New Advancements in Microneedle Resurfacing

Facial skin resurfacing of various forms has been recognized since ancient times. Resurfacing techniques have ranged from sandpaper to lasers, typically using mechanical or heat modalities. Skin resurfacing rewards the patient with rejuvenating benefits including stimulation of new collagen, improving appearance of skin texture, wrinkles, and other signs of photodamage. Andre Camirand first described the microneedling technique (which was then called “needle dermabrasion”) after using a tattoo gun to simulate melanogenesis in hypopigmented scars in 1997. Several years later, in 2004, the first derma-roller microneedle device was launched. Then, in 2009, Majid first reported on significant improvement of acne scars with the microneedling technique, and several similar reports have followed.

In the past year, multiple new mechanical microneedle devices have become available. The procedure has become immensely popular with both physicians and patients, due to its remarkable results, brief healing time, and favorable price point.

**HOW IT WORKS**

The newer mechanical variations of microneedle resurfacing perform what’s known as percutaneous collagen induction therapy. This technology includes automated high-speed vibrating handheld devices with multiple stainless steel 32-gauge disposable needles at the tip. The needles penetrate the skin over 1,000 times per second with precise, vertical micro-wounds, stimulating emission of growth factors, fibroblast growth, and production of collagen and elastin. Due to the minimally invasive nature of the procedure, most patients experience three to four days of clinical healing time with erythema, mild swelling, and possible pinpoint bruising. However, despite the fact that the technique is wounding the skin, the procedure can be used safely in all skin types and body areas. Moreover, since there is no heat, there is less risk of hypo/hyperpigmentation.

During the procedure, patients will require topical anesthesia only. In addition to the needles being very small, the vibration of the device provides some modulation of pain due to gate control. Most devices allow for control of depth of treatment, and several passes can be made depending on the fraction of skin coverage desired. Duration of treatment ranges between five and 10 minutes, and the recommended number of sessions can be between three and six. The treatments can be spread apart by four to six weeks, and benefits are gradual for up to six months as seen with other collagen-stimulating modalities. Patients may resume skin care with gentle, hypoallergenic products and sun protection immediately. Ideally, they would add a post-treatment skin care regimen that includes Vitamin C, growth factor product, oxygenation, hyaluronic acid, and a retinoid as tolerated.
Microneedle resurfacing has been found to be successful for multiple skin conditions. It can be used for acne scars, traumatic/surgical scars, striae, and hypo/hyperpigmented scars. It seems to be best for “young” scars and striae that are still pink. Microneedle resurfacing also can be used for photodamage, lentigines, thin seborrheic keratoses, telangiectasias, and wrinkles, including delicate areas such as upper and lower eyelids, neck, décolletage, and hands. Microneedle resurfacing can also be used to drive product into skin, such as HA, vitamin C, minoxidil, or 5-ALA. A recent study showed a statistically significant increase in hair counts in patients who combined microneedling with regular application of minoxidil compared to minoxidil alone. Caution must be used when applying this technique, however, to avoid increasing the risk of allergic reaction to the applied product. Powell, et al. reported three cases of facial allergic granulomatous reactions in patients who were treated with an OTC vitamin C serum in conjunction with microneedling. The microneedle procedure is often combined with the topical application and/or injection of platelet rich plasma to augment its effect with the addition of the patient’s own stem cells and growth factors. This procedure is commonly known as the “vampire facial.” Although this sounds promising, more research is needed to fully understand the best application of this technique.

**DISCUSSION AND CONCLUSION**

 Unlike most traditional resurfacing techniques, microneedling appears to have the benefit of less downtime, less risk, and real results. The procedure itself is fast, nearly painless, and relatively inexpensive, making it very desirable for patients. Younger patients are seeking it out for treatment of acne scars and striae with less fear of physical and financial pain. It can be used safely in some areas where lasers carry higher risk, such as the eyelids, neck, décolletage, and dorsal hands. It can also be used safely in patients of all skin types, making it a safer starting point for treatment of darker skin patients. It can be combined with topical products and other procedures for optimal results. The future of this procedure is likely in its ability to be combined with topical agents in order to augment their therapeutic potential and in drug delivery with a percutaneous route.

This article is based on Dr. Samolitis’s presentation at the 2013 Cosmetic Surgery Forum. For information about the 2014 Cosmetic Surgery Forum (December 3-6 at the Palazzo, Las Vegas) or to register: www.cosmeticsurgeryforum.com.

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