Case Report / Olgu Sunumu

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Suction blister epidermal graft method in the treatment of vitiligo: Two case reports

Vitiligo tedavisinde vakum büllü epidermal graft yöntemi: İki olgu raporu

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Abstract

Vitiligo is a pigmentation disorder characterized by white depigmented patches on the skin and mucous membranes due to the loss of melanocytes. Different treatments can be applied depending on the location of the disease and its activity. Surgical treatment methods, including suction blister epidermal grafting, are considered for patients who do not respond to topical, phototherapy, or systemic treatments. Two patients with vitiligo were included in the study. Pigmentation was achieved at the application site in one patient who underwent the suction blister epidermal graft method, whereas the other patient did not show repigmentation. The failure to achieve permanent pigmentation in the second patient may be attributed to the insufficient duration of disease inactivity and the high mobility and trauma-prone nature of the treatment site. In recent years, there has been growing interest in surgical treatment methods, such as the suction blister epidermal graft method, especially in patients who are resistant to other treatments. The challenges of these methods, such as difficulty of application, time consumption, and koebnerization, should also be considered.

Keywords: Vitiligo, suction blister epidermal graft, vitiligo treatment

Öz

Vitiligo, deri ve müköz membranlardaki melanositlerin kaybına bağlı olarak beyaz depigmente yamalar şeklinde oraya çıkan bir pigmentasyon bozukluğudur. Tedavisinde hastalığın yerleşim yeri, aktivasyon durumuna göre farklı tedaviler uygulanabilmektedir. Topikal, fototerapi ve sistemik tedavi yanıtsız hastalarda vakum büllü epidermal graft yönteminin de dahil olduğu cerrahi tedavi yönlemleri gündeme gelmektedir. Çalışmaya 2 vitiligo hastası dahil edildi. Vakum Büllü Epidermal Graft yönteminin uygulandığı iki hastanın birinde uygulama yerinde pigmentasyon elde edilirken diğer hastada pigmentasyon elde edilmedi. İkinci olguda kalıcı pigmentasyon sağlanamamasında; hastalık inaktivasyon süresinin yetersizliği ile uygulama bölgesinin mobilite ve travmaya maruz kalma potansiyelinin yüksek olması belirleyici faktörler arasında değerlendirilmektedir. Özellikle diğer tedavilere dirençli hastalarda vakum büllü epidermal graft gibi cerrahi tedavi yöntemlerine son yıllarda ilgi artmaktadır. Umut vadeden bu yöntemlerin uygulama meşakati, zaman alması ve Koebnerizasyon gibi zorlukları da akılda bulundurulmadır.

Anahtar Kelimeler: Vitiligo, vitiligo tedavisi, vakum büllü epidermal graft yöntemi

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Introduction

Vitiligo is a common pigmentation disorder. Vitiligo is characterized by depigmented patches occurring anywhere on the skin as a result of the loss of melanocytes[1]. Diagnosis can often be made clinically. The visualization of depigmented patches under Wood's light is helpful for diagnosis. However, when there is uncertainty in the diagnosis, a skin biopsy can be performed to confirm it. This is especially important in the differential diagnosis of hypopigmented mycosis fungoides, which should be distinguished from other hypo/depigmentation-causing diseases. The disease may be accompanied by other autoimmune diseases, and routine thyroid function tests and thyroid autoantibodies are recommended after diagnosis[2]. Vitiligo is classified as segmental vitiligo, which is frequently unilateral with one or more segments of involvement, and non-segmental vitiligo. Rarely, when these two clinical types occur together, it is referred to as mixed vitiligo[2]. In addition to genetic predisposition, autoimmunity, oxidative stress, and environmental factors may also contribute to the development of the disease[3]. There are numerous treatment options available for vitiligo. Various topical and systemic treatments, phototherapy, and surgical treatment options are also available. Surgical treatment modalities may be used in patients with stable vitiligo who do not respond to topical or systemic medical treatments and phototherapy. Suction blister epidermal grafting (SBEG) is a prominent surgical treatment option that can achieve successful results[1,4]. In this article, we aim to highlight the importance of patient selection, lesion localization, and stability duration in determining treatment success by presenting two cases with different outcomes in which we applied the SBEG method.

Case Report

Two patients with non-segmental vitiligo were included in the case series. One patient was a 50-year-old man, and the other was a 55-year-old woman. Written informed consent was obtained from all patients before the procedure and for publication purposes.

