

Plastic Wrap Versus Occlusive Dressings for the Management of Skin Ulcers: Comparison of Two Symmetrical Wounds in Two Individual Patients

Jun Takahashi^{1*}, Masaharu Miyagawa², Osamu Yokota^{3,4}, Harusuke Aoki¹ and Takesuke Aoki¹

¹Department of Psychiatry, Minakuchi Hospital, Minakuchi-cho, Koka City, Shiga, Japan

²Minamikusatsu Keyaki Clinic, Japan

³Department of Psychiatry, Kinoko Espoir Hospital, Japan

⁴Department of Neuropsychiatry, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Japan

Abstract

To compare the efficacy of plastic wrap (typically used for foods) as a dressing material to treat skin ulcers versus occlusive dressings, each dressing was randomly allocated to simultaneously treat two wounds at symmetrical locations in two individual patients. In case 1, two wounds with full-thickness skin loss on the neck were treated. A wound measuring 6.2 cm² that was treated with plastic wrap healed in 9 weeks. A hydrocellular polyurethane dressing decreased the size of a wound measuring 9.3 cm² to 3.8 cm² in 12 weeks. The surface area reduction rate was 0.7 cm²/week with plastic wrap and 0.5 cm²/week with the hydrocellular polyurethane dressing. In case 2, two shallow skin ulcers in both femoral regions resulting from skin grafting were treated. The plastic wrap dressing was randomly allocated to a wound measuring 25.1 cm² that healed in 18 weeks. The other wound measuring 18.5 cm² was treated with hydrocolloid dressing and epithelialized completely in 13 weeks. The healing rate of each treatment was approximately equal at 1.4 cm²/week. No adverse events developed in either case. These results are limited because of the case study design but suggest that the plastic wrap dressing treatment is as effective as the occlusive dressing technique in the treatment of chronic wounds.

Keywords: Chronic wound; Comparative study; Food wrap; Plastic wrap; Skin ulcer

Introduction

Plastic wrap, typically used for foods, has been effectively used as a dressing material to treat chronic wound including pressure ulcers in Japan [1-6] but not yet widely applied in other countries. Because of its efficacy, low cost [2,4], and ease of use, this treatment has been gradually accepted in many Japanese hospitals and care facilities.

The plastic wrap dressing treatment procedure is as follows [5,6]: After cleansing with copious saline or tap water, the wound is covered with non-sterile plastic wrap (made of polyvinyl chloride, polyvinylidene chloride, or polyethylene) and fixed with non-woven adhesive tape. Because of the weak adhesive strength of this tape, part of the dressing comes off easily if exudate accumulates under it, while the excess exudate drains to outside the wound. Tapes with strong adhesive power are unsuitable for use in this treatment. The dressings must be changed once or several times per day depending on the exudate amount. Frequently exchanging the dressings can prevent local skin troubles including maceration. If much exudate drains around the wound, a thin paper diaper can be applied to absorb it and protect the skin. Accordingly, the plastic wrap dressing occludes the wound incompletely unlike the occlusive dressing technique using modern dressings. This incomplete wound occlusion maintains an adequately moist environment, prevents pressure increases, facilitates autolytic debridement, and prevents wound infection. Thus, the plastic wrap dressing treatment is consistent with the theory of moist wound healing and wound bed preparation.

Since a few comparative studies concerning plastic wrap dressings are available [4-6], the Japanese Dermatological Association and Japanese Society of Pressure Ulcers guidelines approve plastic wrap dressing as a treatment for pressure ulcers [7,8]. However, control groups in these studies were treated with occlusive dressings, gauze dressing with ointments, and/or sprays including pharmaceuticals. No study to date has compared the plastic wrap dressing to occlusive dressing only.

This paper describes the results of a study comparing the efficacy

of plastic wrap dressing versus occlusive dressing for the management of skin ulcers simultaneously present on symmetrical locations in an individual patient. This study was performed in accordance with the Declaration of Helsinki and its amendments and was approved by our institute's institutional review board. After a full explanation of the study was provided, written informed consent was obtained from the patients and their family members.

Case 1

A 35-year-old Japanese man was admitted to a psychiatric hospital



Figure 1: Patient described in case 1 on the day of admission.

