

Scars - cosmetic prevention and skin care

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Scars are a frequent topic in beauty institutes. So far cosmetic only has focused on decorative and concealing products. However, recently developed new agents and bases have considerably improved cosmetic treatment methods.

The surgical and preparative treatments of scars have always belonged into the domain of medicine. In the meantime however cosmetic instruments have been improved so that beauty institutes are able to contribute a significant share to the prevention and care of scars.

Scars develop after accidents, surgery, specific diseases and chronic wounds. They are caused by injuries that reach down to the corium. Depending on the specific zones of the body there is also a different healing process to observe. While wounds on mucous membranes heal without scarring, specific medical conditions like e.g. acne and chickenpox leave holes or "pits" that are visible for quite some time. Below the scarred areas the collagen fibers are spread irregularly and the natural elasticity of the skin is disturbed. The surface of the scar is clearly marked, sometimes even reddish at first and stands out against the surrounding skin as there are no hairs, sebum and sweat glands. The reddish color is caused by various blood vessels that shine through the horny layer. As time passes, the number of blood vessels shrinks and the reddish color fades with the result that the scars may even become pale due to the lack of melanocytes. Hardened areas or softer zones may form as there are also modifications in the connective tissue.

Different kinds of scars

There are different kinds of scars according to the specific genesis. Acne causes **atrophic scars**. During the shrinking process in the wound the originally developed granulation tissue is replaced by fiber-containing connective tissue. But this process finally results in a deficit of collagen fibers.

An increased formation of connective tissue can be found in **hypertrophic scars**. In most of these cases the healing process had been delayed, either caused by continued mechanical irritation or by renewed inflammation as a consequence of infection. Hypertrophic scars have a bulging appearance.

We speak of **keloids** if the newly formed connective tissue is not confined to the original

wound area but continues to grow into the surrounding skin. This process leads to nodular swellings even sometimes of enormous extent. The collagen forming fibroblasts are more active in keloids than in hypertrophic scars.

Skin hardenings combined with reduced skin elasticity are characteristic for **sclerotic scars** which tend to shrink.

By contrast, **fibrous scars** (physiological scars) are smooth and their elasticity is similar to the condition of the surrounding skin. They attract attention through the optical contrast.

Early treatment

While both wound and scar change their appearance quite fast in the beginning, the visible modifications slow down to the end of the healing process. Years later gradual adaptations to the surrounding skin can still be noticed. This is the reason why it makes sense to maintain a long term follow-up treatment. Adequate preventive treatment may even avoid the formation of the scar-like stretch marks. While a preventive treatment of wounds is impossible of course, it is advantageous though to start with the cosmetic skin care already at an early stage in order to achieve as much elasticity in the tissue as possible. A delayed healing process due to a deficient microcirculation in the wound area which occurs for instance in the diabetic leg has rather negative consequences.

As irritations have counterproductive effects it is recommended to use cosmetic creams and gels without perfumes and preservatives. On top of it, the scarred skin has to be protected with UV filters in form of sun screens as the scars lack melanin. Consequently there is an extremely high risk of sun burns.

Vitamins for the skin

An adequate treatment of scars demands for perseverance and a successful treatment needs a long time coming. Especially vitamin A supports and accelerates the recovery process and it is recommended to use it in form of nanoparticles i.e. in combination with membrane active phosphatidylcholine (PC). PC

facilitates the penetration of vitamin A into the skin which is necessary to transform it into the active vitamin A acid. A further advantage is that superficial keratin combines with PC which keeps the scarred tissue soft. Already hardened skin areas are softened.

It is also possible to apply vitamin masks with additional lipid components as well as vitamin C phosphate liposomes (which also contain PC) and vitamin E nanoparticles. Enzymatically released vitamin C is also helpful for the treatment of atrophic scars as their collagen formation is quite deficient. Vitamin E has proved successful in the treatment of stretch marks. To restore the maximum skin elasticity basically all products containing linoleic acid are suitable as it keeps the external barrier layer in a smooth condition. Linoleic acid occurs in PC and in many of the vegetable oils in high concentrations as for instance in wheat germ or grape seed oil.

Possible skin care measures

Although the transepidermal water loss on scar surfaces is lower than on normal skin it may be beneficial to reduce it even further with lipid enriched products. Cornification disorders are typical reactions on acne skin. In this case the essential fatty acids of vegetable oils are important components to prevent a renewed formation of comedones. Paraffin oils are counterproductive in this context and should be avoided.

Stimulating the microcirculation in and around the scar tissue will accelerate the metabolism and as a result also the transformation processes in the tissue. That is the reason why massages with stimulating essential oils and caffeine containing tea products are recommended. Mixtures of different oils like e.g. almond, avocado, olive, grape seed and jojoba oil provide natural PC and consequently excellent massaging features and will soften the skin hardenings.

Different kinds of peelings

Cosmetic peelings before the massage help to remove superficial skin hardenings. It is recommended here to use wax particles in water-containing cream preparations. Abrading elevated scar areas with the microdermabrasion technique is the instrument-based alternative. A removal of the scar edges supports the recovery and softens the contrasts on the skin surface. Although chemical peelings with the help of fruit acids or medical trichloroacetic acid are successful they are not recommended for a long-term use as they are quite stressful for the skin. It is significant to use antipruritic

products specifically in case of keloids. The cosmetic approach here are classical substances like urea and allantoin and the medical alternative are local anesthetics like e.g. lidocain. A study is still in progress to find out whether paracress extract also is an appropriate substance.

Well-targeted preventive measures

Onion extract inhibits excessive tissue formation. That is the reason why it is used for the treatment of scars with hypertrophic tendency. It helps to reduce the formation of collagen-containing connective tissue.

It is important to prevent re-inflammations specifically of new comedones on acne prone skin. The same applies for severe barrier disorders. In this case the individual skin characteristics determine which agents show the best preventive effects. Additives of evening primrose oil, linseed or rose hip oil have proved successful in massage oils and skin care creams. The oils contain threefold unsaturated fatty acids whose degradation products have strong anti-inflammatory effects. Besides the fatty oils there are also watery nanoparticles on the market with non-greasing and fast penetrating features.

Fast penetrating creams are also required for sun protective purposes. It is recommended here to consult the INCI and make sure that the products are free of ethoxylates and other comedogenic substances. If it is the color of the scars that attracts attention the visible contrasts can be softened with self tanning lotions or bleaching products.

Concealing scars

A tolerance test of the make-up bases is highly recommended if make-up is used. In case that the focus is on skin recovery the make-up should not be too occlusive. On the other hand though occlusive coverings as described above may also have positive effects. Specific powders may also reduce the visibility of scars. Until a lasting scar with dry surface has developed and part of the scar still is formed of granulation tissue it is possible to support the healing process with D-panthenol and echinacea extract. In this stage it is very important to maintain antiseptic conditions in order to avoid re-infections.

Besides the medical therapies the cosmetic treatment offers a multitude of different measures. A mix of short term decorative procedures and long term treatment with appropriate active agents is an excellent healing support in most of the cases.

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