

Painful cracks in the skin

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Skin rashes are deep, fissure-shaped tears in the skin that usually occur on the hands or feet. Read here to find out what causes them and which measures and active ingredients help to restore the skin barrier weakened by cracks.

In the first decades after the Second World War, a lot of work was done without hand protection. Tidying up, outdoor and domestic chores such as laundry, dishwashing and other cleaning work put a lot of strain on the hands and feet of women in particular. Household machines and automobility were an unfulfilled dream for most people. Irritations and untreated injuries were the result and often led to rhagades on the hands and feet, among other things.

The incisions, also known as rhagades, that formed from small wounds and reached deep into the dermis repeatedly tore open, became infected and inflamed and were therefore quite long-lasting. As a result, tincture of iodine was booming in pharmacies at the time.

Individual factors

However, anyone who believes that rhagades no longer exist today is mistaken. Although dishwashers, washing machines and cars are now standard household equipment, the composition of cleaning agents has improved dramatically and disposable gloves have become indispensable, other factors have not changed:

- Constant cleaning and disinfection of the hands, combined with negligent skin protection measures, continue to strain the skin barrier in specific occupations. Care and cleaning staff, employees in the metalworking industry who work with processing fluids such

as cooling lubricants and wet workplaces¹ are affected by this – and not least the hairdressing, painting and construction trades.

Skin protection is often unsuitable and the glove material is not adapted to the individual situation. Occlusive skin protection in the industrial sector was already viewed critically in the 1990s, while effective barrier regeneration during non-working hours has a favourable effect² – provided that the products are as physiologically composed as possible. However, this paradigm shift has not arrived everywhere and there are still paraffin-based protective and care creams on the market that have a counterproductive effect on regeneration.

- The condition of the skin barrier is influenced by medication. It is no secret that the epidermis becomes more sensitive with prolonged use of corticoids, not only topically but also orally, and reacts more strongly to aggressive exogenous substances – including prolonged contact with water, which leads to washout and swelling. If left untreated, the skin dries out and tears even without external injury.

Corticoids are just one example of many. Practically every medication, including even over-the-counter headache remedies from the NSAID group, have side effects on the skin with prolonged use.³ The risk increases with the number of drugs used.

¹ TRGS 401, Gefährdung durch Hautkontakt: Ermittlung – Beurteilung – Maßnahmen, Bundesministerium für Arbeit und Soziales

² P. J. Frosch, D. Peiler, V. Grunert, B. Grunenberg, Wirksamkeit von Hautschutzprodukten im Vergleich zu Hautpflegeprodukten bei Zahntechnikern – eine kontrollierte Feldstudie, J Dtsch Dermatol Ges. 2003; 1: 547-557.

M. Fartasch, T. L. Diepgen, H. Drexler, P. Elsner, S. M. John and S. Schliemann, S1-AWMF-Leitlinie (Langversion) Berufliche Hautmittel: Hautschutz, Hautpflege und Hautreinigung ICD 10: L23, L24, Dermatologie in Beruf und Umwelt, Jahrgang 63, Nr. 2/2015, S. 47–74

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³ H. Lautenschläger, Einfluss von Arzneimitteln auf Haut und Hautpflege, Kosmetische Praxis 2009 (2), 11-14

- In addition to medication, epidermal disorders caused by atopy (neurodermatitis), fungal infections on the feet between the toes, psoriasis, herpes, diabetes and chemotherapy (hand-foot syndrome on the palms of the hands and soles of the feet), to name just a few examples, have an impact
- Especially on the feet, thickening, hardening and the associated brittleness of the horny layer are a critical point. Causes include tight shoes, excess weight and exposure to cold. Blood circulation is often disturbed.
- Unkempt or congenitally dry lips can also lead to inflammatory skin cracks (chelitis) in the corners of the mouth. An altered hormonal balance can contribute to this. The elasticity of the epithelia also gradually decreases with age.

These influences lead to pre-stressing of the skin and make it more susceptible to rhagades, also known as fissures, especially in the anal area. The latter occur as a result of restrained and/or hard bowel movements and the associated pressure load, which is promoted by sitting for hours on end.

Conversely, the examples show numerous points of reference that should be considered preventively. The aim must be to stabilise the skin in terms of moisture balance, lipids and elasticity at a physiological optimum against continued external influences and to minimise the latter as far as possible.

Balancing act between dermatology and cosmetics

The treatment of rhagades is borderline, as it may involve dermatological therapy in addition to cosmetic regeneration – that is exactly what Albert M. Kligman defined as "corneotherapy" in his day.⁴

If skin care leads to the disappearance of rhagade skin, the Cosmetics Regulation prohibits the use of the term "healing". This should be borne in mind when claiming cosmetic products – in other words, "Do good, but don't talk about it". Clinical studies confirm this wisdom.⁵

Initial measures

In the acute stage, the fissure must be disinfected. Instead of tincture of iodine, there are now over-the-counter, sprayable antiseptics with antibioticly active substances such as octenidine dihydrochloride (INCI: Octenidine HCL) or polyaminopropyl biguanides (INCI).

