

Clinical outcomes using Viora's SVC™ Technology: Patients' Satisfaction, Safety and Comfort

Inna Belenky (Ph.D.)

KEY WORDS: photoageing, fractional Radiofrequency, vacuum, skin tightening, skin resurfacing, skin rejuvenation

ABSTRACT: The main limitation of the first generation of fractional RF systems is the inability to create sufficient coagulation/necrosis without ablating the epidermal layer, or have the ability to ablate the epidermis without coagulation/necrosis. Viora's SVC™ technology represents the second generation of fractional RF systems. Thirty volunteers underwent a treatment course of 3-6 treatments with Viora's V-FR handpiece. Twenty-nine of the 30 volunteers showed notable to significant improvement in the photoageing symptoms, with no complications or significant adverse events. Due to its wide spectrum of parameters and unique features, SVC™ technology can promote different biological responses in three different skin layers with increased safety and comfort. Viora's fractional RF handpiece (V-FR) represents a new generation of fractional RF devices with enhanced control over biological responses, while improving patients' treatment experience and safety.

Introduction

Since the first introduction of fractional technology in 2003, many fractional systems were launched to the market including ablative and non-ablative fractional lasers, along with the introduction of fractional radiofrequency (RF) technology in 2009 (Fig. 1).

The concept of non-ablative fractional photothermolysis was introduced to the market to address the need for effective, yet low risk, skin rejuvenation techniques. Unlike conventional ablative (CO₂ and Erbium) and non-ablative lasers, fractional modalities treat only a fraction of the skin, leaving up to a maximum of 95% of the skin untouched. The undamaged surrounding tissue allows for a reservoir of viable tissue, permitting rapid epidermal repair [1]. The ablative fractional lasers are used for skin resurfacing applications, including improvement of post-acne scars, skin texture, tone, etc. [2].

The first generation of fractional RF systems create superficial ablation with coagulative/necrosis on the upper dermal layer (Fig. 1). Although the clinical outcomes for skin resurfacing applications were quite sufficient, the main limitation of these systems is the inability to create sufficient coagulation/necrosis without ablating the epidermal layer, or have the ability to ablate the epidermis without coagulation/necrosis on the upper dermis [3].

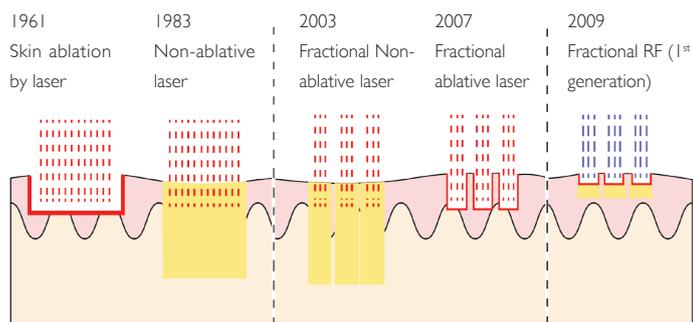


Figure 1. Evolution of the development of skin resurfacing / rejuvenation technologies, including schematic representation of the biological response.

Viora's SVC™ technology represents the 2nd generation of fractional RF systems, with the ability to create separate biological responses: ablation only, coagulation only or both ablation and coagulation. The aim of this study was to evaluate the clinical outcomes using the SVC™ technology for different applications, based on the principle of separated biological responses.

Material and methods

Case Study Group

A group of thirty volunteers (21 females and 9 males) participated in the current study, ranging in age from 34-68 years (mean age, 41 years) and Fitzpatrick skin type II-V.

Device Description

Viora's fractional RF handpiece (V-FR) utilizes the patented SVC™ technology. SVC stands for the combination of Switching, Vacuum and Cooling mechanisms. The switching technology is responsible for the "Smart Heat" pulse, which increases skin conductivity prior to the fractional pulse. In addition, the switching mechanism controls RF depth penetration reflected via three programs: Shallow, Medium and Deep.

The vacuum function ensures proper coupling of electrodes to the skin, minimizing the risk of epidermal burns, reduces pain levels (per the "Gate Theory") and causes more equal, consistent and symmetrical injury points.

The last feature of the SVC™ technology is the cooling mechanism. The cooling technology protects the superficial skin layers and reduces pain levels.

Treatment Regimen

The patients underwent a treatment course of 3-6 treatments, according to each of their symptoms, with intervals of four-six weeks.

For superficial skin resurfacing, which includes skin tone, texture and pigment disorders, the treatments were conducted with the "Shallow" program, 4.00-6.75 J and 10-50 milliseconds. For post acne scars and deep wrinkles the treatments were conducted with the "Deep" program, 3.25-6.50 J and 70-100 milliseconds. For skin rejuvenation and fine wrinkles the treatments were conducted with the "Medium" program, 3.50-6.25 J and 50-80 milliseconds.

