

Successful Treatment of Depressed Scars of the Forehead Secondary to Herpes Zoster Using Subdermal Minimal Surgery Technology

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Depressed facial scars can result from several pathologic processes, such as acne, scleroderma, cutaneous lupus erythematosus, trauma, and secondary changes to the herpes zoster site, as in the case described herein. There are multiple surgical techniques for the correction of these depressed facial scars. These treatments include subcision, medium-depth chemical peels, fillers, carbon dioxide and erbium laser technology, nonablative laser treatment, dermabrasion, punch excision, and fat grafting,¹ which have resulted in varying degrees of success and associated side effects.² Therefore, treatment modalities that are effective in regenerating the dermal matrix and in improving depressed scars with minimal downtime and risk profile are highly desirable.

In “subdermal minimal-surgery” technology, a pneumatically accelerated jet penetrates the epidermis through a small entry point. Once it reaches the dermal layer, the jet immediately spreads laterally in all directions. Because the jet contains heavy hyaluronic acid (HA) molecules that are preloaded into the device, these particles are also directed sideways to create a lateral dispersion.

A 32-year-old Korean man visited the authors’ hospital because of an ipsilateral atrophic, depressed, triangular-shaped defect of the forehead resulting from herpes zoster (Figure 1A). The patient was worried about the cosmetic appearance of the fore-

head defect and wanted it to be treated as soon as possible. The treatment that was given involved the monthly application of subdermal minimal-surgery technology (Airgent; Perfaction, Rehovot, Israel) for 6 months. Anesthesia was administered before treatment by applying a topical anesthetic cream (eutectic mixture of lidocaine and prilocaine, AstraZeneca, Wilmington, DE) for 30 minutes with occlusion. The treatment parameters were as follows: a one-shot 0.2-mL volume of HA and an 80% pressure power with a 10- × 10-mm square-shaped tip. The patient did not require massage on the area after treatment. The patient did not report any pain or discomfort during the treatment. No side effects were evident except some spot bleeding at the injection sites and slight edema that resolved within 48 hours. Initial noticeable improvement was noted after 2 months of treatment, with slight elevation, and the lesion showed marked improvement after 6 months (Figure 1B). Six treatments were given over 6 months. When the treatment was finished, the patient was satisfied with its outcome.

The possible mechanism of Airgent in the reconstruction of a depressed scar is inducing controlled trauma to the dermal layer, which in turn initiates a natural healing process, leading to the desired result. Other treatment modalities that have been used for the correction of depressed facial scars also explain this process.^{3,4} The high-velocity HA particles act as “nanobullets” as they disturb the dermal

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Figure 1. (A) Before treatment and (B) 6 months after sixth treatment.

cells in their passages. This disruption initiates the wound-healing process, which was presumably related to collagen remodeling. Furthermore, the collagen synthesis induced by the wound-healing

process is thought to gradually replace the HA particles. Dermal edema with micro-injury, so-called nanobullets, containing HA particles might facilitate wound-healing processes and provide an aesthetic contribution by sustaining a thicker and longer-lasting dermis.

Although we were not able to determine a clear and precise mechanism of this scar reconstruction, the present study may support the clinical efficacy of subdermal minimal surgery technology (Airgent) in revising the scars produced by herpes zoster. This technique might be applied in various fields of dermatologic scars and surgical scars with excellent clearance in an easy and safe manner.

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