



An Overview of Lines of Acne Scars Management

Abdulsalam Mohammed Bin Khalel, Amin Mohamed Amer, Ayman EL Sayed Ahmed Youssef

Abstract

Background: Dermatologists encounter acne as one of the most common and troublesome inflammatory skin conditions. The disease affects 95 percent to 100 percent of adolescent boys and 83 percent to 85 percent of adolescent girls during puberty, and it lasts into adulthood in about 12 percent to 14 percent of instances. Scarring is one of the most distressing and long-term repercussions of acne, affecting up to 95 percent of patients and 30 percent of those with severe acne. Acne scar treatment is complicated due to the large number of variables to consider while approaching them. The most common scar morphologies are ice pick, box car, and rolling. Scar severity is also an important factor to consider. Severe scars requires a different strategy then mild ones. The amount of surface skin area and/or scar depth, or the number of scars that are bound down, hypertrophic or ice pick scars, as the latter are more difficult to correct than rolling scars, are all examples of severe scarring.

Keywords: Acne Scars, management

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Introduction

Dermatologists encounter acne as one of the most common and troublesome inflammatory skin conditions. The disease affects 95 percent to 100 percent of adolescent boys and 83 percent to 85 percent of adolescent girls during puberty, and it lasts into adulthood in about 12 percent to 14 percent of instances. Scarring is one of the most distressing and long-term repercussions of acne, affecting up to 95 percent of patients and 30 percent of those with severe acne (1).

Acne scars are divided into three main groups. Icepick scars, rolling scars, and boxcar The reason for the placement of acne scars in these three main categories is that the scars have both natural biology as well as specific physical

properties. Depth, width, and 3D architecture are three crucial factors in determining the type of acne scar Jacob and colleagues have previously described a classification system to define atrophic acne scars into 3 basic types: icepick, rolling, and boxcar scars. This classification system has allowed a consistent and standardized definition of acne scars that has been adopted into clinical research and has aided in treatment regimens. Each of these scar types has been classified based on the underlying scar pathology. By classifying acne scars into distinct types, treatment options can be better tailored to each individual patient (2).

Corresponding author: Abdulsalam Mohammed Bin Khalel
Dermatology, Venerology & Andrology Department, Faculty of Medicine, Zagazig University, Egypt
E-mail: kamonna2006@gmail.com



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Treatment for atrophic acne scars differs depending on the forms of acne scars and the treatment modalities' ability to repair scars. Different modalities of acne scar treatment include needling, laser treatment, chemical peeling, punch techniques, fat transplantation, dermabrasion, subcision, other tissue enhancing agents, and combination therapy. The use of numerous therapeutic techniques has been limited due to their lack of efficacy and significant side effects (4).

Methods of treatment post acne scars: A- Chemical Peels:

Chemical peels have been used since ancient Egypt. It works by destroying the damaged outer layers of skin and speeding up the healing process. It is divided into three categories: superficial, medium, and deep peel. The severity of the injury is determined by the acid concentration, vehicle type, contact time, and buffering. Acne vulgaris is treated with superficial peels, while acne scarring is treated with deep peels (5).

Types of chemical peeling: 1- Glycolic Acid:

Glycolic acid (GA) is an alphanhydroxy acid that promotes desquamation and epidermolysis by reducing corneocyte cohesion. It is widely used as a superficial peeling agent due to its

exfoliative properties. Furthermore, a study found that GA peel has an anti-inflammatory effect on acne due to its bactericidal effect on *Propionibacterium acnes*. GA increases dermal hyaluronic acid and collagen gene expression in acne scars by increasing IL6 secretion (6).

2- Jessner's Solution:

Since the late nineteenth century, Jessner's solution (JS) has been used as a peeling agent. It's a superficial peeling agent made up of 14% salicylic acid, 14% resorcinol, and 14% lactic acid in 95% ethanol. Salicylic acid is a lipophilic compound that removes intercellular lipids from the cornified envelope that surrounds epithelial cells. Resorcinol is similar to phenol in terms of structure and chemical composition. Lactic acid is an alpha-hydroxy acid that causes corneocyte separation and stratum corneum desquamation (7).

3- Pyruvic acid:

Pyruvic acid is a -kato acid with antibacterial and keratolytic properties. It also sebo-regulating effect and stimulates neocollagenesis, which is important in the treatment of acne scars and wrinkles. Pyruvic acid is transformed into lactic acid in physiological conditions, which is responsible for maintaining proper epidermal moisture (8).

4- Salicylic acid:

Salicylic acid is a beta-hydroxy acid. Because of its powerful comedolytic and sebostatic properties, it is the peeling agent of choice for active acne. SA can dissolve intercellular cement, reducing corneocyte adhesion. It reduces the number of inflammatory and noninflammatory acne lesions when used in multiple sessions, with the most common

side effects being erythema, dryness, and burning sensation (9).

