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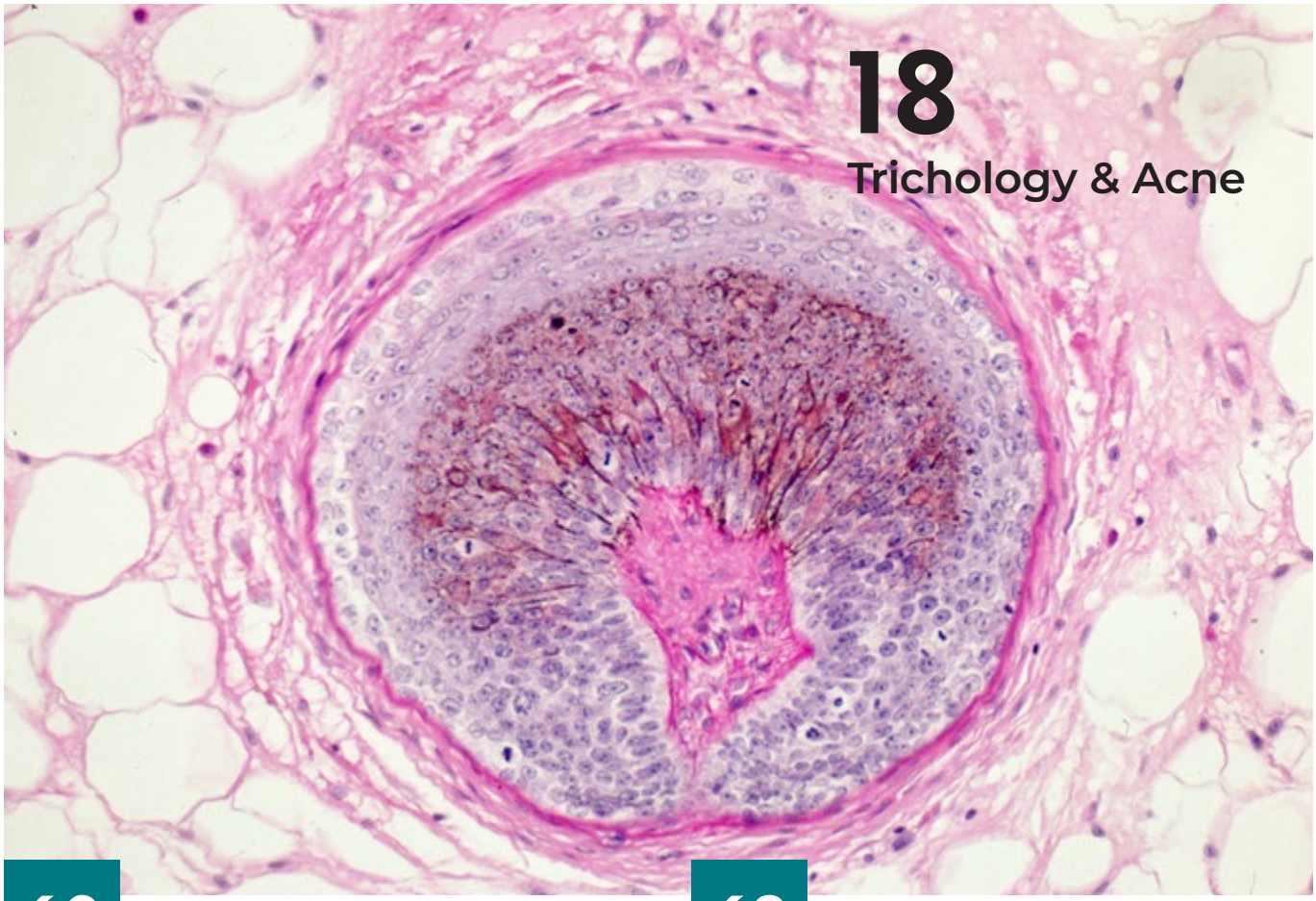

Société Suisse de Dermatologie et Vénéréologie
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FOCUS

Chemical Peeling in the Indication of Acne and Acne Scars

Oliver Kreyden. *Mainly in adolescence acne vulgaris is a common skin disease in different appearance from superficial comedone acne to deep acne papulopustulosa or acne conglobata respectively.*

Areas with high concentrations of pilosebaceous activity may be involved predominately in the face, back and chest. The pathogenesis of acne is complex involving inflammation around the pilosebaceous unit, abnormal keratinisation and Propionibacterium acne as well as hormonal influence [1]. However, the different clinical appearance, pathophysiology and their dermatological different therapy concepts are discussed elsewhere in this issue.Depending on the depth and severity of the inflammation, the clinical picture is varying and therefore the therapy concepts adapt to the clinic. Deep inflammation can lead to permanent scarring, the most concerned complication of this skin disease. Acne itself and scarring in particular correlates with a marked impact on quality of life and self-confidence [2].

