

Efficacy of dermabrasion plus topical 5-fluorouracil in stable vitiligo

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ABSTRACT

Background: Combination of skin ablation and application 5 fluorouracil was previously used in the treatment of vitiligo with good results.

Purpose: In the present study, we are exploring the effect of the use of dermabrasion skin ablation and application of 5 fluorouracil in treatment of patients with resistant vitiligo.

Methods: This study included 40 adult patients with resistant vitiligo lesions in different body parts. The patients were treated with dermabrasion, followed by 5 fluorouracil applications for 15 days. The outcome was then evaluated after maximum period of 3 months.

Results: Forty patients were included (4 male and 36 females). Almost 45% of patients achieved excellent repigmentation (75-100%) after mechanical dermabrasion, followed by 5 fluorouracil application. Very good (50-75%) improvement was achieved in 5% of patients, good improvement (25-50%) in 40% and poor improvement in (< 25%) only 10% of patients. Side-effects reported were post inflammatory hyperpigmentation in 4 (10%) patients; recurrence in 2 (5%) patient, infection in 4 (10%) patients while 30 (75%) patients did not report any side effect.

Conclusion: We concluded that mechanical skin ablation, followed by 5- fluorouracil application for vitiligo is a safe and effective method in treatment of resistant vitiligo.

INTRODUCTION

Vitiligo is a relatively common acquired pigmentary disorder of unknown cause characterized by areas of depigmented skin resulting from loss of epidermal melanocytes.^{1,2}

No single therapy for vitiligo produces predictably good results in all the patients. The response to therapy is highly variable.³

Different forms of therapy used for the management of vitiligo attempt to induce repigmentation of depigmented skin by stimulation of proliferation of remaining melanocytes around the hair follicles.^{4,5}

The role of medical management of vitiligo has best been shown to be the best option for expand-

ing patches. Once the lesions become stable, surgical modalities offer the best option, alone or in addition to medical management.⁶

Different surgical therapies that have been attempted in the management of vitiligo include autologous suction blister grafting,^{7,8} split-thickness grafting,^{9,10} punch grafting,^{11,12} smash grafting, cultured epidermal suspensions and autologous melanocyte culture grafting.^{9,10}

Topical 5-fluorouracil is supposed to induce repigmentation of vitiligo lesions by overstimulation of follicular melanocytes which migrate to the epidermis during epithelialization.¹³ This form of topical therapy can be combined with spot dermabrasion of vitiligo lesions to improve the

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repigmentation response.¹⁴

In the present study, we are exploring the effect of dermabrasion plus topical 5-fluorouracil in treatment of stable vitiligo.

PATIENTS AND METHODS

Forty patients presented by stable vitiligo were recruited from the outpatient clinic of the Department of dermatology, Al-Azhar university hospitals (Cairo & Assiut). The Ethical committee of Al-Azhar university approved the study protocol. An informed written consent was signed by all patients and controls.

Patients were selected randomly having stable vitiligo, so that no appearance of any new lesions and no progression in diameter of already present lesions for at least 6 months. The exclusion criteria were patient's aged less than 10 years, koebner phenomenon, negative micro punch graft test, keloid or hypertrophic scar tendency, history of isotretinoin therapy in last 6 months, hepatitis B or C, and HIV or other uncontrolled chronic systemic diseases.

After local anesthesia, the affected area was cleaned and sterilized with betadine surgical solution followed by 70% alcohol. The vitiliginous area was dermabraded with a high speed dermabrator with 14.000 r.p.m regular diamond fraise. Light strokes were done on vitiliginous area from above downward to obtain the same level of abrasion throughout the treated area. The depth of abrasion was guided by the appearance of slight bleeding from the dermal papillae.

After dermabrasion 5-fluorouracil cream was applied daily under occlusive dressing for 15 days, after that application of topical antibiotics was performed to avoid secondary bacterial infection until epithelization was completed. Follow up was

done by comparing the photographs before and after therapy.

Statistical analysis:

The results were analyzed using SPSS version 16 software. Results were expressed as simple percentage accompanied by a qualitative description of comments. The significance of differences between the data of the study groups, and the mean and standard deviation values were tested by Fisher exact test. $P < 0.05$ was considered as statistically significant.

RESULTS

The study included 40 patients with stable vitiligo: 4(10%) man and 36(90%) women, with a mean \pm SD age of 22.85 ± 10.89 years and mean \pm SD disease duration of $7.55 \pm 3.025.4 \pm 5.6$ years. According to pattern of vitiligo patients were divided into focal (n=10), segmental (n=20) and vitiligo vulgaris (n=10) (Table 1).

