Biomedical Data Science
2026, VOL. 6, NO. 1, 138-141
DOI: 10.47297/wspbdsWSP2752-630531.20260601

The Efficacy of Moist Burn Ointment Combined with Ice Compresses in Postoperative Care Following Fractional Laser Treatment

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ABSTRACT

Objective: To investigate the clinical efficacy of moist burn ointment combined with ice packs in postoperative care following fractional laser treatment, and to provide a scientific nursing protocol for wound healing, symptom relief, and complication prevention after such procedures. Methods: A total of 100 patients who underwent fractional laser treatment at our hospital from June 2024 to December 2025 were selected and randomly assigned using a random number table to a control group and an observation group, with 50 patients in each group. The control group received conventional postoperative care, while the observation group received care combining moist burn ointment with ice packs. The outcomes of the two groups were compared. Results: In the observation group, the time to resolution of redness and swelling, time to scab formation, and time to wound healing were all shorter than in the control group ($P < 0.05$); at 1 h, 24 h, 48 h, and 72 h postoperatively, the VAS pain scores in the observation group were lower than those in the control group ($P < 0.05$); the incidence of complications in the observation group (4.00%) was lower than that in the control group (16.00%) ($P < 0.05$); the overall satisfaction with care in the observation group (98.00%) was higher than that in the control group (80.00%) ($P < 0.05$). Conclusion: The use of moist burn ointment combined with ice packs in postoperative care following fractional laser treatment effectively alleviates postoperative pain, reduces redness and swelling, shortens wound healing time, lowers the incidence of complications, and improves patient satisfaction with nursing care. The nursing outcomes are significant, and this approach is worthy of clinical promotion and application.

KEYWORDS

Moist burn ointment; Ice packs; Fractional laser; Postoperative care; Clinical efficacy; Patient satisfaction

1 Introduction

Fractional laser therapy is a skin rejuvenation and repair technique developed based on localized photothermal effects. It is widely used for treating various skin conditions, such as acne scars and enlarged pores, and is characterized by its minimally invasive nature and minimal damage to surrounding healthy skin. However, postoperative reactions such as wound disruption, redness, swelling, and pain are common. Improper care can easily lead to complications such as hyperpigmentation and infection, thereby affecting treatment efficacy and the recovery period [1]. Scientific and effective postoperative care ensures that the treatment achieves the expected results. Conventional care, which primarily involves wound cleansing and simple cold compresses, has limited efficacy in promoting repair and preventing complications. Moist burn ointment can protect the wound and promote healing, while ice packs can reduce swelling, relieve pain, and control inflammatory responses; combining the two may enhance the effectiveness of care [2-3]. This study enrolled 100 patients to investigate the efficacy of combined care and to provide an optimized postoperative care protocol for fractional laser treatment.

2 Materials and Methods

2.1 General Information

A total of 100 patients who underwent fractional laser treatment at our hospital between June 2024 and December 2025 were selected and randomly assigned to a control group and an observation group using a random number table. Statistical analysis revealed no significant differences in baseline clinical characteristics between the two groups, indicating ideal balance between groups ($P > 0.05$), as shown in Table 1.

Table 1 Comparison of Clinical Data Between the Two Groups

Item	Control Group (n=50)	Observation Group (n=50)	χ^2/t	P
Male/Female	18/32	16/34	0.178	0.673
Age (years)	32.16 ± 5.82	32.84 ± 5.97	0.090	0.928
Treatment site			0.071	0.790
Face	42	41		
Neck	6	7		
Other areas	2	2		
Reason for treatment			0.161	0.688
Acne Scars	28	26		
Enlarged pores	12	13		
Hyperpigmentation	8	9		
Other	2	2		

2.2 Inclusion and Exclusion Criteria

Inclusion Criteria: ① Patients meeting the indications for fractional laser therapy and requiring such treatment; ② Aged 18 – 50 years, regardless of gender; ③ No abnormalities such as infection, ulceration, or inflammation at the treatment site; ④ No history of allergy to moist burn ointment and no contraindications for ice application; ⑤ Willing to participate in this study, able to cooperate with nursing care and follow-up, and willing to sign an informed consent form.

Exclusion Criteria: ① Patients with severe diseases of vital organs such as the liver, kidneys, or heart, or those with autoimmune diseases or coagulation disorders; ② Patients with mental disorders or poor compliance who are unable to cooperate with nursing care and follow-up; ③ Patients with skin diseases such as infection, eczema, or dermatitis at the treatment site; ④ Pregnant or lactating women; ⑤ Patients who have undergone other skin treatments or used medications affecting wound healing within 1 month prior to treatment.

2.3 Methods

Fractional laser treatment for both groups of patients was performed by the same medical team. Treatment parameters were adjusted based on the patient's skin condition, treatment site, and treatment requirements. Immediately after treatment, the treatment site was thoroughly cleansed to remove any residual tissue debris.

