

Effective Treatment of Acne Scars Using Pneumatic Injection of Hyaluronic Acid

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ABSTRACT

Acne scars remain a challenging condition to treat despite multiple currently available technologies.

This study evaluated the clinical efficacy and safety of pneumatic injections of Hyaluronic Acid in the treatment of acne scars.

Two patients (Fitzpatrick skin type IV-V) with acne scars received two sessions of pneumatic, needleless injections of cross-linked hyaluronic acid (HA) at 4-week intervals. The treatment response was assessed by comparing pre- and 3-month post-treatment clinical photography.

The patients' acne scar grade improved from 2 to 1 in the first case, and 3 to 2 in the second case, based on independent physician assessment. Patient degree of satisfaction was similar to the physicians' assessment. No significant adverse events were noted. We conclude that pneumatic injection technology to deliver HA to the tissue is an effective and safe method for improving acne scars, even in patients with dark complexion.

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INTRODUCTION

Acne scars may result from damage to the skin during the healing of active acne. The two causes of acne scar formation can be categorized as either a result of increased tissue formation (hypertrophic scar) or, the more common cause, loss or damage of tissue (atrophic scar).¹ Additionally, acne scars can be divided into 3 basic subtypes: ice-pick scars, rolling scars, and boxcar scars based on their width, depth, and 3-dimensional composition.²

Patients with acne scars may experience severe psychological effects as a result of the cosmetic blemishes. These effects may include emotional debilitation, embarrassment, poor self-esteem, preoccupation, low confidence, anxiety, or depression.³ Current treatment options include dermal fillers, chemical peels, microdermabrasion, laser skin resurfacing, subcision, and needling. The limitations of these treatments are that they may be invasive, and may not provide a complete scar resolution since they do not treat deeper scars. Furthermore, they may cause hyperpigmentation in darker skin types. Another limitation of laser treatments is the need to incorporate needle subcision of scars to release the deep attachments of the scars to underlying structures. There is therefore a need for a treatment modality that will enable treating all scar subtypes, year-round, applicable to darker skin types, and will achieve results with minimal downtime.

This report describes the use of jet volumetric remodeling (JVR) technology to treat acne scars in two patients. It performs by pneumatically accelerating a carrier fluid jet containing high-mass molecules of hyaluronic acid (HA) into the tissue.

MATERIALS AND METHODS

Jet volumetric remodeling technology (Enerjet, PerfAction, Inc., Rehovot, Israel) was used to deliver cross-linked Hyaluronic Acid (Belotero Basic, Merz Aesthetics, Inc., San Mateo, CA). Two patients were treated with the Enerjet system.

Case 1: Female, age 41, Fitzpatrick skin type IV. Acne scars are mainly boxcar type.

Case 2: Male, age 30, Fitzpatrick skin type V. Acne scars are a mix of boxcar and ice pick.

"Overall, the treatment is associated with little or no downtime."

Treatment Protocol

Prior to the treatment, high-resolution photography was documented for each area (Profect Technologies, USA). A treatment session included treatment of the patients' face, as follows:

Case 1: Approximately 20 shots were applied to each side, at a setting of 45% pressure and filling level 5.

Case 2: Approximately 45 shots were applied to each side, at a setting of 40% pressure and filling level 4.

After the treatment, treated areas were visually examined for skin responses. The patients underwent a series of 2 treatment sessions at 4-week intervals. A follow-up evaluation 3

FIGURE 1. Case I: Before and 3 months after 2 treatments (Skin type IV).**FIGURE 2.** Case II. Before and 3 months after 2 treatments (Skin type V).

months after last treatment included high-resolution photography documentation.

RESULTS

Clinical Observations

The treatments were well accepted by the patients who reported mild pain (grading on pain scale) during treatments even without applying an anesthetic prior to the treatment and a high degree of satisfaction (strong improvement). There were no adverse side effects recorded during, after, or in the follow-up.

Positive effects were seen starting 2 weeks after the first therapy on all scars subtypes. In addition, the treatment improved the scars' texture and laxity. The results of treatment are shown in Figures 1-2. The outcome was judged excellent by the patients, the investigator, as well as a blinded, board-certified plastic surgeon. Acne scar grade improved from 2 to

1 in Case 1 and 3 to 2 in Case 2. Minimal side effects include transient bumps and spot bleeding entry points. Overall, the treatment is associated with little or no downtime. Severe adverse events (such as infection, long-lasting erythema, hyperpigmentation) were not observed. Three months after the last treatment, there were marked improvements in acne scars and skin texture.

DISCUSSION

Current acne scars treatment methods such as trichloroacetic acid CROSS technique, subcision, laser resurfacing, punch excision, or elevation and subcision have limited efficacy, and often several techniques are combined.⁴ In particular, darker-skinned patients have a higher probability of prolonged erythema and pigmentary change and a higher risk of hypertrophic scarring in resurfacing procedures such as dermabrasion, laser skin resurfacing, and medium and deep chemical peeling.

Enerjet's needleless mechanism of action is based on high-velocity pneumatic acceleration of high-mass hyaluronic acid particles, which penetrates the epidermis through a tiny entry point. Once the accelerated jet reaches the dermal layer, it spreads laterally, causing a controlled micro-injury to the dermal layer, initiating the wound-healing process, and stimulating neocollagenesis, a favorable secondary effect.⁵

Jet volumetric remodeling technology has shown promising results, and may address some of the limitation of other treatment modalities, and may be used in combination for an effective treatment. This technology is associated with short downtimes and is applicable to all acne scar subtypes as well as all skin types. With JVR technology, the specific scar area is treated, in contrast to other modalities such as chemical peels or laser skin resurfacing where a significantly larger area outside the scar is subject to the treatment.

CONCLUSION

The Enerjet system provides a unique, advanced technology for a safe and effective acne scar treatment with minimal downtime, pain, or side effects. Improved clinical results may be achieved by optimizing HA volume and pressure power according to skin type, treatment area, age, scar type (eg, high pressure power in deep scars, greater volume of HA in extensive scars). Additional controlled trials including multiple patients, longer follow-up, and different parameters will be necessary to determine the optimal settings for achieving the best clinical effects per each scar subtype.

DISCLOSURES

Dr. Patel is a consultant for PerfAction. Mr. Tevet was an employee of PerfAction.

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