Forty resistant vitiligo patches were studied in

Table 1 Characteristics of studied population (n=40)

Variables	No.	%
Duration of disease(years) mean \pm SD (Range)	7.55 \pm 3.02(2-12y)	
Sex		
Male	4	10
Female	36	90
Family history		
Positive	2	5
Negative	38	95
Pattern of vitiligo		
Focal	10	25
Segmental	20	50
Vulgaris	10	25
Course		
Progressive	34	85.0
Stationary	6	15.0
Stability of lesion (years) mean \pm SD (Range)	3.75 \pm 2.92 (1 – 12 years)	

these participants which were distributed over the face (n=4), neck (n=6), trunk (n=2), extremities (n=12) and hands and feet (n=16).

Eighteen of these 40 patients showed excellent response. Two patients showed 50% or greater response. While, 16 patients showed minimal response and 4 patients showed no response at all. (Table 2), (Fig. 1 and 2)

Table 2 Percentage of improvement of vitiligo after 3 months after dermabrasion followed by topical 5-fluorouracil cream for 15 days.

Improvement	No. (n= 40)	%
Poor (< 25%)	4	10.0
Good (25 – 50%)	16	40.0
Very good (50 – 75%)	2	5.0
Excellent (> 75%)	18	45.0
Mean ± SD (Range)	56.50 ± 30.95 (10 – 100)	



Fig. 1 Vitiliginous patch at the medial malleoli showed excellent improvement after mechanical dermabrasion followed by topical 5 fluorouracil. (A) Before treatment (B) After treatment.

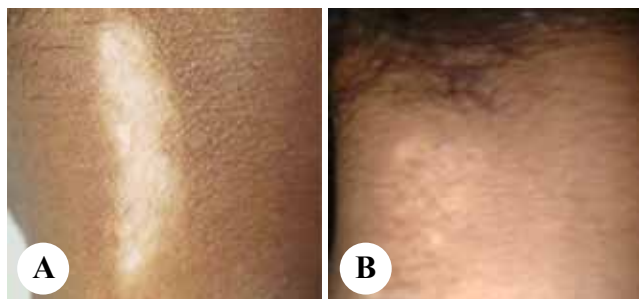


Fig. 2 Vitiliginous patch at the nape showed excellent improvement after mechanical dermabrasion followed by topical 5 fluorouracil. (A) Before treatment (B) After treatment.

Secondary bacterial infection was reported in 4 cases and transient post inflammatory hyperpigmentation in another 4 cases.

DISCUSSION

Dermabrasion is a type of epidermal injury which breaks the integrity of the epidermis and results in stimulation of the amelanotic (inactive) melanocytes present at the outer root sheath of the lower portion of the hair follicle which proliferate and migrate upwards and start actively synthesizing melanin at the infundibulum and from there they migrate further until they reach the surface of the skin.^{15,16}

In our study the patients were subjected to dermabrasion of the vitiliginous area followed by topical application of 5-fluorouracil immediately after dermabrasion daily for about 2 weeks until re-epithelialization occurred and the patients were followed up every 2 weeks for about 3 months. During this period they were encouraged to expose themselves to the sun in slowly increasing dose aiming to help the migration and spreading of melanocytes.

The repigmentation rate with this approach appears to be relatively high considering the fact that only classically resistant areas were treated. Indeed, 45% achieved a complete or almost complete repigmentation.

Several studies have reported significant repigmentation after dermabrasion of the vitiliginous area with topical application of 5 fluorouracil.^{17,18,19} The significant pigmentation observed with dermabrasion raises interesting questions on the mechanisms involved in this process. The mode of repigmentation in vitiligo lesions in our study was either follicular and/or by extension of pigment from the edges. This is in agreement with

the study of Cui, Shen and Wang,¹⁵ who found that the follicular repigmentation may be due to the re-activation of the melanocytes located in the outer root sheath of the hair follicles inside the lesions and that activation of the contiguous pigmented skin may result in melanocytoses.

In this study, marked hyperpigmentation was seen in 4 patches treated with dermabrasion combined with 5-fluorouracil and recurrence was seen in two patches. This is in accordance with the study of Sethi, 2007 who found that hyperpigmentation is a known side-effect of 5-fluorouracil, observed during the treatment of skin tumors and psoriasis.²⁰

This study confirms that mechanical demabrasion followed by topical 5-fluorouracil cream for 15 days was satisfactory alternative treatment for stable vitiligo if currently used medical treatment failed.

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