

## MODERN METHODS OF VITILIGO TREATMENT

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✓ **Resume**

*Vitiligo is the most common skin disease that is accompanied by pigment disorders in the skin. It is easy to diagnose, but characterized by specificity in terms of the complexity of treatment. This paper deals with modern methods of surgical treatment of vitiligo.*

*Aim. To study the effectiveness of therapy for vitiligo based on the localization of the disease process.*

*Materials and methods. In this study, patients with vitiligo were treated by surgical methods of treatment of vitiligo. Vitiliginous depigmented spots were studied according to their location on the body in four regions: the face region, the torso region, the arm region, and the leg region. The application of the mixture of hair follicle cell suspension (NCECS+NCORSHFS) obtained from the hairy part of the head of the patient with vitiligo was mixed with suspension of non-cultured epidermis cells (NCECS) and only suspension of non-cultured epidermis cells were carried out the repigmentation indicators and the effectiveness of the treatment depending on the localization of the depigment area.*

*Conclusion. The study found that both methods had a high rate of facial repigmentation, but significantly higher repigmentation in the arms and legs than the NCECS method when treated with the NCECS+NCORSHFS method. It was concluded that a high rate of repigmentation could be achieved by choosing a treatment method depending on the location of the depigment spots on the body.*

*Key words: vitiligo, melanocytes, transplantation.*

## СОВРЕМЕННЫЕ МЕТОДЫ ЛЕЧЕНИЯ ВИТИЛИГО

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✓ **Резюме**

*Витилиго - самое распространенное кожное заболевание, которое сопровождается пигментными нарушениями в коже. Его легко диагностировать, но оно характеризуется спецификой с точки зрения сложности лечения. В данной работе рассматриваются современные методы хирургического лечения витилиго.*

*Цель. Изучить эффективность терапии витилиго на основе локализации процесса заболевания.*

*Материалы и метод. В данном исследовании лечение пациентов с витилиго проводилось хирургическими методами. Депигментированные пятна витилиго изучались в соответствии с их расположением на теле в четырех областях: область лица, область туловища, область рук и область ног. Смесь суспензии клеток волосяных фолликул (NCECS+NCORSHFS), полученной из волосистой части головы пациента с витилиго, применялась со смеси суспензии некультивированных клеток эпидермиса (NCECS) и сама суспензия некультивированных клеток эпидермиса, было проведено сравнение показателей репигментации и оценка эффективности лечения в зависимости от локализации депигментированного участка.*

*Заключение. Исследование показало, что оба метода демонстрируют высокий уровень репигментации лица, но значительно более высокий уровень репигментации в руках и ногах, чем метод NCECS при лечении методом NCECS+NCORSHFS. Был сделан вывод о том, что высокий уровень репигментации может быть достигнут путем выбора метода лечения в зависимости от расположения депигментных пятен на теле.*

*Ключевые слова: витилиго, меланоциты, трансплантация.*

## ВИТИЛИГОНИ ЗАМОНАВИЙ ДАВОЛАШ УСУЛЛАРИ

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✓ **Резюме**

*Витилиго теридаги пигмент бузилиши билан кечувчи энг кўп учровчи тери касаллиги саналиб диагностика қилиниши бўйича энг осон лекин даволаш мураккаблиги бўйича ўзига хослиги билан ажралиб туради. Ушбу мақолада витилиго ни даволашдаги замонавий жаррохлик усуллари ҳақида сўз юритилган.*

*Мақсад. Касаллик жараёни локализациясига қараб витилиго ни даволаш самарадорлигини ўрганиш.*

