suggesting that it is conducive to white blood cell migration, thereby increasing the anti-infection ability of the incision. 2) Erythromycin ointment: Erythromycin ointment is a macrolide broad-spectrum antibacterial ointment that can inhibit bacterial protein synthesis, has little irritation to the skin and no dependence, and has strong antibacterial and anti-inflammatory effects. It is clinically suitable for the treatment of skin mucosa, ulcerative surfaces and superficial wounds. During dressing change, applying erythromycin ointment after disinfection can enhance the anti-infection ability of wounds [15]. The Vaseline contained in erythromycin ointment is extremely waterproof and can keep the wound moist, just like forming a protective film for the wound, which can not only reduce tissue fluid exosmosis, but also facilitate the growth of granulation tissue and epidermal repair [16]. At the same time, petroleum jelly, as a kind of mineral oil, has poor skin affinity and almost does not cause secondary injury to the wound, so the dressing is easy to remove, and the wound pain is significantly reduced, reducing the pain of patients, which can not only eliminate the fear of patients but also improve the treatment compliance of patients. The effect is fast, the treatment time is short, the treatment cost is cheap, does not affect the follow-up chemotherapy of patients, and greatly reduces the economic burden and psychological burden of patients. In this study, the surgical nursing method was used for the treatment of more severe grade III HFS, and the effect was significant, which alleviated the anxiety, fear and stigma of patients, improved the confidence of patients in treatment, and the treatment time was short so that the chemotherapy regimen of patients could be carried out in sufficient quantity and duration without obvious side effects.

HFS prevention and care measures: in view of the physical and mental characteristics of breast cancer patients, targeted nursing plans should be formulated according to the individual conditions of patients, so as to alleviate the pain caused by HFS as soon as possible, improve their treatment compliance, improve their quality of life, and ensure the continuation of chemotherapy treatment.

Therefore, it is necessary to take preventive measures, diet nursing and psychological nursing after HFS.

Precautionary measures: doing a good job in patient health education and improving patient compliance can effectively prevent and reduce the occurrence of HFS. 1) Elevate the affected limb at rest to promote venous return and relieve pain. 2) Maintain skin integrity, avoid scratching the skin, and instruct the patient not to do hard movements such as binding. 3) When blisters appear, professionals should be asked to deal with them. When peeling occurs, sterilizing scissors should be used to cut off the loose scab. 4) Undamaged parts can be applied with fresh aloe vera and silver ion antibacterial gel [17]. 5) Usually, should pay attention to keeping warm, wearing loose cotton shoes and socks, keeping local clean and hygienic, usually cleaning hands and feet with warm water, and washing your face with a soft towel. In daily life, attention should be paid to avoid skin damage, such as avoiding chemical fiber fabric stimulation and contact with detergent powder, soap and other chemical detergents; avoiding rubbing hands and feet, pressure, not wearing ill-fitting shoes; avoiding contact with hot or cold objects. Use alcohol-free emollients to keep skin moist, reduce skin desquamation, and avoid skin exposure to the sun.

Diet nursing: first evaluate the patient, make reasonable dietary recommendations by talking with the patient, make a reasonable diet plan according to the patient's HFS condition, and execute it as planned. 1) Eat more foods rich in B vitamins such as peanuts and soybeans to ensure a balanced, reasonable and rich diet, mainly eat cereals, eat more meat, fish, eggs, poultry, beans, dairy products, fresh seasonal vegetables and fruits. 2) The "light, easy to digest, high protein, high vitamin, eat less and eat more meals" as the dietary principle, the patient's water intake of at least 2500 mL/d, promote urination, keep the bowels unobstructed; Quit smoking and drinking, avoid hormones, spicy and stimulating food.

Mental nursing: HFS not only causes additional pain to the patient, but also affects the appearance of the hands and feet, which is very reluctant to accept for women. Therefore, clinical health education should be done in detail, pay attention to psychological nursing, let patients with a positive attitude face chemotherapy and adverse reactions, and actively and consciously cooperate with clinical nursing. 1) Do health education in advance, introduce doxorubicin hydrochloride liposomes to patients, explain HFS-related knowledge, guide patients to talk about their inner negative emotions, and protect the privacy of patients. HFS simple introduction card is issued to help patients be vigilant and strive for early detection and treatment. 2) If the patient has HFS, it is necessary to appease the patient's emotions in time, so that the patient can understand that after stopping the drug, the disease can heal itself, will not affect life and work, and reduce their inner pressure.

5. Conclusion

Surgical nursing method is effective for grade III HFS caused by Doxorubicin

hydrochloride liposome chemotherapy after breast cancer surgery, which is worthy of clinical application. However, this study only applied surgical nursing methods to grade III HFS caused by doxorubicin hydrochloride liposome chemotherapy after breast cancer surgery, and whether it is effective for HFS caused by other drugs remains to be further explored. In the follow-up study, we will further increase the sample size and conduct a randomized controlled trial for a more comprehensive study and analysis.

