

Post-traumatic scar camouflage

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Abstract

The article discusses the features of camouflage of post-traumatic scars as one of the types of aesthetic micropigmentation. The main types of scars and the characteristics important for their visual assessment are described. The principles of choosing a pigment shade, the stages of the procedure, and the features of skin healing after the procedure are also considered. Special attention is paid to possible adverse reactions and occupational risks associated with this type of treatment. The practical significance of post-traumatic camouflage for permanent makeup artists is emphasized, as well as the need to maintain a balance between aesthetic correction and medical treatment.

Keywords: post-traumatic scar, scar camouflage, micropigmentation, permanent makeup, scar tissue, pigment, aesthetic correction, skin healing, post-procedural care

Relevance of the study

Post-traumatic scars can differ from the surrounding skin in color and texture, making them a noticeable aesthetic flaw, especially when they are located on visible areas of the body. This can affect a person's self-perception and cause psychological discomfort.

One way to visually correct these changes is through micropigmentation. This technique reduces the color contrast between the scar and surrounding skin, making it less noticeable. Scientific studies have shown that medical tattooing and micropigmentation can be used to mask hypopigmented and post-traumatic scars. While this procedure doesn't eliminate the scar, it does reduce its visibility.

The relevance of studying post-traumatic camouflage stems from the need for competent selection of pigments and techniques for working with scar tissue, adherence to safety protocols, and the systematization of professional approaches among specialists in the field of permanent makeup.

The purpose of the study

The aim of this research is to organize information about post-traumatic scar concealment and to determine its practical importance in the work of a professional makeup artist, considering the characteristics of scar tissue, the principles of pigment selection, the technology of the process, and safety requirements.

Materials and research methods

The research was based on scientific publications and open professional recommendations that dealt with the morphological features of scars, medical tattooing, and micropigmentation, as well as skin healing processes and possible complications after the procedure.

The methods of analysis, comparison, generalization, and systematization of published data were used in this work. The focus was on information that is of practical importance for post-traumatic camouflage operations.

The results of the study

After skin damage, scar formation occurs during the tissue remodeling process. Not only its shape determines the appearance of a scar, but also factors such as its thickness, density, relief, elasticity, and pigmentation pattern. In clinical literature, scars are classified into four main types: flat, atrophic, hypertrophic, and keloid. Discoloration disorders, such as erythema (redness), hyperpigmentation (darkening), and hypopigmentation (lightening), are also assessed separately. The combination of these factors determines how noticeable a scar is against the surrounding skin background.

An atrophic scar is located below the level of the surrounding skin and is characterized by a decrease in tissue volume. In contrast, a hypertrophic scar rises above the surface of the skin but remains within the boundaries of the initial injury. The keloid, on the other hand, can grow beyond the borders of the original wound and usually does not decrease independently over time, unlike a hypertrophic scar. These differences are crucial in the initial evaluation of a scar, as changing only its color does not address the prominent sinking or elevation of tissue [7].

Examples of hypertrophic and keloid scars are shown in the figure below. In a hypertrophic scar, the excess tissue remains within the area of damage, while a keloid may grow beyond its original borders.



Figure 1. Examples of hypertrophic and keloid scars [9]

To choose the best method of aesthetic correction, it is important to consider the type of scar. Different types of scar tissue have different features, such as their relief, location on the skin, and appearance. The main characteristics of some common types of scars are listed in Table 1 below.

Table 1. The main types of scars and their signs during visual assessment

Type of scar	The main signs described in the medical literature	What matters in visual assessment
Flat, mature	The scar is located at about the same level as the surrounding skin, and it usually becomes paler as it matures	The difference in color between the scar and the surrounding skin
Atrophic	The scar sinks relative to the surface of the skin due to tissue loss	At the same time, the color and the difference in relief are noticeable
Hypertrophic	The scar rises above the skin and does not extend beyond the original wound	Thickness, redness, density, and color
Keloid	The scar rises and spreads beyond the boundaries of the original injury	Size, growth activity, color, and relief severity

A source: developed by the author based on reviews devoted to the morphological features of scars

In the scientific literature, medical tattooing is considered from two different points of view. The first is regenerative pigmentation, in which the color of the affected area becomes closer to the color of the surrounding skin. The second is the actual masking, when a noticeable defect is covered with a decorative image. For the work of a professional makeup artist in dealing with post-traumatic scars, the first approach is most relevant – “pigmentation blending,” which involves mixing shades to minimize the visible color difference [1].

The published data most consistently describe regenerative pigmentation in hypopigmented scars, where the scarred area is lighter than the surrounding skin. However, in a systematic review of medical tattooing, it has been noted that with more pronounced hyperpigmentation and a non-uniform surface, or a large scar area, a simple color alignment may not give a satisfactory result. Therefore, it should be understood that the term “camouflage” is not a universal solution for correcting any scar. Instead, it is important to first determine what is causing the visible defect - a lack of pigment, an excess of pigment, or a change in texture.

When masking, it is not the skin color that is evaluated at all, but the actual difference between the scar and its surrounding area. This is due to the fact that scars can be not only lighter than the skin, but also red, pink, or darker. In the clinical classification, a change in scar color is considered as an independent feature, along with thickness and relief [4].

When preparing a mixture for micropigmentation using the published dermatological technique, it is recommended to start with a lighter shade as the base and then gradually add a darker shade until the desired match is achieved. The final mixture is then compared to the surrounding skin around the area that will be altered. Medical tattoo researchers also use a test application to determine how the pigment will appear after it has been injected into the skin [5].