*Тадқиқотнинг материаллари ва усуллари. Тадқиқотда витилиго билан касалланган беморларни витилиго ни даволашдаги жаррохлик усуллари билан даволанган. Витилиго ни депигмент доғлар танадаги жойлашувига кўра тўрт сохага, яъни юз сохаси, гавада сохаси, қўл сохаси ҳамда оёқ сохаларига бўлиб ўрганилган. Култура қилинмаган эпидермис ҳужайралари суспензияси (NCECS) билан култура қилинмаган эпидермис ҳужайралари суспензиясига витилиго билан оғриган бемор бошининг сочли қисмидан олинган соч фолликулаларидан тайёрланган суспензия аралашмасини (NCECS+NCORSHFS) трансплантация қилиш амалиёти амалга оширилиб, депигмент соҳанинг танадаги локализациясига қараб репигментация кўрсаткичлари қиёсланган ва даво самарадорлиги баҳоланган.*

*Хулоса. Тадқиқотдан аниқланишича ҳар иккала усулда юз соҳасидаги репигментация кўрсаткичи юқорилиги, лекин NCECS+NCORSHFS усули билан даволанганда NCECS усулига нисбатан қўл ва оёқларда яққол юқори репигментация юзага келиши аниқланган. Депигмент доғларнинг танадаги жойлашишига қараб даво усулини танадаги репигментацияни юқори кўрсаткичига эришиш мумкинлиги хулоса қилинган.*

*Калит сўзлар: витилиго, меланоцитлар, трансплантация.*

## Introduction

Although a few etiologically based approaches to the therapy have been developed over the past few years, vitiligo is a difficult problem for dermatologists, since there is no clear treatment regimen. The etiology of vitiligo is still understudied and, in addition to the main classical theories of vitiligo development, namely melanocyte destruction (autoimmune, neurogenic, and disturbance of the redox status), inhibition of melanocytes, or their defective adhesion, a new theory based on melanocytic depletion as the prime cause of the disease has been offered recently [1,2]. Many researchers believe that vitiligo is a serious cosmetic defect that occurs in people who have a genetic predisposition and, in most cases, have had emotional disorders [3,4].

Most experts believe that the damage to melanocytes and disruption of melanogenesis processes in the skin of vitiligo patients are mainly caused by autoimmune mechanisms. Although the disease is not accompanied by the worsening of physical well-being, signs of affective anxiety disorders that deteriorate communication skills and decrease the quality of life develop in all patients.

Treating vitiligo is a task of immense complexity, since the causes of its occurrence are unknown, and in most cases, the depigmentation process develops in the presence of complete physical well-being. The therapy is aimed at eliminating cosmetic defects and restoring the skin pigmentation. The choice of treatment method is patient-specific and depends on factors such as the patient's skin phototype, age, somatic status, the type and stability of the disease, and the size and localization of depigmented areas [1,5,6,7]. Almost 80% of vitiligo patients receive ultraviolet radiation, often in combination with taking furocoumarin drugs. The most modern and effective methods include various types of phototherapy (PUVA therapy, UVA and UVB phototherapy, 311 nm, an excimer laser - 308 nm) [7]. And the absence of an effective treatment today (medium-wave ultraviolet therapy, PUVA therapy, treatment with topical

glucocorticosteroid drugs, topical calcineurin inhibitors) is increasingly aggravating the psycho-emotional state of vitiligo patients. Cell transplantation applied for vitiligo treatment radically changes the existing therapy, contributing to the development of new treatment approaches in healthcare based on the use of living cells. The methods of cell transplantation are based on the mechanical transfer of mature cells and undifferentiated precursor cells of melanocytes into the affected skin with the use of intermediate methods of re-cultivation or without them, with the use of a carrier base or without it, in connection with which it starts the process of melanocyte regeneration.

The most important section of regenerative medicine is cell therapy, that is the use of living cells of various origins, which, when introduced into the human body, are capable of active functioning, which leads to the improvement and modification of existing tissue functions, or to the restoration of functions the tissue has lost. Today, it has become possible to use cell transplantation for the treatment of vitiligo, which is characterized by the appearance of depigmented spots prone to peripheral growth and arising from an impairment of the secretory function of melanocytes.

Aim. To study the effectiveness of therapy for vitiligo based on the localization of the disease process.

