International Journal of Multidisciplinary Research and Growth Evaluation.

Application of mesh elastic bandage in wet compress fixation for patients with thoracic and abdominal herpes zoster

Li Li [1], Gao Zumei [2*], Yao Yachun [3]
[1, 3] Department of Dermatological, The First Affiliated Hospital of Yangtze University, Jingzhou, Hubei, PR China
[2] Department of Nursing, The First Affiliated Hospital of Yangtze University, Jingzhou, Hubei, PR China

* Corresponding Author: **Gao Zumei**

Article Info

ISSN (online): 2582-7138
Volume: 03
Issue: 04
July-August 2022
Received: 30-06-2022;
Accepted: 15-07-2022
Page No: 237-240
DOI: https://doi.org/10.54660/anfo.2022.3.4.8

Abstract
Objective: To evaluate the applied effect of mesh elastic bandage in wet compress fixation for patients with thoracic and abdominal herpes zoster.
Methods: 85 patients with thoracic and abdominal herpes zoster hospitalized in dermatology from April 2021 to June 2022 were selected in this study, which requires wet compress with 3% borate lotion.. 43 subjects were admitted as control group and 42 patients were admitted as observation group. The control group used the conventional method for wet compress and the observation group was ring fixed with "mesh elastic bandage" on the basis of the conventional method. After 2 weeks of treatment, the number of wet compress pad displacement, satisfaction and effect of wet compress treatment were compared between the two groups.
Results: The number of wet compress pad displacement in the observation group was significantly lower than that in the control group (P <0.05), and the satisfaction and treatment effect of wet compress treatment in the observation group were significantly higher than that in the control group (P <0.05).
Conclusion: External fixation using elastic bandage for patients with thoracic and abdominal herpes zoster during wet compress treatment can significantly reduce the number of wet compress displacement, improve patients' satisfaction and ensure the therapeutic effect. This fixation method can be used as a clinical reference.

Keywords: mesh elastic bandage; herpes zoster, wet compress

1. Introduction
Herpes zoster is a common disease and frequently occurring disease in the elderly population in dermatology. It is caused by the varicella-herpes zoster virus lurking in the body, and then manifests as the painful herpestic skin disease distributing along the nerve [1]. Although the disease is self-limited, it often causes the postherpetic neuralgia (PHN) due to improper treatment and care, which seriously affects the quality of life for patients [2-3]. PHN should be highly valued by our medical staff. For the treatment of herpes zoster, we use the methods of the systemic anti-inflammatory, nutritional nerve and analgesic. At the same time, we also often combined with local light and wet compress treatment [4]. Wet compress is an effective way to promote the healing of skin lesions for herpes zoster, and it is very common in dermatology [5]. However, the current wet compress method in our department has disadvantages such as easy displacement of wet compress pad and poor treatment experience of wet compress. In order to ensure the effect of wet compress treatment and improve the experience of wet compress treatment, our department has gained a good reputation in wet compress treatment since the introduction of mesh elastic bandage for external fixation in December 2021. The report is as follows.

2. Object
2.1 Research Object
In the dermatology department of our hospital, the clinical application study tried to improve the method of wet compress fixation

In patients with thoracic and abdominal herpes zoster after passing the hospital ethical review and the patient awareness consent. According to the cluster convenience sampling method, 85 patients diagnosed with thoracic and abdominal herpes zoster were selected in the dermatology department of our hospital in this study and required local wet compress treatment with 3% borate lotion between April 2021 and June 2022. 43 patients admitted from April to November 2021 were divided into control group, and 42 patients admitted from December 2021 to June 2022 were divided into observation group. Control group, 30 male, 13 female, age 45-75 years old, weight 52-76kg, average duration of 4 days, herpes site: 32 chest and back,11 abdominal back; Observation group, 28 male, 14 female, age 42-74 years old, weight 53-78kg, average duration of 5 days, herpes site: 30 chest and back, 12 abdomen and back. The two groups herpes morphology, partial aggregation into blocks, surrounding scattered erythema, did not exceed the midline of the body. Universal intravenous antiviral administration (0.9%NS250ml + ganciclovir 0.25g ivgtt qd), reduced neuroedema (0.9%NS250ml + compound glycyrrhizin 120mg ivgtt qd), nutritional nerve (0.9%NS2ml + methocobalamin 0.5mg iv qd), And in pain, give diclofenac sodium plug 50mg plug anus; Skin lesions was applied with 3% borate lotion for 20min bid and pulsed laser for 15min bid. General datas of two groups including gender (χ^2=0.094, P = 0.7059), age (t = -0. 772, P =0.442), weight (t =1.861, P =0.066), duration (t = -1.799, P =0.076), site and degree of skin lesions, and medication were not statistically significant (P> 0.05) and was comparable.