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Conflicts of Interest

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

References

[1] Sung, H., Ferlay, J., Siegel, R.L., Laversanne, M., Soerjomataram, I., Jemal, A., *et al*. (2021) Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA*: *A Cancer Journal for Clinicians*, **71**, 209-249. https://doi.org/10.3322/caac.21660

[2] Zhang, Q., Zhang, M. and Zhai, S. (2019) Health Technical Evaluation of Doxorubicin Hydrochloride Liposome Injection for the Treatment of Multiple Tumors. *Chinese Journal of New Drugs*, **28**, 1145-1152.

[3] Li, Y., Huang, W., Zhang, L., Jiang, L., Lin, X., Wu, H., *et al*. (2022) Evaluation of the Preventive Effect of Regional Cooling Nursing on Hand Foot Syndrome Caused by Doxorubicin Hydrochloride Liposome. *Open Journal of Nursing*, **12**, 772-781. https://doi.org/10.4236/ojn.2022.1211054

[4] Mikoshiba, N., Yamamoto-Mitani, N., Sato, K., Yaju, Y. and Miyashita, M. (2016) Relationship between Self-Care and Hand Foot Syndrome Specific Quality of Life in Cancer Patients. *Open Journal of Nursing*, **6**, 100-109. https://doi.org/10.4236/ojn.2016.62011

[5] Xu, L., Xue, M., Wang, J. and Zhang, W. (2019) Analysis of Risk Factors and Nursing Strategy of Apatinib Mesylate Induced Hand-Foot Syndrome. *Nursing Research*, **33**, 4049-4054.

[6] National Cancer Institute (2009) Common Terminology Criteria for Adverse Events Version 4.0 (NCI-CICAE).

[7] Yap, Y., Kwok, L., Syn, N., Chay, W.Y., Chia, J.W.K., Tham, C.K., *et al*. (2017) Predictors of Hand-Foot Syndrome and Pyridoxine for Prevention of Capecitabine-Induced Hand-Foot Syndrome. *JAMA Oncology*, **3**, 1538-1545. https://doi.org/10.1001/jamaoncol.2017.1269

[8] Chen, S. (2020) Clinical Value Analysis of Celecoxib Plus Vitamin B6 in the Treatment of Hand-Foot Syndrome Caused by Apatinib. *Northern Pharmacy*, **17**, 9-10.

[9] Wang, J. and Geng, D. (2009) Clinical Application of Hydrogels, Hydrocolloid and

Alginate Series Dressings in the Treatment of Chronic Refractory Wounds. *Ningxia Medical Journal*, **34**, 383-388.

[10] Cheng, X., Wu, R., Zhang, Z. and Zhu, Y. (2020) Observation of Curative Effect of Fumigation with Traditional Chinese Medicine on Hand-Foot Syndrome in Patients with Colorectal Cancer after Chemotherapy. *Journal of Clinical Medicine in Practice*, **24**, 32-35.

[11] Yang, A., Fang, M. and Li, M. (2020) Research Progress of Traditional Chinese Medicine in the Treatment of Hand-Foot Syndrome. *Chinese Medicine Guide*, **26**, 86-88, 92.

[12] Tsubouchi, N., Fujibayashi, S., Otsuki, B., Izeki, M., Kimura, H., Ota, M., *et al*. (2017) Risk Factors for Implant Removal after Spinal Surgical Site Infection. *European Spine Journal*, **27**, 2481-2490. https://doi.org/10.1007/s00586-017-5294-1

[13] Farshad, M., Bauer, D.E., Wechsler, C., Gerber, C. and Aichmair, A. (2018) Risk Factors for Perioperative Morbidity in Spine Surgeries of Different Complexities: A Multivariate Analysis of 1,009 Consecutive Patients. *The Spine Journal*, **18**, 1625-1631. https://doi.org/10.1016/j.spinee.2018.02.003

[14] Niethammer, P., Grabher, C., Look, A.T. and Mitchison, T.J. (2009) A Tissue-Scale Gradient of Hydrogen Peroxide Mediates Rapid Wound Detection in Zebrafish. *Nature*, **459**, 996-999. https://doi.org/10.1038/nature08119

[15] Wang, R., Niu, L., Ren, J., Qiao, G., Jiao, H. and Zhang, X. (2016) Observation on the Effect of Erythromycin Ointment on Preventing the Adverse Reactions of Intravesical Infusion Chemotherapy. *Journal of Nursing Science*, **31**, 63-64.

[16] Weng, X. (2011) Application of Erythromycin Ophthalmic Ointment in Surgical Dressing Change. *Chinese Practical Medicine*, **6**, 173.

[17] Li, Y. and Zhang, L. (2018) Nursing of Different Stages of Hand-Foot Syndrome Induced by Doxorubicin Hydrochloride Liposome (Ribodo) Chemotherapy after Breast Cancer Surgery. *Contemporary Nurses*, **25**, 92-94.