One of the areas that are invisible in daily life, such as the abdomen, back, or gluteal region, was selected as the donor area. Afterwards, the area was wiped with an antiseptic and allowed to dry. Intradermal local anesthetic lidocaine was then applied to form a plaque. Subsequently, the large opening of a 20 cc syringe with the piston removed was placed on the area under local anesthesia, and a three-way tap was attached to the small opening. After creating negative pressure using another syringe on the other side of the three-way stopcock, the piston was pulled to 50 cc, and the cannula was closed. A more negative pressure may be required to ensure that the syringe remains securely attached to the skin (Figure 1). The cannula was opened after 1 hr., and the negative pressure was terminated. The roof of the bullae was removed using a fine scalpel. Dermabrasion was performed on the depigmented recipient area using a small curette until mild pinpoint bleeding foci occurred. The bulla ceiling was placed over this area, with the lower and upper parts at the bottom and top, respectively. The harvested epidermal skin graft was preserved in saline before being placed on the dermabraded area. The grafted area was secured with a central-padded transparent film dressing (Tegaderm). To prevent mechanical trauma, the area was covered with gauze and surgical tape. The wound was opened after being closed for 1 week. The pigmentation status was evaluated at 1 and 3 months.

Case 1

Patient 1 was a 50-year-old male whose disease was stable for over 1.5 years. The vitiligo lesion was located on the dorsum of his hand. The patient had a history of treatment with topical corticosteroids, topical calcineurin inhibitors, and intramuscular triamcinolone acetonide. Clinical stability was confirmed by the arrest of lesion progression and the absence of new depigmented areas; however, the lesions remained refractory to repigmentation, necessitating further interventions. After the disease stabilized, topical PUVA therapy was initiated to promote repigmentation of the lesions on the hands; however, the lesions were deemed refractory to treatment because there was no repigmentation after five months of topical PUVA therapy. Because of the lack of clinical response, SBEG was performed. The patient's topical PUVA treatment continued throughout the entire process, except for the period when the graft area remained closed. The donor area was the abdominal region, and no complications were observed. Pigmentation was observed in the grafted area (Figure 2).

Case 2

Patient 2 was a 55-year-old woman who had no new lesions or growth in old lesions for the last 6 months. The lesion was located in the first web space (between the thumb and index finger) of the hand. Despite prior interventions with topical corticosteroids and calcineurin inhibitors, the lesions remained recalcitrant. Topical PUVA therapy was initiated to promote repigmentation. After two months of topical PUVA, the lesions remained refractory, with no signs of repigmentation. To

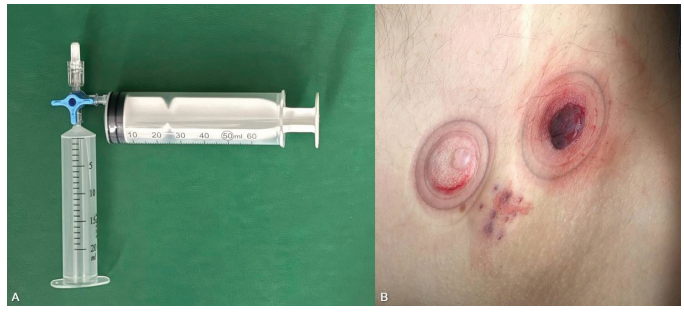


Figure 1. A) Vacuuming the skin using negative pressure with injectors and a three-way tap B) Blisters formed after vacuuming

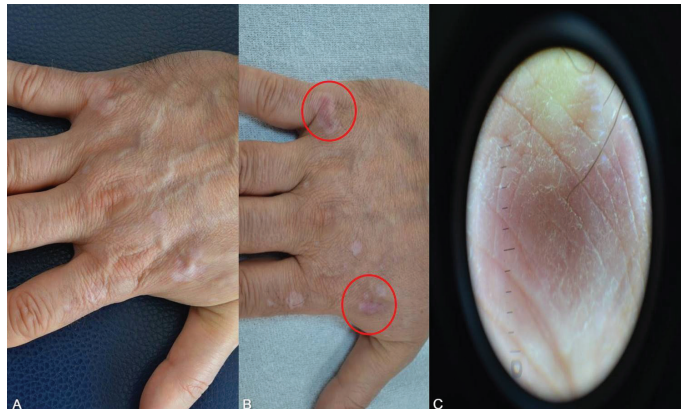


Figure 2. A) Depigmented patches on the back of the hand before the procedure B) Pigmented patches on the left and the right sites on the dorsal hand with a depigmented halo on the lateral side C) Dermoscopic appearance of the pigmented macule

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promote repigmentation, the patient underwent SBEG and continued to receive topical PUVA therapy throughout the treatment period, except for the interval during which the donor site remained dressed. The lumbar region was selected as the donor site. No complications were observed at the donor site. Although slight pigmentation was observed during the first month of control, it completely disappeared by the third month. An inadequate stabilization period, combined with the dynamic nature of the application site, may have contributed to the lack of permanent repigmentation (Figure 3).

Discussion

Vitiligo is a pigmentation disorder that can occur anywhere on the body, including the mucous membranes, due to the loss of melanocytes, which is difficult to treat[2, 3]. Vitiligo treatment, especially repigmentation of lesions, can be very challenging[4]. Surgical treatment methods may be beneficial in patients with stable vitiligo who do not respond to other treatments[5]. Various surgical treatment methods for vitiligo have been tried to date, and each has its advantages and disadvantages. The suitable method should be determined according to the patient's condition. These methods include punch grafting, thin skin grafting, suction blister grafting, noncultured epidermal cell suspension, noncultured follicular cell suspension, and cultured epidermal cell suspension[5].