2.2 Inclusion and exclusion criteria

1. Inclusion criteria: ① patients with thoracic and abdominal herpes zoster requiring wet compress; ② Patients with normal trunk movement and perception; ③ patients with normal language, intelligence and willing to cooperate with the study; ④ patients over 18 years old with normal liver and kidney function.
2. Exclusion criteria: ① patients with suspected allergic symptoms during the use of mesh elastic bandage; ② patients whose wet compress treatment was interrupted due to various reasons.

3. Method

3.1 Wet compress method

The wet compress treatment of the patients in both groups was carried out by two specialized dermatology nurses who had worked in our hospital for more than 3 years and underwent unified operation training. The specific operation steps are as follows: (1) nurse brings wet compress to the patient's bedside to check the patient's information and pull up the curtains to protect her privacy.(2) assisted the patient to take the healthy side in bed and fully exposed the skin lesion.(3) The nurse should wash their hands and wear disposable film gloves, twist the wet pad soaked in 3% boric acid lotion (made of cut 4 layers of overlapping sterile gauze) to no drop of water, and apply it smoothly to the skin damage area, more than 3cm beyond the edge of the pain-affected skin area. The control group was covered a wet application pad with a sterile waterproof and moisturizing treatment towel (80 * 120cm) around the chest and abdomen. Mark the area of the wet pad with a black marker. After the operation, the patient was helped to cover the bedding, and the nurse explained to the patient that the wet compress treatment was required twice a day for 20 minutes. During the wet application, the patient was instructed to remain in bed position to prevent displacement or shedding of the wet pad; However, the method of the observation group is as follows. On the basis of the control group, a mesh elastic bandage was placed on the outer ring of the sterile therapeutic towel. The $10^{\#}$ or $11^{\#}$ mesh elastic bandage was chosen, cut the length so that the wet pad is completely covered, and the elastic is appropriate so that the patient does not feel suffocated. At the end of the operation, nurses assist patient to pull down the jacket and inform them to move freely during the wet compress treatment. Nurses evaluated the location of wet pads of patients every 10min intervals.

3.3 Effect evaluation

The wet pad position is changed compared to the original position, and the skin lesions and pain site are exposed, known as the wet pad displacement. The position of the wet pad should be evaluated twice a day during wet compresses. The number of shifts was statistically summarized on days 7 and 14 of the wet application. On the day of discharge of the patient, the homemade satisfaction questionnaire of wet compress treatment was issued, and the patient was asked to evaluate the convenience and feelings during the wet compress. The score of 81 to 100 was satisfied, 61 to 80 was relatively satisfied, and less than 60 was not satisfied. The total satisfaction rate is the sum of satisfaction rate and comparative satisfaction rate. The efficacy was evaluated according to the criteria of Liu Donglan [6] in the study: recovery: erythema, herpes and pain on the skin subsided ≥ 90%; effective: erythema, herpes and pain subsided ≥75%; improvement: erythema, herpes and pain subsided about 50%; ineffective: erythema, herpes and pain ＜50%.

3.3 Statistical Methods

Statistical analysis was performed using SPSS22.0 software. The measurement data (number of wet pad shifts) used the t-test. The count data (satisfaction rate) used the χ^2 test, and the rank data (satisfaction, efficacy) used the rank sum test. P<0.05 was considered as a statistically significant difference.

4. Results

4.1 Comparison of the number of wet pad displacements between the two groups

The total number of wet pad displacements of the observation group on days 7 and 14 was lower than that of the control group, and the difference was significant (P <0.05), as shown in Table 1.

Table 1: Comparison of the number of wet pad displacements between the two groups ($\bar{\chi}\pm s$, times)

Groups	Cases	Time	Number of wet pad displacements	t	P
Control Group	43	Day 7	7.49±4.58	8.757	0.000
Observation group	42	Day 7	1.14±1.05		
Control Group	43	Day 14	6.84±3.96	9.396	0.000
Observation Group	42	Day 14	0.95±0.88		

4.2 Comparison of patient satisfaction with wet compress treatment between the two groups

The overall satisfaction rate of wet compress treatment in the observation group was higher than that in the control group, which was statistically significant (P <0.05), as shown in Table 2.