## Materials and methods

When examining the frequency of skin types in patients with vitiligo in our follow-up, vitiliginous depigmented spots were famous in 3 of the skin types agreeing to Fitzpatrick among patients in our locale. A total of 345 patients were considered for skin, of which 9, or 2.6%, were found to be II specific. A most extreme of 266 patients, 77.1% of the entire patients, were found to be III patients, whereas 70 (20.3%) patients were found to be IV patients.

Vitiligo was clinically studied in 2 large groups, Segmental and Non-segmental.



Figure 1. Segmental form of vitiligo (in the unilateral facial-neck area).

While maintaining the study, 345 patients were considered in three age categories. That's, 18 to 40 years old, 41 to 60 years old, and 60 years old and older. Of the patients in our follow-up, 194, or 56.2%, were female, whereas 151 (43.8%) were male. Clinically, 121 (35.1%) patients were segmental vitiligo patients, of whom 70 were



Figure 2. Non-segmental form of vitiligo (in the wrist areas of both hands).

women, 51 were patients with vitiligo considered male, and 224 (64.9%) patients were non-segmental vitiligo patients, of whom 124 were female patients and 100 male patients (Table 1).

In terms of age, patients aged 18 to 40 years had 100 cases of segmental vitiligo and 171 patients of non-

Table 1.

Age	18-40	41-60	60 and older	TOTAL
segmental	100	17	4	121
non segmental	171	36	17	224
	271	53	21	345

segmental form of vitiligo. Among patients aged 41 to 60 years, 17 had segmental form vitiligo, and 36 had non-segmental form vitiligo. There were a total of 22 patients over the age of 60, of whom 4 were segmental and 17 were non-segmental.

The distribution in relation to age shows that a large percentage (78,6%) of patients with vitiligo are patients aged 18 to 40 years of age. From this indicator, the contingent of patients at this age, the lifestyle of the asset, as well as other young contingent are considered patients who want to receive nystabate therapy. Patients older than 40 years of age have relatively little recourse and are often considered to be patients in the condition after long treatment.

### Results and discussion.

One of the modern and cutting edge medicines for vitiligo nowadays is the auto-melanocyte exchange strategy. In this study, 113 patients with vitiligo were treated with an unused surgical strategy and automelanocytes confined from health skin of patients were transplanted to depigmented spots completely different ranges of the body. Vitiliginosis depigment areas were examined into four bunches depending on the event in body ranges: face, torso, hands and feet. In 113 patients in our study, vitiliginous depigmented areas were watched on the body parts as takes after (Table 2).

Table 2.

TOTAL	Localization			
	Face	Torso	Hands	Feet
113	43	26	32	12
%	38,0	23,0	28,3	10,7

In 43 patients (38.0%) with vitiligo, depigmented spots were found on the facial zone, whereas in 26 (23.0%) patients, depigmentation spots were watched on distinctive regions of the body. Whereas 32 (28.3%) patients with depigmented spots on the hands complained, 12 (10.7%) patients with depigmented spots on the feet were in our follow-up. Depigmented spots play a vital part within the occurrence of re-pigmentation within the body, depigmented spots within the lower sidelong, acral zone of the body are less touchy to treatment, and re-pigmentation is considered less imperative.

The patients who were taken into our observation were treated with auto-melanocyte transplantation, which was considered a surgical method in the treatment of vitiligo. The treatment was carried out in 2 groups. The first is the transfer of the non-cultured epidermal cell suspension (autokeratinositomelanocytes) (NCECS) from healthy skin to the depigment area, and the second method of treatment is the transfer of the non-cultured epidermal cell suspension to the vitiligo patient in the case where the hair follicle in the hairy part of the head is taken and the suspension prepared from it is mixed (NCECS+NCORSHFS).

Non-cultured epidermal cell suspension (NCECS) is a modern surgical method of treating vitiligo. After

dermabrasion of the upper epidermal layer of the depigment furnace by mechanical or laser, the suspension of automelanocytes is transplanted and fixed with a special collagen for 5-7 days. Repigmentation is observed 2-6 months after the treatment, depending on the restoration of the function of transplanted automelanocytes.