5- Trichloroacetic acid:

Dermatologists and plastic surgeons have been using trichloroacetic acid (TCA) for many years. For light peeling, a 10-25 percent solution is used; it is safe because its systemic toxicity is lower than that of phenol. This peeling is equivalent to a mild sunburn with mild skin erythema for 2-3 days and light exfoliation at 3-5 days and can be repeated after a week but it barely penetrates beyond the epidermis (10).

6- TCA cross:

The chemical reconstruction of skin scars (CROSS) method was first described by Lee et al in 2002, which delivers high-strength acid to atrophic scars in a focal way. The CROSS method, according to the authors, has a lower complication rate than traditional full-face chemical resurfacing because the adjacent normal tissue and adnexal structures are spared, allowing for faster wound healing (11).

B- Dermabrasion/Microdermabrasion:

Dermabrasion and microdermabrasion can be used individually or in combination to treatment acne scarring. Mechanical skin resurfacing, which includes dermabrasion and microdermabrasion, involves removing layers of the epidermis with a handheld abrading instrument. Dermabrasion is a more invasive and technically challenging procedure that involves removing skin down to the papillary dermis level. Microdermabrasion is a less aggressive technique that involves only abrasion of the epidermis' superficial layer (12).

C- Laser treatment:

Laser resurfacing has been shown to be effective in treating acne scars, especially atrophic scars, which are the most common type seen in 80–90% of patients. Lasers are classified as either ablative or non-ablative, with traditional and fractional subtypes. Lasers use thermal energy to selectively destroy targeted tissue and stimulate dermal fibroblasts to replace collagen and elastin (13).

Types of lasers:

1- Ablative laser:

Melting, evaporation, or vaporisation are methods used by ablative lasers to remove damaged scar tissue. The most commonly used ablative lasers for acne scar treatment are the carbon dioxide laser and Erbium YAG laser. These abrade the skin's surface while also assisting in the tightening of the collagen fibres beneath it (14).

Ablative lasers have long been thought to be the gold standard for treating acne scars because they produce significant clinical improvement after just one treatment. They do, however, come with a lot of downtime and potential side effects like erythema, post-inflammatory hyper- or hypopigmentation, and scarring. Newer fractional lasers have less downtime and side effects, but they usually necessitate more treatment sessions to achieve the best results (13).

2- Non ablative laser:

Nonablative laser systems are commonly used for the treatment of atrophic acne scars. They emit visible or infrared (IR) wavelengths, which stimulate type I, III collagen and elastic fibres. Non ablative lasers have the advantage of delivering energy to the dermis without destroying the epidermis, resulting in fewer side effects and faster recovery time.



Clinical improvement may be moderate, particularly for deeper icepick and boxcar scars, patients may need multiple treatment sessions **(15)**.

3- Fractional photothermolysis:

Traditional resurfacing techniques are well-established treatments for changing the appearance and characteristics of the skin, but they come with drawbacks such as long procedural downtime, the risk of scarring, and long-term hyperpigmentation. By creating patterns of microscopic treatment zones (MTZs) while leaving the surrounding skin undamaged, fractional photothermolysis (FP) overcomes these drawbacks, allowing for quick healing and limiting the development of inflammation and fibrosis **(16)**.

4- Fractional radiofrequency:

FRF creates fractional thermal wounds that are delivered directly into the deep reticular dermis using an array of electrodes or microneedles. This technology causes neoeelastogenesis and neocollagenesis by volumetric heating of the dermal structures with little to no heat damage to the epidermis. Its efficacy in treating striae, irregular texture, rhytides, hyperpigmentation, skin laxity, and acne scars **(17)**.

D- Platelet-rich plasma:

PRP is a small volume of plasma containing an autologous concentration of human platelets. Growth factors, such as epidermal growth factor, platelet-derived growth factor, transforming growth factor beta, and vascular endothelial growth factor, are found in it. By binding to specific cell surface receptors, these factors are known to regulate a variety of processes such as cell migration, attachment, proliferation, and

differentiation, as well as promote extracellular matrix production **(18)**.

PRP has been successfully used in dermatology for facial rejuvenation and the treatment of various dermatological disorders such as acne, scars, ulcers of various aetiologies, and alopecia, particularly androgenic alopecia. In addition, positive outcomes have been reported in other diseases such as melasma and burns **(19)**.

E- Punch excision, grafting:

Punch excision involves using a straight-walled disposable or hair transplant punch that is slightly larger than the scar to remove a pitted scar. Sutures are then used to close the wound, just as they would in a normal excision. Punch replacement grafting has been used in dermatology for decades and is most commonly used to treat sharp-walled or deep ice-pick scars with dystrophic or white bases **(20)**.

F- Punch elevation:

Punch elevation combines punch excision and grafting techniques without the risk of skin colour or texture misalignment. This technique is typically used for boxcar scars, and it involves elevating the scar so that it is slightly raised against the bordering tissue after it has been isolated from the surrounding skin. During the healing phase, the grafted tissue retracts, resulting in a levelled surface **(21)**.

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