Journal of Lasers in Medical Sciences

J Lasers Med Sci 2022;13:e78

Case Report

http://journals.sbmu.ac.ir/jlms

doi 10.34172/jlms.2022.78

Notable Enhancement of Facial Scarring Following Autologous Melanocyte-Keratinocyte Transplantation and NUVB Therapy: A Case Report

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Received: December 6, 2022
Accepted: December 19, 2022
Published online December 28, 2022

Abstract

Introduction: There are various types of treatment targeting healing traumatic or accidental skin scars. Transplantation of skin grafts and surgical alternatives, including autologous transplantation of melanocyte-keratinocyte suspension, have also been suggested previously. This study is representing a case of previous skin graft transplantation, complaining of scar formation and discoloration on the transplanted segment.

Case Presentation: The patient was a 37-year-old lady. This patient underwent melanocyte-keratinocyte suspension transplantation and narrow-band ultraviolet B (NUVB) therapy and could reach 40% re-pigmentation enhancement. This method could be introduced as an efficient and safe method of approaching facial scarring.

Conclusion: This method could be introduced as an efficient and safe method of approaching facial scarring.

Keywords: Cell therapy; Melanocytes; Skin graft; Transplantation; NUVB therapy.

Introduction

Facial scarring is defined as a physiologic healing process subsequent to skin lacerations, incisions or loss of one or more cell lines among skin layers.[1] Alteration in melanocyte integrity is one of the key features in the formation of hypo-pigmentation.[2] This issue potentially could impact patients' quality of life, attenuate cosmetic self-satisfaction, and disturb psychological status.[3] Various remedies have been suggested for this phenomenon, including the administration of local or systemic agents, phototherapy, laser, and surgical alternatives.[4] However, regenerative medicine could aid patients who are resistant to the aforementioned methods. For instance, transplantation of melanocyte-keratinocyte suspension has been introduced as a promising element in those who have experienced failure in transplantation of the skin graft at the injured site of the skin.[5] The results of this method are integrated with the structure and anatomy of scars, methodology of cell suspension, transplantation technique, and phototherapy.[6]

Please cite this article as follows: Nilforoushzadeh MA, Nouri M, Alavi S, Amirkhani MA, Zare S, Alavi Rad E, et al. Notable enhancement of facial scarring following autologous melanocyte-keratinocyte transplantation and nuvb therapy: A case report. *J Lasers Med Sci.* 2022;13:e78. doi:10.34172/jlms.2022.78.

Case Presentation

The patient was a 37-year-old lady with a history of facial and scalp trauma accompanied by facial and ear scarring (Figure 1). She had undergone a skin graft and eyebrow and hair transplantation prior to the cosmetic intervention for her ear. Following forehead skin graft surgery, the patient was presenting pallor at the graft site compared with the intact forehead skin subsequent to the scar formation. Afterward, the patient was referred for forehead melanocyte-keratinocyte transplantation. Two months after the transplantation, the patient could reach almost 40% color enhancement as specified by imaging evaluations (Figure 2). Eventually, the patient was considerably satisfied with the result.

The preparation of cell suspension was in accordance with the patent application. After local anesthesia, a 2×5 cm segment was obtained from the patient's gluteal skin. The skin sample was washed with alcohol and phosphate buffered saline (PBS, Miltenyi Biotec) without adding any antibiotics. Then, it was divided into pieces and transferred to Trypsin LE select enzyme (TrypLE™, Sigma Aldrich) for 45 minutes. After dilution with PBS (1:5) and numerous times of cell passage, the enzyme activity was neutralized. Then, the solution was allowed to pass through a 100 µm mesh filter and centrifuged for 10 minutes (1500 rpm). Next, 2 cc of PBS was added to the cell pellet. Thenceforth, the injured site was localized and worn away as much as possible using a microdermabrasion unit (Tebmax x18, Nozhan Co, Iran) and then prepped with normal saline. Cell suspension solution was sprayed over the targeted site homogeneously. Mepitel wound dressing (Mepitel®, M*ölnlycke, Sweden*) was placed on the site and covered with Tegaderm (Tegaderm™) transparent dressing. The patient was discharged after a few hours, and the dressings were removed after a week. The patient received narrow-band ultraviolet B (NUVB) for 30 sessions from the 14th day after transplantation.