It is important to evaluate not only the initial color of the mixture but also how it might change after the procedure. Pigment that is located too close to the surface can lose intensity more quickly, while pigment that is deeper in the skin may acquire a bluish tone due to optical effects. Additionally, the color of surrounding skin can change with sun exposure, and the injected pigment may not change color in the same way. For these reasons, medical literature advises against choosing a neutral shade for tanned skin, as the pigmented area could end up darker than the rest of the skin after the tan fades [6].

Post-traumatic camouflage requires a consistent approach, as the work is done on an area that has undergone damage and healing, rather than on ordinary skin. Therefore, the process begins with assessing the condition of the scar, gathering anamnesis (medical history), photographing the initial skin condition, and obtaining informed consent from the patient. At this point, the possibility of micropigmentation and the appropriate pigment shade are also determined. During the procedure, strict adherence to aseptic techniques and the

use of sterile disposable instruments is essential. It is also recommended in professional practice to record information about the used pigment, including its shade, manufacturer, and batch number, for future reference.

After the preparatory stage, micropigmentation is performed. The pigment is injected into the skin using a special device. The result depends on the technique of work, the depth of pigment injection, the characteristics of the skin area, and the characteristics of the scar. There are no universal parameters that are equally suitable for all cases, so the technique must be chosen based on the specific situation.

After micropigmentation, the skin goes through a recovery process. According to NHS guidelines for medical tattooing, the formation and natural exfoliation of crusts can take around 14-21 days. During this time, the treated area should be protected from further injury, and the crusts should not be removed, as this could affect the retention of the injected pigment [8].

Also, do not evaluate the final shade immediately after the procedure. A more stable color forms after about 4-6 weeks. After that, you can determine if additional correction is required (Table 2).

Table 2. Skin healing after micropigmentation and basic recommendations

Period	Characteristic features	Recommendations
The early days	Possible redness, sensitivity, and crustiness	Do not injure the treated area
Up to 14-21 days	Gradual restoration of the skin surface	Do not remove the crusts, avoid the pool and prolonged contact with water
After 4-6 weeks	A more stable perception of color is formed	Evaluate the result and the need for correction
After healing	Gradual fading of the pigment is possible	Protect the area from UV radiation

A source: author's development based on [2]

After the skin has fully recovered, sun protection is essential. The American Academy of Dermatology suggests using broad-spectrum sunscreens with an SPF of at least 30, as UV exposure can cause pigment fading.

Following the recommendations during the healing process reduces the likelihood of unwanted consequences, but it is not possible to eliminate them. Therefore, when performing post-traumatic camouflage, it is important to take into account possible complications of the procedure.

Since micropigmentation involves the violation of the skin's integrity, both short-term natural reactions and potential pathological changes may occur after the procedure. Common early symptoms include mild redness, sensitivity, and mild swelling. These usually subside as the skin heals.

At the same time, there are more serious complications described in the medical literature. These include bacterial infections, allergic reactions to the pigment components, granulomatous reactions, and undesirable color changes or spread. The main possible reactions are listed in Table 3.

Table 3. Possible adverse reactions after micropigmentation

Reaction	The main value
Redness and slight swelling	They usually refer to an early skin reaction and should gradually decrease
Infection	Requires termination of cosmetic procedures and seeking medical help
Allergic reaction	It may occur immediately or after a certain time
Granulomatous reaction	Requires a medical assessment
Color change or blurring	May worsen the aesthetic result

A source: author's development based on [10]

It is important to pay special attention to symptoms that do not improve, but rather worsen. These include increased redness and pain, the appearance of pus-like discharge, ulcers, fever, or chills. If any of these signs occur, you should stop using any cosmetic products and seek medical help immediately.

Therefore, professional work with post-traumatic scars involves not only technical knowledge of the equipment but also adherence to sanitary standards, competent client selection, and an understanding of when the procedure should be delayed or a medical consultation is necessary beforehand. These requirements determine the practical significance of camouflage as a distinct aspect in the work of permanent makeup artists.

Post-traumatic camouflage is an important area of aesthetic micropigmentation that focuses on reducing the visibility of scars. For permanent makeup artists, this type of work requires a higher level of precision than other procedures, as it is necessary to consider the condition of the skin, the nature of the scar, the differences in skin tone, and the response of the tissue to the introduction of pigment.

The practical value of this method lies in its ability to individually correct areas that differ in color from the surrounding skin, which can remain visible even after the main healing process is complete. With careful selection of shades and techniques, micropigmentation can help to visually align color transitions and make scar borders less noticeable. This approach is used for the aesthetic correction of scars, among other purposes, and for areas with impaired pigmentation.

At the same time, post-traumatic care expands the professional responsibilities of the specialist: they need to be able to assess the initial condition of the skin, choose the correct pigment, document the process, comply with aseptic standards, and monitor the results after healing. If there are signs of inflammation, abnormal scarring, or other concerning changes, the aesthetic treatment should be postponed until a medical consultation is sought.

Thus, post-traumatic makeup is an independent area in the work of a professional makeup artist, where the aesthetic outcome directly depends on the precision of the technique, knowledge of scar tissue characteristics, and adherence to professional boundaries. Its use allows for expanding the possibilities of aesthetic correction while maintaining the distinction between cosmetic procedures and medical treatments.

Conclusions

Post-traumatic camouflage is an aesthetic micropigmentation technique that reduces the appearance of scars by more accurately matching their color to the surrounding skin. The success of the procedure depends on the correct assessment of the scar condition, the choice of color and application technique, as well as compliance with aseptic standards and recommendations during the healing process. However, this procedure has its limitations and can cause undesirable reactions, so it requires careful selection of the client and referral to a doctor if any signs of pathology appear. For a makeup artist, post-traumatic camouflage can be a useful tool

to create a more natural result, but it should not be used as a substitute for medical treatment of scar tissue.

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