

Microneedling for Treatment of Acne Scars: Considerations on the Successful Management of This Aesthetic Procedure

Ettore Minutilli MD

Dermatology and Plastic Surgery, Catholic University of Sacred Heart, Rome, Italy;
SIDCO Regional Delegate, EADV NMSC Task Force Co-Chair, IF AAD

Microneedling is a minimally invasive procedure for treating acne scars which has already been well-established, but it has been reborn in recent years because of innovative findings. It presents many advantages in comparison with other techniques more frequently used such as laser resurfacing and deep chemical peelings; in particular, it consents to achieve good or excellent results with a minimal time (2-3 days) of recovery and rare complications, even in dark phototypes.^{1,2} It is possible to improve the cosmetic results of severe scarring further with the transdermal delivery of drugs such as vitamins, hyaluronic acid, and platelet-rich plasma (PRP). Additionally, combining these with other aesthetic procedures such as peelings, lasers, and fillers, following an appropriate “wash out” period from microneedling, dermatologists can further optimize results.³

Microneedling breaks the compact collagen bundles of scarring in the upper dermis preserving the epidermal barrier function and stimulates the production of new collagen and elastin (as various histological stainings can demonstrate) through the release of cytokines and growth factors by inflammatory process; besides, the creation of deep microchannels permits the transdermal drug delivery. On the contrary, lasers, and in particular ablative lasers break the epidermal barrier with thermal damage and perilesional necrosis so that the times of recovery are longer and side effects are more probable.

More rarely, this technique has been preferred to the traditional aesthetic procedures for treating other scars (surgical, post-traumatic, burn), skin photoaging, and rhytides. In exceptional cases, it has been proven for treating striae distensae and skin laxity with good results.

Of course, contraindications to this aesthetic procedure are active acne, immunosuppression, local infection, keloid predisposition, etc. A prophylactic treatment with oral antiviral drugs for one week can be necessary in cases of a positive history of herpes labialis. Oral anticoagulant drugs have to be interrupted for one week (3 days before and 3 days after the treatment) with this mini-invasive aesthetic procedure.

The first consideration for a successful microneedling is topical anesthesia. Generally, the application of a cream based on 2.5% lidocaine and 2.5% prilocaine under occlusion for 60-90 minutes is suitable before treating acne scars with needles long less than 2 mm; rarely, it can be used topical anesthesia with 30% lidocaine cream for shorter times such as 20-30 minutes and no occlusion, even for more severe scarring. It sets a trend to use a self-occluding topical anesthetic mixture (7% lidocaine and 7% tetracaine) for 30-60 minutes because of its advantages in terms of efficacy and safety.⁴

The second consideration concerns some useful technical suggestions during the operative procedure.⁵ Manual roller devices (“dermaroller”) are easier to manage in large areas, while electric-powered pen devices (“dermapen”) can be preferred in small areas because of the adjustable speeds of the latter; both of them can be combined. These manual devices are more successful when compared with other energy-based instruments such as fractional radiofrequency (FMR) or light-emitting diode (LED) devices⁶ because of the thermal damage for the energy dispersed in the superficial skin by the last ones. The sterile steel needles more frequently used for treating acne scars are thin (30-32 G) and 1.5-2 mm in length to enter the superficial dermis; rarely, needles of 2.5-3 mm in length have been suggested for deep acne scars using only this topical anesthesia. On the contrary, needles of 0.5-1 mm in length are preferable for delicate cosmetic areas of the face such as eyelids or lips, especially for treating skin photoaging and rhytides. The density of the needles can also vary according to the different models of dermarollers in Europe and the USA. The operative procedure is standard and consists of 3-4 soft perpendicular passages of the dermaroller over acne scars in 4 directions (12-16 passages) until fine pinpoint bleeding; later on, the application of ice water-soaked sterile gauzes for a few minutes permits to achieve hemostasis.^{7,8}

The third consideration is essential to obtain the best results without complications (dyspigmentation, granuloma, scarring). During the first phase post-treatment, erythema, edema, and

pain are normal and disappear within 2-3 days. Gel based on hyaluronic acid, vitamins, or growth factors (PRP) has to be applied after the treatment. This cosmetic application has to be repeated daily, preferably in the evening, on the facial unit treated for 7-10 days. Sunblock SPF 50+ has to be applied, preferably in the morning, on the face for 7-10 days too. The best results with scarring improvement of 50-75% in most of the patients and over 75% in a small percentage of the patients can be assessed using various grading scales, even if the Goodman and Baron qualitative and quantitative system is the most frequently used.⁹ According to most of the studies, these results are comparable with those obtained through non ablative lasers and even fractional ablative lasers. They can be achieved with a different number of sessions of microneedling varying from 1-4 to 6-8 according to the subtype and severity of scarring beyond the age of patients and duration of scarring; in fact, the most patients present mixed subtypes of scars with boxcar and rolling scars which show a greater degree of improvement than ice pick scars. It is useful to apply microneedling at 4-week rather than 2-week intervals¹⁰ as well as to evaluate the final result after at least 3 months from the last session and better after a long follow-up (6-12 months) according to the slow times of a complete neo-collagenesis.⁶

