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# Clinical Study on Treating of the Segmental Vitiligo by Autologous Epidermal Grafting

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**Abstract** We analyzed effect rate, period of treatment and therapeutic responses by implanted extensity and affected areas playing new autologous epidermal grafting that we invent to treatment of segmental vitiligo. As a result of study, complete repigmentation rate was 97.5% and effect rate was 98.3%. Average treatment period was 28.1days. The epidermis was implanted as grafts of various extensity within range of 20～120cm$^2$. There is no association between treatment effect and implanted extensity. In hands and foot the treatment effect, as complete repigmentation rate is 66.7% and effect rate is 77.8% was lower than effect of the other sites. Result of our study shows autologous epidermal grafting for segmental vitiligo is the most effective therapy of all other therapies.
**Key words** vitiligo, vitiligo treatment

## Introduction

The great leader Comrade **Kim Jong Il** said as follows.

"**Developing medical science and technology is an important task facing the public health sector today.**"("ON THE FURTHER IMPROVEMENT OF THE HEALTH SERVICE" P.17)

Vitiligo is an autoimmune disease presenting with progressive loss of skin pigmentation affecting about 1% of individuals in most populations worldwide [1, 7, 9]. Vitiligo is an acquired achromia characterized by depigmentation of the epidermis [6]. Vitiligo is a disorder of pigmentation characterized by loss of epidermal melanocytes, which clinically results in localized depigmentation of skin [3]. Clinically vitiligo can be manifested by a few or many white macules on the skin.

There are several clinical types of vitiligo [2, 8]. Clinically vitiliginous forms are distinguished from the segmental type, which follows dermatomal lines, into a localized type, limited to small areas of the skin, and into the generalized type. Generalized vitiligo probably is a disease in which patches of depigmented skin and overlying hair result from autoimmune destruction of melanocytes in involved regions [3, 4]. Segmental vitiligo usually does not cross the midline of the body and affects one segment of the skin. The progression of disease is usually limited to months or a few years. However non-segmental vitiligo includes usually bilateral, symmetrical, and generalized manifestation of the disease.

PUVA therapy for vitiligo is a major therapy yet [8, 9]. Photochemotherapy with psoralen compound and subsequent exposure to UVA (320～400nm) radiation is commonly termed PUVA therapy[8]. PUVA therapy for vitiligo requires usually 100～300 exposures to achieve maximal repigmentation and even then only a few patients achieve total repigmentation. PUVA therapy for vitiligo is given up by many patients with vitiligo because of these features.

Therefore, we have applied the autologous epidermal grafting to treatment for segmental vitiligo and gave a scientific analysis to the treatment effect.

History of surgical therapy for vitiligo began from 1950 and several methods were created till now [9, 10]. Nowadays autologous epidermal grafting is recognized as the most effective therapy of all surgical therapies for vitiligo [8, 9]. However the epidermis is implanted as small 0.5～1.0cm graft because technology that obtain blistered grafts as this method is limited and PUVA therapy or exposure to UVB radiations must be combined for repigmentation around implanted area [5, 9]. Thus the treatment term has several months.

We have applied new technology to the treatment of segmental vitiligo that obtains extensive 120cm$^2$ blistered grafts once operation.

## 1. Patient and Methods

### 1.1. Patient

Those with segmental vitiligo visited vitiligo seminar in Pyongyang Medical College Hospital of **Kim Il Sung** University are 120. Males are 56 and females are 64 of them.

Age and sex of the patients were analyzed in table 1.

Table 1. Age and sex of the patients

| Sex | Age/year | | | | | Total/% |
|---|---|---|---|---|---|---|
| | 10～19 | 20～29 | 30～39 | 40～49 | 50< | |
| Male | 10 | 18 | 16 | 10 | 2 | 56(46.7) |
| Female | 20 | 24 | 10 | 6 | 4 | 64(53.3) |
| Total/% | 30(25.0) | 42(35.0) | 26(21.7) | 16(13.3) | 6(5.0) | 120(100.0) |

As shown in table 1, cases probably were people between the ages of 10 and 50 years.

Lesion extensity of the patients was analyzed in table 2.