Chemical peels induce controlled destruction of the epidermis and dermis which allows regeneration of the epidermis from the epidermal appendages (follicular structur) located in the remaining dermis. Depending on the substance of chemical peels and the application technique chemical peels damage the epidermis or the dermis respectively with subsequent regeneration of the destroyed skin structures through de novo synthesis of the dermal connective tissue or epidermal regeneration. Superficial Peelings act in the epidermis, middle-deep peels have an effect down to the str. papillare and deep peels destroy up to the middle Str. reticulare. If the Str. reticulare is exceeded beyond the hight of the hair follicule, there is a risk of scarring [3].

Acne Scar Classification

Acne sars can be devided into three main categories depending on the response of the the cutaneous collagens to the severity and depth of the induced inflammation. We distinguish atrophic, hypertrophic and dyschromic scars. Atrophic scars are the most common type of acne scars compared to hypertrophic and dyschromia and they are encountered in clinical practice with a ratio 3 to 1 [8]. Atrophic scars on their part can be classified in mainly 2 types: icepick or bowl-like scars. Icepick cars are narrow (0.5 mm). Shallow bowl-like scars are more amenable to ablative recurfacing modalitieswhile deep bowl-like scars are often not as responsive to treatment. With atrophic scars, icepick type represents 60-70 % of the total scars and bowl-like scars 20–30 % [4].

Use of Chemical Peels in Management of Acne and Acne Scars

Superficial Peels as a suporative Treatment for Active Acne

Topical treatment modalities like keratolytic creams combined with antibiotic external are first choice in active acne therapy. In second intention, particularly in patients with more severe activity involving deeper structures of the skin like acne papulopustulsa, additionally systemic antibiotics like minocycline 50 mg twice a day for 6 weeks may be necessary. In the idea to burn out the acne Cunliffe recommends to continue this combined topical and systemic treatment for 12 weeks overall provided that the 6 weeks showed a significant improvement [5]. Severe acne with a risk of scarring or commonly relapsing acne are treated with Isotretinion systemically. Due to obligate and uncomfortable side effects like dry lips and skin in general, back pain, temporally hair loss etc. the dosage is always a topic of discussion. The approved dosage rule for isotretinion of half of the body weight in mg per day for nine months (i.e. 60 kg bw = 30mg/d over 35 weeks) is still the best regimen particularly to prevent further relapses of the acne after therapy termination.

Hence, as therapy modalities for treating acne of different severity are excellent and very effective, peelings play mainly only a supportive role in the treatment of active acne. Most commonly superficial peels are the therapy of choice when treated active acne. Salicylic acid (SA) possesses anticomedonal activity and bactericidal as well as both keratolytic and anti-inflammatory properties [6]. The peeling effect of SA is secondary to the extraction of desmosomal protein including desmoglein, leading to loss of epidermal cell cohesion and therefore desquamation [7]. Usual concentrations range from 10 % to 30 % and the peel is unlikely to the Alphahydroxy Acids (AHA) self-neutralising.

AHA work by lowering the epidermal pH, which decreases corneocyte adhesion and promotes epidermolysis in a loosening the cell cohesion between str. corneum and granulosum (epidermis) with corresponding increased desquamation [3]. The change in pH also impairs intercellular enzymes, which in turn leads to an amplification of the inflammatory cascade and supports desquamation. The induced inflammation stimulates not only glycosaminoglycans but also collagen synthesis. The latter occurs via induction of IL-1A at the keratinocytes and fibroblasts with initiation of cell proliferation [8]. AHA

have to be neutralised based on application time, clinical signs (erythema) or symptoms (burning). The Jessner solution (salicylic acid, resorcinol, lactic acid) can be used as monotherapy for superficial peeling. As a direct pre-treatment for medium-deep TCA or deep phenol peels, the Jessner solution is particularly suitable, as its degreasing and pre-peeling effect results in significantly better penetration of the subsequent TCA or phenol peels. The result of superficial peels depends on the choice of substance, its concentration (20-70 %), the method of application (preparation of the skin, application pressure, number of passes) and the application time. For effective results treatment have to repeated on a weekly base 4 to 6 times. SA, AHA and Jessner Peel can be useful in the management of active comedonal acne with non-atrophic scarring, namely grade 1 macular hyperpigmentation, but they have limited efficacy in the management of established atrophic scars [9].