The final consideration concerns the possibility of combining microneedling with other traditional aesthetic treatments for acne scars such as lasers, peeling, fillers, subcision, RF, and so on. This combination can be suggested in selected cases of severe acne scars to improve the aesthetic results achieved with microneedling alone, but it can also increase the risk of possible complications, especially in dark phototypes. The best association is microneedling with fillers such as PRP or similar drugs¹¹ rather than deep peeling or lasers, preferably after a long follow-up from the last session of microneedling when the process of neo-collagenesis has almost been completed. However, combining microneedling with the transdermal delivery of topical cosmetic drugs since the initial session can prove beneficial, enhancing the ultimate aesthetic results.¹²

In conclusion, microneedling remains a well-established low-cost aesthetic procedure of first choice for the treatment of acne scars¹³ in all phototypes^{14,15} compared to the most traditional lasers or peeling because it has high efficacy and safety with minimal post-treatment recovery rates and risk of complications. Besides, particular recommendations before the treatment, intra-operative, and after the treatment according to a standardized protocol can optimize the final aesthetic results reserving the combination with more traditional therapies to selected severe cases.^{16,17}

DISCLOSURES

The author has no conflicts of interest to declare.

ACKNOWLEDGMENT

Thanks to Prof. K Fritz* for his scientific support in the publication of this manuscript.

*Dermatologic, Aesthetic and Laser Center - Landau, Germany; University of Medicine and Pharmacy "Carol Davila"- Bucharest, Romania; General Secretary of European Society of Cosmetic and Aesthetic Dermatology (ESCAD)

This work has been presented at the SIME (Italian Society of Aesthetic Medicine) Annual Congress 2023 (19-21th May, Rome, Italy) and will be updated at the SIDCO (Italian Society of Surgical and Oncologic Dermatology) Annual Congress 2024 (11-13th April. Sanremo, Italy).

REFERENCES

1. Alster TS, Graham PM. Microneedling: a review and practical guide. *Dermatol Surg.* 2018; 44: 397-404.
2. Alster TS, Ka Yi Li M. Microneedling of scars: a large prospective study with long-term follow-up. *Plast Reconstr Surg.* 2020;145:358-364.
3. Ramaut L, Hoeksema H, Pirayesh A, et al. Microneedling: where do we stand now? A systematic review of the literature. *JPRAS.* 2018;71:1-14.
4. Jimenez-Cauhe J, Boixeda P, Cornejo P, et al. Real-life experience of a lidocaine/tetracaine self-occluding topical anesthetic for dermatological procedures. *J Cosmet Dermatol.* 2022;21:2939-2944.
5. Bandral MR, Padgavankar PH, Japatti SR, et al. Clinical evaluation of microneedling therapy in the management of facial scar: a prospective randomized study. *J Maxillofac Oral Surg.* 2019;18:572-578.
6. Shen YC, Chiu WK, Kang YN, et al. Microneedling monotherapy for acne scars: systematic review and meta-analysis of randomized controlled trials. *Aesth Plast Surg.* 2022;46:1913-22.
7. Villani A, Annunziata MC, Luciano MA, et al. Skin needling for the treatment of acne scarring: a comprehensive review. *J Cosmet Dermatol.* 2020; 19: 2174-81.
8. Casabona G, Alfertshofer MG, Kaye KO, et al. Safety and efficacy of microneedling technology in the treatment of acne scars. *J Cosmet Dermatol.* 2021; 20:3482-3491.
9. Mujahid N, Shareef F, Maymone MBC, et al. Microneedling as a treatment for acne scarring: a systematic review. *Dermatol Surg.* 2020;46:86-92.
10. Alam M, Han S, Pongpruthippan M, et al. Efficacy of a needling device for the treatment of acne scars. A randomized clinical trial. *JAMA Dermatol.* 2014;150:844-849.
11. Elfar NN, Hasby EA. Efficacy and safety of plasma gel as a new modality in treatment of atrophic acne scars. *Int J Dermatol.* 2020;59:620-626.
12. An MK, Hong EH, Suh SB, et al. Combination therapy of microneedle fractional radiofrequency and topical poly-lactic acid for acne scars: a randomized controlled split-face study. *Dermatol Surg.* 2020;46:796-802.
13. Harris AG, Naidoo C, Murrell DF. Skin needling as a treatment for acne scarring: an up-to-date review of the literature. *Int J Women's Dermatol.* 2015; 1: 77-81.
14. Bonati LM, Epstein GK, Strugar TL. Microneedling in all skin types: a review. *J Drugs Dermatol.* 2017;16:308-313.
15. Teymour S, Kania B, Lal K, et al. Energy-based devices in the treatment of acne scars in skin of color. *J Cosmet Dermatol.* 2023;22:1177-1184.
16. Shukla SK, Gold MH. Treatment of acne and acne scars with microneedling. In: Houshmand & Gold eds., *Microneedling: Global Perspectives in Aesthetic Medicine.* Hoboken, NJ: John Wiley & Sons Ltd. 2021.
17. Fritz K. Microneedling and its cosmetic use. In: Baran & Maibach eds, *Textbook of Cosmetic Dermatology*, 6th ed. Boca Raton, FL: CRC Press London, in press, 2023.

AUTHOR CORRESPONDENCE

Ettore Minutilli MD

E-mail:..... ettoreminutilli@yahoo.it