***Corresponding author:** Jun Takahashi, Department of Psychiatry, Minakuchi Hospital, 2-2-43 Honmachi, Minakuchi-cho, Koka City, Shiga 528-0031, Japan, Tel: +81-748-62-1212; Fax: +81-748-62-1215, E-mail: j-takahashi@keyaki-cl.com

Received: February 01, 2017; **Accepted:** March 14, 2017; **Published:** March 20, 2017

Citation: Takahashi J, Miyagawa M, Yokota O, Aoki H, Aoki T (2017) Plastic Wrap Versus Occlusive Dressings for the Management of Skin Ulcers: Comparison of Two Symmetrical Wounds in Two Individual Patients. *Dermatol Case Rep* 2: 118

Copyright: © 2017 Takahashi J, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.



Figure 2: The wounds after surgical debridement in case 1. (A) The right-side wound was treated with the hydrocellular polyurethane dressing. (B) The left-side wound was treated with the plastic wrap dressing treatment. The largest part enclosed with the circle was included in this study.



Figure 3: The wounds in case 2. (A) The right-side wound was treated with the hydrocolloid dressing. (B) The left-side wound was treated with the plastic wrap dressing.

in a psychotic state. Before admission, he had a cold with a sore throat and was under the delusion that he was possessed by the devil on his neck. This delusion made him press on his neck with both fists for several days, after which two symmetric skin ulcers developed (Figure 1). Both wounds were covered with plastic wrap until the black eschars were macerated 2 days later, followed by surgical debridement. Both ulcers reached the subcutaneous fatty tissue. The right-side wound (9.3 cm²) (Figure 2A) was randomly allocated to hydrocellular polyurethane dressing. The distorted left-side wound consisted of three parts. The largest (6.2 cm²) part was included in this study (circled in Figure 2B) and subjected to plastic wrap dressing treatment.

The wound treated with plastic wrap dressing healed completely in 9 weeks. The other wound treated with hydrocellular polyurethane dressing was reduced to 3.8 cm² when the observation ended at 12 weeks due to the patient's discharge. The surface area reduction rate of the wound treated with plastic wrap dressing was 0.7 cm²/week, while that of the hydrocellular polyurethane dressing was 0.5 cm²/week. The plastic wrap dressing and hydrocellular polyurethane dressing were exchanged twice per day and twice per week on average, respectively. No adverse events developed in either wound. During the observation period, the patient's general health and nutritional status were good and his Braden Scale [9] score was 22. Laboratory findings were normal. He did not press on the wounds after the second admission day because his psychotic symptoms improved immediately.

Case 2

A 60-year-old female with schizophrenia and type II diabetes developed two skin ulcers on the front of both femoral regions due to split-thickness skin grafting for burn injuries on her feet. Both ulcers

were treated with gauze dressings and ointment containing alprostadil alfadex. Following the skin graft operation, her auditory hallucinations worsened and she was admitted to a psychiatric hospital 2 months post-operatively. Both ulcers were limited to the dermis. The proliferation of granulation tissue and partial epithelialization were observed in both wounds. By random allocation, the right-side wound measuring 18.5 cm² (Figure 3A) was treated with hydrocolloid dressing, while the left-side wound measuring 25.1 cm² (Figure 3B) was treated with the plastic wrap dressing.

The wound treated with the plastic wrap dressing took 18 weeks to epithelialize completely; in contrast, the wound treated with hydrocolloid dressing was healed in 13 weeks. The healing rate achieved by both treatments was approximately equal at 1.4 cm²/week. The plastic wrap dressings and the hydrocolloid dressings were changed once or twice per day and twice per week, respectively. During the observation period, the patient's health was good, her Braden Scale score was 21, and laboratory findings were normal except for slightly elevated haemoglobin A1C levels (6.6–6.9%). No adverse events occurred with either treatment.

Discussion and Conclusion

These findings are limited because of the case study design but suggest that the plastic wrap dressing treatment is as effective as the occlusive dressing. Since this study compared two wounds at symmetrical locations on two individual patients, the factors influencing the healing of both wounds were identical except for the difference in dressing materials. The plastic wrap dressings required more frequent changing than the occlusive dressings in both cases. However, the frequent dressing changes did not significantly increase the caregiver burden due to the simplicity of the plastic wrap dressing treatment procedure.