Discussion

Surgical alternatives for skin scars could be a considerable approach for those patients who have experienced refractory responses to non-surgical treatments. Transplantation of melanocyte-keratinocyte suspension would potentially transfer melanocytes to the hypo-pigmented segments. Additionally, dermabrasion is regarded as a simple and safe approach against hypertrophic regions in the recipient. Moreover, it would not alleviate the risk of necrosis and hypochromic halation. Still, indicating this method for fingers, eyelids, joints and lips could be accompanied by underlying

Figure 1. The patient had a history of facial scarring and hypo-pigmentation following the primary skin graft.

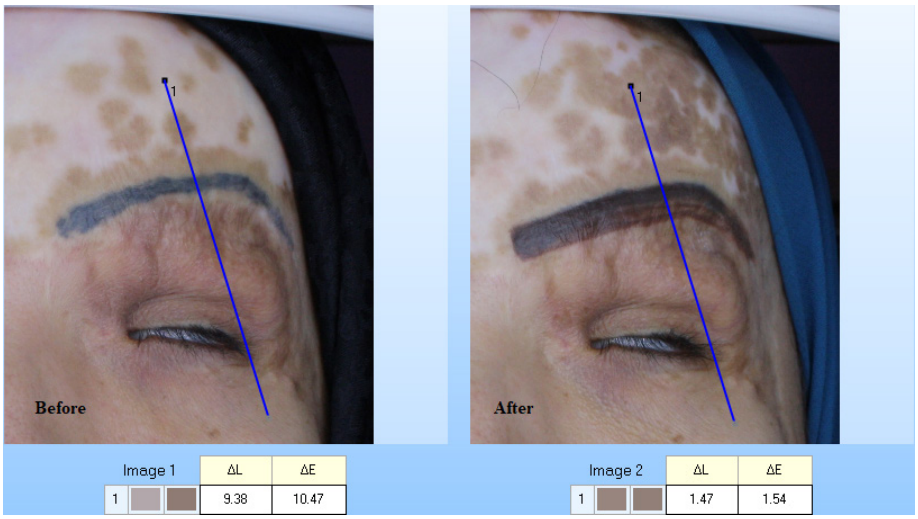

Figure 2. Evaluation of the treatment is illustrated in this figure. The patient could experience about 40% enhancement of hypo-pigmented regions.

challenges beneath.

Previous studies have shown almost similar enhancements after using this method in the treatment of vitiligo patients. Olsson and Juhlin reported a healing rate of 100% in the treatment of three patients with segmental vitiligo and 78% in 20 patients with generalized vitiligo.[7] Furthermore, Mulekar could demonstrate that the healing rate among patients with segmental vitiligo was significantly higher than that of patients with generalized vitiligo.[5] Also, Paul has confirmed that 65% of patients with segmental vitiligo could reach up to 90% of skin re-pigmentation after the induction of this method.[8] Likewise, Huggins et al could illustrate that amelioration in skin discoloration was notably more among patients with partial vitiligo.[6] More specifically, Neves et al concluded that 3 sessions of melanocyte transplantation in accordance with punch grafting could attain a 90% improvement in pretibial discoloration.[9]

In this case, we could observe that transplantation was well tolerated and fairly enhanced facial scarring. The resistibility of hypo-pigmented segments is regarded as the key concern in this paradigm. Besides, the type and location of skin integrity disturbance could also impact the choice of treatment. In this case, the patient did not experience any accompanied complication and the healing process was satisfying. The donor section also underwent appropriate rehabilitation without any scar formation left behind. Transplantation of melanocyte-keratinocyte suspension seems a suitable choice of treatment in patients suffering from prior scars that are refractory to other alternatives. However, most cases of prominent re-pigmentation in comparison with intact skin occur within 2-4 months heterogeneously and might require two or more sessions of transplantation.[10-12] This method has brought benefits to the cases of pigmentation disorders, including segmental vitiligo, leukoderma, and traumatic scarring. Accessibility to this approach together with sufficient medical skill could introduce an effective, simple and safe treatment.

Acknowledgments

This research was funded by the grants offered by Skin and Stem Cell Research Center, Tehran University of Medical Sciences.

Conflict of Interests

The authors declare that they have no conflict of interest.

Ethical Considerations

Informed consent was obtained from the participant. This study was approved by the ethical committee of Tehran University of Medical Sciences (IRCT approval ID: 20200127046282N2).

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