Combination of Glycolic Acid Peel and Microneedling for Treatment of Acne Scar in An Asian Male Skin: A Case Report

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Abstract

Acne scars are a common and long-term complication of acne vulgaris which is caused by the severity of the condition and delay in treatment. Nowadays, there is various treatment option for acne scar but treating it remains to be a challenge. Microneedling is among the method that have been used to improve acne scarring. Furthermore, several studies have shown that combination of microneedling with glycolic acid peel may increase the efficacy of treatment compared to microneedling alone. In this case report, we describe a case of a 42-year-old Indonesian gentleman with moderate acne vulgaris condition and severe acne scar. The patient has suffered from acne since adolescence and has a strong family history of acne. Dermapen treatment in combination with glycolic acid peel was given to him and a near total acne scar recovery was successfully achieved after 20 weeks of treatment. Combination of dermapen and glycolic acid peel for acne scar treatment is effective, safe and well tolerated by the patient without severe side effects and complications.

Keywords: scar recovery, acne vulgaris, glycolic acid peel, dermapen

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Acne refers to a chronic inflammatory disease of the pilosebaceous unit.[1] It involves alteration of keratinization within the pilosebaceous unit, increased in sebum production, proliferation of Propionibacterium acnes (P. acnes), and production of perifollicular inflammation [2]. Acne is characterised by the formation of erythematous papules, comedones, pustules, and/or nodules (i.e., pseudocysts) and these can be accompanied by scarring. Acne is most seen in individuals aged 15 to 24 years and affects the face more compared to the trunk. A study conducted in Muar, Malaysia shows that the prevalence of facial acne among adolescents is about 67.5% [1].

Scarring is the primary long-term physical complication of acne due to an altered wound healing response to cutaneous inflammation, with an inflammatory cell infiltrate [1]. These have been found in 77% of atrophic scars condition. Furthermore, aberrant production and degradation of collagen during the healing process will produce different type acne of scar [2]. An effective early treatment might reduce the long-term complications of acne vulgaris. There are various treatment options available for treating the condition and these includes diets, topical agents, systemic agents or antibiotics and adjunctive procedural therapy. A multimodal approach for acne treatment has been recommended and it should be individualised depending on the severity, types of acne and how it affects the patient's quality of life [3].

The management of acne scars should focus on each component of scarring process. Erythema should be targeted early if present and the treatment should then focus on addressing the scarring. Besides that, the treatment approach should also depend on the types of scars present and whether generalised or individual scars predominate. Combination of treatment can offer high probability of significant improvement for post-acne scar. Furthermore, providing an early treatment for an active acne is the best way to prevent or limit acne-related scarring [2].

Case Presentation

We present a 42-year-old man from Indonesia with complained of worsening facial acne and scar for the past 8 months. He has oily facial skin with multiple scars from previous acne lesions and had been experienced acne since adolescence. The patient had never sought any medical treatment for his skin condition prior to this visit. Besides that, he does not use any skincare products other than 3-in-1 shower cream for hair, face and body for his skin management. The patient has a strong family history of acne vulgaris as his mother and younger brother suffered from a similar condition. This patient is a non-smoker and there is no evidence of psychological stress and other medical illness present.

Dermatological examination showed greasy skin (Fitzpatrick skin type IV) with painful erythematous papules, pustules, and mixture of close and open comedones affecting the forehead, cheeks, nose, chin, and anterior part of the neck (Figure 1). Based on Global Acne Grading System (GAGS), the global score was 20 which is a presentation for moderate acne. There were also combination of boxcar and rolling scars on the cheek, nose and chin. Severe grading was recorded based on Goodman and Baron qualitative grading system.

Management And Outcome

Combination therapy was used to treat this patient. The treatment started with antimicrobial therapy such as Adapalene cream and oral Doxycycline, 100mg daily. Doxycycline was administered for a duration of 3 months. He was also advised to use a gentle gel cleanser and sun protection product with minimum SPF 30 daily. Skin improvement was observed within six weeks after starting the treatment. The frequency of breakouts on the face and neck has decreased.