Table 2: Comparison of satisfaction with wet application treatment between the two groups (case, %)

Groups	Cases	Satisfaction situation			Satisfaction rate
		satisfied	Relatively satisfied	not satisfied	
control group	43	20(47)	8(19)	15(35)	28(65)
observation group	42	40(95)	1(2)	1(2)	41(98)
statistics		Z=-4.871			χ^2=14.690
P		0.000			0.000

4.3 Comparison of the treatment effect between the two groups

On day 14 of hospitalization, the treatment effect of the observation group was significantly better than that of the control group, and the difference was significant (P <0.05), as shown in Table 3.

Table 3 Comparison of the treatment effect between the two groups (case, %)

Groups	Cases	Recovery	Effective	Improvement	Ineffective
control group	43	34(79)	8 (19)	1(2)	0(0)
observation group	42	40(95)	2(5)	0(0)	0(0)
Z		-2.221			
P		0.026			

5. Discussion

5.1 The use of mesh elastic bandage can reduce the number of wet compress pad displacement

Wet compress therapy is a routine operation technique in dermatology, and the application of this technology plays a key role in the healing process of skin lesions. The traditional fixation method often causes the displacement of the wet compress pad due to the insecure fixation method. In addition, patients will inevitably move their limbs during the wet compress treatment, so the displacement of the wet compress pad is often caused. Size 10 and 11 mesh elastic bandages used in this study contained cotton yarn and elastic components, which can be stretched horizontally and vertically, and has the advantages of good elasticity, large mesh, good air permeability and easy operation [7]. At present, it has been gradually applied in the medical and nursing activities of many departments in China, and has achieved good results. The results of this study showed that the use of mesh elastic bandages in patients with thoracic and abdominal herpes zoster can significantly reduce the number of displacement of wet compress pads. This not only guaranteed efficacy of drug treatment, but also effectively reduces the number of sheets are soaked, thus improving the quality of nursing, which has a more far-reaching clinical practical value.

5.2 The use of mesh elastic bandage can improve patient satisfaction

With the continuous improvement of patients' requirements for the quality of nursing services, the traditional forms of nursing services have been difficult to meet the needs of dermatology patients. How to make the maximum use of the existing medical resources to simplify the workflow of caregivers, improve the efficiency of nursing work, and ultimately improve the level and quality of dermatology nursing work, is worth thinking deeply of nursing staff [8]. Mesh elastic bandage is a new type of binding fixation material, which was introduced to China from abroad in the 1980s, mainly used for surgical dressing, indwelling needle fixation and other fields [9-10]. In this study, it was used for the first time in the external fixation of wet compress in patients with herpes zoster. The patient can move freely during the wet compress treatment, avoiding the discomfort caused by maintaining the same position for a long time. In addition, because the mesh elastic bandage loop with sterile therapeutic drape, and it does not directly contact with the skin and wet application pad, so it can be used repeatedly without special circumstances. This method can not only reduce the waste of medical resources, but also will not make patients bear a greater economic burden. Therefore, it can be used as an economical and effective external fixation material in wet application in patients with herpes zoster in dermatology.

5.3 The use of mesh elastic bandage can improve the treatment effect

Wet application is an effective measure to treat local skin lesions of herpes zoster. In the process of wet application, the instability and displacement of wet application pad will affect the effect of wet application. The wet compress solution used in this study is a 3% borate lotion, which has borax as the main component to maintain the normal PH value of the skin (weakly acidic)[11]; At the same time, according to the principle of hydrodynamics (low-concentration exudate flows in the direction of high-concentration medicinal solution), it can reduce nerve edema and promote herpes regression. The results of this study showed that the disease treatment effect was significantly better than the control group. The mesh elastic bandage has the advantages of firm fixation and uniform force. External fixation of wet pads with this bandage can cover the medicine securely in the painful area caused by herpes zoster, so that the efficacy of boric acid is fully exerted, and then promote the early recovery of patients.

6. Conflict of interest

The authors declared no conflict of interest for this study.

7. Consent for publication

All authors have given their consent to publish this article.

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