Control Group: Standard postoperative care. (1) Wound care: Avoid getting the wound wet for the first 24 hours after surgery. After 24 hours, gently clean the wound with sterile saline solution twice daily. After cleaning, gently blot the wound dry with sterile gauze. Do not rub or scratch the wound during this process.(2) Cold Compress Care: Immediately after surgery, apply a sterile ice pack for cold compresses. Each application should last 10–15 minutes, three times daily, for a total of three consecutive days. (3) Sun Protection: Practice thorough sun protection post-surgery. When going outdoors, wear a hat and face mask, and apply medical-grade sunscreen with an SPF of 50+ and PA+++ or higher to avoid direct sunlight on the wound.(4) Diet and Lifestyle Care: Instruct the patient to maintain a light diet, avoid spicy, irritating, and dark-colored foods, and strictly abstain from smoking and alcohol. Avoid strenuous exercise to prevent sweat from irritating the wound. Do not stay up late; ensure adequate sleep each day.(5) Health Guidance: Instruct patients not to pick or scratch scabs; allow scabs to fall off naturally. If the wound exhibits abnormalities, redness, swelling, exudate, or severe pain, seek immediate medical attention. The entire care period is 14 days.

Observation Group: In addition to the routine care provided in the control group, this group received care combining moist burn ointment with ice packs. (1) Ice Pack Therapy: Apply ice packs wrapped in sterile gauze to the wound for 15 minutes at a time, four times daily, for three consecutive days. During application, control the pressure and avoid direct contact between the ice pack and the wound to prevent frostbite. (2) Moist Burn Ointment Care: 24 hours after the procedure, clean the wound and wipe away any residual moisture from the surface. Apply the moist burn ointment evenly over the wound, maintaining a layer thickness of 0.1–0.2 cm, twice daily (once in the morning and once in the evening). Gently massage the area for a moment after application to aid absorption. Continue this regimen until the scab has completely fallen off. (3) Other nursing measures (sun protection, diet, daily care, and health guidance) were consistent with those of the control group. The nursing period was 14 days.

2.4 Observation Criteria

(1) Symptom Improvement: Record the time to resolution of postoperative redness and swelling, time to scab formation, and time to wound healing for patients in both groups.

(2) Pain Scoring: Postoperative pain was assessed using the Visual Analogue Scale (VAS) at four time points—1 hour, 24 hours, 48 hours, and 72 hours post-surgery—for patients in both groups. This scale uses a 0–10 point rating system, where 0 represents no pain and 10 represents unbearable severe pain; a higher score indicates a more severe degree of pain. All scores were self-reported and recorded by patients based on their subjective perception of pain.

(3) Complication Incidence: The occurrence of complications during the postoperative care period was observed and recorded for both groups, primarily including hyperpigmentation and infection, and the complication incidence rate was calculated.

(4) Nursing Satisfaction: When the wound had largely healed 14 days postoperatively, both groups of patients were assessed using a self-designed nursing satisfaction questionnaire. This scale uses a 100-point scoring system, with evaluation results categorized into three levels: Very Satisfied (⩾90 points), Satisfied (70–89 points), and Dissatisfied (<70 points).Overall nursing satisfaction = (Number of "Very Satisfied" cases + Number of "Satisfied" cases) / Total number of cases × 100.00%.

2.5 Statistical Methods

Statistical analysis of the experimental data was performed using the SPSS 26.0 statistical software platform: for continuous variables that followed a normal distribution, data were expressed as ($\bar{x} \pm s$), and independent samples t-tests were used to analyze differences between groups; for categorical variables, data were presented using frequency and percentage [n(%)], and statistical analysis was conducted using the chi-square (χ^2) test.A p-value less than 0.05 was used

as the criterion for determining statistical significance; when $p < 0.05$, differences between groups were considered statistically significant.

3 Results

3.1 Comparison of Symptom Improvement Between the Two Groups

In the observation group, the time to resolution of redness and swelling (2.08 ± 0.52) days, the time to scab formation (3.26 ± 0.76) days, and the time to wound healing (8.96 ± 1.23) days were all shorter than those in the control group (3.45 ± 0.78) days,(4.82 ± 0.95) days, and (8.96 ± 1.23) days, respectively (P < 0.05). See Table 2 for details.

Table 2 Comparison of Symptom Improvement Between the Two Groups ($\bar{x} \pm s$, d)

Group	Number of Cases	Time to Resolution of Redness and Swelling	Time to Scab Formation	Wound healing time
Control Group	50	3.45 ± 0.78	4.82 ± 0.95	8.96 ± 1.23
Observation group	50	2.08 ± 0.52	3.26 ± 0.76	6.72 ± 1.05
t		10.334	9.067	9.794
P		<0.001	<0.001	<0.001

3.2 Comparison of VAS Pain Scores between the Two Groups

The VAS pain scores in the observation group were lower than those in the control group at 1 h post-surgery (5.16 ± 0.82), 24 h (3.87 ± 0.75), 48 h (2.35 ± 0.61), and 72 h (1.02 ± 0.45) compared to the control group ' s scores of 7.82 ± 0.95, (6.53 ± 0.87), (4.26 ± 0.72), and (2.15 ± 0.63) (P < 0.05), respectively. See Table 3 for details.