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Figure 1: Patients' face on the first visit (A: Right), (B: Left)

Figure 2: Patients' face after 20 weeks of treatment (A: Right), (B: Left)

After three months, the treatment focus changed to acne scar improvement. The patient had 3 sessions of chemical peeling with 20% glycolic acid (GA) at pH 3.2 performed on full facial area, alternated by microneedling using Dermapen in 3-4 weeks intervals. A total of 3 sessions of GA chemical peel and microneedling treatment were performed on the patient.

In this case, a significant improvement in atrophic acne scars was observed within 20 weeks of treatment. According to the Goodman and Baron qualitative grading system, the grade changes from severe (Figure 1) to mild (Figure 2). The patient experience mild and transient adverse reactions such as mild erythema and skin flaking post-therapy which lasted to 48 to 72 hours and resolved spontaneously. The patient's utmost satisfaction was achieved.

Discussion

Adult-onset acne (AOA) is defined as a chronic inflammatory disease of the pilosebaceous units occurring beyond the age of 25 years. Acne that persists from adolescence into adulthood is called persistent acne, while acne that appears after the age of 25 is late-onset acne [2]. A study conducted by Goulden et al (1997)[8] reported that AOA is persistent in the majority of cases, generally ranging from mild to moderate in severity and presents with more inflammatory lesions and fewer comedones compared to adolescent acne. In the same study, a family history of AOA was detected in 50% of the patients [7]. Furthermore, a twin study of acne found that genetic factors account for 81% of the variance in acne [8]. In this case report, a 42-year-old male patient suffered from persistent acne condition from adolescence with atrophic post-acne scar and has a strong family history of acne. This might be the cause of persistent acne condition in this patient. Besides that, poor hygiene and the use of comedogenic products on acne-prone areas may also contribute to the persistance of acne in this patient.

The patient's initial treatment option given are adapalene and doxycycline for controlling acne breakouts as new breakouts can lead to a formation of new acne scars. During treatment, this patient was advised to avoid sun exposure and use sunscreen due to the photosensitivity reaction of doxycycline. Scar treatment approach was conducted after active acne was treated.

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A combination of physical therapy and minimal invasive surgical therapy had been used for scar treatment, which is chemical peeling and dermabrasion, respectively. Chemical peeling with 20% glycolic acid at pH 3.2 was performed on full face, alternated with microneedling session using Dermapen in 2 weeks interval for six sessions. Microneedling or percutaneous collagen induction is a safe, minimally invasive, and effective esthetic treatment modality for atrophy acne scars remodelling, skin rejuvenation and tightening. It creates numerous microchannels in atrophic acne scars and physically breaks apart the compact collagen bundles in the superficial layer of the dermis while simultaneously inducing the production of new collagen and elastin underneath the scar.[3] With its fast post-treatment recovery, limited side effect profile, and impressive clinical results, microneedling is a valuable alternative to more invasive procedures such as laser skin resurfacing and deep chemical peeling. In addition, microneedling has demonstrated definitive histologic changes that are directly responsible for the clinical improvement observed. [4]

According to Clinical Practise Guideline management of Acne, 2012, chemical peeling was recommended as an adjuvant treatment for facial acne and scars. Chemical peeling creates controlled destruction of a part or entire epidermis, leading to exfoliation of superficial lesions followed by regeneration of epithelia. Chemical peeling with glycolic acid also inhibits post-inflammatory hyperpigmentation (PIH) by the action of glycolic acid, accelerates the turnover of the epidermis and inhibits melanin formation in melanocytes.

Saadawi et al. (2019)[10] found a significant improvement of atrophic acne scarring in patient with different types of atrophic acne scars who received combination treatment of 35% GA and dermapen compared to the use of dermapen alone with mean improvement of 80% and 100% in microneedling and combination groups respectively. This supports our case report finding where a combination of glycolic acid 20% and dermapen show a significant improvement in acne scars [9].

Pain, erythema and edema have been reported as adverse reaction of microneedling in several studies. For this case, a mild side effects of treatment such as erythema and skin dryness were reported for up to one week. Within 20 weeks of the treatment course, no severe side effects and complications were observed. In conclusion, the combination therapy of microneedling and GA peel were effective in treating patient with acne vulgaris and acne scars with minimal risks of side effects.

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