Table 2. Extensity of lesion

| Extensity of lesion/cm$^2$ | <20 | 21～40 | 41～60 | 61～80 | 81～100 | 101～120 | Total |
|---|---|---|---|---|---|---|---|
| No of patients/% | 13 | 22 | 37 | 27 | 16 | 5 | 120 |
| | 10.8 | 18.3 | 30.8 | 22.5 | 13.4 | 4.2 | 100.0 |

As shown in table 2, lesion extensity of the patients was range between from 10 to 120cm$^2$.

### 1.2. Method

First, the graft obtained from normal skin of the interior femur by blistering. The epidermal of vitiliginous lesion removed by dermabrasion and the graft covered on it. Next the sterilized gauze and sticking plaster left on it.

After operation the gauzes were removed from implanted site within 7～10 days.

Repigmentation of the implanted site observed for 2 months. Treatment effect has assessed in excellent, good and poor. Excellent is complete repigmentation, good is partial one, and poor is no improvement.

## 2. Results and Analysis

### 2.1. Therapeutic response by site

Therapeutic responses by site of lesion were analyzed in table 3.

Table 3. Therapeutic response by site of lesion

| Site | Excellent | Good | Poor | Total | Effect rate |
|---|---|---|---|---|---|
| Face/% | 48(100.0) | | | 48 | 100.0 |
| Trunk/% | 43(100.0) | | | 43 | 100.0 |
| Extremity/% | 20(100.0) | | | 20 | 100.0 |
| Hands, foot/% | 6(66.7) | 1(11.1) | 2(22.2) | 9(100.0) | 77.8 |

$n$=120

As shown in table 3, implanted areas were observed to distinguish in face, neck, trunk, upper limbs and lower limbs. Treatment effect was 100% in face, extremity and trunk respectively. Of 9 lesions of hands and feet, 6(66.7%) had complete repigmentation, 2(22.2%) had partial one and 1(11.1%) showed no improvement.

### 2.2. Therapeutic response by implantation extensity

Therapeutic responses by implantation extensity were analyzed in table 4.

Table 4. Therapeutic response by implantation extensity

| Effect | Grafted extensity /cm$^2$ | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | <20 | 21～40 | 41～60 | 61～80 | 81～100 | 101～120 | |
| Excellent/% | 13(100.0) | 21(95.5) | 37(100.0) | 26(96.3) | 15(93.8) | 5(100.0) | 117(97.5) |
| Good/% | | | | | 1(6.2) | | 1(0.8) |
| Poor/% | | 1(4.5) | | 1(3.7) | | | 2(1.7) |
| Total/% | 13(100.0) | 22(100.0) | 37(100.0) | 27(100.0) | 16(100.0) | 5(100.0) | 120(100.0) |

As shown in table 4, the epidermis was implanted as grafts of various extensity within range of 20～120cm$^2$. There is no association between therapeutic response implanted extensity.

### 2.3. Responses by therapy

Treatment effect of autologous epidermal grafting was analyzed in table 5.

As shown in table 5, of the 120 cases, 117(97.5%) had complete repigmentation, 1(0.8%) had partial one, and 2(1.7%) showed no improvement.

### 2.4. Average treatment period

Average treatment period were analyzed in table 6.

Table 5. Responses by therapy

| No. of cases | Excellent | Good | Poor | Effect rate/% |
|---|---|---|---|---|
| 120 | 117 | 1 | 2 | |
| % | 97.5 | 0.8 | 1.7 | 98.3 |

Table 6. Average treatment period

| No. of cases | Day | | | Mean |
|---|---|---|---|---|
| | <30 | 31～40 | 41～50 | |
| 117 | 92 | 21 | 4 | 28.1±0.5 |
| % | 78.6 | 18.0 | 3.4 | |

As shown in table 6, after operation the gauzes were removed from implanted site within 7～10 days and repigmentation of it was observed. Average treatment period that become repigmentation completely to the normal pigment was 28 days.

## Conclusion

In this study the complete repigmentation rate was 97.5% and the effect rate was 98.3%.

The average repigmentation period of segmental vitiligo by autologous epidermal grafting was about 28 days.

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