The suction blister epidermal graft method was first described by Falabella[1,5] in 1971. Over time, many publications on this method have been added to the literature. In a study comparing different surgical techniques combined with narrow-band ultraviolet B phototherapy, the suction blister epidermal graft method was found to be more successful and safer than the mini punch technique and hair follicle technique[6]. Although the suction blister epidermal graft method is a safe and successful method in selected patients, it is time-consuming and may cause conditions such as perigraft halo, irregular pigmentation, erythema, scarring, infection, and reactivation in the recipient area, as well as Koebner phenomenon, erythema, and hyperpigmentation in the donor area[1,5,6].

There is no consensus regarding the precise magnitude of negative pressure required for bulla induction or the necessary duration of its application, as these parameters vary significantly in the literature. Furthermore, the pre-procedural application of local anesthetics to the target site may contribute to effective pain management and potentially shorten the duration of bulla formation. Although various preparatory techniques can be employed to facilitate bulla induction, further large-scale studies are warranted to standardize the optimal level of negative pressure, the duration of application, and the necessity of routine pre-treatment protocols[6,7,8].

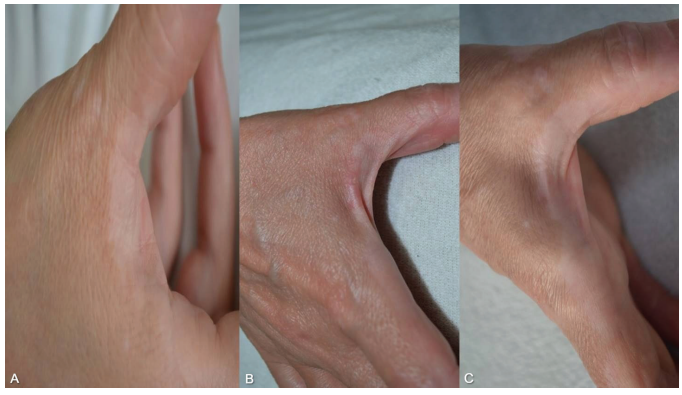


Figure 3. A) Depigmented patch in the mobile area between the thumb and index finger before treatment B) Mild pigmentation in the first month after treatment C) Near-complete loss of pigmentation in the third month

Although pigmentation was initially achieved in both patients, it was not permanent in the second patient. The inability to sustain pigmentation in the second case may be attributed to the anatomical mobility and trauma-prone nature of the application site, combined with a period of disease inactivity shorter than the minimum one-year duration recommended in the literature, which may help explain the failure to maintain pigmentation. Although the pigmentation on the medial part of the hand regressed during the long-term follow-up, the pigmentation area on the lateral part, where the procedure was performed, continued to persist in the first patient, albeit with a reduction in size. The fact that the patient in whom pigmentation was achieved had stable disease for over 1 year when compared with literature data supports the need for a long stable disease period for the SBEG method to be successful and safe[1].

It is recommended that patients with vitiligo have a stable disease for at least 12 months before being treated with the SBEG method[1]. In surgical interventions performed in cases of shorter-duration stable disease or active disease, the risk of the Koebner phenomenon and recurrence is higher[1]. This method, which provides a high degree of pigmentation, is particularly safe and effective in sensitive areas such as the lips and eyelids[5]. However, it is difficult to apply the SBEG method to large areas and moving surfaces. Although it is a successful method for achieving pigmentation, approximately 20% of patients may experience relapse[1]. When comparing segmental vitiligo with non-segmental vitiligo, the SBEG method may be more successful in segmental vitiligo, and the risk of recurrence is higher in non-segmental vitiligo. Therefore, a combination with phototherapy may be a good option, especially in non-segmental vitiligo[1,7].

The differing outcomes observed in our two patients may be attributed to the fact that, in the second patient, the treatment site was located in a mobile area, and the duration of disease stability was shorter than that reported in the literature. Furthermore, the comparatively higher success rates of the SBEG method in segmental vitiligo reported in previous studies, along with the presence of non-segmental vitiligo in both patients, may have contributed to the suboptimal outcomes.

Surgical methods can yield positive results in stable patients with vitiligo who are unresponsive to medical treatment and phototherapy. In this case series, we presented the SBEG method, its results, and its limitations, which we applied to two patients unresponsive to medical treatment and phototherapy. The case series included only two patients, and the stable period of the disease was less than one year in one patient, limiting these results. In light of the current literature data, a long disease stabilization phase and, in selected patients, combination with phototherapy in appropriate areas may yield positive results in achieving pigmentation.

Ethics

Informed Consent: Written informed consent was obtained from the patient for publication.

Footnotes

Authorship Contributions

Surgical and Medical Practices: B.M.D., Concept: S.Y., E.B.B., Design: E.B.B., Literature Search: B.M.D., Writing: B.M.D.

Conflict of Interest: The authors declare that there is no conflict of interest.

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