Medium-Depth and Deep Peels for Acne Scars

Trichloroacetic Acid

Trichloroacetic acid (TCA) is a triple chlorinated carboxylic acid and it mechanism of action is based on destruction of protein structures (denaturation) with inducing cell necrosis. This in turn leads to a degradation and reconstruction of all structural components with an induction of inflammatory wound healing cascades in the dermis with a pronounced and long-lasting immune response. As this denaturation is irreversible, TCA solution will not be neutralised. As all these formulations are lipophilic a pre-treatment degreasing is essential for a correct result. Therefore, the «4-passes» principle is highly recommended with 1. pass with ethanol 70 %, 2. pass with acetone, 3. pass with Jessner Solution and finally 4. pass with the peeling solution indicated (TCA 35 % or Phenol). For better results a series of 3-5 sessions spaced 4-8 weeks apart is recommended. However, middle-deep peels with TCA 35 % have limited evidence for atrophic scars and show only moderate improvement after 3 sessions [10]. Therefore either deep peel with phenol or CROSS (**C**hemical **R**econstruction **o**f **S**kin **S**cars) is the treatment of first intention concerning atrophic scars.

Phenol

Phenol is a hydroxy-substituted derivative of benzol and commonly the Baker-Gordon solution containing 88 % phenol, croton oil, hexachlorophene and distilled water is used for deep peeling [11]. Phenol penetrates quickly and is also absorbed percutaneously with the potential risk of systemic absorption. The potential lethal dose of phenol is reported to be 10-15 g. For the treatment of a full-face phenol peel, less than 1 g of phenol is needed, which is why the so often cited systemic side effects such as arrhythmias, renal or hepatic affections are extremely rare and negligible in clinical practice if the peel is performed correctly. Nevertheless, a phenol peel should always be performed with anaesthesia stand-by with monitoring of basic functions 3. Due to its high induction of collagen synthesis Phenol Peeling is very effectual for superficial and deeper bowl scars, however less effective for deep icepick scars.

CROSS (Chemical Reconstruction of Skin Scars)

In 2002 Lee et al. first proposed the novel technique of applying high concentration of TCA (65–100 %) to only acne scars using a thin and pointing wooden applicator, which allowed spill-over to healthy skin to be minimised. 82 % of the patients receiving 65 % TCA CROSS had a good or excellent result compared to 95 % in the 100 % TCA arm [12]. This technique showed a promising safe, cost effective and efficacious treatment for icepick scars. Studies have suggested that TCA 50 % is less effective than 75 % [Basseila M., Oral presentation IMCAS 2023] and 100 % TCA is more effective than 75 %. However there is no statistical difference between Phenol and 90 % TCA using CROSS technique [13].

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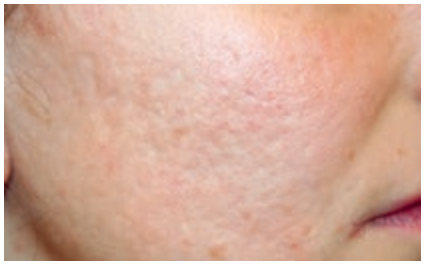
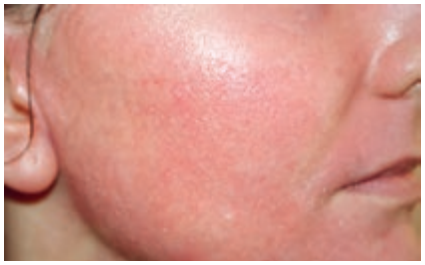
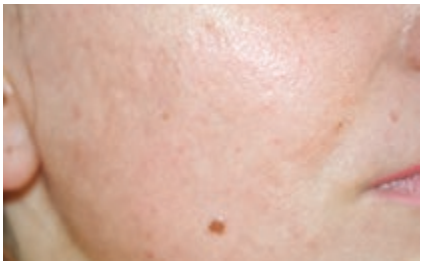


Acne scars before peeling



Skin condition 10 days after deep phenol peeling



Final result 3 months after deep phenol peeling

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Kongressankündigung

Am 17. und 18. November 2023 findet die erste Chemical Peeling Conference CPC 2023 mit einem theoretischen und praktischen Teil inklusive Live-Peelings in Basel statt.
Weitere Informationen finden Sie auf www.kreyden.ch
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