

Editorial

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Microneedling: An Update

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Aesthetic treatments are on the rise and according to the American Society of Plastic Surgery (ASPS), minimally invasive procedures comprise of approximately 89% of all cosmetic treatments. Microneedling is one of the new kids on the block. Though it has been in the market for a little over 10 years, it has become popular in the last 2 years.

Microneedling (MN) may be done with a handheld device which has a rolling cylinder at one end. This cylinder has tiny medical grade stainless steel needles protruding from it. This is rolled on the skin in all four directions to create multiple channels in the skin. Depth of the channels created depend on the length of the needles on the rolling device. The length of the needles ranges from 0.5 mm to 3 mm. These channels allow easy transdermal drug delivery and this makes it useful for mesotherapy and platelet rich plasma (PRP). Microinjuries to the upper dermis release numerous growth factors which cause neocollagenesis.

Microneedling is a simple, inexpensive, clinical procedure with minimal downtime. Topical anaesthesia is most commonly used. There may be erythema and oedema for 3 to 4 days post-treatment. Use of sunscreen and emollients is encouraged after treatment to prevent post-inflammatory hyperpigmentation especially in ethnic skin.

Side effects may be seen in the form of bruising, mild scabbing for a few days, hematomas on the bony areas, secondary bacterial infection, milia, tram track effect seen mainly on bony prominences and post-inflammatory hyperpigmentation.

This procedure is performed to treat acne scars, traumatic scars, striae, skin rejuvenation, dyschromias, alopecia and it is also used for transdermal drug delivery.

Microneedling should be avoided, if there is active bacterial infection, herpes labialis, molluscum contagiosum, verrucae vulgaris, acne in the area to be treated. Other contraindications are rosacea, uncontrolled diabetes, neuromuscular disease, collagen vascular disease, skin malignancy, solar keratosis and chronic skin condition like scleroderma, psoriasis and eczema.

The advantage of microneedling is that there is neither heat nor light involved reducing the chances of long standing side effects in ethnic skin. It is thus safe in skin types III-VI as there is neither any thermal damage nor is the epidermis injured.

It can be combined with other treatment modalities such as chemical peels, nonablative and fractional lasers, and fillers to enhance results.

Various types of devices are now available with the growing popularity of the technique. Enlisted below are a few devices:

1. The needles in dermarollers are mostly made of medical grade stainless steel, but some instruments have needles made of titanium or gold coating that are believed to be less traumatic and safer than the uncoated.
2. Automated rollers: Instruments with disposable heads and hence can be used for many patients. They are battery driven.

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3. Instruments with a vibration mode to reduce pain.
4. Scalp rollers: They have titanium needles unlike stainless steel rollers and are used to treat thinning hair.
5. Instruments with a light-emitting diode (LED) photon light attached, mainly used for scarring and wrinkles. However, no published data is available regarding its efficacy. The various lights available are 405 nm blue, 633 nm red, 590 nm yellow and 560 nm green.
6. Home care dermarollers: The Needle size is less than 0.15 mm in length. They are used for treatment of open pores, fine lines, cellulite, stretch marks and to reduce sebum production. They are also used for transdermal delivery of substances like lipopeptides and other antiaging products. They can be used twice a week for up to 100 times. After use, the rollers have to be cleaned in hot tap water and shaken dry.
7. Dermastamp: They are the miniature versions of the Dermaroller® (c) with diameter of 0.12 mm and needle length varying from 0.2-3 mm. They are used for localized scars (e.g., varicella scars) and wrinkles. The procedure with the derma-stamp can be performed in 2 minutes.
8. Dermapen: It is an automated microneedling device which looks like a pen. This ergonomic device makes use of disposable needles and guides to adjust needle length for fractional mechanical resurfacing. It has 9-12 needles arranged in rows. It makes use of a rechargeable battery to operate in two modes, namely, the high speed mode (700 cycles/min) and the low speed mode (412 cycles/min) in a vibrating stamp-like manner. The needles are disposable and hence it is re-usable. It is safe as the needle tips are hidden inside the guide, and more convenient to treat narrow areas such as the nose, around the eyes and lips without damaging the adjoining skin.
9. DermaFrac™: It is a newer modification of microneedling combining microdermabrasion, microneedling, simultaneous deep tissue serum infusion, and LED. It can be used for acne, uneven skin tone, fine lines and wrinkles, open pores and photo damaged skin. It is non invasive, and cost effective with less down time with individualized selection of serums for infusion.
10. Dermarollers with various types of Microneedles
 - a. Hollow microneedles—for insertion into the skin and infusion of drug through the MN pore created.
 - b. Coated microneedles—for deposition of active ingredient into the epidermis, followed by removal of the MN array.
 - c. Solid microneedles—for skin pretreatment, followed by the application of an active-loaded reservoir
 - d. Dissolving microneedles—for delivery of active compound, incorporated into the matrix of the needles, into the skin.
 - e. Swellable microneedles—for drug delivery through the hydrogel matrix from a drug-loaded reservoir

Microneedling like chemical peels is here to stay owing to its safety and efficacy in all skin types.