Table 3 Comparison of VAS pain scores between the two groups ($\bar{x} \pm s$, points)

Group	Number of Cases	1 h post-op	24 h post-op	48 hours post-op	72 hours post-surgery
Control group	50	7.82 ± 0.95	6.53 ± 0.87 [1]	4.26 ± 0.72 [1) (2]	2.15 ± 0.63 [1) (2) (3]
Observation group	50	5.16 ± 0.82	3.87 ± 0.75 [1)]	2.35 ± 0.61 [1) (2]	1.02 ± 0.45 [1) (2) (3]
t		14.988	16.375	14.312	10.321
P		<0.001	<0.001	<0.001	<0.001

Compared with[1] hour post-surgery, [1]P < 0.05; compared with 24 hours post-surgery, [2]P < 0.05; compared with 48 hours post-surgery, [3]P < 0.05.

3.3 Comparison of Postoperative Complication Rates Between the Two Groups

In the observation group, 1 case of postoperative hyperpigmentation and 1 case of infection occurred, with a total incidence rate of 4.00% (2/50). In the control group, 6 cases of postoperative hyperpigmentation and 2 cases of infection occurred, with a total incidence rate of 16.00% (8/50). The incidence of postoperative complications in the observation group was lower than that in the control group ($\chi^2 = 4.000$, P = 0.046).

3.4 Comparison of Nursing Satisfaction Between the Two Groups

Overall nursing satisfaction in the observation group (98.00%) was higher than that in the control group (80.00%) (P < 0.05); see Table 4 for details.

Table 4 Comparison of Nursing Satisfaction Between the Two Groups [*n*(%)]

Group	Number of Cases	Very Satisfied	Satisfied	Dissatisfied	Overall Satisfaction
Control group	50	19	21	10	40 (80.00)
Observation group	50	32	17	1	49 (98.00)
χ^2					8.274
P					0.004

4 Discussion

Fractional laser therapy is a minimally invasive skin repair technique that initiates skin repair through localized photothermal effects. Postoperative inflammatory reactions, such as redness, swelling, and pain, commonly occur. Improper nursing care can lead to complications such as hyperpigmentation and infection, directly affecting the final treatment outcome. Therefore, the core of postoperative care is to reduce inflammation, relieve pain, protect the wound, and promote healing; selecting a scientific nursing approach is crucial [4-5]. Data from this study indicate that in the observation group, the duration of redness and swelling, scab formation, and wound healing were all shorter than in the control group. At each postoperative time point, VAS pain scores and the incidence of complications were lower in the observation group, while overall satisfaction with care was higher (all P < 0.05), suggesting that the combination of moist burn ointment and ice packs yields superior results. Ice application constricts local blood vessels through low temperatures, reducing redness, swelling, and edema; it lowers nerve ending sensitivity to relieve pain; and it reduces the release of inflammatory factors, thereby creating favorable conditions for wound repair. The ice application regimen in the

observation group—four times daily for 15 minutes each session—maintained its effects for a longer duration than in the control group, resulting in better overall outcomes. Care must be taken to avoid direct contact between the ice pack and the wound to prevent frostbite.Moist burn ointment maintains a moist wound environment, protects the wound, reduces secondary damage, and promotes epithelial cell proliferation. It also exerts anti-inflammatory effects, creating a synergistic effect with ice therapy to further alleviate discomfort and reduce the incidence of complications [6-7]. Conventional care, however, lacks targeted repair measures and fails to meet patient needs, resulting in low satisfaction rates. Combined care integrates physical and pharmacological interventions to rapidly alleviate acute discomfort, continuously promote wound healing, reduce complications, improve the patient's recovery experience, and enhance satisfaction. The incidence of complications was 4.00% in the observation group and 16.00% in the control group. The observation group had a lower incidence of complications because the moist burn ointment shortened the duration of inflammation and inhibited bacterial growth, while ice application alleviated inflammation; together these measures reduced the risk of hyperpigmentation and infection [8].

5 Conclusion

This study has certain limitations, including a small sample size, data collection from a single center, and a relatively short observation period. Future studies could expand the sample size, involve multiple research centers, and extend the observation period to further refine the findings. In summary, the combination of moist burn ointment and ice packs is simple to administer, cost-effective, and well-tolerated by patients. It effectively optimizes postoperative recovery and enhances patient satisfaction, making it suitable for clinical implementation. However, standardized operating procedures must be followed during clinical application, and care plans should be adjusted based on individual patient conditions.

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