Clinical Assessment

Clinical photographic assessments were recorded in two phases: (1) at baseline - prior to the first treatment and (2) four weeks after the final treatment of the treatment course. Additionally, the treating practitioners were asked to record and immediately report any adverse or unexpected side-effects.

Results

All volunteers showed notable to significant improvement in the photoageing symptoms, except one patient who showed deterioration in skin texture. This particular patient, contrary to treatment guidelines, received bi-weekly treatments, in which the deterioration can be attributed to "over-heating".

During the trial, no complications or significant adverse events were recorded. Immediately after the treatment uniform erythema and/or rectangular shaped edema was detected as a positive end-point. When ablative settings were used (high fluence and short pulse duration), a noticeable burning smell from the skin and the tip was detected. When non-ablative settings were used (with pulse duration longer than 70 milliseconds), only uniform erythema was detected. In most cases the edema faded within 40-120 min post procedure; followed by the disappearance of erythema during the next 12-24 hours.

Superficial skin resurfacing procedures

The patients who received superficial skin resurfacing procedures already showed notable improvement in skin tone and texture 4 weeks after the first treatment. The total number of treatments ranged from 2 to 3 treatments, except in cases where solar lentigo was treated. In the case of pigmented disorders, the treatment course was extended to 4-5 treatments (see example in **Fig. 2**).



Figure 2. A 55 year old female before (left) and after 4 treatment sessions (right). Results show a noticeable improvement in the age spot.

Skin resurfacing and rejuvenation procedures

Patients displaying photoaged symptoms which require heat penetration up to the reticular dermis were treated with the "Deep" program. Patients with advanced to severe wrinkles received 3-5 treatments (see example in **Fig. 3**), while patients with post-acne scars required up to 6 treatments (see example in **Fig. 4**), depending on the age and skin's characteristics, such as type of the scar, dermal thickness and natural moisture level.



Figure 3. A 61 year old female before (left) and after 5 treatment sessions (right). Results show a noticeable improvement in wrinkles, skin texture and tone.



Figure 4. A 65 year old female before (left) and after 6 treatment sessions (right). Results show a noticeable improvement in the post-acne scars and general skin texture.

Skin rejuvenation procedures

General skin rejuvenation, fine wrinkle reduction or any procedure requiring heat penetration up to the upper dermis (papillary dermis) were conducted with the "Medium" program. The treatment course ranged between 3 to 5 sessions.

Discussion

Due to its wide spectrum of parameters and unique features, SVC™ technology can promote different biological responses in three skin layers (epidermis, papillary and reticular dermis). For skin resurfacing procedures, an ablative effect is required. Similar to laser action, a response is achieved by using high energy settings with short pulse durations. For skin rejuvenation a longer pulse duration is used to deliver a sufficient thermal dose for coagulation. For a skin tightening effect and lifting only volumetric heating is necessary, which can be achieved by using a low energy setting and the longest pulse duration available.

Understanding which type of procedure is needed for each application is crucial in order to achieve the best clinical outcomes. The target skin layer and target biological response, therefore, will dictate the treatment settings.

In practice, while conducting treatments according to the biological logic described above, the clinical outcomes are significant, as evident in this study group.

Summary

Viora's fractional RF handpiece (V-FR) represents a new generation of fractional RF devices for aesthetic and dermatological skin resurfacing and rejuvenation.

The availability of enhanced control over biological responses enables better targeting of specific skin conditions while improving patients' treatment experience and safety.

References

1. Manstein D, Herron GS, Sink RK, et al. (2004). Fractional photothermolysis: a new concept for cutaneous remodeling using microscopic patterns of thermal injury. *Lasers Surg Med*, 34, 426-438.
2. Cohen SR, Hensler C, Horton K, Broder KV, Moise-Broder PA. (2008). Clinical experience with the Fraxel SR laser: 202 treatments in 59 consecutive patients. *Plast Reconstr Surg*, 121, 297e-304e.
3. Brightman L, Goldman MP, Taub AF. (2009). Sublative rejuvenation: experience with a new fractional radiofrequency system for skin rejuvenation and repair. *J Drugs Dermatol*, 8, s9-13.
4. Lask G, Friedman D, Elman M, Fournier N, Shavit R, Slatkine M. (2006). Pneumatic skin flattening (PSF): a novel technology for marked pain reduction in hair removal with high energy density lasers and IPLs. *J Cosmet Laser Ther*, 8, 76-81.
5. Stureson C, Andersson-Engels S. (1996). Mathematical modelling of dynamic cooling and pre-heating, used to increase the depth of selective damage to blood vessels in laser treatment of port wine stains. *Phys Med Biol*, 41, 413-428.
6. Raulin C, Grema H. (2004). Single-pass carbon dioxide laser skin resurfacing combined with cold-air cooling: efficacy and patient satisfaction of a prospective side-by-side study. *Arch Dermatol*, 140, 1333-1336.