Non-Cultured Outer Root Sheath Hair Follicle Cell Suspension (NCORSHFS) is a suspension made from healthy human hair follicles that is rich in stem cells and growth factors in the follicles.

Our suggested treatment includes blending a suspension arranged from the hair follicle into a suspension arranged from automelanocytes and performing a mesotherapy method some time recently exchanging the suspension arranged from the hair follicles to the depigment region to be transplanted and after that settling the blended suspension to the depigment region (NCECS+NCORSHFS).

In our study, 63 patients with vitiligo treated with NCECS treatment accounted for 55.8% of the total follow-up patients, of whom 41 (33.3%) had a non-segmental form of vitiligo and 22 (19.5%) had a non-segmental form of vitiligo. patients with segmental form. NCECS+NCORSHFS treatment was performed in 50 patients, 40 (80.0%) patients with non-segmental form, and 10 (20.0%) patients with segmental form vitiligo (Table 5).

Table 5.

The name of the treatment	NCECS n=63		NCECS+NCORSHFS n=50	
	non segmental	segmental	non segmental	segmental
Clinical forms of vitiligo				
Total n=113	41	22	40	10
%	65,1%	34,9%	80,0%	20,0%

Table 6.

NCECS n=63	By location			
	Face	Torso	Hands	Feet
	24	13	17	9

Table 7.

NCECS + NCORSHFS n=50	By location			
	Face	Torso	Hands	Feet
	19	13	15	3

Table 8.

	Treatment method	
	NCECS n=63	NCECS+NCORSHFS n=50
	Repigmentation indicator	63,17±2,47%
P<0,001		

Table 9.

NCECS n=63	By location			
	Face	Torso	Hands	Feet
	24	13	17	9
Repigmentation indicator	75,20±3,38%	58,85±4,43%	51,47±5,39%	50,55±5,29%

Table 10.

NCECS + NCORSHFS n=50	By location			
	Face	Torso	Hands	Feet
	19	13	15	3
Repigmentation indicator	86,84±4,61%	85,0±5,68%	85,6±5,29%	85,0±9,79%

Pathological depigmented spots in patients treated with NCECS were as follows according to their location in the body.

In patients treated with NCECS, 24 (38.1%) had depigmented spots located on the facial area. Depigmented spots were detected in 13 patients (20.6%) on the trunk side of the body, in 17 patients (27,0%) in the hands, and 9 patients (14,3 %) in the legs (Table 6).

Of the patients treated with NCECS+NCORSHFS, 19 (38.0%) were transplanted to depigmented spots on the face, 13 (26.0%) were transplanted to the trunk, 15 (30.0%) to the hands, and 3 in one (6.0%) patients, automelanocytes were transplanted into depigmented spots in the foot area in the form of a suspension prepared by hair follicles (Table 7).

Patients who underwent both treatments were followed for 3 months, and after 3 months, the effectiveness of treatment was assessed as a percentage with a re-pigmentation index.

According to Table 8, the overall repigmentation rate in patients treated with NCECS averaged 63.17±2.47%, while NCECS+NCORSHFS was statistically significant at 85.88 ± 1.82% after treatment. (P<0.001).

When the rate of repigmentation of pathological depigmented spots based on their location in the body was studied, the rate of post-treatment repigmentation after NCECS treatment was 75.20±3.38% on average in 24 patients treated in the facial area. Re-pigmentation in the trunk area was 58.85±4.43%, in the hands 51.47±5.39%,

and in the legs, treatment efficiency was 50.55±5.29% (Table 9).

Repigmentation indicators showed high repigmentation in depigment spots on the facial area and low performance on the arms and legs.

In patients treated with NCECS+NCORSHFS, repigmentation of depigmented spots on the skin of the face was 86.84±4.61%, 85.0±5.68% in the trunk, 85.6±5.29% in the hands, and 85.0 ± in the legs. Was 9.79% (Table 10).