Wounds treated with plastic wrap dressing must not be tightly sealed. The incomplete occlusion of the wound maintains an adequately moist environment for wound healing and mitigates its lack of air permeability. Dressings should be changed frequently and necrotic tissue autolyzed as needed. If these principles are followed, the plastic wrap dressing treatment can heal stage III/IV pressure ulcers that cannot be treated with occlusive dressings due to excessive exudate and/or infection [1,3,5]. If not, the wound may deteriorate, leading to serious wound infection and sepsis [10]. Even if plastic wrap dressing treatment is effective, plastic wrap is not a medical material.

Ethical Issues

Ethical discussions are needed and further investigations are necessary to confirm the efficacy and safety of plastic wrap dressing treatment. In addition, further comparative studies including a larger number of participants and wounds are needed to clarify the efficacy of plastic wrap dressing.

Acknowledgements

This work was partially supported by a research grant from Minakuchi Hospital.

Conflict of Interest Statement

The authors disclose no conflicts of interest.

References

1. Toriyabe S, Saito H, Sakurai K (1999) Use of a plastic wrap as a dressing material. *Adv Wound Care*. 12: 405-406.
2. Okamura S, Urabe S, Hisatomi M, Iwasaki K, Sakamoto M (2002) The medical and economic effects of wrap-treatment for pressure ulcers. *Jpn J PU*. 4: 427-430.

3. Oonisi S, Koike T, Shioyama K, Shimomura R, Tsutsumi Y (2006) Use of plastic wrap films for treating pressure ulcers. *Jpn J Med Pharm Sci.* 55: 561-567.
4. Ueda T, Shimokubo S, Honda K, Kamikubo K, Hanaki H, et al. (2006) The evaluation of plastic wrap treatment for pressure ulcers. *Jpn J PU;* 8: 551-559.
5. Takahashi J, Yokota O, Fujisawa Y, Sasaki K, Ishizu H, et al. (2006) An evaluation of polyvinylidene film dressing for treatment of pressure ulcers in older people. *J Wound Care.* 15: 449-450, 452-454.
6. Bito S, Mizuhara A, Oonishi S, Takeuchi K, Suzuki M, et al. (2012) Randomised controlled trial evaluating the efficacy of wrap therapy for wound healing acceleration in patients with NPUAP stage II and III pressure ulcer. *BMJ Open.*
7. Tachibana T, Imafuku S, Irisawa R, Ohtsuka M, Kadono T, et al. (2016) The wound/burn guidelines-2: Guidelines for the diagnosis and treatment for pressure ulcers. *J Dermatol.* 43: 469-506.
8. Guideline for prevention and management of pressure ulcers. (2015) (4th edn). *Jpn J PU.* 17: 487-557.
9. Bergstrom N, Braden BJ, Laguzza A, Holman V (1987) The Braden scale for predicting pressure sore risk. *Nurs Res.* 36: 205-210.
10. Moriyama Y (2010) Severe complication associated with inadequate wet dressing therapy: Benefits and risk of so-called "Wrap therapy". *Jpn Dermatol.* 120: 2187-2194.

Citation: Takahashi J, Miyagawa M, Yokota O, Aoki H, Aoki T (2017) Plastic Wrap Versus Occlusive Dressings for the Management of Skin Ulcers: Comparison of Two Symmetrical Wounds in Two Individual Patients. *Dermatol Case Rep* 2: 118

OMICS International: Open Access Publication Benefits & Features

Unique features:

- Increased global visibility of articles through worldwide distribution and indexing
- Showcasing recent research output in a timely and updated manner
- Special issues on the current trends of scientific research

Special features:

- 700+ Open Access Journals
- 50,000+ editorial team
- Rapid review process
- Quality and quick editorial, review and publication processing
- Indexing at major indexing services
- Sharing Option: Social Networking Enabled
- Authors, Reviewers and Editors rewarded with online Scientific Credits
- Better discount for your subsequent articles

Submit your manuscript at: <http://www.omicsonline.org/submission/>