If possible, the wound should be cleaned beforehand with a mild cleanser. Lotions or partial baths (e.g. foot bath; sitz bath for anal fissures) containing astringent witch hazel extract, epigallocatechin gallate (EGCG; with a low pH value) or tannins – alternatively sage, camomile and tea – are also suitable for this purpose. They also soften the hard edges of the calluses on the hands and feet and make it easier to carefully cut them away.

After drying, it is important to prevent new tension from building up, which could cause further tearing of the gap. This can be achieved by:

- Plasters and bandages
- Self-adhesive gauze bandages
- Medical superglue (tissue adhesive)
- Medical protective coatings for minor defects
- Prevent pressure on the feet by changing footwear and taping around the rhagade – similar to foot blisters

Further treatments

Essential for regeneration ("healing") is the restoration of the physiological balance of skin moisture and lipid content around the rhagade, i.e. the treatment of dry, low-fat skin has priority. Emulsions or better lamellar creams and ointments with barrier-identical or similar substances are suitable for this purpose – without non-degradable synthetic emulsifiers. Foams and paraffin-free oleogels with a minimum of additives but otherwise barrier-affine substances such as long-chain fatty acids, phytosterols and ceramides are ideal – also for oral rhagades (e.g. in stick form) and anal fissures. However, only aqueous solutions and phosphatidylcholine-containing liposomes or nanodispersions should be used as long as the rhagade is still weeping.

⁴ A. M. Kligman, Corneobiology and Corneotherapy – a final chapter, International Journal of Cosmetic Science 2011 (33), 197-209

⁵ Tabata N, O'Goshi K, Zhen YX, Kligman AM and Tagami H, Biophysical assessment of persistent effects of moisturisers after their daily Applications: Evaluation of Corneotherapy, Dermatology 2000;200:308-313

De Paepe K, Hachem JP, Vanpee E, Reseeuw D, Rogiers V., Effect of rice starch as a bath additive on the barrier function of healthy but SLS-damaged skin and skin of atopic patients, Acta Derm Venerol 2002;82:184-6

Active ingredients

Some active ingredients used in the bases are multifunctional. Combinations are common. Often used (in alphabetical order):

- Due to its amidic structure, allantoin has a similar effect to urea and is described as having a regenerative effect in low concentrations.
- Aloe vera gel has antimicrobial properties, has a smoothing effect, stabilises skin moisture and reduces tension.
- Amino acids and urea, the latter in low doses, increase skin moisturisation.
- α -Bisabolol, the antimicrobial component of chamomile extract, is produced synthetically.
- Epigallocatechin gallate (EGCG) is a tea component that has a stabilising, astringent and regenerating effect at a low pH value.
- Essential fatty acids in the form of linseed oil, kiwi oil, rosehip seed oil, phosphatidylcholine and their metabolites inhibit inflammation and are best applied as aqueous nanodispersions.
- Extracts of camomile, sage, calendula, tea, echinacea – have an astringent and/or antimicrobial effect.
- Glycerol is a common accompanying substance and can replace alcohol, which is an irritant in higher concentrations.
- Hyaluronic acid forms a superficially smoothing, moisture-stabilising and tension-reducing film.
- Niacinamide (vitamin B₃) is described as regenerating.
- Panthenol penetrates well into the skin and stimulates cell regeneration.
- Phosphatidylserine – is anti-inflammatory and regenerating.⁶
- Protease inhibitors such as boswellic acids (frankincense extract) – have an anti-inflammatory effect, particularly in the case of infections.
- Vitamin creams – with ingredients such as vitamin A esters, Ascorbic Acid Phosphate (INCI; phosphoric acid esters of vitamin C) and vitamin E esters – have a variety of regenerative effects even at low concentrations.
- Zinc oxide pastes are preferably used for rhagades of the corners of the mouth.

Keratolytic preparations are also used as a preventative measure for foot rhagades caused by a brittle and thickened horny layer. In contrast to skin moisture-stabilising preparations, they contain high concentrations of urea and/or salicylic acid, for example.

Gloves: When it comes to the healing process, air-permeable cotton gloves are well suited, as occlusive conditions slow down regeneration in a similar way to creams containing paraffin.

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⁶ H. Lautenschläger, Phosphatidylserin in der Hautpflege, *Chemie in unserer Zeit* **58** (2), 93-97 (2024); <https://doi.org/10.1002/ciuz.202300005>