As can be seen from the table above, high repigmentation rates have been reported in all areas of the body of vitiligo patients treated with NCECS+NCORSHFS.

Professor Sabirov U.Yu and Dr. Toirov B.A. assessed the effectiveness and safety of noncultured epidermal suspension as a surgical treatment for patients with vitiligo. They retrospectively reviewed in 537 patients (308 females and 229 males) who underwent noncultured epidermal suspension. By the assessment of repigmentation, it has started 3 weeks after treatment (10%), after 4 weeks (25%) and 8 weeks or more. Overall, 89.7% of cases (482/537) exhibited treatment success. Authors conclusion was Noncultured epidermal cell suspension is a reliable surgical option for patients with vitiligo refractory to nonsurgical treatment and especially large areas of vitiligo can be treated by noncultured epidermal cell suspension [8].

Parul Thakur and colleague had studied the efficacy of FUT for segmental/stabilized vitiligo as a treatment option for leukotrichia. They were carried out



Figure 4. The condition before and after treatment with the NCECS+NCORSHFS method in the hand area.

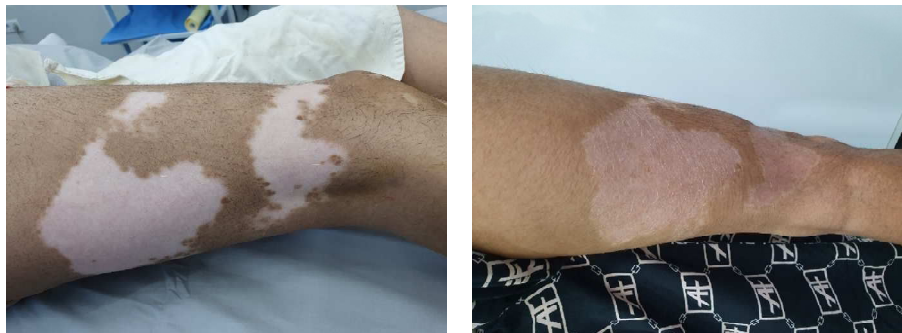


Figure 5. Pre- and post-treatment condition with NCECS+NCORSHFS method in the foot area.

transplantation for fifty patients with 63 lesions of stable vitiligo over nonglabrous areas were treated with follicular unit grafts. And they had assessed reduction in the size of vitiligo patches as well as improvement in the associated leukotrichia were evaluated using subjective and objective assessments. Results were of the 63 patches, good to excellent response was seen in 39 (61.9%), fair in 16 (25.4%), and poor in eight (12.7%) lesions. No repigmentation was seen in two (4.8%) lesions. The mean improvement seen was 61.17%. Excellent color match was observed in 44 lesions (69.8%). Repigmentation of the depigmented hairs occurred in 11 out of 46 patients with associated leukotrichia. Authors conclusion was FUT is a safe and effective method for treating localized and segmental vitiligo, especially on hairy parts of the skin [9].

#### Conclusion.

To conclude, it ought to be famous that the NCECS+NCORSHFS treatment within the treatment of vitiligo was measurably essentially higher than the NCECS treatment, which was affirmed on the premise of the above information. With the correct choice of treatment depending on the degree of solidness of the malady permits you to rapidly and effectively perform re-pigmentation. It has been recommended that stem cells and development components in hair follicles increment the reasonability of dynamic melanocytes determined from the patient's healthy skin within the depigmented area to empower them to operate more effectively than when transplanted without a suspension arranged from hair follicles. Moreover, the occurrence of re-pigmentation with conservative and other methods of treatment in vitiligo, which is in a stable state in the hands and feet areas, is extremely stable with respect to treatment, and with the

use of the NCECS+NCORSHFS method of depigment, increasing the indicator of achieving repigmentation, eliminating the cosmetic defect in patients, as well as improving their quality of life.

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